APPENDIX A

Draft EIS Distribution List

APPENDIX A
DRAFT EIS DISTRIBUTION LIST

Federal Government – Elected Officials

U.S. Representative Earl Blumenauer, OR

U.S. Representative Suzanne Bonamici, OR

U.S. Representative Peter Defazio, OR

U.S. Representative Kurt Schrader, OR

U.S. Representative Greg Walden, OR

U.S. Senator Jeff Merkley, OR

U.S. Senator Ron Wyden, OR

Federal Agencies

Advisory Council on Historic Preservation, Assistant Director for Federal Program Development, Charlene Vaughn, DC

Army Corps of Engineers, Planning and Policy Division, Senior Policy Advisor, John Furry, DC

Bureau of Indian Affairs, DOI, Chief, Division of Environmental and Cultural Resources Management, Marv Keller, VA

Bureau of Land Management, DOI, Senior NEPA Specialist, Kerry Rogers, DC

Bureau of Ocean Energy Management, DOI, Chief, Division of Environmental Assessment, James Bennett, VA

Bureau of Oceans & International Environmental & Scientific Affairs, DOS, Foreign Affairs Officer, Alexander Yuan, DC

Bureau of Safety and Environmental Enforcement, DOI, Chief, Environmental Enforcement Division, Charles Barbee, VA

Commandant (CG-OES-4) Chief (Acting), Deepwater Ports Standards Division, U.S. Coast Guard, Attorney/Advisor, Curtis Borland, DC

Conservation and Environmental Program Division, FSA, USDA, National Environmental Compliance Manager, Nell Fuller, DC

Council on Environmental Quality, Senior Counsel, Ellen Athas, DC

Council on Environmental Quality, Associate Director for NEPA Oversight, Horst Greczmiel, DC

Department of Interior, Office of Environmental Policy and Compliance, Director, DC

Dept. of Health & Human Services, Environmental Program Manager, Edward Pfister, DC

DOD Siting Clearinghouse, Steve Sample, DC

DOD Siting Clearinghouse, Attn: Chief, Mission Evaluation Branch, DC

Environment & Natural Resources Division, DOJ, NEPA Coordinator, Beverly Li, DC

Environmental Protection Agency, Natural Gas STAR, Jerome Blackman, DC

Environmental Protection Agency, Director, Office of Federal Activites, Susan Bromm, DC

Environmental Protection Agency, Assistant Administrator, Office of Enforcement and Compliance Assurance, Cynthia Giles, DC

Environmental Protection Agency, Director, NEPA Compliance Division, Cliff Rader, DC

National Center for Environmental Health, CDC, HHS, Director, Division of Emergency and Environmental Health Services, Sharunda Buchanan, GA

National Oceanic and Atmospheric Administration, Dept. of Commerce, NEPA Policy & Compliance, Steve Kokkinakis, MD

National Park Service, DOI, Chief, Environmental Planning and Compliance Branch, Patrick Walsh, CO

Natural Resources Conservation Service, USDA, National Environmental Coordinator, Andree DuVarney, DC

NOAA National Marine Fisheries Service, Dept. of Commerce, National NEPA Coordinator, Steve Leathery, MD

Office of Assistant Secretary for Transportation Policy, USDOT, Environmental Policy Team Coordinator, Camille Mittelholtz, DC

Office of Assistant Secretary for Transportation Policy, USDOT, Senior Environmental Attorney Advisor, Helen Serassio, DC

Office of Environment and Energy, HUD, Community Planner, Danielle Schopp, DC

Office of Environmental Management, DOE, Principal Deputy Assistant Secretary, Mark Whitney, DC

Office of NEPA Policy and Compliance, DOE, Director, OGC, Carol Borgstrom, DC

Office of Pipeline Safety USDOT PHMSA, Senior Attorney, Bryn Karaus, DC

Office of Pipeline Safety USDOT PHMSA, Director, Engineering and Research Division, Kenneth Lee, DC

Office of the Assistant Secretary of the Army for Civil Works, Assistant for Environment, Tribal & Regulatory Affairs, DC

Office of the Assistant Secretary of the Navy (Energy, Installations and Environment), DC

Office of the Deputy Assistant Secretary of the Air Force (Installations), Attn: Liaison, DOD Siting Clearinghouse (SAF/IEI), DC

Office of the Deputy Assistant Secretary of the Army (Energy & Sustainability), Attn: Liaison, DOD Siting Clearinghouse, DC

Pipeline & Hazardous Materials Safety Administration USDOT, Associate Administrator for Hazardous Materials Safety, Magdy El-Sibaie, DC

Pipeline & Hazardous Materials Safety Administration, Office of Pipeline Safety, USDOT, National CATS Coordinator, Karen Lynch, DC

Pipeline & Hazardous Materials Safety Administration, USDOT, Senior Assistant Chief Counsel, Sherri Pappas, DC

Pipeline & Hazardous Materials Safety Administration, USDOT, Associate Administrator for Pipeline Safety, Jeffrey Wiese, DC

Senate Energy and Natural Resources Committee, Chairman, Mary Landrieu, DC

Surface Transportation Board, USDOT, Chief, Section of Environmental Analysis, Victoria Rutson, DC

U.S. Geological Survey, Chief, Environmental Management Branch, Esther Eng, VA

United States Fish & Wildlife Service, DOI, National Coordinator, Pat Carter, VA

US Customs & Border Protection Dept. of Homeland Security, Branch Chief, Christopher Oh, DC

US Department of Energy, Director, Division of Natural Gas Regulatory Activities, John Anderson, DC

USDA Forest Service-Ecosystem Management Coordination, Assistant Director, NEPA, Joe Carbone, DC

Advisory Council on Historic Preservation, Director, Planning and Review, DC

APHIS PPD/EAD, Deputy Director, MD

Energy and Environmental Readiness Division, Chief of Naval Operations (N45), DC

National Agricultural Library, Acquisitions & Serials Branch, MD

Natural Resources Conservation Service, National Environmental Coordinator, DC

NOAA Office of Policy and Strategic Planning, NEPA Coordinator, DC

US Department of the Interior, Environmental Policy & Compliance, Director, Willie Taylor, DC

Bureau of Indian Affairs, Realty Officer, Greg Argel, OR

Bureau of Reclamation, Public Affairs Specialist, Kevin Moore, OR

Bureau of Reclamation, Area Manager, Jason Phillips, OR

Bureau of Reclamation, Mid-Pacific Region, Klamath Basin Area Office, Water and Lands Specialist, Elizabeth Gregory, OR

Bureau of Reclamation, Mid-Pacific Region, Klamath Basin Area Office, Natural Resource Specialist, Kristen Hiatt, OR

Environmental Analysis Section, Bureau of Ocean Energy Management, Chief, Dave Panzer, CA

Federal Aviation Administration, Office of Air Traffic Organization, Regional Director, WA

Federal Aviation Administration, Seattle Airports District Office, Airspace & Environmental Specialist, Paul Holmquist, WA

Federal Highway Administration, Division Administrator, Daniel Mathis, WA

Klamath Basin National Wildlife Refuge, Refuge Manager, Ron Coleman, CA

National Marine Fisheries Service, Habitat Conservation Division, Assistant Regional Administrator, Michael Tehan, OR

National Marine Fisheries Service, NW Region, Regional Administrator, Will Stelle, WA

National Marine Fisheries Service, Oregon Coast Branch, Branch Chief, Ken Phippen, OR

National Marine Fisheries Service, Oregon State Habitat Conservation Division, Director, Dr. Kim Kratz, OR

National Marine Fisheries Service, Protected Resources Division, Fishery Management Officer, Donna Darm, WA

National Park Service, Michael Linde, WA

Natural Resources Conservation Service, Coquille Service Center, District Conservationist, Amy Wilson, OR

Natural Resources Conservation Service, Douglas County SWCD, District Manager, Walter Barton, OR

Natural Resources Conservation Service, Klamath Falls Service Center, Basin Team Leader, Kevin Conroy, OR

Natural Resources Conservation Service, Klamath Falls Service Center, District Conservationist, David Ferguson, OR

Natural Resources Conservation Service, Medford Service Center, District Conservationist, Erin Kurtz, OR

Natural Resources Conservation Service, Roseburg Service Center, Basin Team Leader, Evelyn Conrad, OR

Northwest Power & Conservation Council, Executive Director, Steve Crow, OR

US Army Corps of Engineers, Eugene Permits Section Chief, Teena Monical, OR

US Army Corps of Engineers, North Bend Field Office, Tyler Krug, OR

US Army Corps of Engineers, Portland Dist, Commander and District Engineer, Col. Richard Hobernicht, OR

US Army Corps of Engineers, Seattle Dist, Commander, Col. Bruce Estok, WA

US Bureau of Indian Affairs, Northwest Regional Office, Regional Director, Stanley Speaks, OR

US Bureau of Land Management, Boise District, Natalie Cooper, ID

US Bureau of Land Management, Coos Bay District Office, Planning and Environmental Coordinator, Steven Fowler, OR

US Bureau of Land Management, Coos Bay District Office, District Manager, Mark Johnson, OR

US Bureau of Land Management, Klamath Falls Resource Area Office, Project Coordinator, Deborah Boudreau, OR

US Bureau of Land Management, Klamath Falls Resource Area Office, Supervisory Planner & Environmental Coordinator, Don Hoffheins, OR

US Bureau of Land Management, Klamath Falls Resource Area Office, Field Manager, Donald Holmstrom, OR

US Bureau of Land Management, Lakeview District Office, District Manager, E. Lynn Burkett, OR

US Bureau of Land Management, Medford District, District Manager, Dayne Barron, OR

US Bureau of Land Management, Medford District, Natural Resource Specialist, Anthony Kerwin, OR

US Bureau of Land Management, Medford District, Field Manager, Jon Raby, OR

US Bureau of Land Management, Medford District, Associate District Manager, Mary Smelcer, OR

US Bureau of Land Management, Medford District, Supervisory Realty Specialist, Carl Symons, OR

US Bureau of Land Management, Medford District, Project Manager, Miriam Liberatore, OR

US Bureau of Land Management, Medford Office, Field Manager, John Gerritsma, OR

US Bureau of Land Management, Oregon State Office, Planning Coordinator, Leslie Frewing, OR

US Bureau of Land Management, Oregon State Office, Acting State Director, Michael Mottice, OR

US Bureau of Land Management, Oregon State Office, Dustin Wharton, OR

US Bureau of Land Management, Oregon State Office, Deputy State Director, Resource Planning, Use & Protection, Mike Haske, OR

US Bureau of Land Management, Price Field Office, Senior National Project Manager, Mark Mackiewicz, UT

US Bureau of Land Management, Roseburg District, Planner and Environmental Coordinator, Paul Ausbeck, OR

US Bureau of Land Management, Roseburg District, Field Manager, Steve Lydick, OR

US Bureau of Land Management, Roseburg District, Realty Specialist, Charlene Rainville, OR

US Bureau of Land Management, Roseburg District, District Manager, Katrina Symons, OR

US Bureau of Reclamation, Mid-Pacific Regional Office, Regional Archaeologist, Laureen Perry, CA

US Coast Guard, Lt. Stephanie Pitts, OR

US Coast Guard, Marine Safety Unit, Sector Portland, Russell Berg, OR

US Coast Guard MLCPAC Environmental Law Branch, Chief, Jack Hug, CA

US Coast Guard, 13th District, Commander, Admiral Keith Taylor, WA

US Coast Guard, Group Air Station North Bend, Surface Operations Chief, Clint Prindle, OR

US Coast Guard, MSU Portland, Commanding Officer, Captain Daniel LeBland, OR

US Coast Guard, Sector Columbia River, Captain, B.C. Jones, OR

US Department of the Interior, Office of Environmental Policy & Compliance, Regional Environmental Officer, Allison O'Brien, OR

US Department of Transportation (DOT), PHMSA Pipeline Safety Western Region Office, Regional Director, Chris Hoidal, CO

US DOT, Federal Aviation Administration, Office of Air Traffic Organization, Manager, System Support, Clark Desing, WA

US DOT, PHMSA/CATS, Ross Reineke, CO

US DOT/PHMSA/CATS, Western Region Office, State Liaison, Tom Finch, CO

US Environmental Protection Agency (EPA), NEPA Review, Teresa Kubo, OR

US EPA, Public Affairs Unit, Mark MacIntyre, WA

US EPA, Oregon Operations Office, Director, Anthony Barber, OR

US EPA Region 10, Office of Ecosystems, Tribal, and Public Affairs, Director, Katherine Kelly, WA

US EPA, Office of Ecosystems, Tribal, and Public Affairs, Manager, NEPA Review, Christine Reichgott, WA

US Fish & Wildlife Service, Klamath Falls Field Supervisor, Laurie Sada, OR

US Fish & Wildlife Service, Energy Projects Coordinator, Doug Young, OR

US Fish & Wildlife Service, Pacific Region, State Supervisor, Paul Henson, OR

US Fish & Wildlife Service, Pacific Region, Assistant Regional Director, Terry Rabot, OR

US Fish & Wildlife Service, Pacific Region, Regional Director, Robyn Thorson, OR

US Fish & Wildlife Service, Roseburg Field Office, Field Supervisor, Jim Thrailkill, OR

US Fish and Wildlife Service (USFWS), Division Supervisor - Energy, Infrastructure, and Ecosystems Services Division, Joe Zisa, OR

USDA Forest Service Fremont-Winema National Forest, Forest Supervisor, Connie Cummins, OR

USDA Forest Service Rogue River-Siskiyou National Forest, Forest Supervisor, Rob MacWhorter, OR

USDA Forest Service, High Cascades Ranger District, District Ranger, Mitch Wilkerson, OR

USDA Forest Service, Klamath Ranger Dist, District Ranger, Margaret Bailey, OR

USDA Forest Service, Pacific NW Region, Michael Hampton, OR

USDA Forest Service, Pacific NW Region 6, Regional Forester, Kent Connaughton, OR

USDA Forest Service, Region 6, Regional Energy Coordinator, Kristen Bonanno, OR

USDA Forest Service, Rogue River-Siskiyou National Forest, Environmental Coordinator, Sasha Fertig, OR

USDA Forest Service, Rogue River-Siskiyou National Forest, Acting District Ranger, Les Moscoso, OR

USDA Forest Service, Umpqua National Forest, Forest Supervisor, Alice Carlton, OR

USDA Forest Service, Umpqua National Forest, Catherine Callaghan, OR

USDA Forest Service, Umpqua National Forest, Wes Yamamoto, OR

USDA Forest Service, Umpqua National Forest, Roseburg Office, Jane Beaulieu, OR

USDA Forest Service, Umpqua National Forest, Roseburg Office, Pam Sichting, OR

USDA Forest Service, Umpqua National Forest, Tiller Ranger District, District Ranger, Donna Owens, OR

Waterways Management & Facilities Inspection, US Coast Guard Marine Safety Unit, Ken Lawrenson, OR

Oregon Agencies and Elected Officials

Governor John Kitzhaber

Office of the Governor, Energy Policy Advisor, Margi Hoffmann

The Honorable Jason Atkinson, Oregon State Legislature

The Honorable Alan Bates, Oregon State Legislature

The Honorable Peter Courtney, Oregon State Legislature

The Honorable Ted Ferrioli, Oregon State Legislature

The Honorable Tim Freeman, Oregon State Legislature

The Honorable Bill Kennemer, Oregon State Legislature

The Honorable Wayne Krieger, Oregon State Legislature

The Honorable Jeff Kruse, Oregon State Legislature

The Honorable Floyd Prozanski, Oregon State Legislature

The Honorable Dennis Richardson, Oregon State Legislature

The Honorable Arnie Roblan, Oregon State Legislature

The Honorable Joanne Verger, Oregon State Legislature

The Honorable Matt Wand, Oregon State Legislature

The Honorable Doug Whitsett, Oregon State Legislature

Oregon Building Codes Division, Director, Patrick Allen

Oregon Business Development Department, Business Development Officer, Coos and Douglas Counties, Chris Claflin

Oregon Business Development Department, Business Development Officer, Jackson and Klamath Counties, Larry Holzgang

Oregon Business Development Department, Director, Tim McCabe

Oregon Department of Agriculture, Director, Katy Coba

Oregon Department of Agriculture, Food Safety Division, Will Fargo

Oregon Department of Agriculture, Natural Resources Division, Administrator, Ray Jaindl

Oregon Department of Agriculture, Natural Resources Division, Land Use & Water Planning Coordinator, Jim Johnson

Oregon Department of Energy, Senior Policy Analyst, Bill Drumheller

Oregon Department of Energy, LNG Emergency Manager, Deanna Henry

Oregon Department of Energy, Energy Facility Analyst, Duane Kilsdonk

Oregon Department of Energy, Senior Policy Analyst, Matt Krumenauer

Oregon Department of Energy, Energy Facility Analyst, Sue Oliver

Oregon Department of Energy, Senior Policy Analyst, Rebecca O'Neil

Oregon Department of Energy, Director, Bob Repine

Oregon Department of Energy, Senior Policy Analyst, Vijay Satyal

Oregon Department of Energy, Operations Analyst, Shanda Shribbs

Oregon Department of Energy, Siting Manager, Tom Stoops

Oregon Department of Energy, Energy Facility Analyst, Billie "Mo" Walker

Oregon Department of Energy, Energy Facility Analyst, John White

Oregon Department of Environmental Quality, Water Quality Division Administrator, Greg Aldrich

Oregon Department of Environmental Quality, Dave Belyea

Oregon Department of Environmental Quality, Regional Solutions Team Representative, Kate Jackson

Oregon Department of Environmental Quality, Office of Compliance and Enforcement Administrator, Leah Koss

Oregon Department of Environmental Quality, Director, Dick Pedersen

Oregon Department of Environmental Quality, Coos Bay Branch, Permit Writer, Martin Abts

Oregon Department of Environmental Quality, Coos Bay Branch, Manager, John Becker

Oregon Department of Environmental Quality, Coos Bay Branch, Permitting/Compliance Specialist, Steve Nichols

Oregon Department of Environmental Quality, Western Region, Region Administrator, Keith Andersen

Oregon Department of Fish & Wildlife, Habitat Conservation Biologist, Jason Brandt

Oregon Department of Fish & Wildlife, Fish Biologist, Mike Gray

Oregon Department of Fish & Wildlife, Chair of the Oregon Fish and Wildlife Commission, Ms. Bobby Levy

Oregon Department of Fish & Wildlife, Charleston Field Office, Habitat Protection Biologist, Christopher Claire

Oregon Department of Fish & Wildlife, Wildlife Division, Administrator, Ron Anglin

Oregon Department of Fish & Wildlife, Wildlife Division, Habitat Resources Program Manager, Jon Germond

Oregon Department of Fish and Wildlife, Fish Division Administrator, Ed Bowles

Oregon Department of Fish and Wildlife, Energy/NRDA Coordinator, Art Martin

Oregon Department of Forestry, Deputy State Forester, Paul Bell

Oregon Department of Forestry, Oregon State Forester, Doug Decker

Oregon Department of Forestry, Stewardship Forester, Jack Tannehill

Oregon Department of Forestry, Division Chief, Administrative Services Division, Satish Upadhyay

Oregon Department of Geology & Mineral Industries, Engineering Geologist, Bill Burns

Oregon Department of Geology & Mineral Industries, State Geologist, Dr. Vicki McConnell

Oregon Department of Justice, Assistant Attorney General, Anika Marriott

Oregon Department of Justice, Senior Assistant Attorney General, Natural Resources Section, Don Pyle

Oregon Department of Land Conservation & Development, Acting Director, Jim Rue

Oregon Department of Land Conservation & Development, OCMP, State-Federal Relations Coordinator, Juna Hickner

Oregon Department of Land Conservation and Development, Senior Coastal Policy Analyst, Matt Spangler

Oregon Department of State Lands, Communications Manager, Julie Curtis

Oregon Department of State Lands, Natural Resources Coordinator, Bob Lobdell

Oregon Department of State Lands, Southern Region Manager, Eric Metz

Oregon Department of State Lands, Director, Louise C. Solliday

Oregon Department of State Lands, Northern Region Manager, Lori Warner-Dickason

Oregon Department of Transportation, Transportation Development Division Administrator, Jerri Bohard

Oregon Department of Transportation, Transportation Planner, Judith Callens

Oregon Department of Transportation, Director, Matthew Garrett

Oregon Department of Transportation, Planning Manager, Erik Havig

Oregon Department of Transportation, Government Relations Manager, Betsy Imholt

Oregon Department of Transportation, Transportation Development Division, Region 3 Planning Manager, Mike Baker

Oregon Energy Facility Siting Council, Chair, W. Bryan Wolfe

Oregon Office of the State Fire Marshall, Deputy State Fire Marshall, Central Point, Charles Chase

Oregon Office of the State Fire Marshall, Deputy State Fire Marshall, North Bend, Sean Condon

Oregon Office of the State Fire Marshall, Deputy State Fire Marshall, Central Point, Michelle Stevens

Oregon Office of the State Fire Marshall, State Fire Marshall, Mark Wallace

Oregon Parks & Recreation Department, Director, Tim Wood

Oregon Parks & Recreation Department, State Historic Preservation Office, Matt Diederich

Oregon Parks & Recreation Department, State Historic Preservation Office, State Archaeologist, Dr. Dennis Griffin

Oregon Parks & Recreation Department, State Historic Preservation Office, Assistant State Archaeologist, John Pouley

Oregon Parks and Recreation Department, Natural Resources, South Coast Coastal Coordinator (Douglas and Coos Counties), Calum Stevenson

Oregon Public Utility Commission, Chair, The Honorable Susan Ackerman

Oregon Public Utility Commission, Commissioner, The Honorable Stephen Bloom

Oregon Public Utility Commission, Interim Executive Director, Michael Dougherty

Oregon Public Utility Commission, Administrator, Electical and Natural Gas Division, Maury Galbraith

Oregon Public Utility Commission, Natural Gas Safety, Kevin Hennesey

Oregon Public Utility Commission, Natural Gas Safety, Al Lau

Oregon Public Utility Commission, Commissioner, The Honorable John Savage

Oregon Public Utility Commission, Natural Gas Safety, Michael Thompson

Oregon Public Utility Commission, Senior Analyst - Electric and Natural Gas Division, Kenneth Zimmerman, Ph.D.

Oregon State Marine Board, Director, Scott Brewen

Oregon Water Resources Department, Land Use Planning, Bill Fujii

Oregon Water Resources Department, Manager, South Central Region, Kyle Gorman

Oregon Water Resources Department, Watermaster, District 19, Mitch Lewis

Oregon Water Resources Department, Watermaster, District 13 (Jackson County), Larry Menteer

Oregon Water Resources Department, Director, Phillip C. Ward

Oregon Water Resources Department, Watermaster, District 17 (Klamath County), Scott White

Oregon Water Resources Department, Watermaster, District 15 (Douglas County), David Williams

South Slough National Estuarine Research Reserve, Manager, Mike Graybill

Local Governments and Elected Officials

Ashland City Council, Council Member, Greg Lemhouse

Ashland City Council, Council Member, Michael Morris

Ashland City Council, Council Member, Dennis Slattery

Canyonville City Council, Council Member, Louise Barton

Canyonville City Council, Council Member, Frank Braudt

Canyonville City Council, Council Member, Judy Coleman

Canyonville City Council, Council Member, Dennis Douglas

Canyonville City Council, Council Member, Buddy Kovachy

Canyonville City Council, Council Member, Ed Parker

City of Ashland, Council Member, Carol Voisin

City of Ashland, Public Works Director, Mike Faught

City of Ashland, Mayor John Stromberg

City of Bonanza, City Recorder, Danice Brakeman

City of Bonanza, Mayor Betty Tyree

City of Butte Falls, City Recorder

City of Butte Falls, Mayor

City of Canyonville, City Administrator/Recorder, Janelle Evans

City of Canyonville, Mayor Bob Deaton

City of Canyonville Public Works Department, Public Works Supervisor, Tony Lakey

City of Coos Bay, City Manager, Rodger Craddock

City of Coos Bay, Police Chief, Gary McCullough

City of Coos Bay, Mayor Crystal Shoji

City of Coos Bay Public Works & Development Department, Director, Jim Hossley

City of Coquille, City Manager, Ben Marchant

City of Eagle Point, City Recorder, Cindy Hughes

City of Eagle Point, Council President, Alan Curriston

City of Eagle Point, Mayor Bob Russell

City of Elkton, Mayor Rebecca Swearingen

City of Glendale, City Recorder, Betty Stanfill

City of Glendale, Mayor Fred Jensen

City of Grants Pass, City Manager, Aaron Cubic

City of Grants Pass, Mayor Mike Murphy

City of Jacksonville, City Recorder, Jan Garcia

City of Jacksonville, Mayor Paula Becker

City of Klamath Falls, City Manager, Rick Whitlock

City of Klamath Falls, Mayor Todd Kellstrom

City of Klamath Falls Community Development, Director, Sandra Fox

City of Klamath Falls, Public Works Department, Director, Mark Willrett

City of Lakeside, Mayor Ed Gowan

City of Malin, City Recorder, Kay Neumeyer

City of Malin, Mayor Gary Zieg

City of Medford, City Manager, Eric Swanson

City of Medford, Mayor Gary Wheeler

City of Medford Planning Department, Director, Jim Huber

City of Merrill, Manager, Merrill City Hall, Samantha Meadows

City of Merrill, Mayor Ronda Lyon

City of Myrtle Creek, Mayor Dan Jocoy

City of Myrtle Creek, Sean Negherbon

City of Myrtle Creek Public Works Department, Director, Jim Watson

City of Myrtle Point, City Manager, John Walsh

City of Myrtle Point, Mayor Michael Johnson

City of North Bend, City Administrator, Terence E. O'Connor

City of North Bend, City Councilor, Mike Eberle

City of North Bend, City Councilor, Larry Garboden

City of North Bend, City Councilor, Howard Graham

City of North Bend, City Councilor, Barry Hayes

City of North Bend, City Councilor, Bill Richardson

City of North Bend, City Councilor, Janet Rubin

City of North Bend, City Planner, David Voss

City of North Bend, Fire Chief, Scott Graham

City of North Bend, Police Chief, Steve Scibelli

City of North Bend, Mayor Rick Wetherell

City of North Bend Public Works, Engineering Coordinator, Derek Windham

City of Powers, City Manager

City of Powers, Mayor Edward Hamlett

City of Riddle, Mayor William Duckett

City of Riddle Public Works Department, Director, Eric Quinn

City of Rogue River, Mayor John Bond

City of Roseburg, City Manager pro-tem, Sheila R. Cox

City of Roseburg, Mayor Larry Rich

City of Roseburg - Public Works Dept, Public Works Director, Nikki Messenger

City of Shady Cove, City Administrator, Danise Brakeman

City of Shady Cove, Mayor Ron Holthusen

City of Talent, City Manager, Tom Corrigan

City of Talent, Mayor William Cecil

Coos Bay City Council, Council Member, Jennifer Groth

Coos Bay City Council, Council Member, Jon Hanson

Coos Bay City Council, Council Member, Stephanie Kramer

Coos Bay City Council, Council Member, Gene Melton

Coos Bay City Council, Council Member,Dr. John Muenchrath

Coos Bay City Council, Council Member, Mike Vaughan

Coos Bay Fire and Rescue, Fire Chief, Stan Gibson

Coos County Commission, Commissioner, Robert (Bob) Main

Coos County Commission, Commissioner, Fred Messerle

Coos County Commission, Commissioner, Cam Parry

Coos County Emergency Management, Program Manager, Glenda Hales

Coos County Planning Department, Planning Director, Patty Evernden

Coos County Sheriff's Office, Sheriff Craig Zanni

Douglas County Commissioners, Commissioners, Joseph Laurance

Douglas County Commissioners, Commissioners, Susan Morgan

Douglas County Commissioners, Commissioners, Doug Robertson

Douglas County Planning Department, Director, Keith Cubic

Douglas County Planning Department, Land Use Planner, John Lazur

Douglas County Public Works Department, Director, Robert Paul

Douglas County Sheriff's Department, Sheriff John Hanlin

Elkton City Council, Council Member, Pat Anderson

Elkton City Council, Council Member, Daniel Burke

Elkton City Council, Council Member, Paula Swanson

Elkton City Council, Council Member, David Wiley

Glendale City Council, Council Member, Bill Boal

Glendale City Council, Council Member, Audina Jephson

Glendale City Council, Council Member, Allen King

Glendale City Council, Council Member, Karen Mehl

Glendale City Council, Council Member, Jim Standard

Glendale City Council, Council Member, Connie Stevens

Jackson County Commission, Commissioner, John Rachor

Jackson County Commission, Commissioner, Don Skundrick

Jackson County Commission, Commissioner, Dennis Smith

Jackson County, County Administrator, Danny Jordan

Jackson County Development Services, Director, Kelly Madding

Jackson County Road Department, Director, John Vial

Jackson County Sheriffs Department, Sheriff Mike Winters

Josephine County Courthouse, Chair, Board of County Commissioners, Simon Hare

Josephine County Courthouse, Commissioner, Harold Haugen

Josephine County Courthouse, Vice Chair, Board of County Commissioners, Don Reedy

Josephine County Planning Department, Planning Director, David Wechner

Josephine County Sheriff's Office, Sheriff Gil Gilbertson

Klamath County Commission, Chair, Klamath County Board of Commissioners, Dennis Linthicum

Klamath County Commission, Commissioner, Al Switzer

Klamath County Commission, Vice Chair, Klamath County Board of Commissioners, Cheryl Hukill

Klamath County Community Development Department, Community Development Director, Sid Mitchell

Klamath County Public Works Department, Director, Stan Strickland

Klamath County Sheriffs Department, Sheriff Tim Evinger

Klamath County, Planning Division, Bill Adams

Klamath County, Planning Division, Robert Moore

Klamath Falls City Council, Council Member, Bill Adams

Klamath Falls City Council, Council Member, Irving Hart

Klamath Falls City Council, Council Member, Trish Seiler

Klamath Falls City Council, Council Member, Dan Tofell

Malin Irrigation District, Luke Robinson

Medford City Council, Council Member, Karen Blair

Medford City Council, Council Member, Chris Corcoran

Medford City Council, Council Member, Al Densmore

Medford City Council, Council Member, Dick Gordon

Medford City Council, Council Member, Greg Jones

Medford City Council, Council Member, Eli Matthews

Medford City Council, Council Member, John Michaels

Medford City Council, Council Member, Bob Strosser

Medford Water Commission, Geologist, Bob Jones

Milo Volunteer Fire District, Manager,

Myrtle Creek City Council, Council Member, Gail Blackwell

Myrtle Creek City Council, Council Member, Ken Brouillard

Myrtle Creek City Council, Council Member, Colette Granger

Myrtle Creek City Council, Council Member, Allan Kusler

Myrtle Creek City Council, Council Member, Ken Schmidt

North Bay Rural Fire Protection District, Fire Chief, Jim Aldrich

Phoenix City Hall, City Manager/Recorder, Eli Naffah

Phoenix City Hall, Mayor Carlos Debritto

Riddle City Council, Council Member, John Gaedecke

Riddle City Hall, City Recorder, Kathleen Wilson

Roseburg Area Chamber of Commerce, President & CEO, Debbie Fromdahl

Roseburg City Council, Council Member, Ken Averett

Roseburg City Council, Council Member, Michael Baker

Roseburg City Council, Council Member, Rick Coen

Roseburg City Council, Council Member, Bob Cotterell

Roseburg City Council, Council Member, Steve Kaser

Roseburg City Council, Council Member, Steve Kaser

Roseburg City Council, Council Member, Tom Ryan

Roseburg City Council, Council Member, Melissa Smith

Roseburg City Council, Council Member, Steve Tuchscherer

Libraries

Butte Falls Branch Library

Canyonville Branch Library

Central Point Branch Library

City of North Bend Library

Coos Bay Public Library

Coquille Public Library

Eagle Point Branch Library

Flora M Laird Memorial Library

Glendale Branch Library

Grants Pass Main Library

Hannon Library, Southern Oregon University

Hazel M Lewis Memorial Library

Jackson County Central Library

JCLS Ashland Library Branch

Klamath Community College Library

Klamath County Main Library

Lane Community College Library, Center Building

Malin Branch Library

Merrill Library

Myrtle Creek Branch Library

Oregon Coast Community College Library

Oregon State Library

Oregon State University Harfield Marine Science Center Guin Library

Oregon Tech Library

Phoenix Branch Library

Riddle Branch Library

Rogue Community College Library, Redwood Campus Library

Rogue Community College Library, Riverside Campus Library

Rogue River Branch Library

Roseburg Library (Douglas County Central Library)

Shady Cove Branch Library

Southwestern Oregon Community College Library

Talent Branch Library

Umpqua Community College Library

University of Oregon Institute of Marine Biology Library

University of Oregon Libraries

White City Branch Library

Media

Ashland Daily Tidings

Daily Courier

Herald and News

KCBY/KVAL-TV

KDCQ 92.9 FM Radio

KOBI-TV

KOTI-TV

Mail Tribune

Rogue River Press

The Columbian

The Daily Astorian

The Eugene Register-Guard

The News-Review

The Oregonian

The Register-Guard

The World

Native Americans

Affiliated Tribes of Northwest Indians, Executive Director, Terri Parr, WA

Burns Paiute Tribe, Cultural Resources, Theresa Peck, OR

Burns Paiute Tribe, Chair, Charisse Soucie, OR

Chinook Nation, Chair, Ray Gardner, WA

Clatsop-Nehalem Confederated Tribes, Chair, Diane Collier, OR

Columbia River Inter-Tribal Fish Commission, Executive Director, Paul Lumley, OR

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Director of Culture, Jesse Beers, OR

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Director, Department of Natural Resources, Howard Crombie, OR

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Tribal Council Chairman, Bob Garcia, OR

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Tribal Planner, Jeffrey Stump, OR

Confederated Tribes of Grand Ronde, Chair, Cheryle Kennedy, OR

Confederated Tribes of Grand Ronde, Cultural Protection Specialist, Khani Schultz, OR

Confederated Tribes of Siletz Indians, Chair, Delores Pigsley, OR

Confederated Tribes of Siletz Indians, Natural Resources Manager, Mike Kennedy, OR

Confederated Tribes of Siletz Indians, Robert Kentta, OR

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Tribal Historic Preservation Officer, Agnes Castroneuvo, OR

Coquille Indian Tribe, Attorney, Melissa Cribbins, OR

Coquille Indian Tribe, Chair, Edward Metcalf, OR

Coquille Indian Tribe, Executive Director, George Smith, OR

Cow Creek Band of Umpqua Tribe of Indians, Chair, Dan Courtney, OR

Cow Creek Band of Umpqua Tribe of Indians, Tribal Archaeologist, Jessie Plueard, OR

Cow Creek Band of Umpqua Tribe of Indians, Attorney, Wayne Shammel, OR

Modoc Tribe of Oklahoma, Chief, Bill Follis, OK

Pit River Tribal Council, Chair, CA

Pit River Tribe, Environmental Coordinator, CA

Shasta Indian Nation, Chair, Janice Crowe, CA

Smith River Rancheria, Chair, Kara Miller, CA

The Klamath Tribes, Chair, Gary Frost, OR

The Klamath Tribes, Vice-Chair, Don Gentry, OR

The Klamath Tribes, Todd Volkenand, OR

The Klamath Tribes, Culture & Heritage, Director, Perry Chockpoot, OR

Intervenors

Blue Ridge Alternate Route 2013

C2 Cattle Company

Cable Huston Benedict Haagensen & Lloyd, LLP

Cascadia Wildlands

Center for Biological Diversity

Citizens Against LNG

Columbia Riverkeeper

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

Crag Law Center [Oregon Shores Conservation Coalition]

Field Jerger LLP

Food & Water Watch

Friends of Living Oregon Waters (FLOW)

Fulbright & Jaworski LLP

Klamath Siskiyou Wildlands Center

National Marine Fisheries Service, Pacific Northwest Region

National Marine Fisheries Service, SW Oregon Habitat Branch

Natural Resources Section, Oregon Department of Justice

Northwest Industrial Gas Users

Oregon Coast Alliance

Oregon Department of Environmental Quality

Oregon Department of Fish and Wildlife

Oregon Department of Land Conservation & Development, OCMP

Oregon LNG

Oregon Wild

Oregon Women's Land Trust

Pacific Coast Federation of Fisherman's Associations (PCFFA) and the Institute for Fisheries Resources (IFR)

Process Gas Consumers Group

Rogue Riverkeeper

Sierra Club Environmental Law Program

Southwest Gas Corporation

TransCanada

Waterkeeper Alliance

Western Environmental Law Center

Bob Barker

Sherry Church

Dustin Clarke

John A. Clarke

Guy W. Cooksey

Bethany Cotton

Joan Darby

Chuck Erickson

Jonathan Hanson

Richard Knablin

William Lackner

Sean Malone

William Moriarty

Joseph Patrick Quinn

Holly Hall Stamper

Affected Landowners on or Adjacent to Proposed Facilities and Routes

Jordan Cove Energy Project

Oregon Department of State Lands

Oregon International Port of Coos Bay

Oregon Dunes National Recreation Area, Siuslaw National Forest

Roseburg Forest Products Company

Southwest Oregon Regional Airport

US Bureau of Land Management, Coos Bay District

Pacific Connector Gas Pipeline Project

11th & F, LLC, CA

5-J Limited Partnership, OR

A.G. & L.M. Dahl Living Trust, OR

Ackley, Daryl F. & Sally B., OR

Adamek, Noble F., OR

Adams, Clarence L. & Stephany D., OR

Adams, Frank C., OR

Adams, Lehman & Cheryl J., OR

Adkins, Allen L., OR

Adkisson, John T. & Marci W., OR

Ager, Leslie R., OR

Alconcher, Melvin J., CA

Alexander, Charles & Bonnie L. Grant, OR

Alford, Gary D., OR

Allen, Arthur L & Karen L, OR

Allen, Ethel K & Addis, Donna Jean, OR

Allen, John, OR

Aloha Gagnon-Baldwin Inheritance Trust, OR

Alvey, Reginald M. & Renee Carol, OR

American AGCredit FLCA, CA

Andersen, Rebecca N, OR

Anderson, Charles A & Jody K, OR

Anderson, Christopher & Leah, OR

Anderson, Keith M. & Josefina V., OR

Anderson, Kimberly S., OR

Andrews, Donald G., OR

Antelope Acquisitions LLC, OR

Anthon, Gordon; Doremus, Holly, CA

AP Timber LLC, OR

APCO Coos Properties, LLC, OR

Arden Development Inc, OR

Arnold, William R. and Xiao, Wei, OR

Arrowood, Lavina Pearl, OR

Auer, Byron L. & Patricia, OR

Auer, Steven C., OR
Ault, Robert D., OR
Ayala, Elizondo, Olivia & Valencia, Teodoro, Sara, CA
Babcock, Howard L. & Rosena M., OR
Bailey, George W. & Joanne S., OR
Baley, Jacob E, OR
Ballard, Robert H & Judith A, OR
Bannack Resources Inc, OR
Barbara A Rowe Living Trust, OR
Barber, George G., OR
Barker, Robert H. & Gail, OR
Barnes, Donald J. & Bonita L., OR
Barnes, Jeffrey W. & Hannah, TRSTES, OR
Barnes, Richard, OR
Barrows, Mark S. and Laura N., OR
Barrows, Richard A. & Malter-Barrows, Jennifer L., OR
Barton, Jacob W., Caleb C., Phillip Wayne, OR
Bashore, Michael E & Jamie Ann, OR
Becklin Land & Cattle, LLC, OR
Beebe, Byron & Raquel Anne, OR
Belknap, Clifton & Judy A., OR
Bennie, A. June & Joseph, OR
Betty York Survivor Trust, OR
Beulah E. Reddington Revocable Survivor Trust, OR
Bigley Loving Trust, OR
Blanchard, Delbert E., OR
BLM-O&C Revested Grant, OR
BLM-Public Domain, OR
BLM-USA, OR
BLM-USA Coos Bay Wagon Road Lands, OR
Blomquist, Hal D. & Donna J., OR
BLS LLC, OR
Booth, Eric V. and Amanda S., OR
Bordner, Dorothy M., and Malepsy, Michael T. & Bonnie L., OR
Boshuizen, Cornelis J.; Gerrit, J. & Patricia A., OR
Bradshaw, Lee and Helfrich, Christine Le, OR
Brambila, Francisco & Antonia, OR
Breuer, John D. & Kara L., OR
Bright, Dean Allen, OR
Brouzes, David & Linda, OR
Brown, Daniel A. & Sarabeth R., OR
Brown, Richard P. & Twyla J., OR
Brown, Robert M. & Judith Gaye, OR
Brozovich, Billie C., OR
Bruce, William Robert, OR
Brunschmid, Marjorie A., OR
Burg, Floyd A., OR
Bustos, Russell & Deanna, OR
C & D Lumber Co., OR
C Morrison Ranch Limited Partnership, CA
C.A. Morrison Trust, OR
C2 Cattle Co, LP, OR
Cain, Mitchell D & Van Sickle, Juliana, OR
Caldwell, Harry A. & Debra L., OR
California Giant, Inc., CA
Callaway, Dale A. & Barbara J., OR
Calley, Charles, OR
Cannon, Lawrence W., OR
Capri Properties LLC, OR
Carney, Robert W. & Mary J., OR
Carson Steve & Joanne Trust, OR
Cary A. Norman Living Trust, OR
Cascade Investment Group LLC, OR
Cates, Kenneth E. & Kristine, OR
Caughell, John F. & Tammy S. Bray, OR
Central Lincoln PUD, OR
Central Oregon & Pacific RR Inc., TX
Chavez, E. Stephen and Pumphery, Ann K., OR
Cheyne, Vincent S.; Paschke, Shannon; and Rohrbacker, Charlotte, OR
City of Coquille, OR
City of Klamath Falls, OR
City of Malin, OR
Clack, Raynor, Ronald and Calvin and Baker, Wanda K., OR
Clark C. Unruh Family Trust, OR
Clarke, John A. & Robert O., OR
CMS & G Inc., OR
Cobb, Floyd A., OR
Cochran, John M., OR
Cole, Wayne M, OR

Coleman, Ross E & Trudy, OR
Collins Timber Company, LLC, OR
Collins, Darren & Diana Lou, KS
Colvin, Edward G. & Sharon L., OR
Connelly, Patricia & Herrera, Stephen A & Mary E, OR
Coos Bay Oyster Co., OR
Coos County, OR
Coos County & Clausen Oysters, OR
Coos County Sheep Co., OR
Coos-Curry Electric CO-OP, Inc., OR
Coquille Indian Tribe Trust, OR
Cowan, Gayle L, OR
Craig, Linda D, OR
Crawford, Donald & Linda A., CA
Crawford, Robert E. & Paul W., OR
Cresswell, Susan & Eugene R., CA
Cross, Lyle & Janey, OR
Cullett Family Trust, OR
D. R. Johnson Lumber Co., OR
Dahlman, James E. & Joan D., OR
Dalton, John R. & Renie H., OR
Dark Living Trust, CA
Davenport, James R. & Archina J., OR
David E Kinyon Revocable Trust, OR
Davis, George and Sheryl, OR
Davis, Kevin, OR
Davis, Miles W & Pamela Kay, OR
Davis, Wayne & Susan, CA
De Amaral, Dennis D. & Linda L., OR
Debra A. Lugo Revocable Living Trust, OR
Decarlo, Dominic J. Jr. & Edna M., OR
Deen, Harvey and Laura, OR
Deen, Russell G. & Lisa, OR
Deep Creek Ranch, OR
Deer Point, LLC, OR
Devine, Delos & Laura J., OR
Dewitt, Patricia M., OR
Diaz Revocable Living Trust, OR
Dicke, Kevin D. & Kitti L., OR
Dickson, Suzanne, OR
Dimeglio, Michael & Ann, OR
DKM LLC, OR
Donald C Standley Trust, OR
Donald E. Fisher 2012 Delaware Trust, OR
Dora Cemetery Association, OR
Dougherty, John D. & Marilyn L., OR
Douglas County, OR
Douglass, David, OR
Dow, George W. & Georgia J., OR
Drahos, Livvy, OR
Driscoll, Christine, OR
Easton, Tracey A. & Jennifer M., OR
Echo Creek, LLC, OR
Eddy, Jeanne, OR
Edward Arthur & Linda Diane Lynch Trust, OR
Edwards, Rebecca J., OR
Edwards, William R., OR
Egelhoff, Randy L. & Carol E., OR
Eichmann, Donald A. & Tammy L., OR
Elam, Victor & Arianne, OR
Ellingson Land Co, OR
Eloisa N Doyle Survivor's Trust, OR
Embertson Martyn D and Sharon M, OR
Emineth, Lester & Jonna, OR
Erickson, Kathleen Ann, OR
Erickson, Patricia K, OR
Estep, Mike, CA
Evans Schaaf Family, LLC, OR
Evans, Brian W. & Kimberly A., OR
Evans, Thomas O. & Glenda S., OR
Exner, John & Marie L, OR
Eyman, Roy L & Samanthy A, OR
Farm of the Family Health and Recreation Association, OR
Fenter, Paul & Julie Ann, OR
Ferch, Marlen E & Carolyn D, OR
FIA Timber Partners II, LP, OR
Fimple, Joyce L., OR
Finley, Mickel & Andrea, OR
Fisher, Don L. & Shirley J., OR
Fleming Living Trust, OR
Foord, Ronald L. & Molly A., OR
Fort Chicago Holdings II U.S., LLC, OR

Foster Family Trust, OR
Four H Organics LLC, OR
Fox, Daniel S. & Anna M., OR
France, Edward J. & Karin Patricia, WA
Fred Messerle & Sons, Inc., OR
Fry, Larry J., OR
Fry, Reyko, CA
Funderburg, Doug, CA
Gagnon, Harvey & Patty, MI
Galivan, Rodney Lloyd & Connie J, OR
Gallup, Robert & Kelly, OR
Gallup, Robert M., OR
Garbini, John & Edie M., OR
Gardner, Allen & Arlene and Gardner, Nile & June, CA
Garrett, Cynthia A., OR
Garriott, W. L. & Helen J., OR
Gary E. Smith Trust, OR
Gavin Rajnus, LLC, OR
Gaylor, Darla R., OR
Georgia-Pacific West, LLC, GA
Gerber, Robert W., OR
Giles Family Trust, OR
Gilmer, Lavina P., OR
Glen & Sharline Crouch Rev Trust, OR
Glockner Investments, OR
Goodell Loving Trust, OR
Goodnature, Sonny S., OR
Gow, Bill C. & Sharon Marie, OR
Graf, Richard A & Sandra L, OR
Grant, Carl Dean & Deana Marie, OR
Green District Inc, OR
Gregory, Patrick G. & Marie A., OR
Gresdel, Donald A., OR
Grimes, Floyd W & Julia A, OR
Groves, Edmund A. & Julie A., OR
Gunnell Family Trust, OR
Gutierrez, Victor & Maria R., OR
H2 Development LLC, OR
Hadwen, James, OR
Hager, Tresa E, OR
Hailicka Living Trust, OR
Hall, Sandra and Stonestreet, James, FL
Hamann Family Trust, OR
Hamann, Donald B., OR
Hamlin, Mark C & Doreen M, OR
Handlos, Linda, OR
Hankins, James V. & Elizabeth M., OR
Haralson, Robert Larry, OR
Harbor Northwest Holdings LLC, CA
Hargrove, Edward L. & Rise K., CA
Harris, Roderick & Carol, OR
Hartman, Ryan E. & Jennifer L. and Kody L. & Kristine J., OR
Haskins, Nancy, OR
Hatcher, Ronald K., OR
Hazen, Walter E. & Wendy A., OR
Heilman, Patricia A, OR
Helben Tree Farm, Inc, OR
Helen E. Northcraft Testamentary Trust, OR
Henderson, Dennis & Karen, NJ
Herbert, Milton, OR
Herndon Family Lands, LLC, OR
Herrell James J and Charlotte M, OR
Herrera, Mary Elizabeth, OR
Herrera, Stephen A & Mary E, OR
Herring Tuesday S and Earl K, OR
Hibdon, Bill D & Alma, OR
Hickman, Amanda A, OR
Higuera, Timothy D., OR
Hild, Delbert W., Trustee, OR
Hill, Drew, OR
Hill, Jeffrey L. & Gidgette N., OR
Hill, William F. & Shirley C., OR
Hogan Family Partnership, OR
Hogue, Jim & Bonnie, OR
Hogue, Neil R. & Leslie N., OR
Holiday Rice Properties & Collins Timber Company, LLC, OR
Holmstrom, Donald J. & Karen K., OR
Hong, Fan Yen & Chun-Mei Lin & Lo Cheng Fan & Kuei Chun, OR
Hoot, Paul M. & Eura M., WA
Hopkins, Randy & Lynita, OR

House, Charla J., OR
Howard, Glen M. & Christine, OR
Howard, Lloyd V., OR
Howard, Roy J & Gail M, OR
Hoy, Allen W. & Ora J., OR
Hoy, Thomas, WA
Huffman & Wright Logging Co., OR
Hughes, Jeffrey D., OR
Hunt, Richard Wayne, OR
Hunter, Keith F., OR
Indian Hill, LLC, OR
Ingersoll, Mark D. & Annette M., OR
Ingersoll, William J. & Shirley, OR
Ireland Land LLC, OR
Isthmus Slough Industries, LLC, OR
J Double D Enterprises, OR
J&J Family Trust, OR
Jack, Curtis H., OR
Jackson, Donald E, OR
James, Matthew L. & Debra, OR
Jeannette M. Brunell Trust, OR
Jensen, Frances Joan Adams, OR
John A. Clarke Family Trust, OR
John and Mary Muenchrath Trust, OR
John Edward Wallington Life Estate and Melody Star Michaelson, OR
John K & Karen L Lilly Revocable Living Trust, OR
John'S Auto Refinishing Inc, OR
Johnson, Bruce & Bernie, OR
Johnson, Cordy A., OR
Johnson, Daniel J. & Carol M., OR
Johnson, Philip K., OR
Johnson, William H., OR
Johnston, Danny Lee; Kara Faye Johnston, OR
Johnston, Donald Scott, OR
Jones Plumbing & Heating, INC., OR
JR Development, LLC, OR
Juhl, Patrick J. & Christine, OR
Julian & Deborah Manders Trust, OR
Juniper Properties LLC, OR
JWTR, LLC, OR
Karas, Christine, OR
Katherine Clark Loving Trust, OR
Kaur, Sukhjit, CA
Kay E. Ganieany Family Trust, OR
Keck, Donald Russell, OR
Keeton Yates I LLC, OR
Keizer, Philip J., Jr., OR
Kelley, Michael P. & Sandra L., OR
Kennerly Ranches LLC, OR
Kent Wechter Trust, OR
Kenyon, Hazel B., OR
Kerns Family Trust, OR
Kerns, Earl M. & Shirley F., OR
Ketchum, Jimmie R. & Carolyn E., OR
Keystone Forest Investments, LLC, OR
Kilroy, Jeffrey J, OR
Kim Haesook Living Trust, OR
Kinnan, Keith A & Diana L, OR
Kirkes, Steve J. & Deniese, OR
Kiser, Frank & Ramona B., OR
Klabunde-Kuriatnyk Janina, OR
Klamath Cascade Group LLC, OR
Klamath County, OR
Klamath Irrigation Dist., OR
Kleemann 2004 Family Revocable Trust, CA
Kleemann, Stephan H., CA
Klein, Jason L. & Adeena, OR
Knowles, John E. & Marie A., OR
Koch RP Holdings I LLC, KS
Kolkow Family Trust, OR
Krestel Trust 03-16-12, CA
Kuhler Dobson, LLC, CA
La Macchia, Frank P. & Irene E., CA
Labrousse, Kenneth J. & Wendy, OR
Laird Timberlands, LLC, OR
Lallo Investments LLC, CA
Laudani, Alan A. & Marcella, OR
Lawrence Family Trust, OR
LBA Contract Cutting, INC., OR
Leatherman Land & Timber Co, OR
Lee, Robin B., OR
Legacy Land & Timber, LLC, OR
Leischner, Terry G. & Maudeen F., OR

Leland W Woods Trust, CA
Lester, Lori A., OR
Lewis, Terry L. & Wendy S., OR
Liberatore, Mirian G and Bud, OR
Liles, Gregory E., OR
Linda Mc'Koen 2008 Revocable Trust, OR
Lindsay, Joe G. & Mary L., OR
Linn, Calvin W & Kathey L, OR
Lloyd, Roxanna D., OR
Lone Rock Timber Investments I, LLC, OR
Lone Rock Timberland Co, OR
Lookingglass Olalla Water, OR
Loupy, Edward N. & Gloria J., OR
Lovell, Nova D. & Ellen M., OR
Lowland Farms, Inc., OR
LTM, Inc, OR
Lucas, William H and Jeannie A, OR
Lyon, Richard D & Jeannie R, OR
Lyon, Rodney R. & Marie M., OR
Lyon, Russell R. & Sandra G., OR
Maeyens, Jr. Melody M. & Edgar, OR
Maguire, Michael D. & Sharon L., OR
Malin Irrigation Dist., OR
Marek, Sandra G., OR
Mark & Melody Sheldon Prop., LLC, OR
Mason, Albert L. & Nancy R., OR
Mast, Harold, OR
Mathas, Christopher, OR
Matsumura, Joyce K., HI
Maurycy, Michael R, CA
Mavilia, John V. & Stacey K., OR
May, Darin T & Chana R, OR
Mazzucchi, David M. & Diana A., OR
McAlister, II, Alister D., OR
McAlpine, Karen N. and Kobl, Debbie K., OR
McAuliffe Revocable Living Trust, OR
McAuliffe, J. Charlie & Priscilla A., OR
Mcauliffe, Joan, OR
Mcauliffe, Joan J & Mcauliffe John C and Priscilla, OR
McCarthy, Louis M & Betty J. & William H., OR
McClendon, Timothy, OR
McCrorey, Venus O., OR
McDonald's Corporation, OR
McGaughey, E. & V. Family Trust, OR
McGettigan, Mary K., OR
McGinnis, Michael L., OR
McGriff, David L. & Emily J., OR
McKay's Coquille, LLC, OR
McKinley Living Trust, CA
McKinney, Howard E & Cheryl B, OR
McLaughlin, Craig L. & Stacey L., OR
McNary, Calvin L. & Charlotte M., OR
Menasha Forest Products Corp, OR
Meriwether Southern Oregon Land & Timber LLC, OR
Merton Bradshaw CO, OR
Metcalf, Mary C., OR
Meuser, Kenny W., OR
Mildred Fitzgerald Family Trust, OR
Mills, Elmer C. & Linda J., OR
Milo Academy Inc., OR
Milo Volunteer Fire District, OR
Minor, John A. & Becky J., OR
Moates, Allen, OR
Molatore, Clifton, Thomas, Jerry, OR
Molatore, Thomas, Jerry, OR
Mollie Ann W. Foster Revocable, OR
Montgomery, Todd R. & Luzmarie V., OR
Moore Mill & Lumber Co, OR
Moore, Ryan P., OR
Moore, Virginia, OR
Morris, Herbert L,. OR
Morris, Scott A. & O'Morris, Shannon M., OR
Mullis, Curt, Thomas, Cynthia, OR
Munch, Ronald P. & Carol J., OR
Murphy Company, OR
Murray, Danelle and Spurlock, Lorraine, OR
Murrell, Richard J. & Terry A., OR
Myers, Roy E. & June E., OR
Napell, Andrew Bradford, CA
Nash, Penelope J., OR
Neal C. Brown Family, LLC, OR
Neale, Constance M, OR

Negherbon, Lucille A, OR
Negherbon, Sean Gregory & Wanita Beth, OR
Nelson, Walter, WA
Nicholas E. Garcia Living Trust, OR
Nichols Bros, Inc., OR
Nichols, Robert C & Beverly J., OR
Noonan, Michael & Karin and Sayles, Gerald & Margaret, OR
Noonan, Michael & Karin M., OR
North Pacific Union Conf. Assn., OR
Northwest Storage Inc., OR
Nyseth, Steve A. and Lorrie A., OR
O'Connor Livestock Co., OR
Odell, Dawn M.; & Towne, Ethel Mae, OR
Oden, Dennis L. & Cynthia R., OR
ODOT, OR
Oeleis, Cynthia, OR
Oliva, George J., OR
O'Neil, Johnny & Maxinne, OR
Ore, William R. & Anona M., OR
Oregon Women's Land, OR
Osborne, Jim, OR
Ostrom, Theresa, OR
Oxbow Timber, LLC, OR
Oyler, Donald A. & Ines E., OR
P. Lancaster Decendent's Trust, OR
Pacific Gas Transmission Co., OR
Pacific West Timber Company (Oregon), LLC, OR
PacifiCorp, OR
Pallin, Curtis J. & Melissa R., OR
Palmer, Jerry S. & Jacqueline M., OR
Pape Properties, OR
Park, David L., OR
Parr Lumber Company, OR
Parret, John W. & Linda L., OR
Pate, Steven Darl & Harvey Ray & Bobby Charles, OR
Patterson, Elizabeth A., OR
Patterson/Fuller Trust, OR
Paula G Smith Living Trust, OR
Peile Lela Maxine Revocable Living Trust, OR
Peile, Edmond, OR
Perpetua Forest Co., OR
Peterson, Dixie L., CA
Peterson, Kimberly H., OR
Petty, Robbie L., OR
Phillips 66 Company, OK
Pifher, Robert L. & Ruth L., OR
Plank, Hazel J. & Thomas, David, OR
Platt Living Trust, OR
Plum Creek Timberlands, LP, OR
Pope Ranch Properties LLC, OR
Powers-Wheeler, Linda L & Charles H Wheeler Jr, OR
Premierwest Bank, OR
Prien, Mandy Kelly & Stephen C., OR
Pulley, Sharon, OR
Q Holdings LLC, OR
Quam, Lynn H. and Hannah, Marsha Jo, OR
R&B Properties Llc & Jack Mathis General Cont Inc, OR
Rajnus, Marla A., OR
Ram Sea Rogue, LLC, OR
Randolph, Craig C. & Robbyn M., OR
Raynor, Ronald and Clack, Calvin and Baker, Wanda K., OR
Reeves, Gordon & Lori, OR
Reis, James P. & Paula T., OR
Rentz, Jimmy Benjamin & Kathleen Irene Rentz, OR
Richelle R. Bryant Living Trust, OR
RMDK Properties LLC, OR
Robbins, Brenda G., TX
Robbins, Michael B., WA
Robert F & Mary F Hodgson Trust, OR
Robert M Farris Trustee, OR
Roberts John M Jr., OR
Robin King Family Trust, OR
Robinette Lane T and Bassima F, OR
Rocha, Justin T. & Heather C., OR
Rode, Alvin & Lou Ann, OR
Rodney & Pamela Neill Living Trust, OR
Rogers, Richard, OR
Rojas, Frank A. & Maria L., CA
Rome Creek Timber III, LLC, OR
Rome Creek Timber, LLC, OR
Rose, James & Judy A., OR

Roseburg Forest Products, OR
Roseburg Resources Co., OR
Ross, Robert G. & Wilma J., OR
Roth, David D.; Galyn; Kathleen, OR
Rullamas, Richard and Carol, OR
Running 3, LLC, OR
Rush, Kevin D. and Jordan, Michele A., and Gaston, Laura, OR
Russell Arthur G Jr., Cathy L, OR
Russell, Jack & Stringer, Frank J, OR
Rust, Richard L & Merry Lou, OR
Rutherford, Monte R., OR
S A Schuyler & Sons Inc., OR
Sacchi, Richard, OR
Sanclemente, Robert A, OR
Sanderson, Micheal Jean, CA
Sandquist, Heather, OR
Sargent Loving Trust, OR
Sarratt, Jerry, OR
SAT & Co., OR
Saul, Juanita, OR
Sause Bros. Ocean Towing CO., Inc., OR
Schleigh, Dan & Teresa, OR
Schmidt, Wayman, OR
Schott, David, OR
Schuster, Eugene V & Evelyn, OR
Schuster, Mark Eugene; Robinson, Debbie Kay, OR
Scoville, Danial D. and Carol Scoville & Mark K., WA
Scoville, Robert G., OR
Scrimsher, Mark E. & Susan L., OR
Seaton, James M. & Treva L., OR
Seneca Jones Timber Company, OR
Seus, Monte J., OR
Sexton, Bradley F. & Theresa A., OR
Sharon L. Farrar Trust, CA
Sharpe, Johnny Calvin & Donell, OR
Shaw, Jackie L. & Belinda A., OR
Shaw, Thomas M. & Elisa A., OR
Sheldon, Jennie M. Wood, WA
Sheldon, Mark & Melody, OR
Shelton, Kenneth E. & Mary, OR
Shelton, Robinette, OR
Shimotakahara, Eva E. & Steven G., OR
Shirtcliff Holdings LLC, OR
Shoffner, John, OR
Silbernagel, Tom & Kathy E., OR
Silver Butte Timber Co., OR
Simmons, Catherine O., MN
Sitter, Marion I., OR
Smejkal, James, OR
Smith Family Trust, OR
Smith, Duane B. & Lea Ann, OR
Smith, Elisa Dawn, IA
Smith, Leonard and Cindy, OR
Smith, Michael J. & Rachelle L., OR
Smith, Robin L & Jennine M, OR
Snelgrove, Jason A. & Christine A., OR
Solomon Joint Living Trust, OR
South Suburban Sanitary District, OR
Squaw Creek Acres LLC, OR
Stalcup Living Trust, OR
Stalcup, Steven & Carole, OR
Standley, Brian S. & Darla J., OR
Standley, Paul B. & Cindy A., OR
Stastny, Edwin J. & Diana F., OR
State Highway Commission, OR
State of Oregon, OR
State of Oregon Land Board, OR
State of Oregon, Fish & Wildlife, OR
Staysa, Gayle Sandra, OR
Steel Creek - Laird Ranch & Tree Farm, LLC, WA
Steele, Robert L. & Hennig, Arnella C., OR
Steenbock, Deborah J., OR
Steinhoefel, Jack, OR
Stevens, William M. & Claudia M., OR
Stinchfield, Thomas A., OR
Stokke, Donald R & Peggy S, OR
Stoller, Mark & Shirleen, OR
Stone Trust, OR
Stone, Dana P. & Roshanna, OR
Stribling, John & Charllot A., OR
Stroup, Deborah Starbuck & Randall C. Law & Linda, OR
Stukel, LLC, OR

Sturm, Eric N. & Carolyn R., OR
Sulffridge, Ervin & Mitzi K, OR
Sulffridge, Mitzi K., OR
Summerville, William C. & Theresa N., OR
Sumner Rural Fire, OR
Sumner, Richard & Marcia, OR
Sutch, Steve J. & Barbara J., OR
Swanpor Corp., GA
Sweet, Steven H., OR
System Global Timberlands LLC, WA
T.E. & C.D. Harlow Family Trust, OR
Tansey Loving Trust, OR
Tansey, John N. & Jeanette R., OR
Tat Enterprises, LLC, OR
Taylor Billy F and Joellen, OR
Taylor, Daniel David & Diana R., OR
Taylor, Jennifer R. & Brian J., OR
Ted L. Fife Family Trust, OR
Tepper, Timothy T., OR
Terbeck, Thomas W., OR
Terry, Victor A. & Penelope, OR
The Elk Lake Corporation, OR
Theiss, Roland & Margaret; Lebengood, C.W., OR
Thompson, Anneliese, OR
Thompson, Donald J. & Carol L., OR
Thompson, Erin and Pence, Stanley J. & Beverly A., OR
Thompson, Jana Traskova, WA
Thompson, Joseph G. & Carla J., OR
Thompson, Richard L. & Joyce Mae, OR
Three Cluff LLC, OR
Timothy, Thomas L. & Patti J., OR
Trail Community Church, OR
Treeland Resources, LLC, OR
Treerock LLC, OR
Tristany, Joseph, OR
Tristar Southwest Oregon Timberlands LLC, OR
Tri-W Group, LP, OR
Tunzi, Anne T, OR
US Bank, Trustee – Statewide Mortgage Loan Trust, OR
USA - Fremont Winema National Forest, OR
USA - Rogue River National Forest, OR
USA - Umpqua National Forest, OR
USA in Trust for Cow Creek Band of Umpqua Tribe of Indians, OR
USPS, OR
Van Wart, Schuyler, OR
Vault Self Storage LLC, AZ
VCP Ranch, Ltd, OR
Virginia Mae & Loyd Walker Reed Trust, OR
Voegeli, Dale L. and Hunter, Roxan D., CA
Voorhies, Sylvia S & Strong, Nancy Parker & Parker, William G, OR
Waechter, Roger & Mary, OR
Walch, Clara, OR
Walker, William W. & Jan M., OR
Walker, John R & Brenda L, OR
Walling, George E & Carol K, OR
Ward, Stephen, OR
Washburn, Paul M. & Eura M., OR
Watson Ranch Development, LLC, OR
Weathers, E. Gary and Robin L., OR
Weaver Family Trust, OR
Webb Briggs Land Co, OR
Webb, Michael S. & Wanda D., OR
Wensel, Daniel B. & Maria A., OR
Westfir Land and Timber LLC, OR
Weyerhaeuser Co., WA
Wheeker, Larry & Shirley, OR
Whitis, Sarah E., OR
Whitlock, George M. & Hazel B., OR
Whitson, Judy Faye, OR
Whittier Trust, CA
Wight, Gary Allen and Mary Catherine, OR
William E. & Betty Lou Schmidli Trusts, OR
Williams, Kathleen, OR
Williams, Virgil D. & Carol F., OR
Williams, Virgil D. & Carol F. and Dalton, Rodney A., OR
Willis, Dee, OR
Willsey, Juanita, OR
Wilson, David D. & Judith A., OR
Wilson, Martin, OR

Windlinx Family Trust, OR
Wing, Randy, OR
Winston-Dillard Rural Fire Protection District, OR
Wolf, John J & Susan L, OR
Wolford, Keith R. & Cindy M., OR
Wolfs, Randy & Randie Jean, OR
Wong-Haigh, Wendy, OR
Wood, Alson L. & Nancy M., OR
Woods, Howard & Gretchen, OR
Woods, James P. & Mary A., OR
Woodward, Steven D., CA
Woolsey, Toni, OR
Worman, Aaron and Sandra, OR
Worthington, Marie D., OR
Wright Loving Trust, OR
Wright Mark Trustee, Endicott, John Trustee, OR
WTCU Railway Company, OR
Yates, Charles & Johanna and Schlatter, Mary L., OR
Yates, Spencer C. & Truly R., OR
Zink, Michelle S., OR
Zuver, Lamarr L & Judith A, OR
Zuver, William & Beth, OR

Affected Landowners on or Adjacent to Alternative Facilities and Routes

Pacific Connector Gas Pipeline Project

Aeck, Michael & Shirley, OR
AGRI Pacific Resources, OR
Apco Coos Properties, LLC, OR
Barton, Jacob W., Caleb C., Phillip Wayne, OR
BLM-O&C Revested Grant, OR
BLM-USA Coos Bay Wagon Road Lands, OR
Brambila, Francisco & Antonia, OR
Bright, Dean Allen, OR
Brunschmid, Marjorie A & Yoshiko, James, OR
Bureau of Land Management - Coos Bay District, OR
California Giant Inc, CA
Cary A. Norman Living Trust, OR
Coleman, John B. & Gloria G., OR
Coos County, OR
Coos County Sheep Co, OR
Cora Clayton Life Estate, CA
Daly, Robert, OR
Daniel J. Pohl & Karen I. Pohl Revocable Trust, OR
Daniel J. Pohl & Karen I. Pohl Revocable Trust, OR
David & Robin King Family Trust, OR
Davis, Bruce E, OR
Davis, Kevin, OR
Demers, Gregory M., OR
Demers, Gregory M., OR
Devine, Delos & Laura J., OR
DKM LLC, OR
Douglas, Walter M. & L. Margaret, OR
Dykstra, Sandra L. & Louis A., OR
Easton, Tracey A. & Jennifer M., OR
Edward York Decedent Trust, OR
Escalera, Ruben & Laura A., OR
Fisher, Donald & Laura, OR
Fred Messerle & Sons Inc, OR
Georgies, Michael D., OR
Glen & Sharline Crouch Rev Trust, OR
Gow, Bill C. & Sharon Marie, OR
Gow, Bill C. & Sharon Marie, OR
Grimm, Thomas M., HI
Haire, William J. & Patsy R., OR
Handlos, Linda, OR
Hankins, James V. & Elizabeth M., OR
Hartman, Ryan E & Jennifer L & Hartman, Kody L & Kristine J, OR
Hong, Fan Yen & Chun-Mei Lin, OR
J. Spear Ranch Co., OR
Jeannette M. Brunell Trust, OR
John Flaxel Trust, OR
Johnson Timber LLC, OR
Johnston, Donald Scott, OR
Juanita Willsey Living Trust, OR
JWTR LLC, OR
Kaur, Sukhjit, CA
Keizer, Philip J., Jr., OR
Kenny, Edward J. & Lee G., OR
Klamath County, OR
Lavin, James P. & Nancy E., OR
Leatherman Land & Timber Co., OR
Lone Rock Timberland Co., OR
LTM Inc, OR

Lyon, Rodney R. & Marie M., OR

Martin, Douglas & Glenda, OR

Mathas, Brent A., OR

McConnell, Marc A. & Dea A., OR

McGettigan, Mary K., OR

McLaughlin, Craig L. & Stacey L, OR

McNeil, Darren P. & Karyn D., OR

Menasha Forest Products Corporation, OR

Minor, John A. & Becky J., OR

Moore Mill & Lumber Co, OR

Morris, Wilma K, WA

Nerida, Quintin M. & Melba L., OR

Oliva, George J., OR

Oregon Department of Forestry, OR

Oregon Department of Transportation, OR

Pacific West Timber Company (Oregon), LLC & The Campbell Group, LLC, OR

Petty, Robbie L., OR

Plum Creek Timberlands LP, OR

Poole, Ronald P & June A, OR

Robbins, Brenda G., TX

Ronning, Eric J., OR

Rose, Norman L. & Martha J., OR

Rupf, Paul & Marcy, CA

Sacchi, Richard, OR

Scott, Eugene R., OR

Scoville, Danial D. and Carol Scoville & Mark K., WA

Seneca Jones Timber Company, OR

Sheldon, Jennie M. Wood, WA

Shelton, Kenneth E & Mary, OR

Shimotakahara, Eva E. & Steven G., OR

Sierks, Brenda Lee & Carl, OR

Silver Butte Timber Co, OR

Simpson, Glenn & Terry L., OR

State Of Oregon, OR

Sumner, Richard & Marcia, OR

Sutch, Steve J. & Barbara J., OR

The Elk Lake Corporation, OR

Tweed, Ronald T., OR

U.S.A. in Trust for Cow Creek Band of Umpqua Tribe of Indians, OR

Wensel, Daniel B. & Maria A., OR

Weyerhaeuser Co., WA

Whitehead, Michael R. & Gayla R., OR

Whitlatch, Charles & Pamela, OR

Other Interested Parties

1000 Friends of Oregon, Southern Oregon Advocate, Greg Holmes, OR

350Corvallis.org, Charles Miller, OR

701 Local, Robert Crane, OR

American Forest Resource Council, AFRC Field Forester, Jacob Groves, OR

American Gas Association, President, Dave Parker, DC

American Rivers, OR

Bay Area Chamber of Commerce, OR

Bay Clinic LLP, M.D., Joseph T Morgan, OR

C2 Cattle Company, Dave Picanso, OR

C2 Cattle Company Ltd Partnership, James R Coonan, OR

Cape Arago Audubon Society, Chapter Contact, Eric Clough, OR

Carpenter's Local 2067, Griffith Davies, OR

Chamber of Medford/Jackson County, President, Brad Hicks, OR

Charleston Merchants Association, OR

Charleston Visitors Center, OR

City of Winston, City Administrator, David Van Dermark, OR

Clarks Branch Water Assoc Inc, OR

Clausen Oysters, Max & Lilli Clausen, OR

Clean Air & Water, Chief Information Officer, Terrance Ness, OR

Clean Air & Water Inc, LeRoy Hippe, OR

Climate Crisis Working Group, Cary D Thompson, OR

Columbia River Estuary Study Taskforce (CREST), Director, Micah Russell, OR

Columbia Riverkeeper, Executive Director, Brett VandenHeuvel, OR

Coos Bay Pilots Association, President, Captain Charles Yates, OR

Coos Bay Visitors Center, OR

Coos Waterkeeper, Executive Director, David Petrie, OR

Coost Consulting LLC & Services, Ken Messerle, OR

David Evans and Associates, Wildlife Biologist, Dave Kennedy, OR

David Evans and Associates, Dana Siegfried, OR

Douglas County Global Warming Coalition Board of Directors, Stuart Liebowitz, OR

Eagle Point Chamber of Commerce, OR

Earth Share of Oregon, Executive Director, Jan Wilson, OR

Edge Environmental, Dan Duce, CO

Edge Environmental, Carolyn Last, CO

Edge Environmental, Archie Reeve, WY

Evans Schaaf Family LLC, OR

Forestry Action Committee, FAC Weed Program Coordinator, Suzanne Vautier, OR

Gertrude E Wickett Trust et al, Joanne Culp, OR

Good Works, Guthrie Wilson, OR

Great Basin Visitor Association, Executive Director, Dawn Brown, OR

Herndon Family Lands, Betty Massoni, NV

Herndon Family Lands, OR

Hoff's Frontier Real Estate, Owner, Tamara Hoff, OR

IBEW (International Brotherhood of Electrical Workers), Russell Tschetter, OR

IBEW 932, Adam Foxworthy, OR

IBEW 932, James Jolley, OR

IBEW 932, Howard Ridge III, OR

IBEW 932, Roy Snook, OR

IBEW 932, Business Manager, Robert Westerman, OR

International Longshoremen's and Warehousemen's Union Local 12, President, Marvin Caldera, OR

Iron Workers 29, President, Joe Bowers, OR

IUOE 701 (Operating Engineers Local 701), Clifton Smith, OR

IWOE 701, Steve Larsen, OR

Jacksonville Chamber of Commerce, OR

JCEP, Elliot Trepper, CO

Jordan Cove Energy LP, Bob Braddock, OR

Jordan Cove Energy Partners, Director of Public Affairs, Michael Hinrichs, OR

Jordan Cove Energy Project, Charles Deister, OR

Jordan Cove Energy Project, Roy Hemmingway, OR

K&K Sound Systems, President, D. Kandel, OR

Kent Wechter Trust, OR

Klamath Tribes, Cultural Resources, CTR Monitor, Troy Townsend, OR

Klamath-Siskiyou Wildlands Center, Siskiyou Wild Rivers Director, Shane Jimerfield, OR

Laborer's International Union, Arden Prehn, OR

Laborers International Union, Pipeline Division, Laura Lee Hughes, OR

Laborer's Local #121, Roger Kaldahl, OR

Laborers Local 1400, Pot Potter, OR

Local 290, Director of Political and Legislative Affairs, Dennis Coplin, OR

Local 290, Tracey Glen, OR

Local 290, Dennis Mask, OR

Local 290, Rick & Helen Two Bears, OR

Local 296, Tracy Shepherd, OR

Lone Rock Timber Mgt. Co, Jake Gibbs, OR

Medford Visitors Information Center, OR

National Park Service, National Trails Intermountain Region Branch Office, Lee Kreutzer, UT

Native Fish Society, Executive Director, Mike Moody, OR

Native Plant Society of Oregon, OR

Natural Resources Conservation Service, OR

Nature Conservancy of Oregon, OR

NCI/Presidential Towers, Assistant Chief of Staff for Installation Management, Paul Mason, VA

North State Resources, Inc., Mike Hupp, CA

North State Resources, Inc., Program Manager, Paul Uncapher, CA

Northwest Environmental Advocates, OR

Northwest Environmental Defense Center, Sara Blankenship, OR

Northwest Gas Association, Executive Director, Dan Kirschner, OR

Northwest Industrial Gas Users, Executive Director, Paula Pyron, OR

Northwest Oregon Regional Partnership, Chair, Shirley Kalkhoven, OR

Operating Engineers Local 701, Fred Cox, OR

Oregon Business Council, President, Duncan Wyse, OR

Oregon Department of Fish and Wildlife, Forest Practices Coordinator, Rod Krahmer, OR

Oregon Department of Fish and Wildlife, Habitat Special Projects Coordinator, Rose Ownes, OR

Oregon Dungeness Crab Commission, Interim Administrator, Hugh Link, OR

Oregon Environmental Council, Executive Director, Andrea Durbin, OR

Oregon Institute of Marine Biology, Director, Dr. Craig Young, OR

Oregon International Port of Coos Bay, Executive Director, Jeffrey Bishop, OR

Oregon International Port of Coos Bay, Director of Communications, Martin Callery, OR

Oregon International Port of Coos Bay, Deputy Executive Director, Michael Gaul, OR

Oregon International Port of Coos Bay, Kathy Wall, OR

Oregon International Port of Coos Bay, Board of Commissioners, President, David Kronsteiner, OR

Oregon League of Conservation Voters, Executive Director, Doug Moore, OR

Oregon Nordic Club - Southern Oregon Chapter, President, Ms. Stefanie Ferrara, OR

Oregon Shores Conservation Coalition, Executive Director, Phillip Johnson, OR

Oregon State University, Department of Forest Science, Associate Program Director, Andrew Bluhm, OR

Oregon Toxics Alliance, David Monk, OR

Oregon Wild, Executive Director, Sean Stevens, OR

Oregon Women's Land Trust, Jenny Council, OR

Oregon Women's Land Trust, Board Member, Renee Côté, OR

Oregon Women's Land Trust and Owl Farm, Kristen Brandt, OR

OSPIRG, Executive Director, Dave Rosenfeld, OR

Pacific Crest Trail Association, Regional Representative, Ian Nelson, OR

Pacific Rainforest Wildlife Guardians, Marcia Denison, OR

Pacific Rivers Council, Executive Director, John Kober, OR

Pacific States Marine Fisheries Commission, Executive Director, Randy Fisher, OR

PC Trask & Associates, Eileen Stone, OR

PC Trask & Associates, Phil Trask, OR

Pacific Connector Gas Pipeline, Pam Barnes, UT

Pacific Connector Gas Pipeline, Engineer, Bethany Green, UT

Pacific Connector Gas Pipeline, Senior Environmental Scientist, Randy Miller, UT

Pacific Connector Gas Pipeline, Bill Vanderlyn, OR

Pipeline Contractor Association, J. Patrick Tielborg, TX

Pipeline Safety Trust, Glenn Archambault, OR

Rocking Horse Ranch, LLC, Brian & Laura Koch, OR

Rocky Mt. Pipeline Constractors Association, Executive Director, J.D. Lormand, LA

Rogue Flyfishers, John Ward, OR

Rogue Flyfishers, Inc., President, Steve Wall, OR

Roseburg Forest Products Co, Mack Brown, OR

Roseburg Forest Products North Bend Chip Facility, Bob Rogers, OR

Salmon for All Inc, Hobe Kytr, OR

SCDC, Executive Director, Sandy Messerle, OR

Sheet Metal Union, Ken Ellisor, OR

Sierra Club - Oregon Chapter, Chapter Director, Brian Pasko, OR

Silver Butte Timber Co, Lewis Howe, OR

South Coast Development Council Inc, OR

South Umpqua Rural Community Partnership, President, Stan Petrowski, OR

South Umpqua Rural Community Partnership, Douglas Roberts, OR

Southern Oregon Land Conservancy, Diane Garcia, OR

Southwest Oregon Regional Airport, OR

Tetra Tech, Amy Bensted, OR

Tetra Tech, John Crookston, WA

Tetra Tech, Susan Hurley, OR

Tetra Tech, Joe Iozzi, WA

Tetra Tech, Rachael Katz, WA

Tetra Tech, Project Manager, John Scott, MA

Tetra Tech, Lynn Sharp, OR

The Freshwater Trust, President, Joe Whitworth, OR

The Partnership for Economic Development in Douglas County, Executive Director, Alex Campbell, OR

The Wetlands Conservancy, Executive Director, Esther Lev, OR

The Wilderness Society, CO

TRC, Vice President, Brad Floyd, GA

U.S. Fish and Wildlife Service, Department of the Interior, OR

U.S. Forest Service, Sara Wassam, OR

UA 290, Dan Bailey, OR

UA Local 290, Ron and Christine Henderson, OR

UA Local 290, Business Agent, Craig Spjut, CA

Umpqua Valley Homebrewers Guild, Gerard Van Assche, OR

Umpqua Watersheds, Board Member, Bob Allen, OR

Umpqua Watersheds, Executive Director, Randy Rasmussen, OR

Umpqua Watersheds, Secretary, Buzz Long, OR

Umpqua Watersheds, Inc., Forest Restoration Coordinator, Tim Ballard, OR

USN Ret, John Holden, OR

Waterwatch of Oregon, Executive Director, John DeVoe, OR

Weyerhaeuser Company, Corporate Energy Manager, Bruce Wittmann, WA

Weyerhaeuser Company Tax Department - CH1C28, OR

Wild Mountain Ranch, Craig & Stacey McLaughlin, OR

Williams Gas Pipeline, Gary Kotter, UT

Williams Gas Pipeline - NW, Toby Schwalbe, UT

Abdul-Qadir, Muhammad, OR

Adams, John & Candy, OR

Adams, Vance, OR

Adams, Judith, OR

Afshar, Audrey Lisa, OR

Agnew, Sean, OR

Akers, Lora-Layne, OR

Albert, Eva, OR

Alexander, Kathleen & Frederick, OR

Alexander, Norman & Joanne, OR

Alexander, Kenneth W & Arlene, OR

Alexander, Jean, OR

Allen, Bob, OR

Alvey, Reggie & Renee, OR

Alvey, Jerry, OR

Ampel, Carol, OR

Andazola, Anita, OR

Anderson, Keith M & Josefina V, OR

Andrews, Donald G., OR

Applegate, Susan, OR

Arndt, Ray, OR

Arnold, Bill and Xio Wei, OR

Artley, Dick, ID

Asbill, Diane, OR

Ashworth, Melody, OR

Atkinson, Ed, OR

Aufderheide, Suzia, OR

Ayers, Deanna, OR

Babcock, Howard L & Rosena M, OR

Bachem, Fritz & Ginger, OR

Bachman, SE, Robert, CA

Baeest, Brady, OR

Bair, Anthony & Mary Ellen, OR

Baker, Larry, OR

Baker, Wanda, OR

Baker, Edward, OR

Baker, Hilary, OR

Baldwin, Lisle, OR

Ball, Daren, OR

Barbato, Joe, OR

Barnes, Pamela, OR

Bart, Mary, OR

Barton, Phillip W., OR

Baumann, Daniel, OR

Baxter, John, OR

Belknap, Judy, OR

Bell, E., OR

Bellah, Robert, OR

Bennett, Kris & Roby, OR

Berg, Don, OR

Bickett, Mark, OR

Bilden, Jennifer & Jerry, OR

Billeter, Brian & Kathryn, OR

Bizean, Susan, OR

Blackledge, John, OR

Blair, David L & Laura A, OR

Blake, Mary Ellen, OR

Blanchard, Linda, OR

Blandino, Ernaldo & Martha, OR

Blanton, Janice, OR

Blevins, Milton & Barbara, OR

Blue, Cynthia, OR

Boland, Tim, OR

Borchard, Steve, OR

Bordner, Dorothy & Adrian, OR

Borges, John, OR
Boyd, Collin, OR
Bransom, Deborah, OR
Brollier, Monte, OR
Brown, Julie, OR
Brown, John, OR
Broyles, Dee-Marie & Gary, OR
Bruce, Margaret, OR
Bruncheau, Michael, OR
Bruno, Mary, OR
Buddenhagen, M. R., OR
Buller, Sheldon, OR
Bunt, Thomas, OR
Button, Irma, OR
Byer, Sara & Dean, OR
Caffo, Pris, OR
Canning, Stephen, OR
Carhart, Pete, OR
Carlson, Mary and Michael, OR
Carlton, John & Ivareno, OR
Carnes, Rida-Lee, OR
Carnes, Roger, OR
Carr, Mary, OR
Carson, Allison, OR
Carson, Richard & Ammie, OR
Carson, Daniel & Cheryl, OR
Casey, Linda & Lester, OR
Casey, David, OR
Cassilly, Anna, OR
Cearleg, Kenneth, OR
Chain, Lisa, OR
Chambers, Richard, OR
Chapman, Edward, OR
Chasm, Richard, OR
Chieco, Eileen and Victor, OR
Choukalos, Ernest, OR
Christiansen, Holly, OR
Christman, Melanie, OR
Clack, Raynor L., OR
Claflin, Chris, OR
Clark, Katherine, OR
Clarke, Robert, OR
Clarke, Lyn, OR
Clayton, Evelyn, CA
Coberly, Ron, OR
Collett, Tom, OR
Collier, Camby, TN
Collier, Alice & James, OR
Combe, David Bud, OR
Comnes, Brian, OR
Corchero, Vic, OR
Cordeiro, Lucille, OR
Coropa, Shelly, OR
Coughlin, Helen, OR
Coughran, Jack & George, OR
Cox, Greg, OR
Cox, Russell, OR
Crae, Jemma, OR
Cripps, Cathy Jo, OR
Cross, Merridy, OR
Crowe, Robert L., OR
Cunningham, James, OR
Davenport, Jim, OR
Davey, Barbara, OR
Davidson, Janeen, OR
Dawkins, Stacey, OR
Day, Charles, OR
de Jong, Pam, OR
Dean, Donal, OR
Delaney, Sam, OR
Dennis, Sandra, OR
Denton, Kenneth, OR
Devoney, Kenneth, OR
Dickinson, Barbara, OR
Dickinson, Stephen, OR
Dickson, Gary W., OR
Dilley, Jan, OR
Donavan, James & Coral, OR
Dondrey, Norman, OR
Dorner, Catherine & John, OR
Dorner, Donna & Mark, OR
Doughty, Julia, CA
Dover, Dennis, OR
Dowell, Susan, OR

Drane, Connie, OR
Draper, Ronell, OR
Dresslar, Clara, OR
Drinen, D.L., OR
Driskell, Carrie, OR
Duane, Maureen, OR
Dubbelman, Dora, OR
Dunzer, John, OR
Dusenberry, Jan & Ellen, OR
Ebner, Charles, OR
Eefbrandt, E, OR
Ellis, Hank, OR
Ellis, Todd, OR
Emmons, Jeremy, OR
Erickson, Michael, OR
Erwin, Mary Jean, OR
Eubanks, Heike M, OR
Evans, Robelee & Susan, OR
Evans, Philip & Lori, OR
Everse, David, OR
Falcy, Laurent, OR
Falcy, Barbara, OR
Falex, Justin, OR
Falukes, Patsy, OR
Fawkes, Clayton & Patsy, OR
Feldman, Marjorie, OR
Fendelman, Carmen, OR
Ferguson, Geri, OR
Fernandez, Leo & Mary, OR
Fety, Jim, OR
Finegan, Lynne, OR
Fir, Douglas, CA
Fischer, Bob & Carol, OR
Fisher, Ann, OR
Fisher, Michael, OR
Fisse, David, OR
Flathers, Courtney, OR
Fleetwood, Fred, OR
Fleming, Edward, OR
Floyd, Mike, OR
Forest, Marsha, CA
Frangoponlos, JenMarie, OR
Frati, Reneé, OR
Frederickson, Beatrice, OR
Friedman, Paul, MD
Frisbie, Jackie & Jerry, OR
Frommen, Lynda & Gary, OR
Fruitman, Nancy & Morris, OR
Fuerst, Marsha, CA
Gaab, Dana, OR
Gage, Carolyn, ME
Gagnon, Harvey, OR
Gala, Saner, OR
Gala, Thad, OR
Gallagher, Mark, OR
Garvey, Jerome M., OR
Gault, Patty, OR
Gebhardt, George, OR
Genarie, Philip, OR
Gerke, Jan & Dennis, OR
German, Louis & Ethel, OR
Gessert, Kate Rogers, OR
Gibbons, Virginia, OR
Gibson, Elizabeth & Robert, OR
Gilman, Tenaya, OR
Glassman, Seymour, OR
Gonzales, Linda, OR
Gonzalez, Albaro, OR
Gordon, Joanne & Bruce, OR
Grab, Dana, OR
Graham, Rod, OR
Gray, Douglas, OR
Grieve, Heston, OR
Grieve, Vernon, OR
Grieve, Kern, OR
Griffith, Dave, OR
Gunial, Gene, OR
Gurney, Don, OR
Gutierrez, Maria, OR
Gutierrez, Victor, OR
Gwynn, Elizabeth, OR
Hahn, Andrea, OR

Hahn, Thomas, OR
Hammons, Jim & Nan, OR
Hancock, Flossie & Karl, OR
Hancock, Michael, OR
Hannah, Marsha Jo, OR
Hanrahan, Carol, OR
Hardie, Karyn, OR
Hardie-Hook, Judy & Gerald, OR
Harlan, Ken & Katy, OR
Harris, Connie, OR
Harris, Tom, OR
Hashell, Jason, OR
Haskell, Angela, OR
Hatton, Raymond, OR
Haudlos, Linda, OR
Hawkins, Robert & Daryl, OR
Hawley, K.L., OR
Haws, Cindy, OR
Hay, Chuck, OR
Heaney, Richard & Judith, OR
Heard, Jeanne, OR
Hein, LeRoy, OR
Henderson, Greg, OR
Henderson, Linda, OR
Herne, Ronnie, OR
Heron, Julie, OR
Hess, Franklin & Kathryn, OR
Hess, Kenneth & Mary, OR
Hickey, William & Marylou, OR
Hicks, Maureen, OR
Hicks, Linda, OR
Hill, Jeff, OR
Hindery, Derrick, OR
Hines, Cynthia & Shane, OR
Hoehn, Paula, OR
Hoesly, Tom, OR
Holm, Irma, OR
Holmstrom, Don, OR
Holzen, Joe, OR
Honi, Ann Wilson, OR
Hooper, Connie, OR
Hosie, Michael J., OR
Houle, Ariana, OR
Howard, Helon, OR
Howe, Kevin A., OR
Hughes, Linda, OR
Hughes, Rosie, OR
Hunt, Peter, OR
Iverson, Jon, OR
Jackson, Shari, OR
Janin, Mary-Jo, OR
Jansen, Marion, OR
Jansen, Robert, OR
Jenkins, Rosemarie, OR
Jennings, Courtlandt, OR
Jermain, Frances, OR
Johns, Darlene, OR
Johnson, Oliver, OR
Johnson, Ray & Dola, OR
Johnson, Maxine, OR
Johnson, Janice, OR
Johnson, Donald, OR
Johnson, Douglas & Rhonda, OR
Jones, Jack and Julie, OR
Jordan, Leslie M., OR
Judd, Henry, OR
Katz, Sara, OR
Kaudel, Karla, OR
Keizer, Ann, OR
Kendell, Robert, Tina & Quenten, OR
Kenyon, Michael, OR
Kerms, Martin, OR
Kessler, Robert, OR
Kime, Rose, OR
King, Susan & Roger, OR
Kinzie, Elizabeth, OR
Kiser, Frank & Ramona, OR
Kleemann, Barbara, OR
Koch, Marlene, OR
Koethke, Lumi, OR
Koska, Sharon & Frank, OR
Krafft, Emily, OR
Kramer, Peggy, OR
Krauskopf, Karl, OR

Kremer, Sandra and Richard, OR
Kretzschmar, Ruben, OR
Krumpeu, Michael, OR
Krupka, Gail, OR
Kubick, Mary Cody and Andrew, OR
Kubik, Andrew, OR
Kutmann, Stephen, OR
Kyle, William & Janet Pierson-, OR
LaGesse, Philip, OR
LaGesse, Lisa, OR
Lang, Cathy, OR
LaRochelle, Eugene, OR
Lassesen, Catherine, OR
Laudani, Marcie, OR
LaVelle, Betty, OR
Layport, Dr. James, OR
Lee, Kenneth & Leah, OR
Lefler, Jo Ann & Edmund, OR
Leggett, Jessie, OR
Lehmer, Aaron, CA
Lehns, Ervia, OR
Lewis, Arline, CA
Lewis, Cleo, OR
Lilienthal, Christina, OR
Lindaman, Trish, OR
Liska, Jessie, OR
Logan, Lyle, OR
Lohman, David, OR
Long, James, OR
Loper, Dennis & Cathie, OR
Loppnow, Milton, OR
Loring, Ida, OR
Lovelace, James, OR
Lovelace, Mary Lou, OR
Lovell, Ellen & Nova, OR
Lowe, Patrick, OR
Lowell, Joy Trevey, OR
Lowery, Lorene, OR
Lowery, Yvonne, OR
Luz, Linda, OR
Lyon, Bob & JoAnn, OR
MacDonald, Dana, OR
Macy, Suzanne, OR
Malepsy, Mike & Bonnie, OR
Mallams, Katy, OR
Mann, Edward & Marcia, OR
Marek, Sandra, OR
Mariah, Steve, OR
Marlia, Kristina, OR
Marquez, Kim, OR
Mason, Iva, OR
Mason, Kathleen, OR
Mathews, Chris, OR
Mauch, Kimberly, OR
Mault, Mike & Anita, OR
Mayens, Edgar, OR
Mayer, Nancy, OR
McCarthy, Pam, OR
McGresar, Thomas, OR
McKechnie, Ralph & Beverly, OR
McKeney, Mark, OR
McKinley, Steve, OR
McMordie, Donald, OR
McNutt, Michael, OR
McRoberts, Betty, OR
McWhorter, Don & Edward, OR
Meagher, Kathleen, OR
Medina, Kathy, OR
Medlin, Cynthia, OR
Melton, Gene, OR
Merck, Wendell, OR
Messerle, Stephanie, OR
Michaud, Brad, OR
Mobley, Deanna, OR
Mobley, Tim & LeAnn, OR
Moen, Richard, OR
Molatore, Tom, OR
Momsen, Anthony, OR
Mori, RS & Anna, OR
Morris, Raymond, OR
Muenchrath, Mary Margaret, OR
Murphy, Rebecca, OR

Murphy, Luke, OR
Murphy, Marlene & Robert, OR
Murray, Penny, OR
Myers, Carla, OR
Nathe, Roger, OR
Nay, Mark, OR
Nelson, Reba & Glenn, OR
Nemeth, Knute, OR
Ness, Beth, OR
Netter, Dennis, OR
Neuner, Jane, OR
NewCamp, Bill, OR
Nichols, B. J., OR
Nipper, William, OR
Noordhoff, Susanna, OR
Norris, Verna, OR
Odegard, Anna, OR
Oliver, Linda & Robert, OR
Olson, Larry & Nancy, OR
O'Morris, Shannon, OR
Opitz, Donna, OR
Osborne, Izora, OR
Osier, David, OR
Page, Cathy, OR
Parker, Robert, OR
Parker, William, OR
Parkins, Linda, OR
Paulson, Garrett, OR
Payton, Gary, OR
Peters, Neal, OR
Petersen, Kim, OR
Peterson, Sarah & Jim, OR
Petrick, Marie, OR
Phillips, Diane, OR
Phillips, Bob, OR
Pick, Gene W., OR
Pierce, C.R., OR
Piercy, Leonard, OR
Plume, Carole & David, OR
Plume, Diane, OR
Plume, Ed, OR
Poller, Theresa & Robert, OR
Pope, Colin, OR
Prien, Mandy & Steve, OR
Pritchett, David, OR
Quinn, Francis, OR
Ra, Rosalie, OR
Rachor, John, OR
Radcliff, Clifton & Clarice, OR
Rais, Mary, OR
Rasmussen, Anders, OR
Rato, John, OR
Readel, Lisa, OR
Redag, P., OR
Reeves, Doro, OR
Reeves, Pamela & Timothy, OR
Regennitter, Rovana, OR
Reichle, Gail, WI
Reising, Christine, OR
Reitz, Joan, OR
Rentz, Marion & Patricia, OR
Reynolds, Cheryl, OR
Rice, Jan, OR
Richardson, Karin, OR
Riggs, Lynne, OR
Robertson, Daniel C., OR
Rocka, Roger, OR
Rocthel, Kathryn, OR
Rodriguez, Dan & Ray, OR
Rohrer, Bill, OR
Rohrer, Maryann, OR
Rollins, Eldon, OR
Rominski, Zarod, OR
Rorascheld, H.I., OR
Rosemeyer, J.C., OR
Roth, Teri Lee, OR
Roudebush, Gail, OR
Rowe, Twyla, OR
Royer, Connie, OR
Royer, Richard, OR
Rusch, Chris, OR
Rutherford, Jean, OR
Ryan, Tim, OR
Rzeszutek, Fran, OR

Sadler, Ron, OR
Salthouse, Amy, OR
Sanders, Carol, OR
Sanders, Vicki, OR
Saunders, Adam, OR
Schmaltz, Larry, OR
Schmidt, David, OR
Schnautz, Chuck, OR
Schroeder, Ann, MT
Schultz, William, OR
Scott, Eugene, OR
Scott, Steve, OR
Seaver, Loren & Carol, OR
Segner, Beverly, OR
Selthor, Beverly, OR
Senn, Trey, OR
Severin, Susan, OR
Shapiro, Rhea, OR
Shiroma, Jeanne, OR
Shockey, Diane, OR
Shockey, Christopher and Kirsten, OR
Shockey, Jakob, OR
Shore, Bob & Sally, OR
Simpson, William, OR
Slalus, Steve, OR
Slater, Timm, OR
Slyter, Carolyn, OR
Smedes, Norman, OR
Smith, Sue, OR
Smith, Susan, OR
Smith, Don, OR
Smith, Stacie, OR
Smith, Randall, NE
Smith, Melva, OR
Smith, Larry & Jacqueline, OR
Smith ET AL, Jack R, OR
Smoak, Kathleen & John, OR
Solory, John, OR
Souza, Shannon, OR
Sparks, Rick, OR
Spencer, Linda, OR
Spencer, Janese, OR
Staley, Kathy, OR
Starnes, Patrick, OR
Staton, William & Cassandra, OR
Steele, Matt, OR
Steinhoefel, Jack L & Dorothy, OR
Stemac, Brenda Ann, OR
Stevenson, Barbara, OR
Stills, Annina, OR
Stirling, Arthur & Mary, OR
Stockebrand, Keith & M Joann, OR
Stockton, Linda, OR
Stockton, Robert, OR
Stockton, Michelle, OR
Stoffel, Janet, OR
Stone, Roshanna, OR
Stratton, Judy, OR
Streng, Ramie, OR
Stuart, Carlyle, OR
Stumpff, Dan, OR
Sturgis, Sharon, OR
Summerhays, Micki, OR
Sutton, Sharon, OR
Swanstrong, Ellen & Donald, OR
Sweatt, Dana, OR
Swenson, Louise, OR
Szlachiuk, Anthony, OR
Takahashi, K., OR
Tarrant, Christoper & Eloise, OR
Tate, Serge & Virginia, OR
Taulbee, Zoe, OR
Taylor, Gary, OR
Taylor, Barbara, OR
Taylor, Andrew, CA
Tenold, Stanley, OR
Terry, Penny & Victor, OR
Tetzloff, Rick, OR
Thompson, Jana, WA
Thomson, Gary, OR
Thrall, Debbie, OR
Tidwell, Stephanie, OR

Tinker, Gloria, OR
Todd, Charlie & Joyce, OR
Toombs, Patricia, OR
Treece, Thomas & Marian, OR
Trigo, Hanne Lore & Ralph, OR
Tufts, Mike & Michelle, OR
Tumey, Donna, OR
Tunzi, Anne, OR
Urie, Irvine, OR
Utal, Matt, OR
VanDozor-Uris, Judith, OR
VanSickle, Hal, OR
Varoujean, Laila, OR
Vassallo, Greg, OR
Vaughn, Judith, OR
Vautier, Wayne, OR
Vincent, Steve, OR
Voss, Diane, OR
Vriend, Wim de, OR
Wager, Brian & Shelly, OR
Waldon-Myers, Debra & Dennis, OR
Wallace, Deb, OR
Wallace, Gary, OR
Ward, Anita, OR
Watkins, Lola, OR
Watson, John, OR
Watterson, Patricia, OR
Webster, Jenny, OR
Webster, Meridee, OR
Wedberg, Lee & Carolyn, OR
Weeldreyer, Cindy, OR
Wehde, Bill, OR
Western, Steve, OR
Weston, Jon, OR
Weygand, Daniel, OR
Weygand, John & Marilyn, OR
Whitsett, Gail & Doug, OR
Whorrall, Linda, OR
Wilcox, Beth, OR
Wilczek, Thomas, OR
Williams, Gary, OR
Williams, Virgil & Carol, OR
Williams, Janice, OR
Winkler, William & Twila, OR
Winters, Rick & Helen, OR
Wood, C., OR
Wood, Sueanna, OR
Woods, Ronald, OR
Wooldridge, Mike, OR
Woolsey, Ernest, OR
Woolsey, Toni, OR
Worthington, Gary & Marie, OR
Yablonski, Paula, OR
Yarbrough, Jim, CA
Yasana, Richard, OR
Yost, Susan, OR
Young, Dan, OR
Young, Zona, OR
Young, Dorothy & Ronald, OR
Young, Jennie, OR
Younker, Tom, OR
Yussim, Herb & Brooke, OR

APPENDIX B

Jordan Cove's Letter of Intent, and the U.S. Coast Guard's Waterway Suitability Report for the Jordan Cove Energy Project

10 February 2012

Coast Guard Sector Columbia River
Attn: Capt Bruce Jones
2185 SE 12th Place
Warrenton, OR 97146

Subj: 2012 JCEP WSA update

Dear Captain Jones:

On behalf of the Jordan Cove Energy Project, I would like to confirm that for purposes of the WSA process, Jordan Cove is allowed to update the WSA as part of our annual update to include the export of LNG from the marine facility. We clearly understand that the WSA will need to be updated for any changes in the Port in addition to the change of exporting vice importing of LNG.

This issue had been raised before at our Emergency Planning Meeting and we are seeking confirmation.

Sincerely,

Frank Whipple

Copy: Capt Daniel LeBlanc, USCG; Russell Berg, USCG; Deanna Henry, OR DOE problem

U.S. Department of Homeland Security
United States Coast Guard

Captain of the Port
U. S. Coast Guard
Sector Columbia River

2185 SE 12th Place
Warrenton, Oregon 97146
Phone: (503) 861-6206
FAX: (503) 861-6355

16711/JORDAN COVE
21 February 2012

Amergent Techs
Attn: Mr. Frank Whipple
3553 N. Atlantic Ave. Suite A-158
Long Beach, CA 90807

JORDAN COVE ENERGY PROJECT WATERWAY SUITABILITY ASSESSMENT (WSA) ANNUAL UPDATE

Dear Mr. Whipple:

I have received your letter of 10 February 2012 in which you seek confirmation that adding export operations to your proposed facility can be handled through the annual WSA update. I concur that your annual WSA update should amend the WSA to include your intention to export LNG from your proposed terminal. In addition to the WSA, your Letter of Intent and Emergency Response Plan should also be reviewed and amended as appropriate. Import and export operations should be incorporated in the development of your Operations Manual and Facility Security Plan.

The waterway impacts associated with export operations at the Jordan Cove terminal should not change or exceed those envisioned in the original Environmental Impact Statement and WSA. If you have questions, please contact Mr. Russ Berg of my staff at (503) 240-9374.

Sincerely,

B. C. JONES

Copy: Jordan Cove Energy Project
Oregon Dept. of Energy
FERC

U.S. Department of Homeland Security
United States Coast Guard

Captain of the Port
U. S. Coast Guard
Sector Columbia River

2185 SE 12th Place
Warrenton, Oregon 97146
Phone: (503) 861-6206
FAX: (503) 861-6355

16611/JORDAN COVE
FEB 24 2014

Mr. Frank Whipple
Amergent Techs
3553 N. Atlantic Avenue Suite A-158
Long Beach, CA 90807

Dear Mr. Whipple:

Your letter of January 13, 2014 which forwarded your annual review of the Waterway Suitability Assessment (WSA) for the proposed Jordan Cove LNG terminal in Coos Bay, Oregon has been received. Having completed the examination of your annual review, we have no objection to your conclusion that the minor changes do not change the risk associated with the waterway or the facility as originally evaluated in your 2007 WSA.

Your annual update is marked "Sensitive Security Information" and as such is not publicly releasable. The Federal Energy Regulatory Commission will receive a copy of your update under separate cover.

If you have any questions, please contact Mr. Russ Berg of my staff at (503) 240-9374.

Sincerely,

P. A. ROPP
Captain, U. S. Coast Guard
By Direction

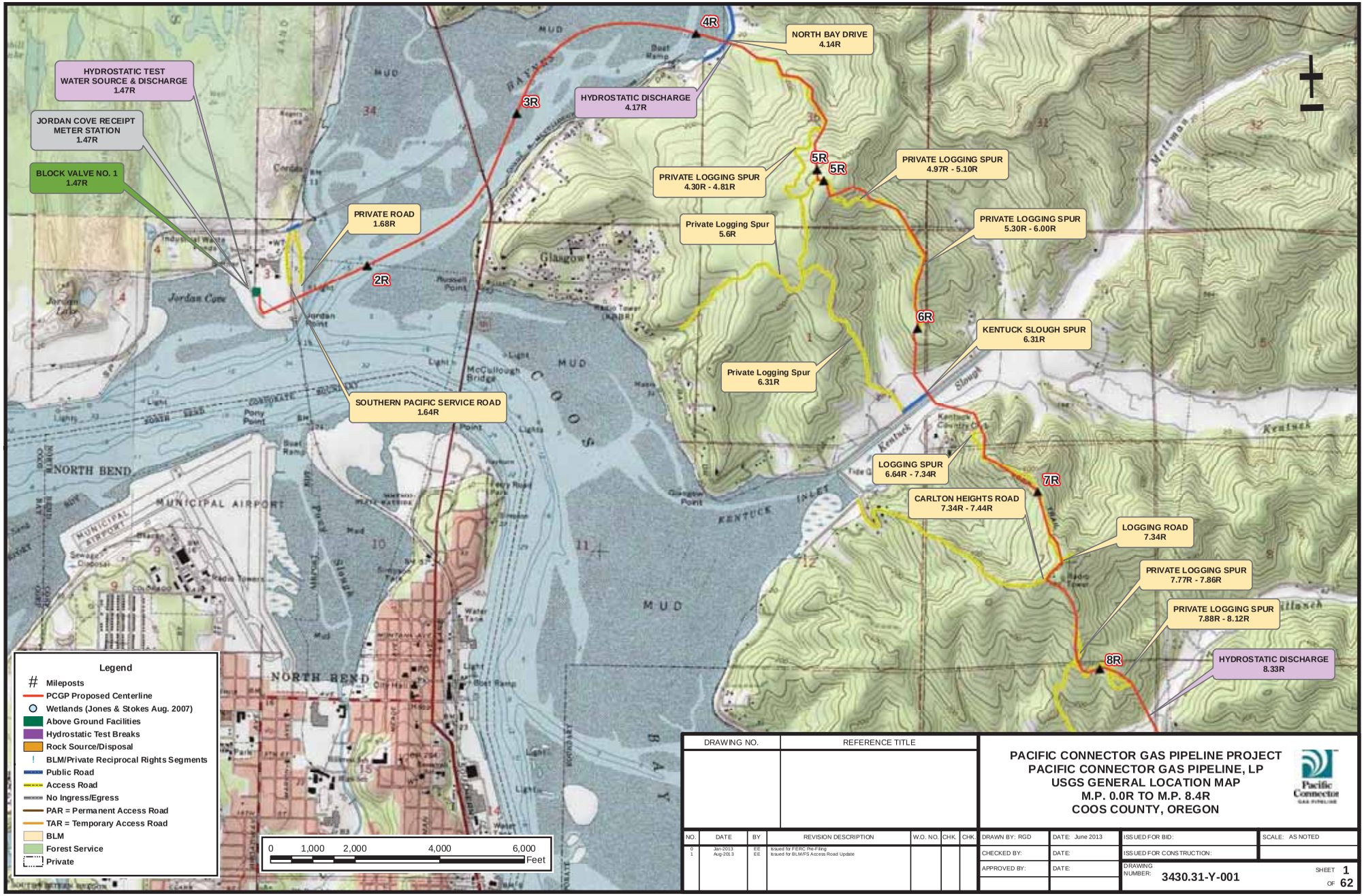
Copy: FERC w/o annual review document

APPENDIX C

Pipeline Route and Work Area Maps

Pipeline Location Maps, Sheets 1-62
Pipe Storage Yards for the Pacific Connector Project, Sheets 1-22

Pipeline Location Maps
Sheets 1–62



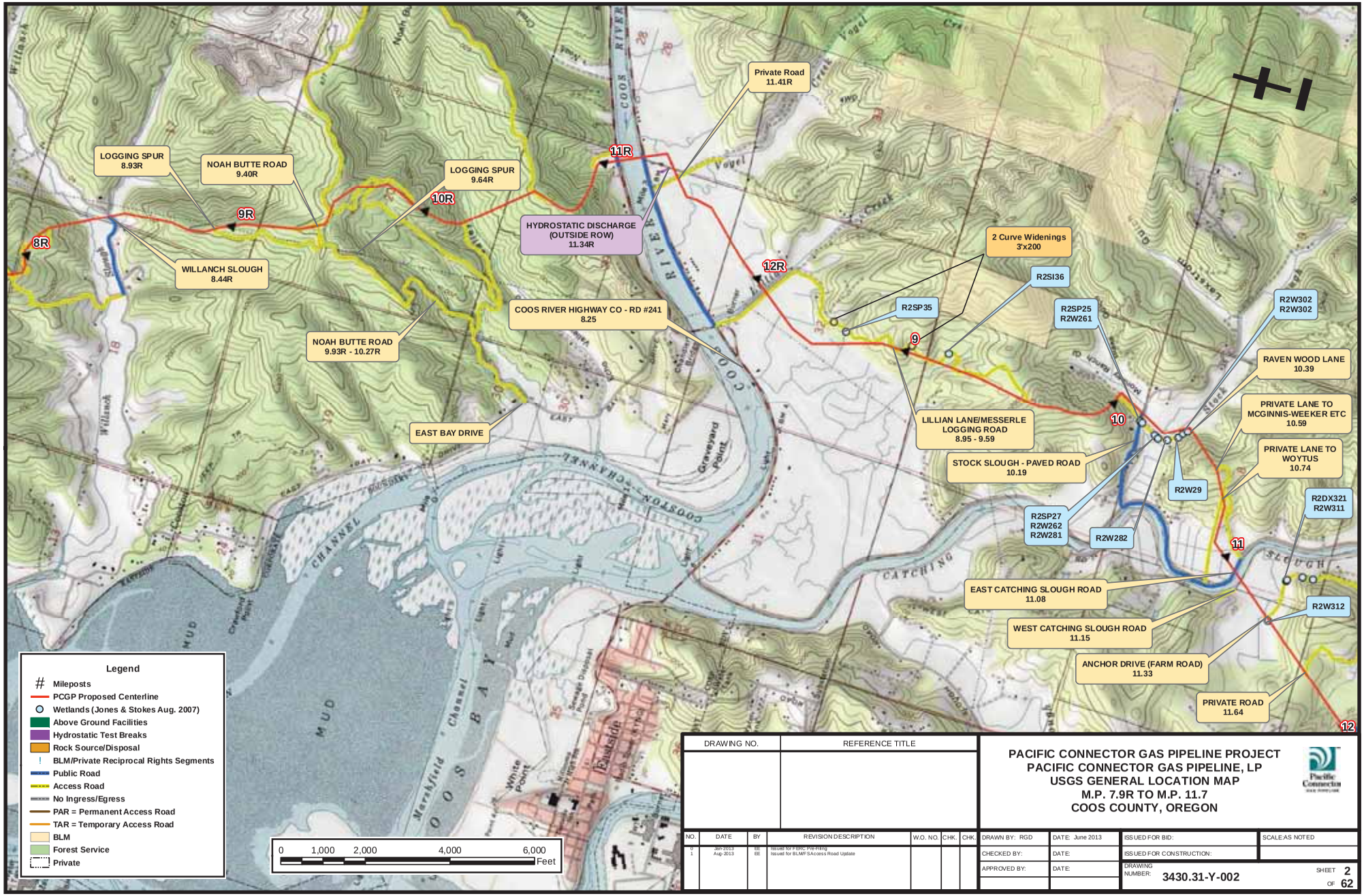
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 0.0R TO M.P. 8.4R
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-001	SHEET 1 OF 62

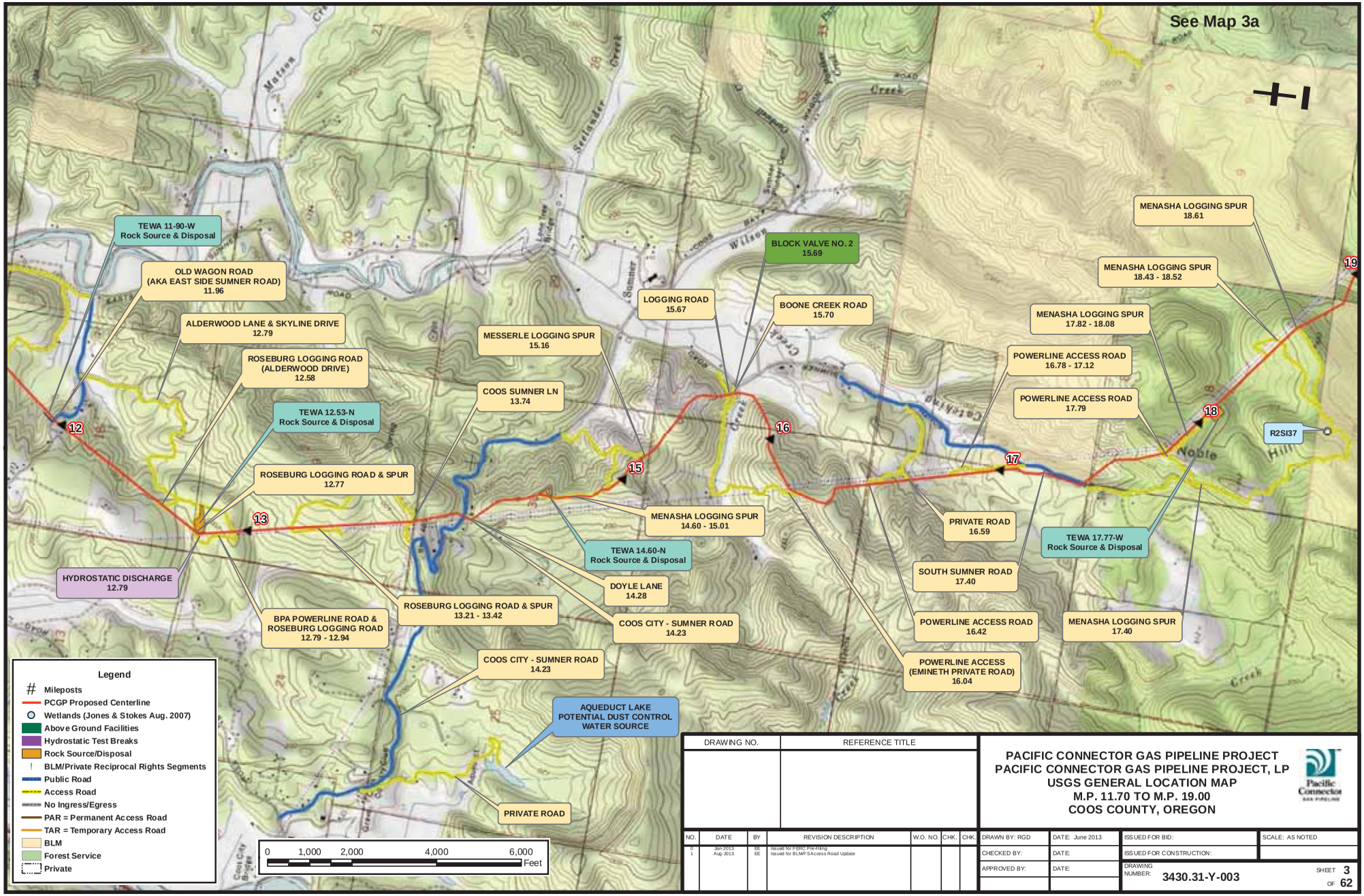


DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 7.9R TO M.P. 11.7
COOS COUNTY, OREGON

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE:AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-002	SHEET 2 OF 62



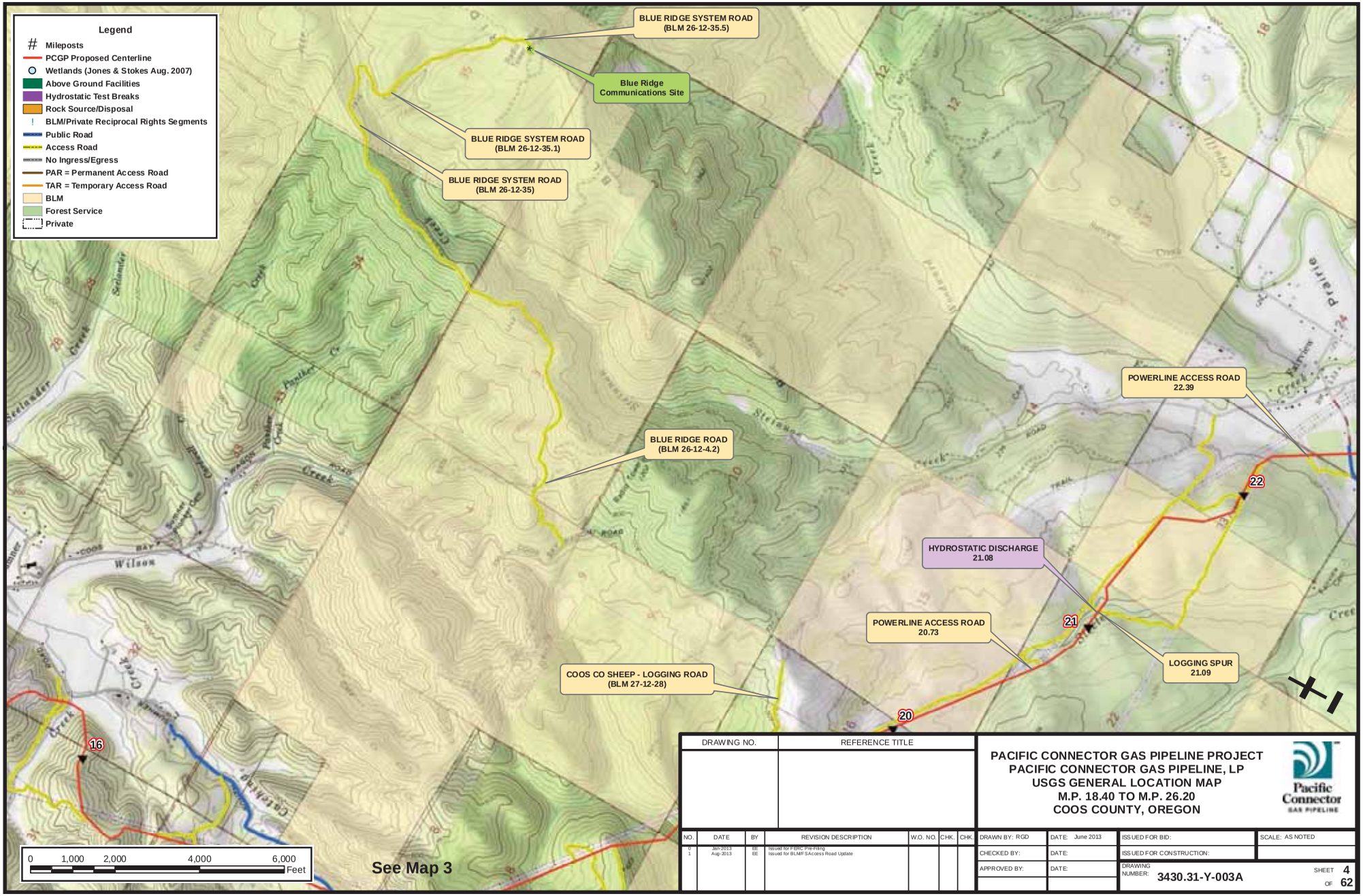
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE PROJECT, LP
USGS GENERAL LOCATION MAP
M.P. 11.70 TO M.P. 19.00
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-003	SHEET 3 OF 62



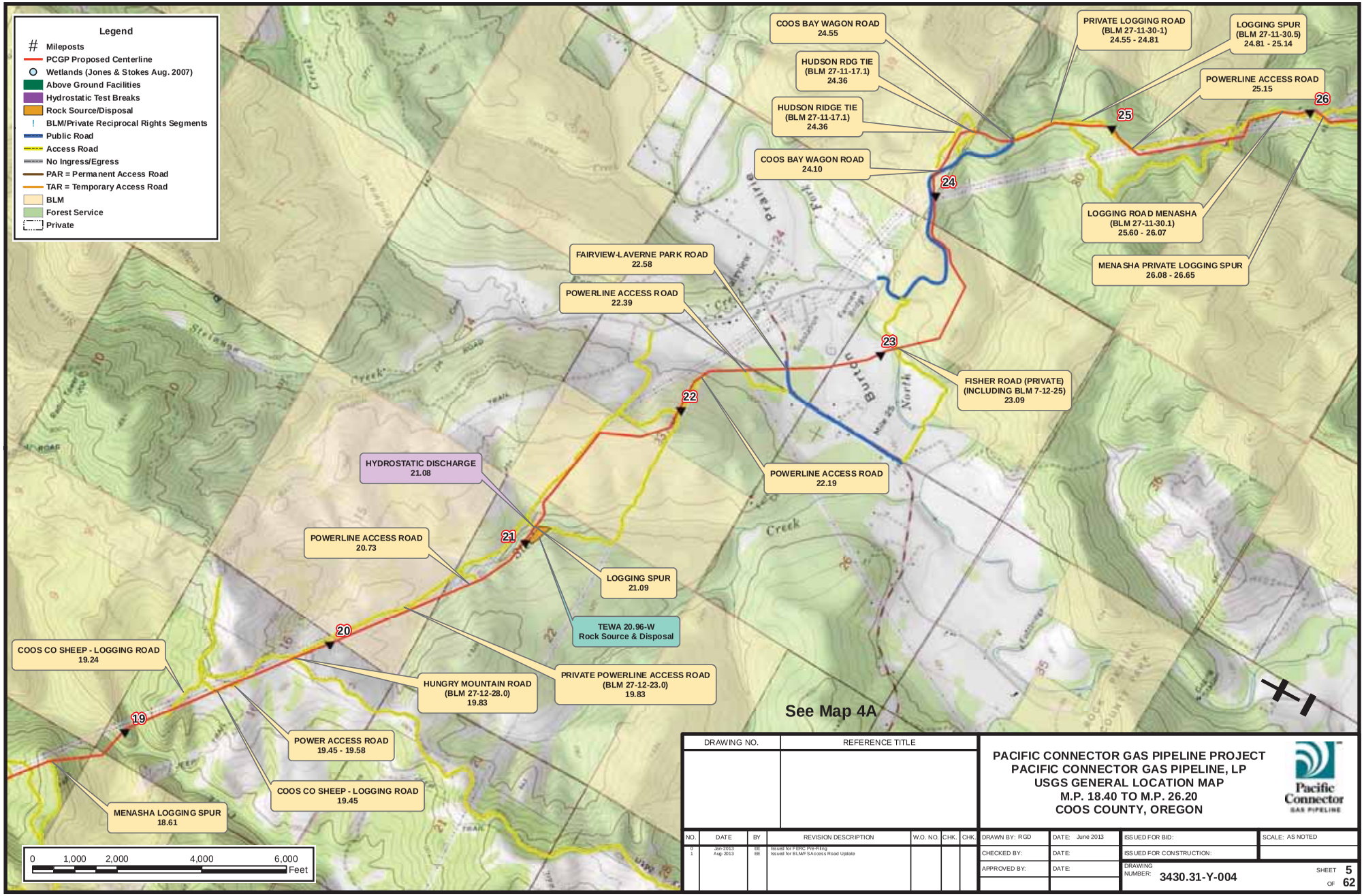
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 18.40 TO M.P. 26.20
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-003A	SHEET 4 OF 62



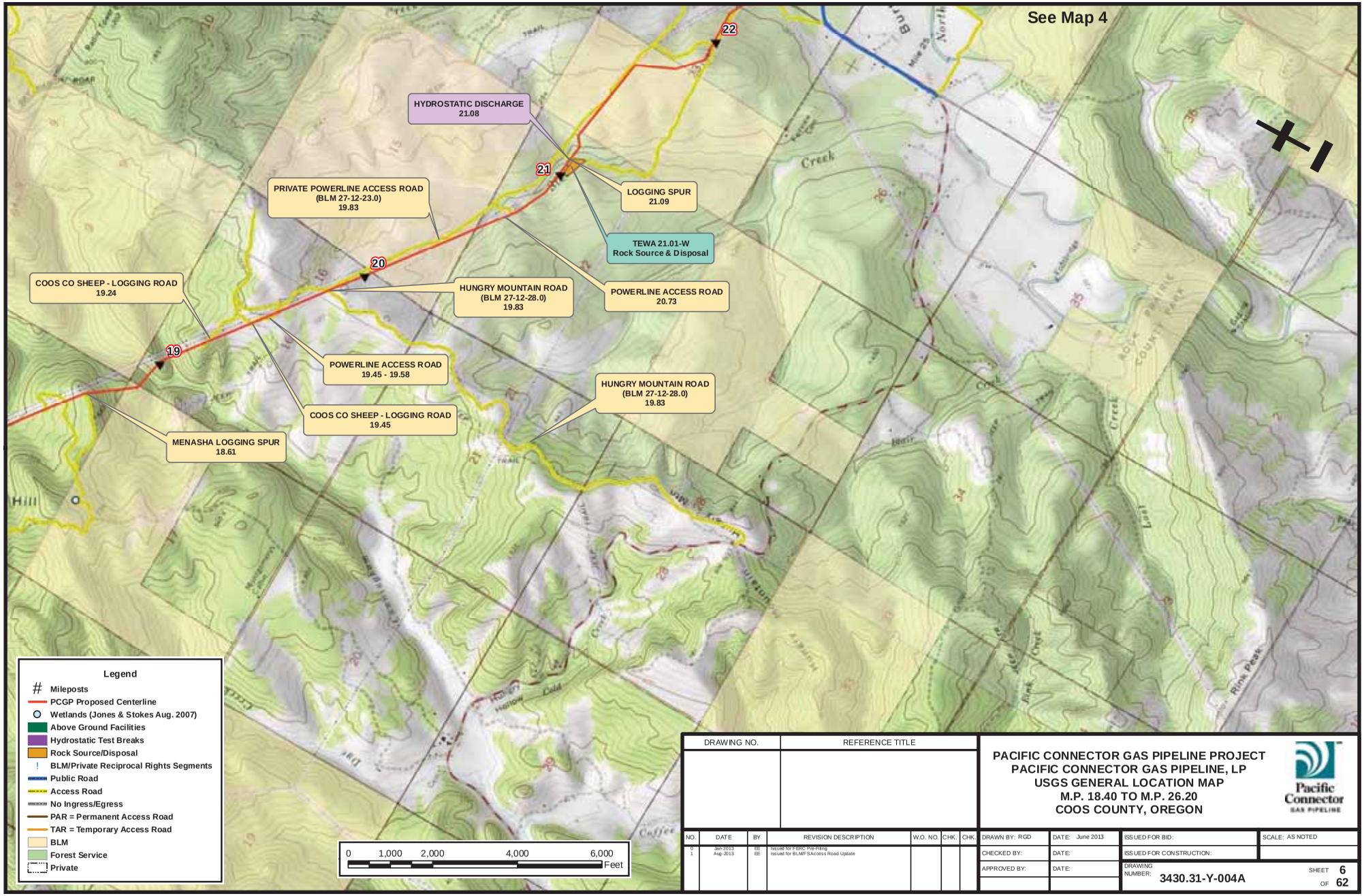
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 18.40 TO M.P. 26.20
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-004	SHEET 5 OF 62



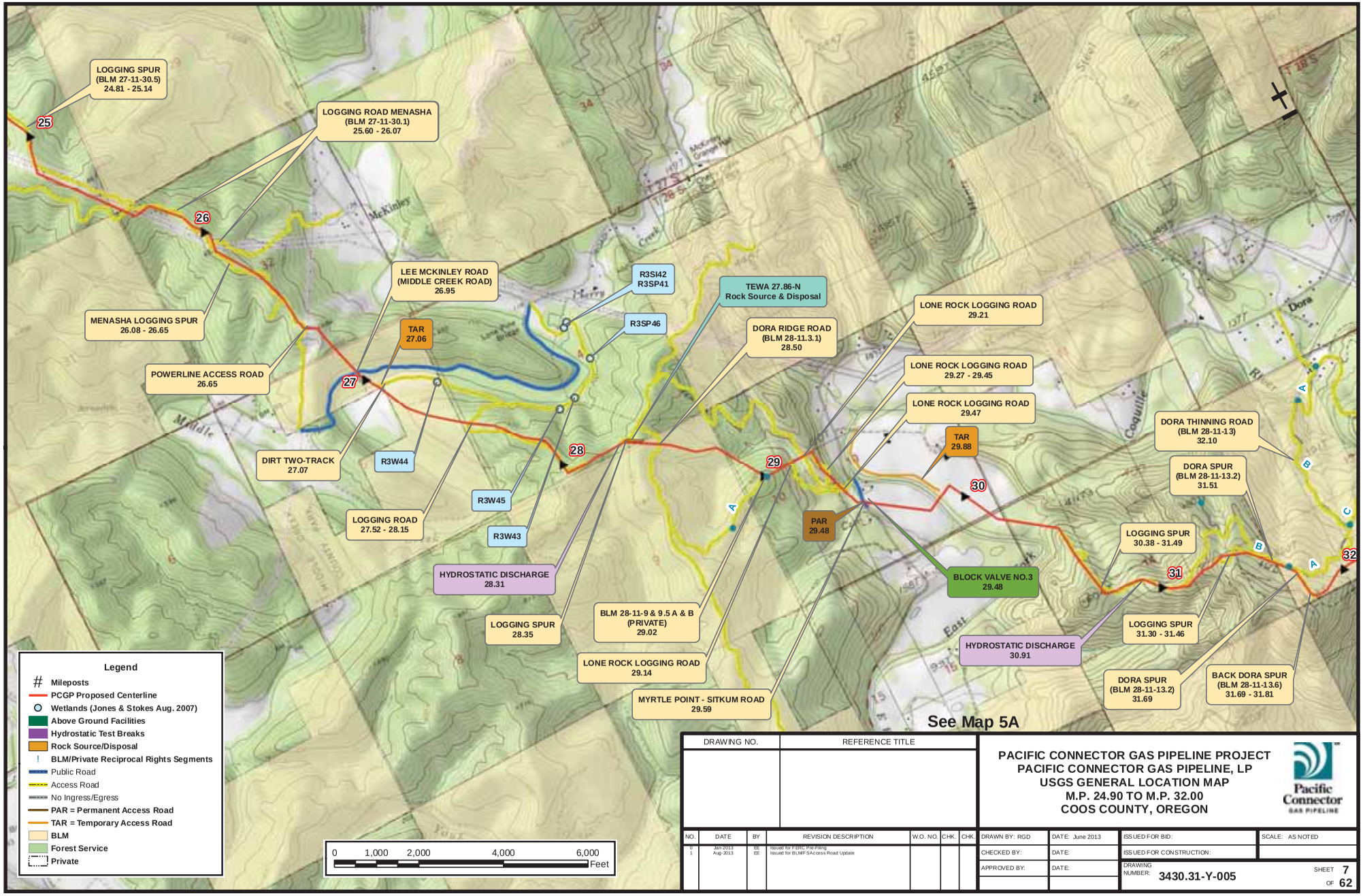
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 18.40 TO M.P. 26.20
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-004A	SHEET 6 OF 62



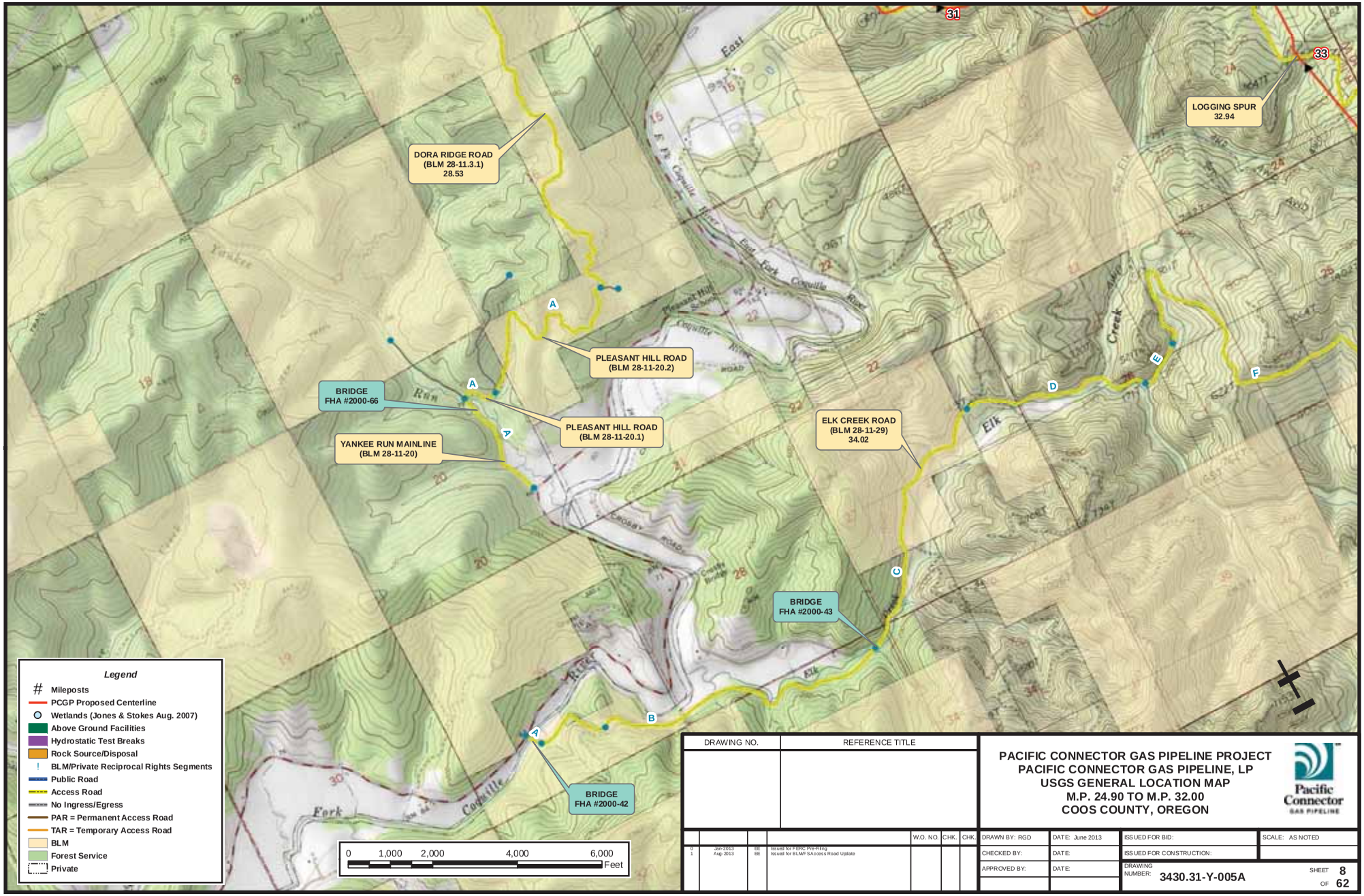
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 24.90 TO M.P. 32.00
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-005	SHEET 7 OF 62



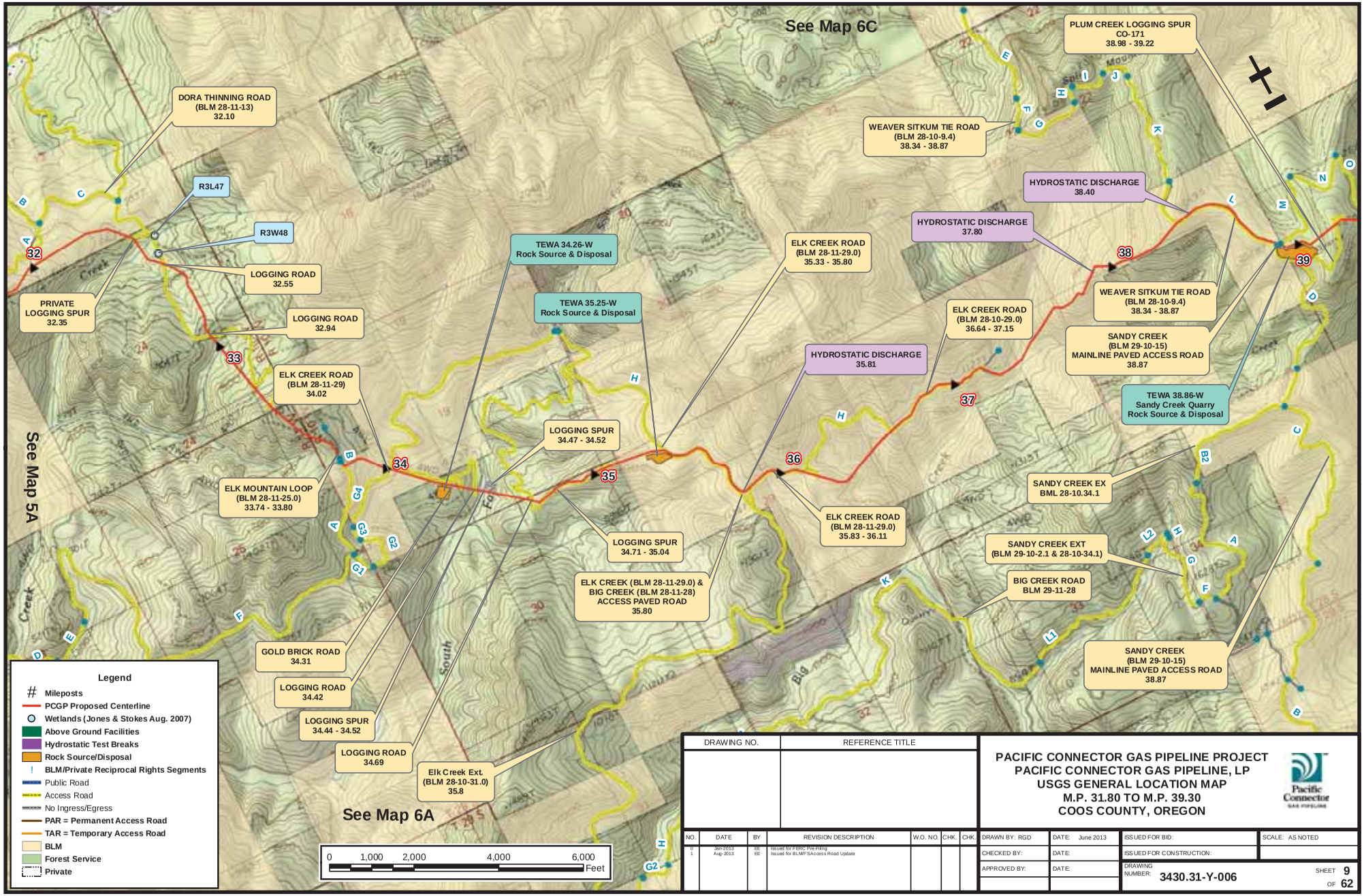
DRAWING NO.	REFERENCE TITLE

				W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 24.90 TO M.P. 32.00
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-005A	SHEET 8 OF 62



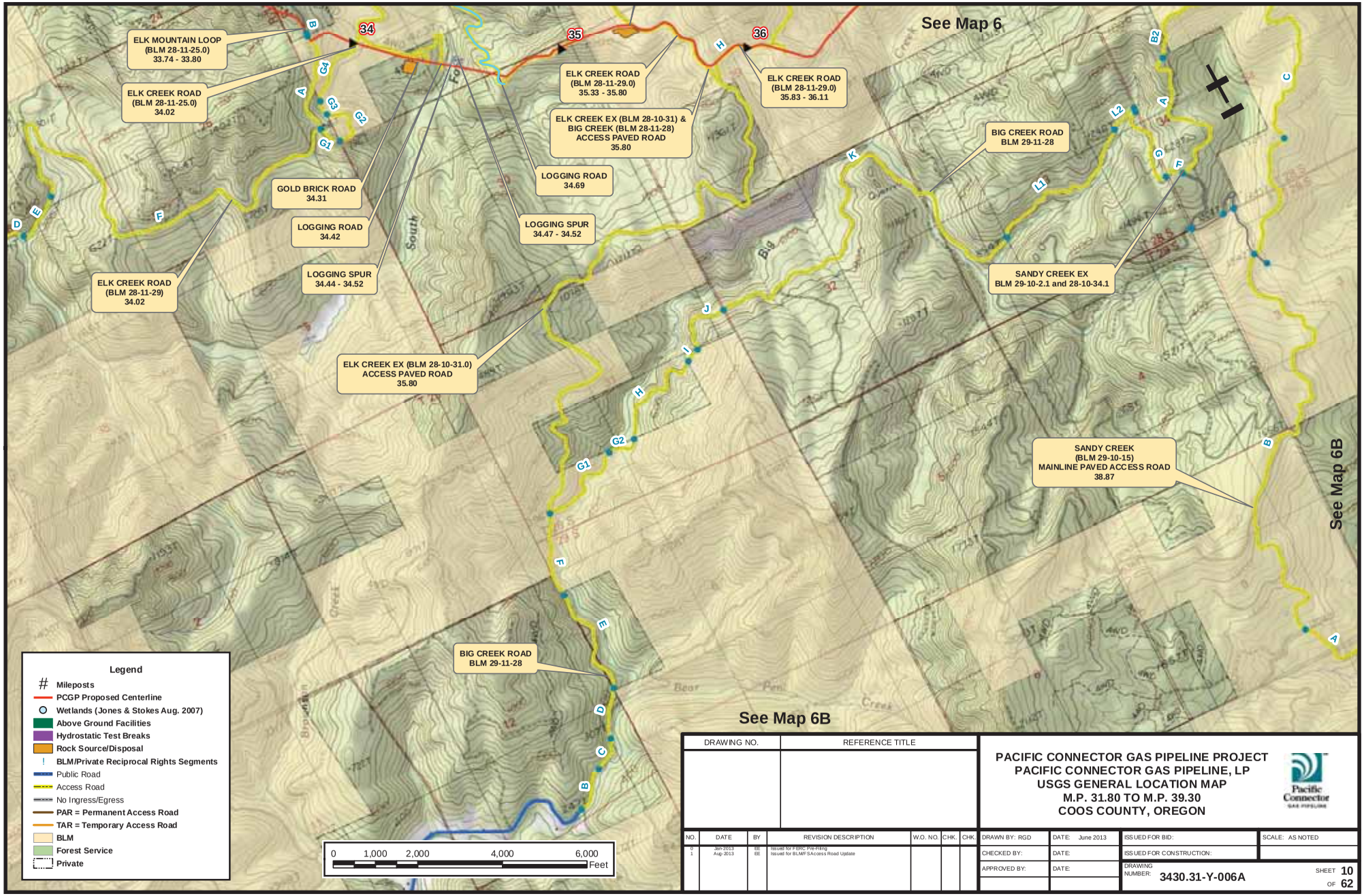
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 31.80 TO M.P. 39.30
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-006	SHEET 9 OF 62



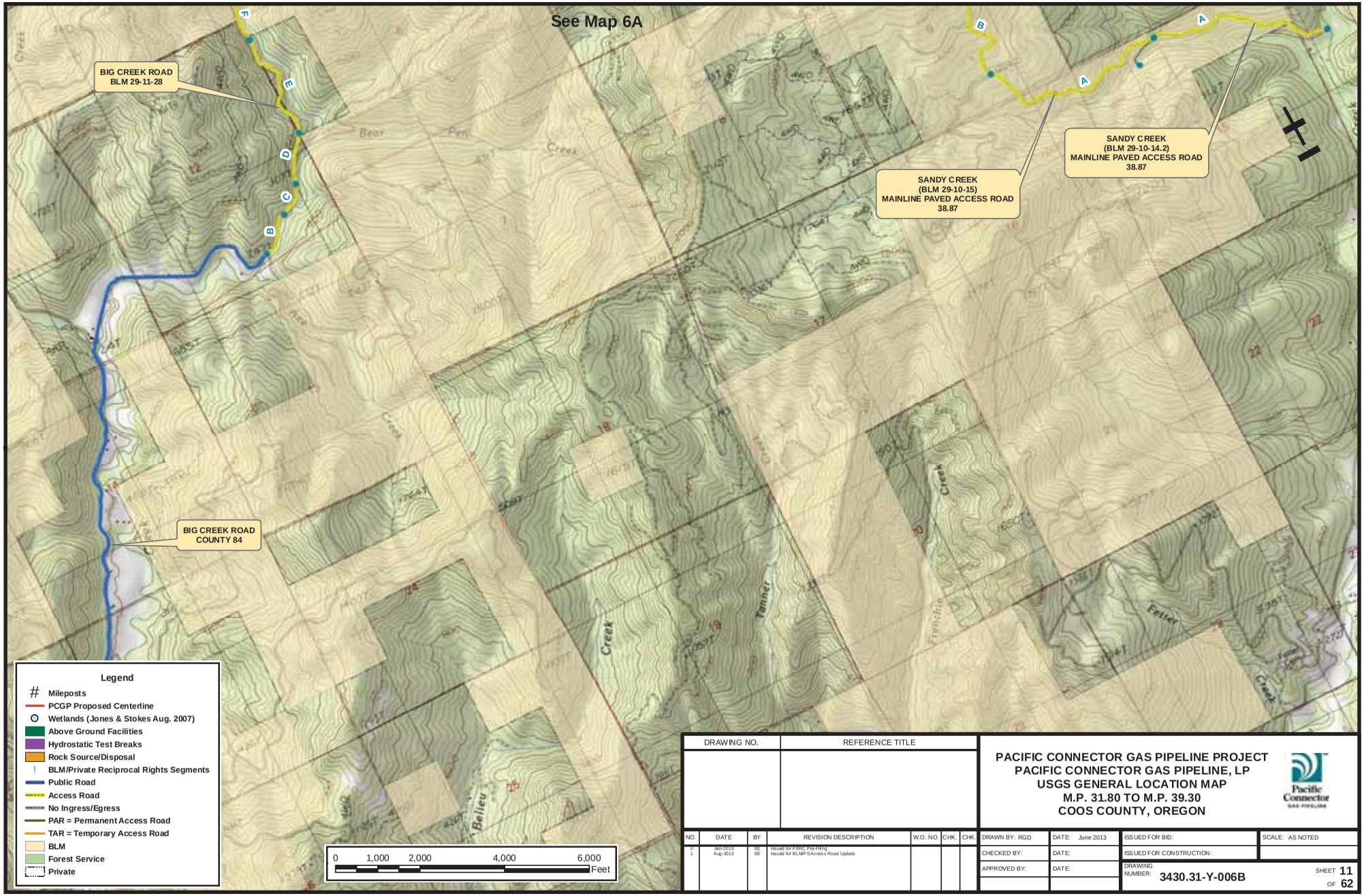
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 31.80 TO M.P. 39.30
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-006A	SHEET 10 OF 62



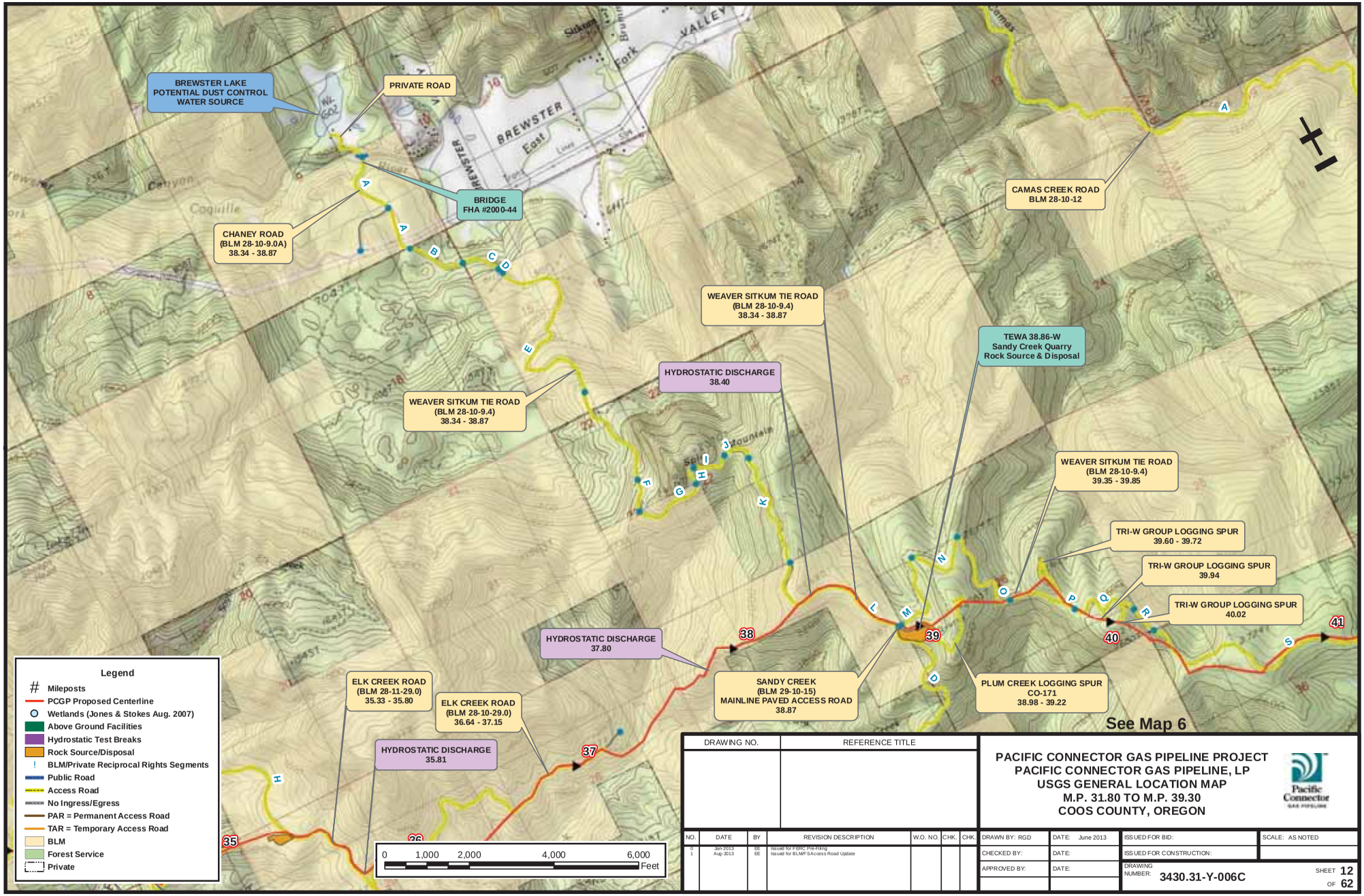
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 31.80 TO M.P. 39.30
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-006B	SHEET 11 OF 62



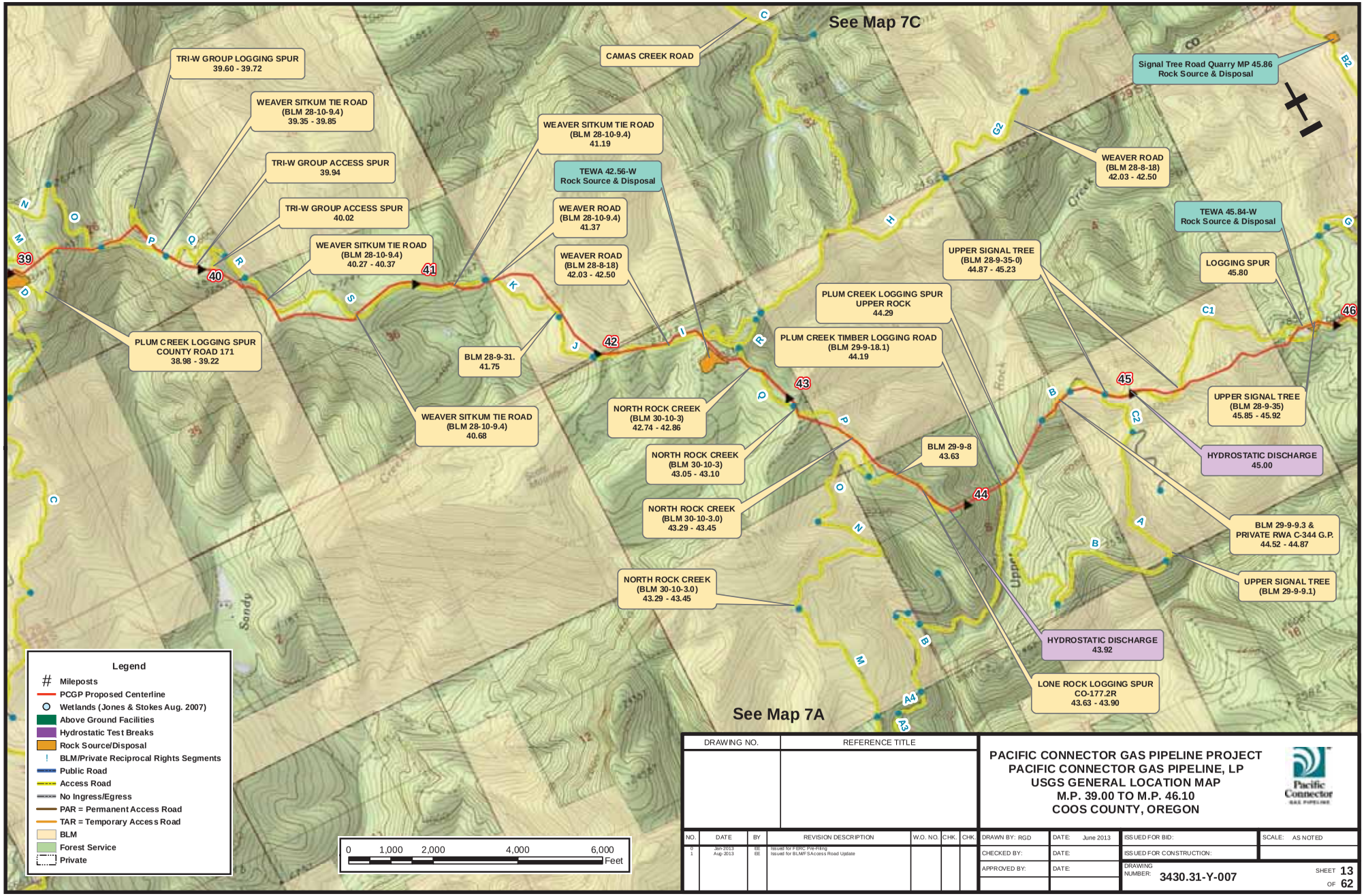
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 31.80 TO M.P. 39.30
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-006C	SHEET 12 OF 62



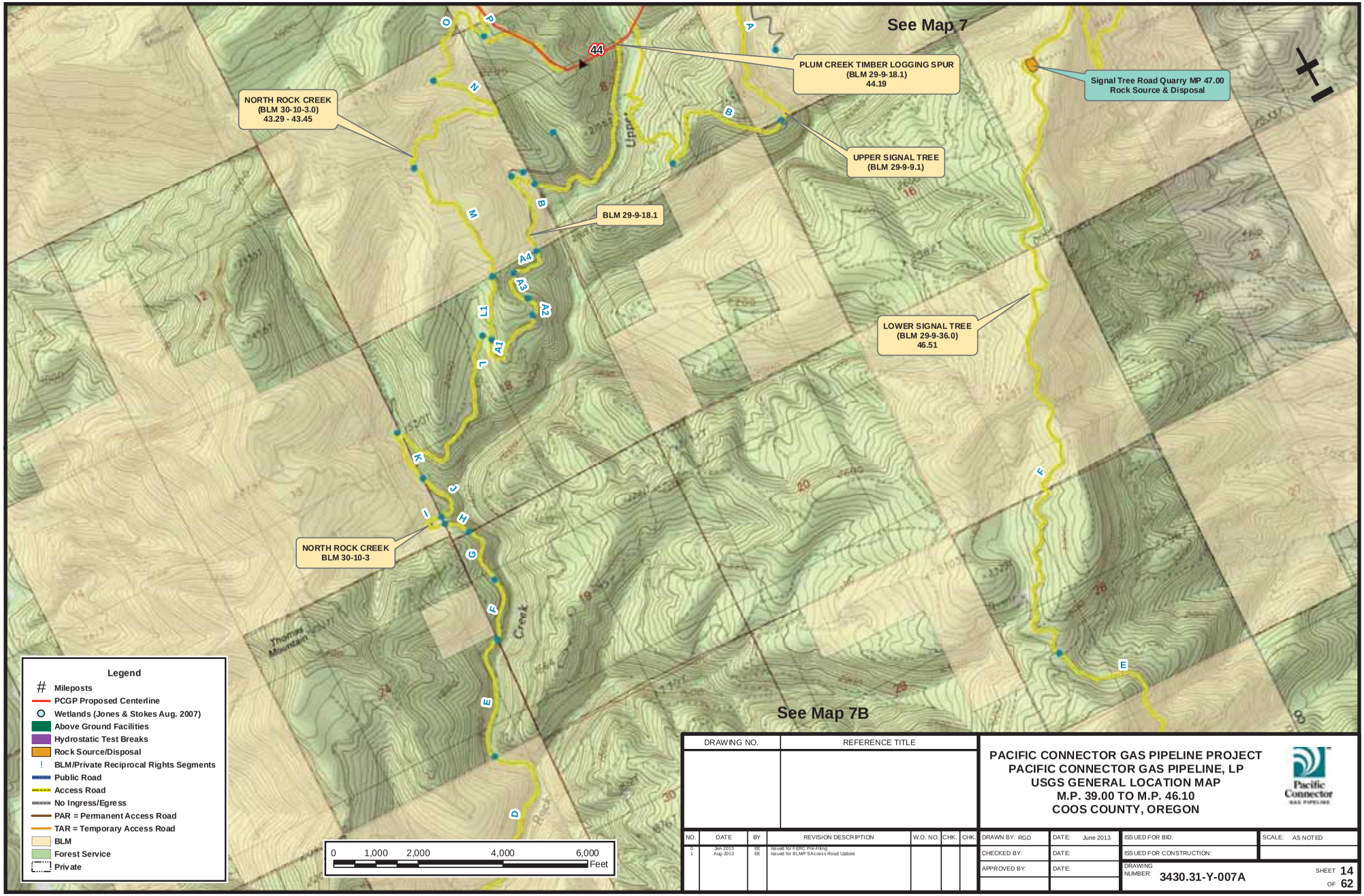
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 39.00 TO M.P. 46.10
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-007	SHEET 13 OF 62



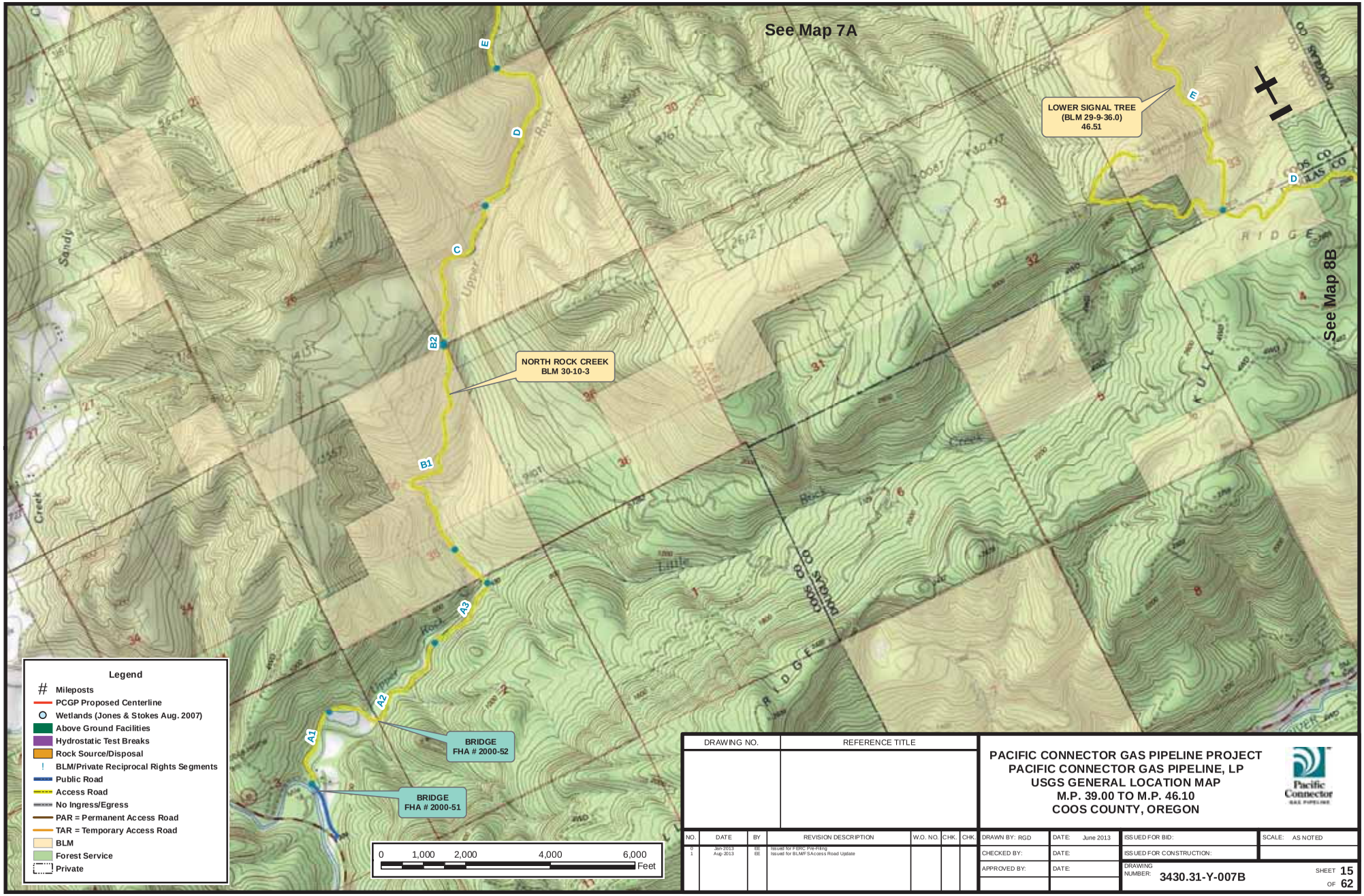
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 39.00 TO M.P. 46.10
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-007A	SHEET 14 OF 62



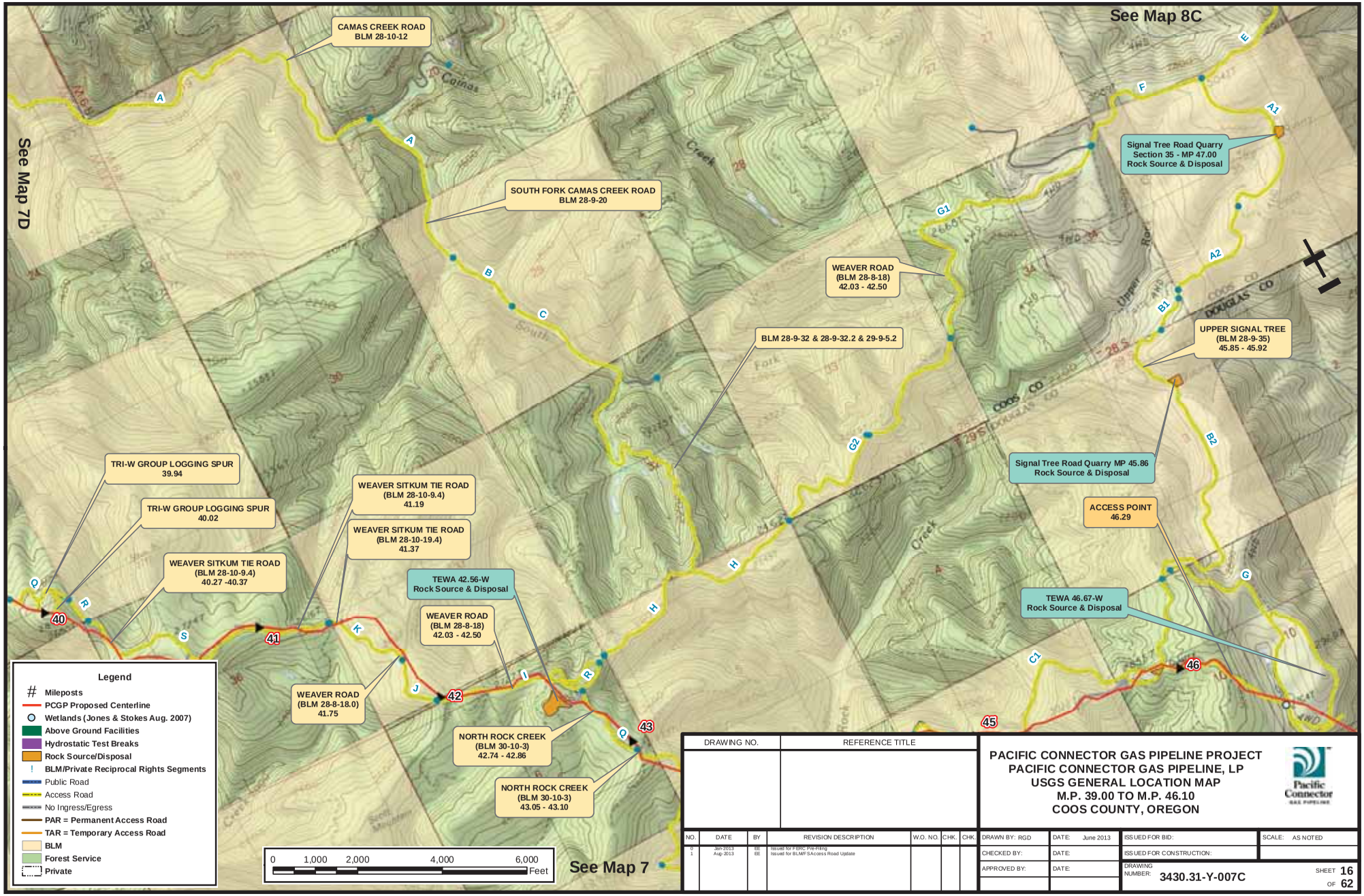
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 39.00 TO M.P. 46.10
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-007B	SHEET 15 OF 62



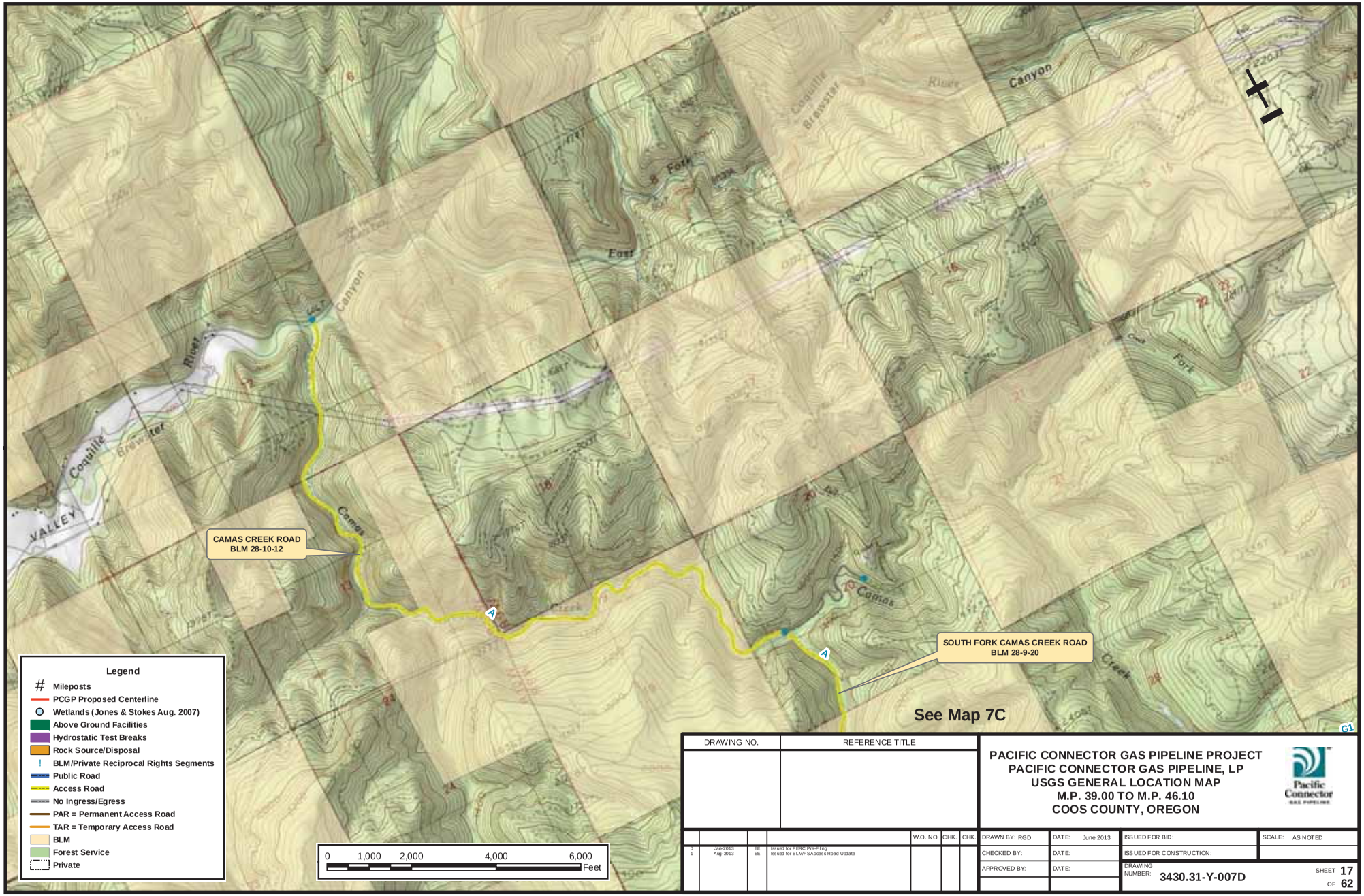
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 39.00 TO M.P. 46.10
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-007C	SHEET 16 OF 62



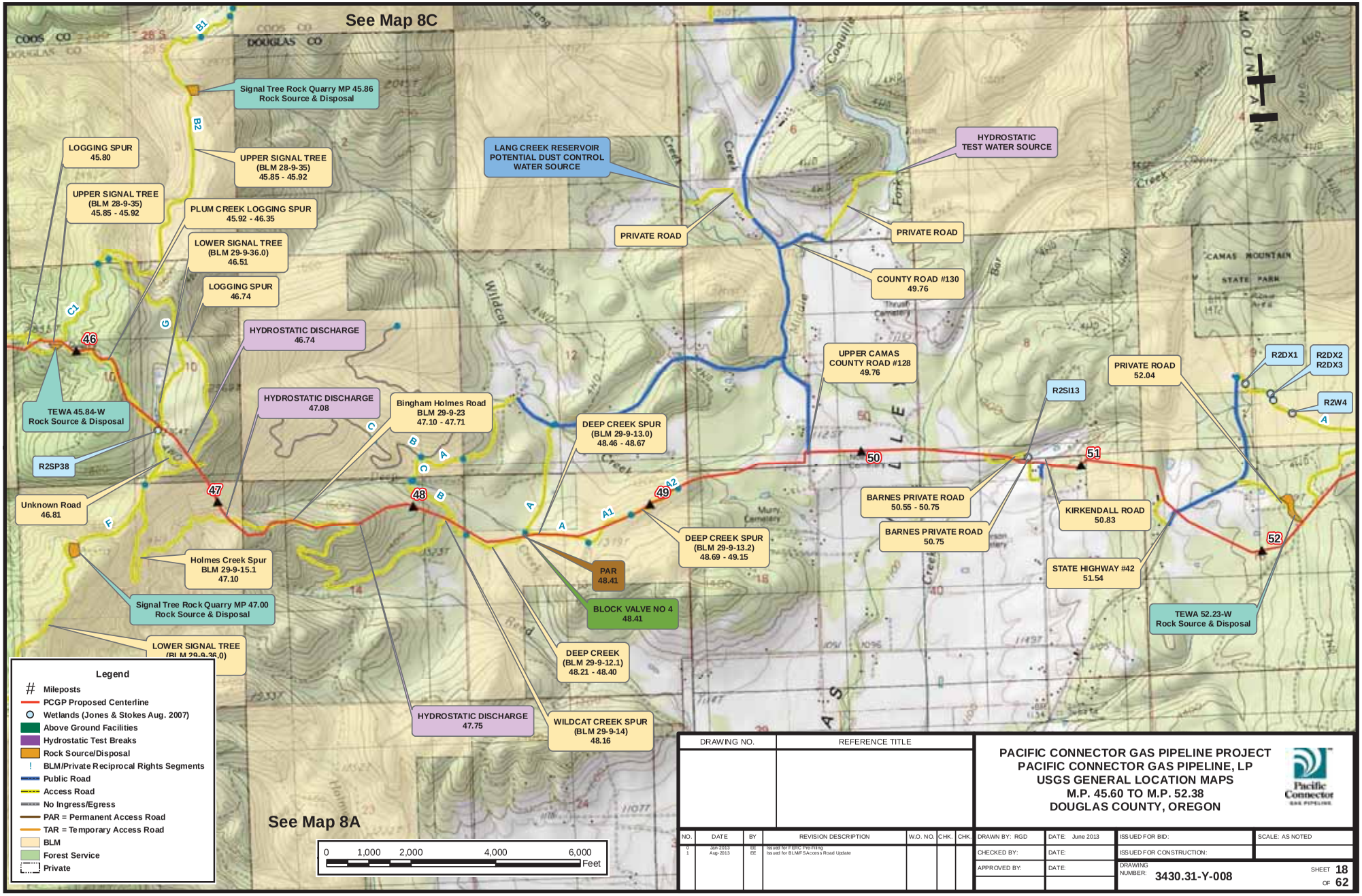
DRAWING NO.	REFERENCE TITLE

				W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 39.00 TO M.P. 46.10
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-007D	SHEET 17 OF 62



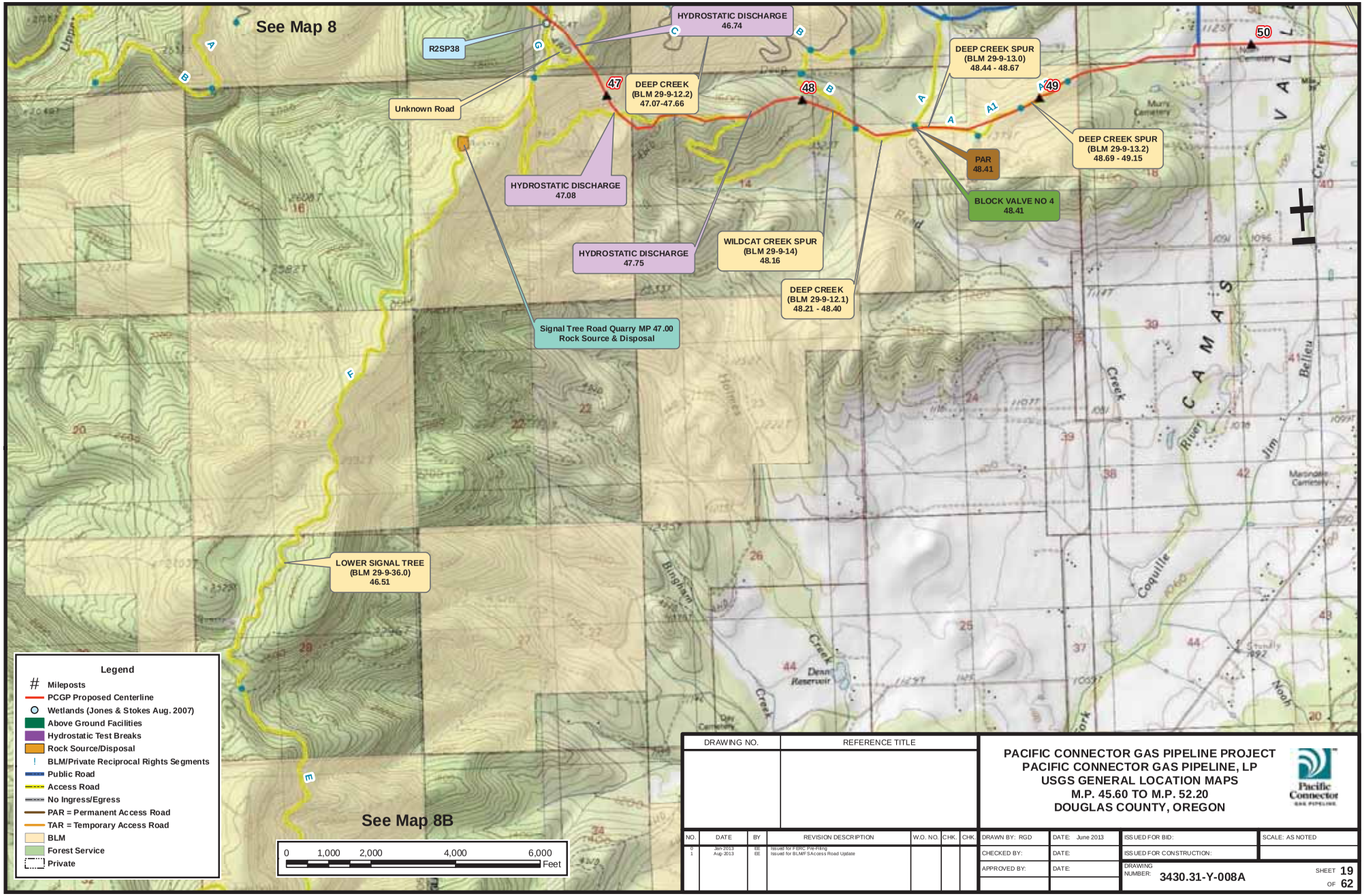
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAPS
M.P. 45.60 TO M.P. 52.38
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-008	SHEET 18 OF 62



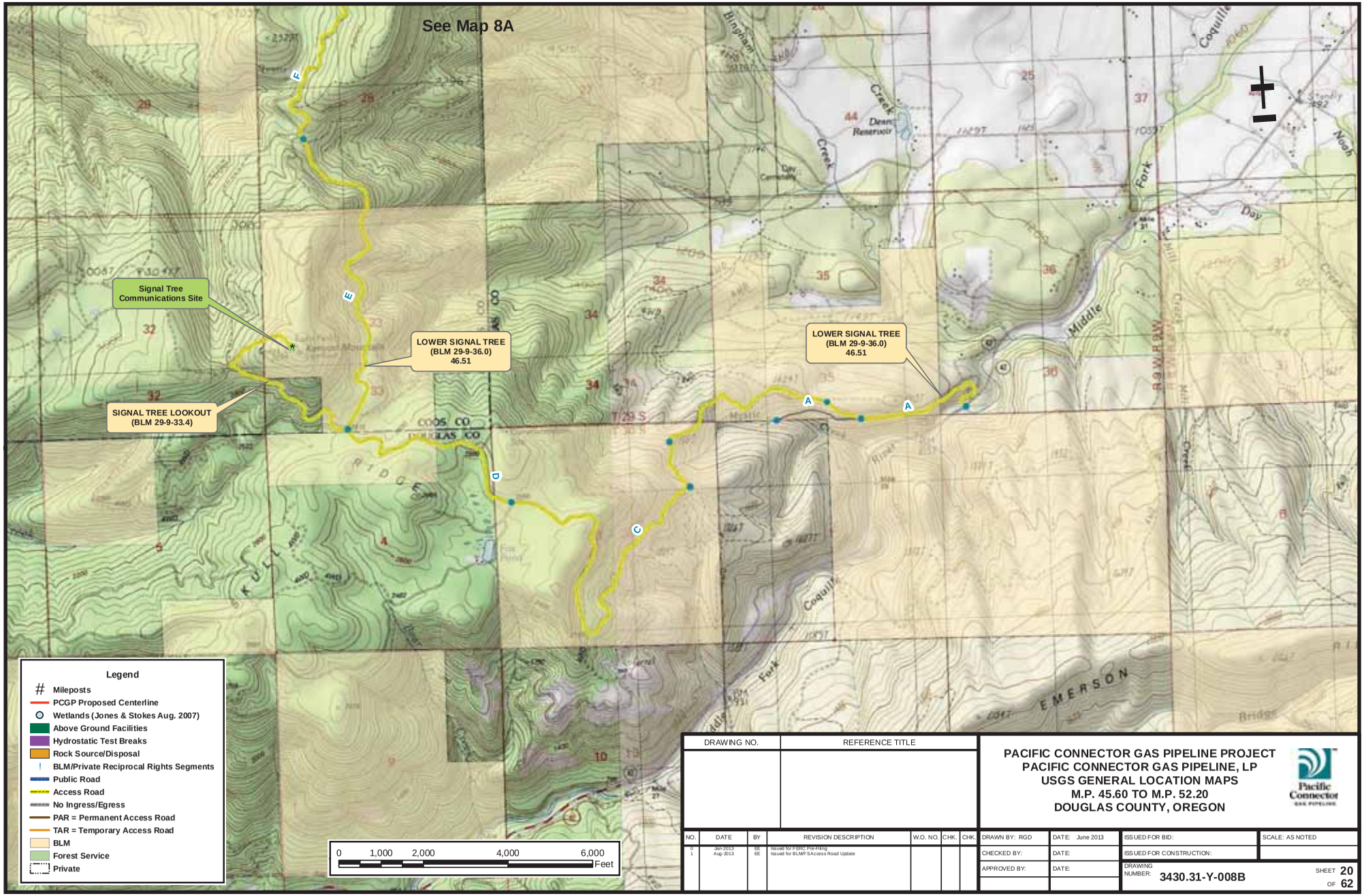
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAPS
M.P. 45.60 TO M.P. 52.20
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-008A	SHEET 19 OF 62



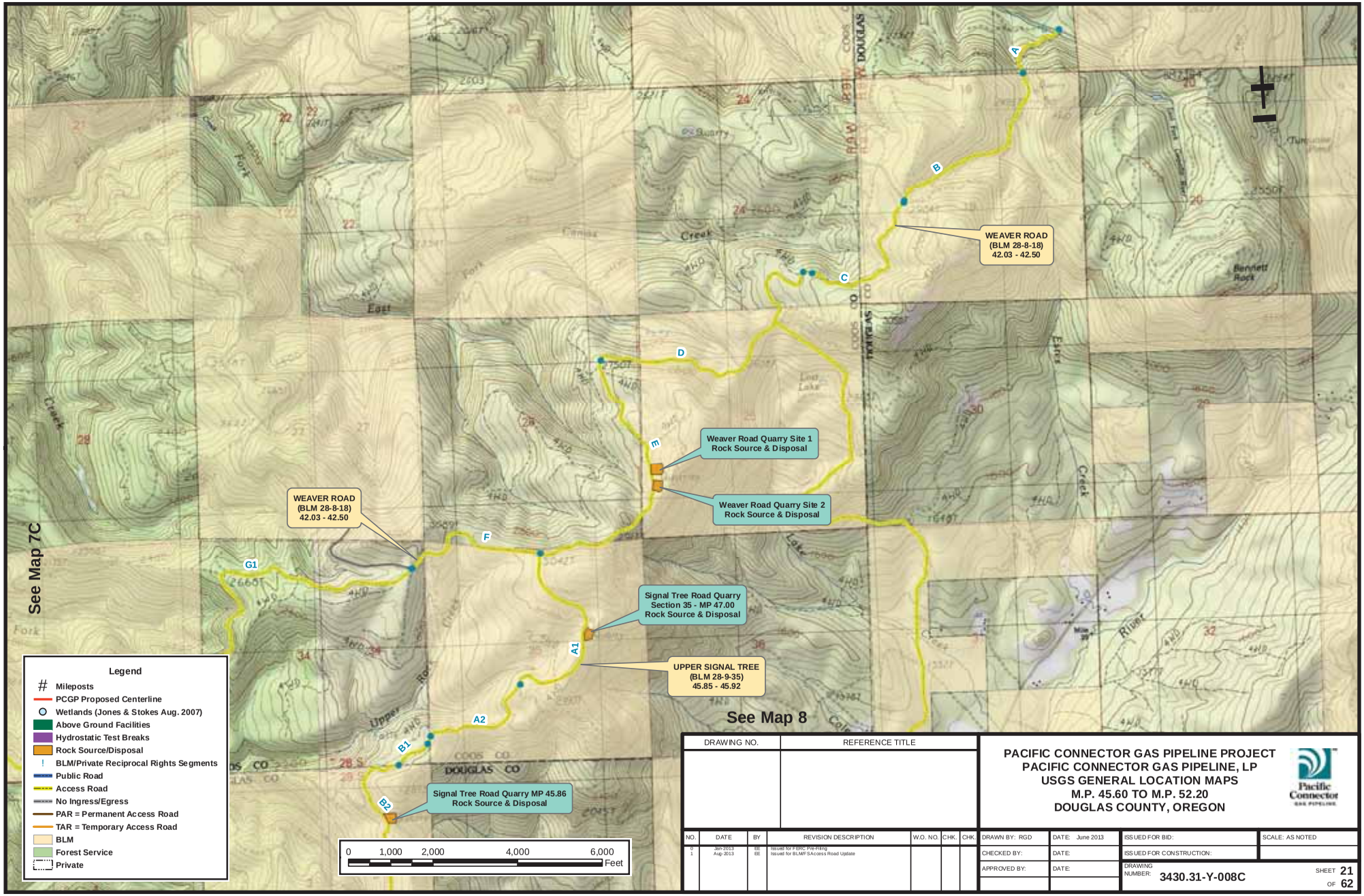
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAPS
M.P. 45.60 TO M.P. 52.20
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-008B	SHEET 20 OF 62



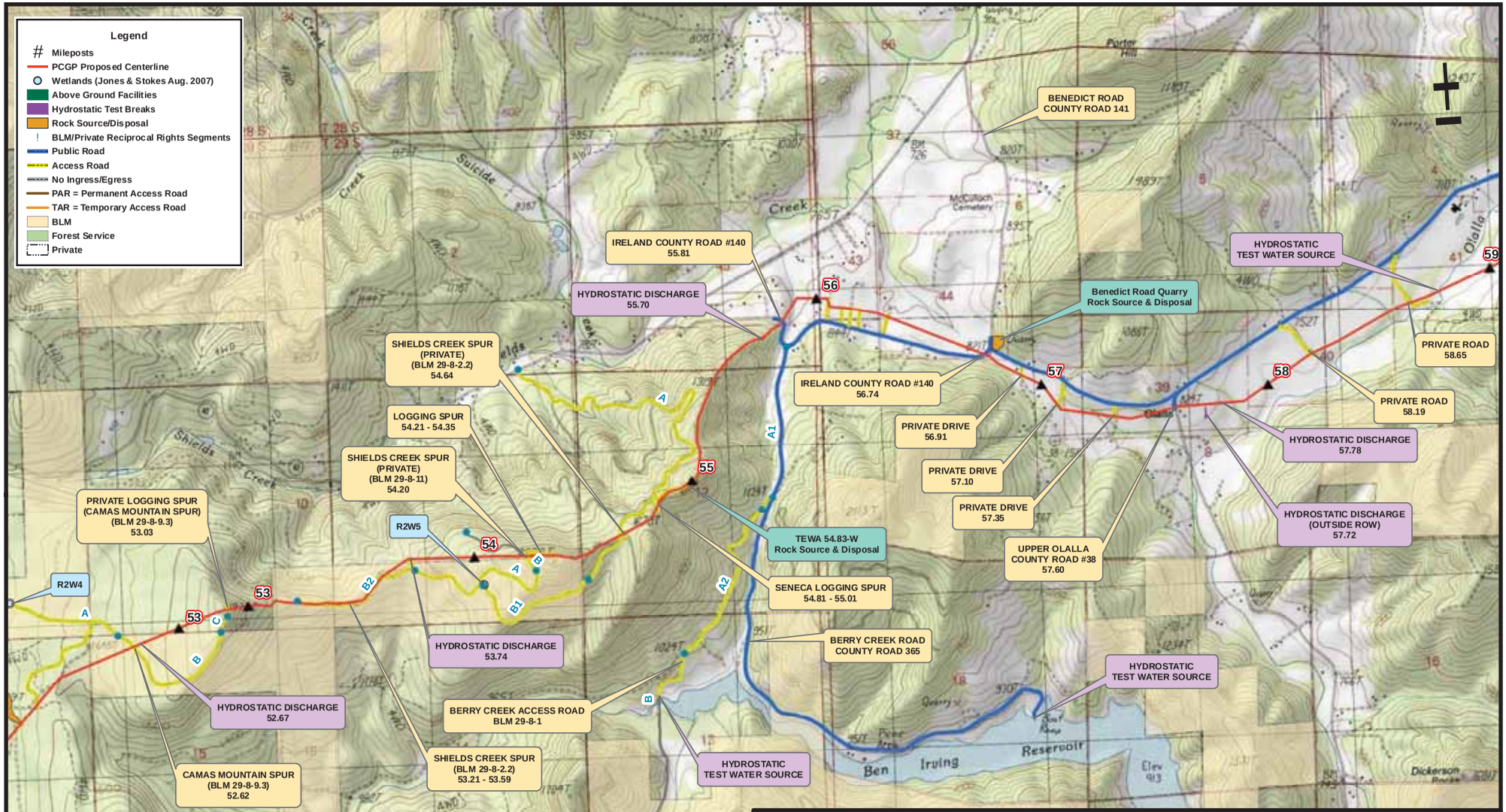
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAPS
M.P. 45.60 TO M.P. 52.20
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-008C	SHEET 21 OF 62

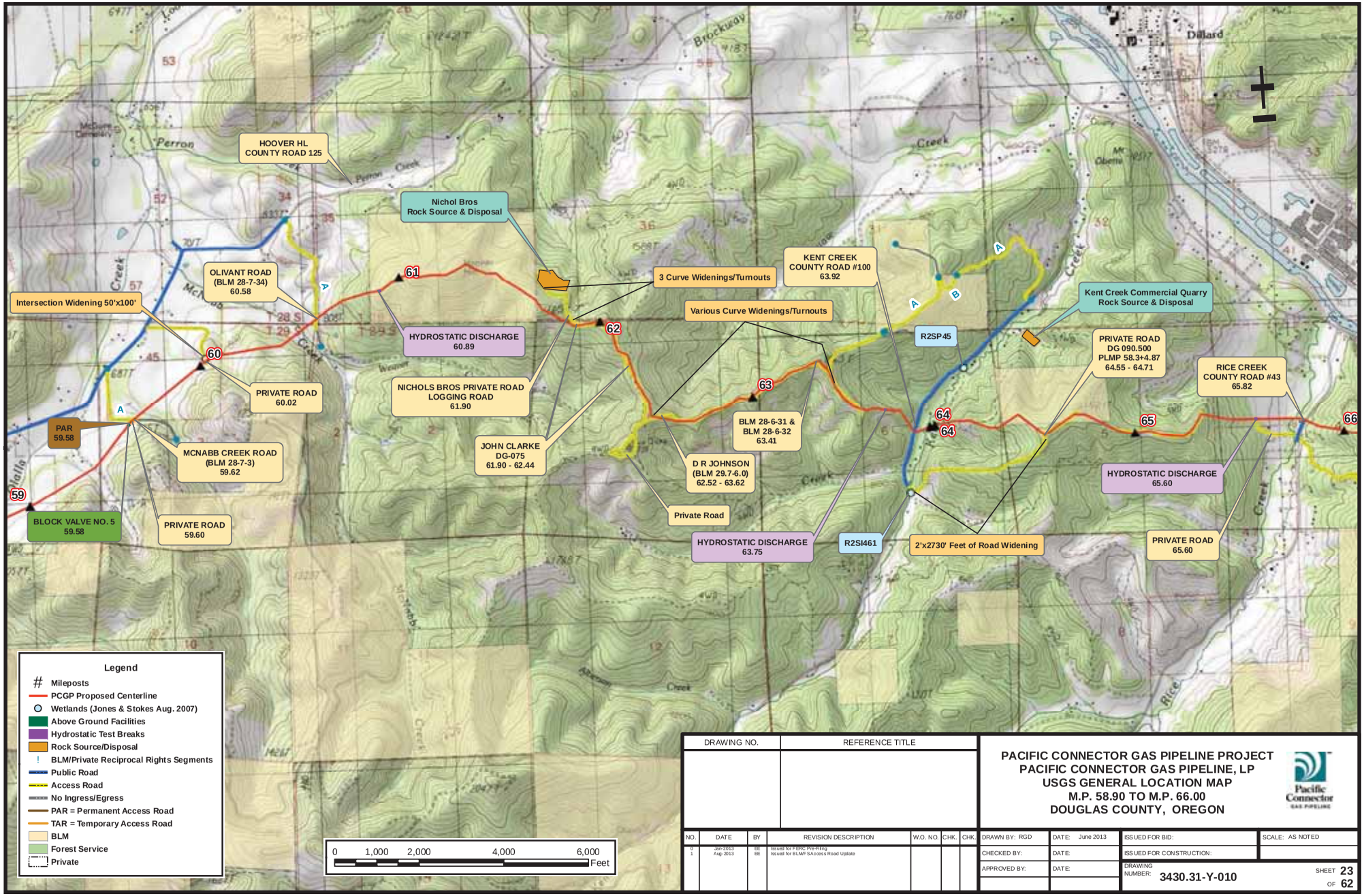


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCAGTION MAP
M.P. 52.00 TO M.P. 59.00
DOUGLAS COUNTY, OREGON

				W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-009	SHEET 22 OF 62



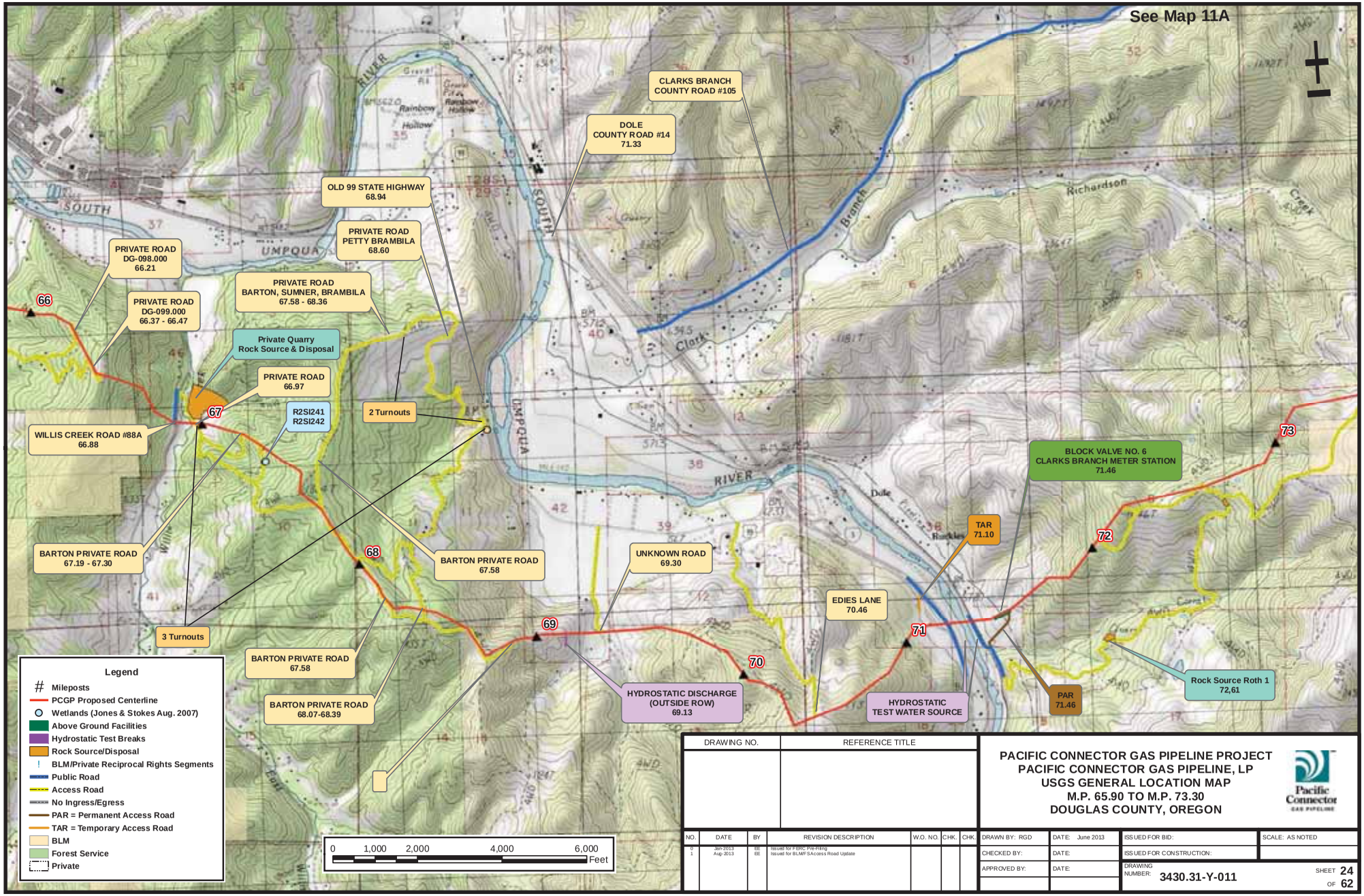
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 58.90 TO M.P. 66.00
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-010	SHEET 23 OF 62



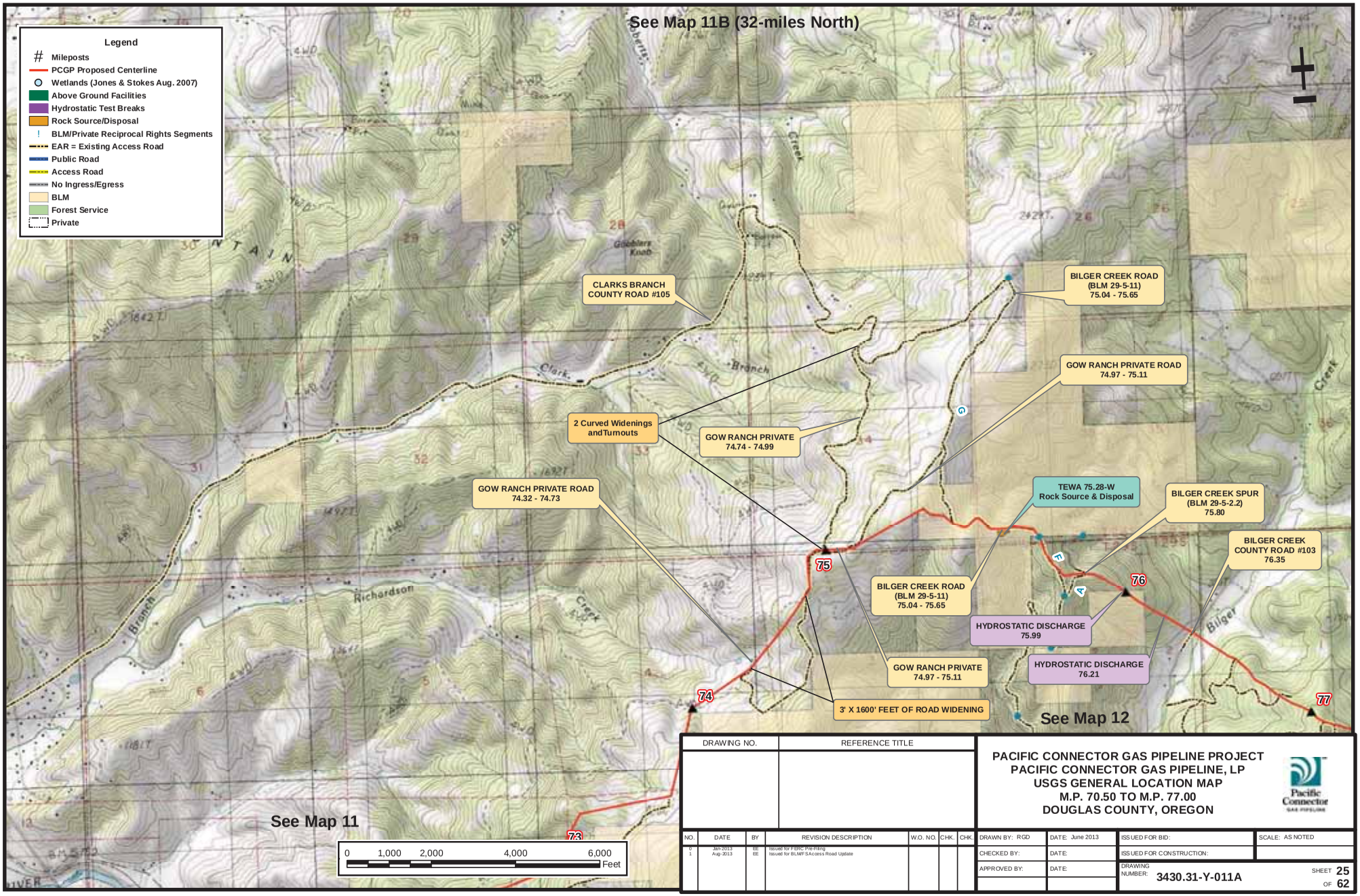
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 65.90 TO M.P. 73.30
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-011	SHEET 24 OF 62

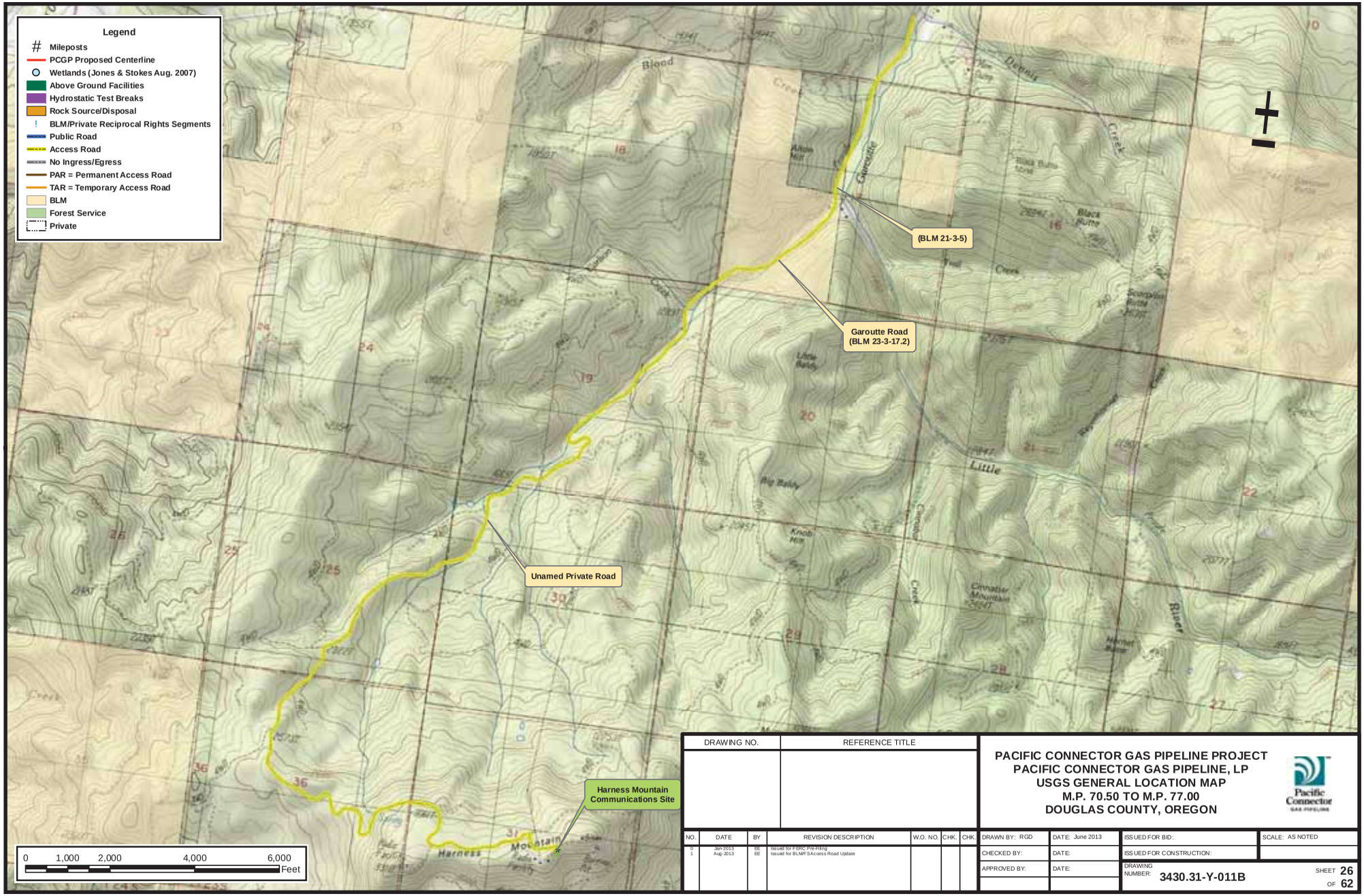


DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 70.50 TO M.P. 77.00
DOUGLAS COUNTY, OREGON

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-011A	SHEET 25 OF 62

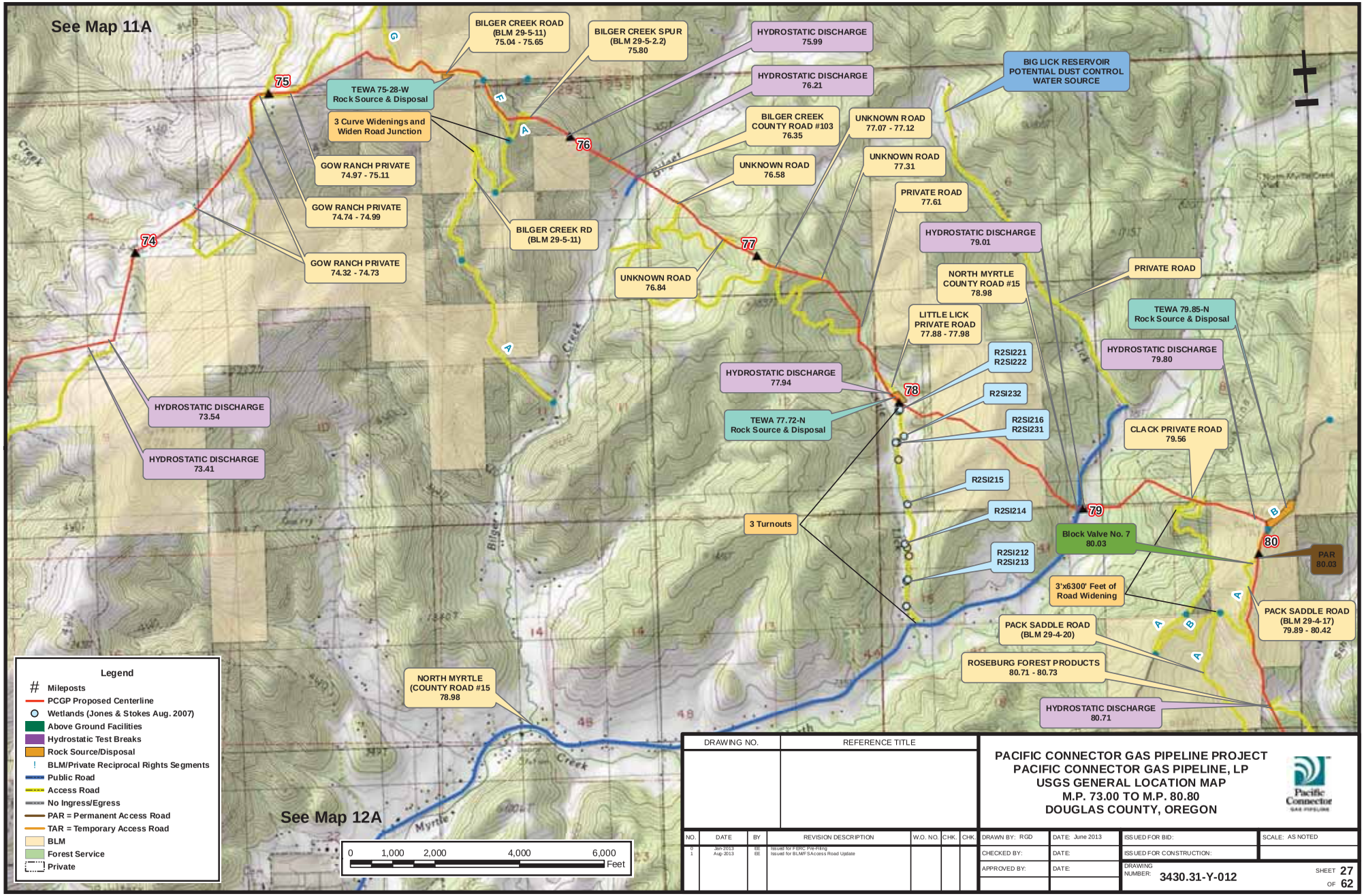


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 70.50 TO M.P. 77.00
DOUGLAS COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-011B	SHEET 26 OF 62



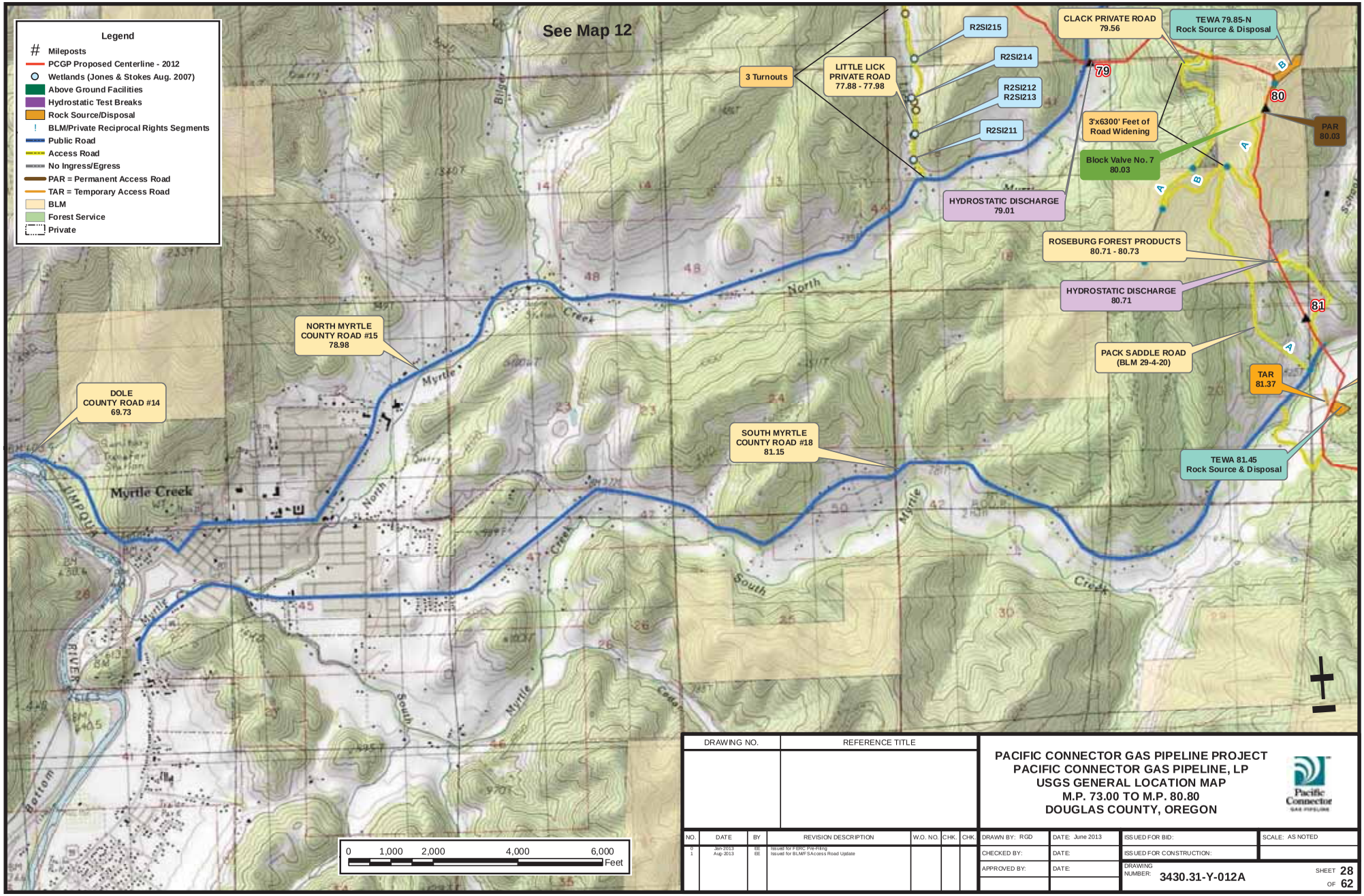
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 73.00 TO M.P. 80.80
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-012	SHEET 27 OF 62



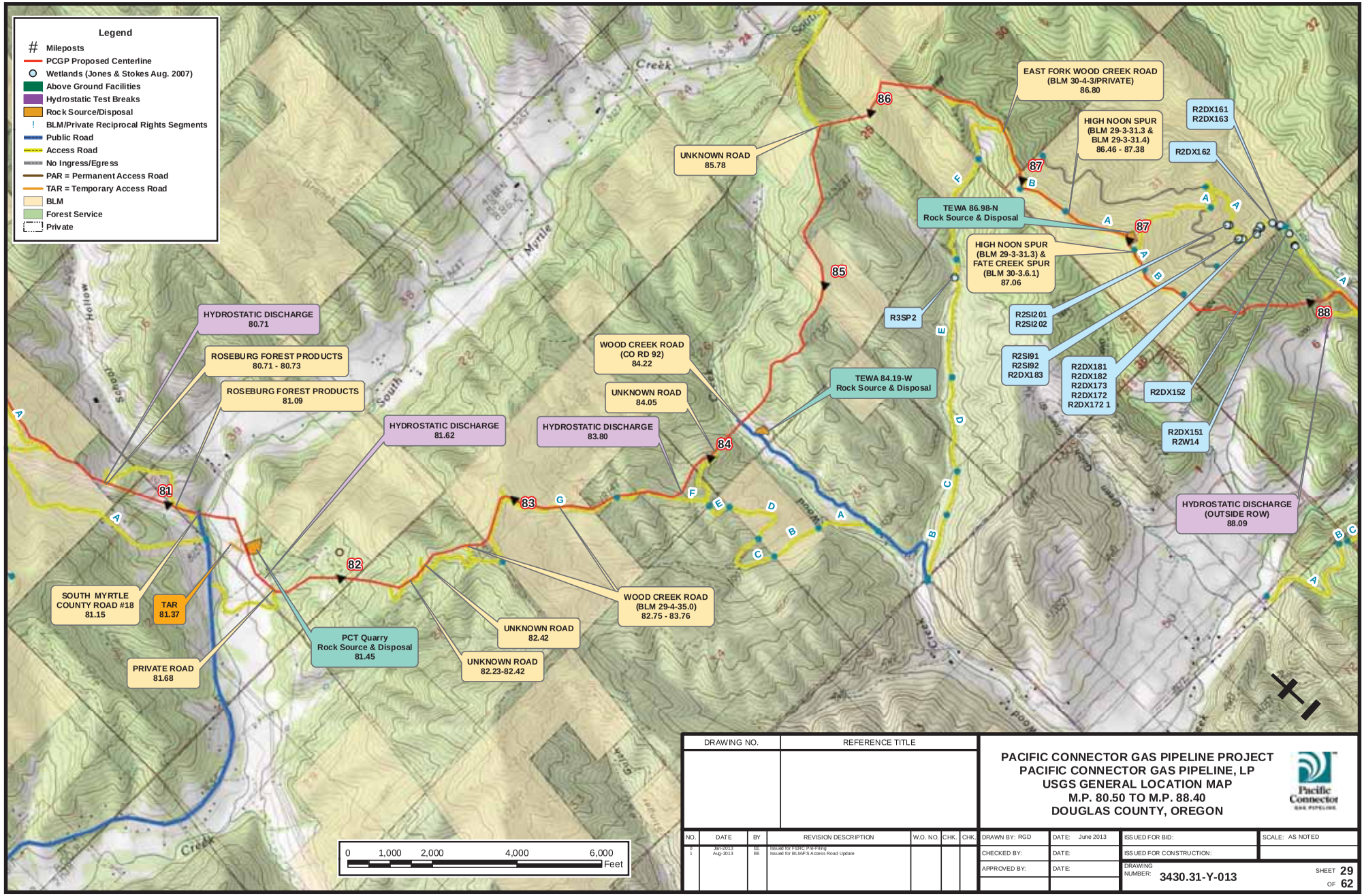
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 73.00 TO M.P. 80.80
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-012A	SHEET 28 OF 62



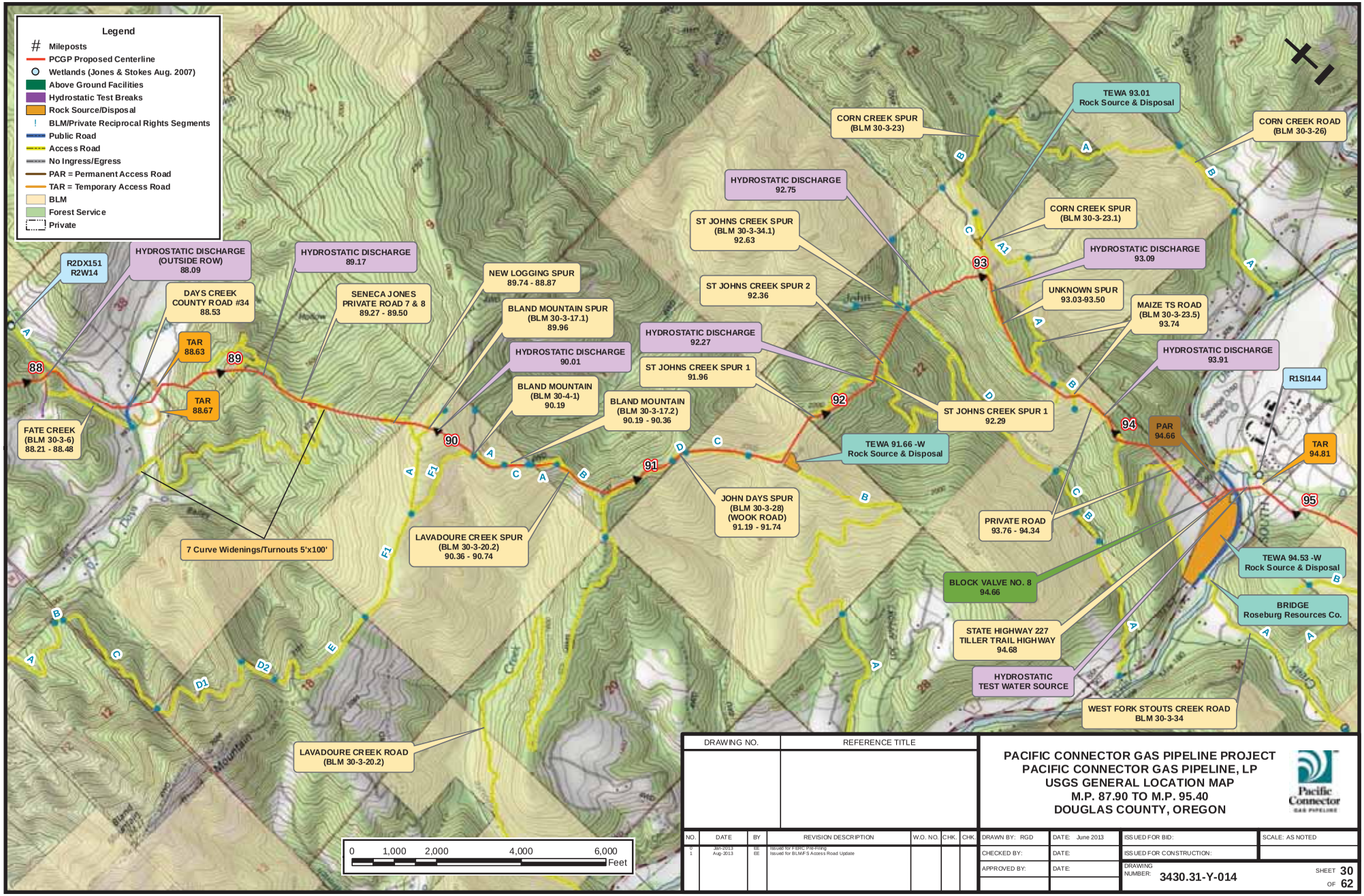
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 80.50 TO M.P. 88.40
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-013	SHEET 29 OF 62



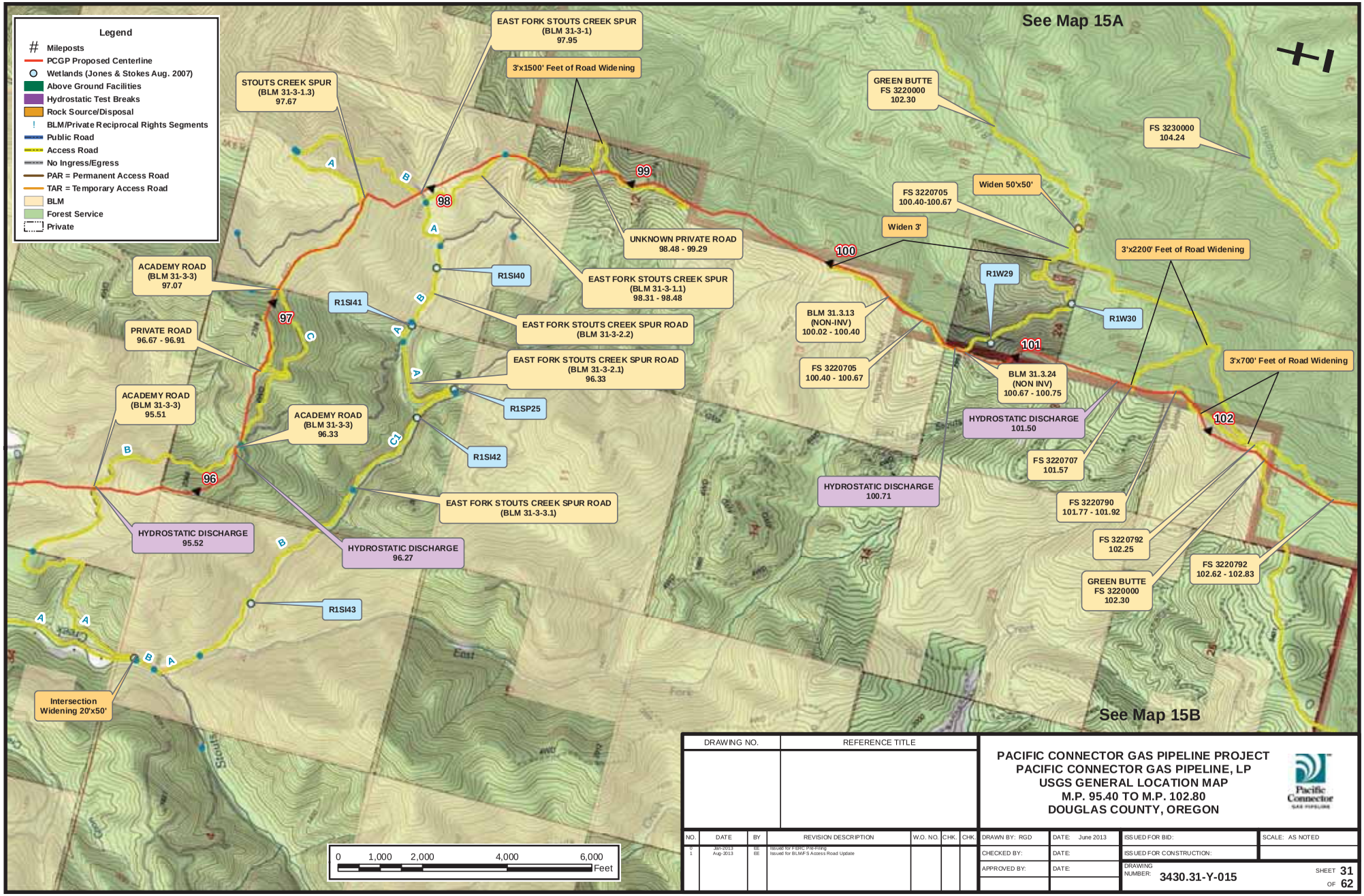
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 87.90 TO M.P. 95.40
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-014	SHEET 30 OF 62

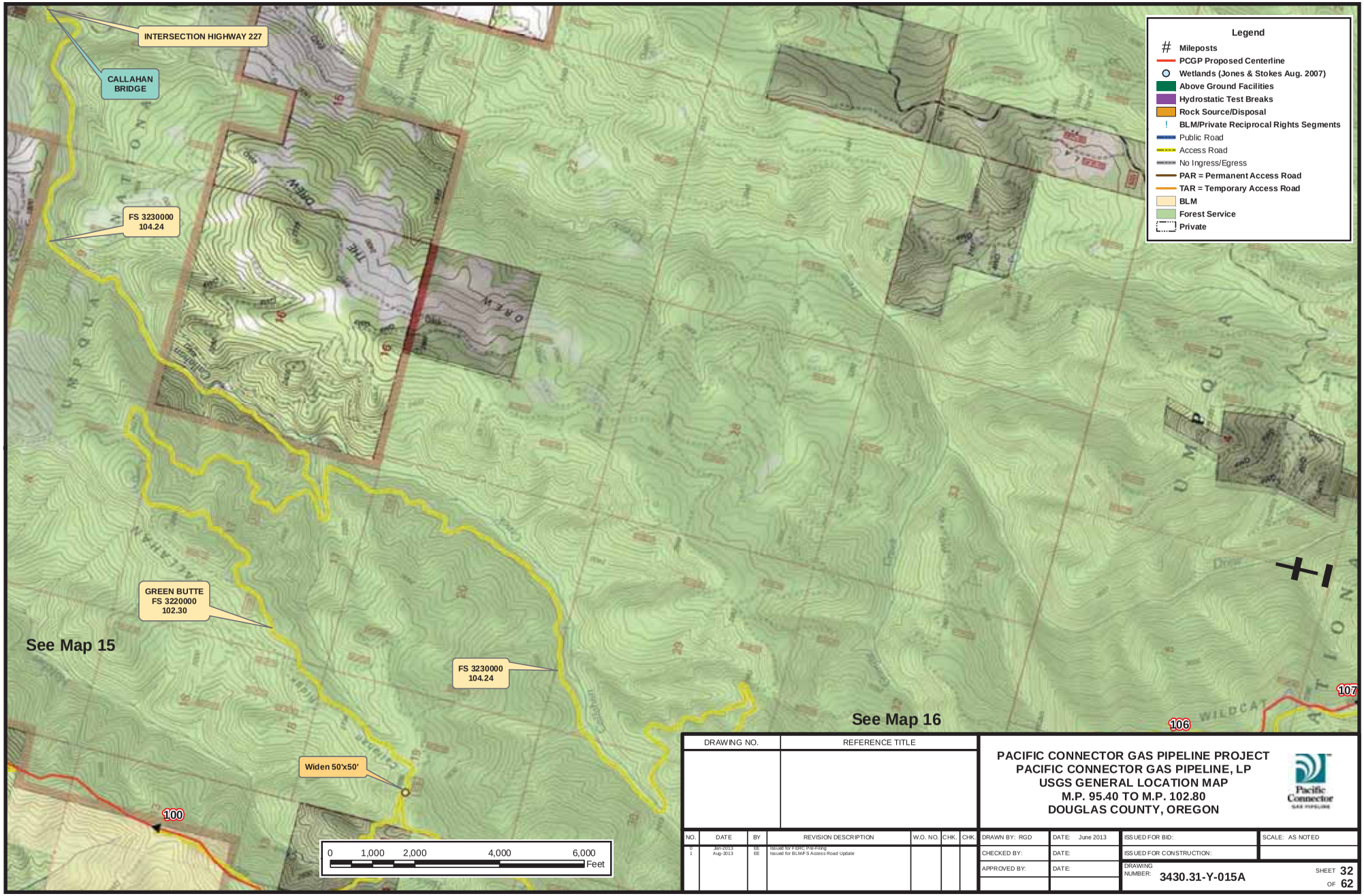


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 95.40 TO M.P. 102.80
DOUGLAS COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Filing Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-015	SHEET 31 OF 62

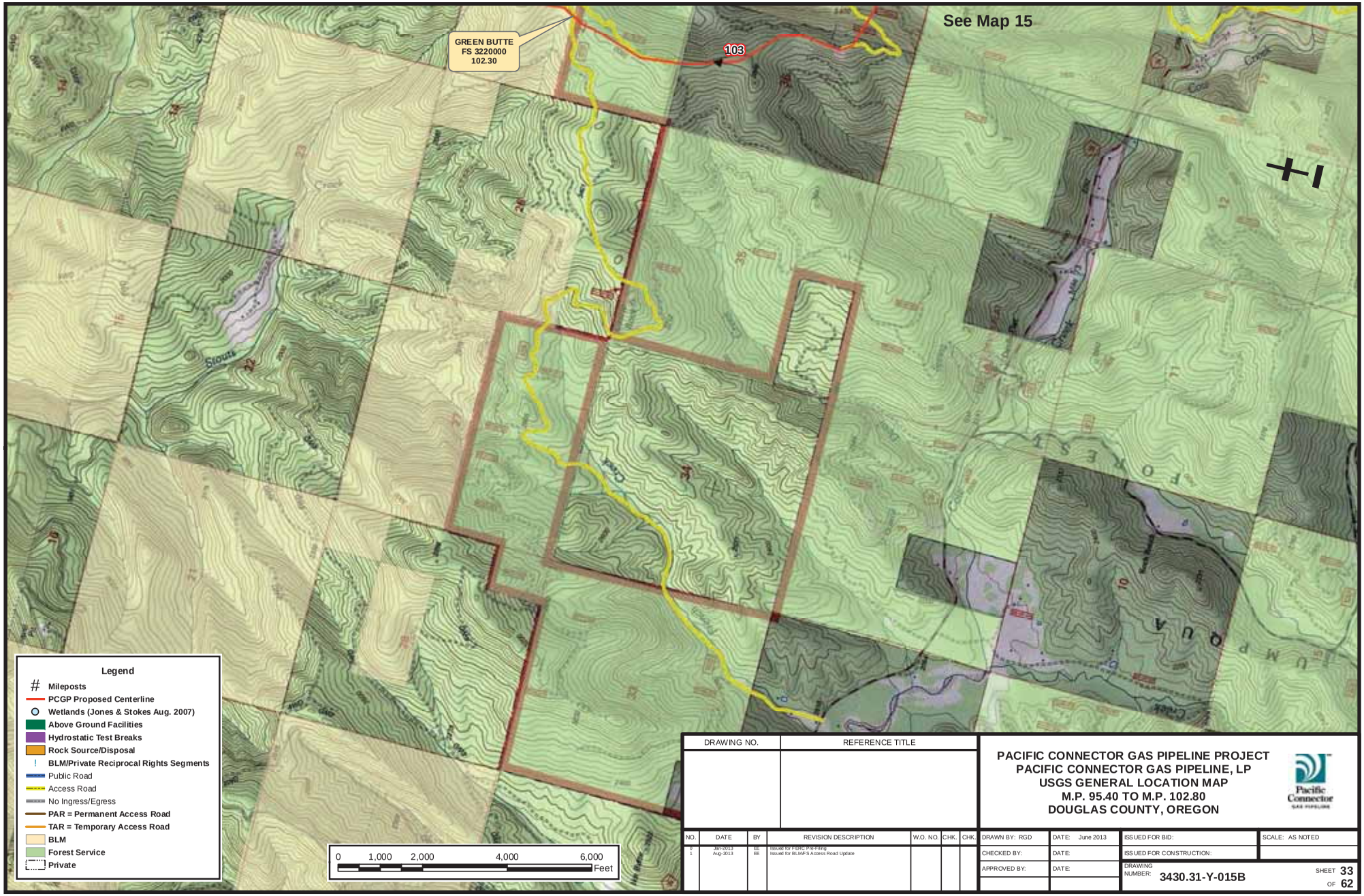


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 95.40 TO M.P. 102.80
DOUGLAS COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-015A	SHEET 32 OF 62

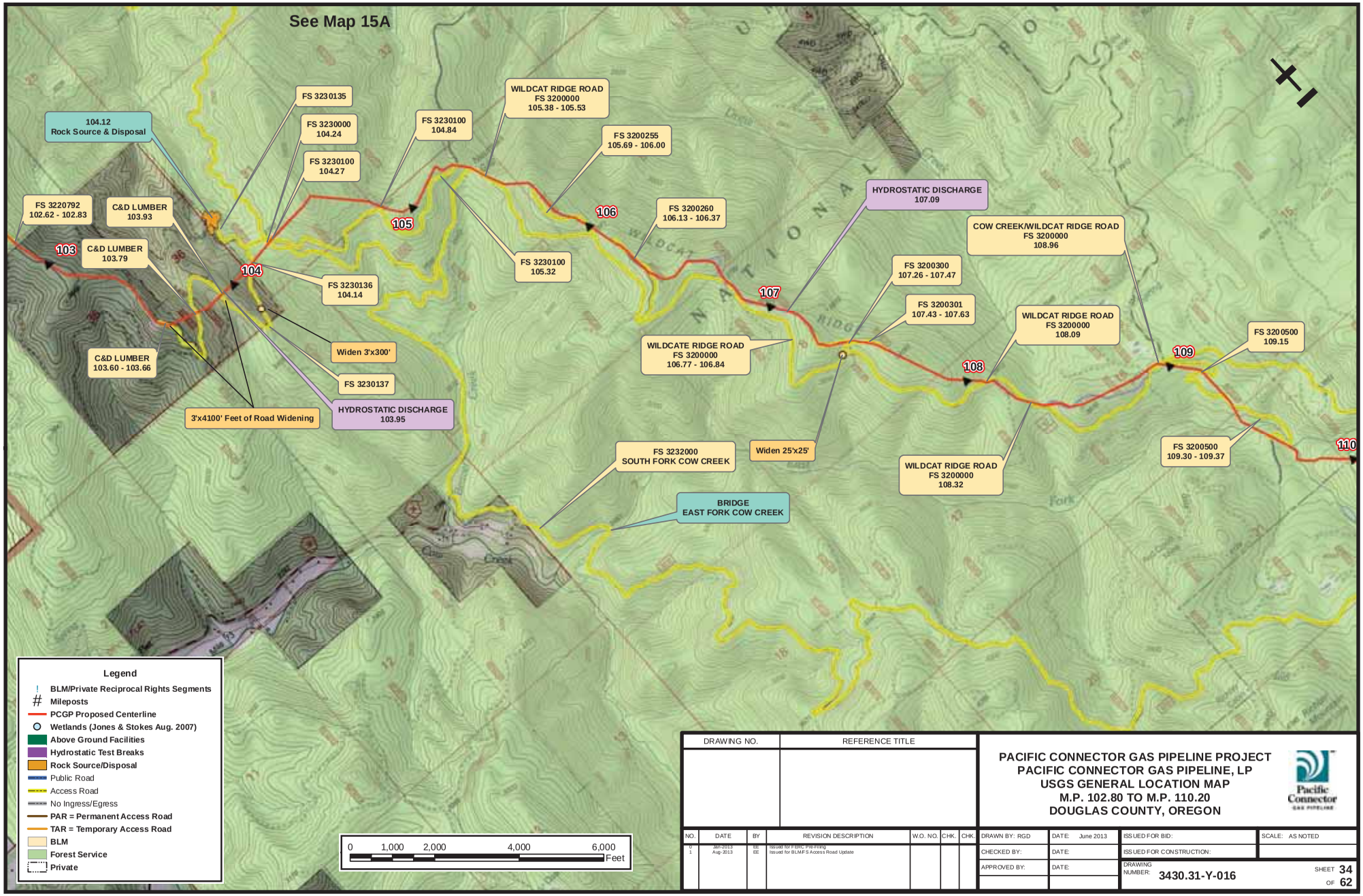


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 95.40 TO M.P. 102.80
DOUGLAS COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-015B	SHEET 33 OF 62



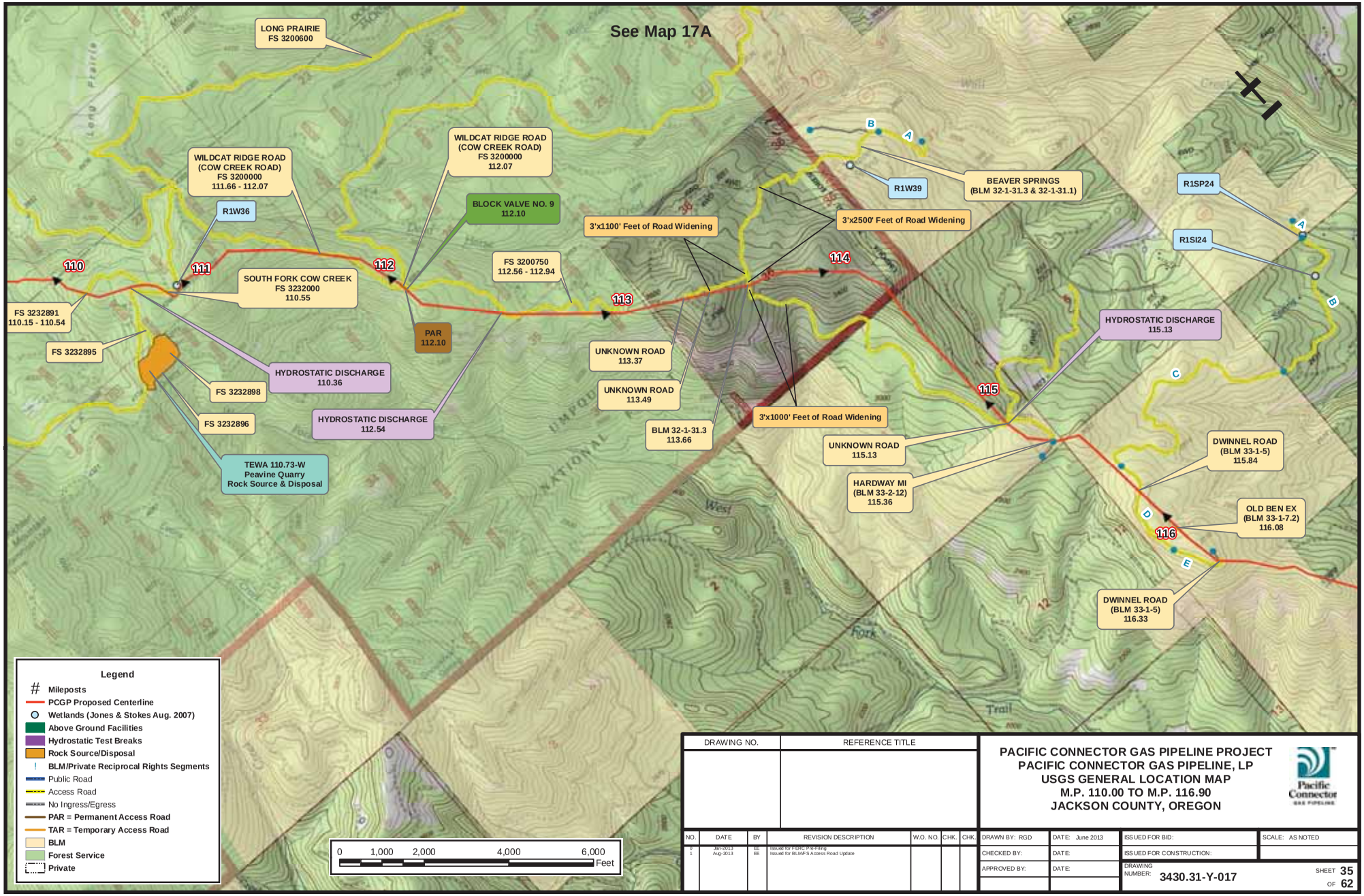
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 102.80 TO M.P. 110.20
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-016	SHEET 34 OF 62



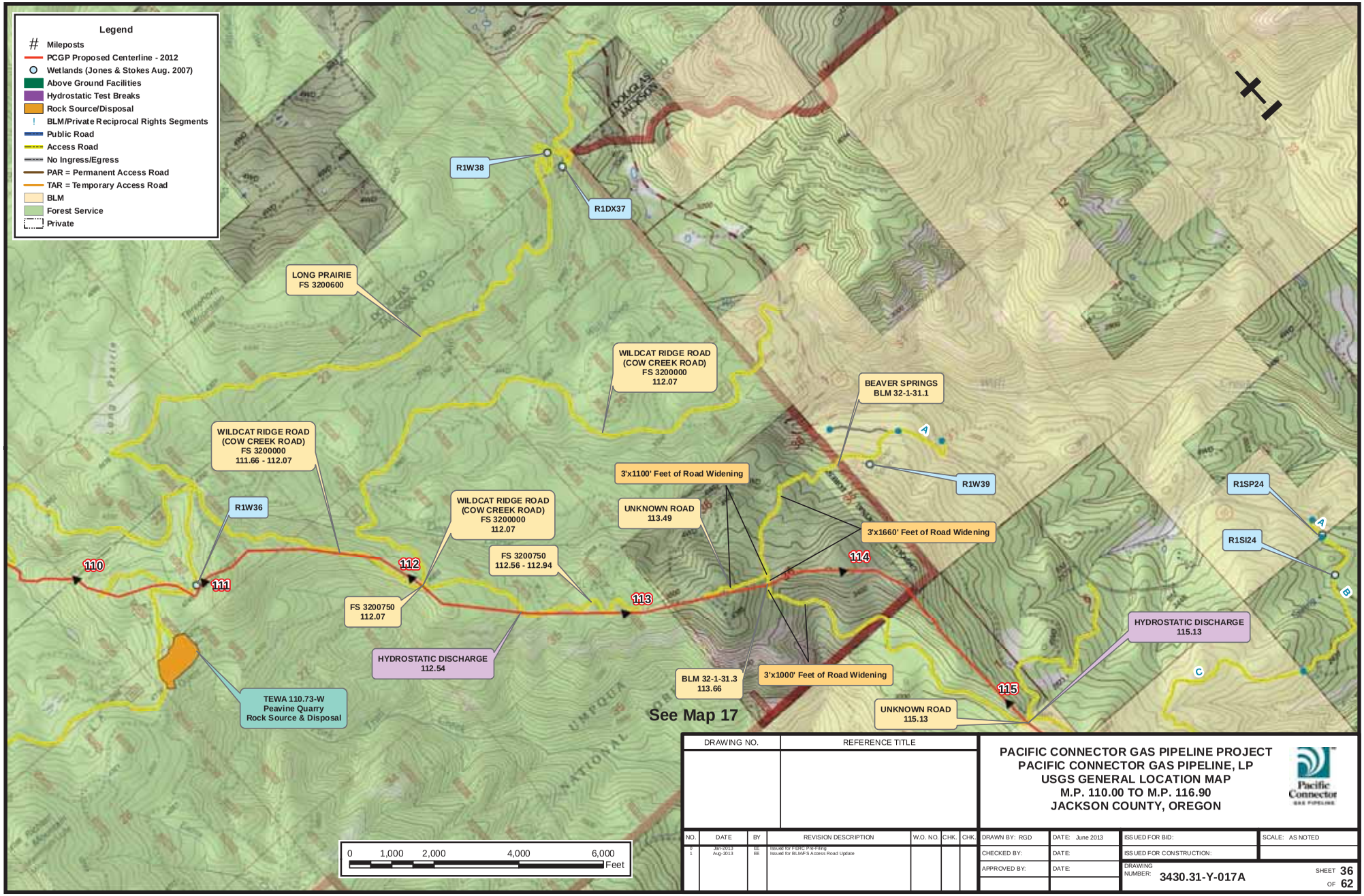
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 110.00 TO M.P. 116.90
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-017	SHEET 35 OF 62



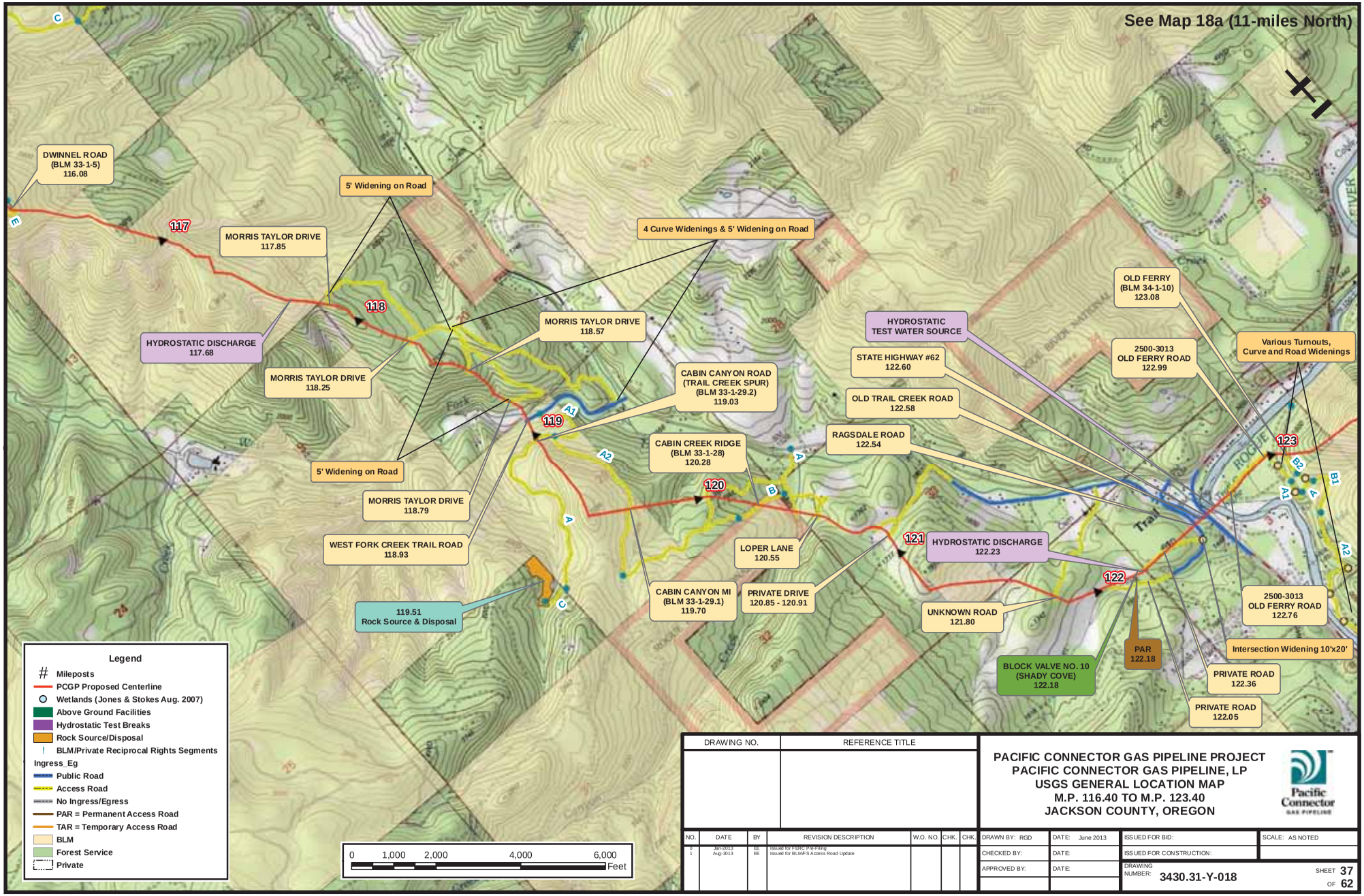
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 110.00 TO M.P. 116.90
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-017A	SHEET 36 OF 62



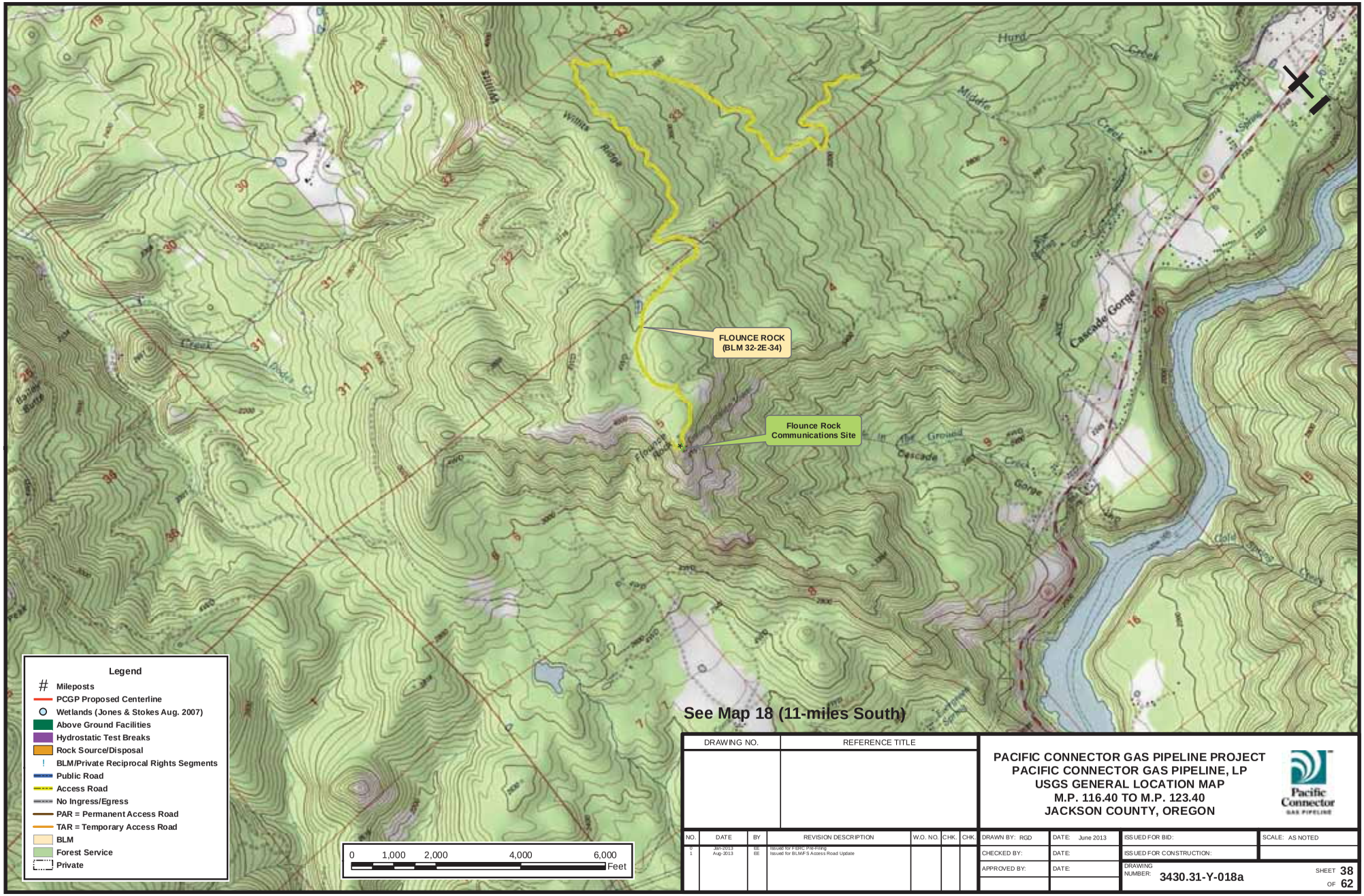
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 116.40 TO M.P. 123.40
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-018	SHEET 37 OF 62



See Map 18 (11-miles South)

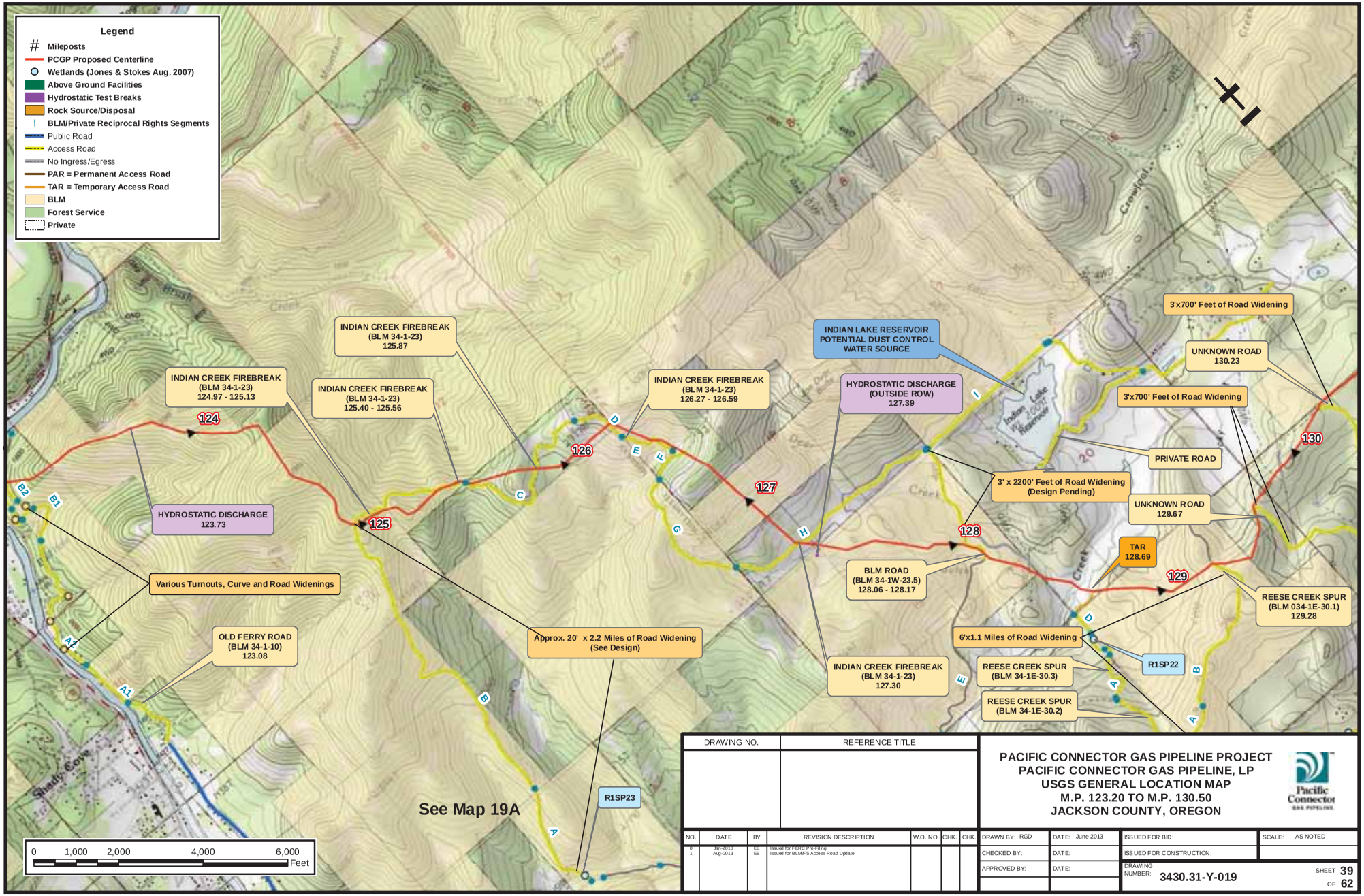
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 116.40 TO M.P. 123.40
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-018a	SHEET 38 OF 62



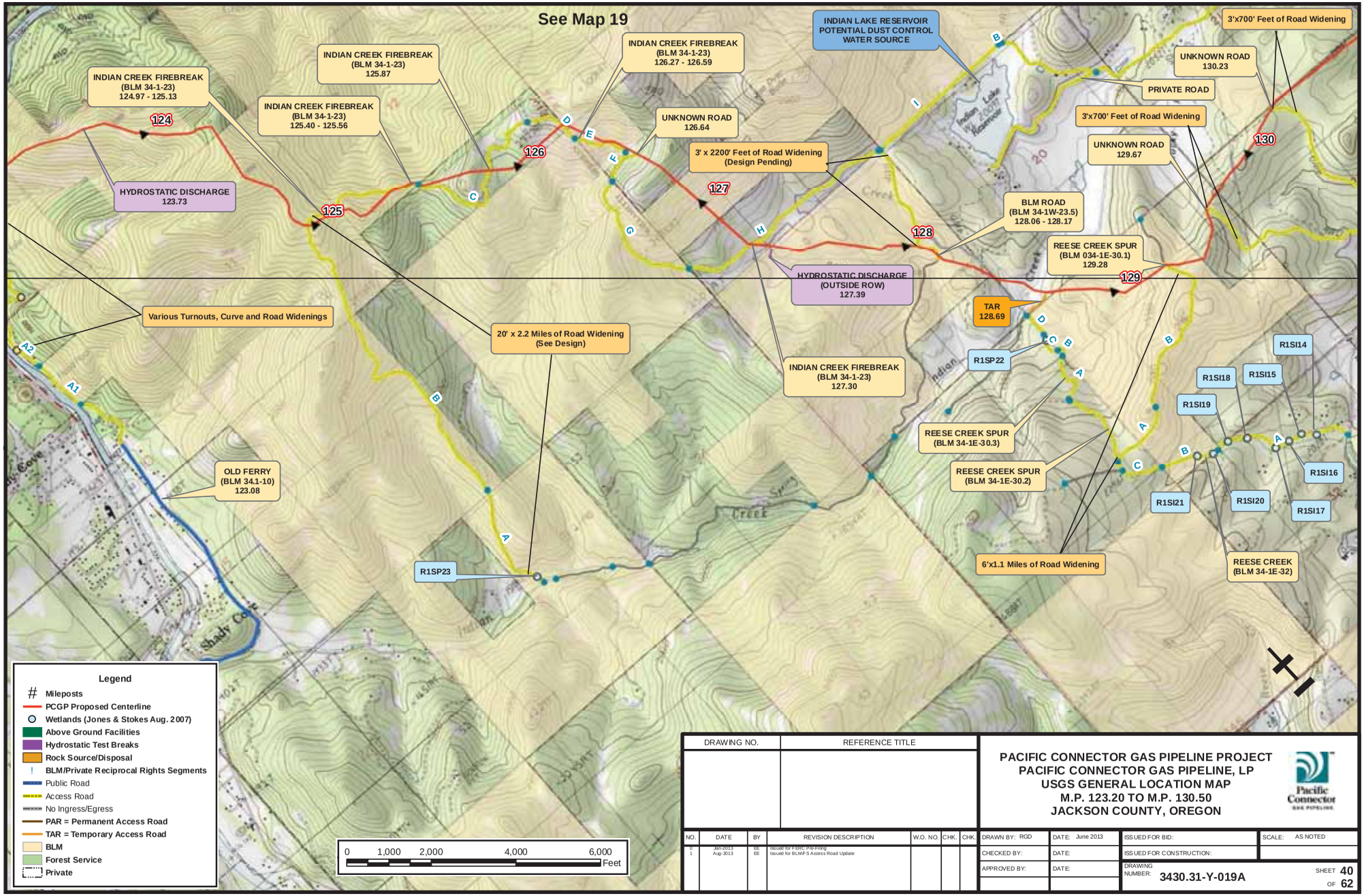
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 123.20 TO M.P. 130.50
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-019	SHEET 39 OF 62



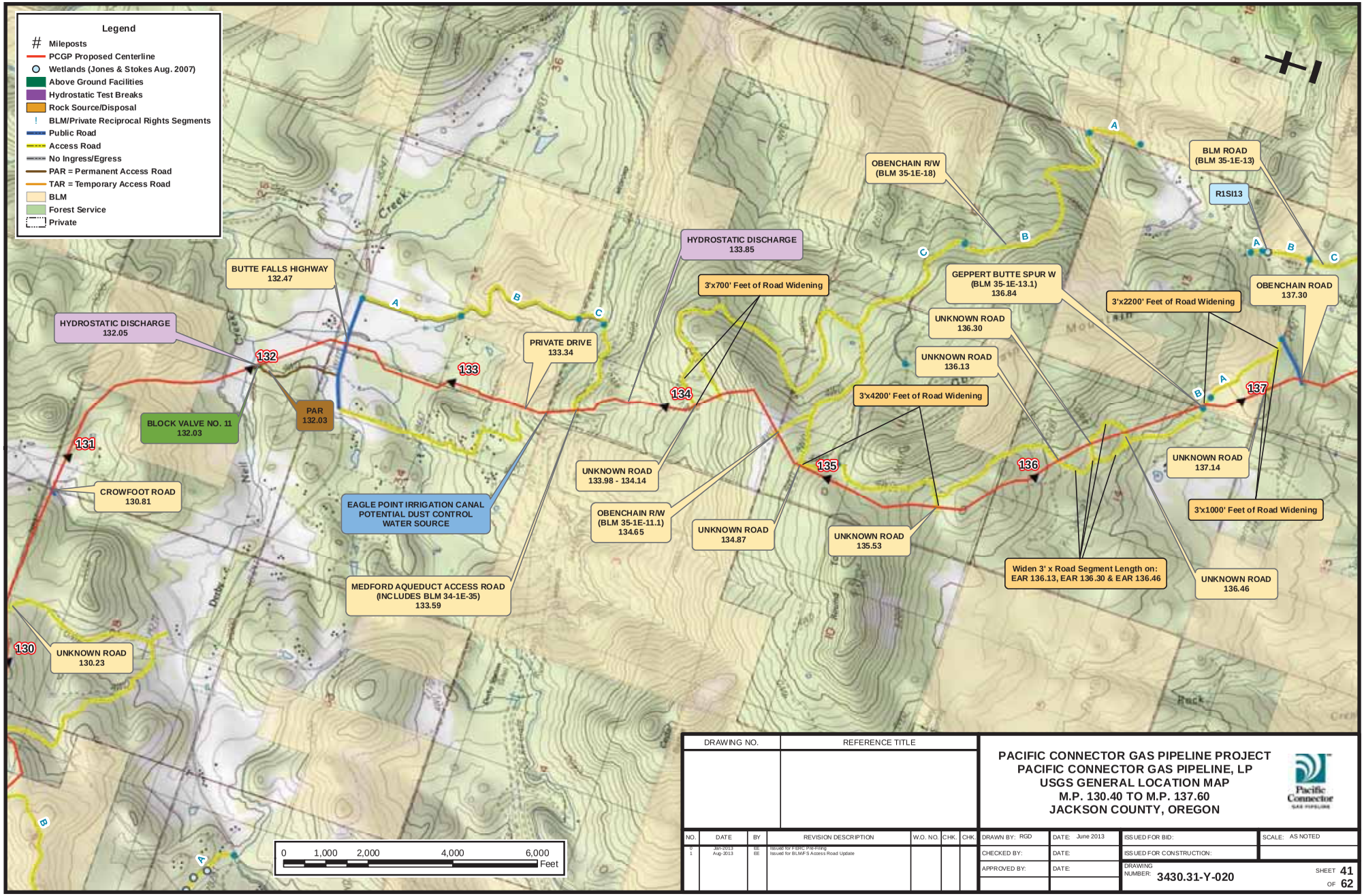
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 123.20 TO M.P. 130.50
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-019A	SHEET 40 OF 62

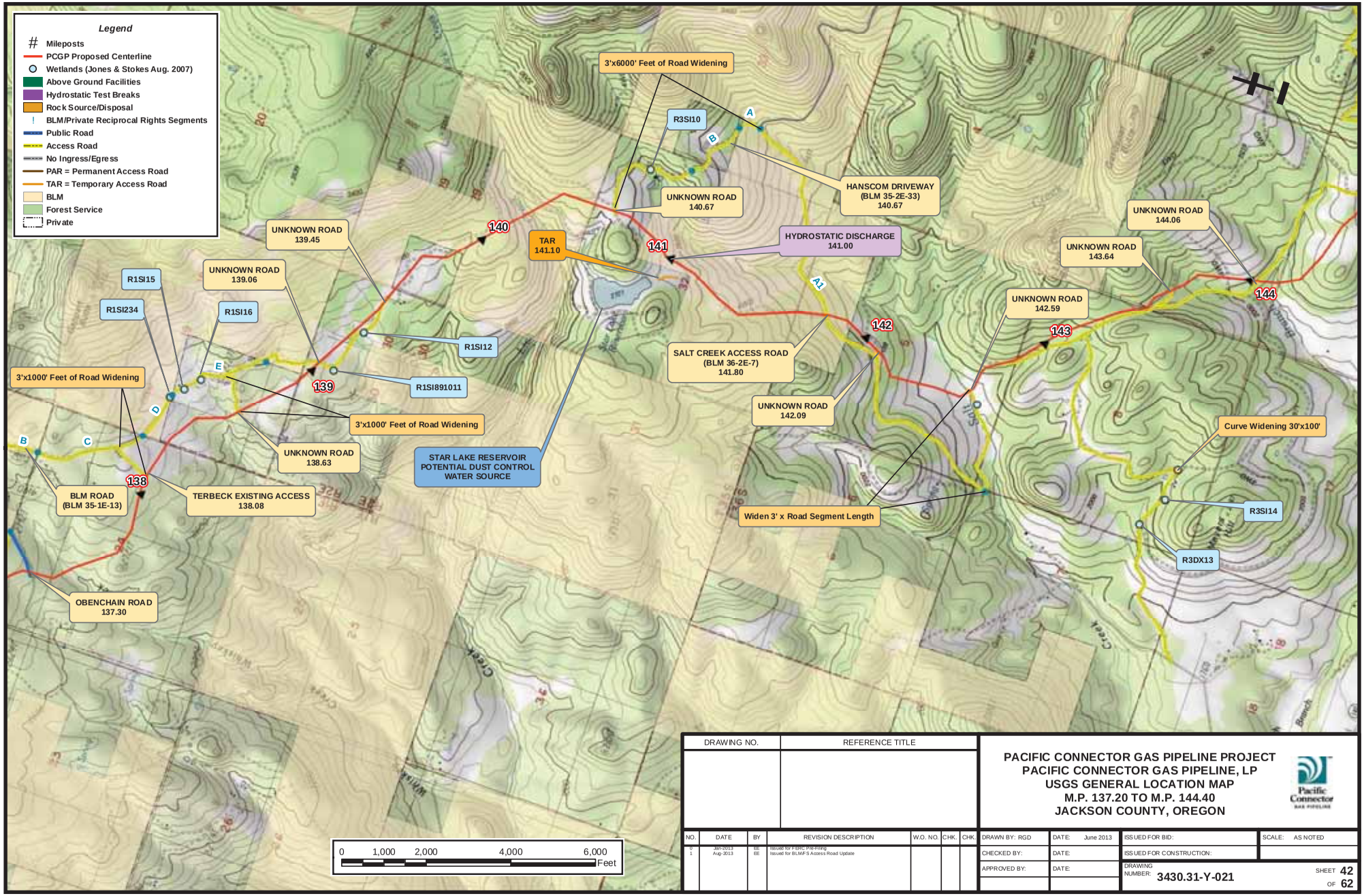


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 130.40 TO M.P. 137.60
JACKSON COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-020	SHEET 41 OF 62



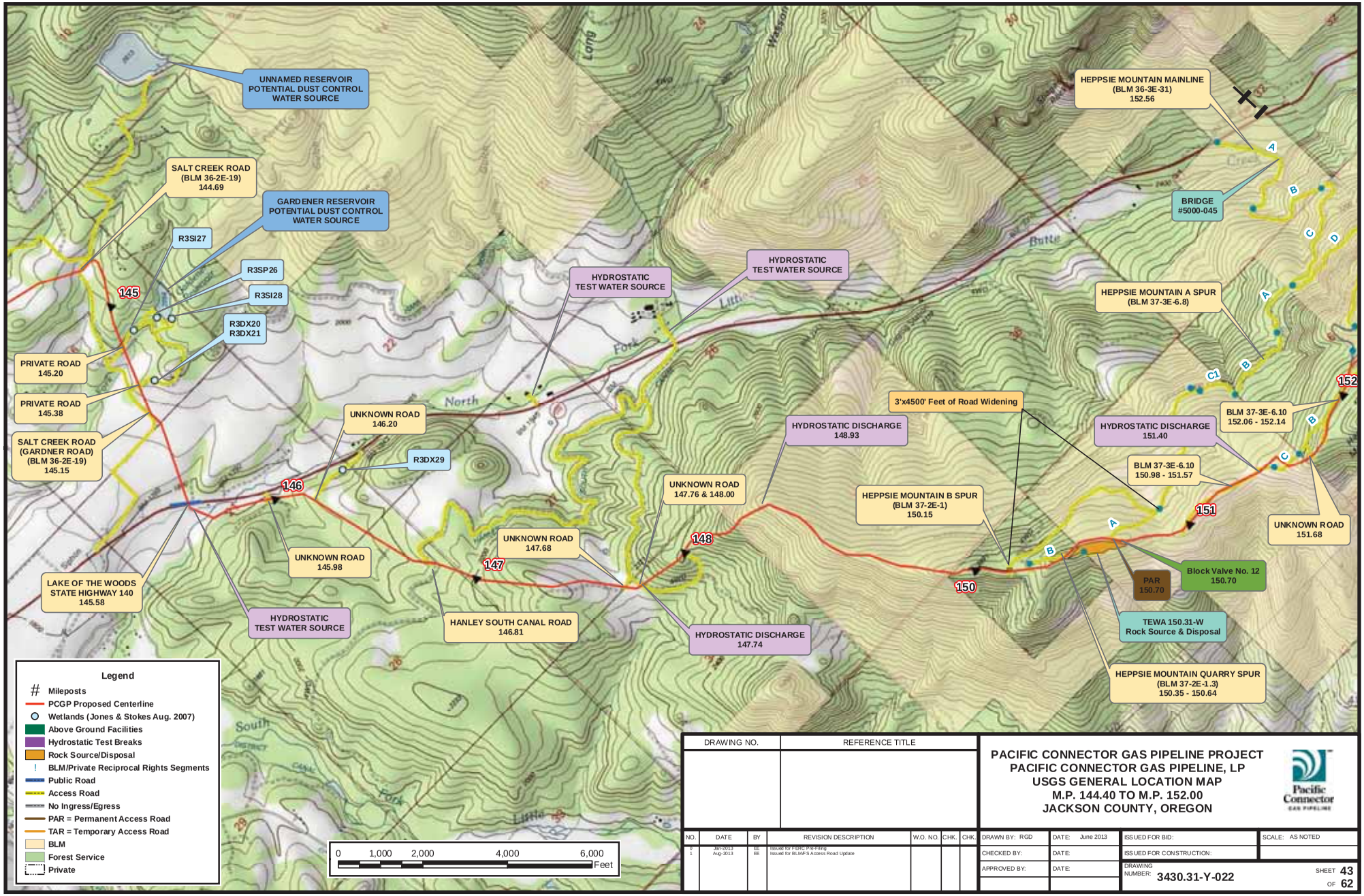
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 137.20 TO M.P. 144.40
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-021	SHEET 42 OF 62



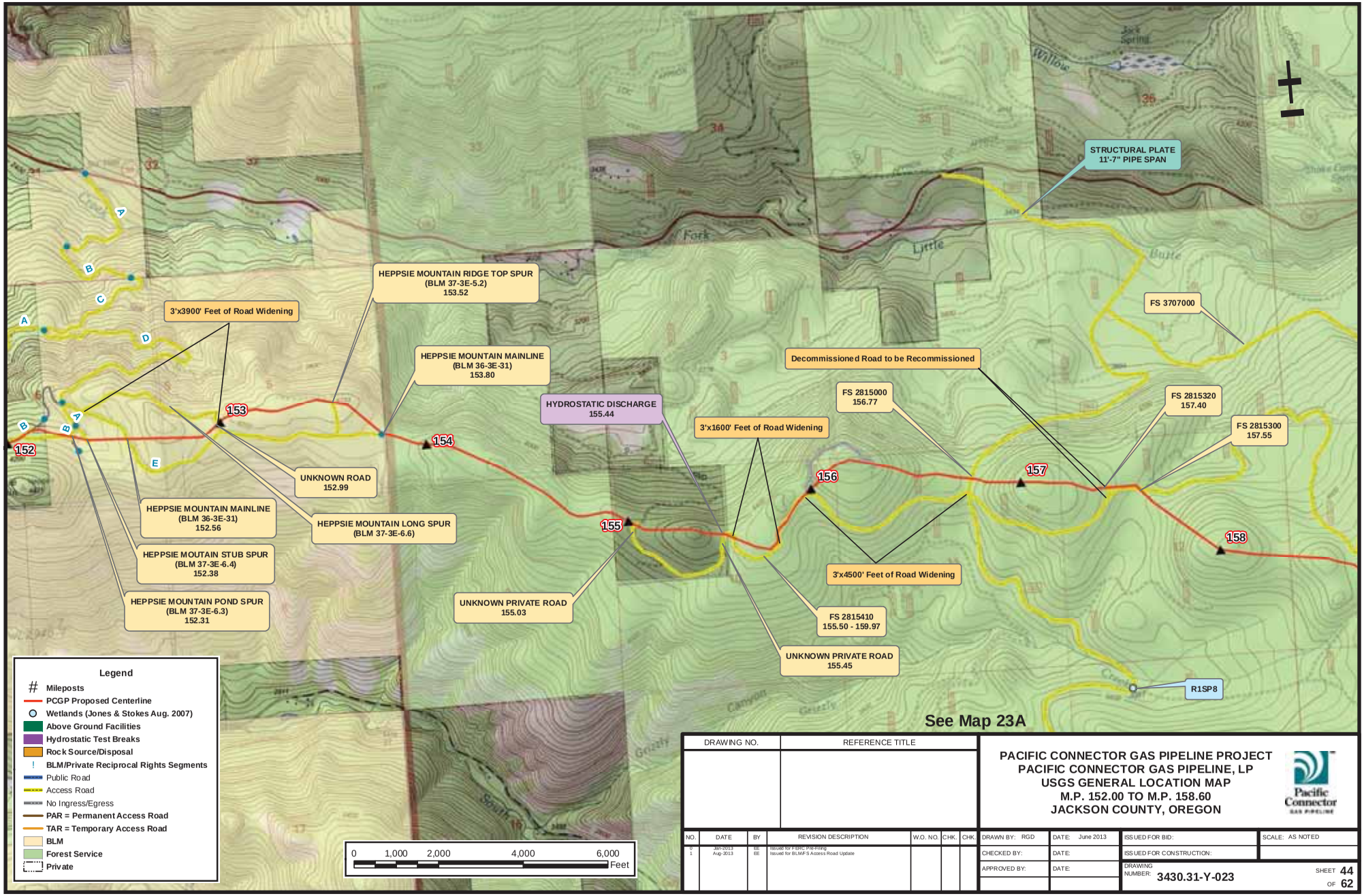
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 144.40 TO M.P. 152.00
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-022	SHEET 43 OF 62



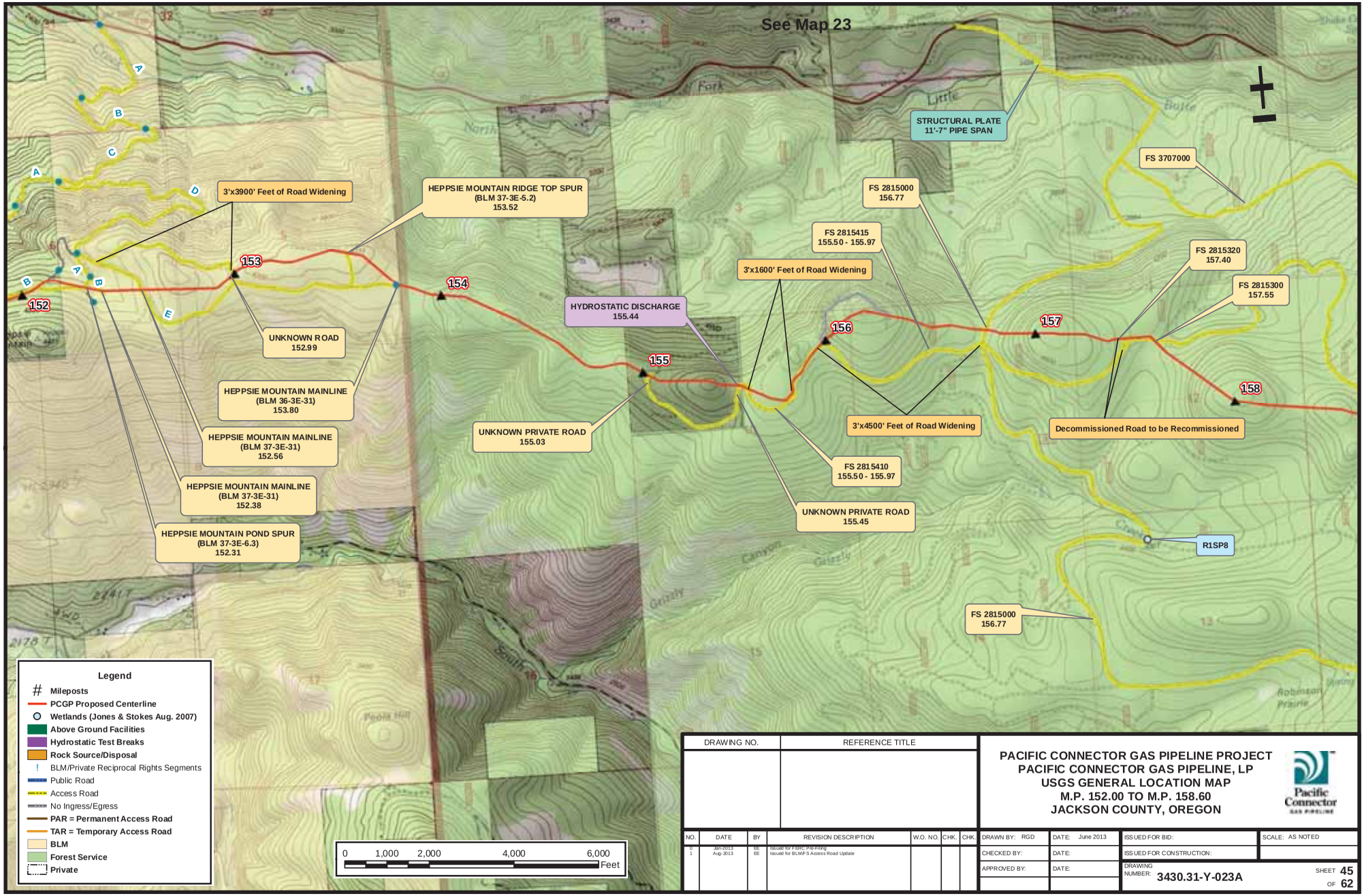
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 152.00 TO M.P. 158.60
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-023	SHEET 44 OF 62



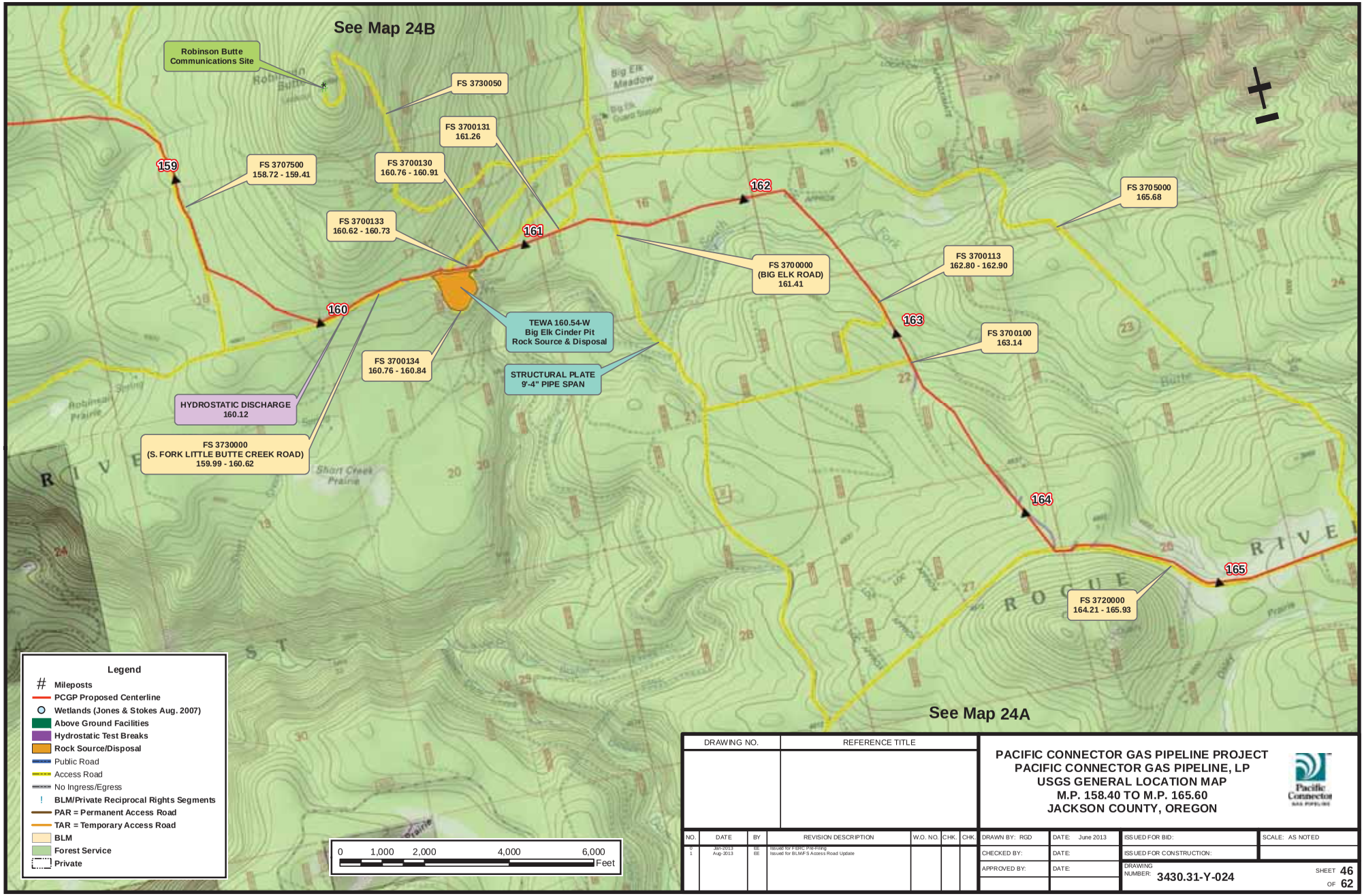
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/FS Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 152.00 TO M.P. 158.60
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-023A	SHEET 45 OF 62

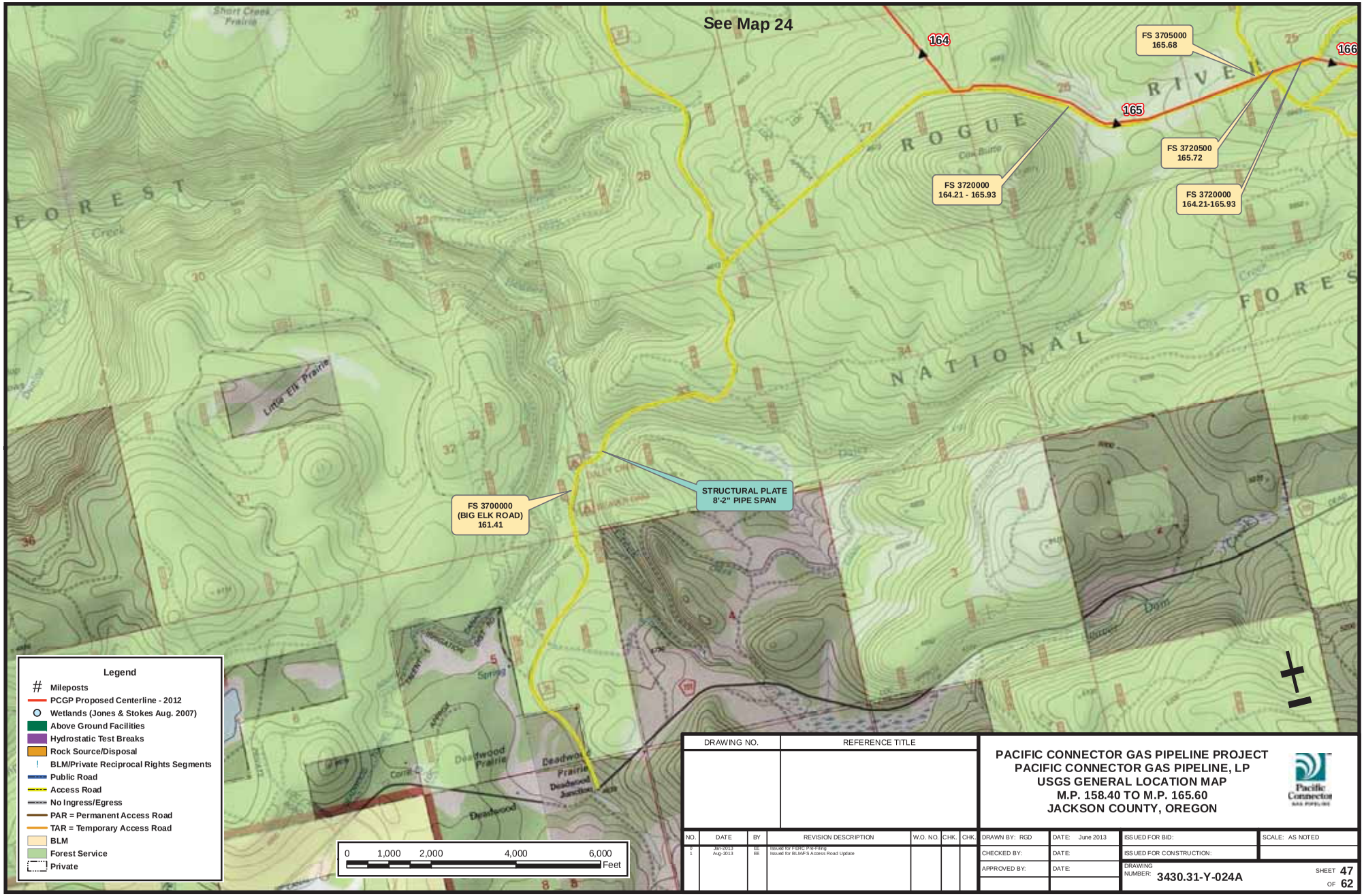


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 158.40 TO M.P. 165.60
JACKSON COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-024	SHEET 46 OF 62



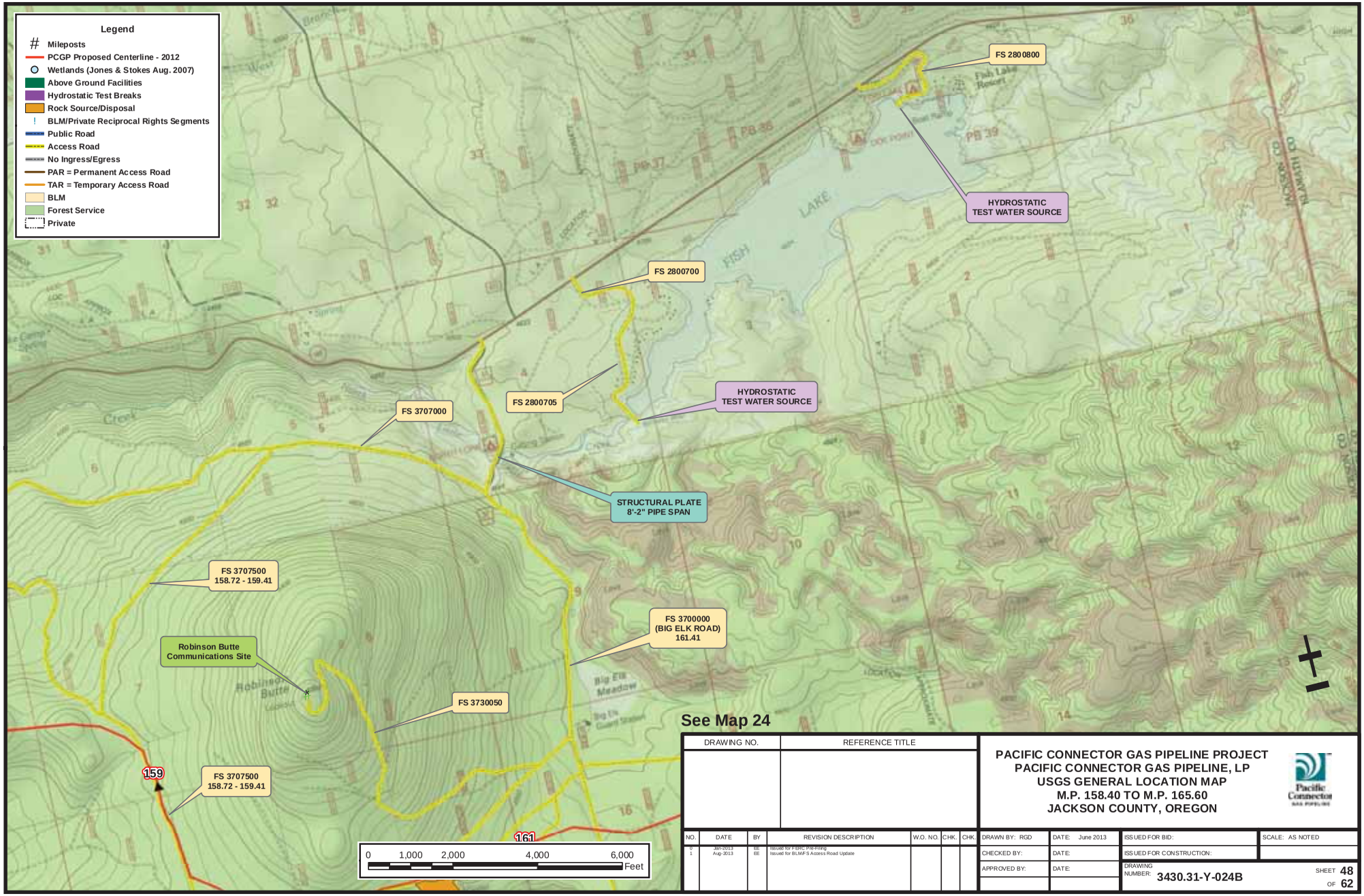
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 158.40 TO M.P. 165.60
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-024A	SHEET 47 OF 62

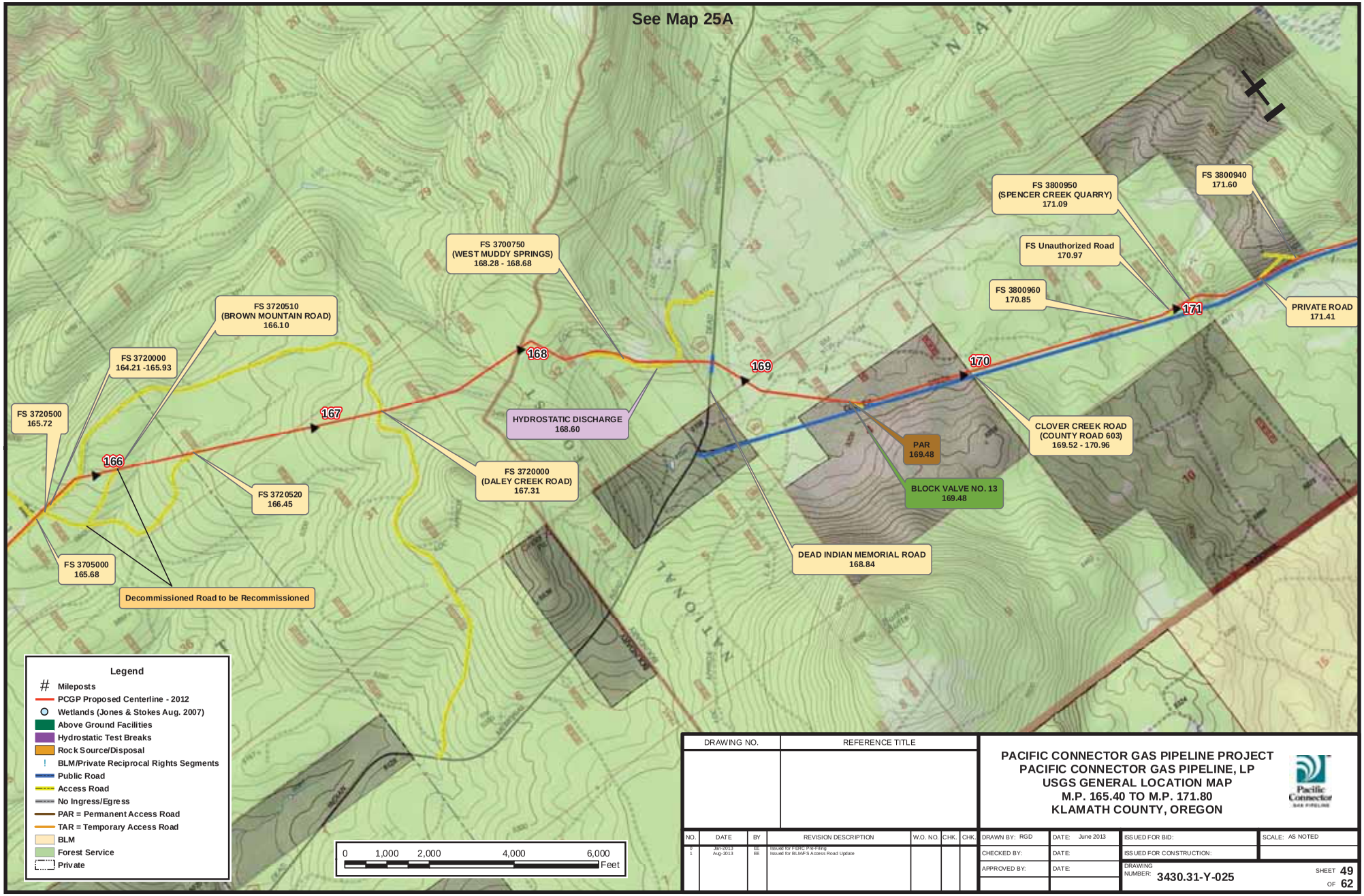


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 158.40 TO M.P. 165.60
JACKSON COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-024B	SHEET 48 OF 62

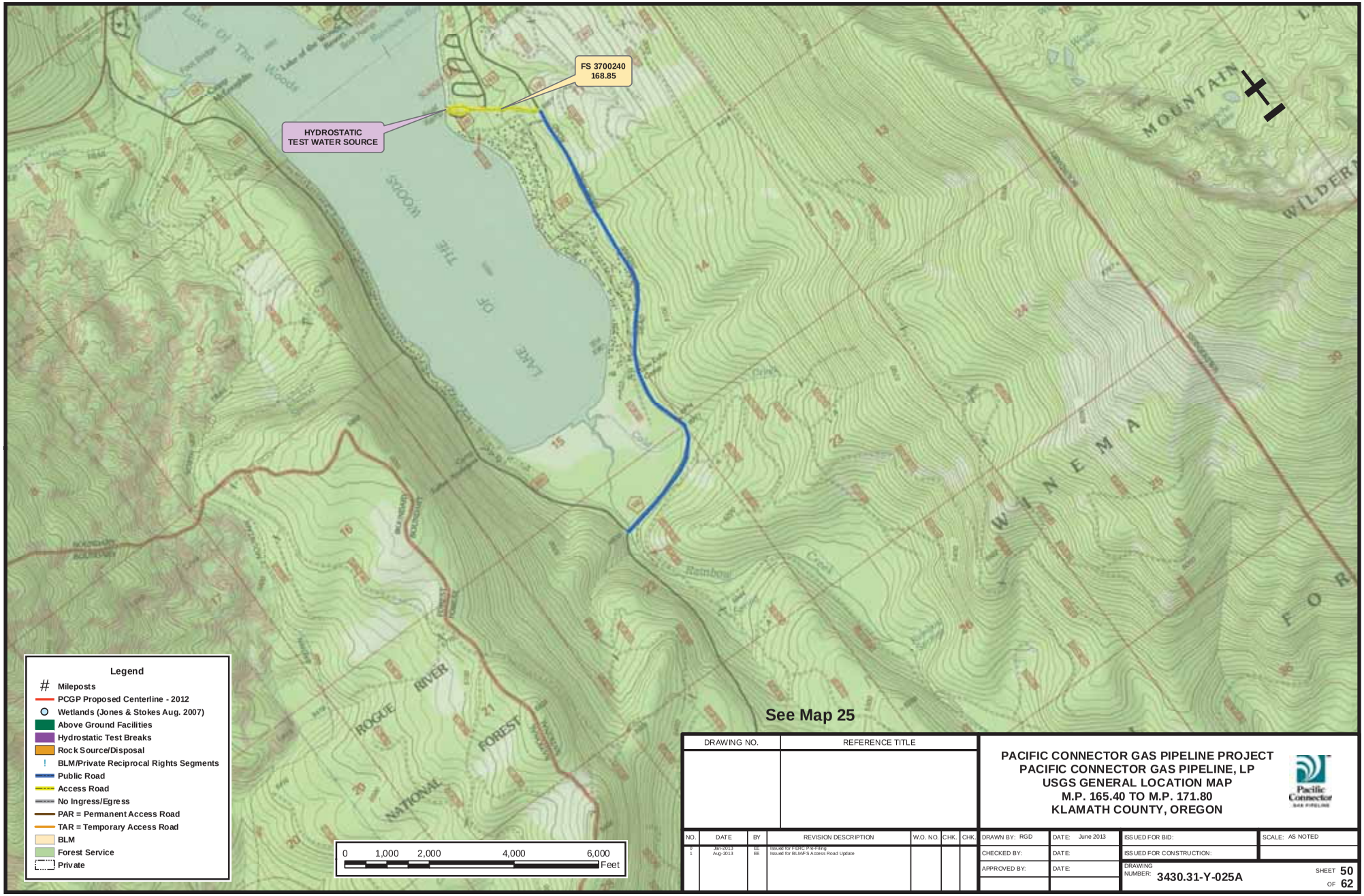


DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 165.40 TO M.P. 171.80
KLAMATH COUNTY, OREGON

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-025	SHEET 49 OF 62

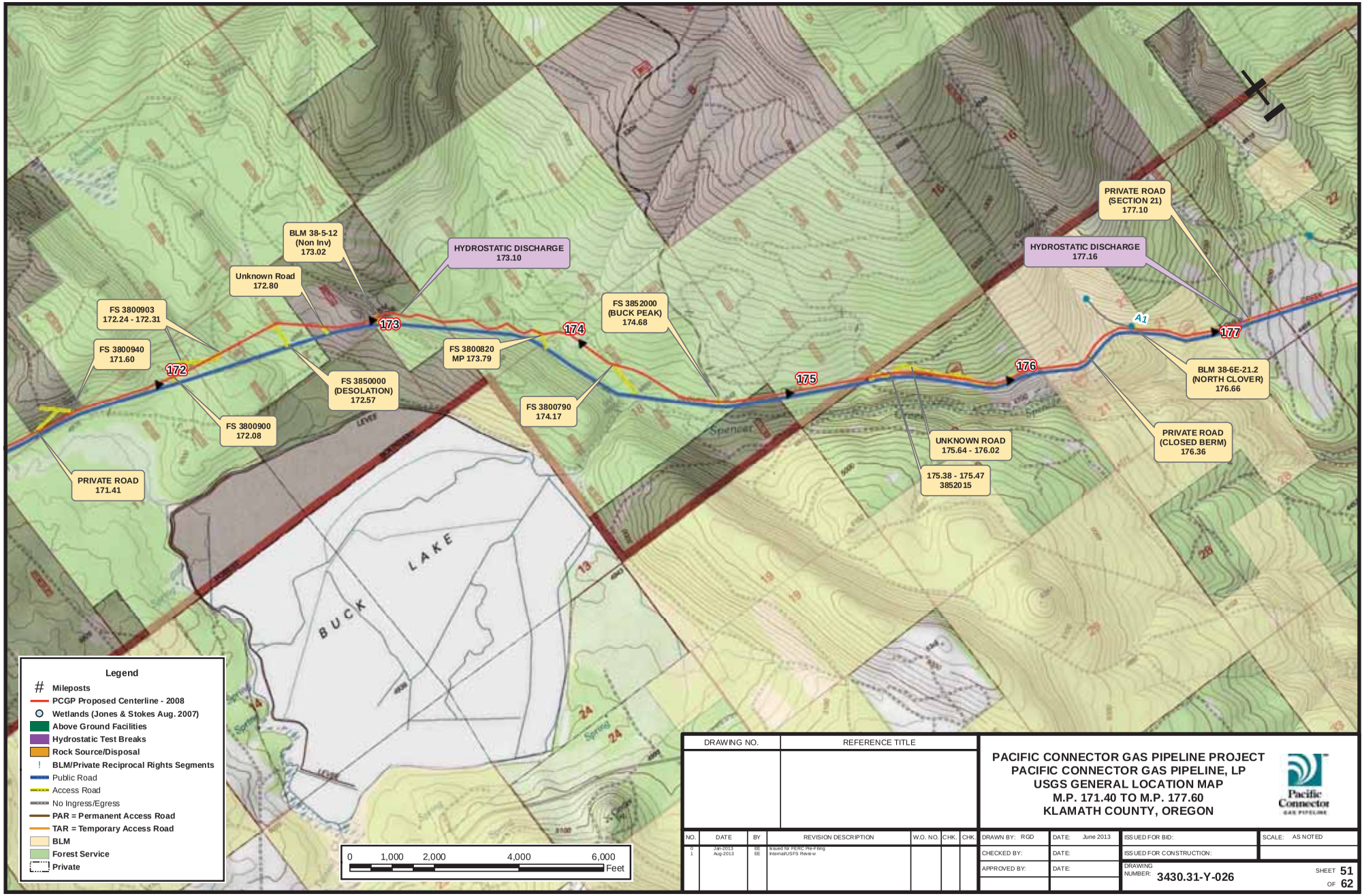


DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 165.40 TO M.P. 171.80
KLAMATH COUNTY, OREGON

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-025A	SHEET 50 OF 62



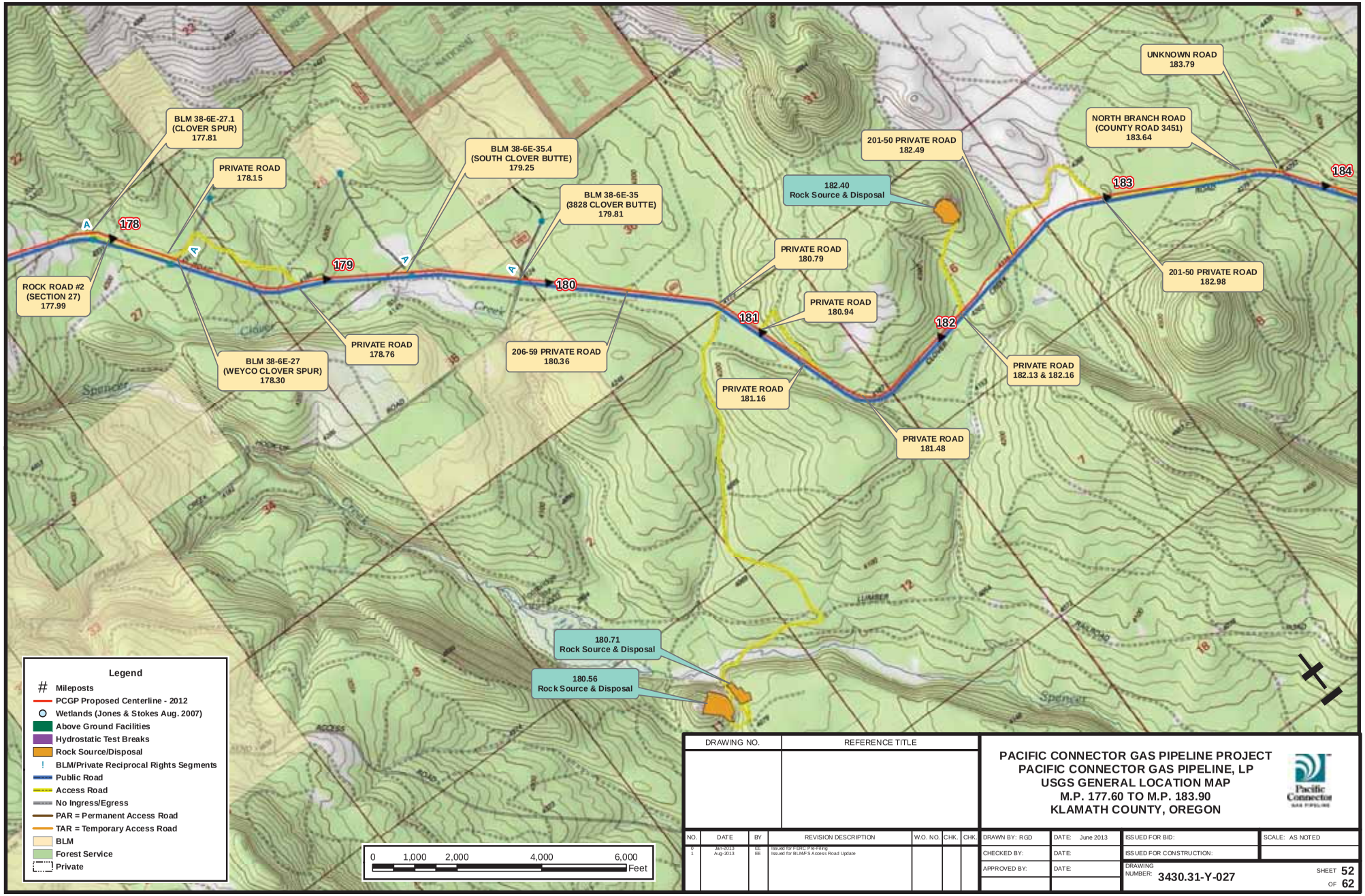
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jan-2013	BE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Internal/USFS Review			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 171.40 TO M.P. 177.60
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-026	SHEET 51 OF 62

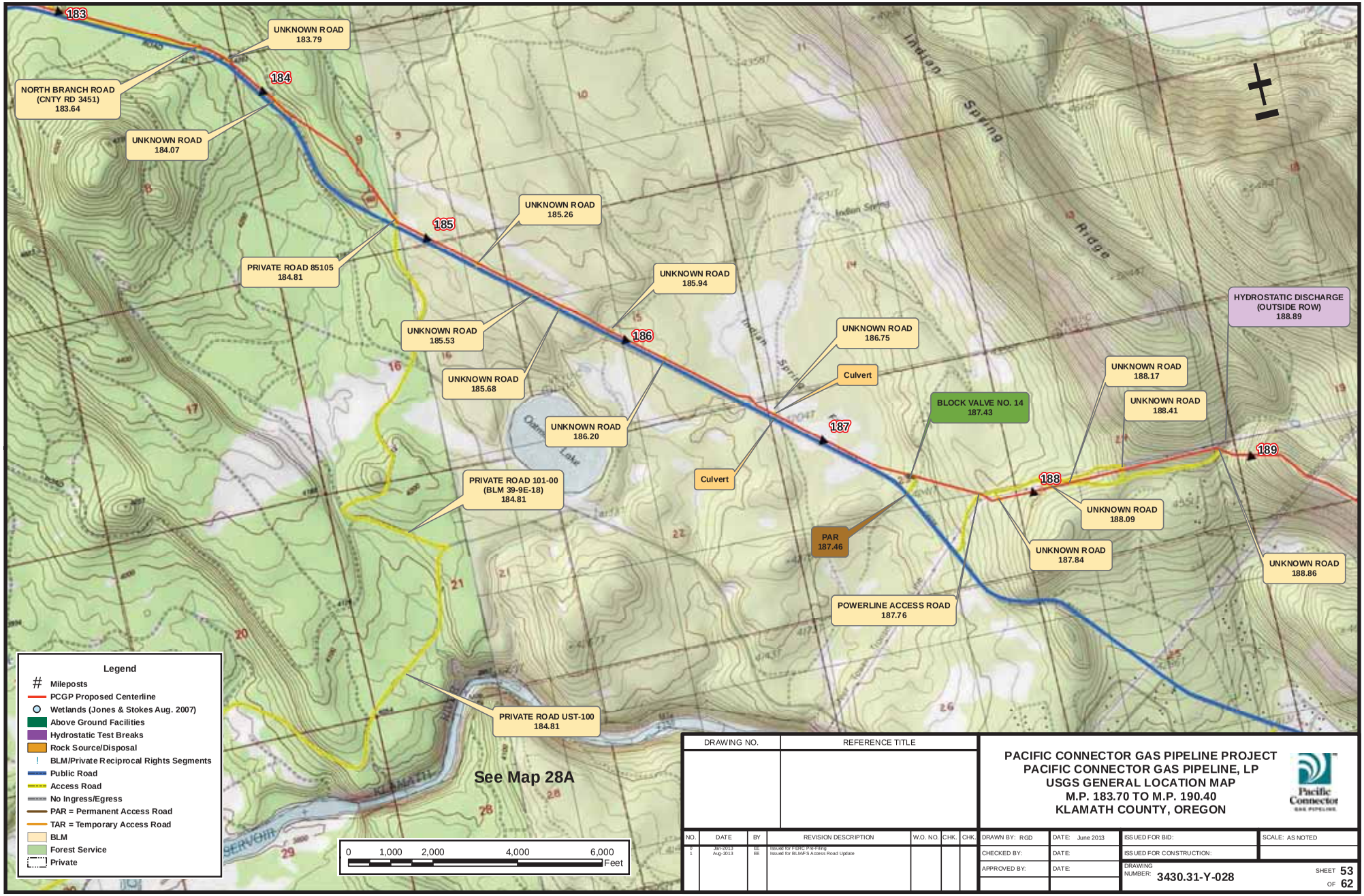


DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 177.60 TO M.P. 183.90
KLAMATH COUNTY, OREGON

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-027	SHEET 52 OF 62



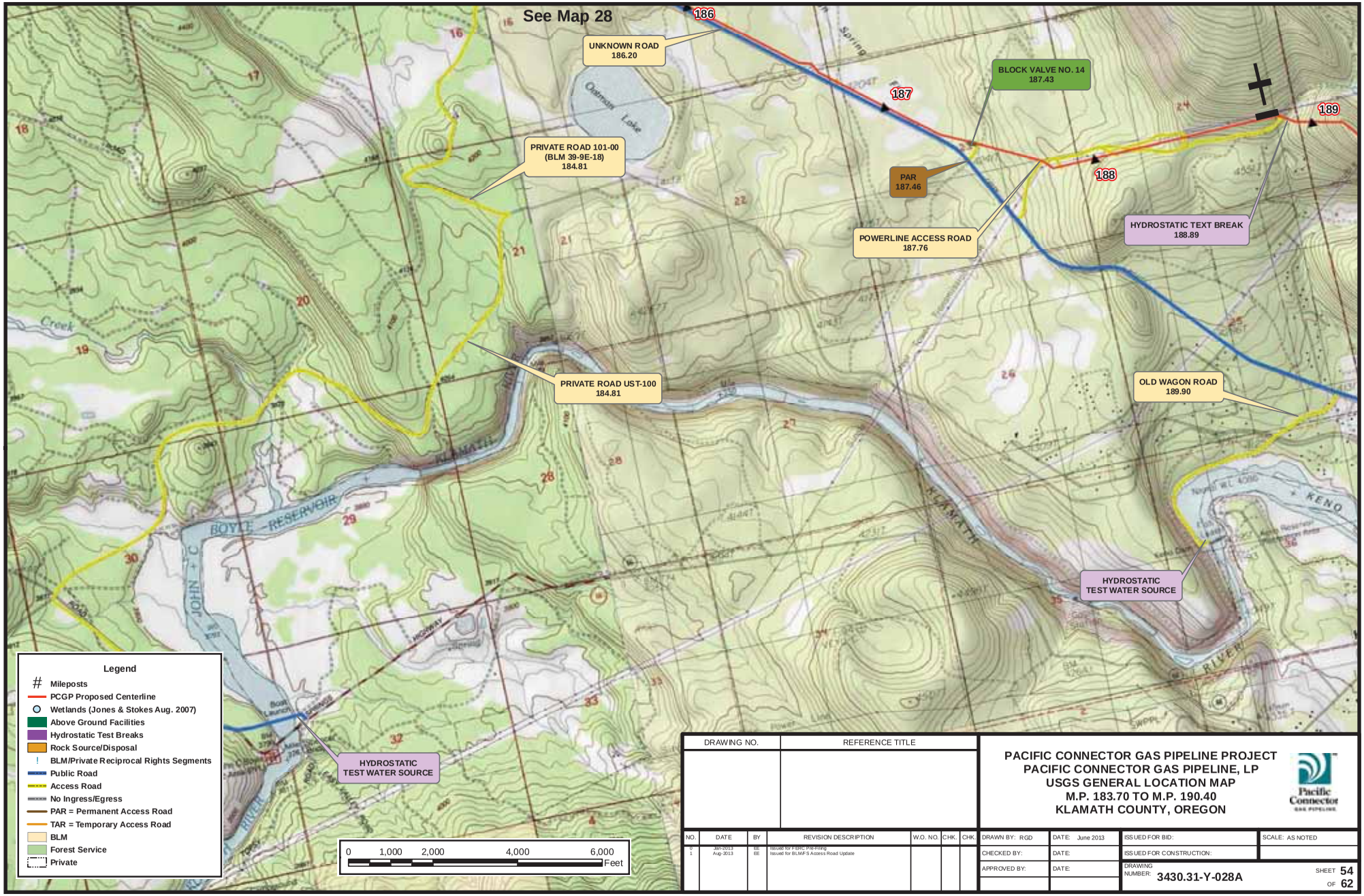
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F.S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 183.70 TO M.P. 190.40
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-028	SHEET 53 OF 62



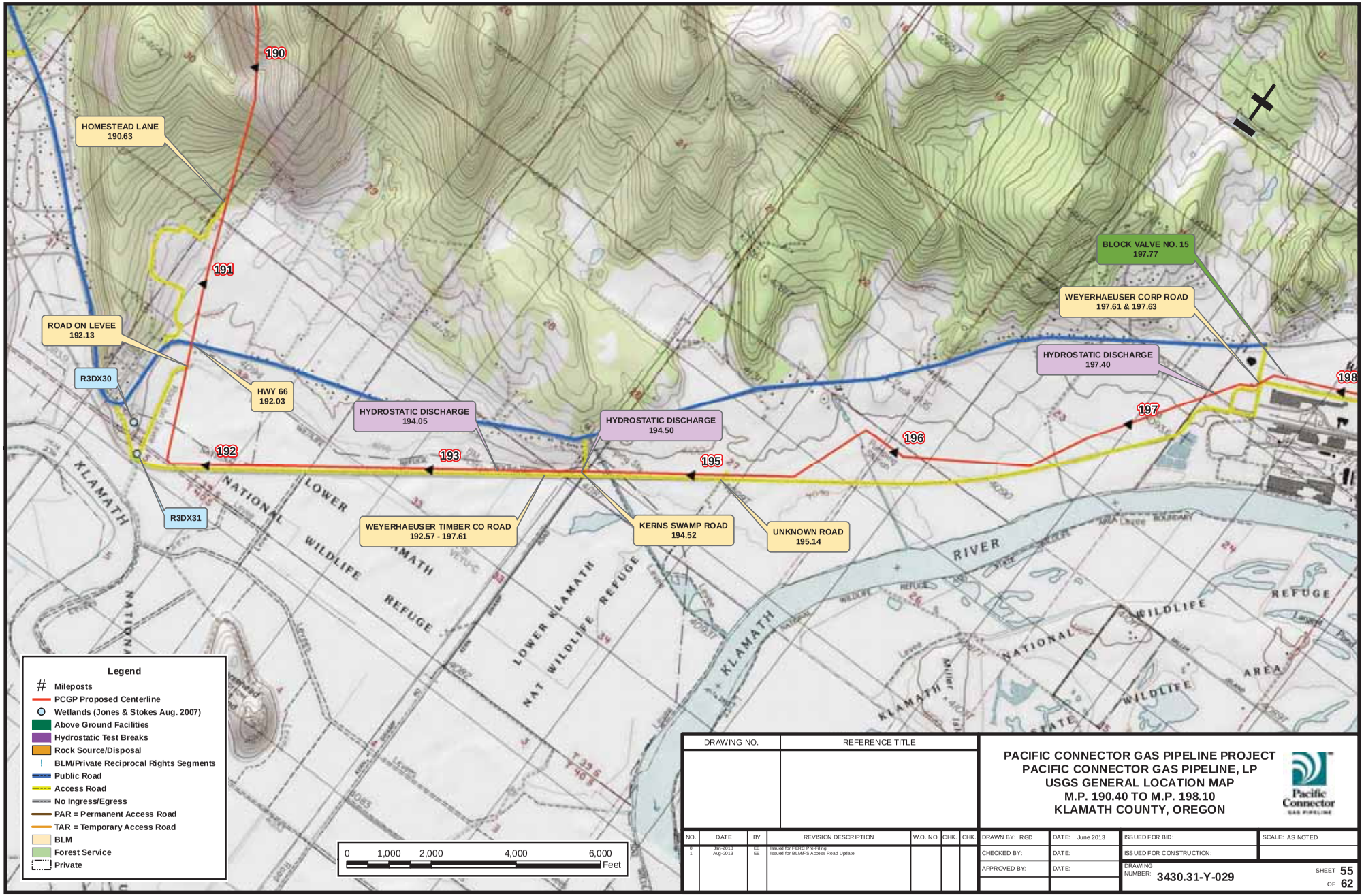
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 183.70 TO M.P. 190.40
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-028A	SHEET 54 OF 62



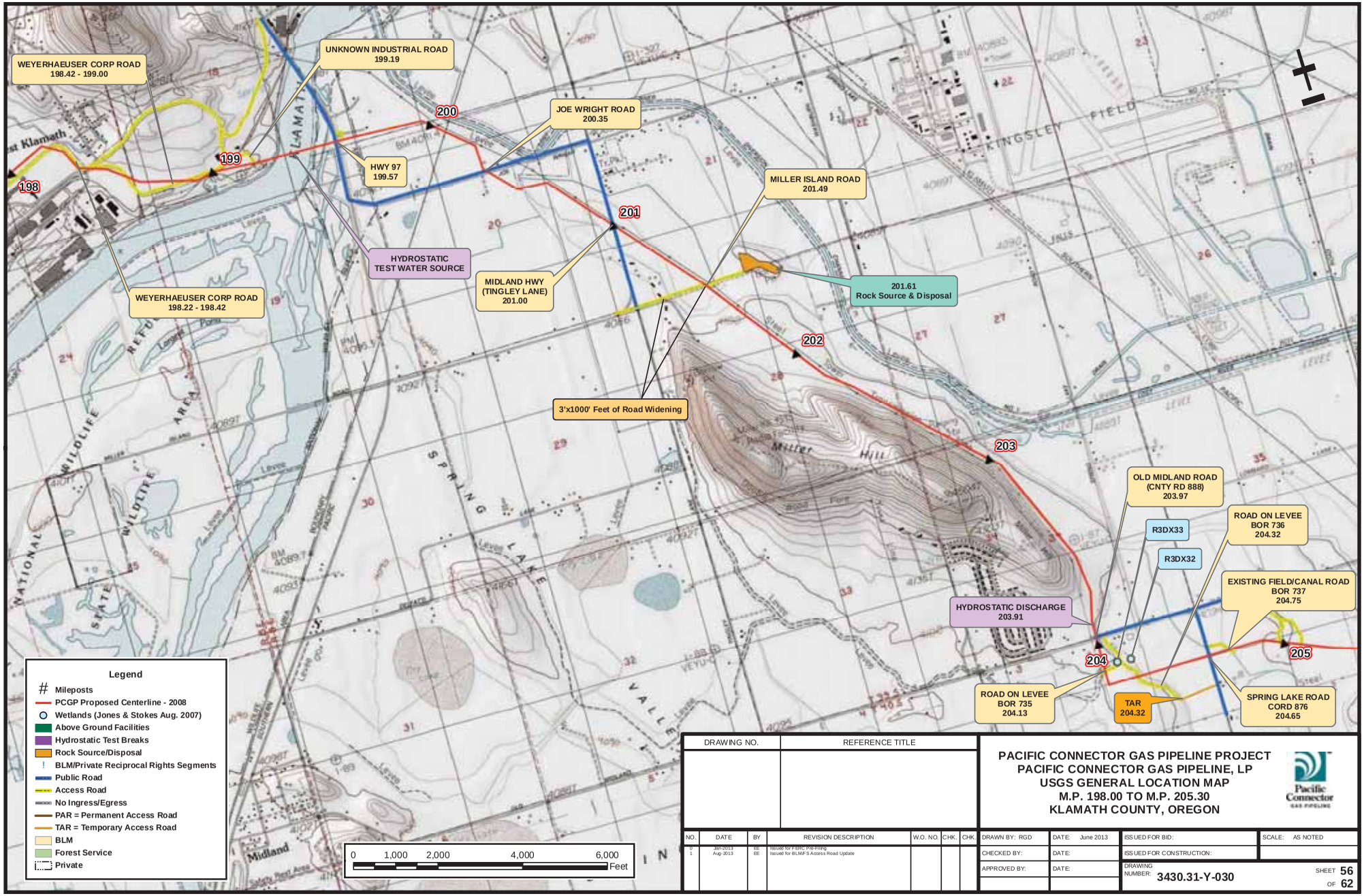
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 190.40 TO M.P. 198.10
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-029	SHEET 55 OF 62



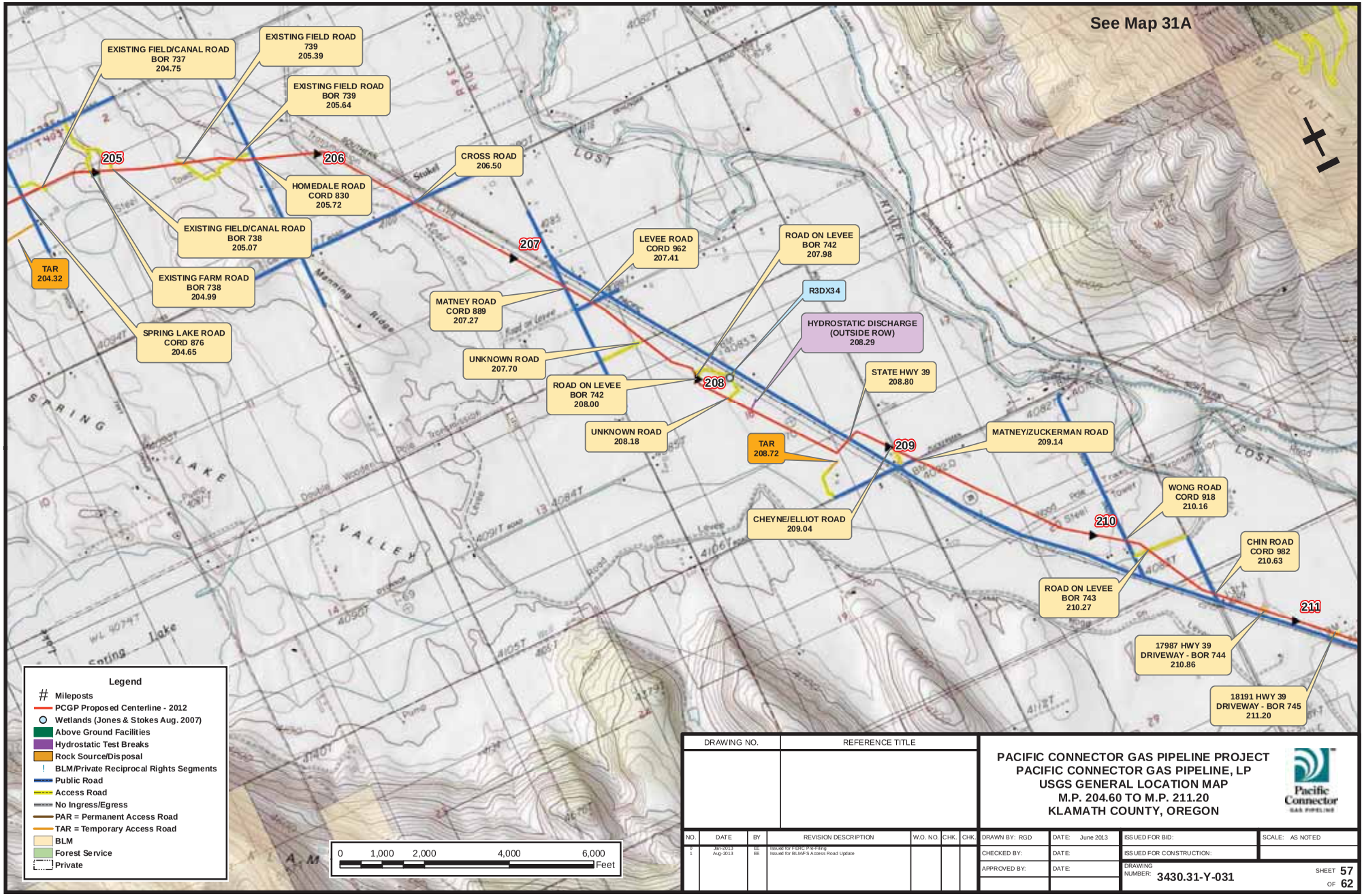
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 198.00 TO M.P. 205.30
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-030	SHEET 56 OF 62



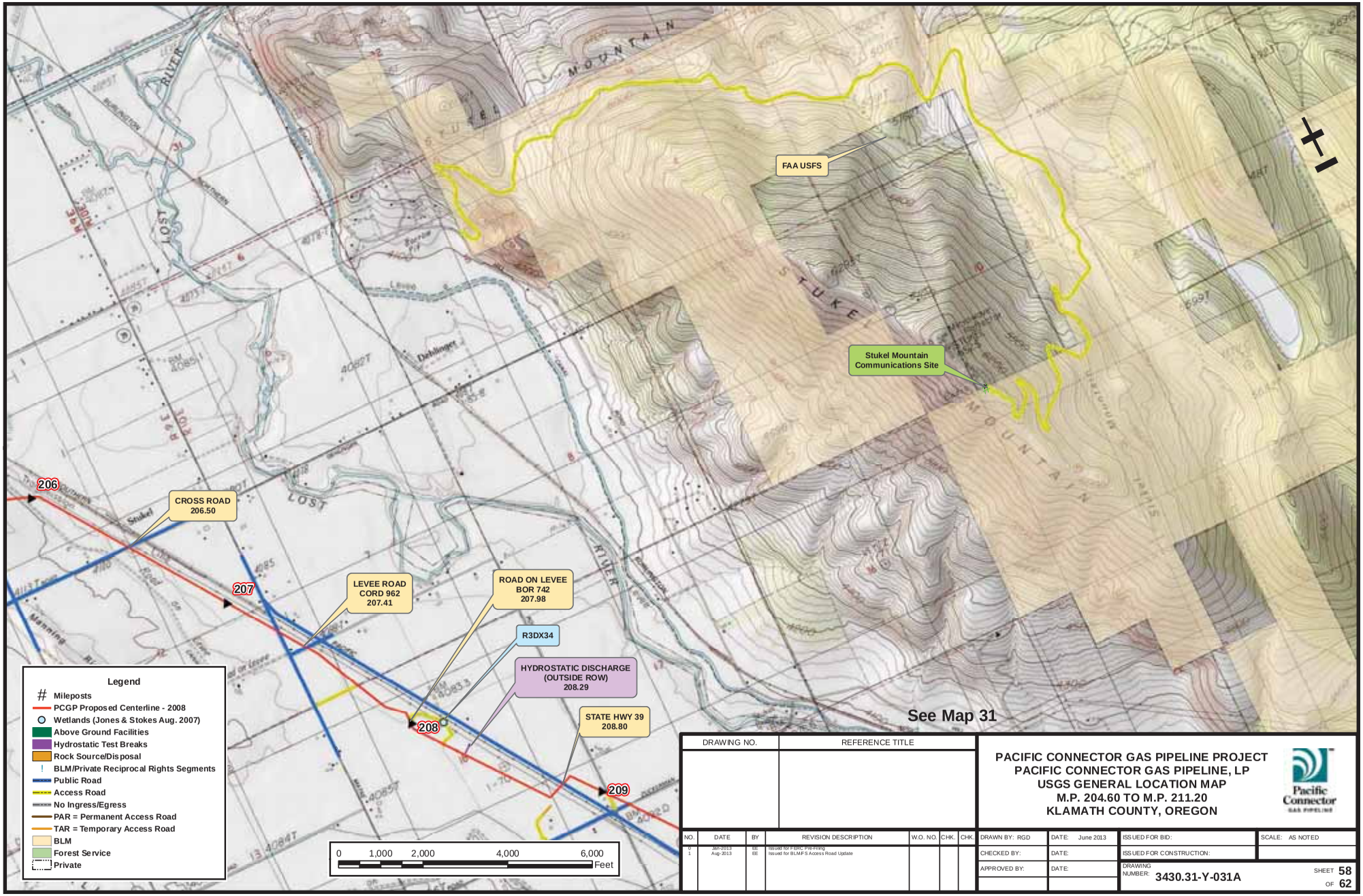
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLMF S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 204.60 TO M.P. 211.20
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-031	SHEET 57 OF 62



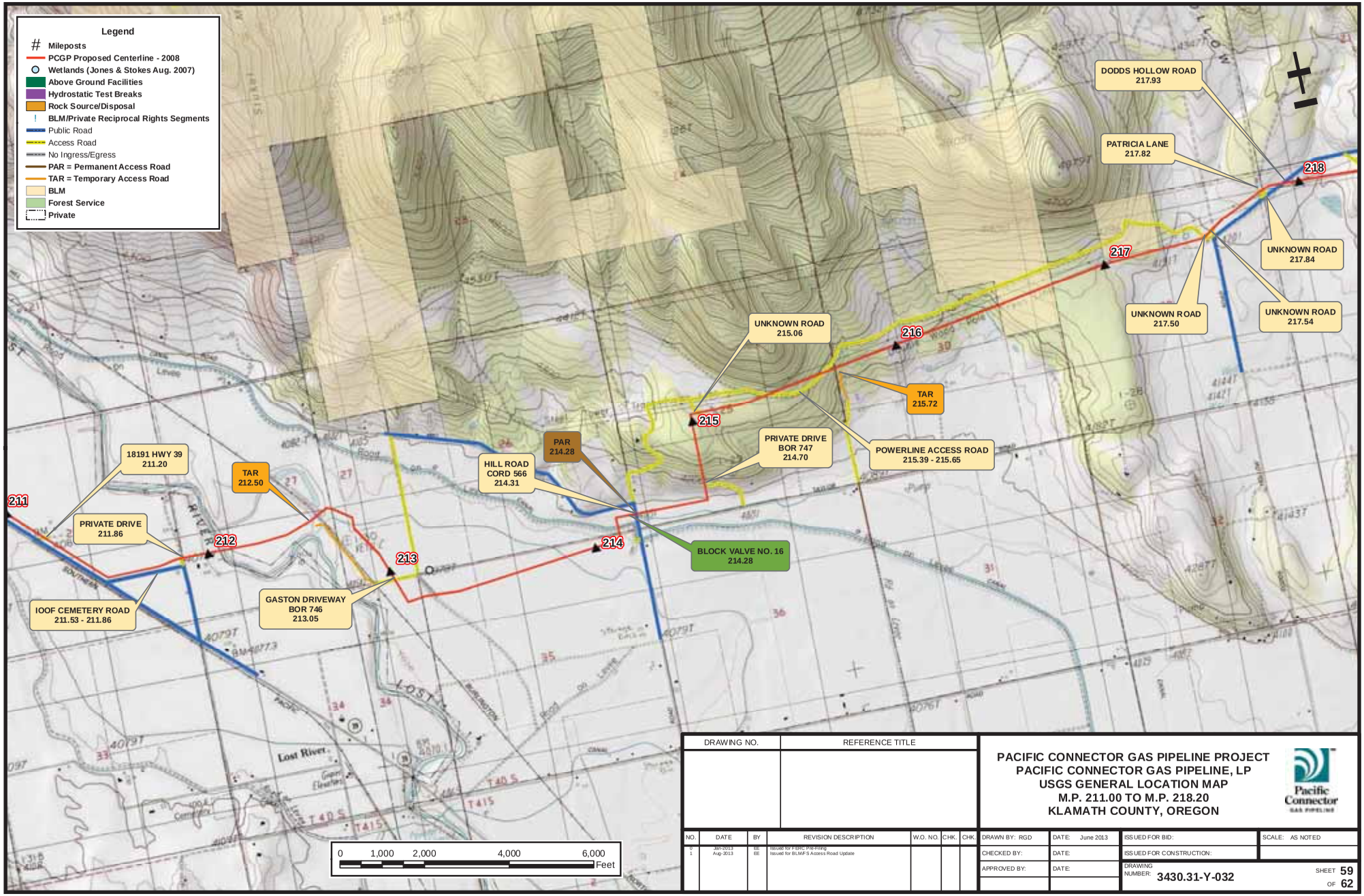
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 204.60 TO M.P. 211.20
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-031A	SHEET 58 OF 62



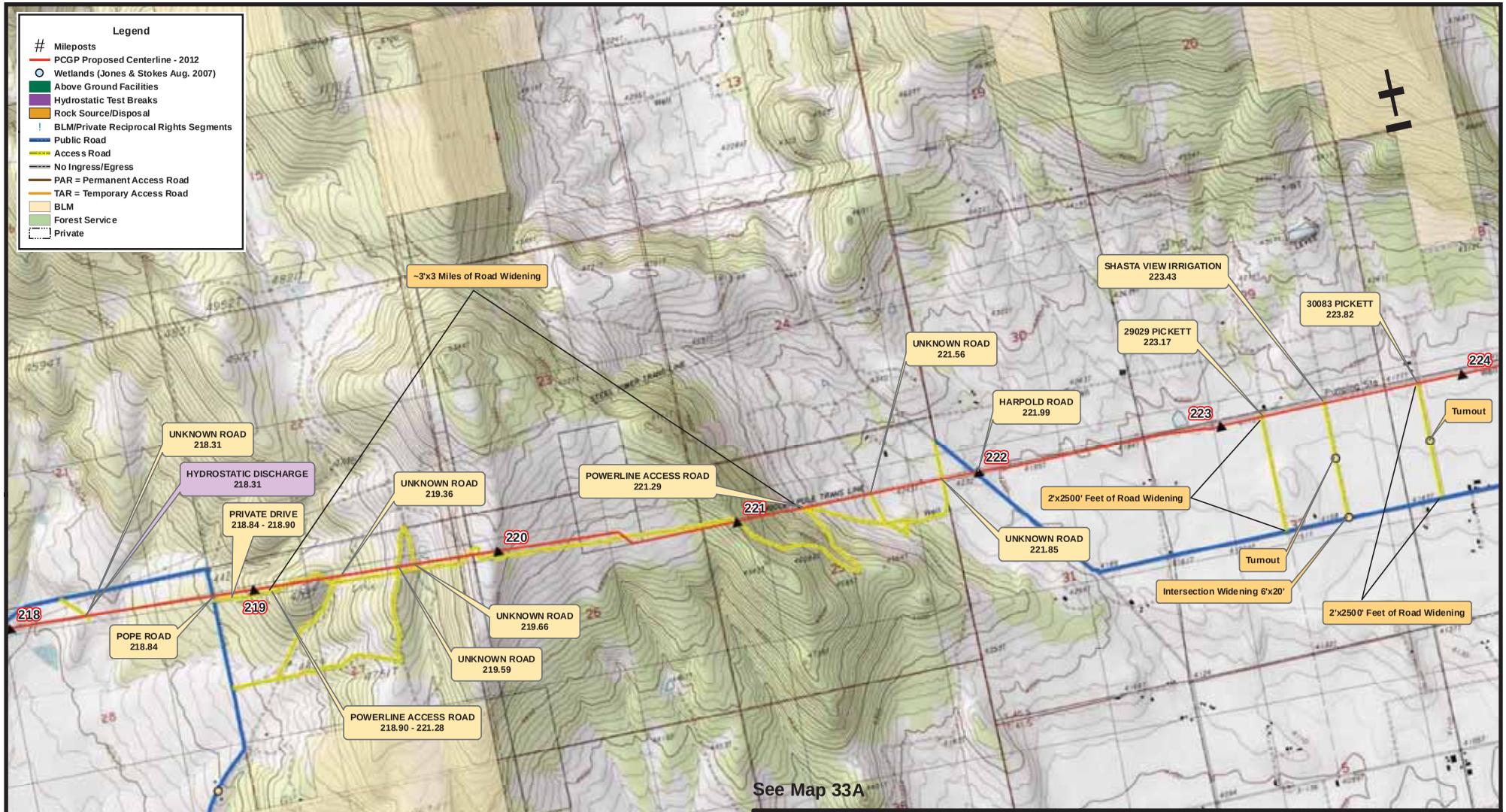
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 211.00 TO M.P. 218.20
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-032	SHEET 59 OF 62



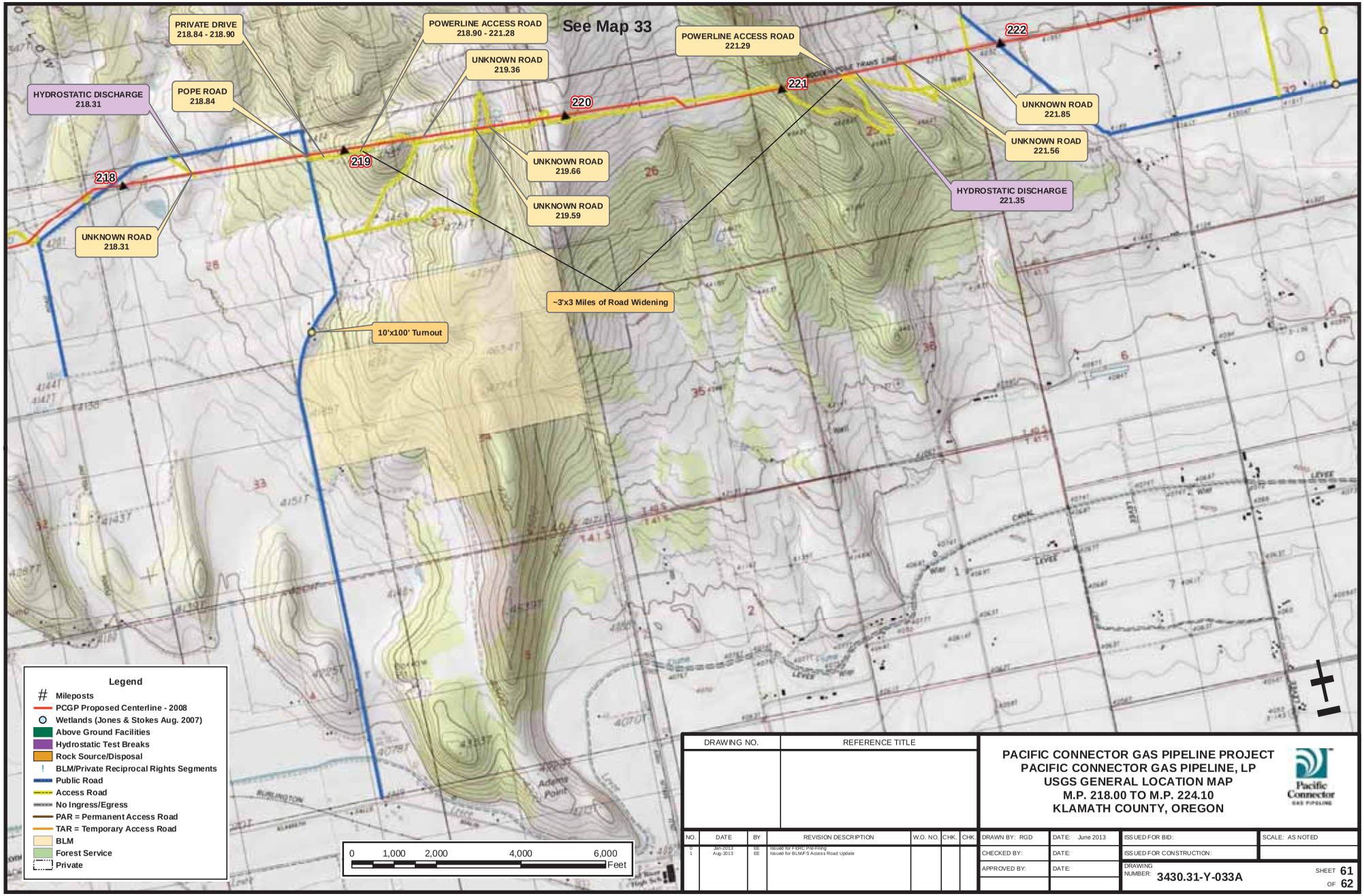
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Public Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 218.00 TO M.P. 224.10
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-033	SHEET 60 OF 62



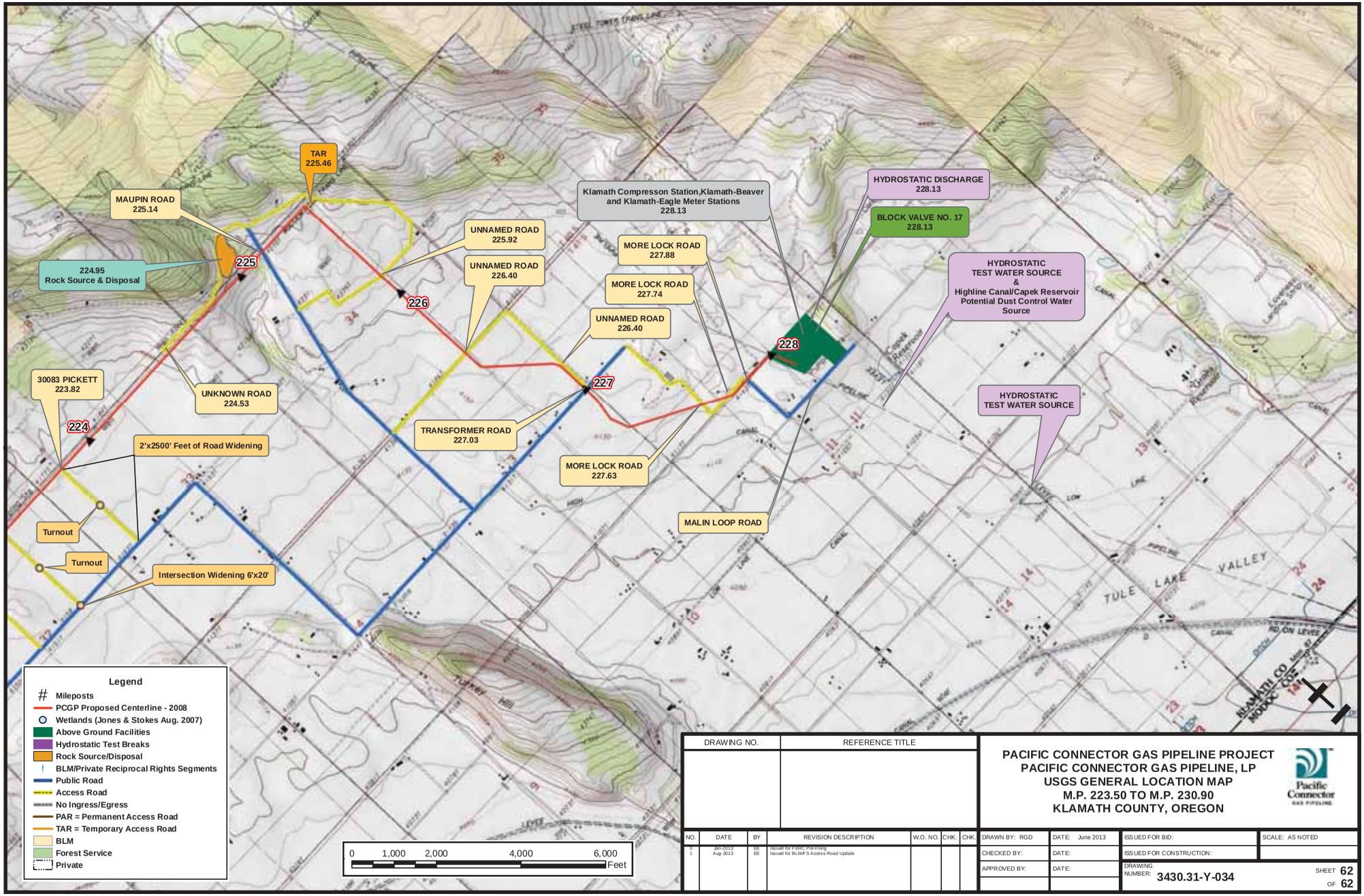
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for Pre-Filing			
1	Aug-2013	EE	Issued for BLM/F S Access Road Update			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 218.00 TO M.P. 224.10
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-033A	SHEET 61 OF 62



DRAWING NO.	REFERENCE TITLE

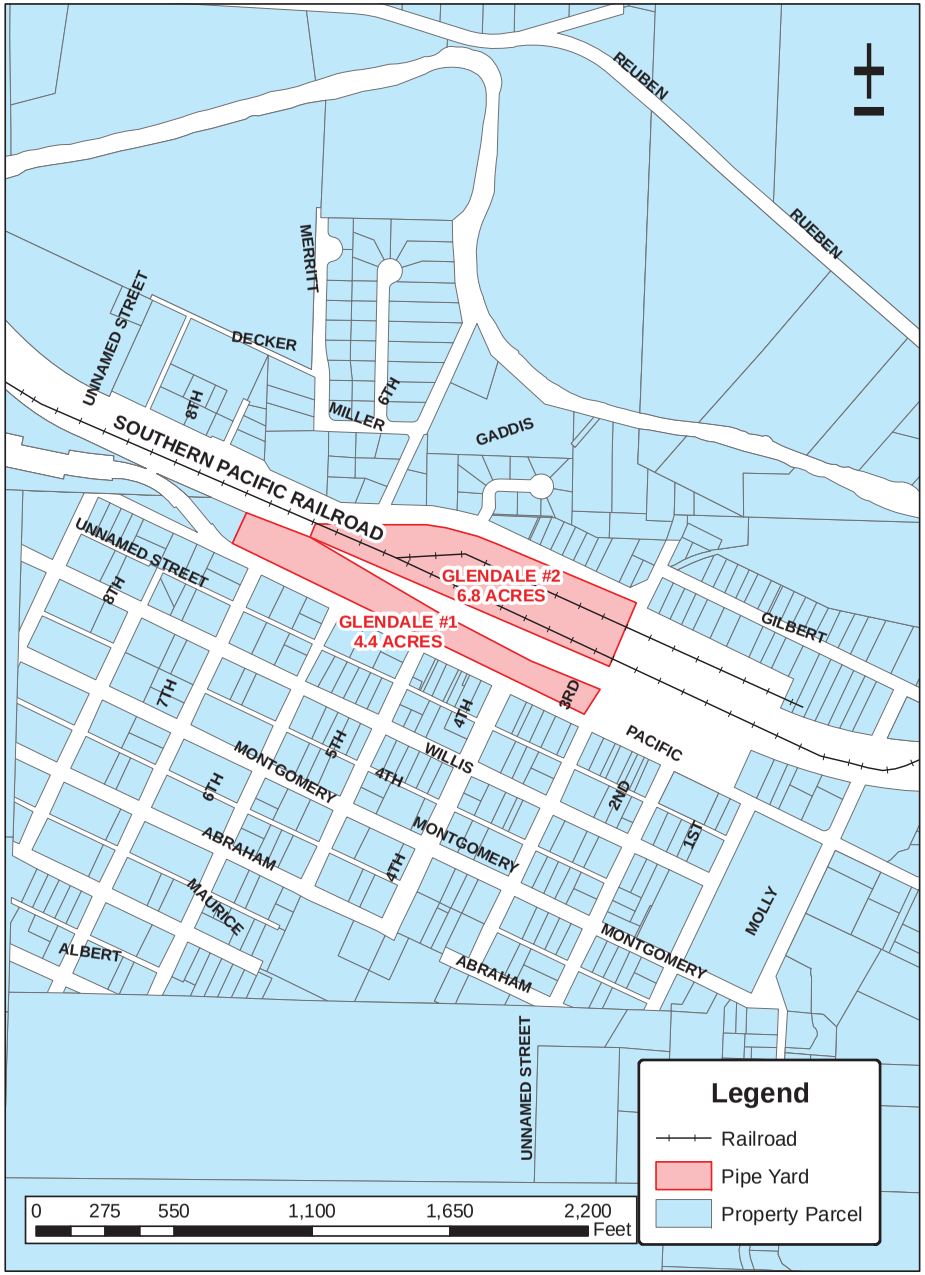
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
USGS GENERAL LOCATION MAP
M.P. 223.50 TO M.P. 230.90
KLAMATH COUNTY, OREGON

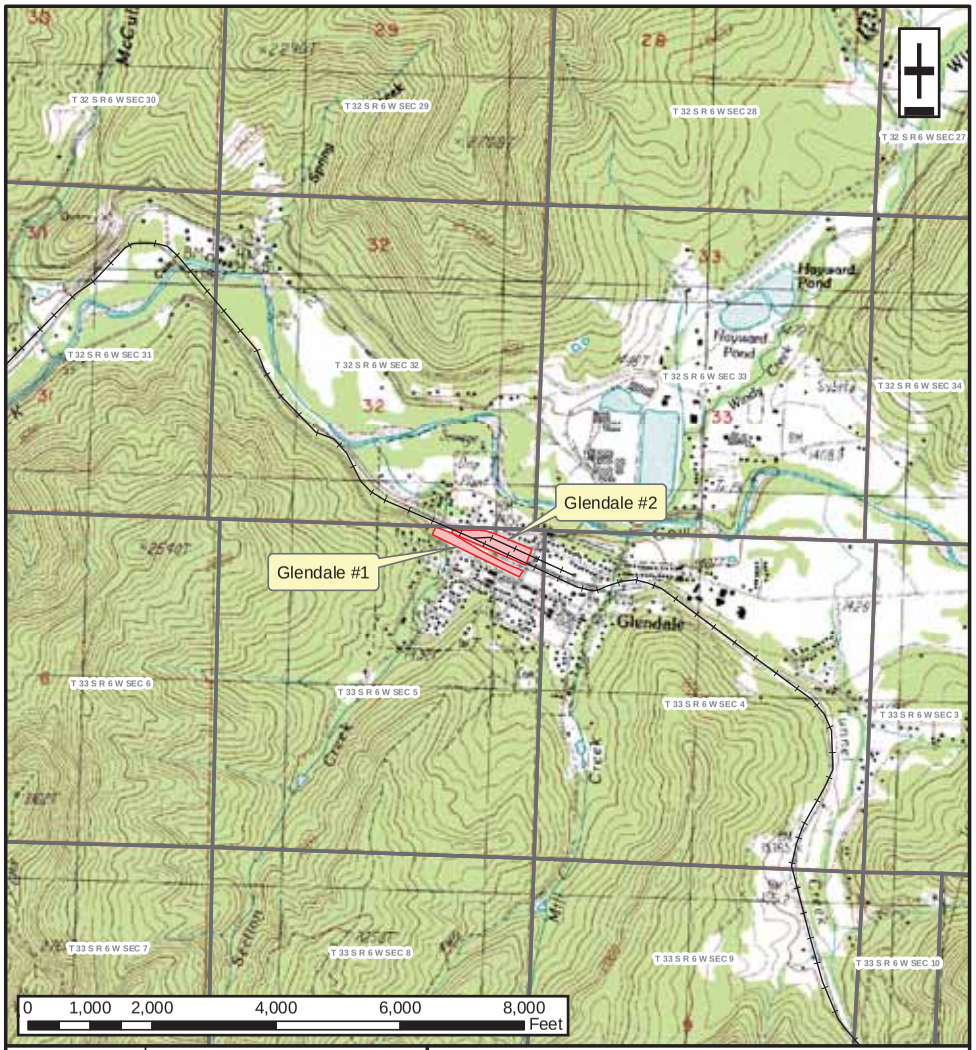
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	CHK.
0	Jun-2013	EE	Issued for FERC Pre-Filing			
1	Aug-2013	EE	Issued for BLMF S Access Road Update			

DRAWN BY: RGD	DATE: June 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.31-Y-034	SHEET 62 OF 62

Pipe Storage Yards for the Pacific Connector Project
Sheets 1–22





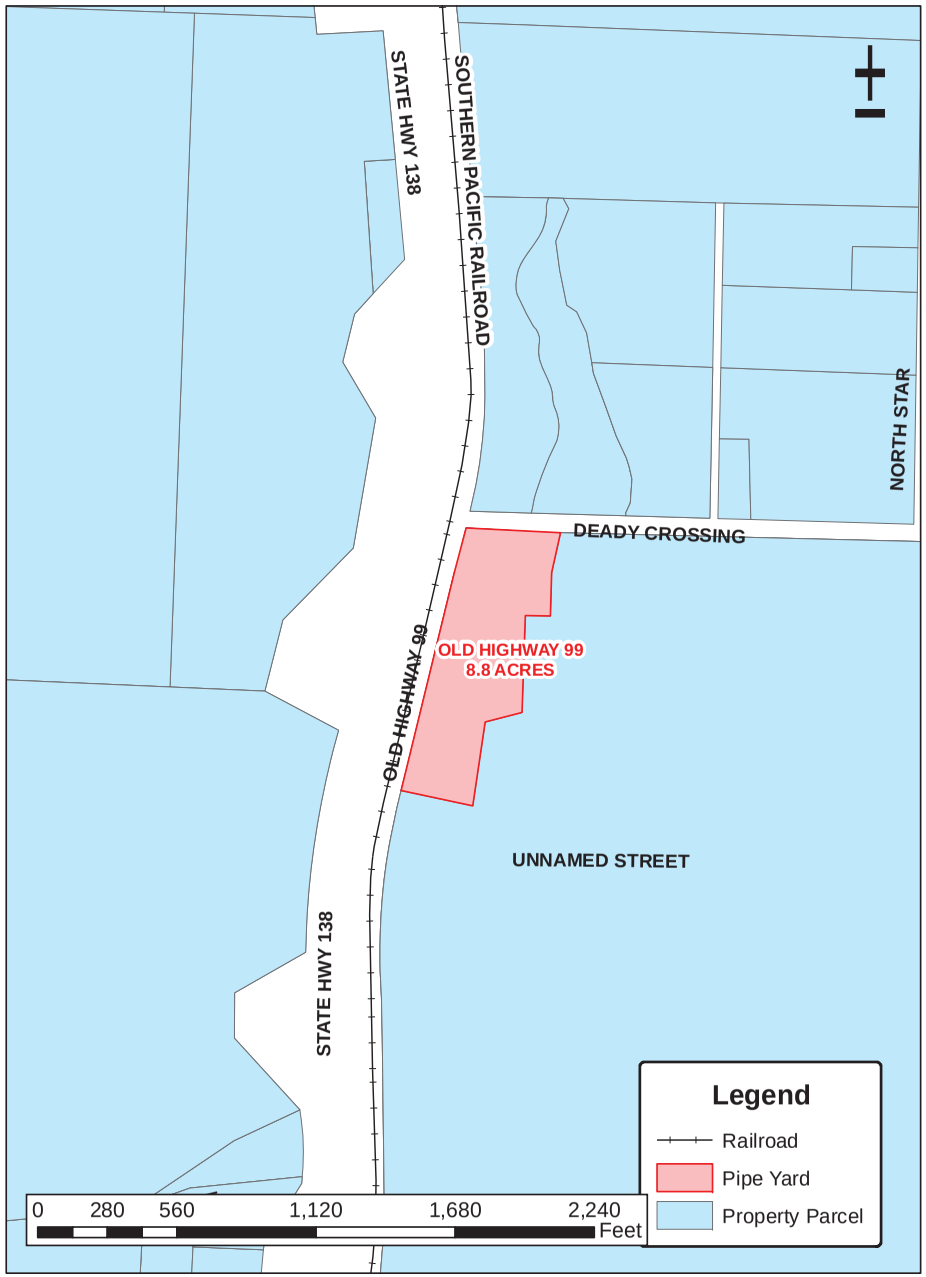
DRAWING NO.	REFERENCE TITLE
GLENDALE MCCULLOUGH CREEK	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

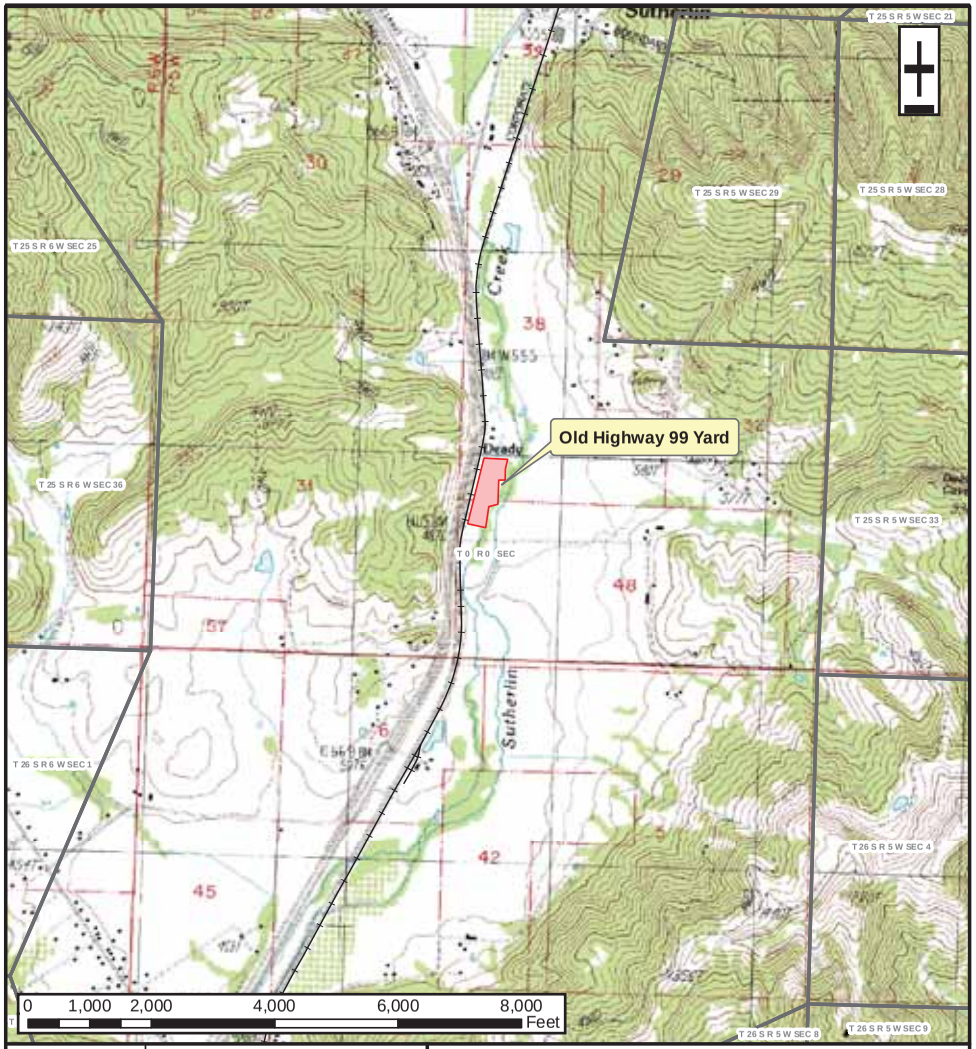
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
GLENDALE 1 & 2
T-33-S, R-6-W, SECT-5
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0001	SHEET 1 OF 1





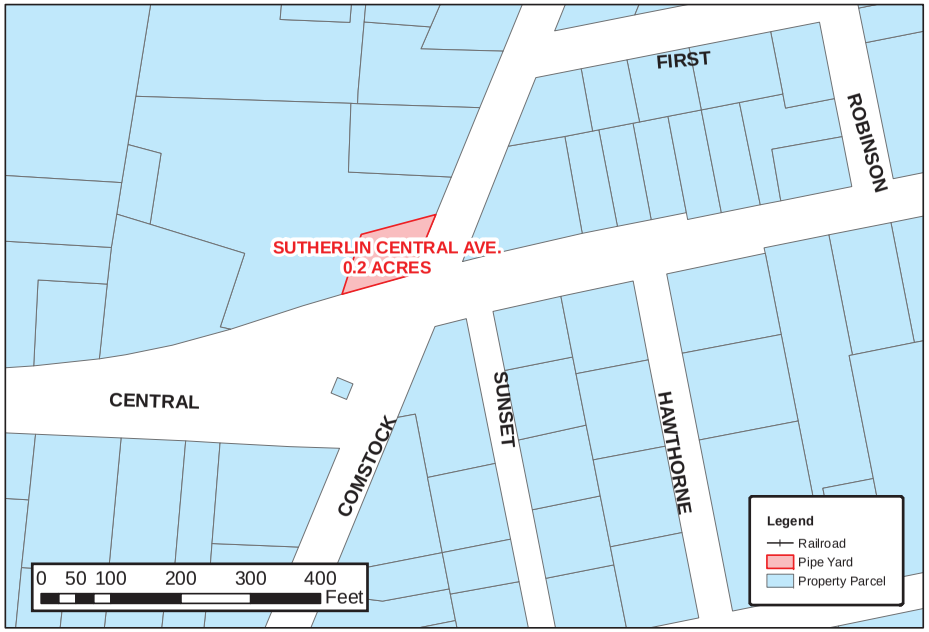
DRAWING NO.	REFERENCE TITLE
WINCHESTER	24 K/7.5 MIN TOPO QUAD

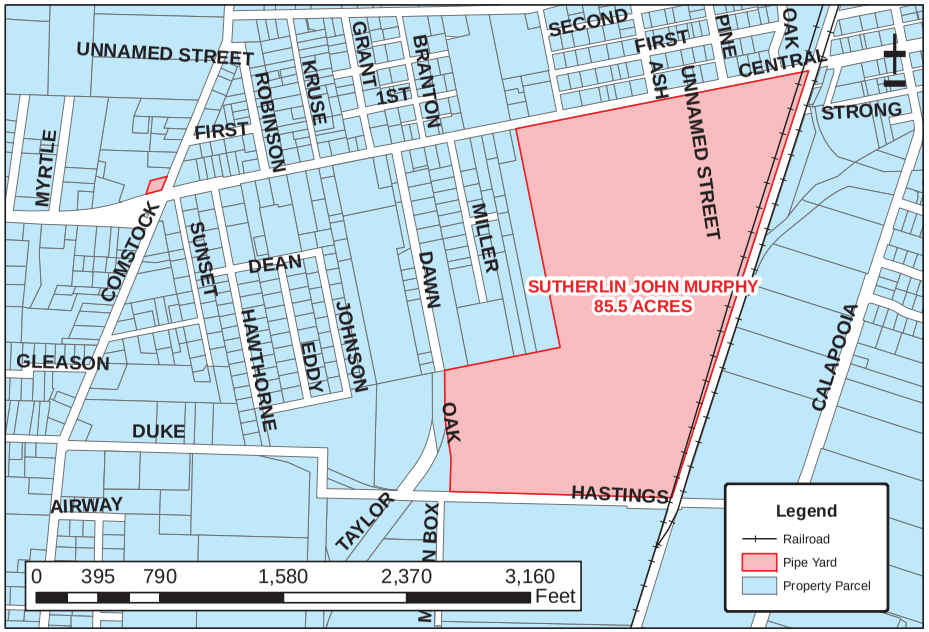
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
OLD HIGHWAY 99
T-25-S, R-5-W
DOUGLAS COUNTY, OREGON

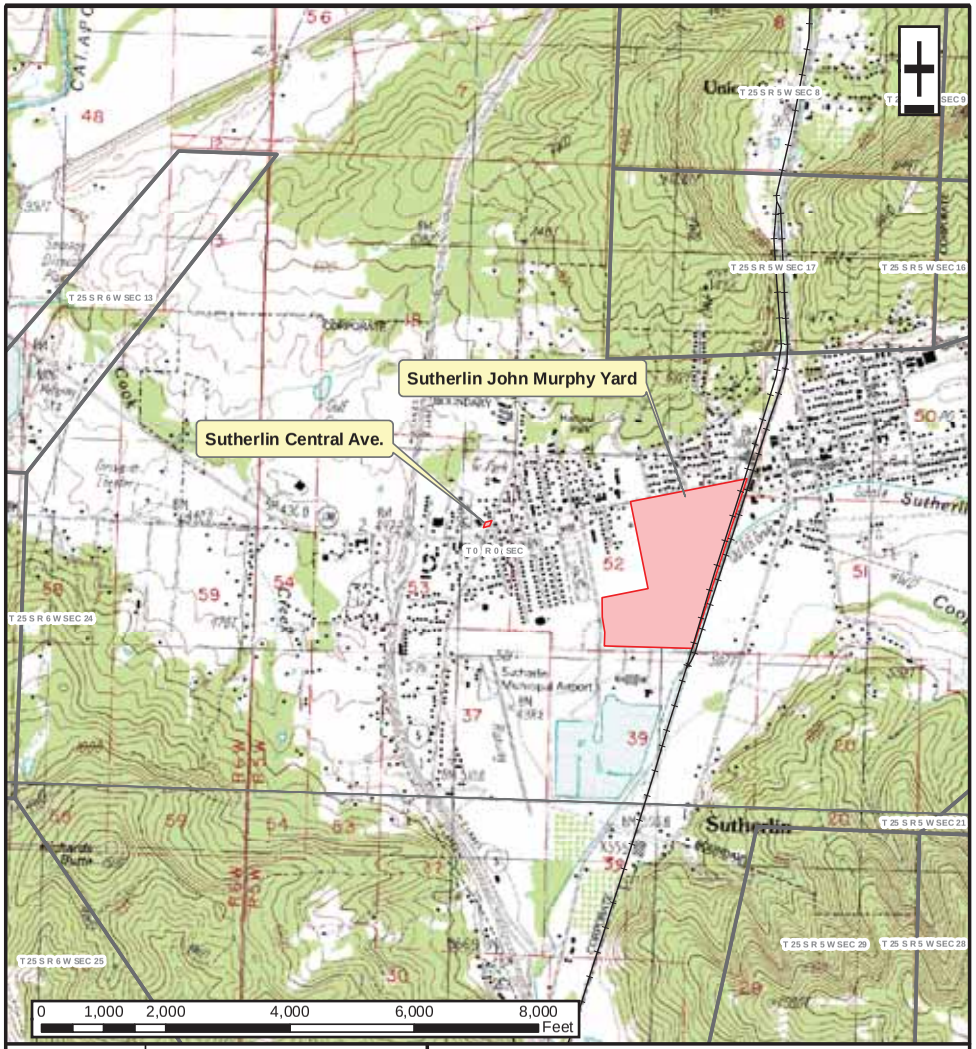
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0002	SHEET 1 OF 1







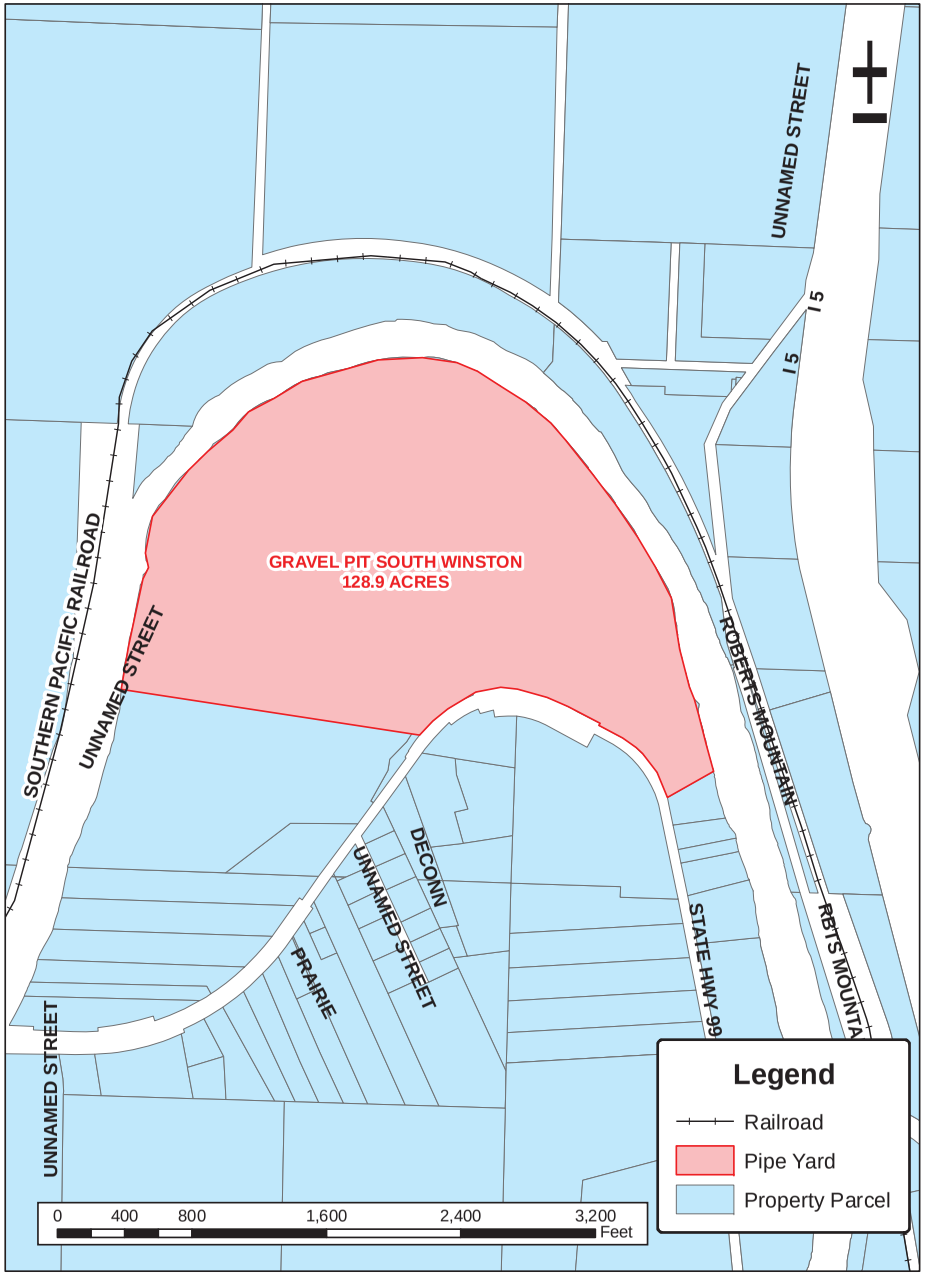
DRAWING NO.	REFERENCE TITLE
WINCHESTER SUTHERLIN	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

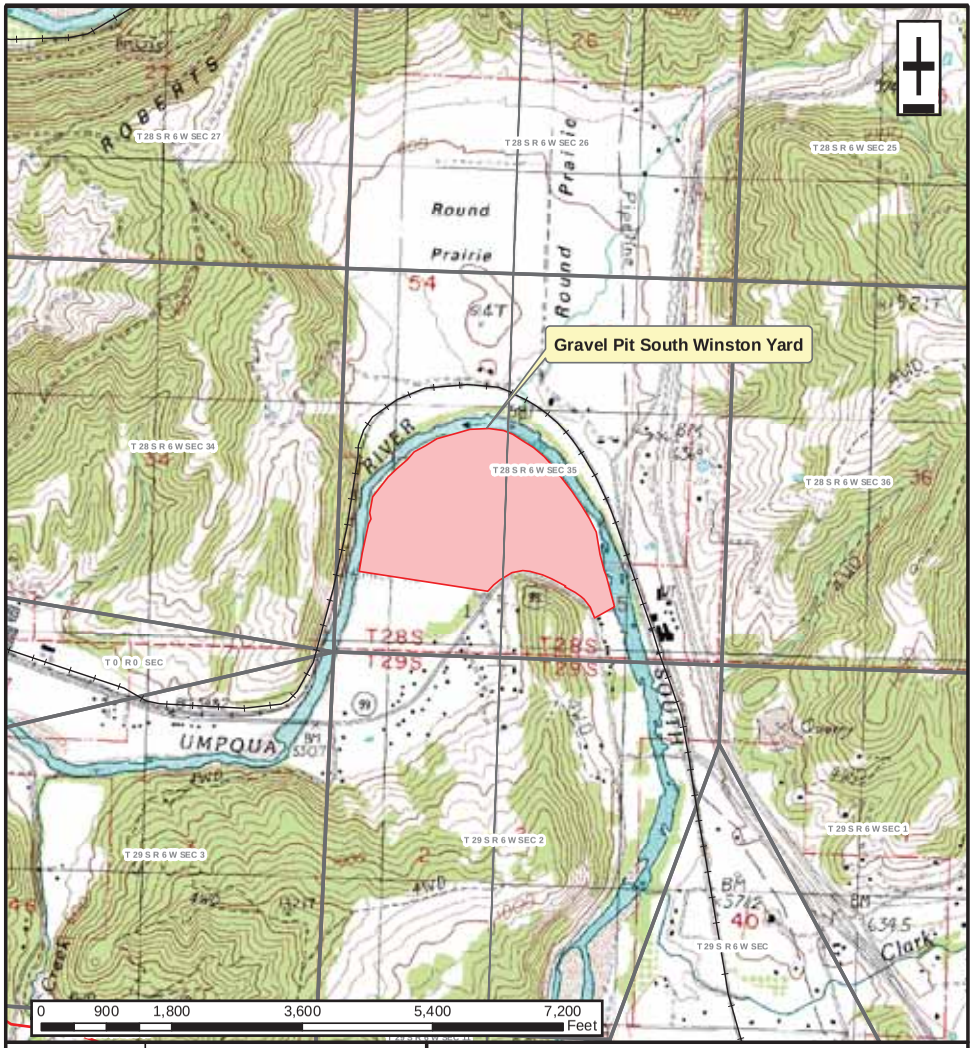
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
SUTHERLIN JOHN MURPHY & CENTRAL AVE
T-25-S, R-5-W, (130-02)
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0003	SHEET 1 OF 1





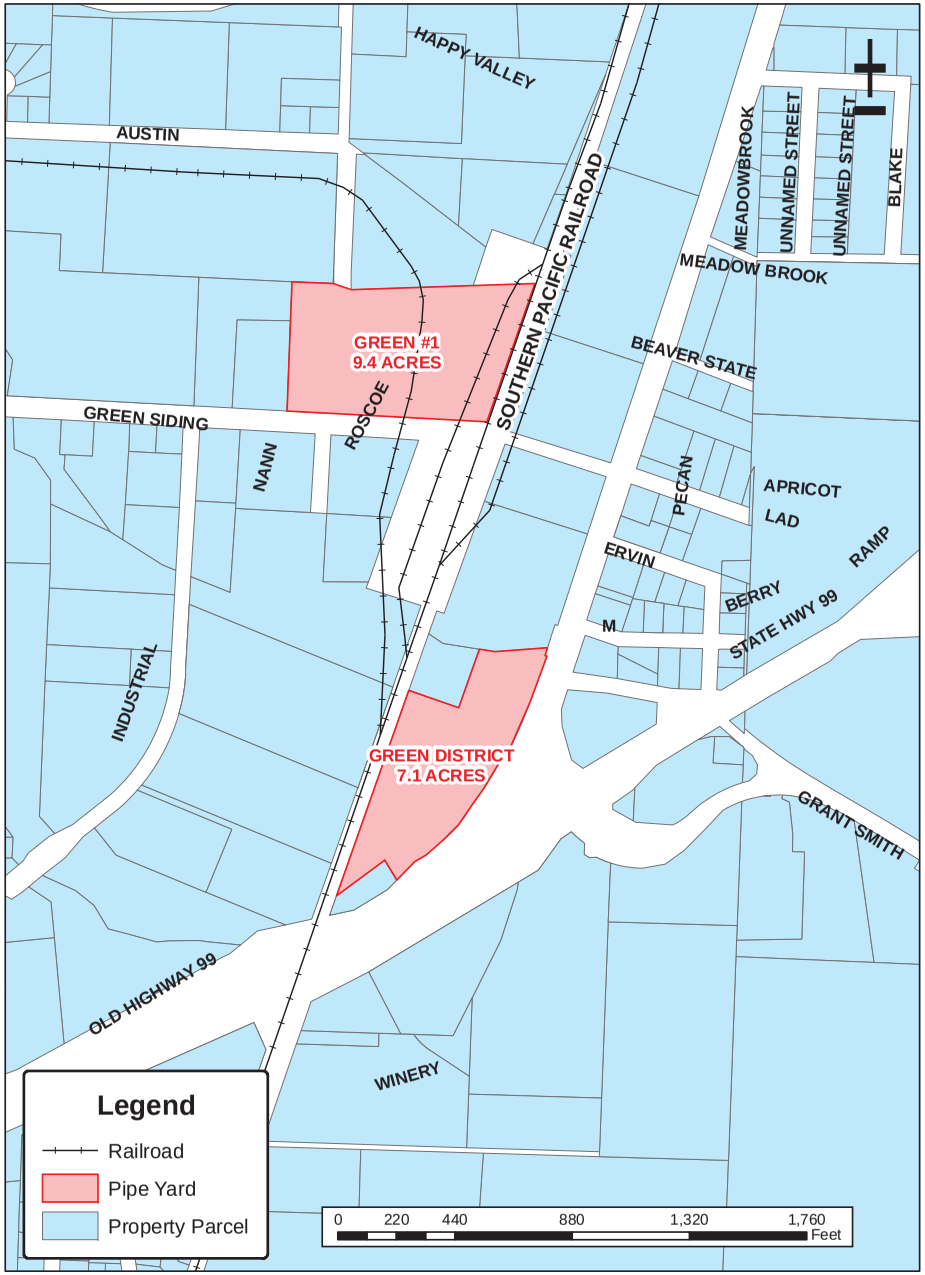
DRAWING NO.	REFERENCE TITLE
MYRTLE CREEK WINSTON	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

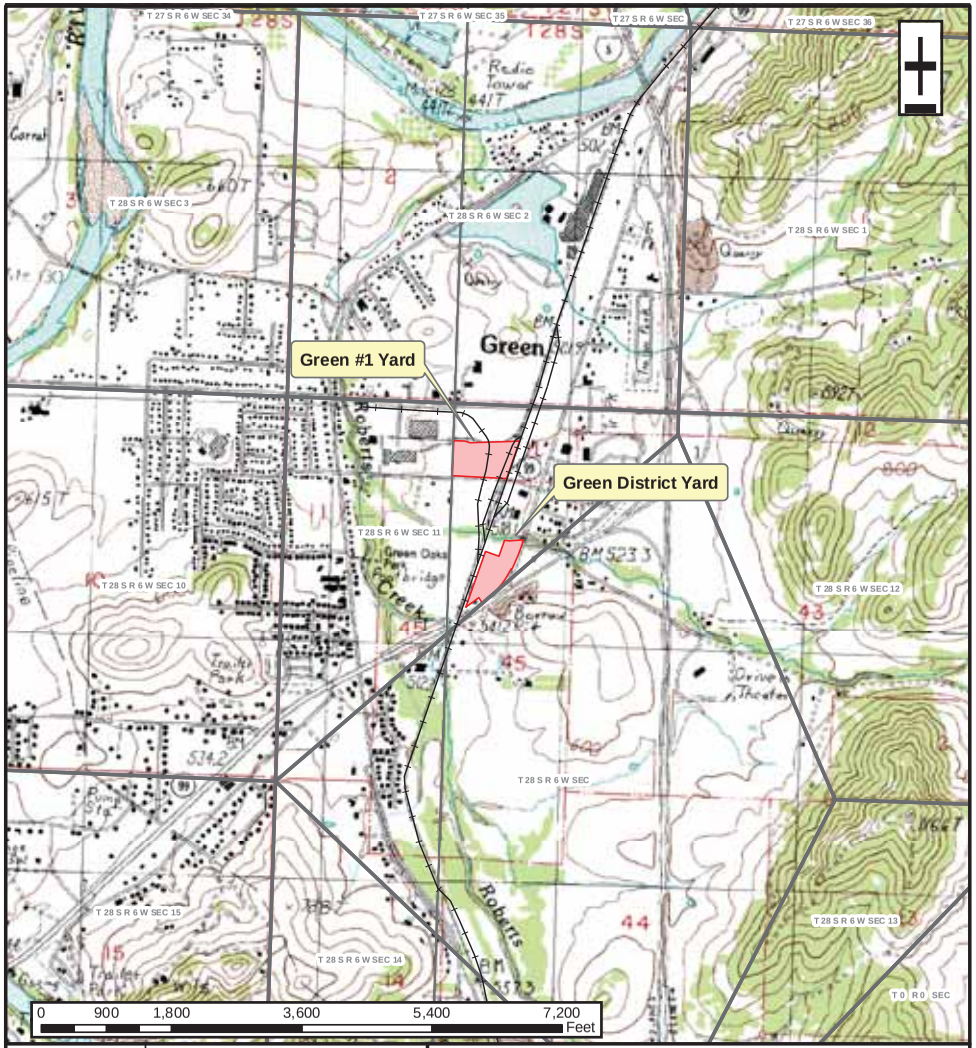
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
GRAVEL PIT SOUTH WINSTON
T-28-S, R-6-W, SECT-35
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0005	SHEET 1 OF 1





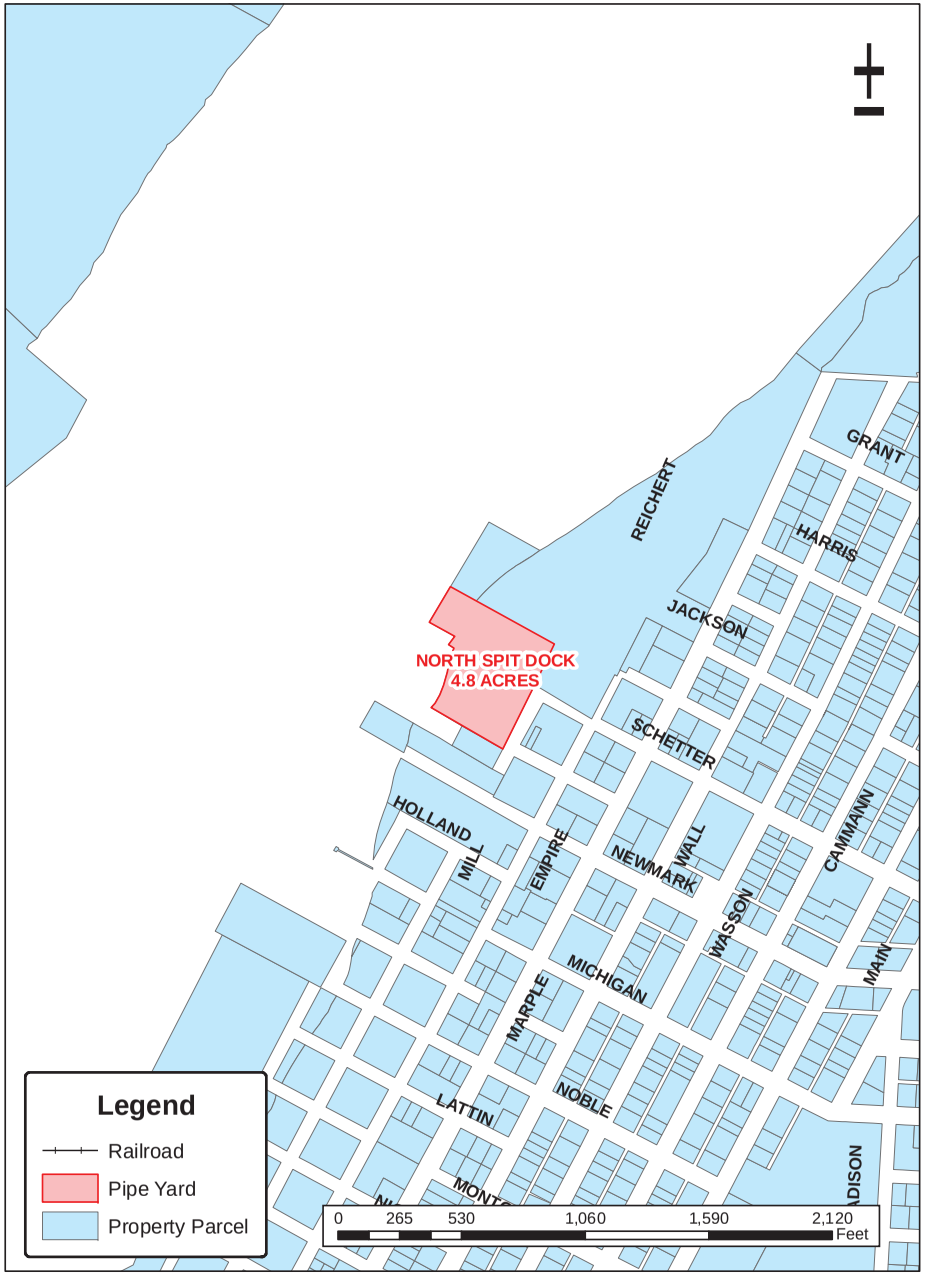
DRAWING NO.	REFERENCE TITLE
ROSEBURG WEST ROSEBURG EAST	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

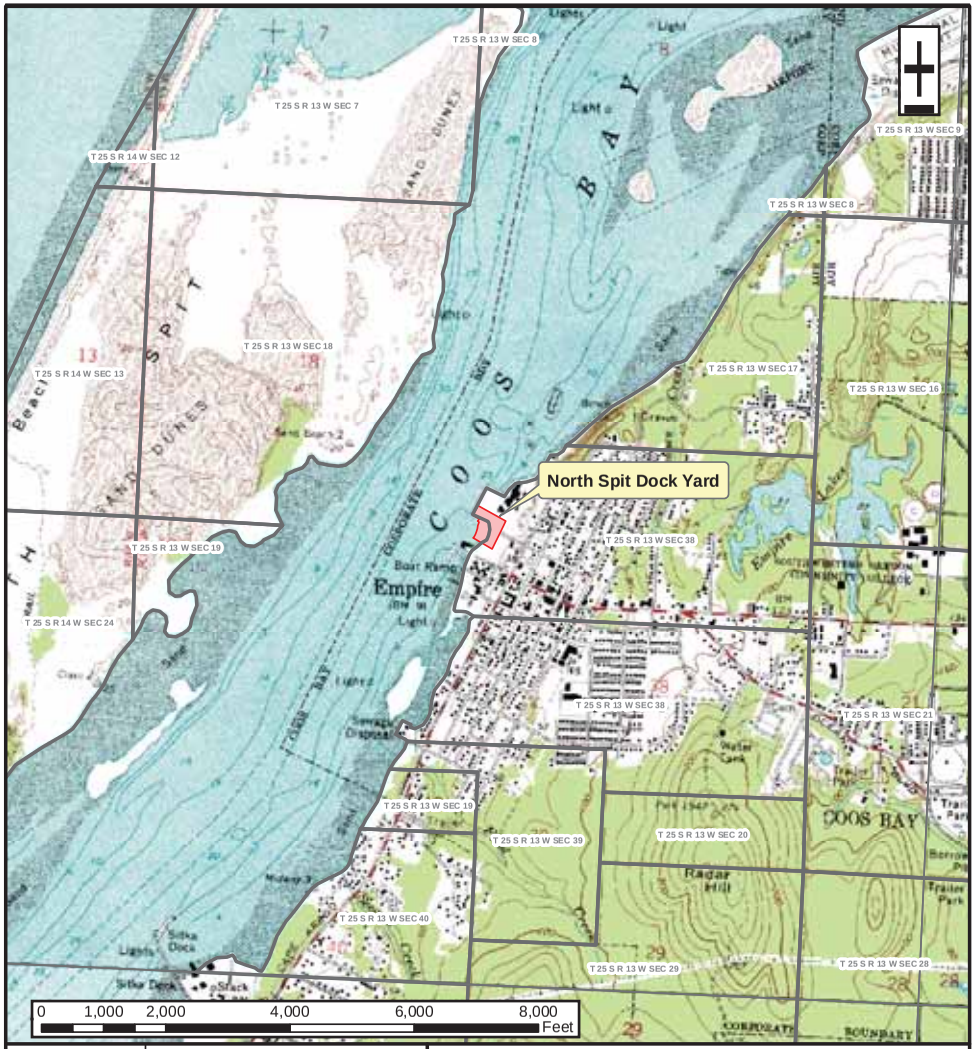
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
GREEN #1 & GREEN DISTRICT
T-28-S, R-6-W, SECT-11
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0006	SHEET 1 OF 1





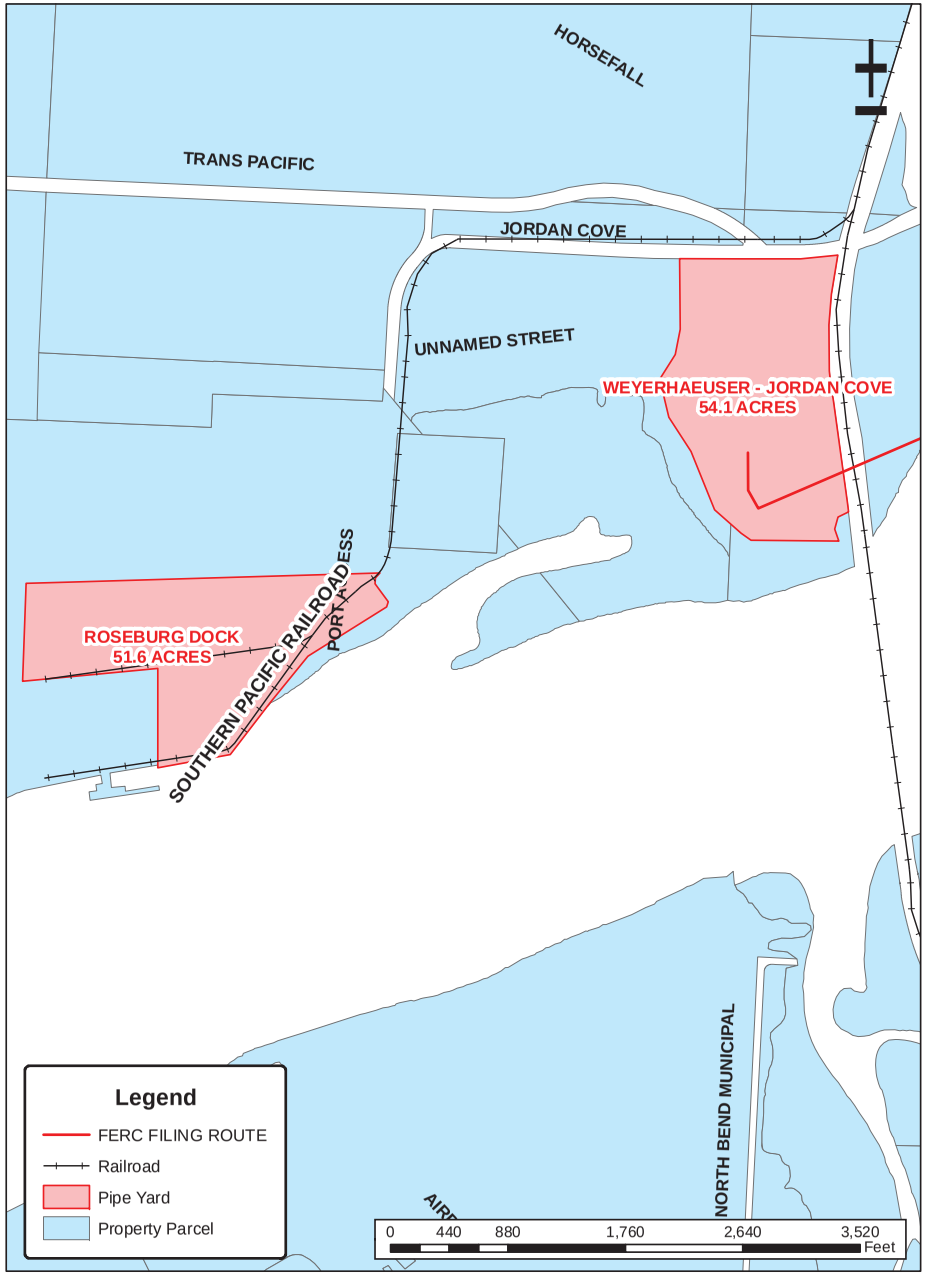
DRAWING NO.	REFERENCE TITLE
EMPIRE CHARLESTON NORTH BEND COOS BAY	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

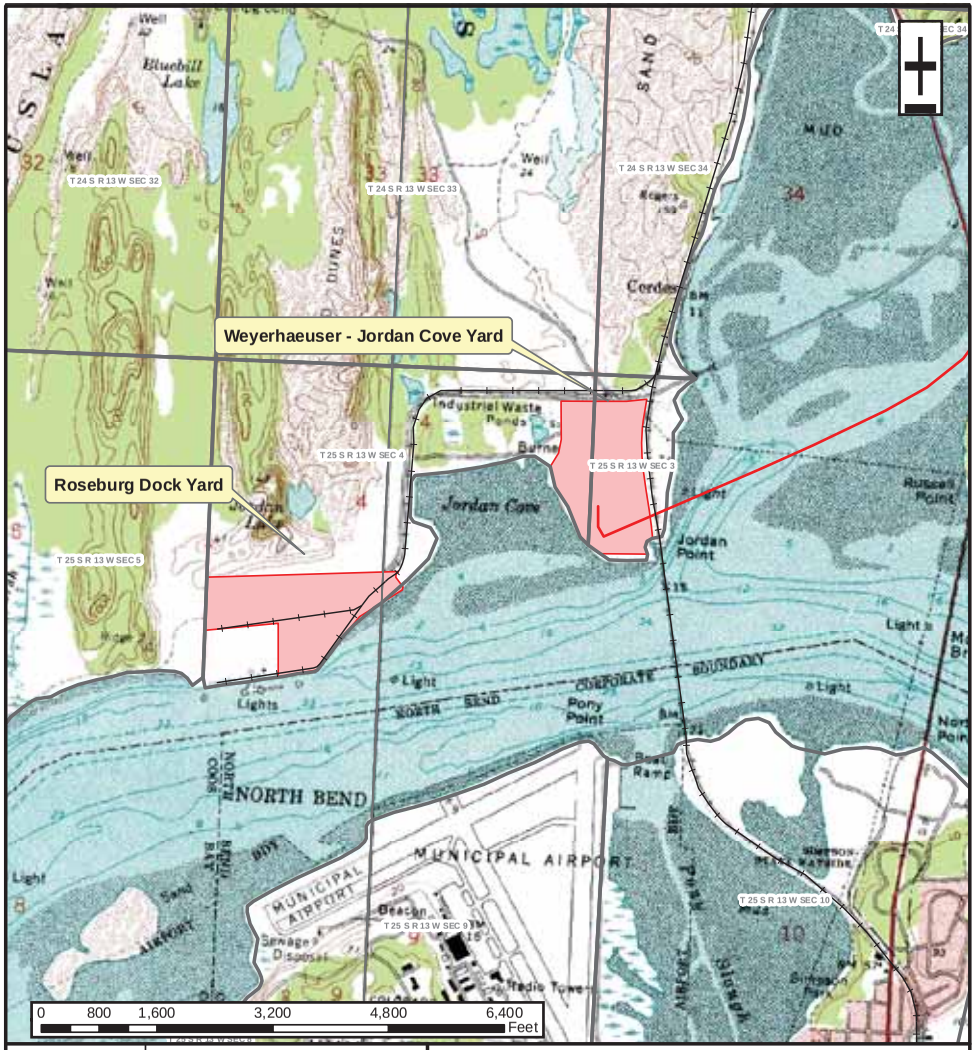
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
NORTH SPIT DOCK
T-25-S, R-13-W, SECT-38
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0007	SHEET 1 OF 1





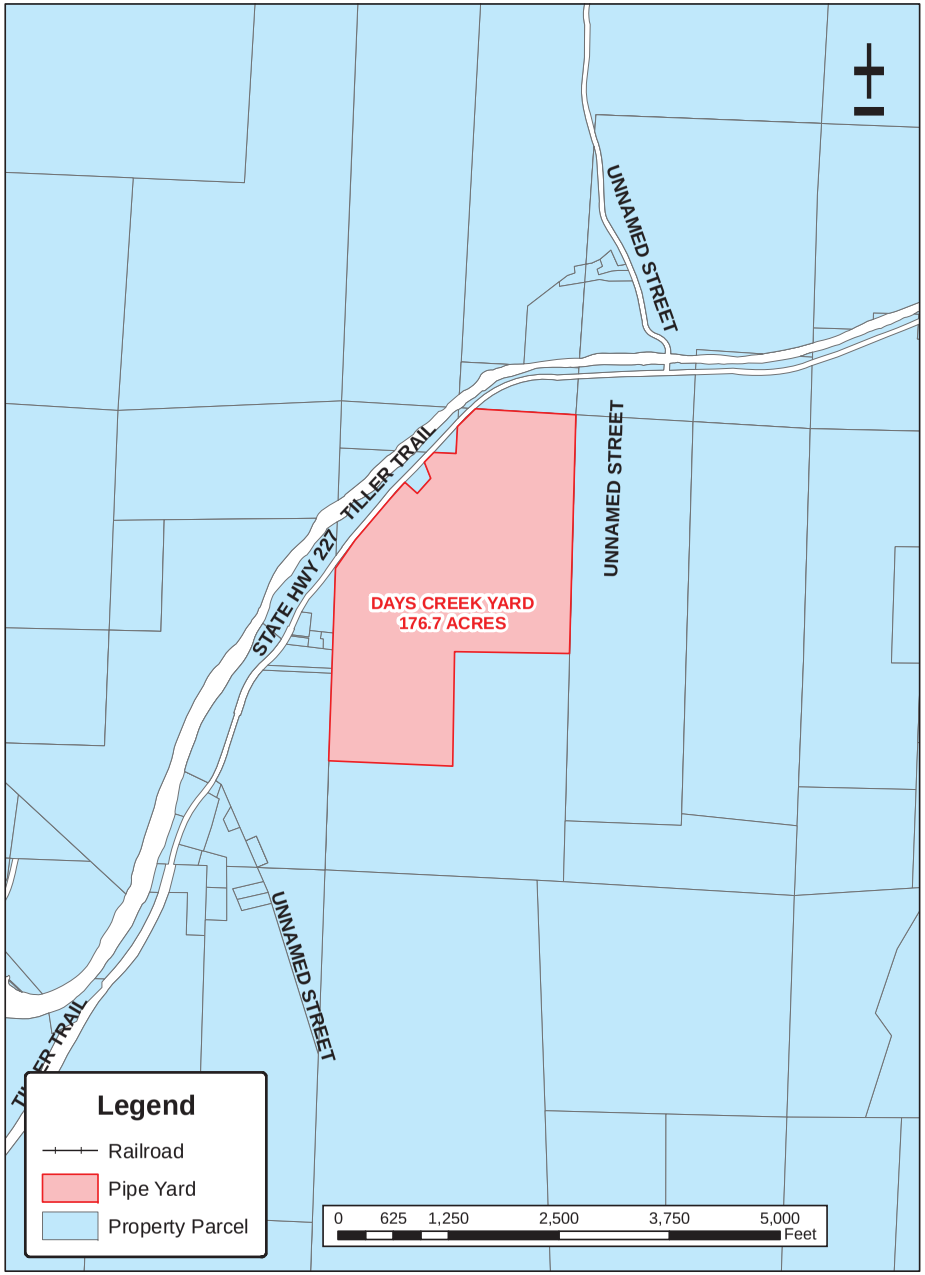
DRAWING NO.	REFERENCE TITLE
EMPIRE NORTH BEND	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

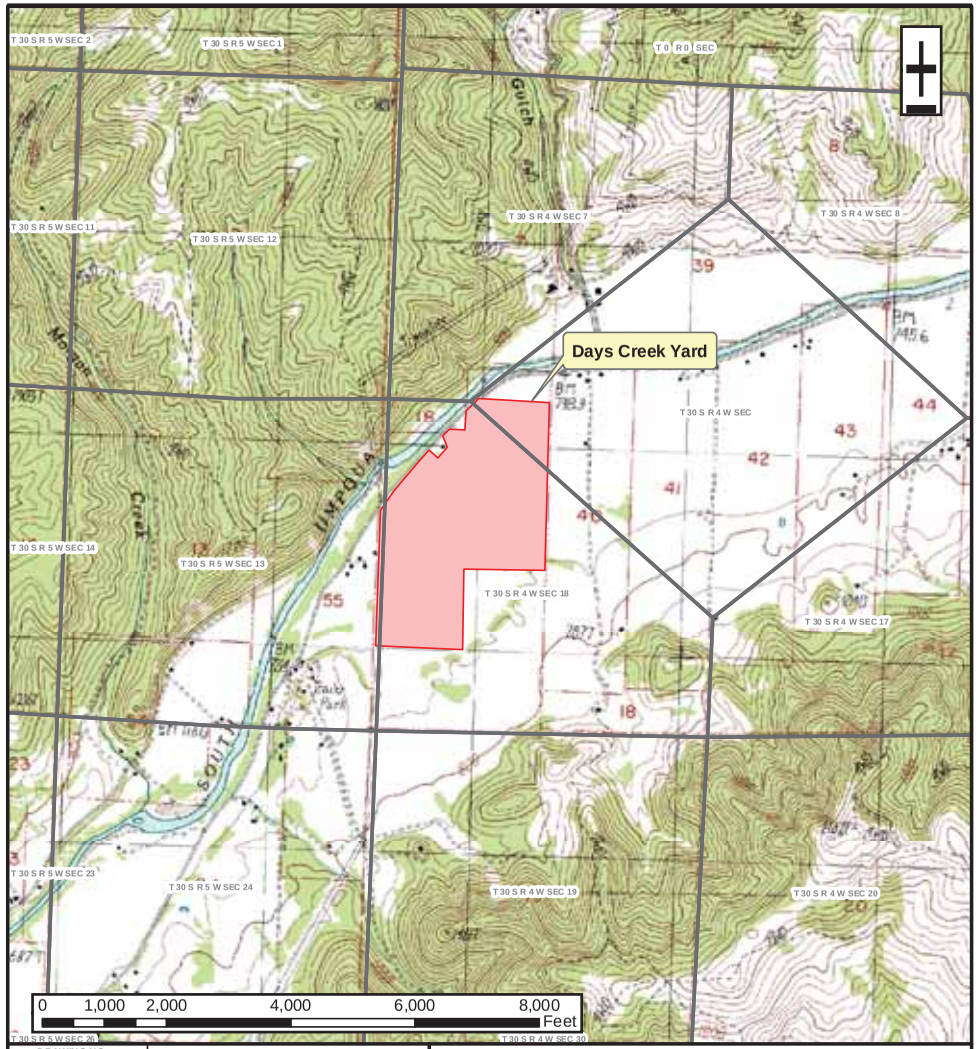
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
ROSEBURG DOCK & WEYERHAUSER-JORDAN COVE
T-25-S, R-13-W, SECT-3 & 4
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0008	SHEET 1 OF 1





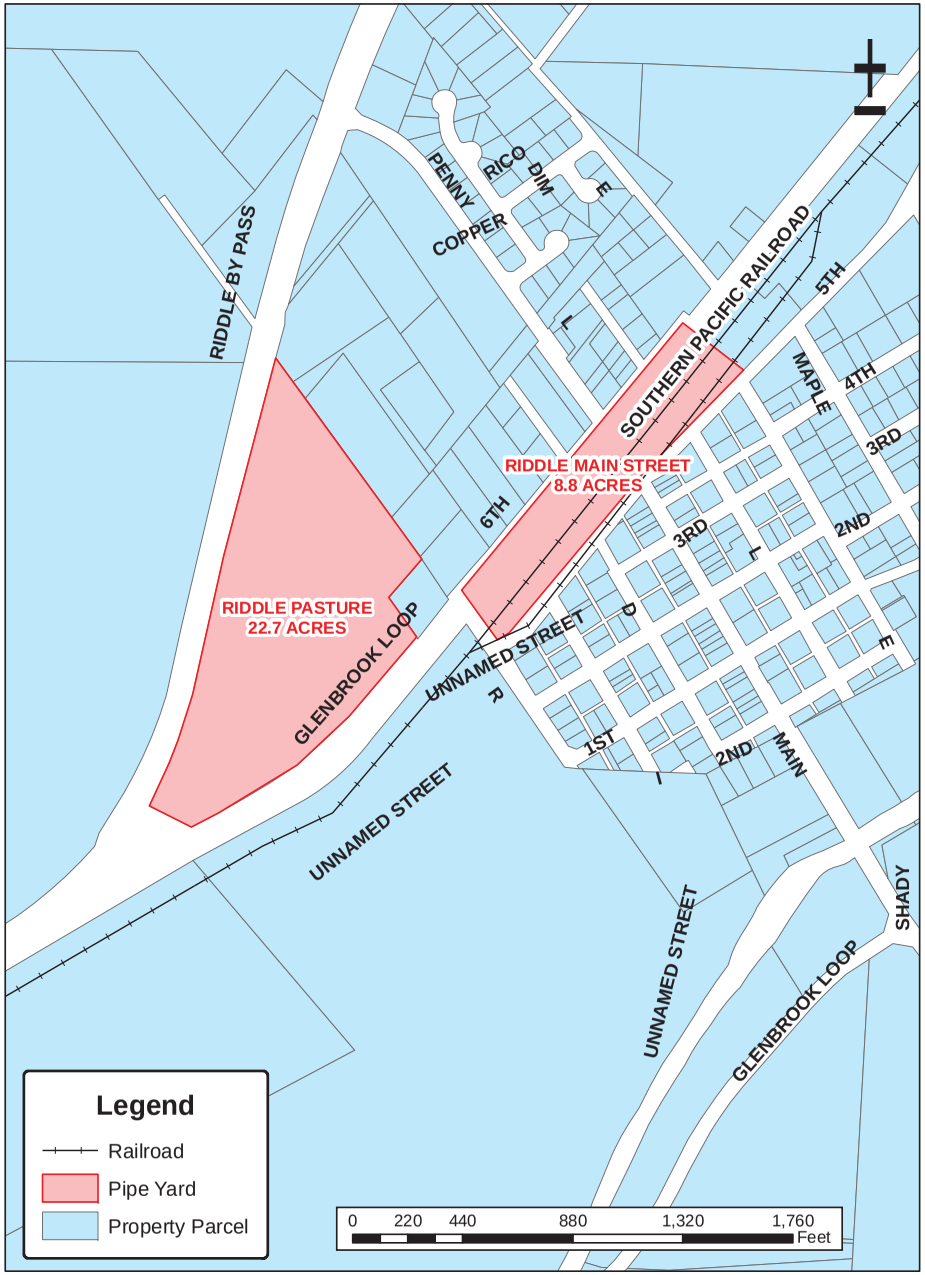
DRAWING NO.	REFERENCE TITLE
DAYS CREEK	24 K/7.5 MIN TOPO QUAD

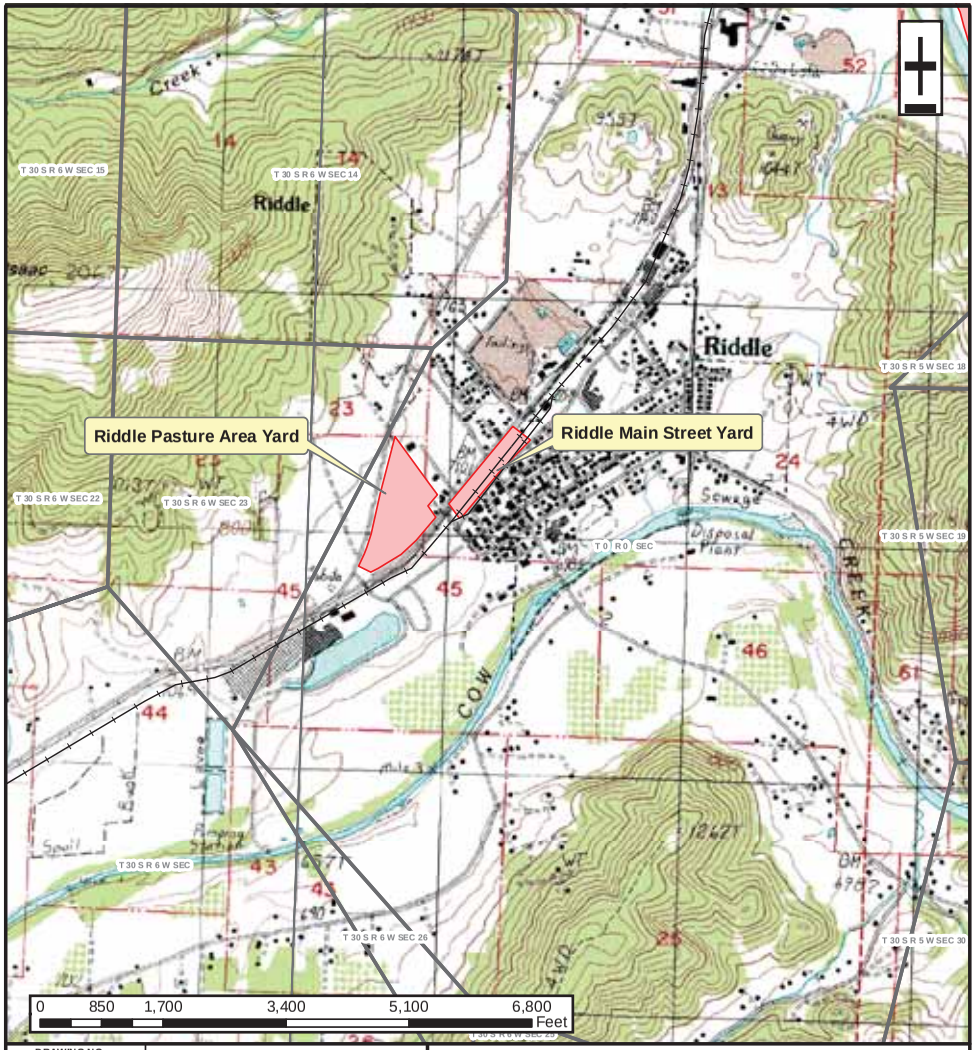
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
DAYS CREEK
T-30-S, R-4-W, SECT- 18
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0009	SHEET 1 OF 1





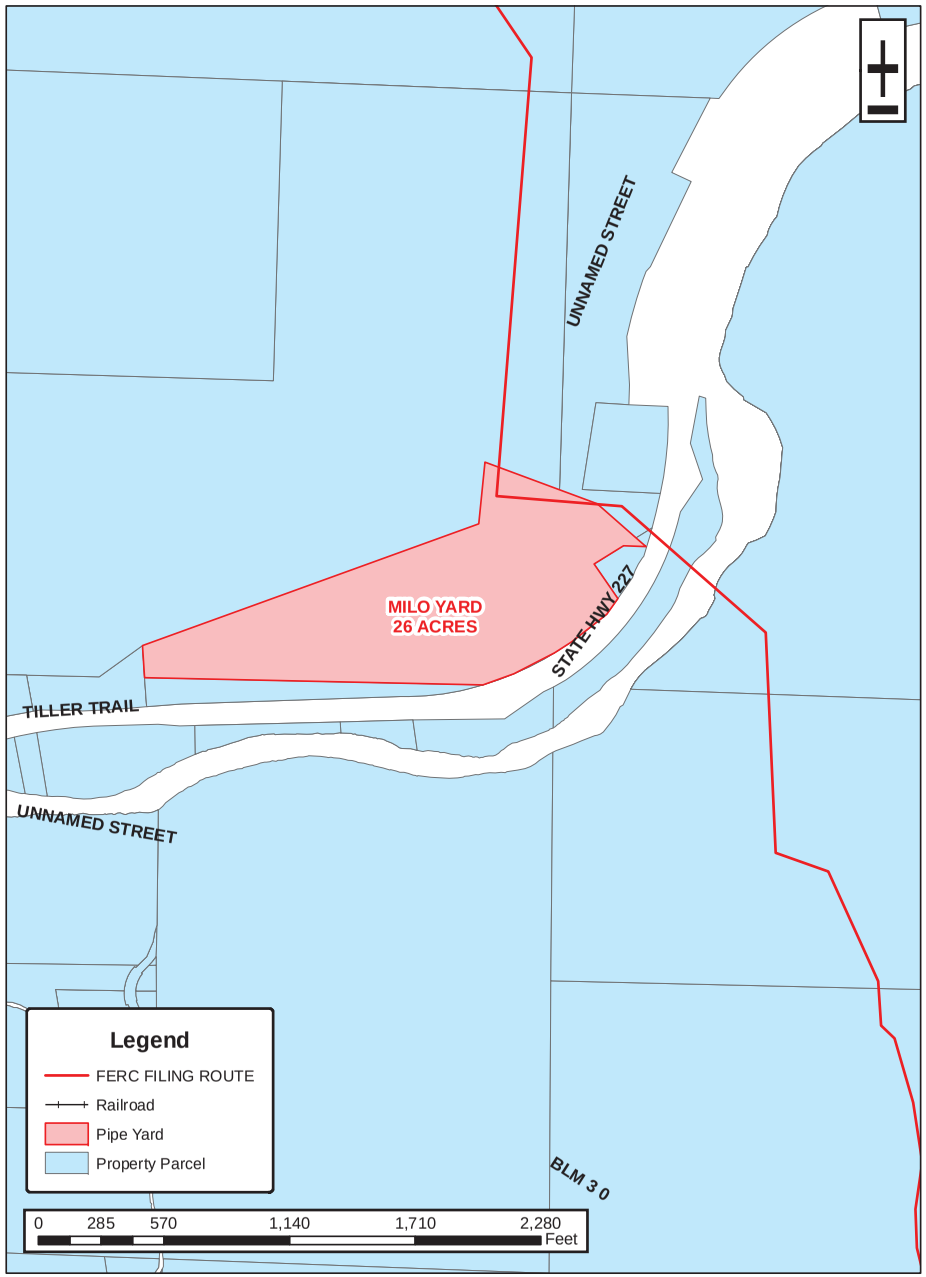
DRAWING NO.	REFERENCE TITLE
NICKLE MOUNTAIN CANYONVILLE	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

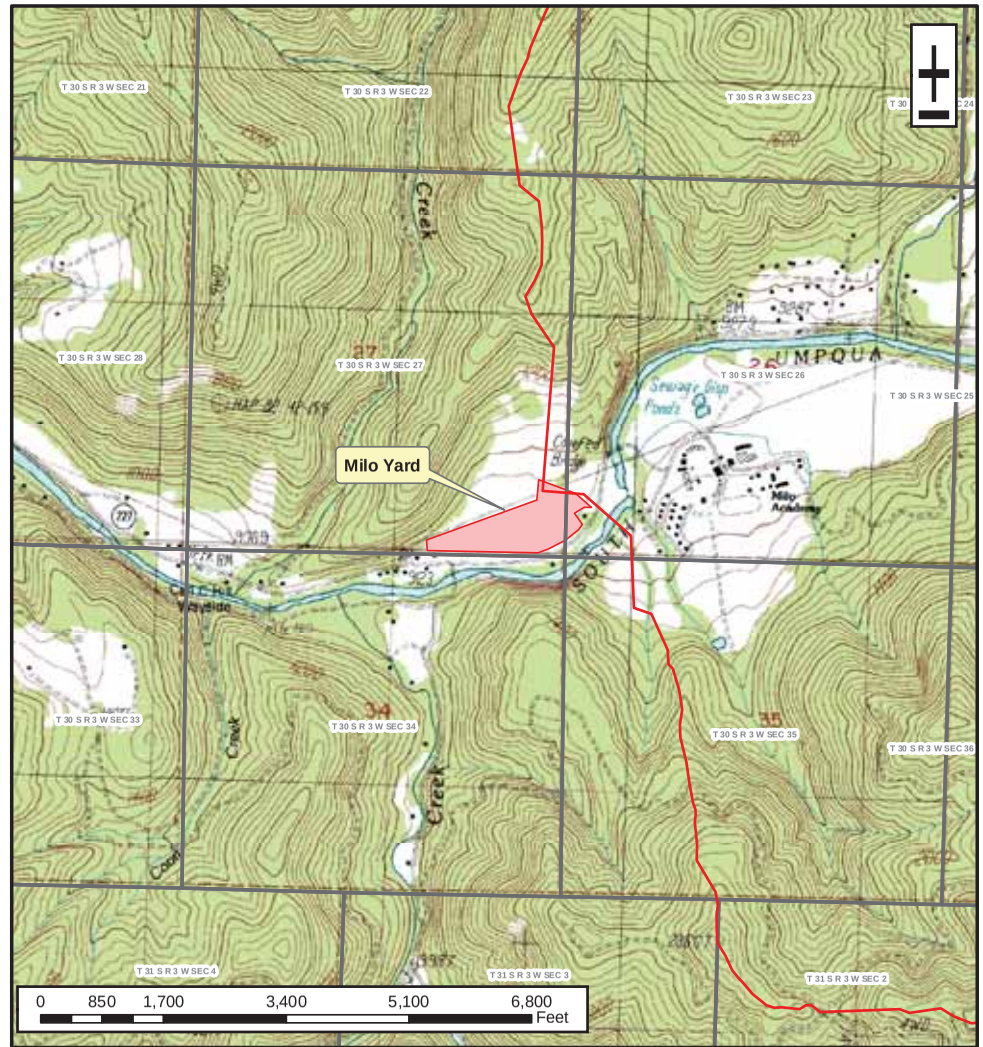
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
RIDDLE PASTURE AREA & RIDDLE MAIN STREET
T-30S, R-6-W (70-01, 70-02)
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0010	SHEET 1 OF 1





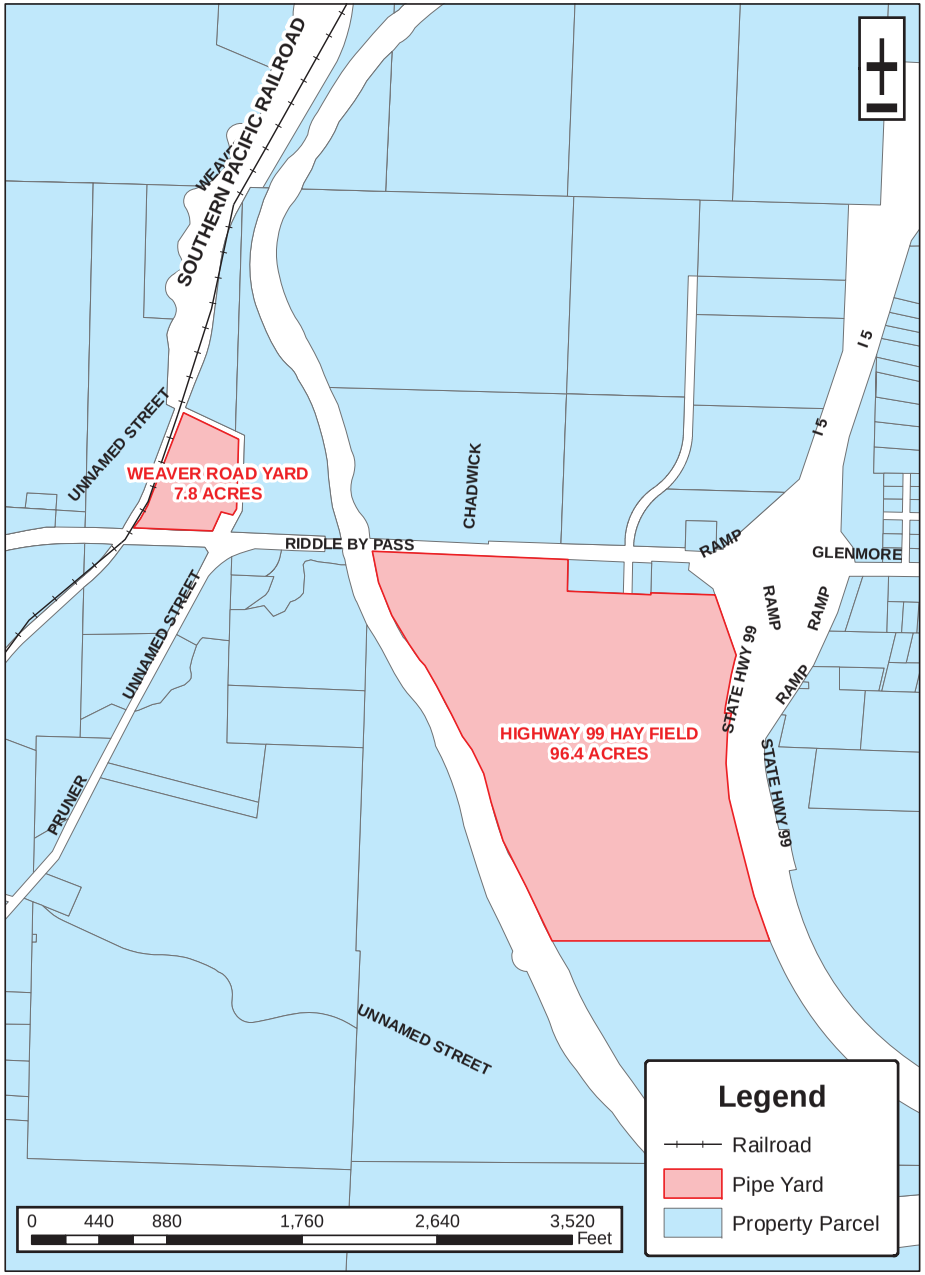
DRAWING NO.	REFERENCE TITLE
MILO	24 K/7.5 MIN TOPO QUAD

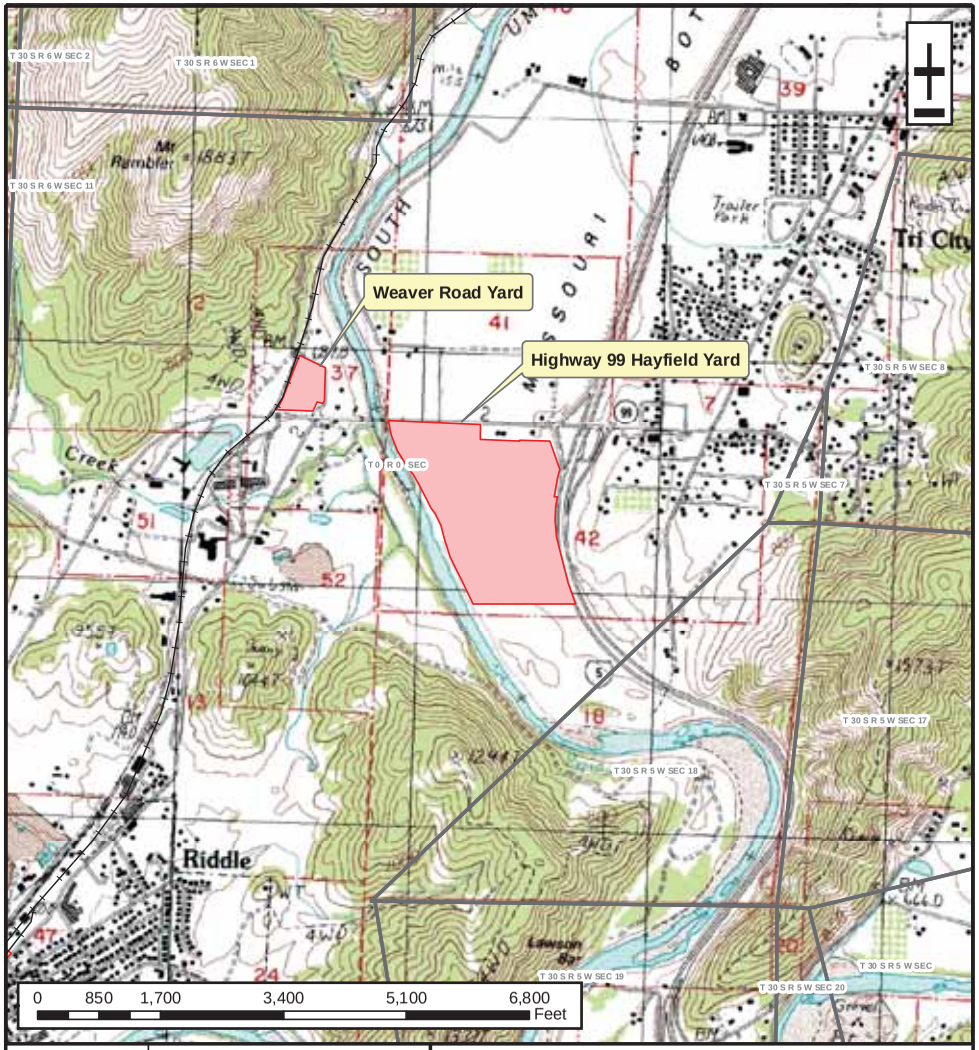
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
MILO YARD
T-30-S, R-3-W, SECT-27
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0011	SHEET 1 OF 1





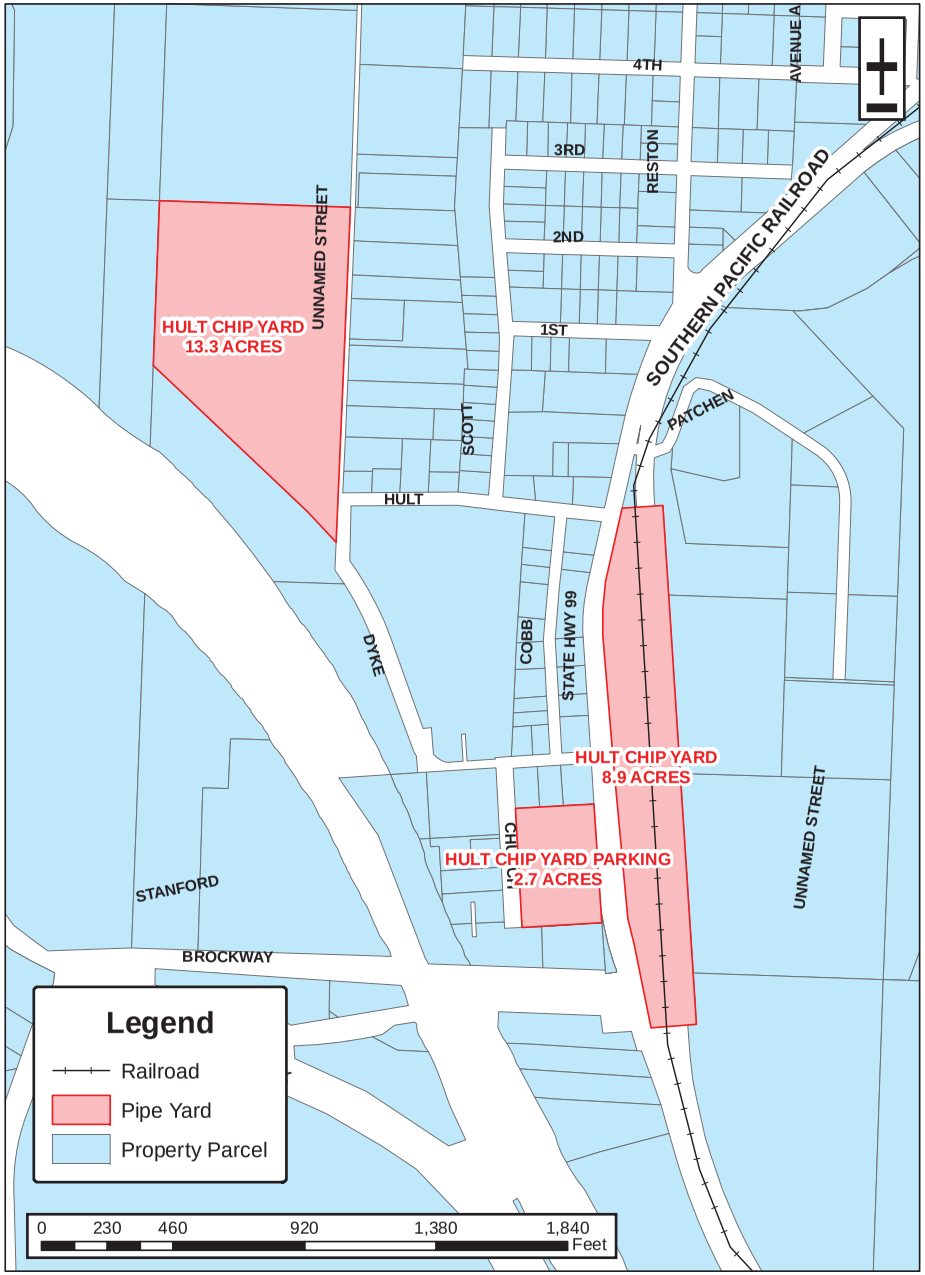
DRAWING NO.	REFERENCE TITLE
CANYONVILLE	24 K/7.5 MIN TOPO QUAD

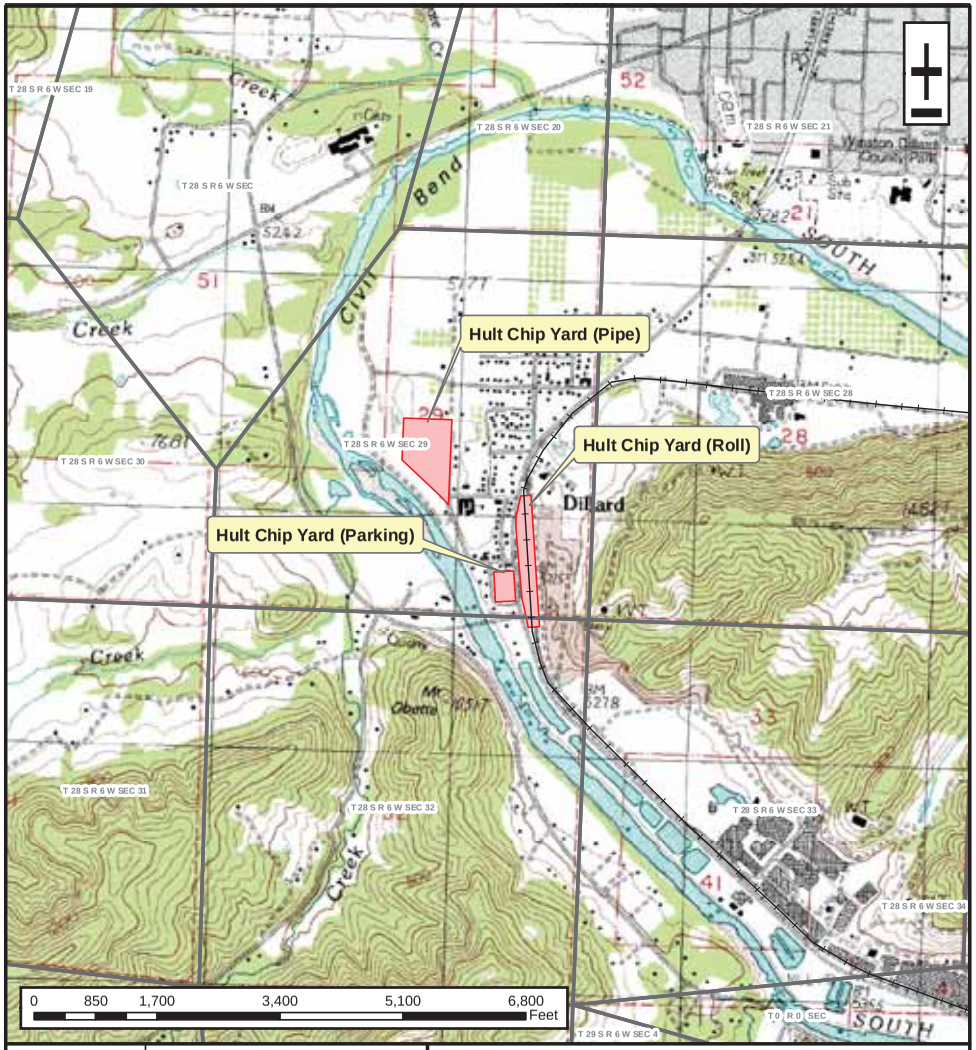
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
WEAVER ROAD & HIGHWAY 99 HAYFIELD
T-30-S, R-5-W, SECT-7C
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0012	SHEET 1 OF 1





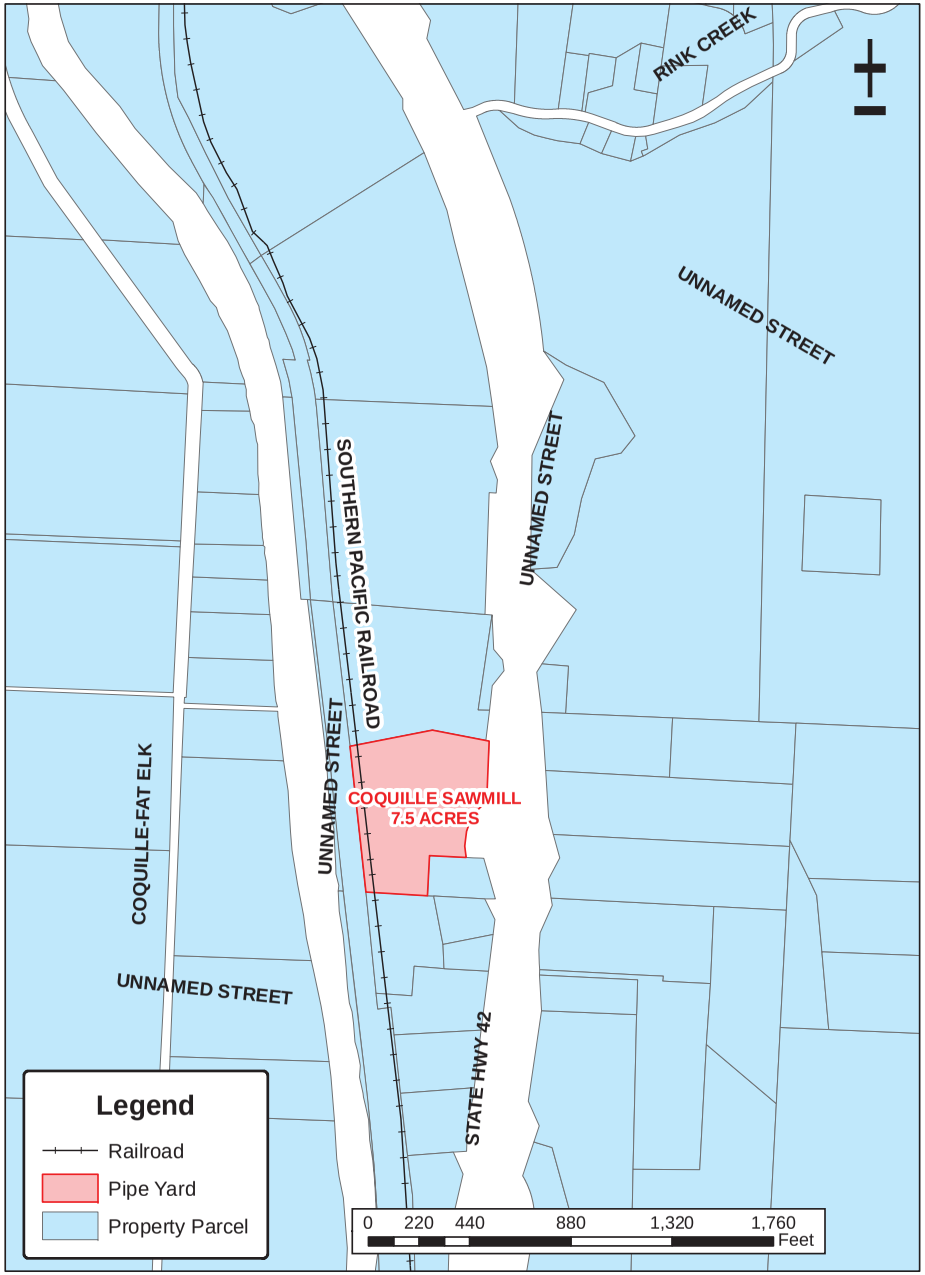
DRAWING NO.	REFERENCE TITLE
WINSTON	24 K/7.5 MIN TOPO QUAD

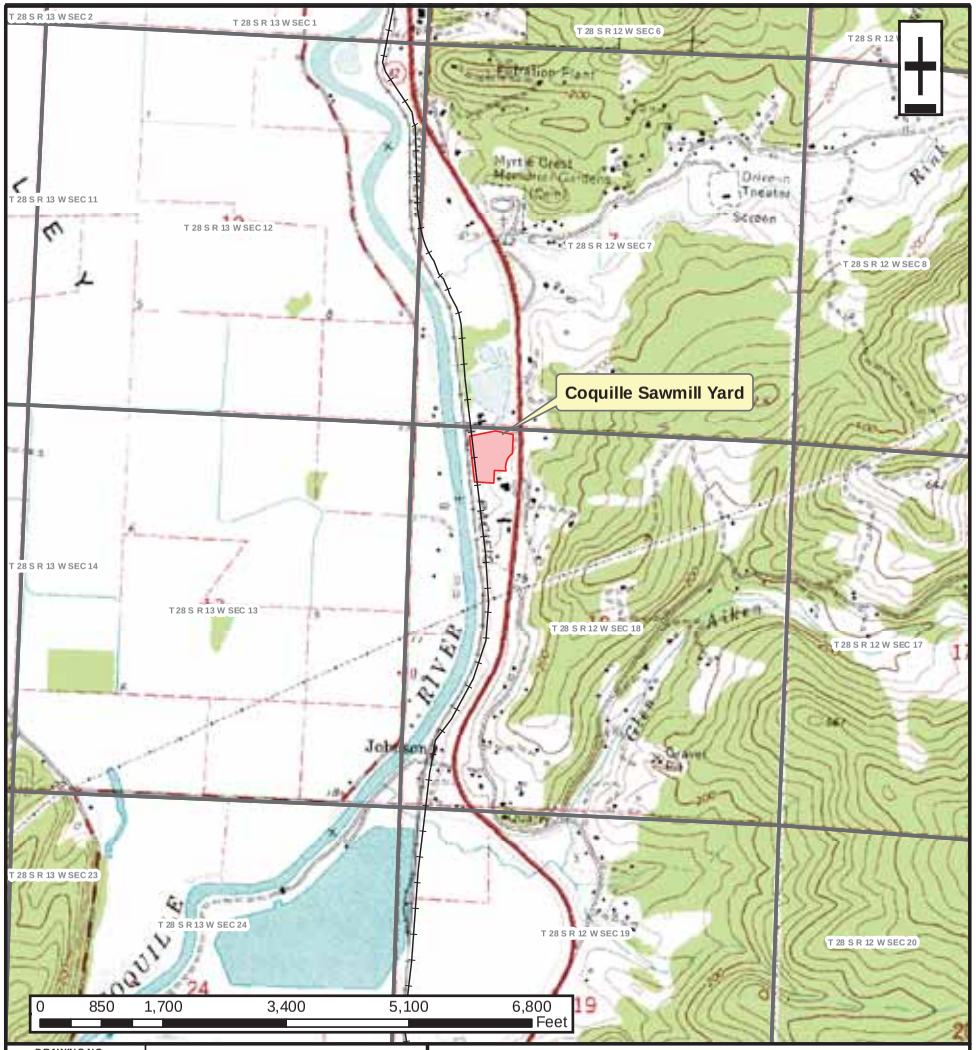
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
HULT CHIP YARDS
T-28-S, R-6-W, SECT-29
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0013	SHEET 1 OF 1





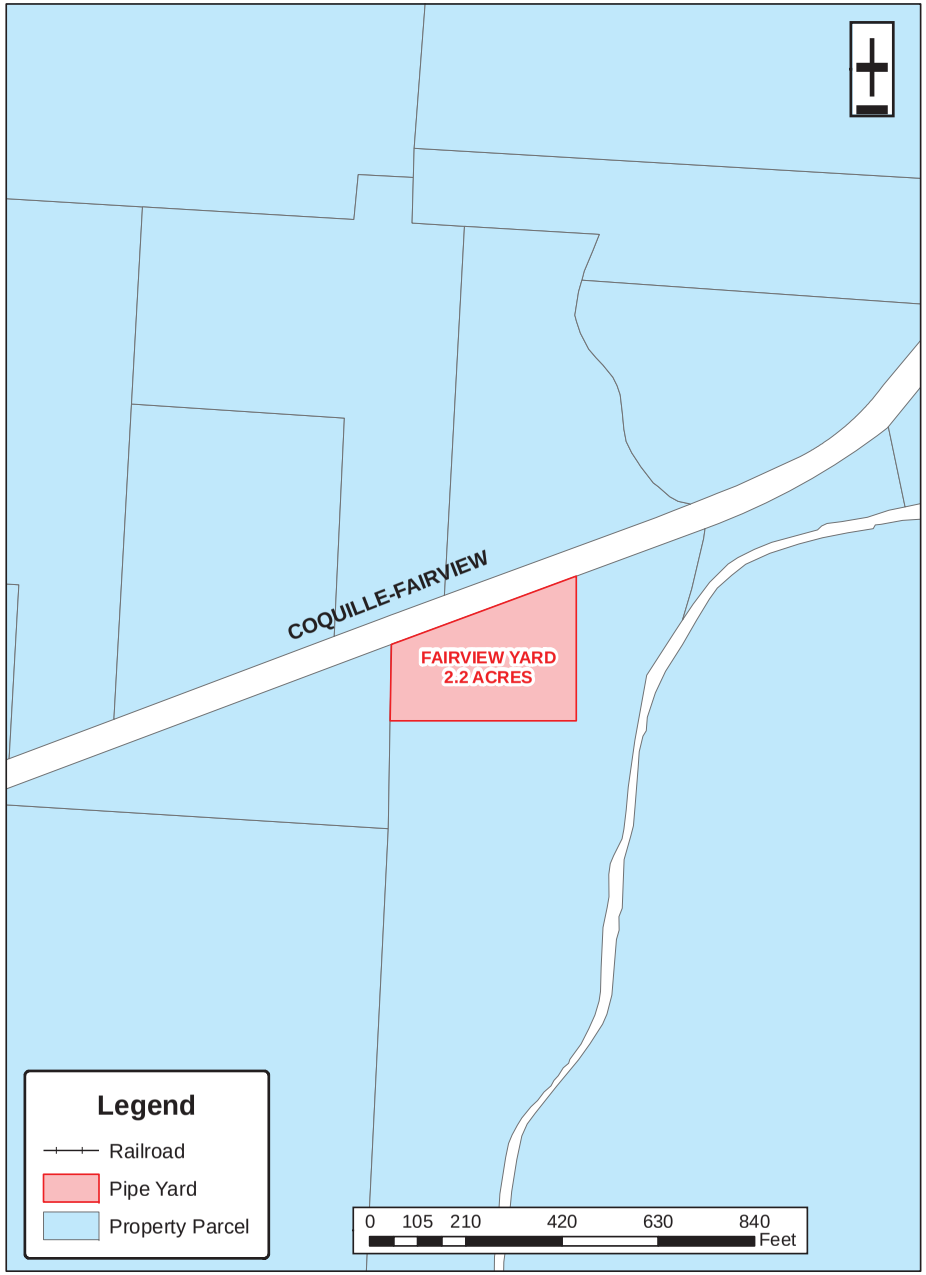
DRAWING NO.	REFERENCE TITLE
COQUILLE	24 K/7.5 MIN TOPO QUAD

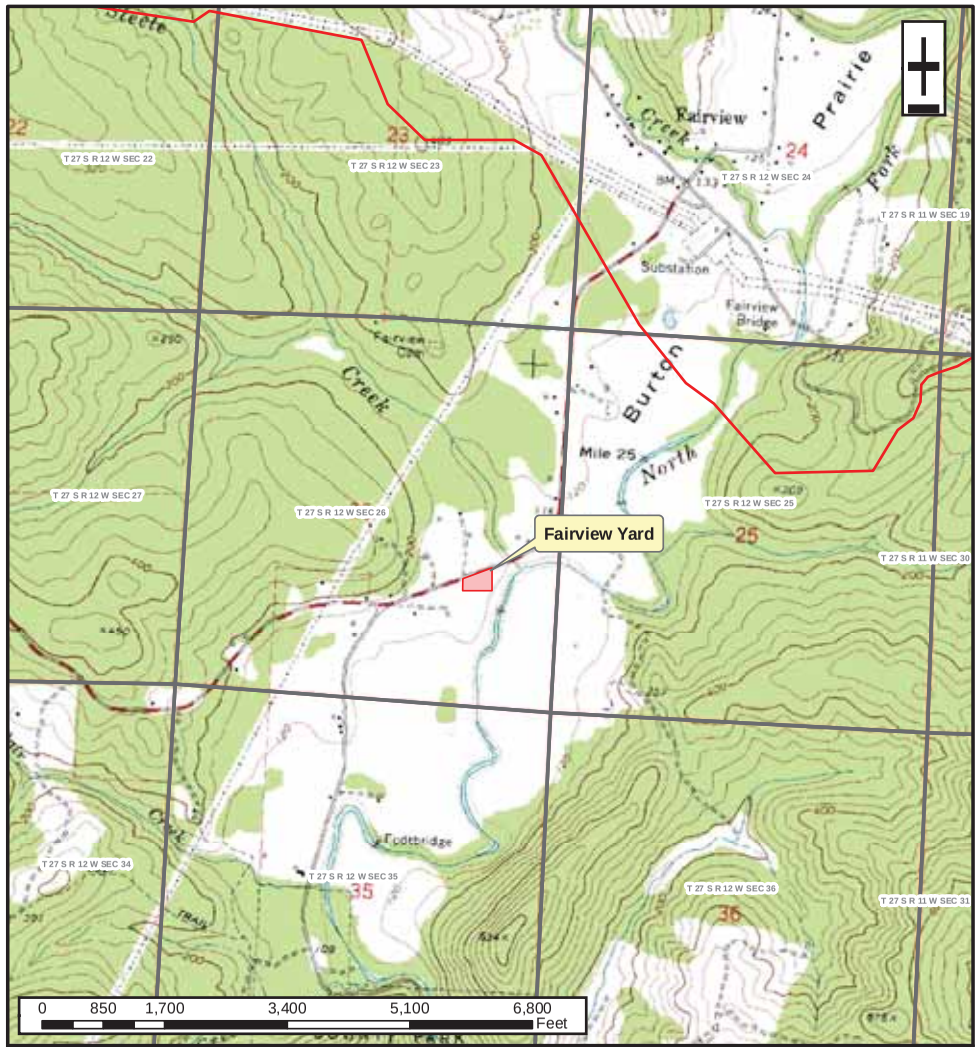
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
COQUILLE SAWMILL
T-28-S, R-12-W, SECT-18
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0014	SHEET 1 OF 1





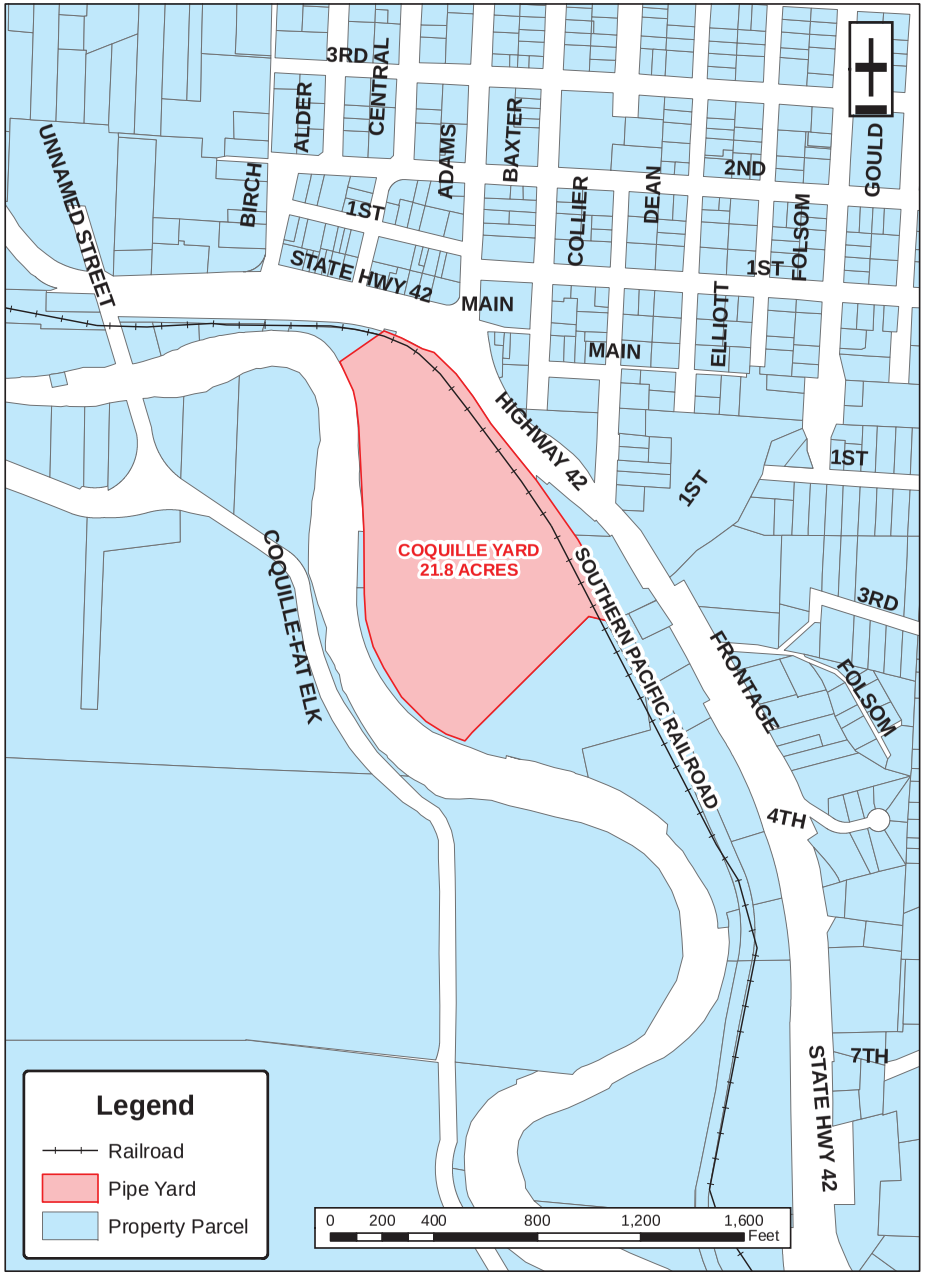
DRAWING NO.	REFERENCE TITLE
MCKINLEY	24 K/7.5 MIN TOPO QUAD

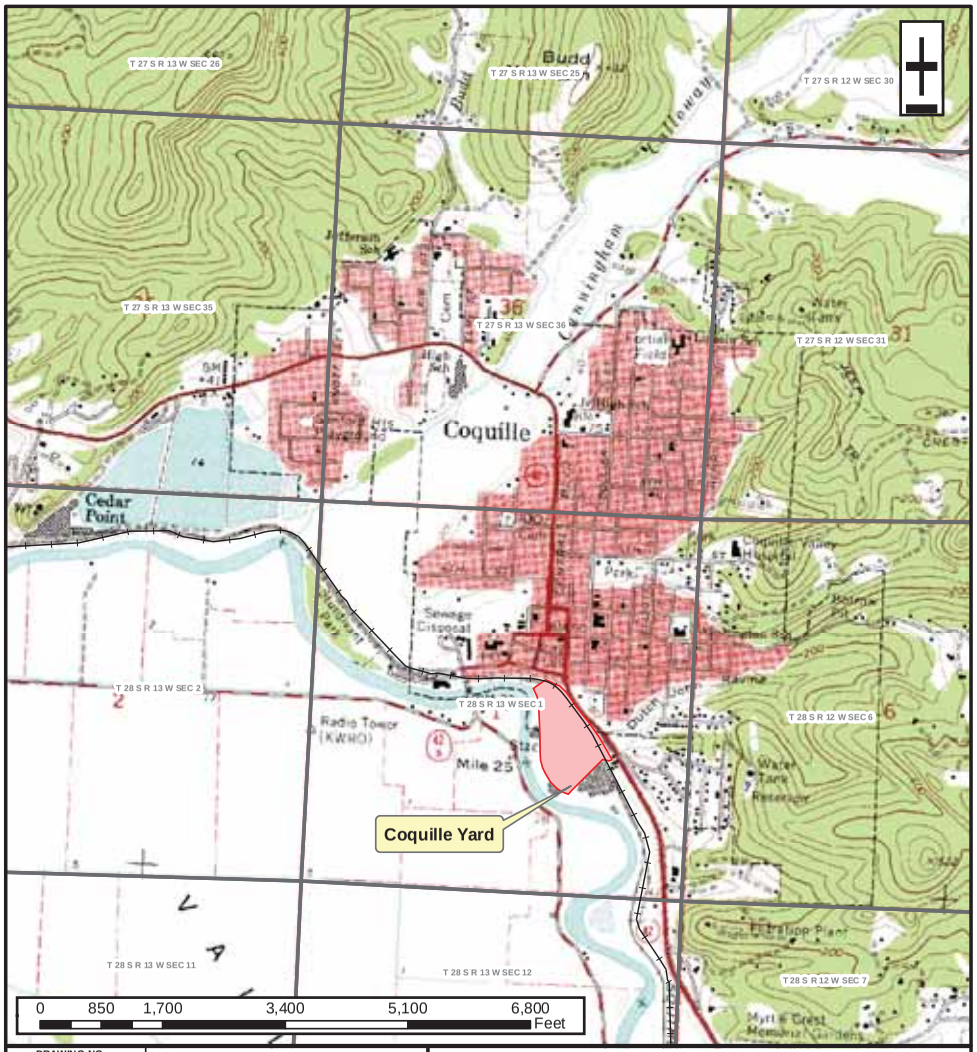
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
FAIRVIEW YARD
T-27-S, R-12-W, SECT-26
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0015	SHEET 1 OF 1





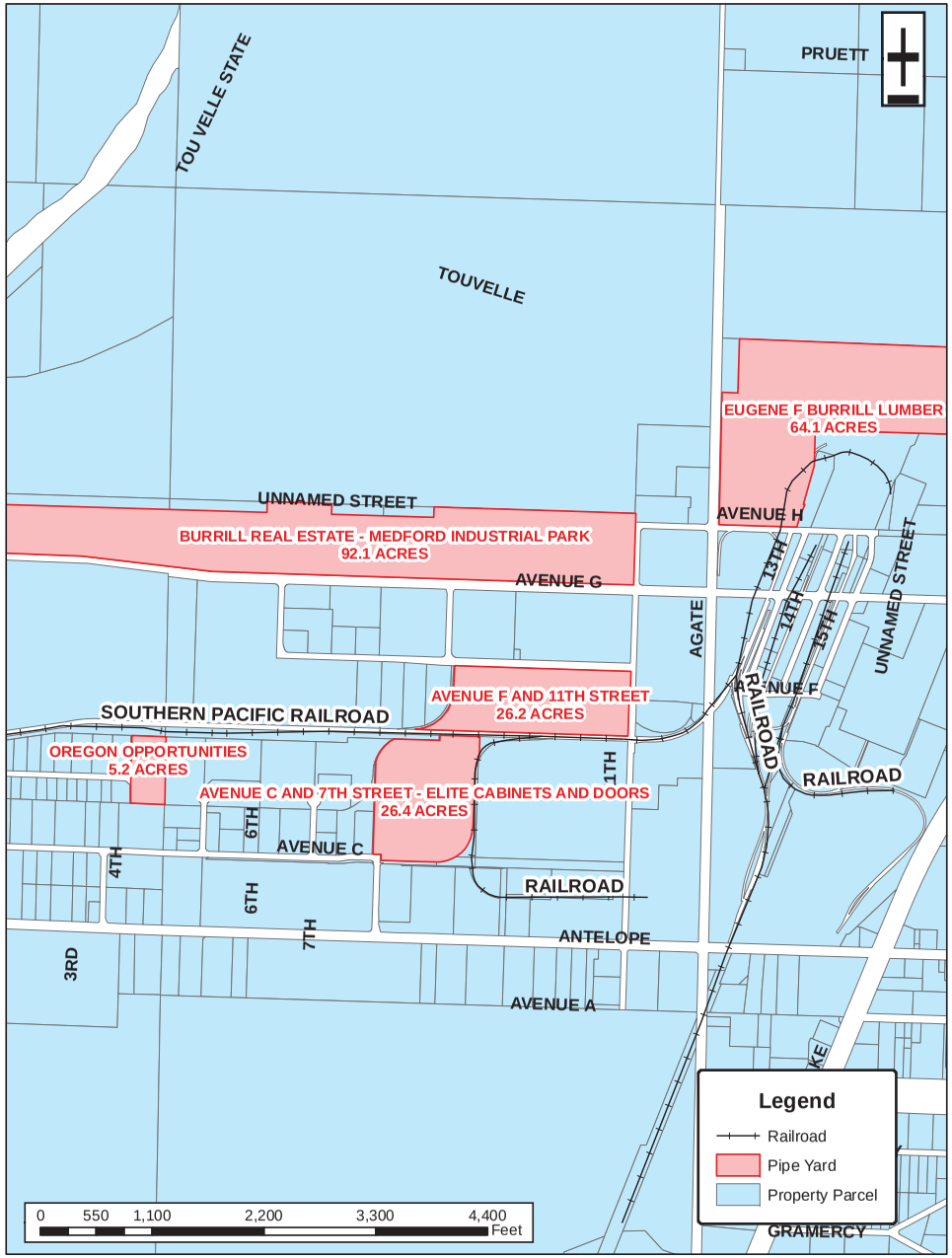
DRAWING NO.	REFERENCE TITLE
COQUILLE	24 K/7.5 MIN TOPO QUAD

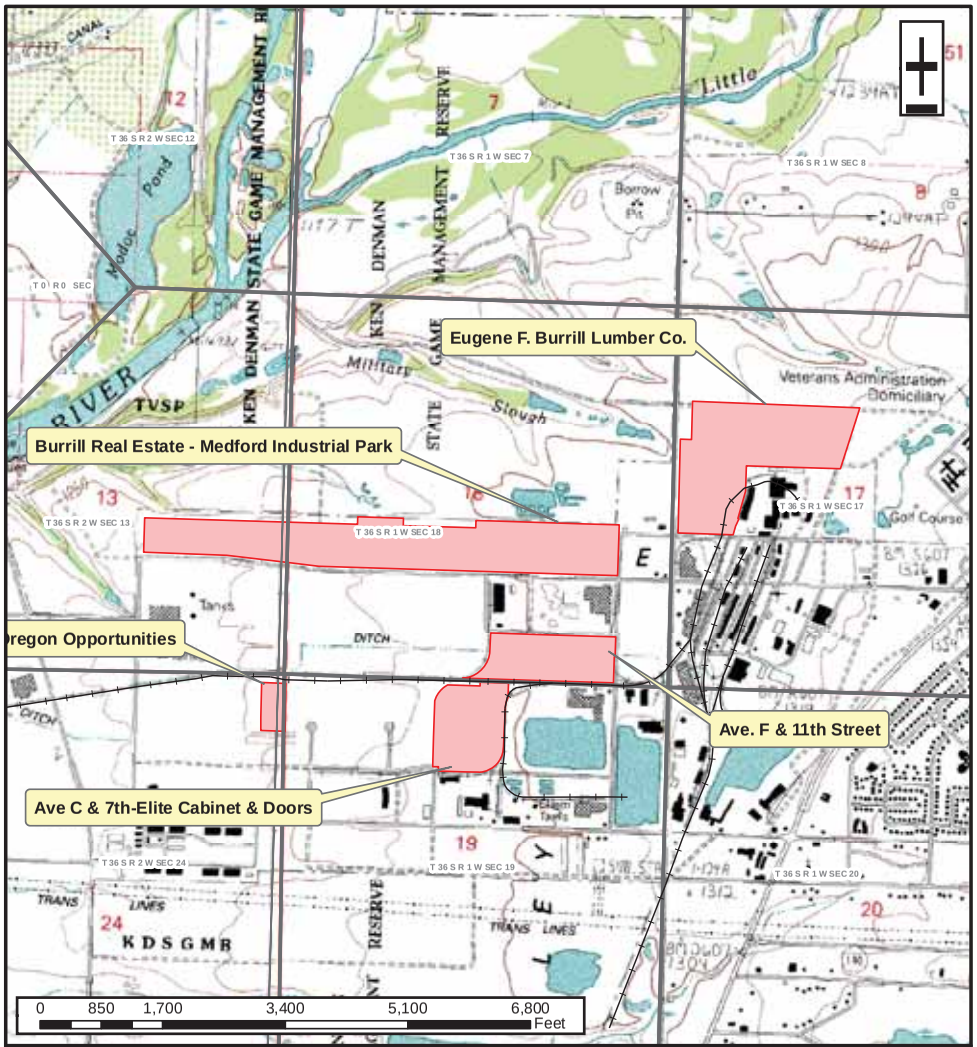
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
COQUILLE YARD
T-28-S, R-13-W, SECT-1
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0016	SHEET 1 OF 1





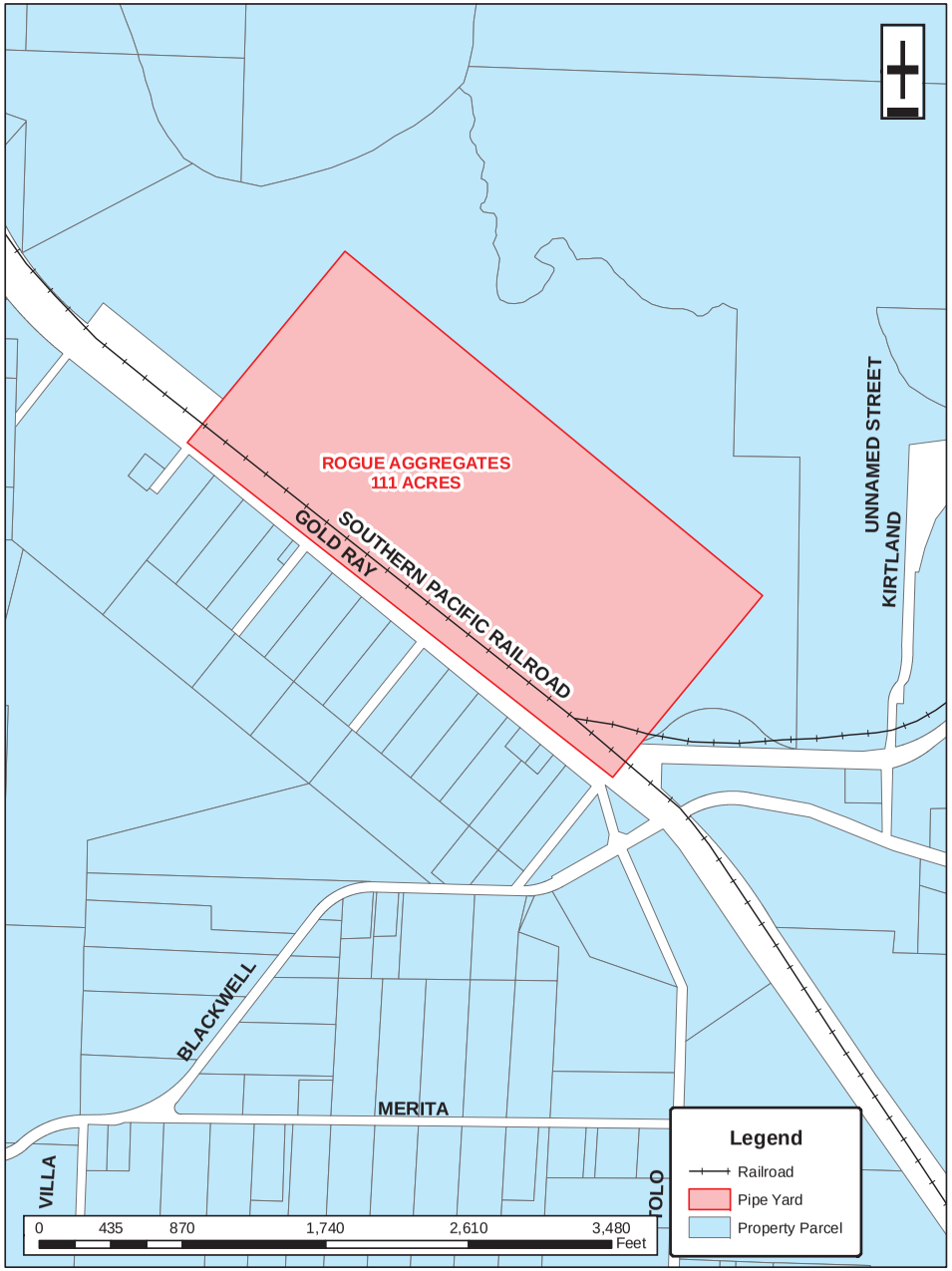
DRAWING NO.	REFERENCE TITLE
SAM'S VALLEY EAGLE POINT	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

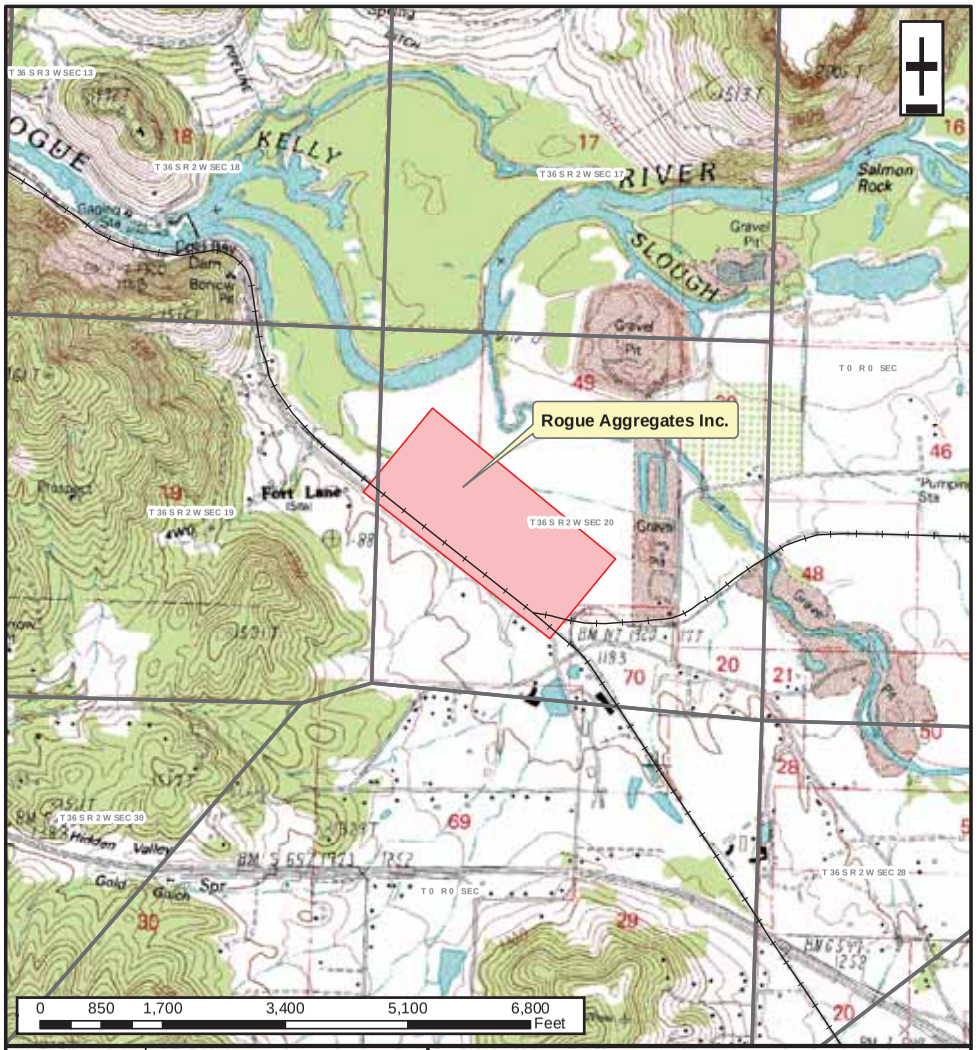
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
Buffill Real Estate, Burill Lumber Co., Oregon Opportunities, Ave. F & 11th, Bite Cabinet & Doors
T-36-S, R-1-W, SECT-18
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0017	SHEET 1 OF 1





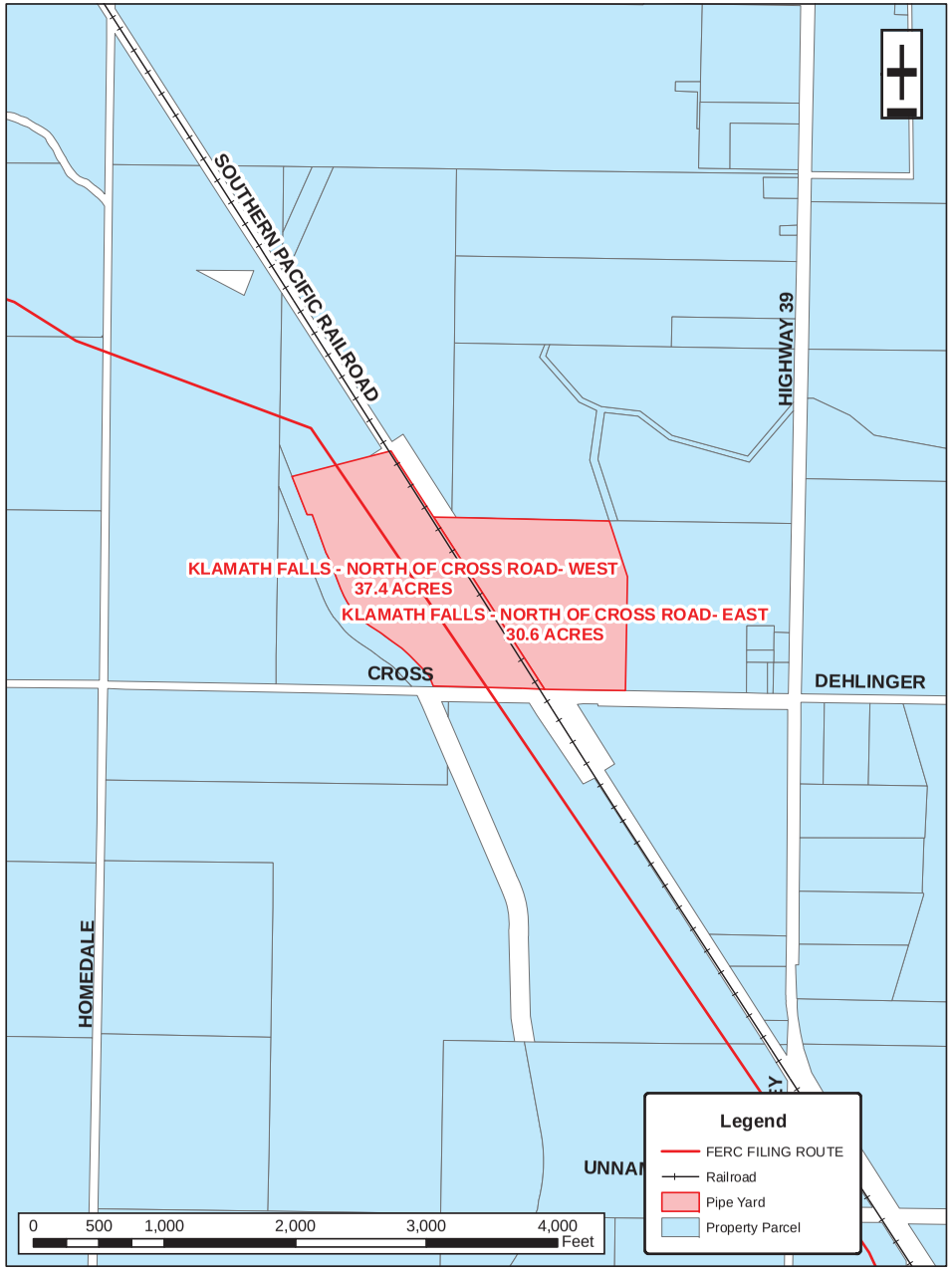
DRAWING NO.	REFERENCE TITLE
SAM'S VALLEY	24 K/7.5 MIN TOPO QUAD

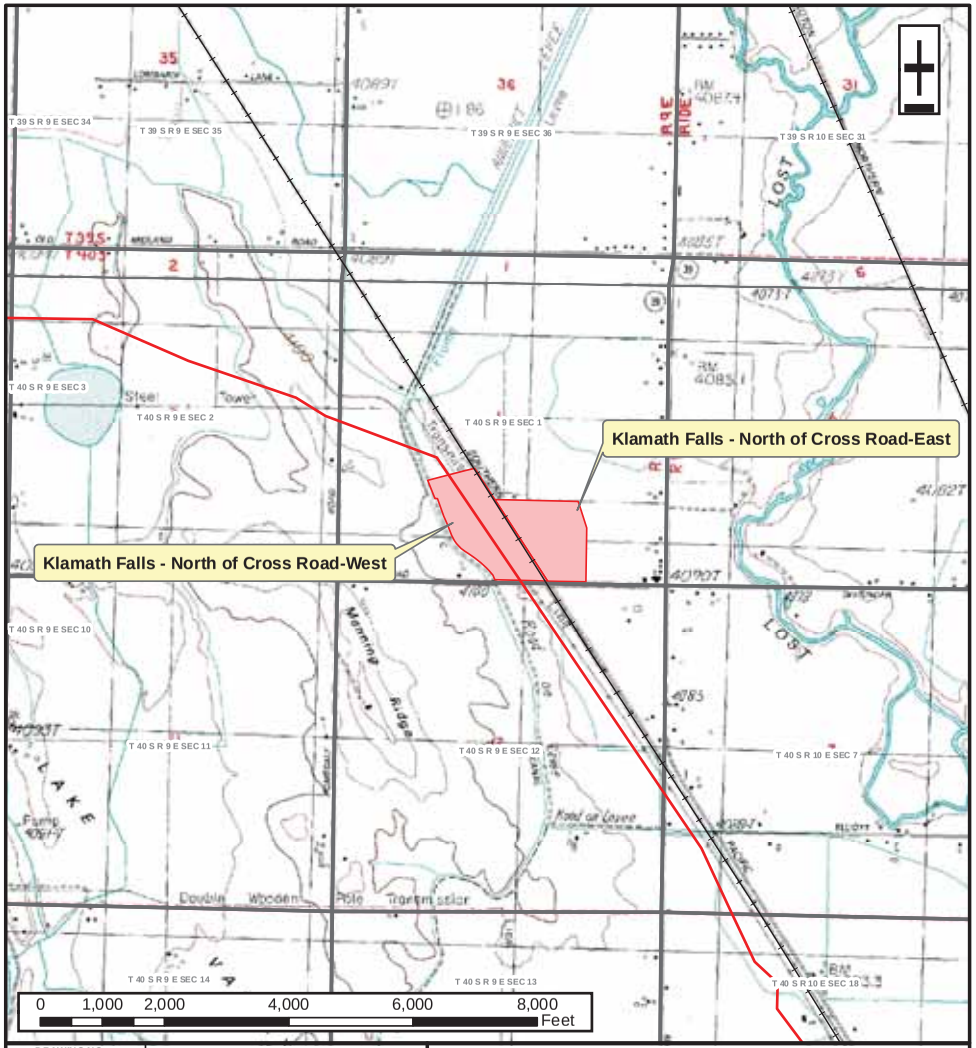
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
ROGUE AGGREGATES INC.
T-36-S, R-2-W, SECT-20
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0018	SHEET 1 OF 1





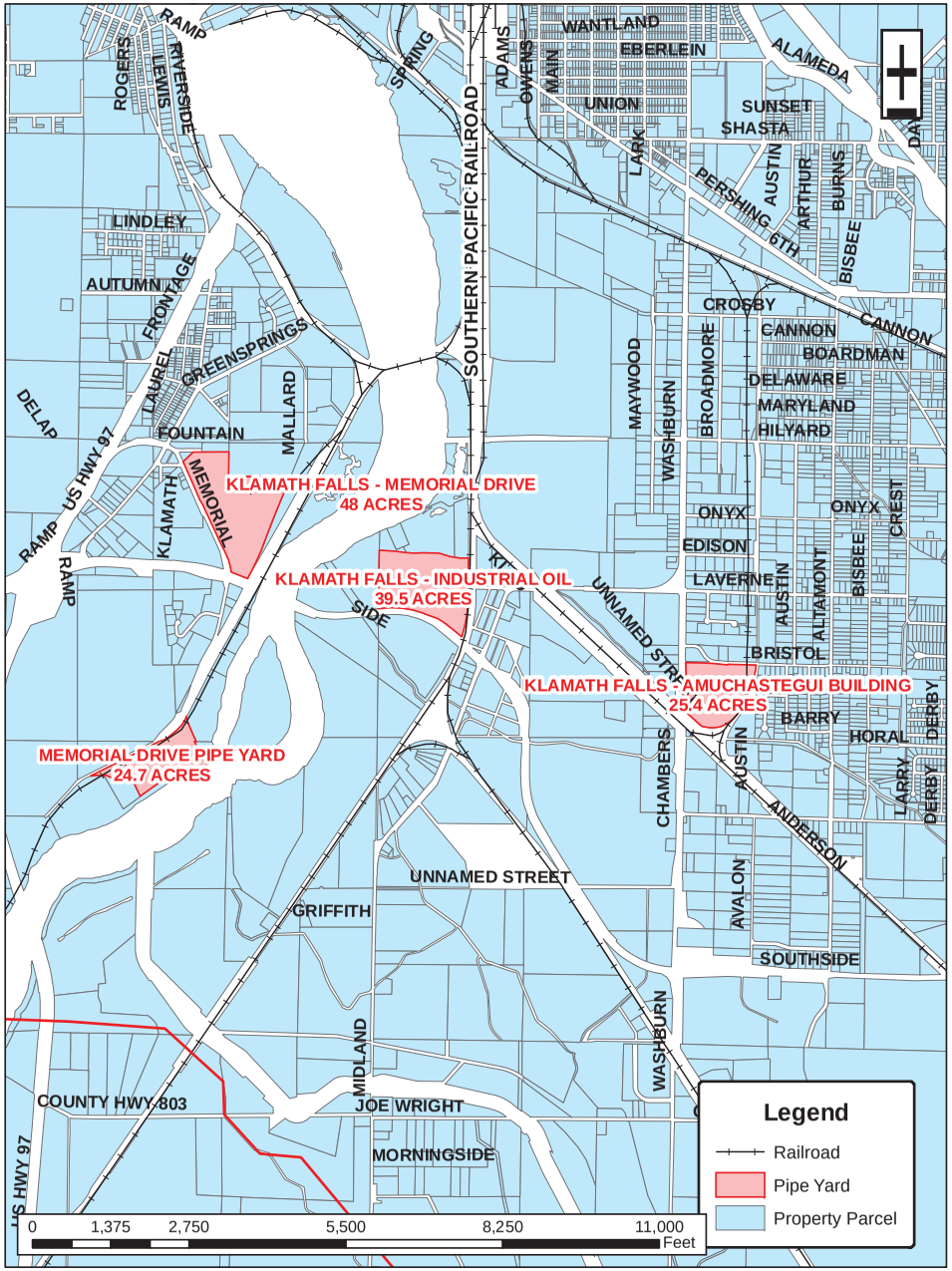
DRAWING NO.	REFERENCE TITLE
ALTAMONT LOST RIVER	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

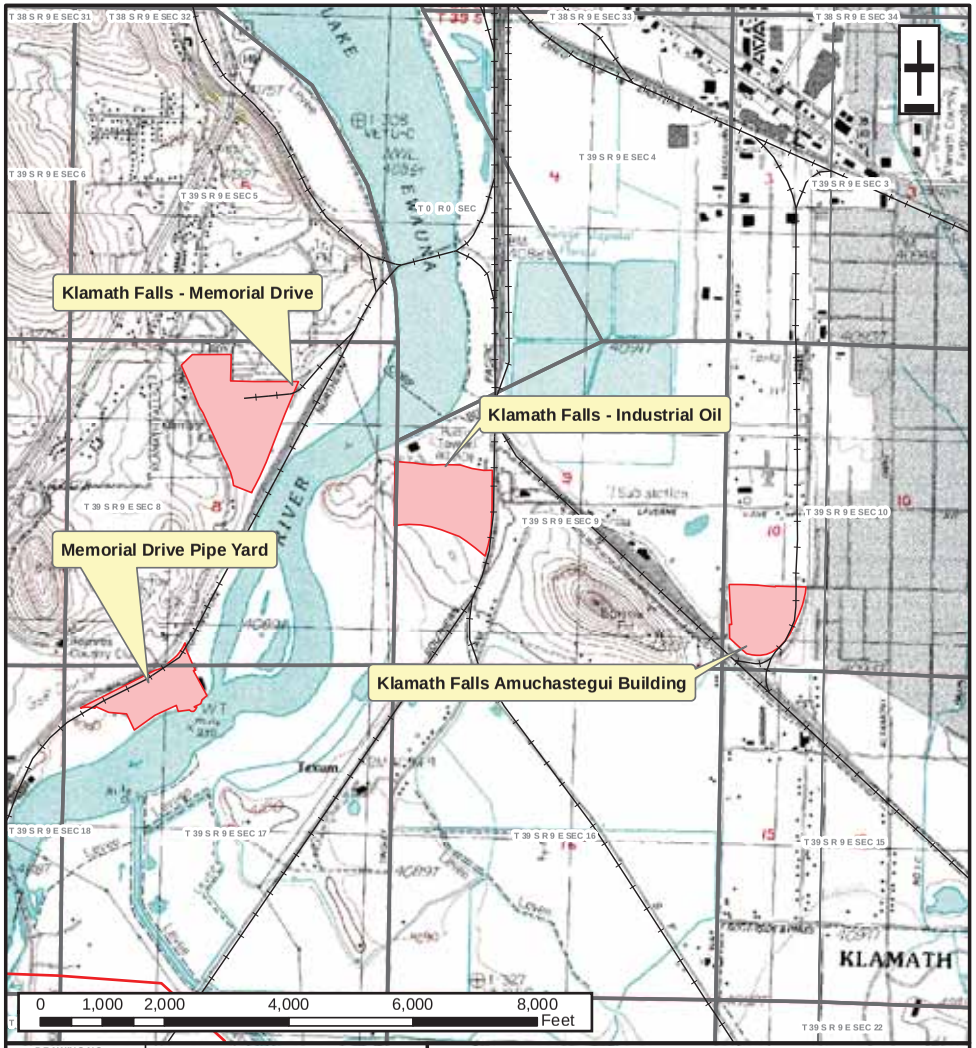
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
KLAMATH FALLS-NORTH OF
CROSS ROAD WEST & EAST
T-40-S, R-9-E, SECT-1
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 1408.36-Y-0019	SHEET 1 OF 1





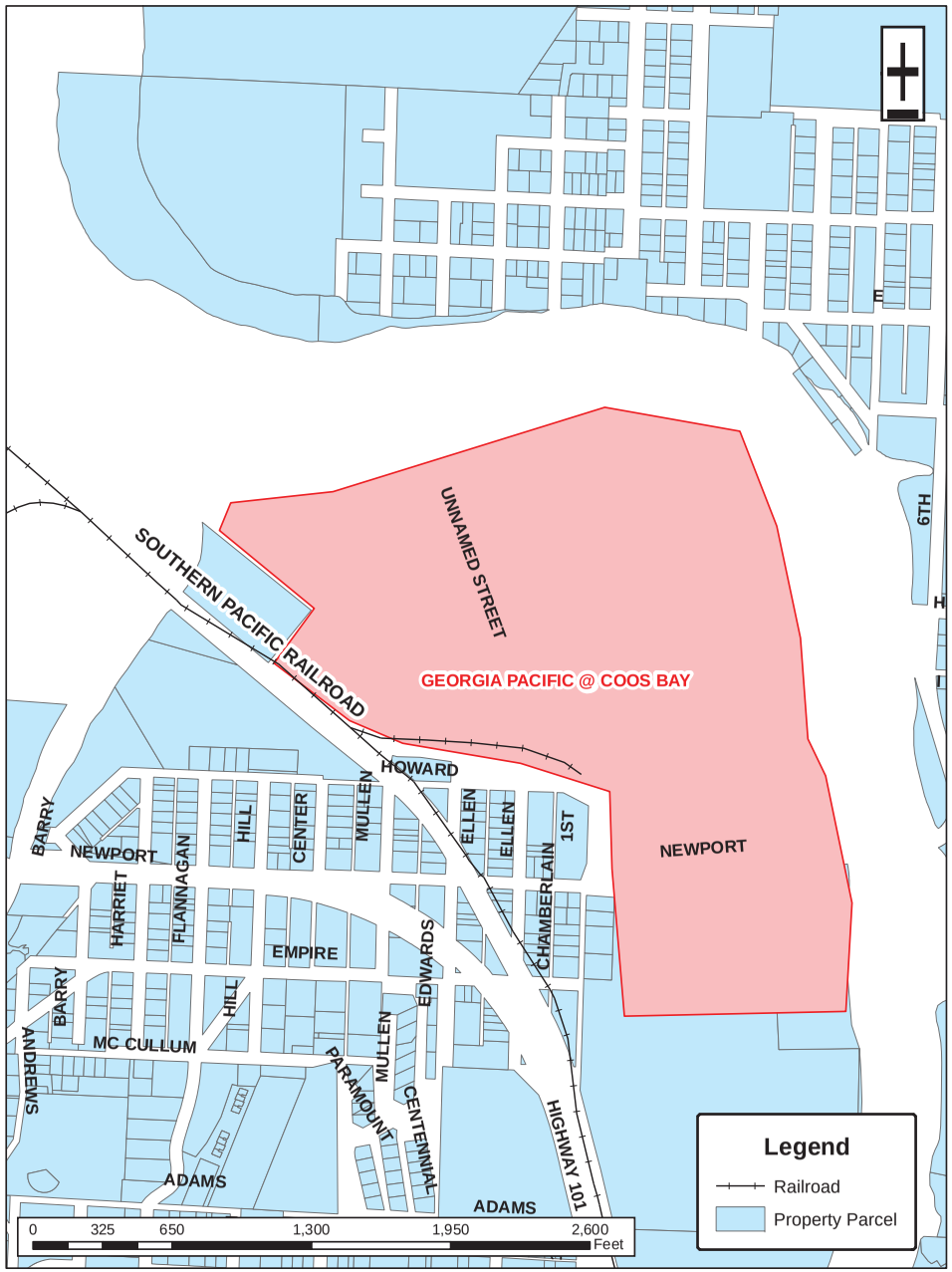
DRAWING NO.	REFERENCE TITLE
KLAMATH FALLS ALTAMONT	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

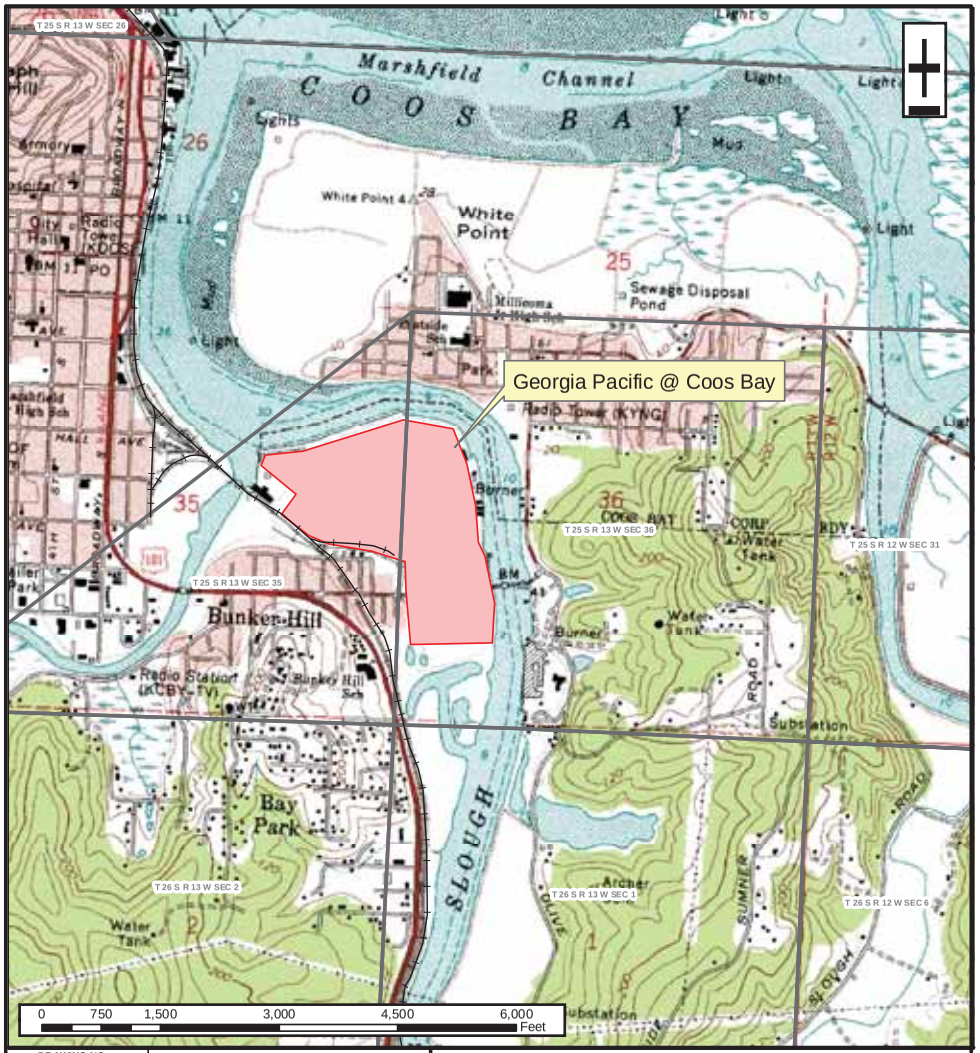
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
INDUSTRIAL OIL, MEMORIAL DRIVE,
AMUCHASTEGUI BUILDING &
KLAMATH FALL - MEMORIAL DRIVE
T-39-S, R-9-E, SECT- 8,9 &10
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0021	SHEET 1 OF 1





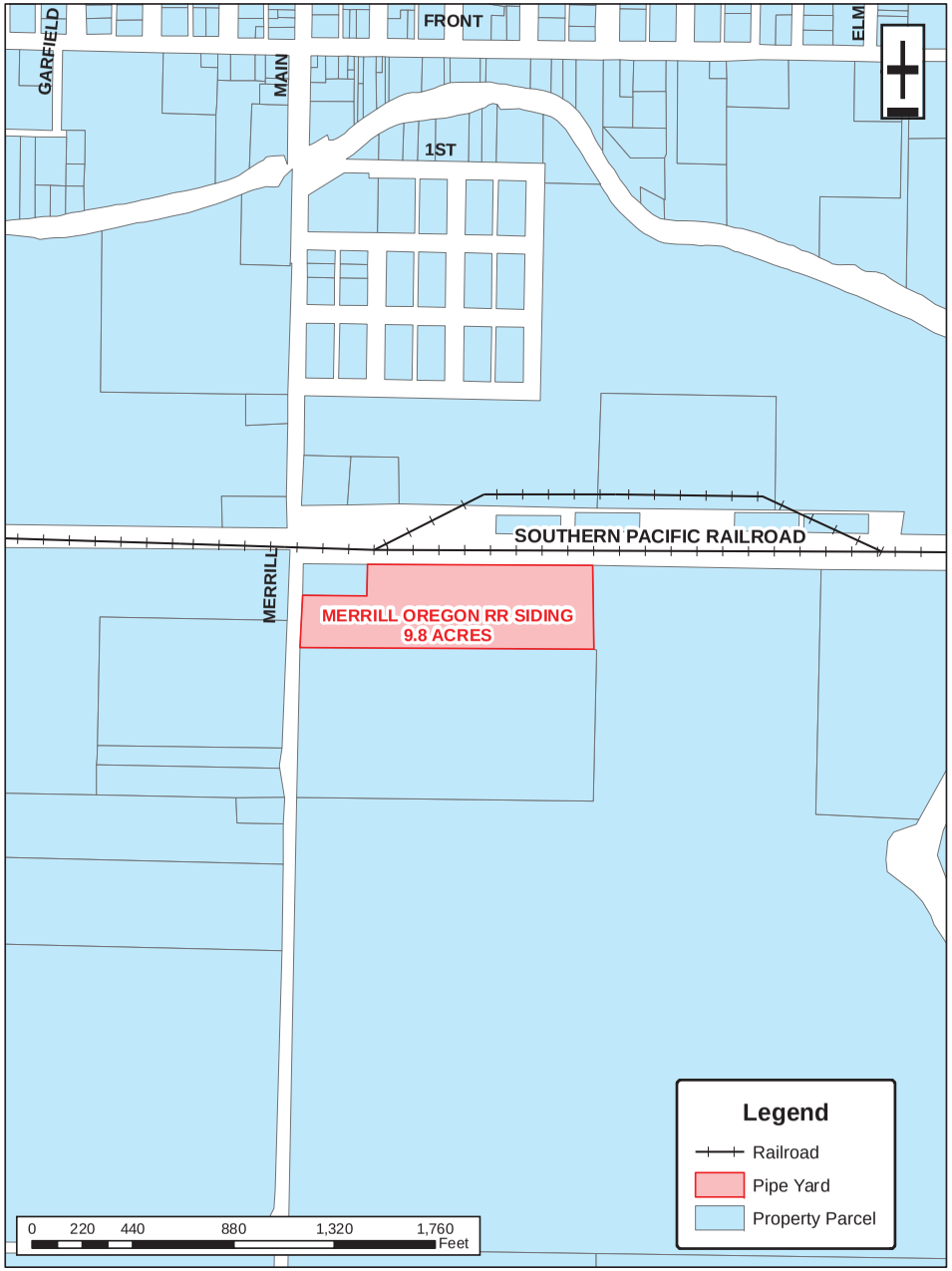
DRAWING NO.	REFERENCE TITLE
NORTH BEND COOS BAY	24 K/7.5 MIN TOPO QUAD 24 K/7.5 MIN TOPO QUAD

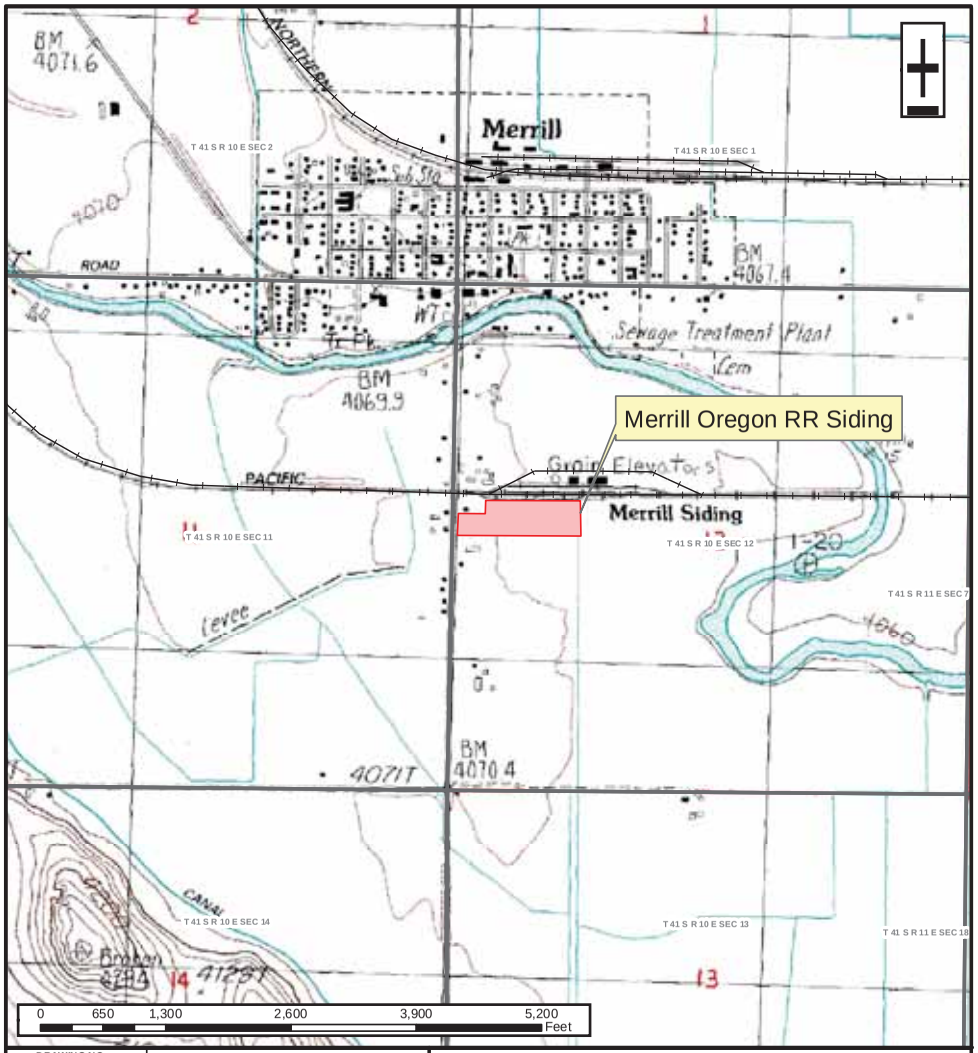
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
GEORGIA PACIFIC @ COOS BAY
T-25-S, R-13-W, SECT- 35 & 36
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0023	SHEET 1 OF 1





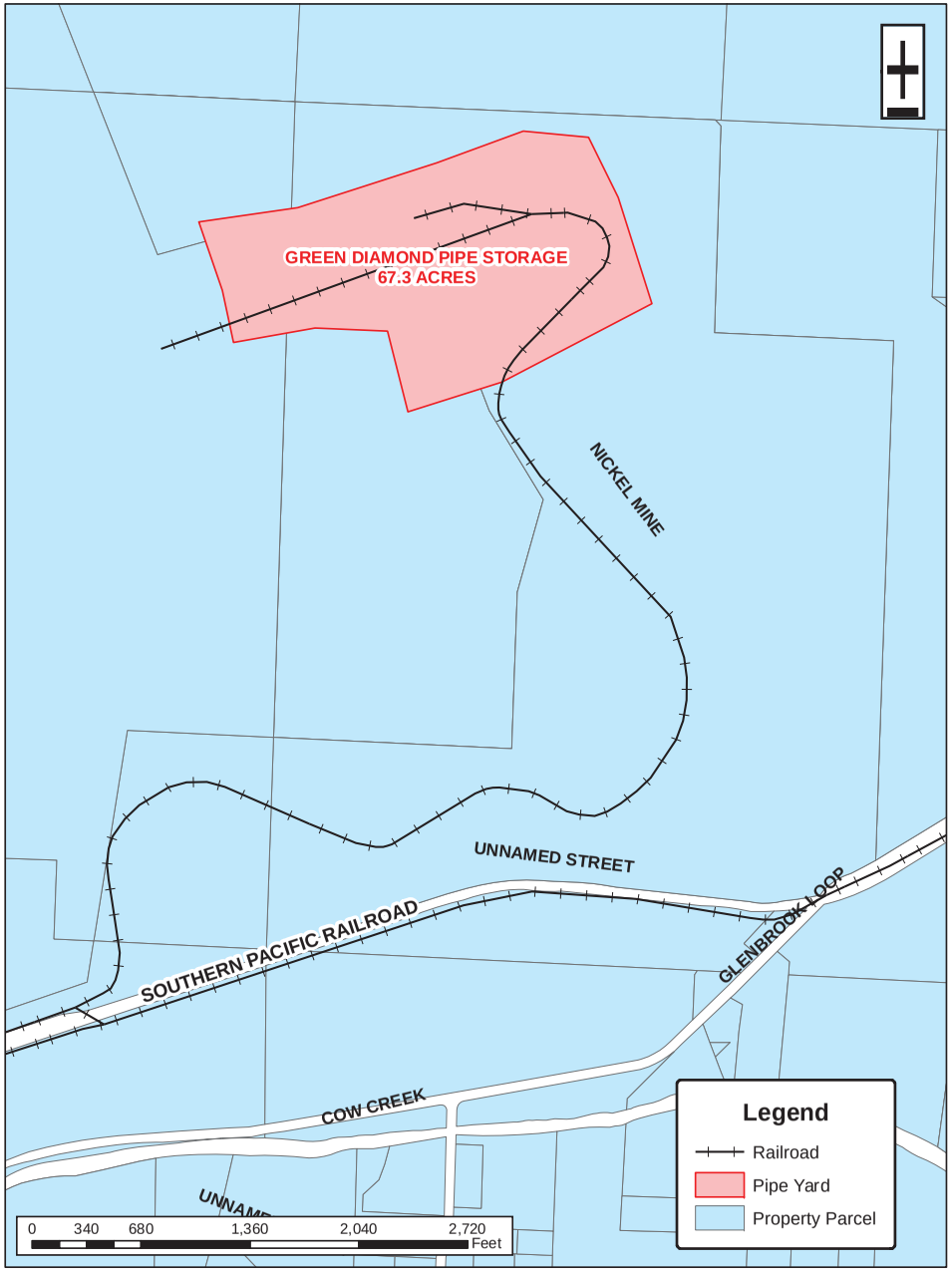
DRAWING NO.	REFERENCE TITLE
MERRILL	24 K/7.5 MIN TOPO QUAD

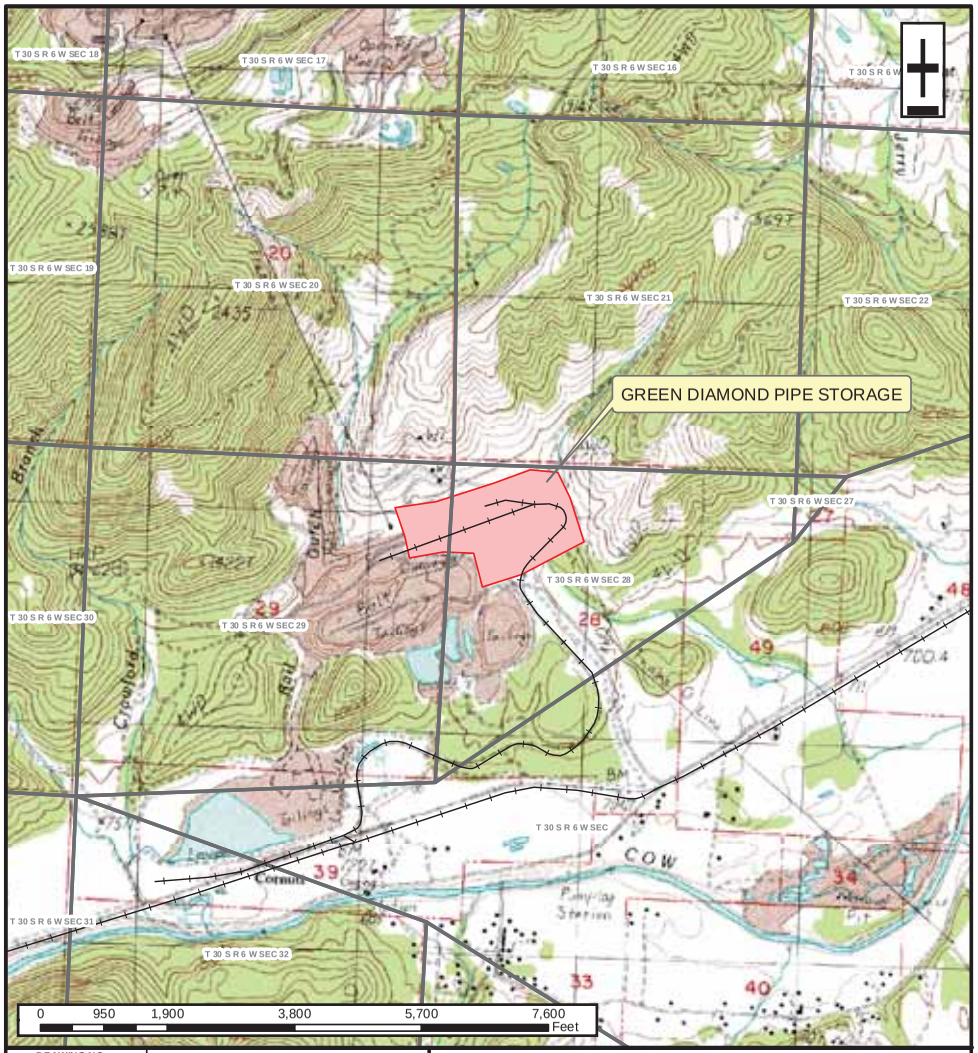
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
MERRILL OREGON RR SIDING
T-41-S, R-10-E, SECT- 12
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0026	SHEET 1 OF 1





DRAWING NO.	REFERENCE TITLE
NICKEL MOUNTAIN	24 K/7.5 MIN TOPO QUAD

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
CONTRACTOR, PIPE, OR OFFLOAD SITES
GREEN DIAMOND PIPE STORAGE
T-30-S, R-6-W, SECT- 28 & 29
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DWG. BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: AS NOTED
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.36-Y-0027	SHEET 1 OF 1

APPENDIX D

Pipeline Facility Tables

D-1. Areas Where the PCGP Project is Co-Located with Existing Rights-of-Way and Corridors
D-2. Access Roads to and Major Roads Crossed by the PCGP Project
D-3. Potential Hydrostatic Discharge (Test Header) Locations within the Construction Right-of-Way
D-4. Areas Where Topsoil will be Salvaged along the Pacific Connector Pipeline Project
D-5. Temporary Extra Work Areas Necessary for Construction of the PCGP Project
D-6. Uncleared Storage Areas Necessary for Construction of the PCGP Project
D-7. Rock Source and Permanent Disposal Sites Identified for Construction of the Pacific Connector Pipeline Project
D-8. Landownership/Jurisdiction by Milepost

TABLE D-1

Areas Where the PCGP Project is Co-Located with Existing Rights-of-Way and Corridors

Begin Milepost	End Milepost	Total Length (miles)	Right-of-Way/ Corridor Type	Ownership	Pipeline Distance from Right-of-Way (feet)	Off-set
Coos County						
4.30R	4.8R	0.5	Weyerhaeuser Logging Road	Private	0 -300	Coincides/Adjacent
4.95R	5.95R	1	Logging Road	Private	0 -125	Coincides/Adjacent
6.57R	7.42R	0.85	Logging Road	Private	0-90	Coincides/Adjacent
7.68R	8.1R	0.42	Logging Road	Private	0-90	Coincides/Adjacent
8.48R	9.4R	0.92	Powerline	BPA Transmission Line	0-260	Coincides/Adjacent
9.4R	9.5R	0.1	Logging Road	Private	0	Coincides
9.68R	9.92R	0.24	Logging Road	Private	90-160	Adjacent
10.54	10.92	0.38	Dirt Two-Track/Private Rd	Private	0-35	Coincides/Adjacent
12.78	14.30	1.52	Powerline/BPA Powerline Rd	BPA Transmission Line	10	55 feet
14.59	15.01	0.42	Menasha Logging Spur	Private	0-30	Coincides
16.26	17.12	0.86	Powerline/ Emineth Private Rd	BPA Transmission Line	10	20 feet
17.12	17.40	0.28	South Sumner Rd	County	35-75	Adjacent
17.57	18.61	1.04	Powerline/ Menasha Logging Spur	BPA Transmission Line	10	20 feet a/
19.02	20.76	1.74	Powerline, Coos Co Sheep - Logging Rd, Pvt Powerline Access Rd, BLM 27-12-28.0	BPA Transmission Line	10	20 feet a/
21.20	21.61	0.41	Powerline, Pvt Powerline Access Rd (BLM 27-12-23.0)	BPA Transmission Line	10	120 feet
21.90	22.23	0.33	Powerline/Powerline Access Road	BPA Transmission Line	10	55 feet
23.66	24.11	0.45	Coos Bay Wagon Road	County	50-75	Adjacent
24.12	24.31	0.19	Powerline/Hudson Ridge Tie - BLM 27-11-17.1	BLM	0-150	Coincides/Adjacent
24.55	25.14	0.59	Powerline/Logging Spur, BLM 27-11-30.1, BLM 27-11-30.5	BLM	0-90	Adjacent
25.19	25.93	0.74	Powerline/Menasha Logging Rd, BLM 27-11-30.1	BPA Transmission Line	0-60	Adjacent
25.93	26.14	0.21	Powerline/ Powerline Access Roads, Menasha Logging Rd, BLM 27-11-30.1	BPA Transmission Line	10	20 feet a/
26.08	26.75	0.67	Menasha Pvt Logging Spur	Private	0-125	Coincides
27.65	28.15	0.50	Logging Rd	Private	0-85	Coincides
29.25	29.46	0.21	Lone Rock Logging Rd	Private	0-60	Coincides
30.48	31.09	0.61	Logging Spur	Private	0-30	Coincides
31.49	31.59	0.10	Dora Spur Rd, BLM 28-11-13.2B, 13.2A	Private	30-80	Adjacent
31.59	31.83	0.24	Dora Spur Rd, BLM 28-11-13.2B, Back Dora, BLM 28-11-13.6	BLM	0-110	Adjacent
33.74	33.81	0.07	Elk Mountain Loop, BLM 28-11-25.0	BLM	0-65	Coincides
34.74	35.12	0.38	Logging Rd, Logging Spur	Private	0-65	Coincides
35.31	35.80	0.49	Elk Creek Rd, BLM 28-11-29.0	BLM	0-65	Coincides
35.84	36.20	0.36	Elk Creek Rd, BLM 28-11-29.0, BLM 28-10-29.2	BLM	0-65	Coincides
36.63	37.22	0.59	Elk Creek Rd, BLM 28-10-29.0, BLM Logging Spur	BLM	0-30	Coincides
38.33	38.89	0.56	Weaver Sitkum Tie Rd, BLM 28-10-9.4	BLM	0-90	Coincides
39.14	39.20	0.06	Co Rd 171, Plum Creek Logging Spur	BLM	0-65	Coincides
39.34	39.76	0.42	Weaver Sitkum Tie Rd, BLM 28-10-9.4	BLM	0-90	Coincides
39.84	39.86	0.02	Tri-W Group Access Spur	Private	0-30	Coincides

TABLE D-1

Areas Where the PCGP Project is Co-Located with Existing Rights-of-Way and Corridors

Begin Milepost	End Milepost	Total Length (miles)	Right-of-Way/ Corridor Type	Ownership	Pipeline Distance from Right-of-Way (feet)	Off-set
40.16	40.29	0.13	Weaver Sitkum Tie Rd, BLM 28-10-9.4	Private	0-75	Coincides
40.67	41.39	0.72	Weaver Sitkum Tie Rd, BLM 28-10-9.4	Private	0-75	Adjacent
41.70	41.80	0.10	Weaver Rd, BLM 28-8-18.0	BLM	75-95	Adjacent
42.03	42.50	0.47	Weaver Rd, BLM 28-8-18.0	BLM	0-120	Adjacent
42.74	42.86	0.12	North Rock Creek, BLM 30-10-3	BLM	0-65	Coincides
42.94	43.11	0.17	Logging Spur, BLM 30-10-3, North Rock Creek	BLM	0-65	Adjacent
43.28	43.46	0.18	BLM 30-10-3, North Rock Creek	BLM	0-65	Coincides
43.50	43.91	0.41	BLM 30-10-3, BLM 29-9-8, Co Rd 177.2R, Lone Rock Logging Spur	BLM	0-370	Adjacent
44.52	45.27	0.75	BLM 29-9-9.3, Pvt RWA C-344 G.P., Upper signal Tree, BLM 28-9-35, Logging Spur, BLM 29-9-9.2	BLM	0-165	Adjacent
Douglas County						
45.84	46.58	0.74	BLM 28-9-35, Plum Creek Logging Spur	BLM	0-125	Coincides
47.10	47.79	0.69	Bingham Holmes Road - BLM 29-9-23,Holmes Creek Spur, Deep Reed Divide Spur	BLM/Private	0-160	Coincides/Adjacent
48.07	49.15	1.08	Deep Creek, BLM 29-9-12.1, Deep Creek Spur, BLM 29-09-13.0, BLM Logging Road	BLM	0-120	Coincides
51.49	51.58	0.09	Powerline	Private	0	Coincides
51.95	52.19	0.24	Private Dirt Road	Private	0-125	Coincides/Adjacent
53.01	53.15	0.14	Private Logging Road (Camas Mountain SP – BLM 29-8-9.3)	Private	25-40	Adjacent
53.22	53.74	0.52	Shields Creek Spur, BLM 29-8-2.2	BLM	0-230	Adjacent
54.20	54.34	0.14	Logging Spur	BLM	0-30	Adjacent
54.79	55.03	0.24	Seneca Logging Spur	Private	0-30	Coincides
61.82	62.51	0.69	Nichols Bros Pvt Rd, John Clarke, DG-075	Private	0-115	Coincides
62.52	63.64	1.12	DR Johnson Pvt Dr	Private	0-165	Coincides
64.55	64.61	0.06	Private Rd, DG-090.500, PLMP 58.3+4.87	Private	0-65	Coincides
64.61	64.73	0.12	Private Rd, DG-090.500, PLMP 58.3+4.87	BLM	0-75	Coincides
66.20	66.26	0.06	Private Rd, DG-098.000	Private	0-65	Coincides
66.37	66.47	0.10	Private Rd, DG-099.000	Private	0-65	Coincides
67.19	67.29	0.10	Barton Private Rd	Private	0-95	Coincides
67.66	68.25	0.59	Barton Private Rd	Private	0	Coincides
68.60	68.88	0.28	Unknown Rd	Private	0-60	Coincides
69.66	70.37	0.71	Unknown Private Dirt Rd	Private	0	Coincides
72.27	72.81	0.54	Private Dirt Road	Private	0-140	Coincides/Adjacent
75.03	75.05	0.02	Bilger Creek Rd, BLM 29-5-11	Public Domain	0-65	Coincides
75.04	75.16	0.12	Private Rd, BLM 29-5-11, Bilger Creek Rd	Public Domain	0-10	Coincides
75.16	75.52	0.36	BLM 29-5-11, Bilger Creek Rd	USA (O&C)	0-10	Coincides
75.52	75.70	0.18	BLM 29-5-11, Bilger Creek Rd	Private	0-65	Coincides
75.74	75.94	0.20	Bilger Creek Rd, BLM 29-5-2.2, Private Logging Spur	Private	0-65	Coincides
77.83	78.04	0.21	Little Lick Private Rd	Private	0-120	Adjacent

TABLE D-1

Areas Where the PCGP Project is Co-Located with Existing Rights-of-Way and Corridors

Begin Milepost	End Milepost	Total Length (miles)	Right-of-Way/ Corridor Type	Ownership	Pipeline Distance from Right-of-Way (feet)	Off-set
79.86	80.42	0.56	School Hollow Spur, BLM 29-4-17	BLM	0-250	Adjacent
80.71	80.73	0.02	Roseburg Forest Products	Private	0-30	Coincides
80.85	80.94	0.09	Powerline Private Rd	Private	0-65	Coincides
81.38	81.70	0.32	Private Dirt Road	Private	0-20	Coincides/Adjacent
82.76	83.81	1.05	Wood Creek Rd, BLM 29-4-35	BLM	0-165	Coincides
86.44	87.98	1.54	High Noon Spur, BLM 29-3-31.3, BLM 29-3-31.4	USA (O&C)	0-65	Coincides
88.13	88.48	0.35	Fate Creek Rd, BLM 30-3-6	Private	0-200	Adjacent
89.11	89.27	0.16	Unknown Access Rd (?poorly-placed Seneca?)	Private	0-80	Coincides
89.27	89.39	0.12	Seneca Rd	Private	0-30	Coincides
89.47	89.51	0.04	Seneca Jones Private Roads 7 & 8	Private	0-30	Coincides
90.14	90.36	0.22	Bland Mtn Spur, BLM 30-3-17.2	USA (O&C)	0-160	Adjacent
90.36	90.51	0.15	Lavadoure Creek Spur, BLM 30-3-20.2	USA (O&C)	0-160	Adjacent
90.51	91.75	1.24	BLM 30-3-20.2, Unknown Spur, John Days Spur, BLM 30-3-28, Wook Rd	Private	0-130	Coincides
93.50	93.76	0.26	Maize Ts Rd, BLM 30-3-23.5, Unknown Rd	Private	0-30	Coincides
96.28	96.38	0.10	Academy Rd, BLM 31-3-3	Private	0-65	Coincides
96.67	96.93	0.26	Private Rd	Private	0-100	Coincides
97.07	97.69	0.62	BLM 31-3-3, Academy Rd, Unknown Rd	BLM	0-140	Coincides
98.29	98.48	0.19	East Fork Stouts Creek Spur, BLM 31-3-1.1	BLM	0-90	Coincides
98.48	98.60	0.12	East Fork Stouts Creek Spur, BLM 31-3-1.1	Private	0-130	Adjacent
98.88	99.30	0.42	Private Rd	Private	0-100	Adjacent
100.02	100.40	0.38	BLM 31-3-13 Non-Inv.	BLM	0-75	Coincides
100.40	100.67	0.27	FS3220705	Umpqua National Forest	0-75	Coincides
100.67	100.76	0.08	BLM 31-3-24 Non-Inv.	Private	0-50	Coincides
101.77	101.92	0.15	FS 3220790	Umpqua National Forest	0-50	Coincides
102.62	102.83	0.21	Sweetheart T.S., FS 3220792	Umpqua National Forest	0-100	Coincides
103.60	103.66	0.06	C&D Lumber	Private	0-65	Coincides
104.77	104.87	0.10	Granite T.S., FS 3230120	Umpqua National Forest	0-65	Coincides
105.35	105.56	0.21	Wildcat Ridge Rd, FS 32	Umpqua National Forest	0-140	Coincides
105.86	106.06	0.20	Neu Thin T.S., FS 3200255	Umpqua National Forest	0-100	Adjacent
106.13	106.36	0.23	East Fork T.S., FS 3200260	Umpqua National Forest	0-70	Coincides
106.76	106.88	0.12	Wildcat Ridge Rd, FS 32	Umpqua National Forest	0-50	Coincides
107.47	107.63	0.16	FS 3200301	Umpqua National Forest	0-30	Coincides
108.09	108.43	0.34	Wildcat Ridge Rd, FS 32	Umpqua National Forest	0-65	Adjacent
108.95	109.16	0.21	FS 3200500	Umpqua National Forest	10-150	Adjacent
109.30	109.37	0.07	FS 3200500	Umpqua National Forest	0	Coincides
110.40	110.58	0.18	FS 3232890, South Fork Cow Creek, USFS 3232	Umpqua National Forest	0-75	Coincides/Adjacent
Jackson County						
111.53	112.10	0.57	Wildcat Ridge Rd, FS 32, Ol Blue, FS 3200750	Umpqua National Forest	0-130	Adjacent
112.56	112.64	0.08	Wildcat Ridge Rd, FS 32	Umpqua National Forest	0-65	Coincides
122.71	122.99	0.28	Old Ferry Rd	Private	0-30	Coincides/Adjacent
125.04	125.13	0.09	Indian Creek Firebreak, BLM 34-1-23	BLM - USA (O&C)	0-65	Adjacent

TABLE D-1

Areas Where the PCGP Project is Co-Located with Existing Rights-of-Way and Corridors

Begin Milepost	End Milepost	Total Length (miles)	Right-of-Way/ Corridor Type	Ownership	Pipeline Distance from Right-of-Way (feet)	Off-set
125.39	125.64	0.25	Indian Creek Firebreak, BLM 34-1-23	BLM	0-115	Coincides
126.27	126.36	0.09	Indian Creek Firebreak, BLM 34-1-23	Private	0-190	Adjacent
126.36	126.60	0.24	Indian Creek Firebreak, BLM 34-1-23	BLM - USA (O&C)	0-190	Adjacent
127.28	127.38	0.10	Indian Creek Firebreak, BLM 34-1-23	Private	0-190	Adjacent
141.59	141.86	0.27	BLM Road	BLM - USA	0-70	Coincides
142.03	142.12	0.09	Salt Creek Access Rd, BLM 36-2E-7	Private	115-150	Adjacent
142.07	142.12	0.05	Unknown Access Rd	Private	0-150	Coincides
144.70	144.77	0.07	Salt Creek Access Rd, BLM 36-2E-19	Private	0-40	Coincides
145.13	145.19	0.06	Gardener Rd, (Salt Creek Rd)	Private	0-50	Coincides
150.17	150.35	0.18	Heppsie Mtn Quarry Spur, BLM 37-2E-1.3	Private	0-115	Adjacent
150.50	150.62	0.12	Heppsie Mtn. D Spur, BLM 37-2E-1.1	BLM	0	Coincides
150.95	151.47	0.52	BLM 37-3E-6.10	BLM	0-60	Coincides
151.87	152.20	0.33	BLM 37-3E-6.10, Unknown Rd	Private	0-90	Adjacent
152.20	152.38	0.18	Unknown Rd, Heppsie Mtn Pond Spur, BLM 37-3E-6.3, Heppsie Mtn Stub Spur, BLM 37-3E-6.4	BLM	0-225	Adjacent
155.31	155.45	0.14	Private Rd	Private	0-65	Coincides
155.45	155.50	0.05	FS 2815-410	Rogue River- Siskiyou National Forest	0-95	Adjacent
155.71	156.00	0.29	FS 2815-410	Rogue River- Siskiyou National Forest	0-270	Coincides
157.46	157.56	0.10	FS 2815-300	Rogue River National Forest	0-95	Coincides
158.72	159.42	0.70	FS 3707500	Rogue River- Siskiyou National Forest	0-170	Coincides/Adjacent
159.98	160.91	0.93	South Fork Little Butte Creek Rd, FS 3730, 3700133, 3700130	Rogue River- Siskiyou National Forest	0-95	Coincides
162.80	162.93	0.13	FS 3700113	Rogue River- Siskiyou National Forest	0-65	Coincides
164.19	165.93	1.74	FS 3720000	Rogue River- Siskiyou National Forest	0-80	Adjacent
Klamath County						
168.26	168.59	0.33	West Muddy Springs, FS 3700750	Fremont-Winema National Forest	0-95	Coincides
169.50	183.68	14.18	Clover Creek Rd (Co Rd 603)	County ROW	50-350	Adjacent
184.61	187.47	2.86	Clover Creek Rd (Co Rd 603)	County ROW	50-150	Adjacent
187.73	188.86	1.13	Powerline	PP&L	0-50	Adjacent
188.92	189.17	0.25	Powerline	PP&L OR Forestry Dept.	10	20 feet a/
189.27	189.64	0.37	Unknown Access Rd	Private	0-65	Coincides
191.83	195.45	3.62	Weyerhaeuser Timber Company Rd, Existing Pipeline	Private	100	Adjacent
197.59	199.13	1.54	Weyerhaeuser Corp Rd	Private	0-90	Adjacent/ Coincides
199.67	199.80	0.13	Private Dr	Private	0	Coincides
200.03	200.22	0.19	Powerline	PP&L, Private	30	0 feet

TABLE D-1

Areas Where the PCGP Project is Co-Located with Existing Rights-of-Way and Corridors

Begin Milepost	End Milepost	Total Length (miles)	Right-of-Way/ Corridor Type	Ownership	Pipeline Distance from Right-of-Way (feet)	Off-set
200.65	202.16	1.51	Powerline	PP&L, Private	30	0 feet
202.16	202.34	0.18	Powerline	PP&L, Private	0-55	0-65 feet
202.34	203.59	1.25	Powerline	PP&L	55	10 feet
202.91	203.61	0.70	Unknown Rd	Private	0-65	Coincides
203.90	204.19	0.29	Powerline	PP&L	45-65	0-20 feet
206.03	207.48	1.45	Powerline	PP&L, Private	30	0 feet
210.57	211.54	0.97	Road, Railroad	State	80	Adjacent
211.54	211.87	0.33	IOOF Cemetery Rd	Private	80-110	Adjacent
215.34	217.00	1.66	Powerline	PP&L	10	20 feet a/
215.38	215.67	0.29	Powerline Access Rd	Private	0-180	Adjacent
217.61	218.01	0.40	Powerline	PP&L, Private	0-55	0-65 feet
218.01	220.50	2.49	Powerline	PP&L, Private	55	10 feet
218.84	218.90	0.06	Private Dr	Private	90	Adjacent
218.90	221.02	2.12	Powerline Access Rd	Private	0-135	Adjacent
220.50	220.61	0.11	Powerline	PP&L, Private	0-55	0-65 feet
220.98	222.06	1.08	Powerline	PP&L	10	20 feet a/
221.27	221.40	0.13	Powerline Access Rd	Private	0-280	Adjacent
222.06	225.46	3.40	Powerline	PP&L	10-50	Adjacent
226.85	227.00	0.15	Unknown Access Rd	Private or Not Known	30-35	Adjacent
227.75	227.85	0.10	More Lock Road	County	30-50	Adjacent
Total		**92.59**				

a/ Standard right-of-way overlap – see Resource Report 1 Figure 1.5-1.

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
Coos County							
Spread 1: MPs 0.00 – 49.73 b/							
1.46R	Jordan Cove Rd	Paved	All-Public	Not Crossed	0.06	0	16
1.64R	Southern Pacific Service Rd	Gravel	All	Bore	0.25	0	10
1.68R	Private Rd	Gravel	All	Open Cut	0.26	0	10
4.14R	North Bay Dr	Paved	All-WTC-Public	Open Cut	0.31	0	10
4.30R - 4.81R	Private Logging Spur	Dirt	All	In ROW	1.04	0	10
4.97R - 5.10R	Private Logging Spur	Gravel	All	In ROW	0.35	0	10
5.30R - 6.00R	Private Logging Spur	Dirt	All	In ROW	0.41	0	10
5.30R - 6.00R	Private Logging Spur	Gravel	All	In ROW	0.45	0	10
5.54R	Private Logging Spur	Dirt	None	Open Cut	0.02	0	
5.64R	Private Logging Spur	Dirt	None	Open Cut	0.07	0	
5.6R	Private Logging Road	Gravel	All	OFF ROW	0.37	0	10
5.6R	Private Logging Road	Paved/Gravel	All	OFF ROW	0.80	0	10
6.31R	Kentuck Slough Rd (Kentuck Way Ln)	Paved	All-Public	Bore	0.15	0	10
6.31R	Private Logging Road	Gravel	Light	OFF ROW	0.93	0	10
6.64R - 7.34R	Logging Spur	Dirt	All	In ROW	0.81	0	10
7.34R	Logging Rd	Gravel	All	Not Crossed	0.06	0	10
7.34R - 7.44R	Carlton Heights Rd	Paved/Gravel	Light	In ROW	1.24	0	10
7.73R	Logging Spur	Dirt	All	Open Cut	0.08	0	10
7.77R - 7.86R	Logging Spur	Dirt	All	Open Cut	0.79	0	10
7.88R - 8.12R	Logging Spur	Dirt	All	Open Cut	0.35	0	10
8.17R	Logging Spur	Dirt	All	Open Cut	0.18	0	10
8.44R	Willanch Slough	Paved	All-Public	Open Cut	0.39	0	10
8.93R	Logging Spur	Dirt	All	Open Cut	0.62	0	10
12.08R	Lillian Ln/Messerle Logging Rd	Dirt d/,e/,f/	All	Open Cut	0.42	0.03	16
8.95 - 9.59	Lillian Ln/Messerle Logging Rd	Dirt d/,e/,f/	All	Open Cut	1.59	0.03	16
9.27R - 9.49R	Unknown Rd	Gravel/Dirt c/,d/,e/	All	In ROW	1.82	0	
9.40R	Noah Butte Rd	Gravel	All	Open Cut	1.61	0	10
9.49R - 9.74R	Unknown Rd	Dirt/Gravel c/,d/,e/,f/	All	Open Cut	1.28	0.36	
9.94R	Unknown Rd	Dirt c/,d/,e/	All	Not Crossed	0.20	0	
10.04	Private Dr	Gravel	All	Open Cut	0.15	0	16
10.19	Stock Slough Ln	Paved	All-WTC-Public	Open Cut	0.46	0	16
10.20R	Unknown Rd	Dirt c/,d/,e/	All	Open Cut	0.68	0	
10.39	Raven Wood Ln	Gravel c/,d/	All-WTC	Open Cut	0.29	0	16
10.54R - 10.61R	Unknown Rd	Gravel/Dirt c/,d/,e/	All	In ROW	1.19	0	
10.59	Private Ln to McGinnis- Weeker Etc	Gravel c/,d/	All	Open Cut	0.08	0	16
10.71	Private Ln to McGinnis- Weeker Etc	Paved	All	Open Cut	0.53	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
10.74	Private Ln to Woytus	Paved	All	Open Cut	0.43	0	16
10.96	Private Road	Gravel	All	Not Crossed	0.14	0	
11.07R	Coos River Hwy	Paved	All-Public	HDD	0.07	0	
11.08	East Catching Slough Rd	Paved	All-WTC-Public	Bore	0.83	0	16
11.15	West Catching Slough Rd	Dirt d/	All-WTC	Not Crossed	0.10	0	16
11.18R	South Coos River Rd. – Co Rd b/	Paved	All-Public	HDD	0.85	0	
11.33	Anchor Dr (Farm Rd)	Dirt d/	All-WTC	Open Cut	0.65	0	16
11.41R	Private Road	Gravel	All	Open Cut	0.35	0	
11.64	Private Rd	Gravel d/,e/	Light	Open Cut	0.80	0	16
11.69	Private Rd	Gravel	None	Open Cut	0.14	0	16
11.88	Private Rd	Gravel	None	Open Cut	0.22	0	16
11.96	Old Wagon Rd (aka East Side Sumner Rd)	Paved	All-WTC-Public	Open Cut	0.67	0	16
12.58	Roseburg Logging Rd (Alderwood Dr)	Paved/ Dirt d/	All	Open Cut	0.11	0	16
12.77	Roseburg Logging Rd & Spur	Dirt d/	All	Open Cut	0.17	0	16
12.79	Alder Wood Ln & Skyline Dr	Gravel d/	All	Not Crossed	1.18	0	16
12.79 - 12.94	BPA Powerline Rd & Roseburg Logging Rd	Gravel d/	All	OFF ROW	0.20	0	16
12.94	BPA Powerline Rd & Roseburg Logging Rd	Gravel d/	All	Open Cut	0.37	0	16
13.21 - 13.42	Roseburg Logging Rd & Spur	Dirt d/	All	Open Cut	0.97	0	16
13.74	Coos Sumner Ln	Gravel d/,e/	All-WTC	Open Cut	0.29	0	16
14	Private Rd	Unknown	All	OFF ROW	0.91	0	10
14.23	Coos City - Sumner Rd	Paved	All-WTC-Public	Open Cut	3.03	0	16
14.28	Doyle Ln	Gravel d/	All	Open Cut	0.07	0	16
14.60 - 15.01	Menasha Logging Spur	Dirt d/,e/	All	In ROW	0.41	0	16
14.91	Menasha Logging Spur	Dirt d/,e/	All	Open Cut	0.22	0	16
15.16	Messerle Logging Spur	Dirt c/,d/,e/	All	Open Cut	0.51	0	16
15.67	Logging Rd	Gravel d/,e/	All	Open Cut	0.19	0	16
15.7	Boone Creek Rd	Gravel d/,e/	All-WTC	Open Cut	0.53	0	16
16.04	Powerline Access (Emineth Pvt Rd)	Gravel d/,e/	All	Open Cut	0.45	0	16
16.42	Powerline Access Rd	Dirt d/,e/	All	Not Crossed	0.18	0	16
16.59	Private Rd	Dirt d/,e/	All	Open Cut	0.43	0	16
16.78 - 17.12	Powerline Access Rd	Dirt d/,e/	Light	Not Crossed	0.36	0	16
17.4	Menasha Logging Spur	Gravel d/,e/	All	Not Crossed	0.84	0	16
17.4	South Sumner Rd	Gravel c/,d/,e/	All-Public	Open Cut	1.29	0	16
17.79	Powerline Access Rd	Gravel d/,e/	All	Open Cut	0.23	0	16
17.82 - 18.08	Menasha Logging Spur	Gravel	All	Open Cut	0.38	0	16
17.88	Menasha Logging Spur	Gravel	All	Open Cut	0.04	0	16
18.43 - 18.52	Menasha Logging Spur	Gravel c/,d/,e/	All	Open Cut	0.59	0	10

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
18.61	Menasha Logging Spur	Gravel d/,e/	All	Open Cut	1.30	0	16
19.24	Coos Co Sheep – Logging Rd	Dirt c/,d/,e/	All	Open Cut	0.25	0	10
19.45	Coos Co Sheep – Logging Rd	Gravel/Dirt d/,e/	All	Open Cut	0.59	0	16
19.45 - 19.58	Powerline Access Rd	Gravel/Dirt d/,e/	All	Open Cut	0.18	0	16
19.83	Hungry Mtn Rd (BLM 27-12-28.0)	Gravel d/	All	Open Cut	2.65	0	14
19.83	Powerline Access Rd (BLM 27-12-23.0)	Gravel d/	All	Not Crossed	2.84	0	16
20	Blue Ridge Comm Site	Gravel	All	OFF ROW-COMM SITE	3.74	0	16
20.73	Powerline Access Rd	Dirt d/,e/	All	Not Crossed	0.11	0	16
21.09	Logging Spur	Gravel d/,e/	All	Open Cut	0.14	0	16
21.98	Powerline Access	Dirt d/,e/	All	Open Cut	0.32	0	14
22.19	Powerline Access	Gravel/Dirt d/,e/	All	Open Cut	1.18	0	16
22.39	Powerline Access Rd	Gravel	All	Open Cut	0.26	0	16
22.57	Private Dr	Gravel	None	Open Cut	0.04	0	
22.58	Fairview-Laverne Park Rd	Paved	All-WTC-Public	Open Cut	0.74	0	16
23.09	Fisher Rd (Private) including BLM 7-12-25)	Gravel d/,e/	All	Open Cut	1.03	0	16
23.22	Unknown Rd	dirt	None	Open Cut	0.02	0	16
23.9	Unknown Rd	Dirt	None	Open Cut	0.03	0	
23.99	Powerline Access Rd	Gravel	None	Open Cut	0.03	0	16
24.1	Coos Bay Wagon Rd	Paved	All-WTC-Public	Open Cut	1.06	0	16
24.36	Hudson Rdg Tie - BLM Rd 27-11-17.1	Gravel	All	Not Crossed	0.28	0	16
24.36	Hudson Rdg Tie - BLM Rd 27-11-17.1	Gravel	All	Open Cut	0.26	0	16
24.55	Coos Bay Wagon Rd	Paved	All-Public	Open Cut	0.30	0	16
24.55 - 24.81	Private logging Rd (BLM 27-11-30.1)	Gravel	All	Open Cut	0.74	0	14
24.99 - 25.14	Logging Spur - BLM 27-11-30.03	Gravel	All	In ROW	0.34	0	16
25.15	Powerline Access Rds	Dirt	All	Open Cut	0.52	0	10
25.60 - 26.07	Logging Rd Menasha (BLM 27-11-30.1)	Gravel c/,d/,e/	All	Open Cut	1.98	0	14
26.08 - 26.65	Menasha Pvt. Logging spur	Dirt/Gravel	All	In ROW	0.78	0	10
26.65	Powerline Access Rd	Dirt d/,e/	All	Open Cut	0.49	0	16
26.65 - 26.75	Logging Spur	Dirt	None	In ROW	0.19	0	10
26.95	Lee McKinley Rd (Middle Creek Rd)	Gravel d/	All-Public	Open Cut	1.93	0	16
26.95-26.99	BLM 28-11-5.2	Aggregate	None	In ROW	0.07	0	
27.07	Dirt Two-Track	Pasture/Dirt d/,e/	All	Not Crossed	0.61	0	10
27.52 - 28.15	Logging Rd	Dirt c/,d/,e/	All	In ROW	1.89	0	16
28.35	Logging Spur	Aggregate	All	Crossed	0.15	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
28.5	Dora Ridge Rd - BLM 28-11.3.1	Gravel d/,e/	All	Open Cut	3.72	0	20
28.5	Pleasant Hill Rd-BLM 28-11-20.2; BLM 28-11-20.1	Aggregate	All	Open Cut	1.30	0	20
28.5	Yankee Run Mainline - BLM 28-11-20	Aggregate	All	Open Cut	0.55	0	20
28.53	Dora Ridge Rd - BLM 28-11.3.1	Gravel d/,e/	All	OFF ROW	0.03	0	20
29.02	BLM 28-11-9 & 9.5 A (BLM) & B (Private)	Gravel d/,e/	All	Open Cut	0.70	0	16
29.14	Lone Rock Logging Rd	Gravel d/,e/	All	Open Cut	0.26	0	16
29.21	Lone Rock Logging Rd	Gravel d/,e/	All	Open Cut	1.22	0	16
29.27 - 29.45	Lone Rock Logging Rd	Gravel d/,e/	All	Open Cut	0.26	0	16
29.47	Lone Rock Logging Rd	Gravel d/,e/	All	Open Cut	0.27	0	16
29.59	Myrtle Point - Sitkum Rd	Paved	All-WTC-Public	Open Cut	0.15	0	16
30.38 - 31.49	Logging Spur	Gravel/Dirt, c/,d/,e/	All	In ROW	1.28	0	16
31.30 - 31.46	Logging Spur	Gravel	All	Open Cut	0.27	0	10
31.51	Dora Spur Rd-BLM 28-11-13.2 A&B	Gravel/Dirt, c/,d/,e/	All	Not Crossed	0.38	0	14
31.69	Dora Thinning Rd - BLM28-11-13.2	Gravel	All	Not Crossed	0.43	0	16
31.69 - 31.81	Back Dora - BLM 28-11-13.6	Gravel	All	In ROW	0.14	0	12
32.1	Dora Thinning Rd - BLM28-11-13	Gravel	All	OFF ROW	1.52	0	14
32.35	Private Logging Spur	Gravel c/,d/,e/	All	Open Cut	0.10	0	16
32.55	Golden Brick Rd	Gravel/Dirt d/,e/	All	OFF ROW	0.31	0	16
32.55	Logging Rd	Gravel/Dirt d/,e/	All	Open Cut	1.78	0	16
32.94	Logging Spur	Gravel/Dirt c/,d/,e/	All	Open Cut	0.33	0	10
33.25	Unknown Rd	Dirt	All	Open Cut	0.44	0	10
33.37	Unknown Rd	Dirt	All	Open Cut	0.31	0	10
33.74 - 33.80	Elk Mountain Loop - BLM28-11-25.0	Paved	All-WTC	In ROW	0.51	0	20
34.02	Elk Creek Rd - BLM 28-11-29	Paved	All-WTC	Open Cut	7.34	0	20
34.31	Gold Brick Rd	Gravel/Dirt c/,d/,e/	All	Open Cut	0.37	0	16
34.37	Logging Spur	Gravel c/,d/,e/	All	Open Cut	0.10	0	10
34.42	Logging Rd	Dirt d/,e/	All	Open Cut	0.34	0	16
34.44 - 34.52	Logging Spur	Dirt d/,e/	None	Open Cut	0.19	0	16
34.69	Logging Rd	Gravel d/	All	Open Cut	1.49	0	16
34.71 - 35.04	Logging Spur	Gravel	All	In ROW	0.42	0	10
35.33 - 35.80	Elk Creek Rd - BLM 28-11-29.0 (Access Rd 10Miles from Sitkum Gravelford Co Rd 63	Paved	All-WTC	In ROW	2.79	0	20
35.34 - 35.80	Big Creek Rd (Co Rd 84) - BLM 28-11-29.0	Paved	All-WTC-Public	OFF ROW	3.13	0	16
35.34 - 35.80	Elk Creek Rd - BLM 28-11-29.0	Paved	All-WTC	OFF ROW	1.52	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
35.8	Elk Creek Ext. (BLM 28-10-31.0)	Paved	All-WTC	OFF ROW	3.28	0	14
35.83 - 36.11	Elk Creek Rd - BLM 28-11-29.0	Paved	All-WTC	In ROW	0.37	0	20
36.18	Logging Spur - BLM 28-10-29.0 28-10-29.2	Gravel	All-WTC	Open Cut	0.08	0	20
36.64 - 37.15	Elk Creek Rd - BLM 28-10-29.0	Paved	All-WTC	In ROW	1.17	0	20
37.15 - 37.22	Unknown BLM Logging Spur	Gravel	None	In ROW	0.08	0	20
38	Private Dr	Gravel d/,e/	All	OFF ROW	0.21	0	10
38.06	BLM 28-10-27.2	Gravel	None	Open Cut	0.03	0	20
38.34 - 38.87	Weaver Sitkum Tie Rd	Paved	All-WTC-Public	OFF ROW	0.06	0	16
38.34 - 38.87	Chaney Rd - BLM 28-10-9.0A	Paved	All-WTC	OFF ROW	0.46	0	20
38.34 - 38.87	Weaver Sitkum Tie Rd - BLM 28-10-9.4	Paved	All-WTC	In ROW	4.84	0	20
38.58	BLM 28-10-27.2	Gravel	None	Open Cut	0.02	0	20
38.87	Big Creek Rd - BLM 29-11-28	Paved	All-WTC	OFF ROW	4.51	0	14
38.87	Sandy Creek Rd - BLM29-10-14.2	Paved	All-WTC	OFF ROW	0.86	0	14
38.87	Sandy Creek Rd - BLM29-10-15	Paved	All-WTC	OFF ROW	4.85	0	14
38.87	Sandy Creek Ext.- BLM29-10-2.1 and BLM 28-10-34.1	Paved	All-WTC	OFF ROW	1.91	0	16
38.87	Sandy Creek (BLM 29-10-15) Mainline Paved Access Rd 10.3 Miles from Hwy 42	Paved	All-WTC	Not Crossed	1.01	0	20
38.98 - 39.22	Plum Creek Logging Spur- CO-171	Dirt/Gravel	All	In ROW	0.67	0	16
39.35 - 39.85	Weaver Sitkum Tie Rd - BLM 28-10-9.4	Paved	All-WTC	In ROW	1.40	0	20
39.60 - 39.72	Tri-W Group Logging Spur	Gravel/Dirt	All	In ROW	0.3	0	16
39.94	Tri-W Group Logging Spur	Gravel d/	All	Not Crossed	0.04	0	16
40.02	Tri-W Group Access Spur	Dirt c/,d/,e/	All	Not Crossed	0.11	0	16
40.27 - 40.37	Weaver Sitkum Tie Rd - BLM 28-10-9.4	Paved	All	In ROW	0.6	0	20
40.61	Tri-W Group Access Spur	Gravel	None	Open Cut	0.05	0	16
40.68	Weaver Sitkum Tie Rd - BLM 28-10-9.4	Paved	All	Open Cut	0.55	0	20
40.8	Logging Spur	Dirt	None	Open Cut	0.02	0	16
40.93	Logging Spur	Dirt	None	Open Cut	0.06	0	16
41.19	Cawrse Rd - BLM 28-10-36	Gravel	None	Open Cut	0.05	0	16
41.19	Weaver Sitkum Tie Rd - BLM 28-10-9.4	Paved	All	Open Cut	0.22	0	20
41.32	Logging Spur	Gravel	None	Open Cut	0.04	0	16
41.37	Weaver Sitkum Tie Rd - BLM 28-10-9.4	Paved	All	Open Cut	0.43	0	20

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
41.39	BLM 28-9-31	Gravel	None	Open Cut	0.02	0	16
41.75	BLM 28-9-31.1	Gravel c/,d/,e/	All	Open Cut	0.04	0	16
42.03 - 42.50	Weaver Rd - BLM 28-8-18	Paved	All	In ROW	1.16	0	14
42.03 - 42.50	Weaver Rd - BLM 28-8-18	Paved	All	OFF ROW	9.51	0	14
42.1	Camas Creek - BLM 29-9-6.3	Gravel	None	Open Cut	0.02	0	16
42.37 - 42.51	Plum Creek Logging SpurCO-177 2Plum Logging Spur	Dirt/Gravel	None	In ROW	0.14	0	16
42.5	Unknown	Gravel	All	OFF ROW	0.32	0	16
42.68	Plum Creek Logging Spur- CO-177 3	Gravel	None	Open Cut	0.19	0	16
42.74 - 42.86	North Rock Creek – BLM30-10-3	Paved	All	In ROW	0.4	0	16
42.74 - 42.86	S Fk Camas Creek Rd - BLM 28-9-32 ; BLM 28-9-32.2; BLM 29-9-5.2	Paved	All	OFF ROW	1.36	0	16
42.74 - 42.86	Camas Creek Rd – BLM28-10-12	Paved	All	OFF ROW	3.94	0	20
42.74 - 42.86	S Fork Camas Crk – BLM 28-9-20	Aggregate	All	OFF ROW	1.76	0	20
42.94 - 43.05	Logging Spur	Gravel	None	Open Cut	0.12	0	16
43.05	BLM 29-9-6.6	Gravel	None	Open Cut	0.02	0	16
43.05 - 43.10	North Rock Creek – BLM30-10-3	Paved	All	In ROW	0.05	0	16
43.29 - 43.45	Cnty Rd 21	Paved	All-WTC-Public	OFF ROW	0.29	0	
43.29 - 43.45	North Rock Creek - BLM30-10-3	Paved	All-WTC	In ROW	2.94	0	16
43.29 - 43.45	North Rock Creek - BLM30-10-3.0	Paved	All-WTC	OFF ROW	7.25	0	16
43.63	BLM 29-9-8	Gravel d/	All	Open Cut	0.16	0	14
43.63 - 43.90	Lone Rock Logging Spur- CO-177.2R	Gravel d/,e/	All	In ROW	0.31	0	10
44	Signal Tree Lookout - BLM 29-9-33.4	Gravel	All	OFF ROW-COMM SITE	1.08	0	16
44.19	Plum Creek Timber Logging Rd - BLM 29-9-18.1	Dirt c/,d/,e/	All	Open Cut	2.30	0	16
44.29	Plum Crk Logging Spur Upper Rock	Dirt c/,d/,e/	Light	Open Cut	0.37	0	16
44.52 - 44.87	BLM 29-9-9.3 & Pvt. RWA C-344 G.P.	Gravel d/	All	In ROW	0.38	0	16
44.87 - 45.23	Upper Signal Tree - BLM28-9-35.0	Gravel d/	All	In ROW	1.38	0	20
44.87 - 45.23	Upper Signal Tree - BLM28-9-9.1	Gravel d/	All	OFF ROW	2.05	0	20
45.24	BLM 29-9-9.2	Gravel	None	Open Cut	0.03	0	16
Douglas County							
45.50 - 45.70	Unknown Logging Rd	Dirt	None	In ROW	0.29	0	16
45.75	Plum Creek Logging Rd	Dirt	None	Open Cut	0.07	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
45.8	Logging Spur	Gravel d/,e/	All	Open Cut	0.23	0	16
45.85 - 45.92	Upper Signal Tree - BLM28-9-35	Paved	All	In ROW	0.61	0	16
45.85 - 45.92	Upper Signal Tree - BLM28-9-35	Dirt	All	OFF ROW	3.40	0	20
45.92 - 46.35	Plum Creek Logging Spur	Dirt/Gravel d/,e/	All	In ROW	0.62	0	16
45.92 - 46.40	Plum Creek Logging Spur	Dirt/Gravel d/,e/	All	OFF ROW	0.07	0	16
46.51	Lower Signal Tree - BLM29-9-36.0	Paved c/	All	Open Cut	11.72	0	14
46.51	Unknown Rd	Dirt	All	OFF ROW	0.19	0	16
46.72	Logging Spur	Gravel c/,d/	All	OFF ROW	0.20	0	16
46.74	Logging Spur	Gravel c/,d/	All	Open Cut	0.69	0	16
46.81	Unknown Rd	Gravel	All	Open Cut	0.10	0	
47.07 - 47.66	Deep Creek - BLM 29-9-12.2	Gravel d/,e/	All-WTC	In ROW	0.67	0	16
47.1	Holms Creek Spur - BLM29-9-15.1	Gravel	All	Not Crossed	1.02	0	
47.10 - 47.71	Bingham Holmes Road - BLM 29-9-23	Gravel	All	In ROW	1.26	0	
48.16	Wildcat Creek Spur - BLM 29-9-14	Dirt	All	Open Cut	0.69	0	
48.21 - 48.40	Deep Creek - BLM 29-9-12.1	Gravel d/	All-WTC	In ROW	0.81	0	16
48.39 - 48.69	Deep Creek Spur - BLM29-9-13.0	Gravel d/	All	OFF ROW	0.22	0	16
48.39 - 48.69	Deep Creek Spur BLM29-9-13.0	Gravel d/	All	OFF ROW	0.31	0	16
48.44 - 48.67	Deep Creek Spur - BLM29-9-13.0	Gravel d/	All	In ROW	0.30	0	16
48.69 - 49.15	Deep Creek Spur - BLM29-9-13.2	Gravel d/	All	In ROW	0.50	0	16
Spread 2: MPs 49.73 – 94.67 6							
49	Wildcat Rd	Paved	All-Public	OFF ROW	1.38	0	10
49	Private Rd	Gravel	All	OFF ROW	0.38	0	10
49.76	Baldwin Rd	Paved	All-Public	Off ROW	0.23	0	10
49.76	Upper Camas County Rd Co Rd 128	Paved	All-Public	Open Cut	2.13	0	10
49.8	Lang Creek Road	Paved	All-Public	Not Crossed	0.36	0	
49.8	Weaver Tie Rd	Paved	All	Not Crossed	2.77	0	
50	Private Rd	Gravel	All	OFF ROW	0.49	0	10
50.2	Private Farm Rd	Dirt	None	Open Cut	0.04	0	16
50.46	Private Rd	Gravel/Dirt d/,e/	All	Open Cut	0.17	0	16
50.55 - 50.75	Barnes Private Rd	Dirt/Gravel c/,d/,e/	All	In ROW	0.38	0	16
50.83	Kirkendall Rd	Paved	All-Public	Open Cut	0.08	0	10
51.31-51.37	Private Rd	Dirt	None	Open Cut	0.08	0	16
51.54	Quiet Mountain Rd	Paved	All-WTC-Public	Bore	0.40	0	14
51.54	State Hwy 42	Paved	All-WTC-Public	Bore	0.07	0	14

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
51.54	State Hwy 42	Paved	All-WTC-Public	OFF ROW	0.43	0	14
51.96	Private Rd	Gravel	None	Open Cut	0.02	0	16
52.04	Private Rd	Gravel	All	Open Cut	0.37	0	10
52.16	Private Rd	Gravel	All	Open Cut	0.52	0	10
52.62	Camas Mountain SP - BLM 29-8-9.3	Gravel d/,e/	All	Open Cut	1.03	0	16
53.03	Private logging road (Camas Mountain SP - BLM 29-8-9.3)	Gravel d/,e/	All	Open Cut	0.53	0	16
53.21 - 53.59	Shields Creek Spur - BLM 29-8-2.2	Gravel d/	All	In ROW	0.87	0	16
53.74	Logging Spur	Gravel	All	Open Cut	0.06	0	16
54.2	Shields Creek Spur- BLM29-8-11 (Private)	Gravel d/	All	Open Cut	1.22	0	19
54.21 - 54.35	Logging Spur	Gravel	All	In ROW	0.14	0	14
54.64	Shields Creek Spur- 29-8-2.2 (Private)	Gravel d/	All	OFF ROW	1.51	0	16
54.64	Shields Creek Spur- BLM29-8-2.2 (Private)	Gravel d/	All	Open Cut	0.33	0	16
54.81 - 55.01	Seneca Logging Spur	Dirt/Gravel	All	In ROW	0.26	0	16
55.81	Berry Creek Rd CoRd365	Paved	All-WTC-Public	OFF ROW	2.85	0	16
55.81	Ireland Co Rd 140	Paved	All-WTC-Public	Bore	0.16	0	16
55.81	Berry Creek Access Rd - BLM 29-8-1	Paved	All-WTC	OFF ROW	1.04	0	20
56.06	Private Dr	Gravel	All	Open Cut	0.10	0	16
56.12	Private Dr	Gravel	All	Open Cut	0.08	0	16
56.16	Private Dr	Gravel	All	Open Cut	0.08	0	16
56.2	Private Dr DG-039	Gravel	All	Open Cut	0.09	0	16
56.32	Private Dr DG-041	Gravel	All	Open Cut	0.09	0	16
56.74	Benedict Rd Co Rd 141	Paved	All-WTC-Public	OFF ROW	0.05	0	16
56.74	Ireland Co Rd 140	Paved	All-WTC-Public	Open Cut	1.74	0	16
56.91	Private Dr	Gravel d/	All	Open Cut	0.06	0	16
57.1	Private Dr	Gravel d/	All	Open Cut	0.12	0	14
57.35	Private Dr	Gravel d/	All	Open Cut	0.06	0	14
57.6	Olalla Rd Co RD 38	Paved	All-Public	OFF ROW	2.61	0	16
57.6	Upper Olalla – Co Rd 38	Paved	All-WTC-Public	Open Cut	0.09	0	16
58.19	Private Rd	Dirt c/,d/	All	Open Cut	0.20	0	16
58.65	Private Rd	Dirt c/,d/,e/	All	Open Cut	0.31	0	16
58.65	Private Rd	Dirt c/,d/,e/	All-Public	OFF ROW	0.07	0	16
59.34	Private Rd	Dirt	None	Open Cut	0.03	0	16
59.6	Private Rd	Gravel d/	All	Open Cut	0.04	0	16
59.62	McNabb Creek Rd - BLM28-7-3	Gravel c/,d/,e/	All	Open Cut	0.35	0	16
60.02	Private Rd	Dirt c/,d/,e/,f/	All-WTC	Open Cut	0.44	0.11	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
60.58	Hoover Hill Rd	Paved	All-Public	OFF ROW	0.54	0	16
60.58	Olivant Rd - 28-7-34 (Private)	Gravel d/	All	Open Cut	0.58	0	16
61.9	Nichols Bros Private Rd Logging Rd	Dirt c/,d/,e/	All	Not Crossed	0.44	0.16	16
61.90 - 62.44	John Clarke DG-075	Dirt c/,d/	All	In ROW	0.63	0	16
62.52 - 63.62	D R Johnson (BLM 29-6-6.0)	Dirt/Gravel c/,d/	All	OFF ROW	0.87	1	16
62.52 - 63.62	D R Johnson (BLM 29-7-6.0)	Dirt/Gravel c/,d/,e/	All	In ROW	1.59	1	16
63.41	BLM 28-6-31 & BLM 28-6-32	Dirt/Gravel c/,d/,e/	All	Not Crossed	0.72	0	16
63.92	Kent Creek – Co RD 100	Paved	All-WTC-Public	Open Cut	1.08	0	14
64.17	Unknown Rd	Dirt	None	Open Cut	0.05	0	16
64.55 - 64.71	Private Rd - DG-090.500- PLMP 58.3+4.87	Dirt d/,e/,f/	All	In ROW	0.94	0.18	16
64.90 - 65.35	Private Rd - DG-090.500	Dirt/Gravel d/,e/	All	In ROW	0.46	0	16
65.6	Private Dr	Gravel	All	Not Crossed	0.22	0	16
65.82	Rice Creek Co RD 43	Paved	All-WTC-Public	Open Cut	0.11	0	16
66.21	Private Rd - DG-098.000	Gravel d/,e/	All	Open Cut	0.34	0	16
66.37 - 66.47	Private Rd - DG-099.000	Gravel d/,e/	All	Open Cut	0.95	0	16
66.88	Willis Creek Rd - 88A	Paved	All-WTC-Public	Open Cut	0.16	0	14
66.9	Private Rd Track 106	Dirt	None	Open Cut	0.14	0	16
66.97	Private Rd	Dirt	All	Open Cut	0.62	0	16
67.19 - 67.30	Barton Private Rd	Dirt d/,e/	All	In ROW	0.59	0	16
67.58	Barton Private Rd	Dirt/Gravel d/,e/,f/	All-WTC	Not Crossed	1.72	0.04	16
67.58 - 68.36	Private Rd Barton, Sumner, Brambila	Dirt d/,e/	All	In ROW	0.79	0	16
67.67	Private Rd	Dirt	All	Open Cut	0.44	0	16
68-59 - 68.88	Unknown Rd	Unknown	All	In ROW	0.52	0	
68.07 - 68-39	Barton Private Rd	Unknown	All	In ROW	0.84	0	
68.6	Private Rd – Petty Brambila	Dirt/Gravel d/,e/,f/	All-WTC	Open Cut	1.14	0.03	16
69.3	Private Dr	Unknown	All	Open Cut	0.49	0	
70.46	Edies Ln	Gravel	All	Open Cut	1.16	0	
71.22	I-5	Paved	All-WTC-Public	HDD	0.53	0	
71.33	Dole – Co RD 14	Paved	All-WTC-Public	HDD	0.33	0	14
72.05	Unknown Rd	Dirt c/,d/,e/,f/	All	Open Cut	0.33	0.12	
72.23 - 72.61	Unknown Rd	Dirt c/,d/,e/,f/	All	Open Cut	0.52	0.2	
73.58	Unknown Rd	Dirt/Gravel c/,d/,e/,f/	All	Not Crossed	3.14	0.5	
73.62 - 74.39	Clarks Branch Co RD 105	Gravel d/,e/	All-Public	OFF ROW	4.69	0	16
74.32 - 74.73	Gow Ranch Private	Gravel d/,e/,f/	All	Open Cut	0.98	0.11	16
74.74 - 74.99	Gow Ranch Private	Gravel d/,e/,f/	All	In ROW	2.80	0.24	10
74.97 - 75.11	Gow Ranch Private	Dirt c/,d/,e/	All	Open Cut	0.82	0	16
75	Harness Mountain Comm Site	Gravel	All	OFF ROW-COMM SITE	7.00	0	10

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
75.04 - 75.65	Bilger Creek Rd - BLM29-5-11	Rock c/,d/,e/,f/	All	In ROW	4.84	0.05	16
75.8	Bilger Creek Spur- BLM29-5-2.2	Dirt/Rock c/,d/,e/	All-WTC	Open Cut	0.21	0	16
75.80 - 75.93	Private Rd - Logging Spur	Gravel	None	In ROW	0.14	0	16
76.35	Bilger Creek – Co RD 103	Gravel	All-WTC-Public	Open Cut	0.12	0	16
76.58	Unknown Rd	Dirt/Gravel c/,d/,e/,f/	All	Open Cut	0.15	0.04	
76.84	Unknown Rd	Dirt/Gravel c/,d/,e/	All	Open Cut	0.78	0	
77.07 - 77.12	Unknown Private Rd	Dirt/Gravel c/,d/,e/	All	In ROW	1.37	0	
77.31	Unknown Rd	Dirt/Gravel c/,d/,e/	All	Open Cut	0.12	0	
77.61	Private Road (Davis, Wayne)	Dirt/Gravel c/,d/,e/	All	Open Cut	0.49	0	
77.88 - 77.98	Little Lick Private Rd	Dirt c/,d/,e/,f/	All	Open Cut	1.22	0.17	16
78	Private Rd to Big Lick Res.	Gravel	All	OFF ROW	1.73	0	10
			All-Public		5.12	0	
78.98	North Myrtle – Co RD 15	Paved	All-WTC-Public	Open Cut	1.51	0	14
79.56	Clack Private Rd	Dirt/Gravel c/,d/,e/	All	OFF ROW	0.41	0.43	14
79.56	Clack Private Rd	Dirt/Gravel c/,d/,e/,f/	All	Open Cut	1.00	0.43	16
79.6	Powerline Access Rd	Dirt c/,d/,e/,f/	All	Open Cut	0.2	0.09	
79.89 - 80.42	Pack Saddle Rd - BLM29-4-17	Gravel c/,d/,e/	All	In ROW	0.99	0	14
79.89 - 80.42	Pack Saddle Rd - BLM29-4-20	Gravel c/,d/,e/	All	OFF ROW	1.12	0	20
80.71 - 80.73	Roseburg Forest Products	Dirt/Gravel	All	Open Cut	0.14	0	10
80.92	Powerline Private Rd	Gravel	None	Open Cut	0.16	0	10
81.09	Roseburg Forest Products	Gravel	All	Open Cut	0.56	0	16
81.15	South Myrtle - Co RD 18	Paved	All-WTC-Public	Open Cut	6.47	0	24
81.68	Private Road (Sutch, Steve)	Unknown	All	Open Cut	0.51	0	
82.23 - 82.42	Unknown Rd	Dirt	All	In ROW	0.29	0	
82.42	Unknown Rd	Dirt	All	Open Cut	0.37	0	
82.64	Unknown Rd	Dirt	All	Not Crossed	0.21	0	
82.75 - 83.76	Wood Creek Rd - BLM29-4-35.0	Gravel c/,d/,e/	All	In ROW	2.61	0	16
82.97	Wood Creek Spur- BLM29-4-27.3	Gravel c/,d/,e/	All	Open Cut	0.04	0	16
83.4	Wood Creek Spur- BLM29-4-27	Gravel	None	Open Cut	0.17	0	16
84.05	Unknown Rd	Dirt/Gravel c/,d/,e/	All	Open Cut	0.32	0	10
84.16	Roseburg Resources	Dirt	None	Open Cut	0.06	0	16
84.22	Wood Creek – Co RD 92	Gravel	All-Public	Open Cut	1.29	0	16
85.78	Unknown Rd	Dirt c/,d/,e/	All	Open Cut	0.7	0	10
86.46 - 87.38	High Noon Spur- BLM 29-3-31.3 & BLM 29-3-31.4	Gravel d/,e/	All	In ROW	1.52	0	16
86.8	East Fork Wood Creek Rd - BLM 30-4-3/Private	Dirt d/,e/	All	Open Cut	2.31	0	10
87.06	High Noon Spur - BLM29-3-31.3, & Fate Creek Spur 30-3.6.1	Gravel d/,e/	All	Open Cut	1.21	0	14
87.95	Eichmann Logging Spur	Dirt	None	Open Cut	0.63	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
88.09	Private Dr	Gravel/Dirt d/,e/	All		0.18	0	
88.09	Eichmann	Dirt c/,d/,e/	All	Open Cut	0.06	0	16
88.21 - 88.48	Fate Creek - BLM 30-3-6	Gravel d/,e/	All	Open Cut	0.82	0	16
88.53	Days Creek – Co RD 34	Paved	All-Public	Open Cut	0.14	0	14
88.69	Private Ln	Gravel	None	Open Cut	0.07	0	16
88.77	Calley Logging Spur	Dirt	None	Open Cut	0.05	0	16
88.93	Seneca Jones Private Rd	Dirt	All	Open Cut	0.48	0	16
89.07	Seneca Jones Private Rd	Dirt	All	Open Cut	0.18	0	16
89.10 - 89.28	Unknown Rd	Dirt	None	In ROW	0.18	0	16
89.27 - 89.50	Seneca Jones Private Rd7 & 8	Dirt, Gravel d/,e/	All	In ROW	0.37	0.1	16
89.27 - 89.50	Seneca Jones Private Rd7 & 8	Dirt, Gravel c/,d/,e/,f/	All	In ROW	1.62	0.1	16
89.74 - 88.87	New Logging Spur	Dirt d/,e/	All	In ROW	0.27	0	16
89.96	Bland Mtn Spur – BLM30-3-17.1	Gravel d/,e/	All	Open Cut	0.53	0	16
90.19	Bland Mtn – BLM 30-4-1	Gravel d/,e/	All	Open Cut	3.79	0	16
90.19 - 90.36	Bland Mtn Spur - BLM30-3-17.2	Gravel	All	In ROW	0.16	0	16
90.36 - 90.74	Lavadoure Crk Spur - 30-3-20.2	Dirt	All	In ROW	0.77	0	14
90.85	Lavadoure Creek - BLM30-3-2-.2	Gravel	All	OFF ROW	4.03	0	16
90.86 - 90.93	Unknown Spur	Dirt	None	In ROW	0.08	0	12
90.88 - 91.19	Unknown Spur	Dirt	All	In ROW	0.44	0	12
91.19 - 91.74	John Days Spur – BLM 30-3-28 (Wook Rd)	Dirt/Gravel d/,e/	All	In ROW	3.15	0	16
91.96	St Johns Creek Spur 1	Dirt d/,e/	All	Open Cut	0.25	0	16
92.29	St Johns Creek Spur 1	Dirt d/,e/	All	Open Cut	1.10	0	16
92.36	St Johns Creek Spur 2	Gravel d/,e/	All	Open Cut	0.20	0	16
92.63	St Johns Creek Spur - BLM 30-3-34.1	Gravel d/,e/	All	Not Crossed	0.07	0	16
92.63	St Johns Creek Spur - BLM 30-3-34.1	Gravel d/,e/	All	Open Cut	2.19	0	16
93.03 - 93.50	Unknown Rd	Dirt	All	In ROW	0.72	0	12
93.58 - 93.62	Corn Creek Spur - BLM30-3-23	Gravel d/,e/	All	Not Crossed	1.73	0	14
93.58 - 93.62	Corn Creek Spur - BLM30-3-23.1	Gravel d/,e/	All	OFF ROW	0.37	0	14
93.58 - 93.62	Corn Creek Rd - BLM30-3-26	Gravel d/,e/	All	OFF ROW	0.84	0	16
93.65	Unknown Spur	Dirt	All	Open Cut	0.10	0	12
93.74	Maize Ts Rd - BLM 30-3-23.5	Gravel d/,e/	All	Open Cut	0.87	0	15
93.76 - 94.34	Unknown Private Rd	Gravel d/,e/	All	In ROW	1.7	0	15
Spread 3: MPs 94.67 – 132.10 6							
94.68	State Hwy 227 Tiller Trail Hwy	Paved	All-Public	Open Cut	0.61	0	14
94.81	Milo & Academy Dr	Paved	All	OFF ROW	0.38	0	16
95.51	Academy Rd - 31-3-3	Gravel c/,d/,e/,f/	All	Open Cut	1.93	0.02	16
96.33	Academy Rd - 31-3-2.3	Dirt/Gravel c/,d/,e/	All	Open Cut	0.03	0	10

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
96.33	Academy Rd - 31-3-3	Dirt/Gravel c/,d/,e/	All	Open Cut	0.86	0	10
96.33	E Fk Stouts Creek Rd -31-3-2.1	Dirt/Gravel c/,d/,e/	All	Open Cut	0.02	0	10
96.67 - 96.91	Private Rd	Gravel d/,e/	All	In ROW	0.46	0	16
97.07	Academy Rd - 31-3-3	Dirt d/,e/	All	Open Cut	0.59	0	10
97.07 - 97.66	Unknown Rd	Dirt	All	In ROW	0.70	0	14
97.67	Stouts Creek Spur- BLM31-3-1.3	Gravel d/	All	Not Crossed	0.44	0	16
97.95	E Fk Stouts Creek Spur- BLM 31-3-1	Gravel d/	All	Open Cut	1.01	0	16
97.95	E Fk Stouts Creek Spur- BLM 31-3-2.1	Gravel d/	All	OFF ROW	0.58	0	16
97.95	E Fk Stouts Creek Spur- BLM 31-3-2.2	Gravel d/	All	OFF ROW	0.40	0	16
97.95	E Fk Stouts Creek Spur- BLM 31-3-3.1	Gravel d/	All	OFF ROW	1.65	0	16
97.95	E Fk Stouts Creek Spur- BLM 31-3-34	Gravel d/	All	OFF ROW	1.42	0	16
97.96	Mighty Fine Ext Spur- BLM 31-3-1.4	Gravel	None	Open Cut	0.07	0	10
98.31 - 98.48	E. FK Stouts Creek Spur- BLM 31-3-1.1	Dirt d/,e/	All	In ROW	0.52	0	16
98.48 - 99.29	Unknown Private Rd	Dirt d/,e/,f/	All	In ROW	1.22	0.1	16
100.02 - 100.40	31-3-13; Non Inv	Gravel c/,d/,e/,f/	All	In ROW	0.37	0.13	16
100.40 - 100.67	FS 3220705	Gravel c/,d/,e/,f/	All	In ROW	0.30	0.11	16
100.40 - 100.67	FS 3220705	Gravel c/,d/,e/,f/	All	Not Crossed	0.21	0.06	16
100.67 - 100.75	31-3-24; Non Inv	Gravel c/,d/,e/,f/	All	In ROW	1.09	0.72	16
100.76	Unknown	Dirt	None	Open Cut	0.06	0	16
101.57	FS 3220707	Dirt d/,e/,f/	All	Open Cut	0.44	0.16	14
101.77 - 101.92	FS 3220790	Dirt d/,e/,f/	All	Open Cut	0.50	0.04	14
102.25	FS 3220792	Dirt d/,e/	All	In ROW	0.11	0	14
102.3	Green Butte FS 3220000	Gravel, d/,e/	All	OFF ROW	4.01	0	16
102.3	Green Butte FS 3220000	Gravel, d/,e/	All	Open cut	6.77	0	16
102.62 - 102.83	FS 3220792	Dirt d/,e/	All	In ROW	0.56	0	14
103.60 - 103.66	C&D Lumber	Dirt/Gravel, d/,e/,f/	All	In ROW	0.31	0	16
103.79	C&D Lumber	Gravel d/,e/,f/	All	Open Cut	0.37	0.28	16
103.93	C&D Lumber	Gravel d/,e/,f/	All	Open Cut	0.22	0	16
103.95	FS 3230137	Gravel d/,e/,f/	All	Not Crossed	0.27	0	16
104.14	FS 3230136	Gravel c/,d/,e/,f/	All	Open Cut	0.39	0.02	14
104.24	FS 3230000	Gravel d/,e/	All	Open Cut	9.58	0	16
104.27	FS 3230100	Gravel, c/,d/,e/	All	Open Cut	0.68	0	14
104.27	FS 3230135	Gravel, c/,d/,e/	All	Not Crossed	0.27	0	14
104.83	FS 3230120	Dirt	None	Open Cut	0.06	0	14
104.84	FS 3230100	Gravel, c/,d/,e/	All	Open Cut	0.35	0	14

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
104.85	FS 3230121	Dirt	None	Open Cut	0.02	0	14
105.32	FS 3230100	Gravel c/ d/,e/	All	Open Cut	0.36	0	14
105.38 - 105.53	Wildcat Ridge Rd - FS3200	Gravel d/,e/	All-WTC	In ROW	3.80	0	14
105.69 - 106.00	FS 3200255	Dirt d/,e/	All	In ROW	0.38	0	14
106.13 - 106.37	FS 3200260	Gravel, d/,e/	All	In ROW	0.48	0	14
106.50 - 106.77	FS 3200269	Dirt	None	In ROW	0.29	0	14
106.77	FS 3200280	Gravel	None	In ROW	0.02	0	14
106.77 - 106.84	Wildcat Ridge Rd - FS3200	Gravel 2	All-WTC	Not Crossed	0.91	0	14
106.77 - 107.10	FS 3200270	Dirt	None	In ROW	0.36	0	14
107.26 - 107.47	FS 3200300	Dirt	All	In ROW	0.23	0	14
107.43 - 107.63	FS 3200301	Dirt d/,e/,f/	All	In ROW	0.27	0.01	14
108.09	Wildcat Ridge Rd - FS3200	Gravel 2	All-WTC	Open Cut	0.94	0	14
108.2	FS 3200330	Gravel	None	In ROW	0.10	0	14
108.32	Wildcat Ridge Rd - FS3200	Gravel 2	All-WTC	Open Cut	0.90	0	14
108.40 - 108.66	FS 3200359	Dirt d/,e/	None	In ROW	0.53	0	
108.88	E Fk T.S. FS 3200380	Gravel	None	Open Cut	0.03	0	10
108.96	Cow Creek/Wildcat Ridge Rd - FS 3200	Gravel 2	All-WTC	Open Cut	1.86	0	14
109.15	FS 3200500	Gravel 2	All	Open Cut	0.56	0	10
109.30 - 109.37	FS 3200500	Gravel 2	All	In ROW	0.41	0	10
109.59 - 109.68	FS 3200500	Gravel 2	All	In ROW	0.20	0	10
110.15 - 110.54	FS 3232891	Dirt d/,e/	All	In ROW	0.47	0	10
110.4	Pevine Quarry FS3232895, FS 3232896 and FS 3232898	Gravel	All	Not Crossed	0.60	0	10
110.55	South Fork Cow Creek USFS 3232	Gravel d/,e/	All	Open Cut	8.64	0	16
Jackson County							
111	Long Prarie Rd FS3200600	Gravel d/,e/	All-WTC	OFF ROW	4.47	0	14
111.66 - 112.07	Wildcat Ridge Rd (Cow Creek Rd) - FS 3200000	Gravel d/,e/	All-WTC	In ROW	4.67	0	14
112.07	FS 3200750	Gravel d/,e/	All	In ROW	0.45	0	14
112.56 - 112.94	FS 3200750	Gravel, d/,e/	All	In ROW	0.71	0	14
113.37	Unknown Rd	Dirt d/,e/,f/	All	Not Crossed	0.13	0	16
113.49	Unknown Rd	Dirt d/,e/,f/	All	Not Crossed	0.20	0.12	16
113.66	BLM 32-1-31.3	Dirt d/,e/,f/	All	Open Cut	3.13	0.24	16
114.08	Unknown Rd	Dirt	None	Open Cut	0.11	0	16
115.13	Unknown Rd	Gravel, d/,e/	All	Open Cut	1.08	0	16
115.36	Hardway MI - BLM 33-2-12	Gravel, d/,e/	All	Open Cut	0.27	0	17
115.84	Dwinnel Rd - BLM 33-1-5	Gravel d/,e/	All	Open Cut	2.71	0	16
116.08	Old Ben Ex 33-1-7.2	Gravel d/,e/	All	Open Cut	0.17	0	16
116.33	Dwinnel Rd - BLM 33-1-5	Gravel d/,e/	All	Open Cut	0.43	0	16
117.85	Morris Taylor Dr	Dirt d/,e/,f/	All	Open Cut	1.71	1.78	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
118.25	Morris Taylor Dr	Dirt d/,e/,f/	All	Open Cut	0.09	0	16
118.57	Morris Taylor Dr	Dirt d/,e/,f/	All	Open Cut	0.23	0	16
118.79	Morris Taylor Dr	Dirt d/,e/,f/	All	Open Cut	0.66	0	16
118.93	West Fork Creek Trail Rd	Paved	All-Public	Open Cut	0.55	0	30
119.03	Cabin Canyon Rd (Trail Creek Spur- BLM 33-1-29.2	Dirt d/	All	Open Cut	1.14	0	14
119.7	Cabin Canyon MI - BLM33-1-29.1	Dirt d/	All	Open Cut	1.17	0	16
120.05	Unknown Rd	Dirt d/	All	Open Cut	0.60	0	14
120.28	Cabin Creek Ridge BLM33-1-28	Dirt d/	All	Open Cut	1.1	0	14
120.45	Unknown	Dirt	All	Open Cut	0.10	0	14
120.55	Loper Ln	Dirt/Gravel d/,e/	All	OFF ROW	0.05	0	16
120.55	Loper Ln	Dirt/Gravel d/,e/	All	Open Cut	0.31	0	16
120.85 - 120.91	Private Dr	Dirt/Gravel d/,e/	All	Open Cut	0.62	0	16
121.8	Unknown Rd	Dirt/Gravel c/d/,e/	All	Open Cut	0.59	0	10
122.05	Private Rd	Gravel	All	Not Crossed	0.3	0	16
122.36	Private Rd	Dirt d/,e/,f/	All	HDD	0.31	0.01	16
122.54	Ragsdale Rd	Paved	All-Public	HDD	0.59	0	16
122.58	Old Trail Creek Rd.	Gravel, Paved d/,e/	All-Public	HDD	1.23	0	16
122.6	State Hwy 62	Paved, Concrete	All-WTC-Public	HDD	0.50	0	10
122.76	2500-3013 Old Ferry Rd	Gravel d/,e/	All-WTC	HDD	0.08	0	16
122.99	2500-3013 Old Ferry Rd	Gravel d/,e/,f/	All-WTC	Open Cut	0.58	0	16
123.08	Old Ferry – BLM 34-1-10	Gravel d/,e/,f/	All-WTC	Open Cut	1.71	0.26	14
123.08	Old Ferry – BLM 34-1-10	Gravel d/,e/,f/	All-WTC-Public	Open Cut	1.38	0.26	14
124	Flounce Rock Comm Site	Gravel	All	OFF ROW-COMM SITE	4.58	0	14
124.97 - 125.13	Indian Creek Firebreak BLM 34-1-23	Gravel d/,e/,f/	All	Open Cut	2.40	0.68	10
125.40 - 125.56	Indian Creek Firebreak - BLM 34-1-23	Dirt, Rock d/,e/	Light	Open Cut	0.79	0	10
125.87	Indian Creek Firebreak - BLM 34-1-23	Dirt, Rock d/,e/	Light	Open Cut	0.4	0	10
126.27 - 126.59	Indian Creek Firebreak - BLM 34-1-23	Dirt, Rock d/,e/	Light	Open Cut	0.67	0	10
126.64	Unknown Rd	Dirt c/d/,e/	All	Open Cut	0.08	0	10
127.3	Indian Creek Firebreak - BLM 34-1-23	Dirt, Rock d/,e/	All	Open Cut	2.43	0	10
127.3	Indian view - BLM 34-1E-20	Dirt, Rock d/,e/	All	OFF ROW	0.49	0	10
128.06 - 128.17	BLM Rd 34-1W-23.5	Dirt d/,e/,f/	All	In ROW	0.62	4.2	16
128.38	Unknown	Dirt	None	Open Cut	0.39	0	16
128.68	Reese Creek Spur – BLM 034-1E-30.2	Dirt d/,e/,f/	All	OFF ROW	0.38	0.2	14

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
128.68	Reese Creek Spur – BLM 034-1E-30.3	Dirt d/,e/,f/	All	OFF ROW	0.55	0.2	14
129	Indian Lake Reservoir Access	Gravel	All	OFF ROW	1.51	0	10
129.28	Reese Creek Spur - BLM034-1E-30.1	Dirt d/,e/,f/	All	Open Cut	1.12	0.79	14
129.28	Reese Creek Spur – BLM 034-1E-32	Dirt d/,e/	All	OFF ROW	1.17	0.79	14
129.67	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	1.11	0.5	16
129.9	Powerline Rd	Dirt	None	Open Cut	0.13	0	16
130.23	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.75	0.5	16
130.81	Crowfoot Rd	Paved	All-WTC-Public	Open Cut	0.04	0	16
Spread 4: MPs 132.10 – 188.00 6							
132.47	Butte Falls Hwy	Paved	All-WTC-Public	Open Cut	0.52	0	16
133.34	Private Dr	Gravel d/	All	Open Cut	1.05	0	16
133.36	Unknown	Dirt	None	Bore	0.15	0	16
133.47	Medford Aqueduct	Dirt	None	Open Cut	0.06	0	16
133.55	Unknown	Dirt	None	Open Cut	0.10	0	16
133.59	Medford Aqueduct Access Rd - BLM 34-1E-35	Dirt d/,e/	All	Open Cut	1.79	0	16
133.98 - 134.14	Unknown Rd	Dirt	None	In ROW	0.21	0	16
134.14	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	1.8	0.5	16
134.27	Unknown Rd	Dirt d/,e/	All	Open Cut	0.24	0	16
134.65	Obenchain R/W - BLM35-1E-11.1	Dirt d/,e/	All	Open Cut	0.75	0	16
134.65	OBENCHAIN R/W - BLM35-1E-18	Dirt d/,e/	All	OFF ROW	2.07	0	16
134.87	Unknown Rd	Dirt d/,e/	All	Open Cut	0.25	0	16
135.53	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.81	0.29	16
136.13	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.92	0.33	16
136.3	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.22	0.08	16
136.46	Unknown Rd	Dirt d/,e/,f/	All	OFF ROW	0.41	0.15	16
136.46	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.26	0.15	16
136.84	Geppert Butte Spur W - BLM 35-1E-13.1	Dirt d/,e/,f/	All	Open Cut	0.51	0.15	15
137.14	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.21	0.08	16
137.3	Obenchain Rd	Gravel, Paved d/	All-Public	Open Cut	0.23	0	16
138.08	Terbeck Existing Access	Dirt d/,e/,f/	All	Open Cut	0.20	0.08	16
138.63	BLM 35-1E-13	Dirt d/,e/	All	OFF ROW	0.64	0.08	16
138.63	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.83	0.08	16
139.06	Unknown Rd	Dirt d/,e/	All	Open Cut	0.64	0	16
139.45	Unknown Rd	Dirt d/,e/	All	Open Cut	0.33	0	16
140.31	Unknown	Dirt	None	Open Cut	0.04	0	

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
140.63	Salt Over Rd - BLM 36-2E-7.1	Dirt	None	Open Cut	0.05	0	
140.67	Hanscom Drway – BLM 35-2E-33	Dirt d/,e/,f/	All	OFF ROW	0.65	0.41	20
140.67	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.31	0.41	20
141.45 - 141.80	Unnamed BLM Rd	Gravel	None	In ROW	0.36	0	
141.8	Salt Creek Access Rd - BLM 36-2E-7	Gravel d/,e/	All	Open Cut	2.15	0	20
142.09	Unknown Rd	Dirt d/,e/	All	Open Cut	0.07	0	16
142.59	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.52	0.33	16
142.8	Unknown Rd	Dirt c/d/,e/	All	Open Cut	0.42	0	
143.64	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	2.48	0.07	16
144.06	Unknown Rd	Dirt c/d/,e/,	All	Open Cut	1.32	0	16
144.69	Salt Creek Rd - BLM 36-2E-19	Dirt	All	Open Cut	1.62	0	14
145.15	Salt Creek Rd (Gardner Road) BLM 36-2E-19	Gravel	All	Not Crossed	1.13	0	14
145.2	Private Rd	Gravel	All	Open Cut	0.69	0	16
145.38	Private Rd	Gravel	All	Open Cut	0.52	0	16
145.58	Lake of the Woods - State Hwy 140	Paved	All-Public	Bore	0.14	0	16
145.98	Unknown Rd	Dirt d/,e/	All	Open Cut	0.06	0	16
146.2	Unknown Rd	Dirt d/,e/	All	Open Cut	0.32	0	16
146.81	Hanley South Canal Rd	Dirt d/,e/	All	Open Cut	2.63	0	14
147	Private Dr	Gravel	All	OFF ROW	0.07	0	10
147.68	Unknown Rd	Gravel d/,e/	All	Open Cut	1.12	0	16
147.76 - 148.00	Unknown Rd	Dirt	All	Open Cut	0.5	0	10
148	Private Dr	Gravel	All	OFF ROW	0.15	0	10
150.15	Heppsie Mtn B Spur - BLM 37-2E-1	Gravel d/,e/,f/	All	OFF ROW	0.59	0.31	16
150.15	Heppsie Mtn B Spur - BLM 37-2E-1	Gravel d/,e/,f/	All	Open Cut	0.33	0.31	16
150.25 - 150.64	Heppsie Mtn Quarry Spur- BLM 37-2E-1.3 - (includes BLM 37-2E-1.1)	Gravel d/,e/	All	Open Cut	2.24	0	16
150.35 - 150.64	Heppsie Mtn Quarry Spur- BLM 37-2E-1.3 - (includes BLM 37-2E-1.1)	Gravel d/,e/	All	OFF ROW	1.64	0	18
150.98 - 151.57	BLM 37-3E-6.10	Dirt d/,e/	All	In ROW	0.55	0	16
151.56	BLM 37-3E-6.10	Dirt d/,e/	All	Open Cut	0.19	0	14
151.68	Unknown Rd	Dirt d/,e/	All	Open Cut	0.08	0	16
151.77	Unknown Rd	Dirt d/,e/	All	Open Cut	0.13	0	16
152.06 - 152.14	BLM 37-3E-6.10	Dirt d/,e/	All	In ROW	0.42	0	14
152.08 - 152.31	Unknown Rd	Dirt	All	Open Cut	0.22	0	10

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
152.31	Heppsie Mtn Pond Spur - BLM 37-3E-6.3	Dirt	All	Open Cut	0.07	0	14
152.38	Heppsie Mtn Stub Spur - BLM 37-3E-6.4	Dirt	All	Open Cut	1.71	0	14
152.56	Heppsie Mtn Mainline - BLM 37-3E-31	Gravel d/,e/	All	Open Cut	1.44	0	18
152.99	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.78	0.27	12
153.52	Heppsie Mtn Ridge Top Spur - BLM 37-3E-5.2	Dirt d/,e/	All	Open Cut	0.17	0	12
153.8	Heppsie Mtn Mainline - BLM 36-3E-31	Gravel d/,e/	All	Open Cut	0.22	0	18
155.03	Unknown Private Rd	Dirt d/,e/	All	Open Cut	0.37	0	14
155.45	Unknown Private Rd	Dirt d/,e/	All	Open Cut	0.32	0	14
155.50 - 155.97	FS 2815410	Dirt, Gravel d/,e/,f/	All	In ROW	1.43	0.42	14
155.98	FS 2815415	Dirt	None	Open Cut	0.33	0	14
156.32	FS 2815415	Dirt	None	Open Cut	0.21	0	14
156.77	FS 2815000	Gravel d/,e/	All	Open Cut	6.81	0	16
157.4	FS-2815320	Decommissioned d/,e/,f/	All	Open Cut	0.06	0.1	14
157.55	FS-2815300	Gravel d/,e/	All	Open Cut	2.80	0	14
158.72 - 159.41	FS 3707500	Gravel d/,e/	All	In ROW	2.71	0	16
159.99 - 160.62	S. Fk Little Butte Creek Rd - FS 3730	Dirt/Gravel d/,e/	All	In ROW	1.97	0	20
160	Robinson Butte Comm Site -FS 3730050	Gravel	All	OFF ROW-COMM SITE	1.92	0	16
160.09	FS 3730180	Dirt	None	Open Cut	0.02	0	
160.41	FS 3730090	Decommissioned	None	Open Cut	0.05	0	
160.59	FS 3730070	Decommissioned	None	Open Cut	0.02	0	
160.62 - 160.73	FS 3700133	Rock d/,e/	All	In ROW	0.15	0	14
160.76	FS 3700134 (Big Elk Cinder Pit)	Rock d/,e/	All	Open Cut	0.48	0	14
160.76 - 160.91	FS 3700130	Gravel d/,e/	All	Open Cut	0.70	0	18
160.85	FS 3700130	Gravel d/,e/	All	Open Cut	0.02	0	18
161	FS 2800700	Gravel	All	OFF ROW	1.00	0	14
161.26	FS 3700131	Dirt d/,e/	All	Open Cut	0.23	0	12
161.41	FS 099	Aggregate	All	OFF ROW	0.52	0	
161.41	Rum Rye Rd FS 3740000	Aggregate	All	OFF ROW	1.19	0	
161.41	Scotch Rd FS 100	Aggregate	All	OFF ROW	0.77	0	
161.41	Big Elk Rd FS 3700000	Gravel d/	All	OFF ROW	3.05	0	16
161.41	Big Elk Rd FS 3700000	Paved	All	Open Cut	5.10	0	16
161.41	FS 3707000	Gravel (cinder)	All	OFF ROW	3.31	0	16
162	FS 2800800	Gravel	All	OFF ROW	0.70	0	18
162.02	FS 3705080 (Decommissioned)	Dirt	None	Open Cut	0.03	0	

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
162.80 - 162.90	FS 3700113	Dirt d/,e/	All	In ROW	0.55	0	14
163.14	FS 3700100	Gravel d/,e/	All	Open Cut	0.96	0	16
163.14 - 163.21	FS 3700115	Unknown	None	In ROW	0.14	0	
163.79 - 164.21	FS 3720180	Decommissioned	None	Open Cut	0.44	0	
163.95	FS 3720185	Decommissioned	None	Open Cut	0.04	0	
164.21 - 165.93	FS 3720000	Gravel d/	All	Open Cut	3.53	0	16
164.3	FS 3720190	Decommissioned	None	Open Cut	0.04	0	
164.4	FS 3720200	Decommissioned	None	Open Cut	0.04	0	
165.47	FS 3720480	Decommissioned	None	Not Crossed	0.04	0	
165.68	FS 3705000	Dirt	All	Open Cut	4.52	0	20
165.72	FS 3720500	Gravel d/	All	Not Crossed	0.20	0	16
166.1	Brown Mtn Rd – FS3720510	Decommissioned d/,e/,f/	All	Open Cut	0.31	0.48	14
Klamath County							
166.45	FS 3720520	Gravel d/,e/	All	Open Cut	0.78	0	16
167.31	FS 3720000 Daley Creek Rd	Gravel d/,e/	All	Open Cut	3.22	0	16
167.51 - 167.69	FS 3720820	Dirt	None	Open Cut	0.36	0	
168.28 - 168.68	West Muddy Springs FS3700750	Gravel d/	All	In ROW	0.91	0	14
168.42	FS 3700754	Dirt	None	Open Cut	0.09	0	
168.84	Dead Indian Memorial Rd	Paved	All-WTC-Public	Open Cut	2.27	0	10
168.85	FS 3700240	Paved	All	OFF ROW	0.54	0	10
168.92	FS 3800991	Dirt	None	Open Cut	0.35	0	
169.1	FS 3800990	Dirt	None	Open Cut	0.37	0	
169.34	FS 3800996	Dirt	None	Open Cut	0.19	0	
169.48	Unknown Rd	Dirt/Gravel	All	Open Cut	0.07	0	10
169.52 - 170.96	Clover Creek Rd – Co Rd 603	Paved	All-Public	Not Crossed	21.37	0	10
169.75	Unknown Rd	Dirt/Gravel	None	Open Cut	0.08	0	10
170.85	FS 3800960	Dirt d/,e/	All	Open Cut	0.03	0	14
170.97	FS Unauthorized Rd	Dirt d/,e/	All	Open Cut	0.03	0	10
171.09	FS 3800950 Spencer Creek Quarry	Dirt d/,e/	All	Open Cut	0.07	0	14
171.41	Private Rd.	Dirt d/,e/	All	Open Cut	0.16	0	16
171.6	FS 3800940	Dirt d/,e/	All	Open Cut	0.18	0	16
172.08	FS 3800900	Dirt d/,e/	All	Open Cut	0.11	0	14
172.24 - 172.31	FS 3800903	Dirt c/d/,e/	All	Open Cut	0.21	0	14
172.57	FS 3850 (Desolation)	Gravel d/,e/	All	Open Cut	0.14	0	16
172.8	Unknown Rd	Dirt	All	Open Cut	0.06	0	
173.02	BLM 38-5-12 (Non Inv)	Dirt d/,e/	All	Open Cut	0.04	0	16
173.79	FS 3800820	Dirt	All	Open Cut	0.11	0	14
174.17	FS 3800790	Gravel d/,e/	All	Open Cut	0.19	0	14
174.68	FS 3852 (Buck Peak)	Gravel d/,e/	All	Open Cut	0.04	0	16
175.38 - 175.47	3852015	Dirt d/,e/	All	Open Cut	0.18	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
175.64 - 176.02	Unknown Rd	Dirt	All	In ROW	0.52	0	16
176.36	Private Rd (Closed Berm)	Dirt d/,e/	All	Open Cut	0.03	0	16
176.66	BLM 38-6E-21.2 (N. Clover)	Rock d/,e/	All	Open Cut	0.06	0	14
177.1	Private Rd (Section 21)	Rock d/,e/	All	Open Cut	0.03	0	16
177.81	BLM 38-6E-27.1 (Clover Spur)	Rock d/,e/	All	Open Cut	0.05	0	14
177.99	Rock Rd2 (Section 27)	Rock d/,e/	All	Open Cut	0.03	0	16
178.26 - 178.28	Private Rd	Gravel d/,e/	All	In ROW	0.38	0	16
178.3	BLM 38-6E-27 Weyco Clover Spur	Gravel d/,e/	All	Open Cut	0.18	0	14
178.76	Private Rd	Rock d/,e/	All	Open Cut	0.56	0	16
179.25	BLM 38-6E-35.4 (S Clover Butte)	Rock d/,e/	All	Open Cut	0.04	0	14
179.81	BLM 38-6E-35 (3828Clover Butte)	Rock d/,e/	All	Open Cut	0.03	0	14
180.36	206-59 (Private Rd)	Gravel d/,e/	All	Open Cut	0.04	0	16
180.79	Private Rd	Rock d/,e/	All	Open Cut	2.87	0	16
181	Private Rd	Dirt d/,e/	All	Open Cut	0.14	0	16
181.33	Private Rd	Dirt d/,e/	All	Open Cut	0.41	0	16
181.55	Private Rd	Dirt d/,e/	All	Open Cut	0.03	0	16
182.13	Private Rd	Gravel (cinder) d/,e/	All	Open Cut	0.07	0	16
182.16	Private Rd	Gravel (cinder) d/,e/	All	Open Cut	0.45	0	16
182.49	201-50 - Private Rd	Rock d/,e/	All	Open Cut	0.60	0	16
182.98	201-50 - Private Rd	Rock d/,e/	All	Open Cut	0.58	0	16
183.6	201-50 - Private Rd	Rock d/,e/	All	Open Cut	0.30	0	16
183.64	North Branch Rd – County 3451	Rock d/,e/	All	Open Cut	0.02	0	16
183.79	Unknown Rd	Dirt d/,e/	All	Open Cut	0.03	0	16
184.07	Unknown Rd	Dirt/Cinder d/,e/	All	Open Cut	0.10	0	16
184.81	Hwy 66	Paved	All-Public	OFF ROW	0.47	0	
184.81	Private Rd 101-100 - BLM 39-9E-18	Gravel d/,e/	All	OFF ROW	2.04	0	16
184.81	Private Rd 85105	Gravel d/,e/	All	Open Cut	0.05	0	16
184.81	Private Rd UST-100	Gravel d/,e/	All	OFF ROW	3.46	0	16
184.81	Keno Acces (BLM 39-7E-31)	Paved	All	OFF ROW	0.88	0	22
185.26	Unknown Rd	Gravel (cinder) d/,e/	All	Open Cut	0.03	0	16
185.53	Unknown Rd	Gravel (cinder) d/,e/	All	Open Cut	0.02	0	10
185.68	Unknown Rd	Gravel (cinder) d/,e/	All	Open Cut	0.04	0	16
185.94	Unknown Rd	Dirt d/,e/	All	Open Cut	0.03	0	16
186.2	Unknown Rd	Dirt d/,e/	All	Open Cut	0.03	0	10
186.75	Unknown Rd	Dirt d/,e/,f/	All	Open Cut	0.03	0	16
187.46	Unknown Rd - PAR187.46 (BVA 13)	Gravel	All	Open Cut	0.09	0	16
187.76	Power Line Access Road	Dirt	All	Open Cut	0.83	0	16
187.84	Unknown Rd	Dirt	All	Open Cut	0.05	0	

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
Spread 5: MPs 188.00 – 230.91 6							
188.09	Unknown Rd	Dirt	All	Open Cut	0.09	0	
188.17	Unknown Rd	Dirt	All	Open Cut	0.35	0	
188.41	Unknown	Dirt	All	Open Cut	0.19	0	
188.86	Unknown Rd	Dirt c/,d/,e/	All	Open Cut	0.40	0	
189.9	Old Wagon Rd	Dirt	All	OFF ROW	1.19	0	10
190.63	Homestead Ln	Dirt d/	All	Open Cut	1.09	0	16
192.03	Hwy 66	Paved	All-Public	Open Cut	6.32	0	10
192.13	Rd on Levee	Gravel d/,f/	All	Open Cut	0.51	0	16
192.57 - 197.61	Weyerhaeuser Timber Company Rd	Paved c/	All	Not Crossed	5.46	0	16
192.571	Weyerhaeuser Timber Company Rd	Paved c/	All	OFF ROW	0.23	0	16
194.52	Kerns Swamp Rd	Gravel d/	All	Open Cut	0.18	0	16
195.14	Unknown Rd	Dirt	All	Open Cut	0.04	0	10
197.61	Weyerhaeuser Corp Rds	Paved	All	Open Cut	0.2	0	16
198.22 - 198.42	Weyerhaeuser Corp Rd	Paved	All	Open Cut	1.33	0	16
198.42 - 199.00	Weyerhaeuser Corp Rds	Gravel	All	In ROW	0.71	0	16
198.63	Weyerhaeuser Corp Rd	Paved	All	Open Cut	0.23	0	16
199.19	Unknown Industrial Rd	Gravel	All	Not Crossed	0.94	0	16
199.28	BN & SF Railroad	Rails	None	HDD	0.26	0	
199.57	Hwy 97	Paved	All-Public	HDD	0.92	0	10
199.6	Private Rd	Gravel	All	Not Crossed	0.07	0	16
200.07	Southern Pacific RR	Rails	None	Bore	0.25	0	
200.35	Joe Wright Rd	Paved	All-Public	Open Cut	1.12	0	16
201	Midland Hwy - Tingley Ln	Paved	All-Public	Open Cut	0.78	0	10
201.49	Miller Island Rd/Drway	Gravel d/,f/	All	Open Cut	0.64	0.07	16
202.92-203.61	Unknown Rd	Dirt	None	In ROW	0.95	0	
203.76	Unknown Rd	Dirt	None	Open Cut	0.19	0	
203.97	Old Midland Rd/Drway	Paved	All-Public	Open Cut	1.03	0	10
204.13	Rd on Levee - BOR 735	Dirt d/	All	Open Cut	0.25	0	16
204.32	Road on Levee - BOR736	Dirt d/	All	Open Cut	0.34	0	16
204.65	Spring Lake Rd - CoRd876	Paved	All-Public	Open Cut	0.51	0	10
204.75	Existing Field/Canal Rd - BOR 737	Dirt d/	All	Open Cut	0.14	0	16
204.99	Existing Farm Rd - BOR738	Dirt d/	All	Open Cut	0.12	0	16
205.07	Existing Field/Canal Rd - BOR 738	Dirt d/	All	Not Crossed	0.33	0	16
205.39	Existing Field Rd - BOR	Dirt d/	All	Open Cut	0.25	0	16
205.64	Existing Field Rd - BOR739	Dirt d/	All	Open Cut	0.16	0	16
205.72	Homedale Rd – Co Rd 830	Paved	All-Public	Open Cut	1.1	0	10
205.97	Rd on Levee	Dirt	None	Open Cut	0.64	0	

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
206.5	Cross Rd	Paved	All-Public	Open Cut	1.17	0	10
207.27	Matney Rd – Co Rd 889	Paved	All-Public	Open Cut	1.01	0	10
207.41	Levee Rd – Co Rd 962	Gravel d/	All-Public	Open Cut	0.22	0	16
207.7	Unknown Rd	Gravel d/	All	Not Crossed	0.21	0	16
207.98	Rd on Levee - BOR 742	Dirt d/	All	Not Crossed	0.16	0	16
208	Rd on Levee - BOR 742	Dirt d/	All	Not Crossed	0.03	0	16
208.17	Unknown Rd	Dirt	None	Open Cut	0.03	0	
208.18	Unknown Rd	Dirt/Gravel d/	All	Open Cut	0.18	0	16
208.72	TAR-208.72 to TEWA208.67-W	Dirt d/	All		0.16	0	16
208.78	Southern Pacific RR	Rails	None	Bore	0.07	0	
208.8	State Hwy 39	Paved	All-Public	Bore	5.1	0	10
209	Stukel Mountain Comm Site	Gravel	All	OFF ROW-COMM SITE	6.66	0	14
209.04	Cheyne/Elliot Rd	Paved	All	Open Cut	0.09	0	
209.14	Matney Rd – Zuckerman Rd	Paved	All-Public	Open Cut	0.41	0	
210.16	Wong Rd – Co Rd 918	Paved	All-Public	Open Cut	0.91	0	16
210.27	Rd on Levee - BOR 743	Dirt d/	All	Open Cut	0.26	0	16
210.63	Chin Rd – Co Rd 982	Gravel d/	All-Public	Open Cut	0.31	0	16
210.86	17987 Hwy 39 – Driveway BOR 744	Gravel d/	All	Open Cut	0.04	0	16
211.2	18191 Hwy 39 – Driveway BOR 745	Gravel d/	All	Open Cut	0.06	0	16
211.53 - 211.86	IOOF Cemetery Rd- Co Rd 988	Gravel d/	All-Public	Not Crossed	0.69	0	16
211.86	Private Dr	Dirt d/	All	Open Cut	0.04	0	16
212.52	Burlington Northern & Santa Fe RR	Rails	None	Bore	0.05	0	
213.05	Gaston Drway (off Hill Rd) - BOR 746	Gravel d/	All	Open Cut	0.83	0	16
213.25	Rd on Levee	Dirt	None	Open Cut	0.14	0	
214.05	Road on Levee	Dirt	All	Open Cut	0.03	0	
214.17	Road on Levee	Dirt	None	Open Cut	0.15	0	
214.31	Hill Rd – Co Rd 566	Paved	All-Public	Open Cut	1.86	0	10
214.7	Private Dr (BOR 747)	Gravel d/	All	Not Crossed	0.23	0	16
215.06	Unknown Rd	Dirt d/	All	Open Cut	0.10	0	16
215.13	Unknown Rd	Dirt	None	Open Cut	0.05	0	
215.39 - 215.65	Powerline Access Rd	Dirt	All	Open Cut	3.00	0	16
215.72	Taylor Rd	Dirt	All	Not Crossed	0.37	0	10
217.5	Unknown Rd	Dirt d/	All	Open Cut	0.43	0	16
217.54	Unknown Rd	Dirt d/	All	Open Cut	0.04	0	16
217.82	Patricia Ln	Gravel d/	All	Open Cut	0.04	0	16
217.84	Unknown Rd	Gravel d/	All	Open Cut	0.04	0	16
217.93	Dodds Hollow Rd	Gravel d/	All-Public	Open Cut	1.93	0	16

TABLE D-2

Access Roads to and Roads Crossed by the PCGP Project

Milepost	Name	Surface	Ingress/Egress a/	Crossing Method	Length	Acres of Improvement	Average Width
218.31	Unknown Rd	Gravel d/	All	Open Cut	0.15	0	16
218.84	Pope Rd	Dirt, Paved, Gravel d/,f/	All-Public	Open Cut	3.09	0.02	16
218.84 - 218.90	Private Dr	Gravel d/	All	Not Crossed	0.07	0	16
218.90 - 221.28	Powerline Access Rd	Dirt d/,f/	All	Open Cut	3.14	0.79	16
219.36	Unknown Rd	Dirt c/,d/,e/	All	Open Cut	0.50	0	16
219.59	Unknown Rd	Dirt c/,d/,e/	All	Open Cut	1.28	0	16
219.66	Unknown Rd	Dirt c/,d/,e/	All	Open Cut	0.18	0	16
221.29	Powerline Access Rd	Dirt d/	All	Open Cut	0.51	0	16
221.56	Unknown Rd	Dirt d/	All	Open Cut	0.24	0	16
221.85	Unknown Rd	Dirt d/	All	Open Cut	0.46	0	16
221.99	Harpold Rd	Paved	All-Public	Open Cut	0.85	0	10
223.17	29029 Pickett	Gravel d/,f/	All	Open Cut	0.49	0.12	16
223.43	Shasta View Irrigation	Dirt d/,f/	All	Open Cut	0.49	0.03	16
223.68	UKNOWN RD	Dirt	None	Open Cut	0.05	0	
223.82	30083 Pickett	Dirt, Gravel d/,f/	All	Open Cut	0.48	0.12	16
223.95	30403 Pickett	Dirt	None	Open Cut	0.05	0	
224.19	Unknown Rd	Dirt	None	Open Cut	0.05	0	
224.53	Unknown Rd	Dirt d/	All	Open Cut	0.80	0	16
225.14	Maupin Rd	Paved	All-Public	Open Cut	2.40	0	16
225.14	Pickett Rd	Paved	All-Public	OFF ROW	2.79	0	16
225.31	Unknown Rd	Dirt	None	Open Cut	0.04	0	
225.92	Unnamed Rd	Dirt d/	All	Open Cut	1.58	0	16
226.4	Unnamed Rd	Dirt d/	All	OFF ROW	0.50	0	16
226.4	Unnamed Rd	Dirt d/	All	Open Cut	0.75	0	16
227.03	Transformer Rd	Paved	All-Public	Open Cut	1.00	0	16
227.63	More Lock Rd	Gravel d/	All	Open Cut	0.52	0	16
227.74	More Lock Rd	Gravel d/	All	Open Cut	0.23	0	16
227.88	More Lock Rd	Gravel d/	All-Public	Open Cut	0.25	0	16
228.36	Malin Loop Rd	Paved	All-Public	OFF ROW	0.44	0	16

a/ The type of equipment which will use the access roads is represented in the Ingress/Egress column with “All” meaning both heavy and light equipment; “All-WTC” meaning heavy and light with traffic control; and “Light” meaning light duty trucks and low profile equipment.
b/ Roads on either side of spread breaks may be used for access on either spread.
c/ Requires pothole filing.
d/ Requires blading/grading.
e/ Requires brush limbing.
f/ Requires widening and/or turnouts.

TABLE D-3

Potential Hydrostatic Discharge (Test Header) Locations within the Construction Right-of-Way

Test Section a/	HUC (Begin MP)	HUC (Ending MP)	Begin MP b/	End MP	Section Length c/ (feet)	Volume d/, e/ (gallons/acre feet)	Jurisdiction f/
1	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	1.47R	4.17R	14,045	694,074 (2.13)	Private
1a	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	4.17R	8.33R	23,443	1,158,530 (3.56)	Private
1b	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	8.33R	11.34R	14,626	722,776 (2.22)	Private
1c	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	11.34R	12.79	15,840	782,790 (2.40)	Private
3	Coos Bay Frontal Pacific Ocean 1710030403	N. F. Coquille River 1710030504	12.79	21.08	43,771.20	2,133,712 (6.55)	Private
4	N. F. Coquille River 1710030504	E. F. Coquille River 1710030503	21.08	28.31	38,174.40	1,896,299 (5.82)	Private
5	E. F. Coquille River 1710030503	E. F. Coquille River 1710030503	28.31	30.91	13,728.00	718,249 (2.20)	Private
6	E. F. Coquille River 1710030503	M. F. Coquille River 1710030501	30.91	35.81	25,872.00	1,252,178 (3.84)	Private
7	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	35.81	37.80	10,507.20	535,932 (1.64)	BLM-Coos
8	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	37.80	38.40	3,168.00	130,878 (0.40)	BLM-Coos
9	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	38.40	43.92	29,145.60	1,502,964 (4.61)	BLM-Coos
10	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	43.92	45.00	5,702.40	294,512 (0.90)	Private
11	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	45.00	46.74	9,240.00	444,774 (1.36)	BLM-Coos
12	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	46.74	47.08	1,584.00	81,141 (0.25)	Private
13	M. F. Coquille River 1710030501	M. F. Coquille River 1710030501	47.08	47.75	2,956.80	160,279 (0.49)	BLM-Roseburg
14	M. F. Coquille River 1710030501	Olalla / Lookingglass Creek 1710030212	47.75	52.67	26,611	1,315,088 (4.04)	BLM-Roseburg
15	Olalla / Lookingglass Creek 1710030212	Olalla / Lookingglass Creek 1710030212	52.67	53.74R	5,755	284,414 (0.87)	BLM-Roseburg
16	Olalla / Lookingglass Creek 1710030212	Olalla / Lookingglass Creek 1710030212	53.74R	55.70	10,348.80	472,622 (1.45)	Private
17	Olalla / Lookingglass Creek 1710030212	Olalla / Lookingglass Creek 1710030212	55.70	57.78R	10,982	542,735 (1.67)	Private

TABLE D-3

Potential Hydrostatic Discharge (Test Header) Locations within the Construction Right-of-Way

Test Section a/	HUC (Begin MP)	HUC (Ending MP)	Begin MP b/	End MP	Section Length c/ (feet)	Volume d/, e/ (gallons/acre feet)	Jurisdiction f/
18	Olalla / Lookingglass Creek 1710030212	Olalla / Lookingglass Creek 1710030212	57.78R	60.89	16,421	811,493 (2.49)	Private
19	Olalla/ Lookingglass Creek 1710030212	Clark Branch – South Umpqua 1710030211	60.89	63.75	15,100.80	779,356 (2.39)	BLM-Roseburg
20	Clark Branch – South Umpqua 1710030211	Clark Branch – South Umpqua 1710030211	63.75	65.60	9,768.00	467,814 (1.44)	Private
21	Clark Branch – South Umpqua 1710030211	Clark Branch – South Umpqua 1710030211	65.60	69.12	19,536.00	851,481 (2.61)	Private
22	Clark Branch – South Umpqua 1710030211	Clark Branch – South Umpqua 1710030211	69.12	70.80	7,920.00	493,006 (1.51)	Private
23	Clark Branch – South Umpqua 1710030211	Myrtle Creek 1710030210	70.80	73.41	13,780.80	731,272 (2.24)	Private
24	Myrtle Creek 1710030210	Myrtle Creek 1710030210	73.41	73.54	686.40	33,921 (0.10)	Private
25	Myrtle Creek 1710030210	Myrtle Creek 1710030210	73.54	75.99	12,936.00	395,688 (1.21)	Private
26	Myrtle Creek 1710030210	Myrtle Creek 1710030210	75.99	76.21	1,161.60	93,162 (0.29)	Private
27	Myrtle Creek 1710030210	Myrtle Creek 1710030210	76.21	77.94	9,134.40	447,779 (1.37)	Private
28	Myrtle Creek 1710030210	Myrtle Creek 1710030210	77.94	79.01	5,649.60	290,505 (0.89)	Private
29	Myrtle Creek 1710030210	Myrtle Creek 1710030210	79.01	79.80	4,171.20	206,135 (0.63)	Private
30	Myrtle Creek 1710030210	Myrtle Creek 1710030210	79.80	80.71	4,804.80	275,479 (0.85)	BLM-Roseburg
31	Myrtle Creek 1710030210	Myrtle Creek 1710030210	80.71	81.62	7,867.20	420,732 (1.29)	Private
32	Myrtle Creek 1710030210	Days Creek-South Umpqua River 1710030205	81.62	83.80	8,448.00	433,755 (1.33)	BLM-Roseburg
33	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	83.80	88.11	22,756.80	1,108,929 (3.40)	Private
34	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	88.11	89.17	5,596.80	320,558 (0.98)	Private
35	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	89.17	90.01	4,435.20	219,181 (0.67)	Private
36	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	90.01	92.27	11,932.80	620,079 (1.90)	BLM-Roseburg
37	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	92.27	92.75	2,534.40	125,246 (0.38)	Private
38	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	92.75	93.09	1,795.20	120,209 (0.37)	Private

TABLE D-3

Potential Hydrostatic Discharge (Test Header) Locations within the Construction Right-of-Way

Test Section a/	HUC (Begin MP)	HUC (Ending MP)	Begin MP b/	End MP	Section Length c/ (feet)	Volume d/, e/ (gallons/acre feet)	Jurisdiction f/
39	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	93.09	93.91	4,329.60	279,486 (0.86)	Private
40	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	93.91	95.52R	8,659	427,925 (1.31)	BLM-Roseburg
41	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	95.52R	96.27	4,066	200,916 (0.62)	BLM-Roseburg
42	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	96.27	100.71	23,443.20	1,169,034 (3.59)	Private
43	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	100.71	101.50	4,171.20	206,135 (0.63)	Private
44	Days Creek-South Umpqua River 1710030205	Upper Cow Creek 1710030206	101.50	103.95	12,936.00	716,246 (2.20)	USFS-Umpqua
45	Upper Cow Creek 1710030206	Elk Creek / S. Umpqua 1710030204	103.95	107.09	16,579.20	836,455 (2.57)	Private
46	Elk Creek / S. Umpqua 1710030204	Upper Cow Creek 1710030206	107.09	110.36R	17,266	853,241 (2.62)	USFS-Umpqua
47	Upper Cow Creek 1710030206	Trail Creek 1710030706	110.36R	112.54	11,510	568,828 (1.75)	USFS-Umpqua
48	Trail Creek 1710030706	Trail Creek 1710030706	112.54	115.13	13,675.20	716,246 (2.20)	USFS-Umpqua
49	Trail Creek 1710030706	Trail Creek 1710030706	115.13	117.68	13,464.00	639,112 (1.96)	BLM-Medford
50	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	117.68	122.23	24,024.00	1,231,142 (3.80)	BLM-Medford
51	Shady Cove - Rogue River 1710030707	Shady Cove - Rogue River 1710030707	122.23	123.73	7,920.00	343,598 (1.05)	Private
52	Shady Cove - Rogue River 1710030707	Shady Cove - Rogue River 1710030707	123.73	127.36	19,166.40	996,734 (3.06)	BLM-Medford
53	Shady Cove - Rogue River 1710030707	Big Butte Creek 1710030704	127.36	132.05	24,763.20	1,223,762 (3.76)	Private
54	Big Butte Creek 1710030704	Big Butte Creek 1710030704	132.05	133.85	9,504.00	480,836 (1.48)	Private
55	Big Butte Creek 1710030704	Little Butte Creek 1710030708	133.85	141.00	37,752.00	1,898,302 (5.83)	Private
56	Little Butte Creek 1710030708	Little Butte Creek 1710030708	141.00	147.74	38,385.60	1,896,962 (5.82)	BLM-Medford
57	Little Butte Creek 1710030708	Little Butte Creek 1710030708	147.74	148.93	3,484.80	172,214 (0.53)	Private
58	Little Butte Creek 1710030708	Little Butte Creek 1710030708	148.93	151.40	13,041.60	644,497 (1.98)	BLM-Medford
59	Little Butte Creek 1710030708	Little Butte Creek 1710030708	151.40	155.44	21,331.20	1,054,158 (3.24)	BLM-Medford
60	Little Butte Creek 1710030708	Little Butte Creek 1710030708	155.44	160.12	24,710.40	1,071,865 (3.29)	Private

TABLE D-3

Potential Hydrostatic Discharge (Test Header) Locations within the Construction Right-of-Way

Test Section a/	HUC (Begin MP)	HUC (Ending MP)	Begin MP b/	End MP	Section Length c/ (feet)	Volume d/, e/ (gallons/acre feet)	Jurisdiction f/
61	Little Butte Creek 1710030708	Spencer Creek 1801020601	160.12	168.60	44,774.40	2,212,687 (6.79)	USFS-Rogue River
62	Spencer Creek 1801020601	Spencer Creek 1801020601	168.60	173.10R	23,760	1,174,185 (3.60)	USFS-Winema
63	Spencer Creek 1801020601	Spencer Creek 1801020601	173.10R	177.09	21,067	1,041,111 (3.20)	USFS-Winema/ Private
64	Spencer Creek 1801020601	Lake Ewauna / Upper Klamath River 1801020412	177.16R	188.89	68,218	3,371,217 (10.35)	Private
65	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	188.89	194.05	20,961.60	1,035,892 (3.18)	Private
66	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	194.05	194.50	2,376.00	1,099,913 (3.38)	Private
67	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	194.50	197.40	15,312.00	756,697 (2.32)	Private
68	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	197.40	199.70	12,144.00	766,333 (2.35)	Private
69	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	199.70	203.91	22,228.80	1,098,516 (3.37)	Private
70	Lake Ewauna / Upper Klamath River 1801020412	Mills Creek - Lower Lost River 1801020409	203.91	208.25	22,915	1,132,437 (3.48)	Private
71	Mills Creek - Lower Lost River 1801020409	Mills Creek - Lower Lost River 1801020409	208.25	218.31	53,117	2,624,957 (8.06)	Private
72	Mills Creek - Lower Lost River 1801020409	Mills Creek - Lower Lost River 1801020409	218.31	228.13	51,850	2,562,333 (7.86)	Private Private 5
					Total f/	**62,111,304 (190.61)**	

a/ Test section locations will be finalized after final engineering design and the construction contractors have been selected for the project.
b/ Beginning and end mileposts were extrapolated from environmental alignment sheets. Mileposts were not calculated from engineering stationing and may not provide a direct correlation between milepost and engineering stationing. "R" represents a revised milepost location based on the incorporation of reroutes into the proposed route.
c/ Section length reflects actual footage calculated directly from engineering stationing.
d/ Section volumes were calculated using section length directly from engineering stationing.
e/ Estimated discharge volume – based on previous test section volume. Water will be cascaded between test sections, where practical, to fill each section to minimize test water requirements.
f/ Jurisdiction corresponds with each test section's beginning MP except Test Section 72 where jurisdiction is provided for both the beginning and ending MPs.

TABLE D-4

Areas Where Topsoil will be Salvaged along the Pacific Connector Pipeline Project

Area	Beginning MP	Ending MP
Coos County		
Wetlands/Pasture	6.22R	6.31R
Wetlands/Pasture	6.34R	6.46R
Pasture	8.31R	8.48R
Pasture	10.96R	11.06R
Wetland/Pasture	11.19R	12.39R
Wetland/Pasture	8.58	8.67
Wetland/Pasture	10.05	10.40
Wetland/Pasture	10.81	11.08
Wetland/Pasture	11.14	11.39
Residential	14.24	14.29
Wetland/Pasture	15.70	15.78
Pasture/Hayfield	22.59	23.04
Pasture/Hayfield	29.49	29.83
Pasture/Hayfield	29.87	30.14
Douglas County		
Croplands/Pasture	49.50	50.25
Croplands/Pasture	50.30	50.55
Pasture/Residential	50.72	50.82
Pasture	51.31	51.55
Pasture	51.58	51.78
Pasture/Wetlands/Residential	55.83	56.56
Pasture/Wetlands/Residential	56.77	57.10
Pasture/Wetlands/Residential	57.12	57.59
Wetlands/Pasture/Hayfield	57.61	57.83
Wetlands/Pasture/Hayfield	57.85	58.20
Wetlands/Pasture/Hayfield	58.21	58.53
Wetlands/Pasture/Hayfield	58.65	58.73
Wetlands/Pasture/Hayfield	58.79	59.60
Wetlands/Pasture/Hayfield	59.66	60.08
Pasture	60.15	60.24
Pasture/Hayfield	60.45	60.57
Pasture/Hayfield	60.58	60.66
Pasture/Hayfield	65.58	65.73
Pasture	66.88	66.94
Pasture	66.97	67.08
Pasture	69.22	69.49
Pasture	71.36	71.54
Pasture	76.41	76.47
Pasture	77.82	78.05
Pasture	79.00	79.03
Hayfield/Pasture	81.20	81.65
Pasture	88.29	88.50
Pasture	88.53	88.57
Pasture	88.61	88.70
Pasture/Wetlands	94.35	94.56
Pasture/Wetlands	94.87	95.07
Jackson County		
Pasture	118.84	118.91
Pasture	120.70	120.82
Pasture/Residential	120.84	120.90
Pasture/Hayfield	121.90	122.20
Pasture/Wetlands	128.47	128.69
Pasture	131.76	132.00
Pasture/Wetlands	132.12	132.68
Pasture/Wetlands	142.26	142.56
Pasture/Wetlands	142.58	142.66
Pasture	144.31	144.78
Pasture/Wetlands	145.05	145.95
Pasture	146.12	146.87

TABLE D-4

Areas Where Topsoil will be Salvaged along the Pacific Connector Pipeline Project

Area	Beginning MP	Ending MP
Klamath County		
Pasture/Hayfield/Wetlands	190.63	197.61
Pasture/Hayfield/Wetlands	197.74	198.21
Pasture/Croplands/Wetlands	199.60	214.67
Croplands	217.30	217.54
Pasture/Croplands	217.55	217.92
Pasture/Croplands	221.31	221.85
Pasture/Croplands	221.99	223.17
Pasture/Croplands	223.21	224.54
Pasture/Croplands	225.15	227.00
Pasture/Croplands/Residential	227.01	227.84
Wetlands [1]	See Table 2.3-1 in Resource Report 2	

a/ Up to the top 12 inches of topsoil will be segregated from the area disturbed by trenching in wetlands, except in areas where standing water or saturated soils are present.

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 1.46	41.69	Weyerhaeuser Cove Pipe Yard	Irregular	Bays and Estuaries, Beaches, Ditches, Evergreen Forest Land, Industrial, Nonforested Wetlands, Trans, Comm, Utilities Corridors	Bays and Estuaries, Beaches, Ditches, Forested Dunes, Industrial, Palustrine Emergent (PEM), Roads, Corridors	Private/State
TEWA 4.13-N	3.18	Ingress/egress, road crossing, steep slope	900 x 420 (Irregular)	Bays and Estuaries Beaches Mixed Forest Land Trans, Comm, Utilities Corridors	Bays and Estuaries Beaches Mixed Conifer/Mixed Dec Roads, Corridors	Private/State
TEWA 4.13-W	1.62	Ingress/egress, road crossing, steep slope	700 x 175 (Irregular)	Bays and Estuaries Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Bays and Estuaries Mixed Conifer/Mixed Dec Urban Roads, Corridors	Private/State
TEWA 4.29-W	1.29	PI, side cut	50 x 1145	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 4.56-N	0.34	PI, road crossing, side cut	30 x 510	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 4.63-W	2.14	PIs, road crossings, side cut	30 x 4,100	Regenerating Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	Private
TEWA 5.01-N	0.35	PIs, road crossing, side cut	20 x 645	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 5.32-N	0.3	PI, road crossing, parking	50 x 530 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 5.39-W	0.18	PI, road crossing, side cut	30 x 300	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 5.55-N	0.22	PI, road crossings, side cut	15 x 680	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 5.56-W	0.45	PI, road crossings, side cut	35 x 700	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 5.87-W	0.19	PI, road crossings, side cut	30 x 300	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 5.95-N	0.44	PI, road crossing, parking, side cut	30 x 573 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private/State
TEWA 6.00-W	1.4	PIs, side cut, steep slope	20 x 1,450 (Irregular)	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Mixed Conifer/Mixed Dec Douglas Fir Dominant - Mixed Conifer Mixed Conifer/Mixed Dec	Private/State

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 6.22-N	0.76	Ingress/egress, road crossing, bore pit, topsoil storage, Kentuck Slough	15 x 506 (Irregular)	Cropland and Pasture Streams and Canals Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Rivers and Streams Roads, Corridors	State
TEWA 6.28-W	0.69	Ingress/egress, road crossing, bore pit, topsoil storage, Kentuck Slough	155 x 200	Cropland and Pasture Streams and Canals Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Rivers and Streams Roads, Corridors	State
TEWA 6.34-N	0.8	Ingress/egress, road crossing, bore pit, topsoil storage, Kentuck Slough	15 x 668 (Irregular)	Cropland and Pasture Mixed Forest Land Streams and Canals	Agriculture Palustrine Emergent (PEM) Mixed Conifer/Mixed Dec Rivers and Streams	Private/State
TEWA 6.34-W	1.26	Ingress/egress, road crossing, bore pit, topsoil storage, Kentuck Slough	Irregular	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	State
TEWA 6.43-W	1	PIs, road crossings, side cut, steep slope	35 x 1,325 (Irregular)	Clearcut Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 6.55-N	0.13	PI, side cut	20 x 375	Clearcut Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 6.67-N	0.36	PI, road crossing, side cut	60 x 400	Clearcut Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 6.70-W	0.1	PI, road crossing, side cut	35 x 150	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 6.77-W	0.9	PIs, road crossings, side cut	15 x 2,261	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 7.20-N	2.09	PIs, road crossings, parking, side cut	300 x 785 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 7.31-W	0.08	PI, road crossing	35 x 160	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 7.40-W	0.09	PI, road crossing	35 x 152	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 7.44-W	1.91	Ingress/egress, PI, road crossing, side cut	Irregular	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 7.92-W	0.14	PIs, road crossing	35 x 206	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 8.02-N	0.28	PIs, road crossings, steep slope	15 x 811	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 8.02-W	0.42	PIs, road crossings, side cut, steep slope	15 x 1,224	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 8.31-N	0.21	Ingress/egress, road crossing, topsoil storage	15 x 625 (Irregular)	Cropland and Pasture Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	Private
TEWA 8.36-W	0.11	Hydrostatic test discharge	50 x 100	Cropland and Pasture	Agriculture	Private
TEWA 8.43-W	0.1	Ingress/egress, road crossing, topsoil storage	50 x 66	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 8.44-N	0.13	Ingress/egress, road crossing, topsoil storage	15 x 242 (Irregular)	Cropland and Pasture Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	Private
TEWA 8.45-W	1.39	PIs, road crossing, side cut, steep slope	40 x 1,568	Cropland and Pasture Mixed Forest Land Streams and Canals	Agriculture Mixed Conifer/Mixed Dec Rivers and Streams	Private
TEWA 8.73-N	0.18	PI, top of hill	50 x 160	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 8.87-W	0.09	PI, road crossing	35 x 150	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 8.94-W	0.08	PI, road crossing	30 x 150	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 8.99-W	1.75	PIs, road crossings, side cut Road crossing, waterbody crossing, side cut	30 x 2,432 15 x 208	Clearcut Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Roads, Corridors Mixed Conifer/Mixed Dec	Private
TEWA 9.44-W	2	PI, ingress/egress, road crossing, side cut	200 x 363 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 9.51-W	3.63	PIs, road crossings, side cut	35 x 3,542 (Irregular)	Regenerating Evergreen Forest Land Streams and Canals, Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	Private
TEWA 10.25-W	0.15	Road crossing, side cut	50 x 175 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 10.35-W	0.09	Road crossing, side cut	50 x 75	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 10.40-W	0.09	Road crossing, side cut	50 x 75	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 10.52-W	0.13	PI	35 x 200	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 10.71-W	1.17	PIs, road crossing, side cut, steep slope	30 x 1,841	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 11.27-N	0.98	Coos River HDD	170 x 309 (Irregular)	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 11.27-W	0.12	Coos River HDD	65 x 138	Cropland and Pasture	Agriculture	Private
TEWA 11.31-W	0.36	Ingress/egress, road crossing crossing, top soil storage	50 x 481 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 11.32-N	0.66	PI, ingress/egress, road crossing, waterbody crossing	35 x 981	Cropland and Pasture Trans, Comm, Utilities Corridors Regenerating Evergreen Forest Land	Agriculture Roads, Corridors Mixed Conifer/Mixed Dec	Private
TEWA 11.39-N	0.08	Side cut	10 x 380			Private
TEWA 11.41-W	0.5	PI, ingress/egress, road crossing, waterbody crossing	55 x 592 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 11.48-N	0.17	Road crossing, side cut	10 x 770	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 11.53-N	1.35	PI, ingress/egress, waterbody crossing	30 x 1954	Cropland and Pasture	Agriculture	Private
TEWA 11.53-W	1.89	PI, ingress/egress, waterbody crossing	55 x 1,949 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 11.91-N	0.51	Canal crossing, top soil storage	30 x 746	Cropland and Pasture	Agriculture	Private
TEWA 11.92-W	0.49	Canal crossing, top soil storage	50 x 706 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 12.08-N	1.36	HDD Coos River, Wetland and Topsoil Salvage	30 x 2,010	Cropland and Pasture Ditches	Agriculture Palustrine Emergent (PEM) Ditches	Private
TEWA 12.08-W	1.79	PI, spoil storage	50 x 1,753 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 8.76-W	0.69	Staging for wetland crossing, spoil storage	30 x 1,037	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 8.95-N	0.23	Road crossings, side cut	50 x 200	Clearcut Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 9.05-W	0.29	Staging for waterbody crossing	50 x 592 (Irregular)	Evergreen Forest Land Mixed Forest Land	Douglas Fir Dominant - Mixed Conifer Mixed Conifer/Mixed Dec	Private
TEWA 9.20-W	0.06	Wetland/waterbody crossing, side cut	50 x 50	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 9.25-N	0.14	Road crossing, waterbody crossing, side cut	15 x 416	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 9.25-W	0.13	Road crossing, waterbody crossing, side cut	15 x 376	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 9.34-W	0.11	Waterbody crossing, side cut	15 x 315	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 9.35-N	0.1	Waterbody crossing, side cut	15 x 280	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 9.51-N	3.63	Pls, road crossings, side cut	50 x 2,566 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 10.03-N	0.09	PI, road crossing, top soil storage	50 x 75	Cropland and Pasture	Agriculture	Private
TEWA 10.08-W	0.29	PI, ingress/egress, road crossing, topsoil storage	60 x 586 (Irregular)	Cropland and Pasture	Agriculture, Palustrine Emergent (PEM), Ditches	Private
TEWA 10.21-W	0.31	Ingress/egress, road crossing, waterbody crossing, topsoil storage	50 x 520 (Irregular)	Cropland and Pasture	Agriculture,Palustrine Emergent (PEM)	Private
TEWA 10.33-N	0.5	PI, fitting installation, spoil and topsoil, road crossing	65 x 825 (Irregular)	Cropland and Pasture, Ditches,Trans, Comm, Utilities Corridors	Agriculture, Palustrine Emergent (PEM), Ditches, Roads, Corridors	Private
TEWA 10.33-W	0.51	Ingress/egress, Stock Slough/road crossing, topsoil storage	150 x 211 (Irregular)	Cropland and Pasture, Ditches,Trans, Comm, Utilities Corridors	Agriculture, Palustrine Emergent (PEM), Ditches, Roads, Corridors	Private
TEWA 10.37-W	0.99	PI, road crossing, side cut, steep slope	55 x 882	Cropland and Pasture Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Agriculture Mixed Conifer/Mixed Dec Urban Roads, Corridors	Private
TEWA 10.59-N	0.06	Ingress/egress, staging, spoil storage, steep slope	25 x 100	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 10.59-W	0.06	Ingress/egress, staging, spoil storage, steep slope	25 x 100	Mixed Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 10.75-N	0.05	PI, road crossing	20 x 130	Mixed Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 10.80-N	1.61	PI / Topsoil	250 x 1,389 (Irregular)	Cropland and Pasture Ditches Mixed Forest Land Residential	Agriculture Palustrine Emergent (PEM) Ditches Mixed Conifer/Mixed Dec Urban	Private
TEWA 10.96-W	0.59	Coos River HDD	90 x 314 (Irregular)	Cropland and Pasture Mixed Forest Land Residential	Agriculture Mixed Conifer/Mixed Dec Urban	Private
TEWA 11.04-W	0.51	Catching Slough Crossing, Bore Pit installation, spoil/topsoil	165 x 200	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 11.14-N	0.82	Catching Slough Crossing, Bore Pit installation, spoil/topsoil	170 x 779 (Irregular)	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 11.14-W	0.94	Catching Slough Crossing, Bore Pit installation, spoil/topsoil	225 x 200	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 11.30-N	2.69	Coos River HDD Pullback waterbody crossing, top soil storage	75 x 1, 495 10 x 389	Cropland and Pasture Residential Trans, Comm, Utilities Corridors Cropland and Pasture	Agriculture Urban Roads, Corridors Palustrine Emergent (PEM)	Private
TEWA 11.70-W	0.07	Road crossing, waterbody crossing, side cut	10 x 300	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 11.80-W	0.04	Waterbody crossing, side cut	10 x 180	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 11.90	0.52	Ingress/egress, parking, staging		Cropland and Pasture Herbaceous Rangeland Residential Trans, Comm, Utilities Corridors	Agriculture Grasslands (W. Cascades) Urban Roads, Corridors	Private
TEWA 11.90-W	0.1	Ingress/egress, staging, spoil storage	15 x 291	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 11.91-N	0.51	Canal crossing, top soil storage	30 x 746	Cropland and Pasture	Agriculture	Private
TEWA 11.92-W	0.49	Canal crossing, top soil storage	50 x 706 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 11.97-N	0.17	PI, road crossing, side cut	25 x 311	Mixed Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 11.97-W	0.39	Ingress/egress, staging, spoil storage	80 x 370 (Irregular)	Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Urban Roads, Corridors	Private
TEWA 12.06-N	0.66	Waterbody crossing, side cut	30 x 1,134	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.08-N	1.36	HDD Coos River, Wetland and Topsoil Salvage	30 x 2,010	Cropland and Pasture Ditches	Agriculture Palustrine Emergent (PEM) Ditches	Private
TEWA 12.08-W	1.79	Waterbody crossing, side cut	30 x 951	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.27-W	0.11	Waterbody crossing, side cut	25 x 190	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.28-N	0.06	Waterbody crossing, side cut	25 x 117	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.31-N	0.23	Waterbody crossing, side cut	25 x 405	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.31-W	0.22	Waterbody crossing, side cut	25 x 404	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.39-N	0.12	Waterbody crossing, side cut	25 x 245	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.40-W	0.17	Waterbody crossing, side cut	25 x 298	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.45-N	0.23	Waterbody crossing, side cut	25 x 384	Mixed Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.47-W	0.12	Waterbody crossing, side cut	25 x 270	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.53-N	4.49	Disposal, Staging, hydrostatic discharge	Irregular	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 12.53-W	0.37	Road crossings, waterbody crossing, side cut	25 x 640	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 12.77-W	0.08	PI, road crossing	35 x 137	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 12.87-N	0.04	Waterbody crossing, side cut	15 x 115	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 12.91-N	0.13	Road crossing, side cut, top of hill	30 x 277 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 12.99-N	0.05	Waterbody crossing staging	30 x 90	Mixed Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.01-W	0.18	Road crossing, waterbody crossing, side cut	15 x 533	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 13.02-N	0.05	Waterbody crossing staging	30 x 100 (Irregular)	Mixed Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.02-W	0.13	Waterbody crossings, side cut	15 x 368	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 13.20-N	0.21	Side cut	15 x 620	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.21	0.34	Staging, parking	100 x 150	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 13.34-W	0.17	Road crossing, side cut	15 x 483	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 13.43	0.34	Staging, parking	100 x 150	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 13.44-N	0.25	Waterbody crossing staging	50 x 536	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.44-W	0.17	Waterbody crossing, side cut	15 x 483	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 13.57-N	0.17	Waterbody crossing staging	50 x 195 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.6-N	0.11	Waterbody crossing staging	50 x 150 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.62-W	0.07	Waterbody crossing, side cut	15 x 196	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 13.68-W	0.12	Road crossing, waterbody crossing, side cut	15 x 340	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 13.74	0.16	Ingress/egress, parking, staging		Clearcut Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.75-N	0.48	Ingress/egress, road crossing, staging	75 x 947 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 13.93-W	0.2	Ingress/egress, road crossing, staging	55 x 216	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 14.23-W	0.64	Ingress/egress, road crossing, PI, residential avoidance	60 x 551	Mixed Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 14.38-W	0.1	PIs, side cut	15 x 297	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 14.53-W	0.46	Staging, spoil storage	30 x 787	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 14.60-N	0.79	Staging, spoil storage	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 14.78-W	0.87	PIs, road crossings, side cut	35 x 1,287	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 15.13-W	0.13	PI, road crossing, side cut, staging	50 x 155 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 15.15-N	0.08	PI, road crossing, side cut, staging	35 x 119	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 15.45-W	1.04	PIs, road crossings, top soil storage	110 x 1,432 (Irregular)	Clearcut Forest Land Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Agriculture Palustrine Emergent (PEM) Rivers and Streams Roads, Corridors	Private
TEWA 15.70-N	0.28	Ingress/egress, top soil storage	160 x 95	Cropland and Pasture Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	Private
TEWA 15.89-N	1.54	PIs, road crossings, side cut, top of hill	35 x 2,541 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 16.17-W	0.09	PIs/spoil storage	35 x 150	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.22-W	0.42	PIs/spoil storage, Slope & waterbody crossing staging	50 x 592 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.24-W	0.09	PI, road crossing, side cut	35 x 150	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 16.41-W	0.52	Waterbody crossing, road crossing, side cut	50 x 710 (Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.56-W	0.08	Waterbody crossing, road crossing, side cut	30 x 130	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.57-N	0.66	Ingress/egress, parking, staging, spoil storage, water body crossing	175 x 141 (Irregular)	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 16.71-W	0.02	Waterbody crossing, side cut	15 x 58	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.74-W	0.07	Waterbody crossing, side cut	15 x 193	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.80-W	0.02	Waterbody crossing, side cut	15 x 68	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.83-W	0.05	Waterbody crossing, side cut	15 x 143	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 16.87-W	0.15	Waterbody crossing, side cut	15 x 427	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 17.05-W	1.12	PI, substation avoidance, spoil storage, staging	50 x 1,946 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	BLM/Private
TEWA 17.08-N	0.56	Ingress/engress, substation avoidance, PI, spoil storage	145 x 303 (Irregular)	Industrial Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Industrial Mixed Conifer/Mixed Dec	BLM
TEWA 17.32-N	0.18	Ingress/egress, road crossing, PI, spoil storage	15 x 539	Mixed Forest Land Regenerating Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	Private/BLM
TEWA 17.43-W	0.17	Waterbody crossing staging	55 x 200	Mixed Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 17.48-W	0.17	Waterbody crossing staging	50 x 200	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 17.53-W	0.38	PI, spoil storage, staging	55 x 400	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 17.58-N	0.7	PIs, side cut, steep slope	30 x 1,050	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 17.77-W	2.2	Timber clearing Landing, PI, steep slope staging	55 x 1,566 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 17.79-N	0.41	PI, road crossings, side cut, staging	105 x 207 (Irregular)	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 18.08-N	0.39	Waterbody crossing, road crossing, staging	30 x 590	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 18.21-N	0.09	Waterbody crossing staging	20 x 215	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 18.21-W	0.11	Waterbody crossing staging	20 x 267	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 18.28-W	0.09	Waterbody crossings, side cut	15 x 267	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 18.35-W	0.22	Waterbody crossings, road crossing, side cut	15 x 631	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 18.49-W	2.39	PIs, road crossing, waterbody crossing, side cut	100 x 2,275 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	BLM/Private
TEWA 18.61-N	0.11	PI, staging	50 x 150	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 18.96-N	0.34	Steep slope/waterbody crossing staging, spoil storage	30 x 516	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 18.96-W	0.46	Steep slope/waterbody crossing staging, spoil storage	50 x 466	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 19.06-N	0.12	Waterbody crossing staging	30 x 200	Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 19.06-W	1.15	Waterbody crossing staging	50 x 1, 053	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 19.25-N	0.62	Road crossings, side cut	20 x 1,400	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 19.59-N	0.42	Road crossings, side cut	15 x 1,229	Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 19.84-W	0.3	Road crossing, side cut	30 x 460	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 20.02-N	1.09	Waterbody crossings, side cut	15 x 2,945	Streams and Canals Trans, Comm, Utilities Corridors	Rivers and Streams Mixed Conifer/Mixed Dec	BLM/Private
TEWA 20.02-W	0.85	Side cut	30 x 1,260	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM/Private
TEWA 20.40-W	0.43	Side cut, spoil storage	30 x 650	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 20.60-W	0.39	Road crossing, waterbody crossings, side cut	30 x 587	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 20.73-W	0.23	PI, spoil storage, staging	30 x 330	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 20.81-W	0.4	PI, waterbody crossings, side cut	30 x 589	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 20.88-N	0.16	PI, side cut	30 x 267	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 20.96-W	2.23	Disposal, Staging, hydrostatic discharge	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 21.15-W	0.45	PIs, waterbody crossing, side cut	55 x 464	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 21.41-W	0.1	Road crossings, side cut	15 x 300	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 21.57-W	0.37	PI, spoil storage	60 x 401	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 21.76-W	0.09	PI, side cut	30 x 150	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 21.88-N	0.19	PI, side cut	60 x 310 (Irregular)	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 21.90-W	0.09	PI, side cut	35 x 150	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec	Private
TEWA 21.99-W	0.03	Road crossings, side cut	30 x 50	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec	Private
TEWA 22.11-W	0.27	PI, road crossing, side cut, staging	50 x 300	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec	Private
TEWA 22.12-N	0.42	PI, road crossing, side cut, staging	50 x 400	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec	Private
TEWA 22.55-N	0.53	Ingress/egress, road crossing, parking, staging	150 x 158	Regenerating Evergreen Forest Land Residential	Douglas Fir-W. Hemlock- W.Red Cedar Urban	Private
TEWA 22.55-W	0.27	Ingress/egress, road crossing, parking, staging	80 x 147	Regenerating Evergreen Forest Land Residential	Douglas Fir-W. Hemlock- W.Red Cedar Urban	Private
TEWA 22.59-N	0.77	Ingress/egress, road/wetland crossing, topsoil	10 x 2,416 (Irregular)	Cropland and Pasture Ditches Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Grasslands (W. Cascades) Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 22.59-W	0.54	Ingress/egress, road crossing, parking, staging	150 x 161	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 23.02-W	0.29	North Fork Coquille River crossing	80 x 157	Cropland and Pasture Mixed Forest Land	Agriculture Mixed Conifer/Mixed Dec	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 23.09-W	2.58	North Fork Coquille River crossing	15 x 4,196 (Irregular)	Clearcut Forest Land Evergreen Forest Land Forested Wetland Mixed Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Douglas Fir-W. Hemlock- W.Red Cedar Palustrine Forest (PFO) Roads, Corridors	BLM/Private
TEWA 23.24-N	0.38	PI, spoil storage, steep slope staging	55 x 400	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 23.90-W	0.08	PI, side cut	30 x 150	Clearcut Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 23.96-N	0.57	Ingress/egress, staging, parking	100 x 248	Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	BLM/Private
TEWA 24.07-W	0.14	Ingress/egress, road crossing, staging, parking	50 x 165	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 24.09-N	1.27	Ingress/egress, road crossing, staging, parking	30 x 1,712 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 24.14-W	0.18	Ingress/egress, road crossing, staging, parking	50 x 215	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 24.27-W	0.64	PI, spoil storage	50 x 1,359 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 24.52-N	0.14	ingress/ergress, road crossing	50 x 150	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 24.55-N	0.1	ingress/ergress, road crossing	30 x 157	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 24.55-W	0.11	ingress/ergress, road crossing	65 x 94	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 24.63-W	0.53	Logging landing, steep slope staging, spoil storage	50 x 1,002 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 24.77-N	0.15	Logging landing, steep slope staging, spoil storage	30 x 250	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 24.97-W	0.39	Timber clearing Landing, PI, steep slope staging	75 x 467 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 25.14-N	0.23	PI, spoil storage	50 x 201	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 25.17-W	1.89	PIs, road crossing, side cut	30 x 2,740	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 25.60-N	1.83	Log landing, PI, powerline/pipeline crossing, staging	315 x 651 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	BLM/Private
TEWA 25.74-N	0.96	PIs, road crossings, side cut, parking, staging	65 x 776	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 25.74-W	0.9	PI, powerline/pipeline crossing, staging, spoil storage	50 x 860	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 25.95-W	6.31	PI, powerline/pipeline crossing, staging, spoil storge	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 26.04-N	7.06	PI, spoil storage	Irregular	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 26.56-W	0.5	Ingress/egress, staging, parking	50 x 454	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 26.62-N	0.13	PI, spoil storage, road crossing, staging	55 x 125	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 26.65-W	0.42	Ingress/egress, staging, parking	55 x 394	Clearcut Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec	Private
TEWA 26.76-N	0.67	Ingress/egress, road crossing/steep slope staging	20 x 972 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	BLM/Private
TEWA 26.91-W	0.36	Ingress/egress, road crossing/steep slope staging	100 x 175	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	BLM
TEWA 26.96-W	0.36	Middle Creek crossing	75 x 200	Mixed Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	BLM
TEWA 27.06-W	0.41	Middle Creek crossing	100 x 150	Cropland and Pasture Mixed Forest Land Orchards, Groves, Vinyards, Nurseries, Horticultural	Agriculture Mixed Conifer/Mixed Dec	BLM/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 27.22-W	0.09	PI, side cut	30 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 27.48-N	0.32	Log landing, ingress/egress, steep slope staging	50 x 273	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 27.49-W	0.23	Log landing, ingress/egress, steep slope staging	50 x 250	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 27.66-N	0.23	PIs, road crossing, side cut	30 x 324	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 27.86-N	2.36	PI, spoil storage, steep slope staging	30 x 2,990 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM/Private
TEWA 28.05-W	0.1	PI, road crossing, side cut	40 x 150	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 28.30-W	0.63	log landing, PI/spoil storage, hydrostatic dischare		Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar Douglas Fir-W. Hemlock-W.Red Cedar	BLM/Private
TEWA 28.48-N	0.07	Ingress/egress, road crossing, parking, staging	30 x 116	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 28.48-W	0.06	Ingress/egress, road crossing, parking, staging	30 x 98	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 28.50-N	0.07	Ingress/egress, road crossing, parking, staging	30 x 119	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 28.50-W	1.17	Ingress/egress, road crossing, parking, staging	15 x 1,741 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 28.81-N	0.19	Waterbody crossing staging	60 x 170	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 28.87-N	0.86	Waterbody crossing and steep slope staging	30 x 1,522	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	Private
TEWA 28.87-W	0.98	Waterbody crossing and steep slope staging	25 x 1,701	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 29.19-W	1.67	PI, road crossings, waterbody crossing	235 x 698 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 29.30	0.23	Parking, staging		Cropland and Pasture	Agriculture	Private
TEWA 29.44-W	0.14	Road crossing, waterbody crossing, side cut	40 x 157	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 29.45-N	0.09	Road crossing, waterbody crossing, side cut	35 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 29.48-N	1.24	Road crossing, topsoil, E Fork Coquille River crossing	10 x 1,866 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Mixed Conifer/Mixed Dec	Private
TEWA 29.53-N	0.34	Waterbody and road crossing staging, ingress/egress	130 x 256 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 29.55-W	0.63	Waterbody and road crossing staging, ingress/egress	165 x 316 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 29.78-W	0.78	PI, waterbody crossing, top soil storage	100 x 367	Cropland and Pasture Mixed Forest Land	Agriculture Mixed Conifer/Mixed Dec	Private
TEWA 29.87-N	0.64	PI, waterbody crossing, top soil storage	100 x 282	Cropland and Pasture	Agriculture	Private
TEWA 29.87-W	0.81	PI, waterbody crossing, top soil storage	15 x 1,043 (Irregular)	Cropland and Pasture Regenerating Evergreen Forest Land	Agriculture Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 30.17-W	0.09	PI, side cut	30 x 150	Cropland and Pasture Regenerating Evergreen Forest Land	Agriculture Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 30.29-W	0.88	PI, spoil storage	30 x 1,042 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 30.66-W	0.12	PI, side cut	30 x 210	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 30.68-N	0.37	Log landing, PI/spoil storage, steep slope staging	60 x 399	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 30.76-W	0.2	PI, road crossing, side cut	30 x 296	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 30.86-W	0.49	Logging landing, PI, spoil storage, staging, hydrostatic test discharge	50 x 497	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	Private
TEWA 30.87-N	0.36	Logging landing, PI, spoil storage, staging, hydrostatic test discharge	30 x 537	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 31.00-W	5.21	Logging landing, steep slope staging	30 x 5,479 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Mixed Conifer/Mixed Dec Rivers and Streams Roads, Corridors	BLM/Private
TEWA 31.05-N	1.5	Logging landing, steep slope staging	50 x 1,326	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	Private
TEWA 31.49-N	0.61	Road crossing, waterbody crossing, side cut	Irregular	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM/Private
TEWA 31.65-N	0.5	PI, road crossings, side cut, staging	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 31.77-N	0.32	PIs, road crossing, side cut	30 x 514	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 32.41-N	0.11	Waterbody crossing staging	50 x 91	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 32.41-W	0.09	Waterbody crossing staging	50 x 82	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 32.46-W	0.47	Ingress/egress, road crossing, staging Waterbody crossing staging, PI/spoil storage	55 x 400 30 x 150	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors Clearcut Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors Mixed Conifer/Mixed Dec	Private
TEWA 32.48-N	0.36	Ingress/egress, parking, staging, spoil storage	100 x 186 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM/Private
TEWA 32.62-N	0.2	PI, side cut	65 x 300 (Irregular)	Clearcut Forest Land	Mixed Conifer/Mixed Dec	Private
TEWA 32.82-W	0.39	PI, spoil storage	50 x 400	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 32.87-N	0.25	PI, spoil storage	30 x 400	Clearcut Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 32.97-N	0.11	waterbody crossing	50 x 100	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 32.97-W	0.11	waterbody crossing	50 x 100	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 33.01-N	0.11	waterbody crossing	50 x 100	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 33.02-W	0.07	waterbody crossing	30 x 100	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 33.20-W	1.93	Steep slope staging	30 x 2,810	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 33.33-N	0.25	Logging landing, steep slope staging	30 x 400	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 33.56-N	0.22	Logging landing, steep slope staging, spoil storage	50 x 250	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 33.77-N	0.29	PI, spoil storage, ingress/egress, parking, staging	50 x 305	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private
TEWA 33.78-W	0.99	PI, spoil storage, road crossinig	50 x 875 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM
TEWA 34.00-N	0.06	Ingress/egress, road crossing, parking , staging	30 x 111	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 34.00-W	0.06	Ingress/egress, road crossing, parking , staging	30 x 109	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 34.03-N	0.06	Ingress/egress, road crossing, parking , staging	30 x 100	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 34.03-W	0.06	Ingress/egress, road crossing, parking , staging	30 x 101	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 34.26-W	2.07	Staging, parking, truck turnaround, Disposal	300 x 300	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 34.42-W	0.17	Waterbody crossing and steep slope staging	50 x 200	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 34.47-W	0.17	Waterbody crossing and steep slope staging	50 x 200	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 34.53-N	1.78	Log landing, ingress/egress, road crossing, steep slope	30 x 2,430 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 34.53-W	2.56	Log landing, ingress/egress, road crossing, steep slope	30 x 2,516 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 35.25-W	2.12	Disposal, ingress/egress, road crossing, staging	230 x 660 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 35.27-N	0.38	Log landing, Ingress/egress, road crossing , staging	50 x 361	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 35.76-W	0.28	Staging, parking	175 x 120 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 35.79-N	0.69	Ingress/egress, PI, spoil storage, staging, parking	75 x 519	Regenerating Evergreen Forest Land Streams and Canals	Douglas Fir-W. Hemlock- W.Red Cedar Rivers and Streams	BLM
TEWA 35.80-W	0.58	Ingress/egress, PI, spoil storage, staging, parking	105 x 289	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 36.11-N	0.51	Ingress/egress, road crossing, spoil storage, staging	80 x 425 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 36.11-W	1	Ingress/egress, road crossing, spoil storage, staging	15 x 1,925 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 36.63-W	1	Log landing, steep slope and inroad work staging	15 x 1,103 (Irregular)	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 36.85-W	0.05	PIs, waterbody crossing, side cut	15 x 148	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 36.97-W	0.55 0.14	PIs, side cut	15 x 1,191 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 37.14-N		Staging for in-road work, parking, spoil storage	55 x 125	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 37.73-N	0.14	PI, log landing, steep slope staging, spoil storage	15 x 414	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 37.73-W	0.31	PI, log landing, steep slope staging, spoil storage	35 x 443	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
TEWA 38.29-N	0.41	log landing, steep slope staging, spoil storage, parking	105 x 443 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 38.29-W	1.21	log landing, steep slope staging, PI/spoil storage	15 x 2,557 (Irregular)c	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 38.86-W	5.59	Ingress/egress, rock source & disposal, staging, spoil storage	Irregular	Clearcut Forest Land Regenerating Evergreen Forest Land Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Industrial Roads, Corridors	BLM/Private
TEWA 39.14-N	10.73	Log decking and storage, heliport, staging	Irregular	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 39.18-W	0.45	PI, spoils storage, steep slope staging	100 x 300 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 39.34-N	2.35	Steep slope and in-road work staging, ingress/egress	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 39.39-W	2.56	In-road work staging, spoil storage	30 x 2,480 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 39.82-N	0.34	In-road work staging, spoil storage	100 x 146	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 39.86-N	0.33	In-road work staging, spoil storage	100 x 145	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 39.92-W	0.49	In-road work staging, spoil storage	30 x 746	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 39.96-N	1.42	Steep slope staging, spoil storage	50 x 1,624 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM/Private
TEWA 40.00-W	0.19	log landing/steep slope staging	50 x 212	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private
TEWA 40.24-W	0.51	In road work staging, spoil storage	50 x 421	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 40.34-N	2..18	In road work staging, PI, spoil storage	30 x 2,357 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 40.42-W	0.92	Log landing, staging	15 x 2,113 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 40.70-W	0.05	PI, road crossing	15 x 141	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 41.09-N	0.64	Ingress/egress, road crossing , staging, parking	50 x 530	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 41.15-W	0.36	PIs, road crossings, side cut	15 x 1,036	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 41.32-N	0.48	Ingress/egress, road crossing , staging, parking	50 x 476	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM/Private
TEWA 41.51-W	0.28	PI, spoil storage	55 x 314	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 41.73-N	0.12	Ingress/egress, road crossing, parking , staging	50 x 100	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
TEWA 41.82-W	0.36	PIs, side cut	15 x 1,051	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM/Private
TEWA 41.98-N	0.28	PI, spoil storage,	55 x 315	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM/Private
TEWA 42.04-W	1.86	PI, ingress/egress, road crossing, spoil storage	30 x 2,486 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 42.32-N	0.45	PIs, side cut	20 x 982	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 42.56-W	4.07	Disposal, log decking/storage/loading, road crossing	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 42.67-W	0.97	PI, road crossing staging/spoil storage	30 x 944 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 42.86-W	0.41	Road crossings, side cut	30 x 630	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 43.04-W	0.98	PI, road crossing, staging and spoil storage, parking	100 x 740 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 43.05-N	0.56	PI, road crossing, staging and spoil storage, parking	60 x 531	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 43.18-N	0.36	PI, road crossing, side cut	30 x 550	Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 43.50-W	0.54	Log landing/decking/storage/loading, staging	30 x 653 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 43.72-N	0.08	PI	30 x 150	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 43.83-W	1.54	Log landing/decking/storage/loading, steep slope staging	50 x 2,015 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 44.17-N	0.14	Steep slope/waterbody crossing staging	50 x 150	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 44.24-W	0.17	Steep slope/waterbody crossing staging	50 x 200	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 44.25-N	0.17	Steep slope/waterbody crossing staging	50 x 200	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 44.50-N	5.34	log landing, decking and storage, steep slope staging	105 x 2,338 (Irregular)	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
TEWA 44.50-W	1.19	log landing, decking and storage, steep slope staging	105 x 536	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 44.69-W	2.62	PI, spoil storage, road crossing	30 x 3,405 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM
TEWA 44.83-N	0.38	Ingress/egreess, road crossing, log decking/storage	50 x 275	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 45.13-N	0.43	Ingress/egress, road crossing staging	30 x 659	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM
TEWA 45.52-W	0.19	PI, side cut	60 x 250	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM
TEWA 45.58-N	0.7	PI, side cut	30 x 1,055	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Pivate
TEWA 45.60-W	0.09	PI, side cut	30 x 150	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 45.69-W	0.08	PI, side cut	30 x 150	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
TEWA 45.76-W	0.09	PI, side cut	35 x 150	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 45.84-W	1.57	Disposal, Parking & Staging - Existing Quarry Site	20 x 2,057 (Irregular)	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 45.96-N	0.31	PI, spoil storage	50 x 340 (Irregular)	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	Private
TEWA 46.10-N	0.26	PI, spoil storage	55 x 300	Clearcut Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
TEWA 46.28-N	0.24	Staging, parking	95 x 220 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
TEWA 46.35-N	0.18	PI, spoil storage	30 x 300	Clearcut Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 46.50-N	0.1	Wetland Crossing	25 x 177	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 46.58-N	0.15	Wetland Crossing	50 x 117	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 46.64-N	0.12	PI	30 x 200	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 46.76-N	0.07	Road crossing	30 x 100	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 46.79-N	0.37	Road Crossing, steep slope	10 x 1,420 (Irregular)	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
TEWA 47.09-N	0.03	Road crossing	30 x 50	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 47.11-N	0.03	Road crossing	30 x 50	Evergreen Forest Land Trans, Comm, Utilities Corridors Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer Roads, Corridors Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 47.18-N	0.11	PI	35 x 200			Private
TEWA 47.25-N	0.11	PI	35 x 200	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 47.32-N	0.13	PI	35 x 200	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 47.42-N	0.12	PI	30 x 200	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 47.52-W	0.37	PI	30 x 562	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 47.53-N	0.26	PI	30 x 374	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 47.71-N	0.31	PI	30 x 468	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 47.72-W	0.12	PI	30 x 200	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 47.85-N	0.7	PI, spoil storage	30 x 911 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 47.92-W	0.55	PI, side cut	30 x 844	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 48.08-W	0.85	Ingress/ergress, road and waterbody crossing	80 x 1,005 (Irregular)	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
TEWA 48.30-N	0.79	Staging/storage, log decking, hauling, pipe storage	100 x 874 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 48.45-W	0.08	PI, road crossing, side cut	30 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 48.64-W	0.69	Staging/storage, log decking/hauling, road crossing	80 x 633 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 49.00-W	0.46	PIs, road crossings, side cut	30 x 707	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 49.18-W	0.65	PI, side cut	30 x 981	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer	BLM/Private
TEWA 49.48-N	0.79	Ingress/egress, staging, parking, road crossing	120 x 1,709 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 49.74-W	0.12	Ingress/egress, staging, parking, road crossing	20 x 250	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 49.77-N	1.82	Ingress/egress, staging, parking, road crossing	120 x 2,578 (Irregular)	Cropland and Pasture Ditches Mixed Forest Land Residential	Agriculture Ditches Douglas-Fir-Mixed Deciduous Forest Urban	Private
TEWA 49.77-W	0.58	Ingress/egress, staging, parking, road crossing	110 x 534 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 50.20	0.24	Water Source - Dust (Lang Creek Reservoir) Water Source - Hydro (Kinnan Lake)		Beaches Herbaceous Rangeland Trans, Comm, Utilities Corridors	Beaches Grasslands (W. Cascades) Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 50.21-W	0.18	Middle Fork Coquille River crossng staging	30 x 268	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 50.30-W	0.6	Middle Fork Coquille River crossng staging	150 x 175	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 50.35-N	0.11	Middle Fork Coquille River crossng staging, topsoil	10 x 490	Cropland and Pasture	Agriculture	Private
TEWA 50.45-N	0.11	Topsoil	10 x 490	Cropland and Pasture	Agriculture	Private
TEWA 50.62-W	0.17	PI, road crossing	50 x 205 (Irregular)	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 50.68-W	0.08	PI, road crossing, waterbody crossing	70 x 67	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 50.71-W	0.14	Stream Crossing	50 x 100	Cropland and Pasture Regenerating Evergreen Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 50.78-N	0.44	PI, road crossing, top soil storage	80 x 210 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 51.27-W	1.87	PIs, ingress/egress, road crossing, staging	15 x 2,219 (Irregular)	Cropland and Pasture Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 51.45-N	0.33	PI, ingress/egress, road crossing	50 x 335 (Irregular)	Cropland and Pasture Regenerating Evergreen Forest Land	Agriculture Douglas Fir Dominant - Mixed Conifer	Private
TEWA 51.55-N	0.36	PI, ingress/egress, road crossing, staging	10 x 1,094 (Irregular)	Cropland and Pasture Evergreen Forest Land	Agriculture Douglas Fir Dominant - Mixed Conifer	Private
TEWA 51.90-W	0.14	PI	30 x 200	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer	Private
TEWA 51.91-W	0.14	PI	30 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 52.04-N	2.62	Parking, staging	Irregular	Evergreen Forest Land Herbaceous Rangeland Industrial Nonforested Wetlands Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades) Industrial Palustrine Unconsolidated Bottom (PUB) Roads, Corridors	Private
TEWA 52.59-W	0.36	Road crossing, side cut, staging	105 x 159	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 52.62-W	0.24	Road crossing, side cut, staging	105 x 105	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 52.94-W	1.06	PI, road crossing, side cut, top of hill	150 x 475 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 53.00-W	0.1	PI, side cut	15 x 280	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 53.03-N	0.41	PI, road crossing, side cut, top of hill	80 x 447 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 53.07-N	0.19	PI, steep slope staging, spoil storage	35 x 294	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM/Private
TEWA 53.08-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 53.21-N	0.11	Staging, parking	50 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Roads, Corridors Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 53.44-N	0.37	PI, spoil storage	55 x 395			BLM
TEWA 53.62-W	0.85	PI, staging, parking, steep slope staging	50 x 720 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
TEWA 54.39-N	0.15	PI, side cut	15 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM/Private
TEWA 54.46-N	0.15	PIs, side cut	15 x 426	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 54.46-W	0.15	PIs, side cut	15 x 431	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 54.70-W	0.3	PI, side cut	30 x 450	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 54.83-N	0.48	PIs, road crossings, side cut	30 x 718	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 54.83-W	3.72	Disposal, steep slope staging, spoil storage	30 x 5,067	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 55.01-N	2.19	PIs, side cut	30 x 3,447	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 55.76-N	0.75	Ingress/egress, parking, road crossing, steep slope	155 x 250 (Irregular)	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 55.82-N	0.25	Topsoil	30 x 380	Cropland and Pasture Evergreen Forest Land Mixed Forest Land Residential	Agriculture Douglas Fir Dominant - Mixed Conifer Douglas-Fir-Mixed Deciduous Forest Urban	Private
TEWA 55.89-W	0.33	PI, spoil storage, waterbody crossing	90 x 224 (Irregular)	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 55.90	0.13	Water Source - Hydro (Ben Irving Reservoir-1) Water Source - Hydro (Ben Irving Reservoir-2)		Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 55.92-N	0.02	Topsoil, waterbody staging	10 x 80	Cropland and Pasture	Agriculture	Private
TEWA 55.95-N	0.4	Topsoil, waterbody staging	10 x 1,736	Cropland and Pasture Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 56.08-W	0.1	Road crossing	15 x 256 (Irregular)	Cropland and Pasture Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 56.13-W	0.06	Road crossing	15 x 175	Cropland and Pasture	Agriculture	Private
TEWA 56.17-W	0.05	Road crossing	15 x 135	Cropland and Pasture	Agriculture	Private
TEWA 56.20-W	1.41	ingress/egress, road crossing, topsoil	290 x 1,141 (Irregular)	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Rivers and Streams Roads, Corridors	Private
TEWA 56.29-N	0.23	Ingress/egress, road crossing staging, spoil storage	50 x 201	Cropland and Pasture Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 56.35-N	0.34	Ingress/egress, road crossing staging, spoil storage	10 x 1,503	Cropland and Pasture Regenerating Evergreen Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 56.69-W	0.19	ingress/egress, road crossing, topsoil	50 x 195	Forested Wetland Mixed Forest Land	Palustrine Forest (PFO) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 56.72-N	0.11	Ingess/egress, road crossing	50 x 100	Forested Wetland Mixed Forest Land	Palustrine Forest (PFO) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 56.74-W	0.29	Ingess/egress, road crossing	50 x 342	Forested Wetland Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Palustrine Forest (PFO) Douglas-Fir-Mixed Deciduous Forest Urban Roads, Corridors	Private
TEWA 56.75-N	0.12	Road crossing,	50 x 98 (Irregular)	Forested Wetland Residential Trans, Comm, Utilities Corridors	Palustrine Forest (PFO) Urban Roads, Corridors	Private
TEWA 56.79-N	0.65	Wetland spoil /topsoil	10 x 1,706 (Irregular)	Cropland and Pasture Forested Wetland Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Palustrine Forest (PFO) Douglas-Fir-Mixed Deciduous Forest Urban Roads, Corridors	Private
TEWA 57.10-W	0.03	Road crossing, waterbody crossing	30 x 50	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 57.11-N	0.3	PI, spoil storage, topsoil	50 x 720 (Irregular)	Cropland and Pasture Herbaceous Rangeland Mixed Forest Land Streams and Canals	Agriculture Palustrine Emergent (PEM) Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Rivers and Streams	Private
TEWA 57.12-W	0.09	PI, waterbody crossings	35 x 150	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 57.25-W	0.06	Topsoil	10 x 267	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 57.31-N	0.49	Topsoil, ingress/egress, road crossing	10 x 1,535 (Irregular)	Cropland and Pasture Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Urban Roads, Corridors	Private
TEWA 57.57-W	0.17	Ingress/egress, road crossing	50 x 150	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 57.60-N	1.02	Ingress/egress, road crossing, topsoil, waterbody	100 x 1,032 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 57.81-N	0.09	waterbody crossing	50 x 88	Cropland and Pasture	Agriculture	Private
TEWA 57.81-W	0.13	waterbody crossing	50 x 112	Cropland and Pasture	Agriculture	Private
TEWA 57.86-N	0.33	PI, waterbody crossing	115 x 166 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 57.86-W	0.11	PI, waterbody crossing	50 x 95	Cropland and Pasture	Agriculture	Private
TEWA 57.89-W	0.02	PI	15 x 70	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 57.91-N	0.37	Topsoil	10 x 1,609	Cropland and Pasture Ditches	Agriculture Palustrine Emergent (PEM) Ditches	Private
TEWA 58.21-N	0.82	Waterbody crossing, topsoil	10 x 1,706 (Irregular)	Cropland and Pasture Ditches	Agriculture Palustrine Emergent (PEM) Ditches	Private
TEWA 58.56-N	1.23	Waterbody crossing, topsoil	135 x 931 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 58.65-W	0.44	Staging	50 x 390 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 58.79-N	1.49	Ollala Creek crossing, wetland/ag topsoil	10 x 2,604 (Irregular)	Cropland and Pasture Ditches Mixed Forest Land Cropland and Pasture	Agriculture Palustrine Emergent (PEM) Ditches Douglas-Fir-Mixed Deciduous Forest Agriculture	Private
TEWA 58.79-W	0.62	Ollala Creek crossing	100 x 290			Private
TEWA 59.30-N	1.45	Waterbody crossing, topsoil, ingress/egress road crossing	170 x 1,662 (Irregular)	Cropland and Pasture Mixed Forest Land Trans, Comm, Utilities Corridors Cropland and Pasture	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors Agriculture	Private
TEWA 59.31-W	0.03	waterbody crossing	30 x 50			Private
TEWA 59.33-W	0.09	PI, road crossing	30 x 150	Cropland and Pasture	Agriculture	Private
TEWA 59.62-W	0.06	PI, road crossing	30 x 70 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 59.66-N	0.42	Hydro Discharge/topsoil	10 x 1,817	Cropland and Pasture Mixed Forest Land	Agriculture Palustrine Emergent (PEM) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.01-N	0.35	Trib to McNabb Creek spoil/topsoil	50 x 576 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.05-W	0.29	Trib to McNabb Creek spoil	50 x 298 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.14-N	0.29	Trib to McNabb Creek spoil	50 x 395 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.14-W	0.14	Trib to McNabb Creek spoil	50 x 124	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.25-W	0.08	PI, side cut	30 x 150	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.35-W	0.63	PI, spoil storage.	55 x 745 (Irregular)	Cropland and Pasture Herbaceous Rangeland Mixed Forest Land	Agriculture Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.45-N	0.04	Topsoil	10 x 195	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.52-N	0.74	Staging/topsoil, ingress/egress	250 x 360 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 60.54-W	0.78	Ingress/egress, watebody and road crossing staging	210 x 360 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 60.59-N	0.35	Ingress/egress, road crossing staging	55 x 430 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.71-W	0.08	PI, side cut	30 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 60.82-W	0.08	PI, side cut	30 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 60.87.W	0.42	Log landing, steep slope staging, spoil storage, hydrostatic discharge	51 x 400	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 60.88-N	0.58	PI, spoils storage, log landing, hydrostatic discharge	150 x 217 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 60.98-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.02-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.08-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.15-W	0.17	log landing, steep slope staging	50 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 61.27-N	0.21	log landing, steep slope staging	50 x 227	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.29-W	0.11	PI, side cut	35 x 175	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.35-W	0.41	Log landing, PI, steep slope staging, spoil storage	30 x 786 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.41-N	1.06	Log landing, steep slope staging, spoil storage	135 x 629 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 61.70-N	0.11	Log landing, steep slope staging, PI, spoil storage	35 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 61.70-W	0.13	Log landing, steep slope staging, PI, spoil storage	35 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 61.87-W	0.12	Log landing, steep slope staging, PI, spoil storage	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 62.02-N	0.29	Log landing, steep slope staging, PI, spoil storage	30 x 431	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 62.03-W	0.11	Log landing, steep slope staging, PI, spoil storage	15 x 330	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 62.17-W	0.09	PI, side cut	35 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 62.20-W	0.07	PI, road crossing, side cut	35 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 62.24-W	0.21	Log landing, steep slope staging, spoil storage	50 x 250	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 62.44-W	0.7	Log landing, steep slope staging, PI, spoil storage	60 x 634	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 62.52	3.06	Staging, truck turn-around, parking	Irregular	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 62.92-W	0.41	PIs, road crossings, side cut	30 x 839 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 63.19-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 63.30-W	0.71	Log landing, steep slope staging, PI, spoil storage	30 x 908 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 63.31-N	0.38	Log landing, steep slope staging, PI, spoil storage	55 x 300	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 63.59-W	1.28	Log landing, steep slope staging, PI, spoil storage	50 x 1,454 (Irregular)	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 63.77-N	0.59	Log landing, steep slope staging, PI, spoil storage	60 x 501	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 63.88-N	0.2	Ingress/egress, road crossing	50 x 195	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 63.90-W	0.21	Ingress/egress, road crossing	50 x 149	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 63.93-N	0.12	PI, ingress/egress, road crossing, waterbody crossing, side cut	50 x 126 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 63.93-W	0.13	Ingress/egress, parking, road and waterbody crossing	50 x 150	Herbaceous Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 63.99-N	0.24	Log landing, waterbody crossing/steep slope staging	50 x 303	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 64.00-W	0.24	Log landing, waterbody crossing/steep slope staging	50 x 269	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 64.11-N	0.28	Log land, steep slope staging, spoil storage	50 x 298 (Irregular)	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 64.11-W	0.27	Log land, steep slope staging, spoil storage	50 x 286 (Irregular)	Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 64.33-N	0.25	Log land, PI, spoil storage, steep slope staging	30 x 366	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 64.38-W	0.03	PI, side cut	20 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 64.55-W	0.48	log landing, PI, spoil storage, steep slope staging	50 x 450	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 64.69-W	0.29	log landing, PI, spoil storage, steep slope staging	50 x 409 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 64.71-N	0.31	log landing, PI, spoil storage, steep slope staging	50 x 260	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 64.80-W	0.1	Side cut	15 x 301	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 64.88-N	0.19	PIs, side cut	15 x 544	Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM/Private
TEWA 64.92-W	0.12	PI, side cut	15 x 336	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 65.06-W	0.03	PI, side cut	15 x 100	Shrub and Brush Rangeland	Shrublands	Private
TEWA 65.11-W	0.03	PI, side cut	15 x 100	Shrub and Brush Rangeland	Shrublands	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 65.21-W	0.26	Steep slope staging, PI, spoil storage	50 x 297 (Irregular)	Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 65.27-W	0.04	PI, side cut	15 x 100	Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 65.33-W	0.03	PI, side cut	20 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 65.47-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 65.58-N	0.82	Log landing, steep slope staging, Rice Creek crossing	150 x 868 (Irregular)	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land	Agriculture Douglas-Fir-Mixed	Private
TEWA 65.58-W	0.17	Log landing, steep slope staging, hydrostatic discharge	50 x 200	Cropland and Pasture Regenerating Evergreen Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 65.77-W	0.28	Ingress/egress, Rice Creek and Road crossing staging	65 x 228 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 65.82-W	0.22	Ingress/egress, parking	50 x 393 (Irregular)	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 66.03-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 66.06-W	0.75	Log landing, steep slope staging, PI, spoil storage	30 x 1,139	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 66.19-N	0.21	PI, road crossing, side cut	15 x 600	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 66.34-W	0.05	Road crossing, side cut	30 x 75	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 66.36-W	0.04	Road crossing, side cut	35 x 32 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 66.37-W	0.04	Road crossing, side cut	30 x 75	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 66.41-N	0.21	PI, spoil storage, side slope	35 x 350	Mixed Forest Land Residential Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Urban Shrublands Roads, Corridors	Private
TEWA 66.43-W		PI, road crossing, side cut	35 x 97	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 66.62-W	0.38	Log landing, steep slope staging, PI, spoil storage	55 x 400	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 66.68-N	0.62	Log landing, steep slope staging, PI, spoil storage	30 x 1,011 (Irregular)	Deciduous Forest Land Mixed Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 66.76-W	0.12	PI, side cut	30 x 200	Shrub and Brush Rangeland	Shrublands	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 66.85-W	0.18	Ingress/egress, road crossing	50 x 143	Deciduous Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Rivers and Streams Roads, Corridors	Private
TEWA 66.89-N	0.46	Ingress/egress, Road and waterbody (Willis Creek)	80 x 292 (Irregular)	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 66.89-W	0.62	Ingress/egress, Road and waterbody (Willis Creek)	145 x 185 (Irregular)	Herbaceous Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Rivers and Streams Roads, Corridors	Private
TEWA 66.97-W	0.29	Waterbody crossing (Willis Creek) staging	50 x 226	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 66.98-N	1.01	Staging, parking	80 x 508	Herbaceous Rangeland Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Industrial Roads, Corridors	Private
TEWA 67.03-W	0.15	PI, waterbody crossing, side cut	50 x 178	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 67.17-W	0.47	Log landing, steep slope staging, road crossing	30 x 719	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 67.26-N	0.12	Log landing, steep slope staging, road crossing	30 x 208	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 67.46-W	1.4	Log landing, steep slope staging, spoil stograge	35 x 1,107 (Irregular)	Deciduous Forest Land Herbaceous Rangeland Trans, Comm, Utilities Corridors	Oregon White Oak Forest Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 67.49-N	0.13	Log landing, steep slope staging, PI, spoil storage	35 x 200	Deciduous Forest Land Herbaceous Rangeland	Oregon White Oak Forest Grasslands (W. Cascades)	Private
TEWA 68.24-W	0.26	PI	50 x 200	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 68.43-W	0.11	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 68.58-W	0.11	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 68.73-N	0.23	PI	100 x 200	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 68.73-W	0.49	PI	70 x 377	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 68.93-W	0.19	PI	30 x 306	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 69.54-W	0.11	PI	30 x 200	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 69.85-W	0.11	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 70.02-W	0.13	PI	35 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 70.08-W	0.11	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 70.17-W	0.11	PI	30 x 200	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 70.33-N	0.23	PI	100 x 200	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 70.33-W	0.51	PI	50 x 390	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 70.45-N	0.05	Road Crossing, Ingress / Egress	20 x 100	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 70.72-W	0.61	PI, Side Hill	20 x 850 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 71.04-W	2.22	Staging, PI, Direct Pipe	300 x 809 (Irregular)	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 71.06-N	4.61	Direct Pipe Pull-Back and Staging	305 x 345 (Irregular)	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 71.25	0.43	Water Source - Hydro (South Umpqua River-1)	55 x 152 (Irregular)	Beaches	Beaches	Private
		Water Source - Hydro (South Umpqua River-2)	Irregular			
TEWA 71.36-W	4.15	Direct Pipe Laydown	625 x 834 (Irregular)	Cropland and Pasture Herbaceous Rangeland Trans, Comm, Utilities Corridors	Agriculture Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 71.43-N	0.5	Meter Station		Cropland and Pasture Herbaceous Rangeland	Agriculture Grasslands (W. Cascades)	Private
TEWA 71.66-W	0.11	PI	31 x 200	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 71.76-W	0.13	PI	35 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 72.15-W	0.11	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 72.82-W	0.12	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 73.09-W	0.11	PI	35 x 200	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
TEWA 73.52-W	0.13	PI	35 x 200	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
TEWA 73.63-W	0.06	Road crossing	30 x 100	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 73.91-W	0.11	PI	30 x 200	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
TEWA 74.28-W	0.29	PI, spoil stoage, staging	30 x 475	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 74.52-W	0.17	PIs, side cut	30 x 272	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
TEWA 74.55-N	0.76	Staging, steep slope staging, PI, spoil storage	150 x 150 (Irregular)	Mixed Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 74.64-N	0.27	PI, spoil storage, staging	30 x 428	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 74.66-W	0.24	PI, road crossing	30 x 347	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 74.84-W	0.46	PI staging/spoil storage	60 x 500 (Irregular)	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 74.97-W	0.63	PIs, road crossings, side cut	50 x 522 (Irregular)	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 75.16-N	0.07	PIs, side cut	40 x 135 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 75.28-W	3.07	Rock Source & Staging	35 x 3,714 (Irregular)	Mixed Forest Land Mixed Rangeland Regenerating Evergreen Forest Land Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Industrial Roads, Corridors	BLM/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 75.33-N	0.47	Side slope spoil storage	30 x 517 (Irregular)	Herbaceous Rangeland Mixed Forest Land Regenerating Evergreen Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 75.45-W	0.26	Road crossing	50 x 233	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 75.66-N	0.36	PI, spoil storage, steep slope staging	60 x 397	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 75.91-N	0.16	Side slope slope storage, steep slope staging	30 x 260	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 76.05-N	0.1	PI, side cut, top of hill	50 x 90	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 76.05-W	0.15	PI, side cut, top of hill	50 x 130	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM
TEWA 76.18-N	1.43	Steep slope staging, hydro discharge location	250 x 250	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 76.31-N	0.29	Ingress/egress, road crossing, staging, parking	50 x 248	Mixed Rangeland	Grasslands (W. Cascades)	Private
TEWA 76.31-W	0.74	Ingress/egress, road crossing, staging, parking	150 x 230	Mixed Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 76.36-N	0.06	Road and waterbody crossing staging	42 x 60	Cropland and Pasture	Agriculture	Private
TEWA 76.36-W	1.09	Road and waterbody crossing staging	360 x 58 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 76.41-N	0.42	Waterbody crossing/steep slope staging, log landing	60 x 303	Cropland and Pasture	Agriculture	Private
TEWA 76.41-W	1.03	Waterbody crossing/steep slope staging, log landing	150 x 300	Cropland and Pasture	Agriculture	Private
TEWA 76.54-W	0.38	Log landing, steep slope staging, spoil storage	50 x 374	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 76.66-W	0.1	PI, top soil storage, top of hill	50 x 98	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 76.67-N	0.27	Log landing, steep slope staging, PI spoil storage	30 x 427	Mixed Forest Land Nonforested Wetlands	Douglas-Fir-Mixed Deciduous Forest Palustrine Emergent (PEM)	Private
TEWA 76.70-W	0.03	PI, top soil storage, top of hill	15 x 77	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 76.75-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 76.81-W	0.07	PI, road crossing, side cut	15 x 155 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 76.85-W	0.03	PI, road crossing, side cut	30 x 50	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 76.99-W	1.17	Log landing, steep slope staging, spoil storage	50 x 1,298 (Irregular)	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 77.05-N	0.32	Log landing, steep slope staging, spoil storage	50 x 324	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 77.28-W	0.39	Ingress/egress, staging	30 x 520 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 77.31-N	0.11	Ingress/egress, staging	50 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 77.37-N	0.28	PI, side cut, top of hill	15 x 810	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 77.42-W	0.19	Side cut	15 x 550	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 77.56-W	0.08	PI, road crossing, side cut, top soil storage	30 x 166 (Irregular)	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 77.66-W	0.04	PI, side cut, top soil storage	15 x 100	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 77.68-N	0.11	Waterbody crossing, side cut	50 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 77.72-N	2.81	Staging, pipe storage	25 x 1,573 (Irregular)	Cropland and Pasture Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Rivers and Streams Roads, Corridors	Private
TEWA 77.95-W	3.69	Staging, spoil storage, pipe storage, hydrostatic test discharge	630 x 510 (Irregular)	Cropland and Pasture Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Rivers and Streams Roads, Corridors	Private
TEWA 78.12-W	0.73	Log landing, steep slope staging, PI, spoil storage	30 x 1,091	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 78.45-N	0.98	Log landing, steep slope	150 x 589 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 78.50-W	0.08	PI, side cut	30 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 78.61-N	0.44	PIs, side cut	15 x 1,280	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 78.70-W	0.08	PI, side cut	30 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 78.84-W	0.09	PI, side cut	30 x 150	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 78.94-W	0.25	Ingress/egress, road crossing	50 x 214	Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Urban Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 78.99-W	1.2	Ingress/egress, road and waterbody (Myrtle Creek)	100 x 641 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 79.00	0.13	Water Source - Dust (Big Lick Reservior)		Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 79.00-N	0.48	Staging, hydrostatic discharge	230 x 112 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 79.13-N	0.09	Waterbody (Myrtle Creek) crossing, steep slope staging	30 x 145	Mixed Forest Land Streams and Canals	Douglas-Fir-Mixed Deciduous Forest Rivers and Streams	Private
TEWA 79.14-W	0.19	Waterbody (Myrtle Creek) crossing, steep slope staging	50 x 202 (Irregular)	Mixed Forest Land Streams and Canals	Douglas-Fir-Mixed Deciduous Forest Rivers and Streams	Private
TEWA 79.18	0.03	Road crossing, side cut	30 x 50	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 79.24-N	0.21	PIs, side cut	15 x 593	Mixed Forest Land, Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 79.24-W	1.06	PIs, road crossing, side cut	30 x 1,596 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 79.57-W	0.19	PI, road crossing, side cut	50 x 159	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 79.63-W	0.21	PIs, side cut	50 x 409 (Irregular)	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 79.65-N	0.35	PIs, side cut	30 x 505	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 79.75-W	0.36	PIs, road crossing, side cut	15 x 1,063	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 79.85-N	3.52	Disposal, PI, spoil storage, log landing, steep slope	Irregular	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 80.04-W	0.05	Road crossing, side cut	30 x 84	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 80.09-N	0.79	PIs, side cut	30 x 1,147	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 80.18-W	0.08	PI, road crossing, side cut	30 x 150	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 80.23-W	0.08	PI, side cut	30 x 150	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 80.30-W	0.09	PI, road crossing, side cut	30 x 150	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 80.33-W	1.14	PIs, road crossings, side cut	30 x 1,746	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 80.65-N	2.85	Ingress/egress, staging, parking, hydrostatic dischcarge	300 x 1,435 (Irregular)	Herbaceous Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 81.06-W	1.43	Ingress/egress, road crossing, staging, parking	155 x 489 (Irregular)	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 81.16-N	0.26	Ingress/ergress, road and waterbody (South Myrtle Creek)	80 x 139	Deciduous Forest Land Herbaceous Rangeland	Alder-Cottonwood Grasslands (W. Cascades)	Private
TEWA 81.16-W	0.13	Ingress/ergress, road and waterbody (South Myrtle Creek)	75 x 100 (Irregular)	Deciduous Forest Land Herbaceous Rangeland	Alder-Cottonwood Grasslands (W. Cascades)	Private
TEWA 81.21-W	4.95	Waterbody (South Fork Myrtle Creek), steep slope staging	445 x 789 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 81.56-W	0.12	PI	30 x 200	Cropland and Pasture	Agriculture	Private
TEWA 81.68-W	0.12	PI	30 x 200	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 81.73-W	0.12	PI	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 81.85-W	0.11	PI	35 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 82.26-W	0.13	PI	35 x 200	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 82.30-N	0.17	Staging, log landing		Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 82.40-N	0.48	Staging, log landing		Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 82.46-W	0.11	PI	35 x 200	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 82.54-W	0.99	PIs, road crossing, side cut, staging	30 x 1,236 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 82.64-N	0.17	Staging, log landing		Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 82.89-W	0.29	PIs, road crossings, side cut	15 x 868	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 82.93-N	1.27	Log land, steep slope staging, PI, spoil storage	190 x 422 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 83.27-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 83.28-N	1.02	Log land, steep slope staging, PI, spoil storage	75 x 674	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 83.35-W	0.11	PIs, road crossings, side cut	15 x 320	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 83.49-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 83.56-N	0.39	PI, road crossing, side cut	30 x 565	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 83.63-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 83.75-W	1.71	Log land, steep slope staging, PI, spoil storage	255 x 413 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 83.91-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 83.97-W	0.08	PIs, side cut	15 x 237	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 83.98-N	0.08	PIs, side cut	15 x 235	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.04-W	0.48	Waterbody crossing (Woods Creek)	30 x 633 (Irregular)	Herbaceous Rangeland Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 84.14-N	0.11	Waterbody crossing (Woods Creek)	50 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.19-N	0.81	Waterbody crossing (Woods Creek), steep slope staging	100 x 350	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 84.19-W	11.08	Staging, spoil storage, waterbody crossing	1,474 x 385 (Irregular)	Clearcut Forest Land Herbaceous Rangeland Mixed Forest Land Nonforested Wetlands Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 84.34-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.41-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.51-N	0.11	PI, side cut staging	50 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 84.52-W	0.73	Log landing, steep slope staging, PI, spoil storage	55 x 1,064 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.62-N	0.5	Log landing, steep slope staging, PI, spoil storage	50 x 503	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.75-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.81-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.88-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 84.99-N	0.28	Log landing, steep slope staging, spoil storage	50 x 300	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 84.99-W	0.29	Log landing, steep slope staging, spoil storage	50 x 300	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 85.20-N	0.14	PI, side cut	30 x 222	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 85.22-W	0.8	Log landing, steep slope staging, PI, spoil storage	20 x 1,532	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 85.28-N	0.36	PIs, side cut	30 x 558	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 85.64-W	0.06	PI, side cut	15 x 180	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 85.67-N	0.14	Side cut	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 85.71-W	0.32	PI, road crossing, side cut, staging	60 x 485 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 85.87-W	0.44	PI, side cut	55 x 773 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 86.11-W	0.17	PI, side cut	40 x 300	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 86.15-N	0.26	PI, side cut	30 x 389	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 86.37-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 86.45-W	0.24	PIs, road crossing, side cut	30 x 367	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 86.49-W	1.49	PI, road crossing, side cut	30 x 1,703 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 86.56-N	0.04	PI, road crossing, side cut	15 x 100	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 86.64-W	0.04	PI, road crossing, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 86.69-W	0.15	PI, road crossing, side cut	55 x 200 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 86.76-N	0.7	PIs, road crossing, side cut	30 x 1,021	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 86.85-W	5.9	Log landing/ heliport, staging pipe storage, spoil storage	245 x 1,618 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 86.98-N	0.92	Disposal, log landing/ heliport, staging pipe stor	160 x 250	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 87.01-N	0.09	PI, road crossing, side cut	20 x 295	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 87.02-W	0.2	PIs, road crossing, side cut	40 x 300	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 87.15-N	0.8	In-road construction, PI, spoil storage	30 x 1,187	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 87.32-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 87.45-W	0.38	PI, side cut	55 x 360	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 87.47-N	0.69	Log landing, steep slope staging, PI, spoil storage	30 x 1,055	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 87.53-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 87.56-W	0.09	PIs, side cut	15 x 254	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 87.64-W	0.13	PIs, side cut	15 x 378	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 87.71-W	0.1	PIs, side cut	15 x 305	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 87.82-N	0.11	Side cut	15 x 315	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 87.89-W	0.54	PIs, road crossing, side cut	30 x 1,075 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 88.01-N	0.09	PIs, side cut	15 x 263	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 88.07-N	1.65	Ingress/egress, road crossing construction staging	100 x 747 (Irregular)	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Rivers and Streams Roads, Corridors	Private
TEWA 88.25-W	1.45	Ingress/egress, road crossing, waterbody crossing	100 x 1,182 (Irregular)	Cropland and Pasture Mixed Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 88.29-N	0.21	Topsoil	10 x 905	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 88.49-N	0.89	Ingress/egress, road/waterbody (Fate Creek) crossing	150 x 160 (Irregular)	Cropland and Pasture Residential Trans, Comm, Utilities Corridors	Agriculture Urban Roads, Corridors	Private
TEWA 88.49-W	0.07	Ingress/egress, road/waterbody (Fate Creek) crossing	80 x 45 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 88.52-W	0.93	Ingress/egress, road/waterbody (Days Creek) crossing	150 x 275 (Irregular)	Cropland and Pasture Deciduous Forest Land	Agriculture Alder-Cottonwood	Private
TEWA 88.53-N	0.41	Ingress/egress, road/waterbody (Days Creek) crossing	170 x 214 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 88.61-W	1.6	Waterbody (Days Creek)crossing/steep slope staging	165 x 1,188 (Irregular)	Clearcut Forest Land Cropland and Pasture Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest Agriculture	Private
TEWA 88.62-N	0.33	Waterbody (Days Creek)crossing/steep slope staging	35 x 502 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 88.81-N	0.11	PI, side cut	35 x 210	Clearcut Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 88.92-W	0.03	PI, road crossing, side cut	15 x 100	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 89.05-W	0.35	log landing, steep slope staging	100 x 151	Clearcut Forest Land Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 89.11-N	0.65	Ingress/egress, log landing/hauling, steep slope staging	50 x 560	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 89.11-W	0.68	Log landing, steep slope staging, PI, spoil storage	50 x 775 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 89.26-N	0.58	PI, road crossings, side cut	30 x 840	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 89.50-W	0.11	Road crossing, side cut	50 x 100	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 89.76-W	0.06	PI, road crossing, side cut	30 x 106	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 89.77-N	0.08	PI, road crossing, side cut	35 x 110	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 89.79-N	0.14	PI, road crossing, side cut	30 x 251	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 89.82-W	0.03	PI, side cut	15 x 100	Clearcut Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 89.85-W	0.08	Road crossing, side cut	30 x 175 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 89.88-W	0.06	PI, road crossing, side cut	30 x 135 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 89.95-W	0.03	Road crossing, side cut	30 x 50	Corridors Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 89.96-W	0.04	Road crossing, side cut	30 x 50	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 89.98-W	0.76	Log landing, steep slope staging, ingress/egress	30 x 1,117	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 90.20-N	1.39	Steep slope staging, PI/in-road work spoil storage	80 x 1,059 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 90.25-W	0.76	Steep slope staging, PI/in-road work spoil storage	100 x 384 (Irregular)	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 90.39-W	0.03	PI, road crossings, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 90.48-N	1.66	Ingress/egress, PI, spoil storage	185 x 957 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 90.50-W	0.03	PI, road crossings, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 90.53-W	0.38	PI, spoil storage	55 x 400	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 90.65-W	0.03	PI, road crossings, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 90.72-W	0.04	PI, road crossings, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 90.80-N	0.72	PI, spoil storage	55 x 700	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 90.80-W	0.88	Ingress/engress, PI, spoil storage	55 x 795	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 90.96-W	2.4	Steep slope staging, in-road work, spoil storage	30 x 3,506	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 91.02-N	4.69	Steep slope staging, in-road work, spoil storage	50 x 3,805 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 91.66-W	3.11	Disposal, steep slope staging, spoil storage	30 x 1,793 (Irregular)	Clearcut Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 91.93-N	0.63	PI, steep slope staging, spoil storage	95 x 388 (Irregular)	Clearcut Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.07-N	0.23	Log landing, steep slope staging, spoil storage	30 x 349	Clearcut Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.07-W	0.3	Log landing, steep slope staging, spoil storage	30 x 455	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.22-N	0.59	Ingress/egress, log landing/hauling, steep slope staging	80 x 400	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.23-W	0.42	Ingress/egress, log landing/hauling, steep slope staging	55 x 400	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.30-N	0.41	Ingress/egress, log landing/hauling, steep slope staging	50 x 400	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.30-W	0.39	Ingress/egress, log landing/hauling, steep slope staging	50 x 400	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.51-N	0.18	Log landing, steep slope staging, spoil storage	50 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.51-W	0.17	Log landing, steep slope staging, spoil storage	50 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 92.57-N	0.32	Steep slope/waterbody crossing (St. Johns Creek) staging	100 x 250 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.57-W	0.32	Steep slope/waterbody crossing (St. Johns Creek) staging	100 x 250 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.62	0.81	Parking, staging, turn-around	50 x 761	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.63-N	0.5	Ingress/egress, steep slope/waterbody crossing (St Johns Creek)	135 x 233 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.63-W	0.52	Ingress/egress, steep slope/waterbody crossing (St Johns Creek)	280 x 75 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 92.69-N	0.12	Steep slope staging	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.69-W	0.17	Steep slope staging	50 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.76-W	1.25	Log landing, steep slope staging, spoil storage	150 x 974 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.78-N	0.12	Log landing, steep slope staging, spoil storage	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 92.90-N	0.09	Log landing, steep slope staging, spoil storage	30 x 146	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 93.00-W	0.17	PIs, side cut	15 x 498	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 93.01	0.55	Disposal	Irregular	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 93.01-N	1.37	Log landing, steep slope staging, PI, spoil storage	170 x 386 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 93.31-W	0.09	PIs, side cut	15 x 259	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 93.44-N	1.09	Ingress/egress, PI, steep slope staging, spoil storge	30 x 1,648	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
TEWA 93.48-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 93.65-W	1.04	Parking, staging, spoil storage	310 x 145 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 93.69-W	0.04	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 93.73-W	0.85	Parking, staging, PI, spoil storage	220 x 325 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM
TEWA 93.80-N	0.13	Log landing, steep slope staging, spoil storage	30 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 93.90-W	0.27	Log landing, steep slope staging, spoil storage, hydrostatic test discharge	30 x 400	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
TEWA 94. 2-W	0.54	PIs, side cut	30 x 1,113 (Irregular)	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 94.00-N	0.81	Log landing, steep slope staging, PI, spoil storage	30 x 1,214	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 94.35-W	0.23	Top soil storage	15 x 659	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 94.52.-W	27.51	Milo Pipe Yard (pipe/contractor yard), stage, disposal	1,948 x 1,105 (Irregular)	Herbaceous Rangeland Nonforested Wetlands Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 94.52-N	0.46	PI, spoil storage	140 x 400 (Irregular)	Herbaceous Rangeland Mixed Forest Land Nonforested Wetlands	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Palustrine Emergent (PEM)	Private
TEWA 94.64-N	2.47	Ingress/egress, staging, parking, Hwy 227 crossing	290 x 368 (Irregular)	Herbaceous Rangeland Nonforested Wetlands Residential	Grasslands (W. Cascades) Palustrine Emergent (PEM) Urban	Private
TEWA 94.69-N	1.93	Hwy 227 and S. Umpqua River crossing staging, spoil storage	225 x 819 (Irregular)	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
				Mixed Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Rivers and Streams Roads, Corridors	
TEWA 94.69-W	0.59	Hwy 227 and S. Umpqua River crossing staging, spoil storage	200 x 120 (Irregular)	Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Rivers and Streams Roads, Corridors	Private
TEWA 94.77-W	0.22	S. Umpqua River crossing staging	50 x 238	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
TEWA 94.84-W	0.1	waterbody crossing	50 x 75	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 94.86-N	0.18	Topsoil	10 x 821	Mixed Forest Land Mixed Rangeland Nonforested Wetlands	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Palustrine Emergent (PEM)	Private
TEWA 94.99-W	0.04	PI	20 x 100	Mixed Rangeland	Grasslands (W. Cascades)	Private
TEWA 95.04-N	0.07	Topsoil	10 x 300	Mixed Forest Land Mixed Rangeland Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Douglas Fir Dominant - Mixed Conifer	Private
TEWA 95.39	1.03	Staging, log decking/hauling	150 x 300			BLM
TEWA 95.49-N	0.26	Log landing, ingress/egress, steep slope staging	75 x 150	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 95.94-N	1.26	Log landing, steep slope staging, spoil storage	75 x 1,013 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 95.96-W	0.83	Log landing, steep slope staging, spoil storage	30 x 1,396	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 96.16-N	0.23	PI, spoil storage, staging	50 x 273	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 96.25-N	0.84	Log landing, Ingress/egress, road crossing, PI, spoil storage	30 x 1,526 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 96.25-W	1.11	Log landing, Ingress/egress, road crossing, PI, spoil storage	30 x 1,633	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 96.67-W	0.2	Log landing, steep slope staging, spoil storage	25 x 447 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 96.77-N	0.1	PI spoil storage	25 x 216	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 96.90-N	0.47	Log landing, steep slope staging, spoil storage	75 x 473 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 96.91-W	0.08	Log landing, PI, spoil storage	25 x 163	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 97.02-N	0.35	Log landing, staging spoil storage	75 x 247	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 97.04-W	0.22	Log landing, staging spoil storage	75 x 150	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 97.18-W	0.24	PI, spoil storage	25 x 445	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 97.38-N	0.25	PI, spoil storage	30 x 400	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 97.41-W	0.04	PI, road crossing, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 97.61-W	0.31	PI spoil storage	15 x 814 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 97.63-N	0.9	Log landing/hauling, ingress/egress, staging, spoil storage		Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 97.79-N	0.6	Log landing, PI, spoil storage	25 x 865 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 97.82-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 97.92-W	0.53	Log landing, Ingress/egress, road crossing, staging	235 x 477 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 98.05-W	1.2	Spoil storage	25 x 1,910 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 98.08-N	0.28	Spoil storage	10 x 1,222	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 98.55-W	0.14	PIs, road crossings, side cut	15 x 404	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 98.58-N	0.13	Log landing, steep slope staging, PI, spoil storage	15 x 400	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 98.68-N	0.13	Log landing, steep slope staging, PI, spoil storage	15 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 98.69-W	0.06	PIs, side cut	15 x 181	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 98.73-W	1.19	PI, spoil stoage	30 x 2,365 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 98.86-N	1.29	Log landing, steep slope staging, PI, spoil storage	295 x 375 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 98.94-N	0.92	PI, spoil stoage	30 x 1,144 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 99.20-W	0.03	PI, road crossing, side cut	15 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 99.27-W	0.59	PIs, road crossing, side cut	15 x 1,232 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private
TEWA 99.57-W	0.03	PI, road crossing, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 100.16-W	0.13	PI, road crossing, side cut	30 x 300 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 100.55-W	0.03	PI, road crossing, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 100.65-W	0.04	PI, road crossing, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 100.70-W	0.26	Hydro Test Discharge	75 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 100.87-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 100.95-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 101.01-W	0.35	PI, spoil storage	50 x 382	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 101.14-W	0.35	Log landing, staging, spoil storage	75 x 415 (Irregular)	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 101.20-N	0.04	Side cut	30 x 1,630	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 101.63-N	0.17	Log landing, steep slope staging, spoil storage	40 x 228	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 101.63-W	0.49	Log landing, steep slope staging, PI, spoil storage	30 x 1,004 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 101.77-N	0.32	Log landing, steep slope staging, spoil storage	50 x 380 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 102.00-W	0.69	Log landing, steep slope staging, PI, spoil storage	30 x 1,005	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 102.19-N	2.53	Ingress/egress, log landing/hauling, road crossing	310 x 751 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 102.32-W	0.02	Ingress/egress, road crossing	15 x 80	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM/USFS
TEWA 102.35-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 102.40-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 102.62-W	0.09	PI, side cut	15 x 250	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 102.63-N	0.20	Ingress/egress, PI, spoil storage, staging, parking	45 x 300 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 102.69-N	0.22	Spoil storage	15 x 650	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 102.72-W	0.52	PI, road crossing, side cut	30 x 810	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS/Private
TEWA 102.93-W	0.12	PI, side cut	15 x 340	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 102.99-W	0.17	PI, spoil storage	15 x 480	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 103.21-W	0.92	PI, spoil storage	30 x 1,382	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 103.56-W	0.50	PI, spoil storage, steep slope staging	30 x 737	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 103.58-N	0.26	PI, spoil storage, steep slope staging	50 x 275	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 103.76-N	0.68	Road/wetland crossing staging, spoil storage	50 x 650	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 103.77-W	0.17	Road crossing spoil storage	50 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 103.84-W	0.04	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 103.92-N	0.81	Staging, log decking/hauling, parking, hydrostatic test discharge	150 x 234	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 103.92-W	0.80	Ingress/egress, staging, log decking/hauling, parking	150 x 233	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 104.03-W	0.37	Ingress/egress, road crossing	30 x 546	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private
TEWA 104.17	0.62	Parking	170 x 193 (Irregular)	Trans, Comm, Utilities Corridors	Roads, Corridors	USFS
TEWA 104.23-N	0.10	Ingress/egress, road crossing	25 x 193	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 104.23-W	0.13	Ingress/egress, road crossing	25 x 247	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 104.42-W	0.45	Log landing, steep slope staging, PI, spoil storage	50 x 632 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 104.50-N	0.17	Log landing, steep slope staging, PI, spoil storage	30 x 264	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 104.71-W	1.10	Ingress/egress, road crossing, staging, parking	75 x 962 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 104.80-N	0.21	Ingress/egress, road crossing, staging, parking	30 x 300	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 104.94-N	0.07	PI, spoil storage	25 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 104.94-W	0.19	PI, side cut	50 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 105.02-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 105.15-N	1.02	PI, spoil storage	30 x 1,454	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 105.18-W	0.20	PI, spoil storage	25 x 368	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 105.29-W	0.10	Ingress/egress, road crossing	25 x 177	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 105.35-W	0.24	Ingress/egress, staging, parking	75 x 240 (Irregular)	Ditches Evergreen Forest Land Trans, Comm, Utilities Corridors	Ditches Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 105.52-N	0.19	PI, spoil storage	25 x 336	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 105.54-W	0.30	Ingress/egress, staging, parking	15 x 895	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 105.65-N	0.05	Steep slope staging, PI, spoil storage	15 x 150	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 105.80-N	0.31	Side cut, spoil storage PI	30 x 490	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 105.80-W	0.34	Ingress/egress, side cut, spoil storage PI	30 x 518	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
				Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	
TEWA 105.92-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 106.03-W	0.22	Ingress/egress, road crossing, spoil storage	75 x 165	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 106.13-N	0.17	Spoil storage	50 x 184	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 106.13-W	0.26	PIs, road crossing, side cut	30 x 417	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 106.31-N	0.10	Ingress/egress, staging, spoil storage	15 x 315	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 106.33-W	0.81	Ingress/egress, staging, log decking/hauling, parking	30 x 1,307 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 106.38	0.62	Staging/parking		Trans, Comm, Utilities Corridors	Roads, Corridors	USFS
TEWA 106.39-N	0.13	PI, spoil storage	15 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 106.63-W	0.08	PIs, side cut	15 x 249	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 106.76-N	0.38	Ingress/egress, in-road construction, staging, parking	20 x 863	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 106.76-W	0.50	PIs, road crossings, side cut	30 x 752	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 107.05-N	1.02	Hydro Test Discharge, PI, spoil storage	30 x 1,493	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 107.09-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 107.13-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 107.20-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 107.29-W	0.31	Log landing, steep slope staging, spoil storage	50 x 423 (Irregular)	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 107.45-W	0.05	PI, spoil storage	15 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 107.56-W	0.05	PI, spoil storage	15 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 107.91-N	0.05	PI, spoil storage	15 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 108.07-N	0.96	Ingress/egress, road crossing, PI, spoil storage	30 x 1,277 (Irregular)	Ditches Evergreen Forest Land Trans, Comm, Utilities Corridors	Ditches Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 108.07-W	0.36	Ingress/egress, road crossing, PI, spoil storage	35 x 427 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 108.33-N	0.45	Ingress/egress, road crossing, PI, spoil storage	30 x 527 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 108.38-W	0.18	PI, road crossing, side cut	50 x 187 (Irregular)	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 108.42-W	0.34	Ingress/egress, road crossing, PI, spoil storage	50 x 485 (Irregular)	Ditches Regenerating Evergreen Forest Land	Ditches Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 108.47-N	0.41	PI, spoil stoarage	55 x 425	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 108.56-W	0.09	PI, side cut, top of hill	30 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 108.84-W	0.11	PI, road crossing, side cut	15 x 325	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 108.91-W	0.16	PI, road crossing	30 x 306	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 109.10-W	0.43	PI, road crossing, log landing, side cut	50 x 448	Evergreen Forest Land Nonforested Wetlands Streams and Canals Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Palustrine Shrub (PSS) Rivers and Streams Roads, Corridors	USFS
TEWA 109.12-N	0.06	waterbody crossing	30 x 89	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 109.20-N	0.47	Waterbody crossing, side cut	30 x 682	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 109.34-N	0.30	PI, road crossings, log landing, side cut, spoil storage	30 x 438	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 109.58-W	0.17	Road crossing, log landing, side cut, spoil storage	50 x 138	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 109.59-N	0.22	Road crossings, parking, staging, spoil storage	20 x 527 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 109.68-N	0.09	Road crossing, waterbody crossing, spoil storage	120 x 59 (Irregular)	Evergreen Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Rivers and Streams Roads, Corridors	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 109.71-W	0.04	PI, waterbody crossing, side cut	30 x 135 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 109.73-N	0.07	PI, waterbody crossing, side cut	55 x 166 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 109.83-W	0.23	PIs, side cut	50 x 255	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 109.90-W	0.09	PIs, side cut	15 x 248	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 109.99-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.01-N	0.24	PIs, side cut	30 x 380	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.06-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.12-W	0.23	Ingress/egress, road crossing, side cut, log landing	50 x 250	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 110.19-N	0.10	PI, side cut	25 x 215	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.21-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.27-W	0.34	Staging, parking, truck turnaround	75 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.34-W	0.66	PIs, road crossings, side cut	50 x 787 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 110.57-W	0.10	PI, side cut	30 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 110.73 Peavine Quarry	15.87	Staging, Parking, Disposal, hydrostatic discharge	Irregular	Evergreen Forest Land Nonforested Wetlands Streams and Canals Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Palustrine Unconsolidated Bottom (PUB) Rivers and Streams Industrial Roads, Corridors	USFS
TEWA 110.98-W	0.23	PIs, side cut, steep slope	30 x 405 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 111.10-W	0.64	Staging, parking, truck turn around, top of hill	100 x 319 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 111.21-W	0.11	Log landing, steep slope staging, PI, spoil storage	15 x 341	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 111.22-N	0.26	Log landing, steep slope staging, PI, spoil storage	55 x 259	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 111.80-W	0.07	Road crossing, side cut	30 x 75	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 111.82-W	0.09	PI, road crossing, side cut	30 x 174	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 111.93-W	1.56	Log landing/hauling, ingress/egress, road crossing	100 x 744	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 112.01-N	0.17	Log landing/hauling, ingress/egress, road crossing	50 x 264 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 112.08-N	0.34	Log landing/hauling, ingress/egress, road crossing	15 x 776 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 112.18-W	0.09	PI, side cut	30 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 112.53-N	0.34	Log landing/hauling, ingress/egress, road crossing	100 x 150	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 112.54-W	0.59	Log landing/hauling, ingress/egress, road crossing	50 x 565	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 113.05-N	2.33	Log landing/hauling, ingress/egress, staging, parking	15 x 2,669 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 113.08-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 113.62-N	1.13	Ingress/egress, road crossing, spoil storage	30 x 1,659	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 113.65-W	0.04	PI, road crossing, side cut	15 x 100	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 114.12-N	0.42	PI, spoil storage	50 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.12-W	0.39	PI, spoil storage	50 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.26-W	0.13	PI, steep slope staging, spoil storage	15 x 402	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.28-N	0.27	PI, side cut, top of hill	50 x 249	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.43-W	0.17	PIs, side cut	15 x 502	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.55-N	0.13	PI, side cut	30 x 200	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.55-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 114.68-W	0.27	Side cut	15 x 770	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 114.99-N	0.77	Log landing/hauling, ingess/egress, road crossing,	30 x 865 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
TEWA 115.11-W	0.43	Log landing/hauling, ingess/egress, road crossing	100 x 181	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 115.23-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 115.32-N	0.47	Log landing/hauling, ingess/egress, road crossing	50 x 441	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
TEWA 115.33-W	1.04	Log landing/hauling, ingess/egress, road crossing	50 x 946	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
TEWA 115.81-N	0.56	Log landing/hauling, ingress/egress, road crossing	100 x 295	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 115.83-W	0.50	Log landing/hauling, ingress/egress, road crossing	100 x 246	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 115.95-W	0.93	Log landing/hauling, ingress/egress, road crossing	30 x 1,251 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 116.06-N	0.13	Log landing/hauling, ingress/egress, road crossing	50 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 116.08-N	0.10	Log landing/hauling, ingress/egress, road crossing	50 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 116.30-W	0.19	PI, road crossing, side cut	30 x 302	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 116.43-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 116.56-N	0.14	PI, spoil storage	15 x 418	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 116.59-W	4.17	PI, spoil storage	30 x 7,409 (Irregular)	Evergreen Forest Land Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir -White Fir//Tanoak-Madrone Mixed Shrublands Roads, Corridors	BLM/Private
TEWA 117.13-N	0.14	PI, side slopes, spoil storage	15 x 431	Evergreen Forest Land Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Shrublands	BLM
TEWA 117.26-N	0.15	PI, side slopes, spoil storage	15 x 465	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 117.68-N	2.08	Ingress/egress, road crossing, PI, spoil storage	30 x 1,872 (Irregular)	Evergreen Forest Land Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir -White Fir//Tanoak-Madrone Mixed Shrublands Roads, Corridors	BLM/Private
TEWA 118.14-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 118.23-N	0.23	Ingress/egress, road crossing, spoil storage, parking	50 x 250	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	Private
TEWA 118.26-W	0.42	PI, spoil storage	55 x 439	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 118.38-W	0.20	PI, spoil storage	35 x 300	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 118.46-N	0.29	PIs, side cut	30 x 440	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 118.60-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 118.66-W	0.14	PIs, side cut	15 x 392	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 118.70-N	0.34	PIs, road crossing, waterbody crossing, side cut	15 x 986	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	Private
TEWA 118.83-W	0.26	PI, waterbody crossing	50 x 246	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
				Streams and Canals	Rivers and Streams	
TEWA 118.89-W	0.23	Ingress/egress, road crossing, waterbody crossing	50 x 186	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas Fir -White Fir//Tanoak-Madrone Mixed	BLM/Private
TEWA 118.93-N	0.13	Ingress/egress, road crossing	50 x 107	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	BLM
TEWA 118.93-W	0.11	Ingress/egress, road crossing	50 x 97	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	BLM
TEWA 119.01-W	0.05	Road crossing	30 x 75	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	BLM
TEWA 119.03-N	0.57	PIs, road crossing, side cut, steep slope, top of hill	50 x 537	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 119.03-W	0.66	PIs, road crossing, side cut, steep slope, top of hill	50 x 615	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	BLM
TEWA 119.26-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	BLM
TEWA 119.38-W	0.13	PI, spoil storage	25 x 250	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	BLM
TEWA 119.47-N	0.13	PI, steep slope staging, spoils storage	15 x 400	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	BLM
TEWA 119.50-W	0.32	PI, steep slope staging, spoils storage	55 x 350 (Irregular)	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	BLM
TEWA 119.67-W	0.12	Ingress/egress, road crossing, spoil storage	25 x 235	Deciduous Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Rivers and Streams Roads, Corridors	BLM
TEWA 119.68-N	0.12	Ingress/egress, road crossing, spoil storage	25 x 236	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	BLM
TEWA 119.90-W	0.88	Ingress/egress, road crossing, PI, spoil storage	50 x 1,027 (Irregular)	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	Private
TEWA 120.15-W	1.09	Ingress/egress, road crossing, spoil storage, parking	30 x 1,620 (Irregular)	Deciduous Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas Fir -White Fir//Tanoak-Madrone Mixed Roads, Corridors	BLM/Private
TEWA 120.26-N	0.29	Ingress/egress, road crossing, spoil storage, parking	50 x 300	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	BLM/Private
TEWA 120.48-W	0.10	waterbody crossing	50 x 100	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 120.53-N	0.13	Ingress/egress, road crossing, spoil storage, parking	25 x 250	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 120.53-W	0.50	Ingress/egress, road crossing, spoil storage, parking	50 x 500	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas Fir -White Fir//Tanoak-Madrone Mixed Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 120.67-W	0.03	PI, side cut	15 x 100	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 120.72-W	0.12	PIs, side cut	15 x 338	Mixed Forest Land	Douglas Fir -White Fir//Tanoak-Madrone Mixed	Private
TEWA 120.73-N	0.17	PI, wetland crossing, staging	15 x 505	Mixed Rangeland	Grasslands (W. Cascades)	Private
TEWA 120.84-W	0.15	PIs, road crossing, side cut, top soil storage	15 x 321 (Irregular)	Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Urban Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 120.85-N	0.15	Wetland crossing staging, ingress/egress	85 x 96 (Irregular)	Residential Trans, Comm, Utilities Corridors	Urban Roads, Corridors	Private
TEWA 120.93-N	0.07	PI, waterbody crossing	15 x 157 (Irregular)	Deciduous Forest Land	Oregon White Oak Forest	BLM
TEWA 121.03-N	0.51	PI, side slopes, spoil storage	15 x 1,498	Deciduous Forest Land Mixed Forest Land Mixed Rangeland	Oregon White Oak Forest Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	BLM/Private
TEWA 121.20-W	0.36	PI, side slopes, spoil storage	50 x 335	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 121.83-N	0.67	PI, spoil storage	10 x 2,147 (Irregular)	Deciduous Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
TEWA 121.86-W	0.04	PI, side cut	15 x 100	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 121.95-W	12.23	HDD (Rogue River) staging/pull- back	Irregular	Deciduous Forest Land Herbaceous Rangeland Mixed Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Grasslands (W. Cascades) Grasslands (W. Cascades) Rivers and Streams Grasslands (W. Cascades)	Private
TEWA 122.50	0.51	Water Source - Dust (Indian Lake Reservior -1) Water Source - Dust (Indian Lake Reservior -2)	105 x 61 (Irregular) 165 x 111 (Irregular)	Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 122.61-W	1.02	Rogue River HDD	Irregular	Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Rivers and Streams Roads, Corridors	Private/State
TEWA 122.78-N	0.19	HDD (Rogue River) staging	45 x 254	Mixed Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 122.78-W	0.40	HDD (Rogue River) staging	60 x 255	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 122.96-W	0.34	Ingress/egress, PI, road crossing, spoil storage	50 x 365	Evergreen Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 123.02-N	0.29	PI, road crossing, side cut	50 x 300	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 123.07-W	0.03	Road crossing	30 x 50	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 123.08-W	0.03	Road crossing	30 x 50	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	Private
TEWA 123.09-N	0.52	PI, side cut, top of hill	25 x 698 (Irregular)	Deciduous Forest Land Evergreen Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 123.17-W	1.08	PIs, side cut, top of hill	30 x 1,595	Deciduous Forest Land Evergreen Forest Land Mixed Rangeland	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades)	BLM/Private
TEWA 123.50-N	0.10	PI, side cut	30 x 175	Deciduous Forest Land	Oregon White Oak Forest	BLM
TEWA 123.53-W	2.84	PIs, side cut staging, parking, truck turn around, top of hill	30 x 3,212 (Irregular)	Deciduous Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Shrublands	BLM
TEWA 123.61-N	0.26	Steep slope staging	30 x 413	Deciduous Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Shrublands	BLM
TEWA 123.71-N	0.26	Hydrostatic Test Water Discharge	75 x 150	Deciduous Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Shrublands	BLM
TEWA 123.93-N	0.26	PI, spoil storage	30 x 412	Deciduous Forest Land	Oregon White Oak Forest	BLM
TEWA 124.06-N	0.67	Log landing, steep slope staging, spoil storage		Deciduous Forest Land Evergreen Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Shrublands	BLM/State
TEWA 124.19-W	0.55	Log landing, steep slope staging, spoil storage	30 x 843	Deciduous Forest Land	Oregon White Oak Forest	BLM/State
TEWA 124.30-N	0.61	Log landing, steep slope staging, spoil storage	120 x 200 (Irregular)	Deciduous Forest Land	Oregon White Oak Forest	State
TEWA 124.54-N	0.25	Log landing, steep slope staging, spoil storage	30 x 404	Deciduous Forest Land Evergreen Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 124.54-W	1.01	Log landing, steep slope staging, spoil storage	100 x 504	Deciduous Forest Land Evergreen Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 124.95-N	2.08	Log landing, ingress/egress, road crossing, steep slope	50 x 1,892 (Irregular)	Deciduous Forest Land Evergreen Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	BLM
TEWA 124.99-W	1.93	Log landing, steep slope staging, spoil storage	15 x 3,296 (Irregular)	Deciduous Forest Land Evergreen Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	BLM
TEWA 125.35-W	2.40	Log landing, ingress/egress, steep slope staging	30 x 2,863 (Irregular)	Evergreen Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	BLM/Private
TEWA 125.37-N	1.45	Log landing, ingress/egress, steep slope staging	25 x 2,397	Evergreen Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	BLM/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 125.85-N	0.16	Ingress/egress, road crossing, spoil storage	30 x 272	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 125.92-N	0.10	Waterbody crossing staging	25 x 201	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 125.92-W	0.14	Waterbody crossing staging	25 x 263	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 125.99-N	0.10	Waterbody crossing staging	25 x 200	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 125.99-W	1.92	Ingress/egress, steep slope staging, PI, spoil storage	25 x 2,512 (Irregular)	Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM/Private
TEWA 126.09-N	0.16	Staging waterbody crossing	25 x 300	Shrub and Brush Rangeland	Shrublands	Private
TEWA 126.26-N	0.79	Ingress/egress, steep slope staging, PI, spoil storage	75 x 411	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Shrublands Roads, Corridors	BLM/Private
TEWA 126.56-N	0.24	staging/spoil storage, side cut	75 x 137	Deciduous Forest Land Strip Mines, Quarries, and Gravel Pits	Oregon White Oak Forest Industrial	BLM
TEWA 126.73-N	0.26	Steep slope staging, spoil storage	50 x 269	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 126.73-W	0.26	Steep slope staging, spoil storage	50 x 280	Mixed Forest Land Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak Ponderosa Pine/White Oak	Private
TEWA 127.24-N	0.92	Ingress/egress, road crossing, staging, PI, spoil storage	30 x 772 (Irregular)	Ditches Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ditches Ponderosa Pine/White Oak Shrublands Roads, Corridors	Private
TEWA 127.25-W	0.25	PI, ingress/egress, road crossing, spoil storage	50 x 327 (Irregular)	Ditches Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ditches Shrublands Roads, Corridors	Private
TEWA 127.34-W	0.04	waterbody crossing	30 x 75	Mixed Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Shrublands	Private
TEWA 127.49-N	0.16	PI, side cut	15 x 477	Mixed Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Shrublands	BLM
TEWA 127.62-W	1.17	PIs, side cut	30 x 1,726	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 127.65-N	0.66	PIs, side cut	30 x 977	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 127.86-N	0.14	PI, side cut	30 x 250	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 128.01-N	0.28	PI, road crossing, side cut	30 x 427	Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM
TEWA 128.01-W	0.77	PIs, road crossing, side cut	30 x 1,158	Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM
TEWA 128.15-N	0.25	PI, road crossing, side cut	30 x 400	Mixed Forest Land Trans, Comm, Utilities Corridors Mixed Forest Land	Ponderosa Pine/White Oak Roads, Corridors Ponderosa Pine/White Oak	BLM
TEWA 128.31-W	0.07	PI, side cut	15 x 200			BLM
TEWA 128.44-W	0.06	PI, waterbody crossing, side cut	15 x 200	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 128.55-N	0.29	Wetland crossing staging	10 x 676 (Irregular)	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 128.55-W	0.15	Wetland crossing staging	50 x 175	Cropland and Pasture	Agriculture	Private
TEWA 128.63-W	0.29	Wetland crossing staging	50 x 275	Cropland and Pasture	Agriculture	Private
TEWA 128.68-W	0.06	waterbody crossing	30 x 100	Cropland and Pasture Mixed Forest Land Streams and Canals	Agriculture Douglas-Fir-Mixed Deciduous Forest Rivers and Streams	Private
TEWA 128.79-N	0.46	Steep slope staging	100 x 200	Shrub and Brush Rangeland	Shrublands	BLM
TEWA 128.84-W	0.15	Wetland crossing staging	50 x 160	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM
TEWA 128.89-W	0.20	Wetland crossing staging	50 x 263 (Irregular)	Evergreen Forest Land Forested Wetland Mixed Forest Land	Douglas Fir Dominant - Mixed Conifer Palustrine Forest (PFO) Douglas-Fir-Mixed Deciduous Forest	BLM
TEWA 128.93-N	0.30	Steep slope staging, spoil storage	15 x 891	Deciduous Forest Land Evergreen Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Shrublands	BLM
TEWA 128.96-W	0.96	PIs, road crossing, side cut	15 x 2,774	Deciduous Forest Land Evergreen Forest Land Mixed Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak Shrublands	BLM/Private
TEWA 129.58-W	0.17	PI, side cut	30 x 270	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 129.65-W	0.24	PI, spoil storage	30 x 400	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 129.84-W	0.46	Ingess/egress, PI, spoil storage	30 x 702	Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Shrublands Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 130.06-W	0.33	PI, spoil storage	30 x 507	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 130.25-W	0.11	PI, road crossing, side cut	30 x 200	Deciduous Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Shrublands	Private
TEWA 130.49-W	0.21	PIs, side cut	30 x 337	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 130.75-W	0.34	Ingress/egress, road crossing, spoil storage	75 x 259	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 130.79-N	0.14	Ingress/egress, road crossing, spoil storage	60 x 126	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 130.81-W	0.29	Ingress/egress, road crossing, spoil storage	75 x 191	Mixed Rangeland Nonforested Wetlands Shrub and Brush Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Palustrine Shrub (PSS) Shrublands Rivers and Streams Roads, Corridors	Private
TEWA 130.86-W	0.07	waterbody crossing	30 x 100	Mixed Rangeland	Grasslands (W. Cascades)	Private
TEWA 131.03-N	0.41	Wetland crossing staging	15 x 1,174	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 131.18-W	0.45	PI, spoil storage	50 x 500 (Irregular)	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 131.36-N	1.21	Spoil storage	15 x 2,833 (Irregular)	Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Streams and Canals	Grasslands (W. Cascades) Ponderosa Pine/White Oak Shrublands Rivers and Streams	BLM/Private
TEWA 131.36-W	1.76	PI, spoil storage	30 x 2,597	Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Streams and Canals	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak Shrublands Rivers and Streams	BLM/Private
TEWA 131.90-N	0.25	Waterbody crossing (Neil Creek) staging, topsoil	15 x 539 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 131.94-W	0.17	Waterbody crossing (Neil Creek) staging	50 x 200	Cropland and Pasture	Agriculture	Private
TEWA 132.04-W	1.40	Butte Falls Compressor Station, hydrostatic discharge	290 x 192 (Irregular)	Mixed Rangeland	Grasslands (W. Cascades)	Private
TEWA 132.37-W	0.11	PI, top soil storage		Nonforested Wetlands	Palustrine Emergent (PEM)	Private
TEWA 132.44-N	0.13	Ingress/egress, Butte Falls Hwy crossing	50 x 112	Nonforested Wetlands Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 132.44-W	0.18	Ingress/egress, Butte Falls Hwy crossing	75 x 103	Nonforested Wetlands Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 132.47-N	0.12	Ingress/egress, Butte Falls Hwy crossing	50 x 103	Cropland and Pasture Herbaceous Rangeland Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 132.47-W	0.19	Ingress/egress, Butte Falls Hwy crossing	75 x 114	Cropland and Pasture Herbaceous Rangeland Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 132.57-W	0.11	PI, top soil storage	30 x 200	Cropland and Pasture Herbaceous Rangeland	Palustrine Emergent (PEM) Grasslands (W. Cascades)	Private
TEWA 132.67-W	0.13	Wetland/PI,spoil storage	30 x 200	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 132.72-W	0.08	Waterbody crossing (Quartz Creek) staging	30 x 154	Deciduous Forest Land	Oregon White Oak Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 132.80-W	0.15	Waterbody crossing (Quartz Creek) staging	30 x 250	Evergreen Forest Land Herbaceous Rangeland	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades)	Private
TEWA 132.89-W	0.53	PI, spoil storage	30 x 794	Deciduous Forest Land Mixed Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Ponderosa Pine/White Oak Shrublands	Private
TEWA 133.14-W	0.06	PI, side cut	30 x 100	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 133.24-N	0.54	Medford Aqueduct (bore pit)	50 x 524	Evergreen Forest Land Mixed Forest Land Streams and Canals	Douglas Fir Dominant - Mixed Conifer Douglas Fir -White Fir//Tanoak-Madrone Mixed Ponderosa Pine/White Oak Rivers and Streams	BLM
TEWA 133.28-W	1.14	Medford Aqueduct (bored pit), ingress/egress, staging	310 x 389 (Irregular)	Evergreen Forest Land Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Urban Roads, Corridors	BLM/Private
TEWA 133.40-N	0.26	Medford Aqueduct (bore pit)	75 x 150	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 133.41-W	0.45	Medford Aqueduct (bore pit)	50 x 466	Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Douglas Fir Dominant - Mixed Conifer Shrublands Roads, Corridors	BLM/Private
TEWA 133.44-N	0.43	Staging, spoil storage	50 x 351 (Irregular)	Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Shrublands Roads, Corridors	BLM/Private
TEWA 133.56-N	0.46	PI, ingress/egress, road crossing, spoil storage	30 x 721	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 133.56-W	1.29	Ingress/egress, road crossing, spoil storage, staging	30 x 1,913	Clearcut Forest Land Evergreen Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 133.72-N	0.80	Staging, spoil storage	50 x 864 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
TEWA 133.98-N	0.25	Road crossings, side cut, top of hill	15 x 400	Clearcut Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 133.98-W	0.39	Road crossings, side cut, top of hill	30 x 400	Clearcut Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 134.08-W	0.18	PI, spoil storage	30 x 276	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
TEWA 134.25-N	0.28	PIs, road crossing, side cut, top of hill	15 x 825	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 134.25-W	0.11	PI, road crossing, side cut	30 x 200	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 134.39-W	0.34	PI, spoil storage	105 x 366 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak Ponderosa Pine/White Oak	Private
TEWA 134.58-W	1.38	Log landing/hauling, ingress/egress, road crossing	150 x 400	Mixed Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 134.78-W	0.12	PI, road crossing	30 x 200	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
TEWA 134.88-W	0.40	Road crossing, side cut	15 x 1,168	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
TEWA 135.27-W	0.12	PI	30 x 200	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
TEWA 135.38-W	0.25	PI, spoil storage	30 x 400	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
TEWA 135.52-N	0.23	Log landing/hauling, ingress/egress, road crossing	100 x 100	Clearcut Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Shrublands Roads, Corridors	Private
TEWA 135.52-W	0.11	Log landing/hauling, ingress/egress, road crossing	50 x 100	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Shrublands Roads, Corridors	Private
TEWA 135.63-W	0.13	PI, side cut	30 x 200	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 135.79-W	1.26	PI, staging, spoil storage	30 x 1,066 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 135.81-N	0.14	PI, side cut	15 x 413	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 135.94-N	0.13	PI, spoil storage	15 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 136.11-N	0.39	Log landing/hauling, ingress/egress, road crossing	50 x 585 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 136.11-W	0.28	Log landing/hauling, ingress/egress, road crossing	50 x 300	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 136.28-N	0.17	Ingress/egress, staging	50 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 136.28-W	0.17	Ingress/egress, staging	50 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
TEWA 136.44-N	0.17	Ingress/egress, staging	50 x 200	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 136.44-W	0.17	Ingress/egress, staging	50 x 200	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 136.80-N	0.65	Log landing/hauling, ingress/egress, road crossing	175 x 141	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer	BLM/Private
TEWA 136.80-W	0.39	Log landing/hauling, ingress/egress, road crossing	50 x 400	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 136.89-N	0.39	Log landing/hauling, ingress/egress, road crossing	50 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 137.03-N	0.07	Spoil storage	25 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 137.03-W	0.07	Spoil storage	25 x 150	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 137.13-N	0.17	Ingress/egress, road crossing, spoil storage	50 x 200	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	BLM/Private
TEWA 137.22-W	0.41	Log landing/hauling, ingress/egress, road crossing	50 x 385	Herbaceous Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 137.26-N	0.28	Log landing/hauling, ingress/egress, road crossing	100 x 156 (Irregular)	Herbaceous Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 137.30-N	0.10	Ingress/egress, road crossing, spoil storage	50 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 137.31-W	0.10	Ingress/egress, road crossing, spoil storage	50 x 100	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
TEWA 137.39-W	0.31	Waterbody crossing (Whiskey Creek)	30 x 465	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
TEWA 137.50-N	0.06	Waterbody crossing (Whiskey Creek)	15 x 172	Herbaceous Rangeland Regenerating Evergreen Forest Land	Grasslands (W. Cascades) Ponderosa Pine/White Oak	Private
TEWA 137.50-W	0.18	Waterbody crossing (Whiskey Creek)	50 x 186	Herbaceous Rangeland Regenerating Evergreen Forest Land	Grasslands (W. Cascades) Ponderosa Pine/White Oak	Private
TEWA 137.70-W	0.12	PI, spoil storage	30 x 200	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
TEWA 137.80-W	0.41	PI, spoil storage	50 x 400	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
TEWA 137.98-W	0.42	Log landing/hauling, ingress/egress, road crossing	30 x 640	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 138.03-N	0.41	Log landing/hauling, ingress/egress, road crossing	50 x 400	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 138.24-W	0.39	PI, spoil storage	50 x 400	Mixed Forest Land Regenerating Evergreen Forest Land Streams and Canals	Ponderosa Pine/White Oak Ponderosa Pine/White Oak Rivers and Streams	Private
TEWA 138.39-W	0.30	PI, spoil storage	55 x 258 (Irregular)	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 138.40-N	0.22	PI, spoil storage	50 x 226	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 138.47-W	0.15	Waterbody crossing staging	50 x 128	Shrub and Brush Rangeland	Shrublands	Private
TEWA 138.52-W	0.15	Waterbody crossing staging	50 x 128	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak Grasslands (W. Cascades)	Private
TEWA 138.56-N	0.68	PI, spoil storage	100 x 440 (Irregular)	Mixed Forest Land Mixed Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 138.56-W	0.25	Log landing/hauling, ingress/egress, road crossing	50 x 250	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 138.91-W	0.04	PI, side cut	15 x 100	Mixed Forest Land	Ponderosa Pine/White Oak	Private
TEWA 139.01-N	0.30	Ingress/egress, road crossing, spoil storage	50 x 300	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 139.01-W	0.32	Ingress/egress, road crossing, spoil storage	50 x 300	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 139.08-N	0.29	Wetland and waterbody crossing, side cut	50 x 300	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 139.08-W	2.06	Ingress/engress, staging	270 x 371 (Irregular)	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 139.38-W	0.50	PI, road crossing, side cut	30 x 100 (Irregular)	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 139.41-W	0.05	PI, road crossing, side cut	30 x 37 (Irregular)	Herbaceous Rangeland	Grasslands (E. Cascades)	Private
TEWA 139.55-W	0.07	Wetland staging	30 x 119	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 139.57-N	0.06	Wetland staging	25 x 114	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 139.69-N	0.35	PI, spoil storage	50 x 273	Herbaceous Rangeland Streams and Canals	Grasslands (W. Cascades) Rivers and Streams	Private
TEWA 139.82-W	1.03	PI, waterbody crossing, side cut, top of hill	15 x 2,282 (Irregular)	Evergreen Forest Land Mixed Forest Land Shrub and Brush Rangeland Streams and Canals	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Shrublands Rivers and Streams	BLM/Private
TEWA 140.27-N	0.13	Waterbody crossing staging, ingress/egress	25 x 223	Mixed Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	BLM
TEWA 140.28-W	0.26	Waterbody crossing staging, ingress/egress	50 x 192	Mixed Forest Land	Ponderosa Pine/White Oak	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 140.32-N	0.55	Spoil storage side slopes/PI	20 x 1,295 (Irregular)	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Ponderosa Pine/White Oak	BLM
TEWA 140.32-W	0.65	Spoil storage side slopes/PI	55 x 635	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 140.66-W	0.04	Road crossing	30 x 50	Herbaceous Rangeland Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Shrublands Roads, Corridors	Private
TEWA 140.68-W	0.45	PI, spoil storage	50 x 483 (Irregular)	Mixed Rangeland Shrub and Brush Rangeland	Grasslands (W. Cascades) Shrublands	Private
TEWA 140.90-W	0.07	PI, waterbody crossing, side cut	30 x 120	Mixed Rangeland	Grasslands (W. Cascades)	BLM
TEWA 140.93-W	1.44	Staging, hydrostatic discharge	30 x 1,039 (Irregular)	Mixed Rangeland Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Shrublands Roads, Corridors	BLM/Private
TEWA 140.98	2.06	Water source	295 x 382 (Irregular)	Lakes Mixed Forest Land Mixed Rangeland Nonforested Wetlands	Open Water Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Palustrine Emergent (PEM)	Private
TEWA 141.27-W	0.03	PI	15 x 100	Shrub and Brush Rangeland	Shrublands	BLM
TEWA 141.40-W	0.12	PI, spoil storage	30 x 200	Deciduous Forest Land	Oregon White Oak Forest	BLM
TEWA 141.52-W	0.34	PI, side cut	15 x 993	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Ponderosa Pine/White Oak	BLM
TEWA 141.77-N	0.28	Ingress/egress, road crossing, staging	50 x 314	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	BLM
TEWA 141.77-W	0.27	Ingress/egress, road crossing, staging	50 x 293	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	BLM
TEWA 141.88-W	0.02	PI, side cut	15 x 100	Deciduous Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Shrublands	BLM
TEWA 141.97-W	3.94	Ingress/egress, staging, parking	360 x 1,393 (Irregular)	Deciduous Forest Land Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Oregon White Oak Forest Grasslands (W. Cascades) Ponderosa Pine/White Oak Shrublands Roads, Corridors	Private
TEWA 142.07-N	0.66	Ingress/egress, road crossing, spoil storage, staging	215 x 316 (Irregular)	Shrub and Brush Rangeland	Shrublands	Private
TEWA 142.17-N	0.63	Waterbody (Salt Creek) crossing, PI, spoil storage	10 x 1,980 (Irregular)	Cropland and Pasture Deciduous Forest Land Streams and Canals	Agriculture Palustrine Emergent (PEM) Oregon White Oak Forest Rivers and Streams	Private
TEWA 142.51-W	0.38	Waterbody (Salt Creek) crossing staging, PI, spoil storage	55 x 357	Cropland and Pasture	Palustrine Emergent (PEM)	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 142.58-N	0.22	Waterbody (Salt Creek) crossing staging, topsoil storage	50 x 417 (Irregular)	Cropland and Pasture Ditches Mixed Forest Land	Agriculture Palustrine Emergent (PEM) Ditches Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 142.58-W	0.13	Waterbody (Salt Creek) crossing staging, spoil storage	50 x 163	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 142.68-N	0.15	PIs, side cut	30 x 260	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
TEWA 142.80-N	0.41	PI, side cut	30 x 619	Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak Shrublands Roads, Corridors	Private
TEWA 142.83-N	0.98	PIs, side cut	30 x 1,452	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Ponderosa Pine/White Oak	Private
TEWA 143.05-W	0.40	PI, spoil storage	50 x 400	Deciduous Forest Land Streams and Canals	Oregon White Oak Forest Rivers and Streams	Private
TEWA 143.31-W	0.64	Log landing/staging	15 x 1,067 (Irregular)	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	Private
TEWA 143.53-W	0.30	PI, spoil storage	50 x 315	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 143.69-W	0.59	PI, spoil storage	50 x 616 (Irregular)	Deciduous Forest Land Nonforested Wetlands Shrub and Brush Rangeland Streams and Canals	Oregon White Oak Forest Palustrine Unconsolidated Bottom (PUB) Shrublands Rivers and Streams	Private
TEWA 143.78-N	0.50	PI, road crossing, side cut	15 x 1,461	Deciduous Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Oregon White Oak Forest Shrublands Roads, Corridors	Private
TEWA 144.00	0.58	Water Source - Dust (Unnamed Reservior)		Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 144.12-W	0.09	PI, waterbody crossing, side cut	30 x 150	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 144.17-N	0.14	PI, side cut	15 x 409	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 144.17-W	0.23	PI, side cut	30 x 350	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 144.34-W	0.46	PIs, waterbody crossing, side cut	10 x 1,775 (Irregular)	Deciduous Forest Land Herbaceous Rangeland	Oregon White Oak Forest Grasslands (E. Cascades)	Private
TEWA 144.59-N	0.58	PIs, road crossing, waterbody crossing, side cut	40 x 994 (Irregular)	Deciduous Forest Land Herbaceous Rangeland Shrub and Brush Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Grasslands (E. Cascades) Shrublands Rivers and Streams Roads, Corridors	Private
TEWA 144.70-W	0.79	PIs, road crossing, waterbody crossing, side cut	50 x 858 (Irregular)	Deciduous Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Shrublands	Private
TEWA 144.80-N	1.04	PIs, side cut	30 x 1,818 (Irregular)	Deciduous Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Oregon White Oak Forest Shrublands Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 145.00	0.36	Water Source - Dust (Gardener Reservior-1)	130 x 67 (Irregular) 135 x 91 (Irregular)	Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 145.07-W	0.03	PI, side cut	15 x 100	Deciduous Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Oregon White Oak Forest Shrublands Roads, Corridors	Private
TEWA 145.18-W	0.39	Road crossing, side cut	50 x 377	Deciduous Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Oregon White Oak Forest Shrublands Roads, Corridors	Private
TEWA 145.38-N	0.94	PIs, road crossings, waterbody crossings	10 x 3,012 (Irregular)	Cropland and Pasture Ditches Mixed Forest Land Nonforested Wetlands Streams and Canals Trans, Comm, Utilities Corridors	Agriculture Ditches Douglas-Fir-Mixed Deciduous Forest Palustrine Shrub (PSS) Rivers and Streams Roads, Corridors	Private
TEWA 145.39-W	0.59	Road crossing	25 x 100	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 145.49-W	0.65	PIs, road crossings	50 x 618	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 145.53-W	0.20	Ingress/egress, road crossing, waterbody crossing	50 x 183	Cropland and Pasture Ditches Mixed Forest Land Streams and Canals	Agriculture Ditches Douglas-Fir-Mixed Deciduous Forest Rivers and Streams	Private
TEWA 145.58-N	0.48	PI, ingress/egress, road crossing, waterbody crossing, topsoil	55 x 443	Cropland and Pasture Mixed Forest Land Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 145.58-W	0.55	PI, ingress/egress, road crossing, waterbody crossing, topsoil	55 x 468	Cropland and Pasture Mixed Forest Land Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
TEWA 145.70-N	0.51	PIs, waterbody crossing, side cut	10 x 1,373 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 145.70-W	0.57	PI, waterbody crossing	160 x 225 (Irregular)	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
TEWA 145.91-W	0.48	PI, road crossing, waterbody crosing, side cut	30 x 695	Cropland and Pasture Mixed Forest Land Trans, Comm, Utilities Corridors	Agriculture Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 146.07-W	0.39	PI, waterbody crossing	50 x 483 (Irregular)	Mixed Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Shrublands	Private
TEWA 146.14-N	0.90	Topsoil	10 x 3,357 (Irregular)	Mixed Forest Land Shrub and Brush Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Shrublands Rivers and Streams Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 146.40	0.26	Water Source - Hydro (N. Fork Little Bitte Creek-2)		Mixed Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 146.70	0.10	Water Source - Hydro (N. Fork Little Bitte Creek-2)		Mixed Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
TEWA 146.81-N	0.22	PI, waterbody crossing	50 x 150	Deciduous Forest Land Herbaceous Rangeland	Oregon White Oak Forest Grasslands (W. Cascades)	Private
TEWA 146.82-W	0.10	PI, waterbody crossing	50 x 101	Deciduous Forest Land Herbaceous Rangeland	Oregon White Oak Forest Grasslands (W. Cascades)	Private
TEWA 146.92-W	0.03	PI, side cut	15 x 100	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 147.02-W	0.04	PI, side cut	15 x 100	Deciduous Forest Land	Oregon White Oak Forest	Private
TEWA 147.08-N	0.98	Log landing/decking/hauling, steep slope staging	15 x 1,545 (Irregular)	Deciduous Forest Land Herbaceous Rangeland	Oregon White Oak Forest Grasslands (W. Cascades)	Private
TEWA 147.35-W	0.04	PI	15 x 100	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 147.47-W	0.03	PI, side cut	15 x 100	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
TEWA 147.68-N	0.68	Ingress, ergress, PI, spoil storage, staging, park	130 x 413 (Irregular)	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 147.72-W	0.18	PI, road crossing, side cut	30 x 258	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Ponderosa Pine/White Oak	Private
TEWA 147.76-W	0.04	Road crossing, side cut	30 x 75	Mixed Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Roads, Corridors	Private
TEWA 147.93-W	2.28	PI, spoil storage	30 x 2,813 (Irregular)	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Ponderosa Pine/White Oak	BLM/Private
TEWA 148.42-N	0.48	PI, side cut, top of hill	50 x 400	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 148.53-W	0.47	Log landing, spoil storage	75 x 350	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 149.22-N	2.28	PI, spoil storage	50 x 504	Evergreen Forest Land Mixed Forest Land	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak	BLM
TEWA 149.26-W	2.28	Log landing, PI, staging, spoil storage	95 x 1,656 (Irregular)	Mixed Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Shrublands	BLM
TEWA 149.49-N	0.16	PI, spoil storage	20 x 363	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 149.63-W	3.58	Log landing, steep slope staging, PI, spoil storage	50 x 3,068 (Irregular)	Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM/Private
TEWA 149.72-N	0.74	Spoil storage - side slopes	35 x 935	Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Douglas Fir Dominant - Mixed Conifer Shrublands	BLM
TEWA 149.97-N	0.33	Ingress/egress, rock source & disposal, staging	10 x 1,043 (Irregular)	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Shrublands Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 150.20-N	0.90	Ingress/egress, staging, spoil storage, parking	50 x 835	Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Shrublands Roads, Corridors	Private
TEWA 150.31-W	6.45	Staging, spoil storage, parking	260 x 2,221 (Irregular)	Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM/Private
TEWA 150.40-N	0.15	PI, road crossing, side cut	25 x 292	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Shrublands Roads, Corridors	Private
TEWA 150.66-N	0.15	Road crossing, side cut	25 x 280	Mixed Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Shrublands	BLM
TEWA 150.72-W	2.52	Log landing, staging, spoil storage	75 x 2,103 (Irregular)	Herbaceous Rangeland Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM
TEWA 150.82-N	0.07	Log landing, staging spoil storage	25 x 150	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 150.88-N	0.07	Log landing, staging spoil storage	25 x 150	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	BLM
TEWA 150.94-N	0.50	Log landing, staging spoil storage	15 x 1,329 (Irregular)	Herbaceous Rangeland Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM
TEWA 151.16-W	0.39	PI, spoil storage	50 x 400	Herbaceous Rangeland	Grasslands (W. Cascades)	BLM
TEWA 151.35-N	0.18	Ingress/egress, PI, spoil storage	25 x 340	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	BLM
TEWA 151.38-W	4.36	Ingress/egress, PI, spoil storage, side cut, hydrostatic discharge	25 x 5,457 (Irregular)	Evergreen Forest Land Herbaceous Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades) Douglas Fir Dominant - Mixed Conifer Ponderosa Pine Forest and Woodland Roads, Corridors	BLM/Private
TEWA 152.29-N	0.80	Ingress/egress, road crossing, staging, water source	75 x 647 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	BLM
TEWA 152.54-N	0.43	Ingress/egress, road crossing, staging, parking	75 x 250	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 152.54-W	0.05	Ingress/egress, road crossing, staging, parking	75 x 250	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine Forest and Woodland Roads, Corridors	BLM
TEWA 152.86-W	0.51	PI, spoil storage	50 x 480	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	BLM
TEWA 153.00-W	0.50	PI, spoil storage	50 x 485	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine Forest and Woodland	BLM
TEWA 153.24-W	0.35	PIs	50 x 337	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	BLM
TEWA 153.41-W	1.20	Ingress/egress, PI, spoil storage	50 x 1,125	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	BLM
TEWA 153.76-N	0.11	PI, spoil storage	25 x 216	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
TEWA 153.76-W	0.52	Log landing/decking/hauling, staging, spoil storage	175 x 323 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
TEWA 154.09-W	0.57	Log landing/decking/hauling, staging, spoil storage	150 x 199	Herbaceous Rangeland Shrub and Brush Rangeland	Grasslands (W. Cascades) Shrublands	USFS
TEWA 154.10-N	0.43	Log landing/decking/hauling, staging, spoil storag	75 x 256	Mixed Rangeland	Grasslands (W. Cascades)	USFS
TEWA 154.71-N	0.20	PI, spoil storage	20 x 455	Evergreen Forest Land Mixed Rangeland	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades)	USFS
TEWA 154.72-W	1.09	Log landing/decking/hauling, staging, spoil storage	150 x 591 (Irregular)	Evergreen Forest Land Mixed Rangeland	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades)	USFS
TEWA 154.86-W	0.24	PIs, log landing, decking/hauling	25 x 445	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS/Private
TEWA 155.02-N	0.24	Log landing, staging, spoil storage	50 x 232	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 155.02-W	0.46	PI, spoil storage	100 x 200	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 155.07-W	3.01	Log landing/decking/hauling, ingress/egress, road crossing	50 x 2,219 (Irregular)	Clearcut Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 155.39-N	0.90	Log landing/decking/hauling, ingress/egress, road crossing	95 x 563 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private
TEWA 155.62-N	0.83	Ingress/egress, road crossig, PI, spoil storage	50 x 778	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 155.71-W	0.06	PI, side cut	30 x 82	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 155.78-W	0.75	Log landing, decking/hauling, Ingress/egress, road crossing	15 x 1,110 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 155.96-N	0.18	Log landing, decking/hauling, Ingress/egress, road crossing	50 x 200	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 156.15-N	0.20	PI, spoil storage	15 x 579	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 156.15-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 156.18-W	0.38	PI, spoil storage	55 x 400	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 156.75-W	0.05	Road crossing, side cut	30 x 71	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 156.78-N	0.21	Ingress/egress, road crossing, staging	50 x 200	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 156.78-W	0.75	Ingress/egress, road crossing, staging	15 x 1,090 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 157.32-W	0.19	PIs, side cut	30 x 303	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 157.39-W	0.02	Road crossing, side cut	30 x 75	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 157.44-N	0.40	Log landing, decking/hauling, Ingress/egress, road crossing	50 x 400	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 157.45-W	1.17	Log landing, decking/hauling, Ingress/egress, road crossing	85 x 885 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 157.96-N	0.21	PI, spoil storage	25 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 157.96-W	0.22	PI, side cut	25 x 400	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 158.47-W	0.88	PI, spoil storage	15 x 2,587	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 158.72-N	1.00	Ingress/ergress, spoil storage, staging, parking	160 x 351 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 159.40-W	0.14	Ingress/ergress, staging, spoil storage, parking	35 x 190	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 159.43-W	0.07	Ingress/ergress, staging, spoil storage, parking	30 x 115	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 159.54-W	0.08	PI, side cut	30 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 159.69-W	0.08	PI, side cut	30 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 159.73-N	0.13	PIs/spoil storage	15 x 400	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 159.76-W	0.09	PI, side cut	30 x 150	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 159.84-N	0.65	Ingress/egress, PI, spoil storage	30 x 878 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 159.98-W	0.09	PI, road crossing, side cut	30 x 150	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 160.10-N	2.75	Staging -in-road work, parking, spoil storage, hydo discharge	30 x 3,267 (Irregular)	Evergreen Forest Land Mixed Rangeland Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Grasslands (E. Cascades) Shrublands Roads, Corridors	USFS
TEWA 160.10-W	0.59	Staging -in-road work, parking, spoil storage, hydro discharge	80 x 355	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 160.54-W	15.26	Log landing/decking/hauling, ingress/egress, staging	920 x 1,096 (Irregular)	Evergreen Forest Land Mixed Rangeland Shrub and Brush Rangeland Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Grasslands (E. Cascades) Shrublands Industrial Roads, Corridors	USFS
TEWA 161.23-N	1.84	Staging, truck turn around	200 x 537 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 161.40	1.59	Water Source - Hydro (Fish Lake-1) Water Source - Hydro (Fish Lake-2)		Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	USFS
TEWA 161.53-W	0.40	PI, side cut	50 x 382	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 161.96-W	0.29	Log landing, staging spoil storage	50 x 300	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 162.17-W	0.08	PI, spoil storage	30 x 177	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 162.37-N	0.34	S. Fork Little Butte Creek crossing staging	50 x 350	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 162.38-W	0.23	S. Fork Little Butte Creek crossing staging	50 x 251	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 162.47-W	0.26	S. Fork Little Butte Creek crossing staging	50 x 277	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 162.48-N	0.22	S. Fork Little Butte Creek crossing staging	50 x 233	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 163.11-N	0.69	Ingress/egress, road crossing, staging, spoil storage	50 x 350	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 163.11-W	0.34	Ingress/egress, road crossing, staging, spoil storage	50 x 350	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 163.26-W	0.09	PIs/spoil storage	30 x 150	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 163.42-W	0.22	PIs/spoil storage	50 x 256	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 163.68-W	0.20	Log landing, staging, spoil storage	50 x 260 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 164.14-W	0.94	Log landing/decking/hauling, ingress/egress, road crossing	100 x 570 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 164.15-N	0.47	Log landing/decking/hauling, ingress/egress, road crossing	50 x 452	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 164.29-W	1.29	PIs, road crossing, side cut	15 x 3,534	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 164.31-N	0.09	PI, road crossing, side cut	35 x 150	Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 165.00-W	10.05	Log landing/decking/hauling, in- road construciton	660 x 851 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 165.13-W	0.09	PI, road crossing, side cut	30 x 150	Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 165.88-W	0.39	Ingress/egress, road crossing, spoil storage, parking	55 x 400	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 166.06-W	0.30	Ingress/egress, road crossing, spoil storage, parking	50 x 301	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 166.08-N	0.28	Ingress/egress, road crossing, spoil storage, parking	50 x 300	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 166.39-W	0.29	Ingress/egress, road crossing, spoil storage, parking	50 x 301	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 166.44-N	0.28	Ingress/egress, road crossing, spoil storage, parking	50 x 300	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 167.28-W	0.11	Ingress/egress, road crossing, spoil storage, parking	65 x 100	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 167.30-N	0.12	Ingress/egress, road crossing, spoil storage, parking	55 x 100	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 167.31-W	0.11	Ingress/egress, road crossing, spoil storage, parking	65 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 167.32-N	0.11	Ingress/egress, road crossing, spoil storage, parking	55 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 168.05-N	0.33	PI, side cut	50 x 270	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 168.23-W	0.44	Log landing/decking, hauling, Ingress/egress, staging, parking	50 x 348 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 168.26-W	0.40	Log landing/decking, hauling, Ingress/egress, staging, parking	115 x 250 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 168.56-W	2.33	Ingress/egress, road crossing, spoil storage, parking	210 x 800 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 168.66-N	0.18	ingress/egress, Log landing/decking, hauling,road crossing	50 x 135	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 168.69-N	0.07	Ingress/egress, road crossing, spoil storage, parking	50 x 86	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 168.80-N	0.16	Dead Indian Memorial Highway crossing, staging	50 x 163	Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 168.80-W	0.13	Dead Indian Memorial Highway crossing, staging	50 x 145	Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 168.85-N	0.17	Dead Indian Memorial Highway crossing, staging	50 x 160	Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 168.85-W	0.09	Dead Indian Memorial Highway crossing, staging	50 x 114 (Irregular)	Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 169.49-N	0.44	Log landing/decking/hauling, Ingress/ergress, bloc	55 x 448	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	Private
TEWA 169.51-W	0.43	Log landing/decking/hauling, Ingress/egress	40 x 398 (Irregular)	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	Private
TEWA 169.73-N	0.29	Ingress/egress, road crossing, spoil storage, parking	50 x 300	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 169.73-W	0.19	Ingress/egress, road crossing, spoil storage, parking	30 x 300	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	Private
TEWA 170.26-N	0.18	Ingress/egress, staging, spoil storage, parking	50 x 200	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
TEWA 170.26-W	0.17	Ingress/egress, staging, spoil storage, parking	30 x 280	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 170.59-W	0.34	Log landing/decking/hauling, ingress/egress, staging	50 x 350	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
TEWA 170.84-W	0.40	Ingress/egress, PI	30 x 607	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 170.90-N	0.26	PI, side cut	50 x 251	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 170.98-N	0.07	Ingress/egress, parking	15 x 200	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 171.01-N	0.19	Wetland crossing and staging	50 x 176	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 171.01-W	0.20	Wetland crossing and staging	50 x 176	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 171.08-N	1.85	PIs, road crossings, wetland/waterbody crossing, top soil storage	15 x 4,748 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private
TEWA 171.08-W	0.26	Wetland crossing and staging, ingress/egress, park	50 x 265	Evergreen Forest Land Herbaceous Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Grasslands (E. Cascades) Roads, Corridors	USFS
TEWA 171.19-W	0.19	PI, side cut	50 x 225	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 171.50	0.77	Parking, staging	230 x 180 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 172.05-N	0.38	PI, road crossing, side cut	50 x 362	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 172.39-N	0.17	Wetland crossing, top soil storage	50 x 184	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 172.46-N	0.18	Wetland crossing, top soil storage	50 x 160	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 172.58-N	0.29	PI, road crossing, side cut	55 x 280	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 173.01-W	0.28	Road crossing	50 x 283	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
TEWA 173.45-W	0.53	PIs, side cut	15 x 1,410	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 173.91-N	0.12	PI, side cut	15 x 352	Herbaceous Rangeland Regenerating Evergreen Forest Land	Grasslands (E. Cascades) Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 173.91-W	0.18	PI, side cut	25 x 352	Herbaceous Rangeland Regenerating Evergreen Forest Land	Grasslands (E. Cascades) Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 174.15-W	0.22	PI, road crossing, side cut	25 x 408	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 174.26-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 174.27-N	0.11	PI, side cut	15 x 320	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 174.32-W	0.03	PI, side cut	15 x 100	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
TEWA 174.52-W	0.04	PI, side cut	15 x 100	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 174.66-N	0.25	PI, ingress/egress, road crossing, side cut	50 x 244	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
TEWA 174.66-W	0.07	Ingress/egress, road crossing, side cut	30 x 106	Trans, Comm, Utilities Corridors	Roads, Corridors	USFS
TEWA 174.69-W	0.06	PI, ingress/egress, road crossing, side cut	30 x 104	Trans, Comm, Utilities Corridors	Roads, Corridors	USFS
TEWA 175.13-N	4.90	PIs, road crossings, side cut	30 x 6,554 (Irregular)	Evergreen Forest Land Mixed Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine Forest and Woodland Grasslands (E. Cascades) Roads, Corridors	USFS/Private
TEWA 176.31-W	0.08	PIs, side cut	15 x 285 (Irregular)	Mixed Rangeland Trans, Comm, Utilities Corridors	Grasslands (E. Cascades) Roads, Corridors	BLM
TEWA 176.42-W	0.03	PI, road crossing, side cut	15 x 100	Mixed Rangeland	Grasslands (E. Cascades)	BLM
TEWA 176.48-W	0.08	PI, road crossing, side cut	15 x 176 (Irregular)	Mixed Rangeland	Grasslands (E. Cascades)	BLM

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 176.49-N	1.53	PIs, road crossing, waterbody crossing, side cut	25 x 2,681	Evergreen Forest Land Mixed Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Grasslands (E. Cascades) Rivers and Streams Roads, Corridors	BLM
TEWA 176.76-W	0.07	PI, side cut	15 x 220	Trans, Comm, Utilities Corridors	Roads, Corridors	BLM
TEWA 176.86-W	0.09	PIs, side cut	15 x 255	Trans, Comm, Utilities Corridors	Roads, Corridors	BLM
TEWA 177.15-N	0.13	PI, ingress/egress, road crossing	25 x 235	Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 177.56-N	0.27	Road crossing	50 x 275	Evergreen Forest Land Herbaceous Rangeland	Ponderosa Pine Forest and Woodland Grasslands (E. Cascades)	Private
TEWA 177.72-W	0.04	Wetland.waterbody crossing, top soil storage	30 x 55	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 177.81-W	0.06	Wetland waterbody crossing, top soil storage	30 x 156 (Irregular)	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 177.83-N	0.39	PIs, side cut	25 x 704	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 177.89-W	0.07	Road crossing, side cut	30 x 100	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 177.92-W	0.50	PI, road crossing, side cut	35 x 914 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.08-N	0.11	Parking	40 x 200	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 178.10-W	0.07	Road crossing, side cut	30 x 113	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.22-W	0.06	Road crossing, side cut	30 x 104	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 178.25-W	0.05	Road crossing, side cut	30 x 50	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.27-N	0.11	Parking	45 x 211	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 178.27-W	0.05	Road crossing, side cut	30 x 75	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.29-W	0.05	Road crossing, side cut	30 x 65	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.30-N	0.12	Parking	35 x 215	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 178.70-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.71-N	0.39	PIs, side cut	50 x 374	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 178.74-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.78-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.82-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.85-N	0.13	Ingress/egress, road crossing, side cut	25 x 240	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.86-W	0.03	Ingress/egress, road crossing, side cut	15 x 77	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 178.88-W	0.03	Ingress/egress, road crossing, side cut	15 x 77	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 178.92-W	0.03	PI, side cut	15 x 100	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 179.00-W	0.03	PI, side cut	15 x 100	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 179.36-N	0.14	Ingress/egress, road crossing, staging	55 x 124	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 179.37-W	0.03	Ingress/egress, road crossing	15 x 77	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 179.39-W	0.03	Ingress/egress, road crossing	15 x 77	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 179.50-W	0.03	PI, wetland crossing, side cut, top soil storage	15 x 100	Nonforested Wetlands Trans, Comm, Utilities Corridors	Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 179.67-N	0.27	Staging, truck turn around	50 x 269	Evergreen Forest Land	Ponderosa Pine Forest and Woodland	BLM
TEWA 179.86-W	0.03	Ingress/egress, road crossing	15 x 77	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 179.87-N	0.13	Ingress/egress, road crossing	25 x 239	Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 179.88-W	0.03	Ingress/egress, road crossing	15 x 77	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 180.35-N	0.27	Ingress/egress, road crossing	50 x 276	Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 180.72-W	0.09	PIs, road crossing	15 x 268	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 180.75-N	0.30	PIs, ingress/egress, road crossing	50 x 296	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 180.80-W	0.04	PI, road crosssing	15 x 111	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 180.99-N	0.11	Ingress/egress, road crossing, parking, staging	50 x 100	Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Shrublands Roads, Corridors	Private
TEWA 181.27-N	0.13	Ingres/egress, road crossing, side cut	25 x 259	Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 181.46-N	0.97	PIs, road crossing, side cut	30 x 1,766 (Irregular)	Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 182.14-N	0.27	Ingress/egress, road crossing	50 x 266	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 182.32-W	0.03	PI	15 x 100	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 182.48-N	0.13	PI, ingress/egress, road crossing	25 x 245	Evergreen Forest Land Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	Private
TEWA 182.87-W	0.03	PI	15 x 100	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine Forest and Woodland Roads, Corridors	Private
TEWA 182.96-W	0.10	PIs, road crossing	15 x 293	Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 183.57-N	0.13	PI, side cut	25 x 249	Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 183.65-W	0.10	PIs, ingress/egress, road crossings, side cut	15 x 303	Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 183.76-W	0.09	PIs, ingress/egress, road crossing, side cut	15 x 259	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 183.77-N	0.09	PIs, road crossing, side cut	25 x 174			Private
TEWA 184.02-W	0.03	PI, side cut	15 x 100	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 184.04-N	1.40	PIs, ingress/egress, road crossing, side cut	25 x 2,469	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 184.14-W	0.03	PI, road crossing, side cut	15 x 100	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 184.30	1.76	Water Source - Hydro (John C. Boyle Reservior)		Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 184.56-W	0.05	Road crossing, side cut	30 x 75	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 184.58-W	0.21	Road crossing, side cut	15 x 525 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 184.80-N	0.23	PI, ingress/egress, road crossing	50 x 243	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 184.83-W	0.06	PI, ingress/egress, road crossing	30 x 125	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 185.23-N	0.13	Ingress/egress, road crossing	25 x 245	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 185.67-N	0.20	Ingress/egress, road crosssig	50 x 209	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 185.90-N	0.13	Ingress/egress, road crossing, parking, staging, spoil storage	25 x 244	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 186.17-N	0.27	Ingress/egress, road crossing	50 x 266	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 186.22-W	0.45	PI, wetland crossing, side cut, top soil storage	10 x 1,973	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Ponderosa Pine - W. Roads, Corridors	Private
TEWA 186.65-W	0.54	PI, wetland crossing, side cut, top soil storage	10 x 2,337	Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 186.76-N	0.23	Ingress/egress, road crossing, parking	100 x 100	Herbaceous Rangeland	Grasslands (E. Cascades)	Private
TEWA 187.12-W	0.13	Spoil storage	10 x 591	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 187.28-W	0.10	PI, side cut	30 x 175	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 187.41-N	0.30	Block Valve installation, ingress/egress, PI	50 x 254	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 187.73-N	0.14	PI	30 x 200	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
				Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Shrublands Ponderosa Pine - W. Juniper	
TEWA 187.80-W	0.15	PI	30 x 200	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 188.09-W	0.05	Road crossing	30 x 50	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 188.11-W	0.05	Road crossing	30 x 81	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 188.20-W	0.08	Road crossing	30 x 50 (Irregular)	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 188.23-W	0.08	Road crossing	30 x 169 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 188.40-W	0.03	Road crossing	30 x 50	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 188.41-W	0.03	Road crossing	30 x 50	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 188.42-N	0.77	PI, side cut	15 x 2,257	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 188.82-W	0.66	PI	30 x 956	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Roads, Corridors	Private
TEWA 189.00	0.66	Water Source - Hydro (Keno Reservoir)		Beaches Trans, Comm, Utilities Corridors	Beaches Roads, Corridors	Private
TEWA 189.11-W	0.13	PI	30 x 200	Regenerating Evergreen Forest Land	Ponderosa Pine - W. Juniper	Private
TEWA 189.26-W	0.14	PI	30 x 200	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine - W. Juniper Grasslands (E. Cascades) Roads, Corridors	Private
TEWA 189.37-W	0.14	PI	30 x 200	Evergreen Forest Land	Western Juniper Woodland	Private
TEWA 189.48-N	0.73	PI, side cut	30 x 1,054	Evergreen Forest Land	Western Juniper Woodland	Private
TEWA 189.80-W	0.14	PI	30 x 200	Evergreen Forest Land	Western Juniper Woodland	Private
TEWA 190.13-N	0.14	PI	30 x 200	Evergreen Forest Land	Western Juniper Woodland	Private
TEWA 190.13-W	0.14	PI	30 x 200	Evergreen Forest Land	Western Juniper Woodland	Private
TEWA 190.40-W	3.19	Spoil storage	30 x 4,641 (Irregular)	Cropland and Pasture Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Western Juniper Woodland Roads, Corridors	Private
TEWA 190.63-N	1.43	Topsoil	20 x 3,124	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 191.98-N	0.27	Topsoil	75 x 83 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 192.03-N	0.20	Ingress/egress, Hwy 66 crossing, canal crossing, s	20 x 449	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 192.03-W	0.61	Ingress/egress, Hwy 66 crossing, canal crossing, s	50 x 517	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 192.13-N	4.69	Ingress/egress, canal/wetland crossing, PI, spoil/topsoil	25 x 6,696 (Irregular)	Cropland and Pasture Ditches	Agriculture Palustrine Emergent (PEM) Ditches	Private
TEWA 192.13-W	22.88	Ingress/egress, canal crossing, spoil/topsoil stor	55 x 18,386 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 192.58-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 192.76-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 192.95-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 193.12-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 193.32-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 193.44-W	4.85	Canal/wetland crossing, PI, spoil/topsoil storage	25 x 5,817 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 193.50-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 193.69-N	0.46	Spoil/topsoil storage	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 193.88-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 194.07-N	0.46	Dewatering, hydrostatic discharge	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 194.26-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 194.50	0.20	Parking	60 x 251 (Irregular)	Other Urban or Built-up Land Trans, Comm, Utilities Corridors	Urban Roads, Corridors	Private
TEWA 194.51	0.23	Parking	75 x 264 (Irregular)	Trans, Comm, Utilities Corridors	Roads, Corridors	Private
TEWA 194.53-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 194.64-W	3.12	Spoil/topsoil storage	25 x 5,441	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 194.72-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 194.91-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 195.08-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 195.28-N	0.46	Dewatering	100 x 200	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 195.69-N	0.29	Topsoil storage	55 x 233	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 195.74-N	6.66	Topsoil storage	55 x 5,287	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 195.76-W	2.67	PIs, wetland/waterbody crossings, top soil storage	25 x 5,168	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 196.65-N	2.24	Canal crossing, staging, spoil storage, Dewatering	275 x 684 (Irregular)c	Cropland and Pasture Ditches Nonforested Wetlands	Agriculture Ditches Palustrine Unconsolidated Bottom (PUB)	Private
TEWA 196.65-W	0.35	Canal crossing, staging, spoil storage	25 x 622	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 196.79-W	0.38	Canal crossing, staging, spoil/topsoil storage	25 x 632	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 196.89-N	0.86	Wetland/waterbody crossings, top soil storage	30 x 1,026 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 196.91-W	0.46	Canal crossing, staging, spoil/topsoil storage	25 x 820	Cropland and Pasture	Agriculture	Private
TEWA 197.09-W	0.14	Canal crossing, staging, spoil/topsoil storage	25 x 231	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 197.31-W	0.09	Canal crossing, staging, spoil/topsoil storage	15 x 258	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 197.38-W	0.85	Canal crossing, staging, spoil/topsoil storage, hydrostatic test discharge	30 x 1,075 (Irregular)	Commercial and Sevices Cropland and Pasture	Urban Agriculture Palustrine Emergent (PEM)	Private
TEWA 197.51-N	0.63	Ingress/egress, PI, parking	70 x 568 (Irregular)	Commercial and Sevices Trans, Comm, Utilities Corridors	Urban Roads, Corridors	Private
TEWA 197.65-N	0.91	Ingress/egress, staging	120 x 444	Other Urban or Built-up Land	Urban	Private
TEWA 197.66-W	0.45	Ingress/egress, staging	150 x 201 (Irregular)	Other Urban or Built-up Land	Urban	Private
TEWA 197.75-W	0.54	Topsoil storage, canal crossing	10 x 1,612 (Irregular)	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 198.06-N	3.12	Ingress/egress, canal/road/wetland crossing staging	135 x 1,730 (Irregular)	Cropland and Pasture Mixed Forest Land Other Urban or Built-up Land Residential Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Urban Roads, Corridors	Private
TEWA 198.18-W	0.09	PI, ingress/egress	35 x 127	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 198.22-W	9.79	Collins Pacific Yard	545 x 858 (Irregular)	Other Urban or Built-up Land Trans, Comm, Utilities Corridors	Urban Roads, Corridors	Private
TEWA 198.42-W	4.42	Collins Pacific Yard	65 x 2,180 (Irregular)	Other Urban or Built-up Land Trans, Comm, Utilities Corridors	Urban Roads, Corridors	Private
TEWA 198.43-N	6.75	Collins Pacific Yard	685 x 1,260 (Irregular)	Herbaceous Rangeland Other Urban or Built-up Land Trans, Comm, Utilities Corridors	Grasslands (E. Cascades) Urban Roads, Corridors	Private
TEWA 198.72-N	5.36	Collins Pacific Yard	300 x 1,429 (Irregular)	Other Urban or Built-up Land Trans, Comm, Utilities Corridors	Urban Roads, Corridors	Private
TEWA 198.92-W	0.04	PI	15 x 100	Other Urban or Built-up Land	Urban	Private
TEWA 198.98-W	0.91	Klamath River HDD staging and pull back	25 x 1,379 (Irregular)	Nonforested Wetlands Other Urban or Built-up Land	Palustrine Unconsolidated Bottom (PUB) Urban	Private
TEWA 199.04-N	1.65	Klamath River HDD staging and pull back	95 x 1,098 (Irregular)	Other Urban or Built-up Land	Urban	Private
TEWA 199.58-W	14.01	Staging/spread move around, Klamath River HDD	620 x 991 (Irregular)	Cropland and Pasture Ditches	Agriculture Palustrine Emergent (PEM) Ditches	Private
TEWA 199.60-N	4.69	Klamath River HDD staging and pull back	140 x 1,774	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 199.79-W	0.09	Wetland crossing, top soil storage	50 x 75	Cropland and Pasture	Agriculture	Private
TEWA 199.91-W	0.80	Railroad crossing (bored), PI, spoil/topsoil storage	50 x 716	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 199.97-N	0.30	Railroad crossing (bored), PI, spoil/topsoil storage	25 x 530	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 200.09-N	0.31	Railroad crossing (bored), PI, wetland crossing, topsoil storage	25 x 1,020 (Irregular)	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 200.09-W	0.09	Wetland crossing, top soil storage	50 x 75	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 200.18-W	0.48	PI, spoil storage	55 x 468	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 200.31-N	1.23	Ingress/egress, road crossing, spoil storage, staging	260 x 401	Cropland and Pasture Residential Trans, Comm, Utilities Corridors	Agriculture Urban Roads, Corridors	Private
TEWA 200.47-N	0.27	Canal crossing, PI, spoil storage	55 x 280	Cropland and Pasture Shrub and Brush Rangeland	Agriculture Sagebrush Steppe	BR/Private
TEWA 200.54-N	2.08	Canal/road crossing staging, PI, spoil/topsoil storage	55 x 2,408 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 200.61-W	0.38	PI, spoil storage	55 x 400	Cropland and Pasture	Agriculture	Private
TEWA 200.98-W	0.23	Ingress/egress, road crossing, spoil storage	50 x 194	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 201.01-N	1.16	Ingress/egress, road/wetland crossing, spoil/topso	10 x 3,285 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 201.01-W	0.27	Ingress/egress, road crossing, spoil storage	50 x 292	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 201.44-W	0.23	Ingress/egress, road/canal crossing, spoil storage	50 x 250	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 201.58-W	0.18	Canal crossing	50 x 191	Cropland and Pasture	Agriculture	Private
TEWA 201.63-N	4.71	Canal crossing	10 x 12,258 (Irregular)	Cropland and Pasture Ditches Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Sagebrush Steppe Roads, Corridors	BR/Private
TEWA 201.63-W	0.16	Canal crossing	55 x 159	Cropland and Pasture	Agriculture	Private
TEWA 202.14-W	0.98	Powerline crossing, PI, spoil strorage	50 x 868	Cropland and Pasture	Agriculture	Private
TEWA 203.72-W	0.39	Road crossing, PI, spoil storage	50 x 400	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 203.85-W	0.82	Staging, PI spoil/topsoil storage	150 x 523 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 203.95-W	0.05	Staging, PI spoil/topsoil storage	30 x 73	Cropland and Pasture	Agriculture	Private
TEWA 203.97-N	0.68	Ingress/egress, road/canal crossing, spoil/topsoil	60 x 758 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 203.97-W	0.23	Ingress/egress, road crossing, spoil storage	50 x 225	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 204.09-W	0.08	Canal crossing	30 x 126	Cropland and Pasture	Agriculture	Private
TEWA 204.13-N	0.92	Canal crossing, PI, spoil/topsoil storage	40 x 1,040	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 204.13-W	0.83	Canal crossing, PI, spoil/topsoil storage	30 x 1,181	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 204.34-N	0.67	Ingress/egress, road/canal crossing, spoil/topsoil	10 x 1,645 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 204.34-W	0.14	Canal crossing	50 x 150	Cropland and Pasture	Agriculture	Private
TEWA 204.62-W	0.17	Ingress/egress, road cross spoil storage	50 x 175	Cropland and Pasture	Agriculture	Private
TEWA 204.66-N	0.51	Ingress/egress, road/canal cross spoil/topsoil storage	60 x 386	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 204.66-W	0.54	Ingress/egress, road/canal cross spoil/topsoil storage	50 x 432	Cropland and Pasture	Agriculture	Private
TEWA 204.75-N	0.75	Canal crossing, spoil/topsoil storage	10 x 2,112 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Roads, Corridors	Private
TEWA 204.75-W	0.19	Canal crossing	50 x 226	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 204.86-W	0.39	PI, spoil storage	50 x 400	Cropland and Pasture Ditches	Agriculture Ditches	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 205.11-W	0.14	Canal crossing	50 x 146	Cropland and Pasture	Palustrine Emergent (PEM)	Private
TEWA 205.15-N	0.60	Canal crossing	10 x 1,220 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 205.15-W	0.14	Canal crossing, spoil/topsoil storage	50 x 150	Cropland and Pasture	Agriculture	Private
TEWA 205.37-W	0.23	Canal crossing	55 x 200	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 205.40-N	0.70	Ingress/egress, road/canal crossing, spoil/topsoil	10 x 1,702 (Irregular)	Cropland and Pasture Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Agriculture Sagebrush Steppe Roads, Corridors	Private
TEWA 205.42-W	0.29	Canal crossing	50 x 300	Cropland and Pasture Shrub and Brush Rangeland	Agriculture Sagebrush Steppe	Private
TEWA 205.54-W	0.28	PI, spoil storage	50 x 300	Cropland and Pasture	Agriculture	Private
TEWA 205.67-W	0.03	PI	15 x 100	Cropland and Pasture	Agriculture	Private
TEWA 205.69-W	0.19	Ingress/egress, road crossing, spoil storage	55 x 184	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 205.73-N	0.73	Ingress/egress, road/canal crossing, spoil/topsoil	10 x 1,159 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 205.73-W	0.21	Ingress/egress, road crossing, spoil storage, staging	50 x 217	Cropland and Pasture	Agriculture	Private
TEWA 205.92-W	0.23	Canal crossing	70 x 200	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 205.98-N	0.96	Ingress/egress, road/canal crossing, spoil/topsoil	10 x 2,785 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 205.98-W	1.21	Canal crossing, staging spoil storage	230 x 440 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 206.44-W	0.19	Ingress/egress, road crossing, spoil/topsoil storage	50 x 209	Cropland and Pasture	Agriculture	Private
TEWA 206.51.N	1.11	Ingress/egress, road/canal crossing, spoil/topsoil	10 x 3,171 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 206.51-W	0.11	Ingress/egress, road/canal crossing, spoil/topsoil storage	60 x 106	Cropland and Pasture	Agriculture	Private
TEWA 207.05-W	0.28	Canal crossing	50 x 284	Cropland and Pasture	Agriculture	Private
TEWA 207.12-N	0.78	Ingress/egress, road/canal crossing, spoil/topsoil	60 x 632	Cropland and Pasture	Agriculture	Private
TEWA 207.12-W	0.24	Canal crossing	60 x 216	Cropland and Pasture	Agriculture	Private
TEWA 207.24-W	0.14	Ingress/egress, road/canal crossing, spoil/topsoil	90 x 125	Cropland and Pasture	Agriculture	Private
TEWA 207.28-N	0.38	Ingress/egress, road/canal crossing, spoil/topsoil	10 x 680 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 207.28-W	0.30	Ingress/egress, road/canal crossing, spoil/topsoil	50 x 320	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 207.37-W	0.10	Ingress/egress, road/canal crossing, spoil/topsoil	50 x 133	Cropland and Pasture	Agriculture	Private
TEWA 207.43-N	0.61	Ingress/egress, road/canal crossing, spoil/topsoil	35 x 797	Cropland and Pasture	Agriculture	Private
TEWA 207.43-W	0.32	Ingress/egress, road/canal crossing, spoil/topsoil storage	40 x 402	Cropland and Pasture	Agriculture	Private
TEWA 207.57-W	0.64	Ingress/egress, canal crossing, spoil/topsoil storage	100 x 200 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 207.62-N	0.79	Ingress/egress, canal crossing, staging, topsoil storage	10 x 1,972 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 207.62-W	0.74	Ingress,egress, canal crossing, staging, spoil/topsoil storage	100 x 401	Cropland and Pasture	Agriculture	Private
TEWA 207.85-W	0.91	Canal crossing, PI, spoil/topsoil storage	145 x 649 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 208.00-N	0.35	Canal crossing, PI, spoil/topsoil storage	60 x 312	Cropland and Pasture	Agriculture	Private
TEWA 208.01-W	0.88	Canal crossing, PI, spoil/topsoil storage	80 x 438	Cropland and Pasture	Agriculture	Private
TEWA 208.08-N	0.46	Ingress/egress, canal crossing, staging, spoil/topsoil	35 x 547	Cropland and Pasture Residential	Agriculture Urban	Private
TEWA 208.08-W	0.97	Ingress/egress, canal crossing, staging, spoil/topsoil	100 x 454	Cropland and Pasture	Agriculture	Private
TEWA 208.19-N	2.20	Ingress/egress, Railroad/Hwy 39/canal crossing, staging	10 x 3,044 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 208.19-W	0.64	Ingress/egress, canal crossing, staging, spoil/topsoil storage	100 x 324 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 208.67-W	1.69	Railroad/Hwy 39/powerline/canal crossing (bored),	125 x 652	Cropland and Pasture	Agriculture	Private
TEWA 208.80-N	1.78	Ingress/egress, Railroad/Hwy 39/canal crossing, staging	60 x 1,083 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 208.80-W	1.12	Ingress/egress, Railroad/Hwy 39/canal crossing, staging	175 x 443 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 208.99-W	0.19	Road/canal crossing,	50 x 193 (Irregular)	Cropland and Pasture Ditches Residential	Agriculture Ditches Urban	Private
TEWA 209.05-N	0.79	Ingress/egress, road crossing, staging, spoil/topsoil	60 x 511	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 209.05-W	0.49	Ingress/egress, road crossing, staging, spoil/topsoil	125 x 302 (Irregular)	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 209.16-N	0.83	Ingress/egress, road/canal crossing, staging, spoil storage	10 x 1,558 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 209.16-W	0.53	Ingress/egress, road/canal crossing, staging, spoil storage	100 x 191	Cropland and Pasture	Agriculture	Private
TEWA 209.41-W	0.17	Canal crossing	50 x 189	Cropland and Pasture	Agriculture	Private
TEWA 209.46-W	0.18	Canal crossing	65 x 161	Cropland and Pasture	Agriculture	Private
TEWA 209.47-N	1.50	Ingress/egress, road/canal/powerline crossing, staging	10 x 3,575 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 209.79-W	0.09	Powerline crossing	25 x 200	Cropland and Pasture	Agriculture	Private
TEWA 209.86-W	0.04	PI	15 x 100	Cropland and Pasture	Agriculture	Private
TEWA 210.13-W	0.29	Ingress/egress, road crossing, staging, spoil/topsoil storage	75 x 142	Cropland and Pasture Residential	Agriculture Urban	Private
TEWA 210.17-N	0.76	Ingress/egress, road/canal crossing, staging, spoil storage	65 x 498	Cropland and Pasture	Agriculture	Private
TEWA 210.17-W	0.67	Ingress/egress, road/canal crossing, staging, spoil storage	175 x 336 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 210.27-N	1.80	PI, ingress/egress, road crossing, waterbody crossings, topsoil	10 x 3,042 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 210.27-W	0.86	Ingress/egress, road/canal crossing, staging, spoil storage	75 x 478	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 210.56-W	0.04	PI, road crossing	15 x 100	Cropland and Pasture	Agriculture	Private
TEWA 210.86-N	0.50	Road crossings, waterbody crossings, top soil storage	10 x 1,777 (Irregular)	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 211.20-N	0.59	Road crossing, waterbody crossing	50 x 560	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 211.34-N	0.45	PI, waterbody crossings, top soil storage	10 x 965 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 211.51-W	0.36	PI, waterbody crossings	30 x 492	Cropland and Pasture Ditches Trans, Comm, Utilities Corridors	Agriculture Ditches Roads, Corridors	Private
TEWA 211.53-N	1.31	Lost River, PI, spoil/topsoil storage	10 x 2,758 (Irregular)	Cropland and Pasture Ditches Streams and Canals	Agriculture Ditches Rivers and Streams	Private
TEWA 211.98-W	1.23	Lost River, crossing, spoil/topsoil storage	125 x 436	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 212.08-N	1.33	Lost River/railroad, crossing, spoil/topsoil storage	10 x 2,276 (Irregular)	Cropland and Pasture Nonforested Wetlands Streams and Canals	Agriculture Palustrine Emergent (PEM) Rivers and Streams	Private
TEWA 212.08-W	0.49	Lost River, crossing, spoil/topsoil storage	100 x 232	Cropland and Pasture Streams and Canals	Agriculture Rivers and Streams	Private
TEWA 212.36-W	0.04	PI	15 x 100	Cropland and Pasture	Agriculture	Private
TEWA 212.49-W	0.44	Railroad crossing, spoil/topsoil storage	100 x 186	Cropland and Pasture Nonforested Wetlands Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Roads, Corridors	Private
TEWA 212.53-N	1.45	Railroad crossing, PI, spoil/topsoil storage	100 x 487 (Irregular)	Cropland and Pasture Nonforested Wetlands	Agriculture Palustrine Emergent (PEM)	Private
TEWA 212.53-W	0.44	Railroad crossing, PI, spoil/topsoil storage	100 x 392 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 212.68-N	1.23	Ingress/egress, road/canal crossing, PI, spoil/topsoil	10 x 3,131 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 212.69-W	0.11	PIs, wetland crossing, top soil storage	15 x 331	Cropland and Pasture	Agriculture	Private
TEWA 212.88-W	0.40	PI, spoil/topsoil storage	50 x 400	Cropland and Pasture	Agriculture	Private
TEWA 213.01-W	0.29	Ingress/egress, road crossing, spoil/topsoil storage	50 x 300	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 213.15-W	0.10	PI	40 x 150	Cropland and Pasture	Agriculture	Private
TEWA 213.21-W	1.00	Canal crossing, staging/topsoil storage	150 x 229	Cropland and Pasture	Agriculture	Private
TEWA 213.28-N	1.50	Ingress/egress, canal crossing, spoil/topsoil storage	10 x 2,889 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 213.28-W	2.13	Canal crossing, spoil/topsoil storage	150 x 1,013 (Irregular)	Cropland and Pasture Ditches	Agriculture Ditches	Private
TEWA 213.80-W	0.37	Ingress/egress, canal crossing,	150 x 113	Cropland and Pasture	Agriculture	Private
TEWA 213.83-N	0.11	Canal crossing, spoil/topsoil storage	35 x 152	Cropland and Pasture	Agriculture	Private
TEWA 213.83-W	0.96	Canal crossing, spoil/topsoil storage	150 x 221	Cropland and Pasture	Agriculture	Private
TEWA 213.87-N	2.07	Canal crossing, PI, spoil/topsoil storage, staging	10 x 1,472 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 213.88-W	0.86	Canal crossing, spoil/topsoil storage	150 x 298	Cropland and Pasture	Agriculture	Private
TEWA 214.05-W	5.08	Ingress/egress, canal crossing, PI, spoil/topsoil	270 x 710 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 214.19-N	2.32	Ingress/egress, canal crossing, PI, spoil/topsoil	150 x 683	Cropland and Pasture	Agriculture	Private
TEWA 214.19-W	0.50	Canal/egress, PI, spoil/topsoil storage	90 x 275	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 214.31-N	1.09	Ingress/egress, road crossing, PI, spoil/topsoil storage	10 x 1,802 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 214.31-W	0.26	Ingress/egress, road crossing, spoil/topsoil storage	80 x 150	Cropland and Pasture	Agriculture	Private
TEWA 214.59-W	1.59	Ingress/egress, road crossing, PI, spoil/topsoil storage	125 x 525 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 214.68-W	0.23	Ingress/egress	50 x 250	Shrub and Brush Rangeland	Sagebrush Steppe	Private
TEWA 214.98-W	7.94	PI, spoil storage, (rock), ingress/egress	15 x 13,235 (Irregular)	Evergreen Forest Land Herbaceous Rangeland Shrub and Brush Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Western Juniper Woodland Grasslands (E. Cascades) Sagebrush Steppe Rivers and Streams Roads, Corridors	BLM/Private
TEWA 214.99-N	0.57	PI, spoil storage	50 x 500	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Sagebrush Steppe Sagebrush Steppe	Private
TEWA 215.93-N	0.09	Rock storage	50 x 100	Trans, Comm, Utilities Corridors	Sagebrush Steppe	Private
TEWA 216.46-N	0.09	Spoil storage (Rock)	50 x 100	Trans, Comm, Utilities Corridors	Sagebrush Steppe	Private
TEWA 217.49-N	0.11	PI, road crossings	10 x 308 (Irregular)	Herbaceous Rangeland Trans, Comm, Utilities Corridors	Grasslands (E. Cascades) Roads, Corridors	Private
TEWA 217.55-W	0.21	Ingress/egress, road crossing, staging, parking	75 x 100	Cropland and Pasture	Agriculture	Private
TEWA 217.58-W	0.40	PI, spoil/topsoil storage	50 x 400	Cropland and Pasture	Agriculture	Private
TEWA 217.55-N	1.47	Powerline/waterbody crossing	10 x 2,564 (Irregular)	Cropland and Pasture Evergreen Forest Land Herbaceous Rangeland	Agriculture Western Juniper Woodland Grasslands (E. Cascades)	Private
TEWA 217.80-W	0.05	Road crossing	30 x 75	Cropland and Pasture	Agriculture	Private
TEWA 217.83-W	0.32	Ingress/egress, road crossing, PI, spoil/topsoil	50 x 319	Herbaceous Rangeland Trans, Comm, Utilities Corridors Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Grasslands (E. Cascades) Roads, Corridors Sagebrush Steppe Roads, Corridors	Private
TEWA 217.92-W	0.13	Road crossing	50 x 75			Private
TEWA 218.05-N	1.47	Powerline/waterbody crossing,	10 x 168	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors Shrub and Brush Rangeland	Sagebrush Steppe Roads, Corridors Sagebrush Steppe	Private
TEWA 218.05-W	0.09	waterbody crossing	30 x 160	Shrub and Brush Rangeland	Sagebrush Steppe	Private
TEWA 218.09-W	0.09	waterbody crossing	30 x 160	Shrub and Brush Rangeland	Sagebrush Steppe	Private
TEWA 218.28-N	0.29	Ingress/egress, road crossing, spoil storage	50 x 300	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Sagebrush Steppe Roads, Corridors	Private
TEWA 218.30-W	0.29	Ingress/egress, road crossing, spoil storage	50 x 300	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Sagebrush Steppe Roads, Corridors	Private
TEWA 218.80-N	0.35	Ingress/egress, road crossing, spoil storage, hydrostatic test discharge	50 x 352	Evergreen Forest Land Trans, Comm, Utilities Corridors	Western Juniper Woodland Roads, Corridors	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 218.80-W	2.32	Ingress/egress, road crossing, spoil storage (rock)	20 x 4,648 (Irregular)	Evergreen Forest Land Residential Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Western Juniper Woodland Urban Sagebrush Steppe Roads, Corridors	Private
TEWA 219.21-N	0.29	Spoil storage	50 x 300	Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Western Juniper Woodland Sagebrush Steppe Roads, Corridors	Private
TEWA 219.58-N	0.17	Road crossing	50 x 150	Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Western Juniper Woodland Sagebrush Steppe Roads, Corridors	Private
TEWA 219.69	1.10	waterbody crossing	211 x 312 (Irregular)	Evergreen Forest Land Nonforested Wetlands	Western Juniper Woodland Palustrine Unconsolidated Bottom (PUB)	Private
TEWA 219.70-W	8.16	Spoil storage (Rock), PI, ingress/egress, staging	30 x 9,988 (Irregular)	Cropland and Pasture Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Agriculture Western Juniper Woodland Sagebrush Steppe Roads, Corridors	Private
TEWA 219.98-N	0.87	Spoil storage	30 x 800 (Irregular)	Evergreen Forest Land Shrub and Brush Rangeland	Western Juniper Woodland Sagebrush Steppe	Private
TEWA 220.47-N	1.14	PI, staging, spoil storage	150 x 755 (Irregular)	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Sagebrush Steppe Roads, Corridors	Private
TEWA 221.27-N	0.61	Road crossings, waterbody crossing, top soil storage	10 x 2,656	Cropland and Pasture Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Agriculture Sagebrush Steppe Roads, Corridors	Private
TEWA 221.78-N	0.35	Ingress/egress, road crossing, spoil/topsoil storage	10 x 1,068 (Irregular)	Cropland and Pasture Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Agriculture Western Juniper Woodland Sagebrush Steppe Roads, Corridors	Private
TEWA 221.96-W	0.17	Ingress/egress, road crossing, spoil/topsoil storage	50 x 155	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 221.99-N	1.36	Ingress/egress, road crossing, spoil/topsoil storage	10 x 5,135 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 221.99-W	0.36	Ingress/egress, road crossing, spoil/topsoil storage	15 x 653 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 222.92-W	0.18	PIs, road crossing	15 x 518	Cropland and Pasture	Agriculture	Private
TEWA 222.98-N	0.43	Ingress/egress, road crossing, spoil/topsoil storage	10 x 1,194 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 223.13-W	0.40	Topsoil, ditch crossing	50 x 400	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 223.21-N	0.94	Topsoil, ditch crossing	10 x 3,246 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 223.21-W	0.21	Road/ditcd crossing, spoil/topsoil storage	50 x 231	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 223.42-W	0.12	Road crossing, spoil/topsoil storage	30 x 210	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 223.67-W	0.03	Road crossing	30 x 50	Cropland and Pasture	Agriculture	Private
TEWA 223.68-W	0.03	Road crossing	30 x 50	Cropland and Pasture	Agriculture	Private
TEWA 223.81-W	0.03	Road crossing	30 x 50	Cropland and Pasture	Agriculture	Private
TEWA 223.82-W	0.03	Road crossing	30 x 50	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 223.83-N	0.15	Topsoil	10 x 652	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 223.95-N	0.71	Topsoil	10 x 3,101	Cropland and Pasture Shrub and Brush Rangeland	Agriculture Sagebrush Steppe	Private
TEWA 223.94-W	0.07	Road crossing	30 x 50	Cropland and Pasture	Agriculture	Private
TEWA 223.95-W	0.07	Road crossing	30 x 50	Cropland and Pasture	Agriculture	Private
TEWA 224.03-W	0.12	Spoil/topsoil storage	30 x 210	Cropland and Pasture	Agriculture	Private
TEWA 224.17-W	0.12	Spoil/topsoil storage	30 x 210	Cropland and Pasture	Agriculture	Private
TEWA 224.53-W	1.17	Spoil storage (Rock)	15 x 2,781 (Irregular)	Cropland and Pasture Shrub and Brush Rangeland	Agriculture Sagebrush Steppe	Private
TEWA 225.13-N	0.08	Ingress/egress, road crossing	50 x 72	Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Western Juniper Woodland Sagebrush Steppe Roads, Corridors	Private
TEWA 225.13-W	0.10	Spoil storage (Rock)	50 x 83	Evergreen Forest Land	Western Juniper Woodland	Private
TEWA 225.15-N	4.37	Topsoil	10 x 15,090 (Irregular)	Cropland and Pasture Ditches Other Urban or Built-up Land Residential Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Agriculture Palustrine Emergent (PEM) Ditches Urban Sagebrush Steppe Roads, Corridors	Private
TEWA 225.15-W	1.17	Ingress/egress, road crossing, staging, PI, spoil/topsoil	10 x 1,549 (Irregular)	Cropland and Pasture	Agriculture	Private
TEWA 226.39-W	0.05	Road crossing	30 x 75	Cropland and Pasture	Agriculture	Private
TEWA 226.40-W	0.05	Road crossing	30 x 75	Cropland and Pasture	Agriculture	Private
TEWA 226.49-W	0.09	PI	35 x 150	Cropland and Pasture	Agriculture	Private
TEWA 226.80-W	0.29	PI, wetland crossing, top soil storage	50 x 356 (Irregular)	Cropland and Pasture	Agriculture Palustrine Emergent (PEM)	Private
TEWA 226.98-W	0.06	Road crossing	25 x 100	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 227.01-W	0.06	Road crossing	25 x 100	Cropland and Pasture	Agriculture	Private
TEWA 227.06-W	0.03	PI	15 x 100	Cropland and Pasture	Agriculture	Private
TEWA 227.17-W	0.04	PI	15 x 100	Cropland and Pasture	Agriculture	Private
TEWA 227.25-W	0.31	PI, waterbody crossing, top soil storage	55 x 300	Cropland and Pasture	Agriculture	Private

Table D-5

Temporary Extra Work Areas Necessary for Construction of the PCGP Project

Temporary Extra Work Areas (TEWAs) (MP- Working [W] or Non- Working [N] side)	Size (acres)	Purpose	Dimension	Land Use	Vegetation	Jurisdiction
TEWA 227.60-W	0.05	Road crossing	30 x 63	Cropland and Pasture	Agriculture	Private
TEWA 227.62-W	0.05	Road crossing	30 x 75	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 227.69-W	0.07	Road crossing	30 x 127	Cropland and Pasture Residential	Agriculture Urban	Private
TEWA 227.72-W	0.14	PI, road crossing	15 x 271 (Irregular)	Cropland and Pasture Trans, Comm, Utilities Corridors	Agriculture Roads, Corridors	Private
TEWA 227.85-W	0.05	Road crossing	30 x 75	Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Sagebrush Steppe Roads, Corridors	Private
TEWA 228.13	5.79	Water Source - Dust (Low Line Canal) Water Source - Hydro & Dust (High Line Canal & Capek Reservoir) Water Source - Hydro & Dust (High Line Canal)	60 x 725 (Irregular) 140 x 947 (Irregular) 160 x 491 (Irregular)	Cropland and Pasture Ditches Nonforested Wetlands Trans, Comm, Utilities Corridors Cropland and Pasture Trans, Comm, Utilities Corridors Cropland and Pasture Ditches	Agriculture Ditches Palustrine Emergent (PEM) Roads, Corridors Agriculture Ditches	Private
Grand Total	**1094.47**					

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 15.54-N	0.36	25 x 621	Clearcut Forest Land Cropland and Pasture Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Agriculture Mixed Conifer/Mixed Dec Roads, Corridors	Private
UCSA 15.56-W	0.08	15 x 209	Clearcut Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
UCSA 15.61-W	0.15	15 x 419	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Mixed Conifer/Mixed Dec Roads, Corridors	Private
UCSA 15.80-N	0.30	25 x 506	Mixed Forest Land Regenerating Evergreen Forest Land	Mixed Conifer/Mixed Dec	Private
UCSA 15.81-W	0.39	25 x 688	Regenerating Evergreen Forest Land Evergreen Forest Land	Mixed Conifer/Mixed Dec Douglas Fir Dominant - Mixed Conifer	Private
UCSA 27.69-N	3.58	100 x 1,968 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 27.69-W	4.41	100 x 1, 968	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 29.39-W	0.19	35 x 251	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
UCSA 31.05-N	1.26	50 x 1,183	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Mixed Conifer/Mixed Dec Roads, Corridors	Private
UCSA 31.05-W	0.78	25 x 1,357	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar Mixed Conifer/Mixed Dec	Private
UCSA 34.53-N	7.19	70 x 3,927 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM/Private
UCSA 34.53-W	1.31	70 x 828	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	Private
UCSA 34.72-W	5.43	75 x 2,800 (Irregular)	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private
UCSA 37.35-W	1.44	30 x 2,099	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
UCSA 37.37-N	1.34	30 x 1,963	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 37.81-W	1.80	30 x 2,615cc	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private
UCSA 37.84-N	1.83	30 x 2,655	Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM
UCSA 38.37-N	2.18	30 x 3,103c	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private
SA 38.3	2.18	30 x 3,103c	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
UCSA 40.04-N	0.38	20 x 754 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridords	Douglas Fir-W. Hemlock- W.Red Cedar Roads, Corridors	BLM/Private
UCSA 40.05-W	0.63	55 x 496	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM/Private
UCSA 40.32-W	0.66	50 x 602	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	Private
UCSA 43.21-W	1.08	30 x 1,434 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
UCSA 43.93-N	2.82	100 x 1,261	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
UCSA 43.96-W	2.09	85 x 1,069	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
UCSA 44.29-N	0.92	100 x 398	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	Private
UCSA 44.29-W	2.52	100 x 1,098	Clearcut Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	Private
UCSA 45.26-N	1.23	30 x 1,754	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
UCSA 45.33-W	0.73	30 x 1,032	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir-W. Hemlock-W.Red Cedar Roads, Corridors	BLM
UCSA 45.58-W	0.08	30 x 91	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
UCSA 45.62-W	0.27	30 x 363	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	BLM
UCSA 45.72-W	0.17	30 x 213	Clearcut Forest Land Evergreen Forest Land	Douglas Fir-W. Hemlock- W.Red Cedar	BLM/Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 45.78-W	0.08	30 x 98	Evergreen Forest Land	Douglas Fir-W. Hemlock-W.Red Cedar	Private
UCSA 47.88-N	1.14	30 x 1,637	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
UCSA 53.03-W	3.94	30 x 3,766 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
UCSA 53.05-N	1.44	100 x 734 (Irregular)	Regenerating Evergreen Forest Land	Douglas Fir Dominant -Mixed Conifer	Private
UCSA 54.21-N	4.64	100 x 2,190 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 54.39-W	2.70	105 x 1,238 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant -Mixed Conifer Roads, Corridors	BLM/Private
UCSA 55.07-N	2.17	20 x 3,753 (Irregular)	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 55.07-W	1.64	20 x 3,580	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 60.65-W	0.21	30 x 289	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 60.67-N	0.77	30 x 1,115	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 60.74-W	0.31	30 x 421	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 60.86-W	0.08	30 x 79	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 60.92-N	1.29	30 x 1,850	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 60.93-W	0.67	30 x 1,104 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 61.18-W	0.41	30 x 573	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 61.31-N	0.39	30 x 571	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 61.33-W	0.19	15 x 465 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 61.50-W	0.79	30 x 1,136	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 61.53-N	0.70	30 x 997	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 62.55-N	15.31	100 x 7,358	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 62.55-W	13.60	100 x 7,229 (Irregular)	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 64.02-N	0.34	30 x 466	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 64.03-W	0.32	30 x 430	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 64.17-N	0.60	30 x 865	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 64.17-W	1.35	30 x 2,067	Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Shrublands Roads, Corridors	BLM/Private
UCSA 64.40-N	1.11	30 x 1,650	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 64.62-W	0.28	30 x 477	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 64.75-W	1.37	30 x 2,640 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM/Private
UCSA 64.76-N	2.82	30 x 4,383	Mixed Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM/Private
UCSA 65.26-W	1.03	30 x 1,704	Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
UCSA 65.83-N	1.93	30 x 3,105	Herbaceous Rangeland Mixed Forest Land Residential Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Urban Roads, Corridors	Private
UCSA 65.85-W	0.12	15 x 344	Mixed Forest Land Residential	Douglas-Fir-Mixed Deciduous Forest Urban	Private
UCSA 65.92-W	0.50	30 x 790	Mixed Forest Land Residential	Douglas-Fir-Mixed Deciduous Forest Urban	Private
UCSA 66.29-W	0.18	30 x 250	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 66.44-W	0.64	30 x 930	Residential Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Urban Shrublands Roads, Corridors	Private
UCSA 66.48-N	0.88	30 x 1,425	Mixed Forest Land Residential Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Urban Shrublands	Private
UCSA 66.70-W	0.23	30 x 303	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	Private
UCSA 66.79-W	0.24	30 x 336	Deciduous Forest Land Shrub and Brush Rangeland Streams and Canals	Oregon White Oak Forest Shrublands Rivers and Streams	Private
UCSA 67.07-N	0.71	30 x 1,018	Herbaceous Rangeland Mixed Forest Land Regenerating Evergreen Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 67.07-W	0.40	30 x 564	Herbaceous Rangeland Regenerating Evergreen Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 67.30-N	0.71	30 x 1,006	Clearcut Forest Land Deciduous Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Oregon White Oak Forest Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 67.31-W	0.58	30 x 806	Clearcut Forest Land Deciduous Forest Land	Douglas-Fir-Mixed Deciduous Forest Oregon White Oak Forest	Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 75.04-N	1.50	105 x 666 (Irregular)	Mixed Forest Land Herbaceous Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	BLM
UCSA 75.18-N	11.03	100 x 5,508 (Irregular)	Mixed Forest Land Mixed Rangeland Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Shrublands Roads, Corridors	BLM/Private
UCSA 75.31-W	9.06	85 x 5,376 (Irregular)	Mixed Forest Land Mixed Rangeland Regenerating Evergreen Forest Land Shrub and Brush Rangeland Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Shrublands Industrial Roads, Corridors	BLM/Private
UCSA 76.22-N	1.02	100 x 445	Mixed Forest Land Mixed Rangeland	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades)	Private
UCSA 76.61-N	11.23	100 x 5,513	Mixed Forest Land Nonforested Wetlands Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Palustrine Emergent (PEM) Roads, Corridors	Private
UCSA 76.61-W	9.71	100 x 5,679	Cropland and Pasture Mixed Forest Land Nonforested Wetlands Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Palustrine Emergent (PEM) Roads, Corridors	Private
UCSA 77.62-N	0.67	100 x 507 (Irregular)	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 77.62-W	1.36	100 x 605	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 77.71-N	1.61	80 x 991	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 78.04-W	13.23	130 x 4,845	Cropland and Pasture Mixed Forest Land	Agriculture Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 78.56-N	5.28	85 x 2,661	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 79.16-N	5.63	100 x 4,035 (Irregular)	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 79.17-W	0.04	30 x 55	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 79.19-W	0.24	30 x 416	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 79.38-W	0.09	15 x 267	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 79.52-W	12.38	100 x 6,938	Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Agriculture Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 79.91-N	8.46	100 x 4,186	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 81.66-N	8.43	100 x 6,765	Clearcut Forest Land Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Grasslands (W. Cascades) Roads, Corridors	Private
UCSA 81.70-W	11.29	100 x 5,409	est Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 82.42-N	5.93	100 x 6,765	Clearcut Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 82.72-W	11.57	100 x 5,516	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 82.98-N	12.51	100 x 6,526	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 83.81-W	3.80	100 x 2,085	Herbaceous Rangeland Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Roads, Corridors	Private
UCSA 84.26-N	37.90	100 x 17,920	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 84.27-W	33.13	100 x 17,261	Herbaceous Rangeland Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 87.17-W	10.27	100 x 5,223 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 87.38-N	7.32	105 x 3,700 (Irregular)	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 88.72-N	14.31	100 x 7,179 (Irregular)	Clearcut Forest Land Cropland and Pasture Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Agriculture Roads, Corridors	BLM/Private
UCSA 88.73-W	3.68	100 x 1,718	Clearcut Forest Land Cropland and Pasture Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Agriculture Roads, Corridors	Private
UCSA 89.08-W	12.71	100 x 6,997 (Irregular)	Clearcut Forest Land Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 90.20-N	2.59	95 x 2,058 (Irregular)	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 90.31-W	7.19	100 x 4,043	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	BLM/Private
UCSA 90.66-N	3.71	100 x 2,112	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 91.75-N	0.70	30 x 1,023	Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 91.99-W	0.30	30 x 410	Clearcut Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.00-N	0.25	30 x 340	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 92.13-N	0.33	30 x 467	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 92.16-W	0.29	30 x 388	Clearcut Forest Land Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 92.30-N	0.12	30 x 150	Clearcut Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.30-W	0.14	30 x 173	Clearcut Forest Land Trans, Comm, Utilities Corridors	Douglas-Fir-Mixed Deciduous Forest Roads, Corridors	Private
UCSA 92.40-N	0.41	30 x 562	Clearcut Forest Land Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.40-W	0.40	30 x 552	Clearcut Forest Land Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.55-N	0.09	30 x 104	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.55-W	0.08	30 x 82	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.64-W	0.19	30 x 262	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.67-N	0.11	30 x 153	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.73-N	0.20	30 x 258	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.73-W	0.10	30 x 121	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.82-N	0.31	30 x 440	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 92.93-N	0.33	30 x 450	Mixed Forest Land	Douglas- ir-Mixed Deciduous Forest	BLM/Private
UCSA 92.94-W	2.23	30 x 3,729	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 93.08-N	1.34	30 x 1,926	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 93.77-N	0.16	30 x 173	Mixed Forest Land Regenerating Evergreen Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 93.80-W	0.33	30 x 486	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM
UCSA 93.84-N	0.61	30 x 860	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	BLM/Private
UCSA 93.98-W	0.16	30 x 225	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 94.04-W	0.21	15 x 597	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 94.23-N	0.45	30 x 639	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 94.23-W	0.46	30 x 645	Herbaceous Rangeland	Grasslands (W. Cascades)	Private
UCSA 98.31-N	1.91	100 x 793	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 98.31-W	1.12	105 x 750 (Irregular)	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
UCSA 98.46-N	4.40	100 x 2,023	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
UCSA 98.46-W	39.14	100 x 19,392	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/USFS/Private
UCSA 98.92-N	34.86	100 x 16,400	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/USFS/Private
UCSA 111.14-W	2.20	30 x 3,412	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 111.27-N	2.81	30 x 4,138	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 111.86-W	0.27	30 x 379	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 112.07-W	0.39	30 x 532	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 112.20-W	1.27	30 x 1,810	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 112.64-W	5.30	30 x 7,835	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private
UCSA 114.33-N	8.65	100 x 4,052	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 114.34-W	9.22	100 x 4,891 (Irregular)	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM/Private
UCSA 115.47-N	1.23	30 x 1,783	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 115.52-W	1.17	30 x 1,678	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 115.86-N	0.72	30 x 1,033	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 115.88-W	0.25	30 x 360	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 116.28-N	4.88	30 x 8,140 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Shrublands Roads, Corridors	BLM/Private
UCSA 116.35-W	0.85	30 x 1,284	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 116.74-W	0.62	15 x 1,797	Evergreen Forest Land Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Shrublands	BLM/Private
UCSA 117.10-W	0.12	15 x 321	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 117.42-W	0.41		Evergreen Forest Land Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Shrublands	BLM
UCSA 118.00-W	0.94	30 x 1,421	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir –White Fir/Tanoak-Madrone Mixed Roads, Corridors	Private
UCSA 118.03-N	0.78	30 x 1,099	Mixed Forest Land	Douglas Fir –White Fir/Tanoak-Madrone Mixed	Private
UCSA 118.28-N	1.94	50 x 2,270	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir –White Fir/Tanoak-Madrone Mixed Roads, Corridors	Private
UCSA 118.43-W	1.26	30 x 2,126	Herbaceous Rangeland Mixed Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas Fir -White Fir/Tanoak-Madrone Mixed Roads, Corridors	Private
UCSA 118.95-N	0.26	30 x 381	Mixed Forest Land Trans, Comm, Utilities Corridors	Douglas Fir – White Fir/Tanoak-Madrone Mixed Roads, Corridors	BLM
UCSA 118.95-W	0.22	30 x 314	Mixed Forest Land	Douglas Fir – White Fir/Tanoak-Madrone Mixed	BLM
UCSA 119.20-N	6.32	30 x 5,588 (Irregular)	Deciduous Forest Land Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas Fir - White Fir/Tanoak-Madrone Mixed Rivers and Streams Roads, Corridors	BLM/Private
UCSA 119.21-W	0.86	30 x 1,505	Mixed Forest Land	Douglas Fir – White Fir/Tanoak-Madrone Mixed	BLM

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 119.54-W	1.20	30 x 1,929	Deciduous Forest Land Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors Deciduous Forest Land	Oregon White Oak Forest Douglas Fir - White Fir/Tanoak-Madrone Mixed Rivers and Streams Roads, Corridors Oregon White Oak Forest	BLM/Private
UCSA 120.10-W	0.38	15 x 807	Mixed Forest Land	Douglas Fir –White Fir/Tanoak-Madrone Mixed	BLM/Private
UCSA 120.32-N	0.48	30 x 680	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Douglas Fir -White Fir/Tanoak-Madrone Mixed	BLM/Private
UCSA 120.46-N	0.14	30 x 200	Mixed Forest Land	Douglas Fir –White Fir/Tanoak-Madrone Mixed	Private
UCSA 120.50-W	0.11	30 x 141	Mixed Forest Land Mixed Rangeland	Douglas Fir –White Fir/Tanoak-Madrone Mixed Grasslands (W. Cascades)	Private
UCSA 121.67-N	0.66	30 x 1,123	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 121.67-W	0.82	30 x 1,262	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 124.37-N	0.63	30 x 905	Deciduous Forest Land Evergreen Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 124.41-W	0.50	30 x 707	Deciduous Forest Land Evergreen Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 124.62-N	1.22	30 x 1,819	Deciduous Forest Land Evergreen Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 124.62-W	0.83	15 x 1,981	Deciduous Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Roads, Corridors	BLM
UCSA 125.31-N	0.17	25 x 278	Evergreen Forest Land Mixed Forest Land	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak	BLM
UCSA 125.31-W	0.16	30 x 200	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
UCSA 125.60-N	1.07	50 x 978	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak	Private
UCSA 125.82-N	0.12	30 x 145	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 126.58-N	0.55	30 x 791	Mixed Forest Land Regenerating Evergreen Forest Land Streams and Canals Strip Mines, Quarries, and Gravel Pits Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Ponderosa Pine/White Oak Rivers and Streams Industrial Roads, Corridors	BLM/Private
UCSA 126.58-W	0.53	30 x 768	Mixed Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Ponderosa Pine/White Oak Roads, Corridors	BLM/Private
UCSA 126.78-N	0.14	30 x 195	Mixed Forest Land	Ponderosa Pine/White Oak	Private
UCSA 126.79-W	0.13	30 x 179	Mixed Forest Land	Ponderosa Pine/White Oak	Private
UCSA 128.68-N	0.31	30 x 446	Cropland and Pasture Mixed Forest Land Shrub and Brush Rangeland Streams and Canals	Agriculture Douglas-Fir-Mixed Deciduous Forest Shrublands Rivers and Streams	BLM/Private
UCSA 128.70-W	0.44	30 x 613	Mixed Forest Land Shrub and Brush Rangeland	Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM/Private
UCSA 128.82-N	0.09	30 x 128	Shrub and Brush Rangeland	Shrublands	BLM
UCSA 129.02-W	1.27	15 x 3,104	Deciduous Forest Land Evergreen Forest Land Mixed Forest Land Shrub and Brush Rangeland	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Douglas-Fir-Mixed Deciduous Forest Shrublands	BLM/Private
UCSA 129.10-N	2.72	30 x 3,954	Deciduous Forest Land Evergreen Forest Land Herbaceous Rangeland Mixed Forest Land Shrub and Brush Rangeland Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest Shrublands Rivers and Streams Roads, Corridors	BLM/Private
UCSA 129.62-W	0.14	30 x 169	Mixed Forest Land	Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 129.74-W	0.39	30 x 536	Herbaceous Rangeland Mixed Forest Land	Grasslands (W. Cascades) Douglas-Fir-Mixed Deciduous Forest	Private
UCSA 134.65-N	2.94	30 x 4,290	Clearcut Forest Land Mixed Forest Land Mixed Rangeland Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Grasslands (W. Cascades) Shrublands Roads, Corridors	Private
UCSA 134.65-W	0.50	30 x 706	Clearcut Forest Land Mixed Rangeland	Ponderosa Pine/White Oak Grasslands (W. Cascades)	Private
UCSA 134.88-W	1.04	30 x 2,083 (Irregular)	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
UCSA 135.30-W	0.29	30 x 398	Clearcut Forest Land	Ponderosa Pine/White Oak	Private
UCSA 135.46-W	0.22	30 x 306	Clearcut Forest Land Shrub and Brush Rangeland	Ponderosa Pine/White Oak Shrublands	Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 135.53-N	1.82	30 x 3,046	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 135.53-W	0.37	30 x 520	Clearcut Forest Land Trans, Comm, Utilities, Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 135.66-W	0.47	30 x 670	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 135.99-W	0.46	30 x 634	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 136.17-N	0.34	30 x 619	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 136.17-W	0.42	30 x 578	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 136.32-N	0.48	30 x 667	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 136.32-W	0.48	30 x 667	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 136.48-N	1.18	30 x 1,706	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 136.48-W	1.18	30 x 1,686	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 136.88-W	1.21	30 x 1,847	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine/White Oak Roads, Corridors	BLM/Private
UCSA 136.97-N	0.51	30 x 840	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	BLM
UCSA 137.16-N	0.38	30 x 535	Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
UCSA 137.71-N	1.16	30 x 1,698	Mixed Forest Land Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
UCSA 137.87-W	0.42	30 x 574	Mixed Forest Land Regenerating Evergreen Forest Land	Ponderosa Pine/White Oak	Private
UCSA 139.84-W	0.52	15 x 1,483	Mixed Forest Land	Ponderosa Pine/White Oak	BLM/Private
UCSA 141.45-W	0.82	30 x 1,722 (Irregular)	Deciduous Forest Land Mixed Forest Land Streams and Canals Trans, Comm, Utilities Corridors	Oregon White Oak Forest Ponderosa Pine/White Oak Rivers and Streams Roads, Corridors	BLM
UCSA 141.49-N	1.01	30 x 1,469	Deciduous Forest Land Trans, Comm, Utilities Corridors	Oregon White Oak Forest Roads, Corridors	BLM

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 143.10-N	1.26	30 x 1,825	Deciduous Forest Land Herbaceous Rangeland Streams and Canals	Oregon White Oak Forest Grasslands (W. Cascades) Rivers and Streams	Private
UCSA 147.78-W	0.56	30 x 799	Deciduous Forest Land Mixed Forest Land	Oregon White Oak Forest Ponderosa Pine/White Oak	Private
UCSA 147.93-N	1.79	30 x 2,615	Deciduous Forest Land Evergreen Forest Land Mixed Forest Land	Oregon White Oak Forest Douglas Fir Dominant - Mixed Conifer Douglas-Fir-Mixed Deciduous Forest Ponderosa Pine/White Oak	BLM/Private
UCSA 148.48-W	0.23	30 x 300	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
UCSA 148.49-N	0.72	30 x 1,014	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
UCSA 148.50-W	0.45	30 x 630	Mixed Forest Land	Ponderosa Pine/White Oak	BLM
UCSA 149.31-N	3.77	100 x 2,158 (Irregular)	Evergreen Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Shrublands	BLM
UCSA 150.49-N	0.51	25 x 875	Mixed Forest Land Shrub and Brush Rangeland Trans, Comm, Utilities Corridors	Ponderosa Pine/White Oak Shrublands Roads, Corridors	BLM/Private
UCSA 151.85-N	0.91	30 x 1,350	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	Private
UCSA 152.48-N	0.21	30 x 329	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	BLM
UCSA 152.48-W	0.21	30 x 317	Regenerating Evergreen Forest Land	Ponderosa Pine Forest and Woodland	BLM
UCSA 153.10-W	0.86	50 x 726	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Ponderosa Pine Forest and Woodland	BLM
UCSA 153.81-N	1.07	30 x 1,550	Evergreen Forest Land Mixed Rangeland Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades) Shrublands	USFS
UCSA 153.81-W	1.01	30 x 1,464	Evergreen Forest Land Regenerating Evergreen Forest Land Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Shrublands	USFS
UCSA 154.13-W	2.12	30 x 3,068	Evergreen Forest Land Shrub and Brush Rangeland	Douglas Fir Dominant - Mixed Conifer Shrublands	USFS

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 154.15-N	2.99	30 x 4,607	Clearcut Forest Land Evergreen Forest Land Mixed Rangeland	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades)	USFS/Private
UCSA 154.82-W	0.46	30 x 1,016	Clearcut Forest Land Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS/Private
UCSA 155.26-N	0.48	30 x 706	Clearcut Forest Land	Douglas Fir Dominant - Mixed Conifer	Private
UCSA 155.49-W	0.87	30 x 1,248	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 155.72-W	0.55	15 x 1,283	Evergreen Forest Land	Douglas Fir Dominant -	USFS
UCSA 155.72-W	0.55	(Irregular)	Regenerating Evergreen Forest Land	Mixed Conifer	USFS
UCSA 155.77-N	0.72	30 x 1,029	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 156.00-N	2.68	30 x 4,166	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 156.00-W	0.59	30 x 921	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 156.26-W	1.82	30 x 2,629	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 156.82-N	2.26	30 x 3,259	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 156.85-W	0.20	15 x 560	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 156.98-W	1.24	30 x 1,787	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 157.37-W	0.06	30 x 71	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 157.40-W	0.19	30 x 256	Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Roads, Corridors Douglas Fir Dominant - Mixed Conifer	USFS

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 157.51-N	4.23	30 x 6,433	Mixed Rangeland Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Grasslands (W. Cascades) Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 157.62-W	5.37	30 x 9,392	Evergreen Forest Land Mixed Rangeland Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer Grasslands (W. Cascades)	USFS
UCSA 158.79-N	3.69	30 x 5,550	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 159.45-W	0.34	30 x 472	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 159.58-W	0.44	30 x 603	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 159.72-W	0.18	30 x 231	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 159.79-W	0.71	30 x 998	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 160.00-W	0.40	30 x 556	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 160.01-N	0.33	30 x 462	Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 160.17-W	1.34		Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 161.32-N	0.22	30 x 317	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 161.32-W	0.23	30 x 335	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 161.52-N	3.11	30 x 4,518	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Roads, Corridors	USFS
UCSA 162.01-W	1.21	30 x 1,857	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 162.52-N	2.16	30 x 3,109	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 162.52-W	2.14	30 x 3,086	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 163.18-N	3.52	30 x 5,096	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 163.48-W	0.74	30 x 1,036	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 163.71-W	1.53	30 x 2,278	Evergreen Forest Land Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 164.23-W	0.23	30 x 306	Evergreen Forest Land	Shasta Red Fir-Mountain HemlockForest	USFS
UCSA 164.34-N	6.42	30 x 9,284	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir- Mountain Hemlock Forest Roads, Corridors	USFS
UCSA 165.16-W	2.67	30 x 3,845	Clearcut Forest Land Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir- Mountain Hemlock Forest Roads, Corridors	USFS
UCSA 165.96-W	0.40	30 x 555	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
UCSA 166.11-W	1.01	30 x 1,434	Herbaceous Rangeland Regenerating Evergreen Forest Land Streams and Canals	Grasslands (W. Cascades) Shasta Red Fir- Mountain Hemlock Forest Rivers and Streams	USFS
UCSA 166.13-N	1.12	30 x 1,595	Herbaceous Rangeland Regenerating Evergreen Forest Land Streams and Canals	Grasslands (W. Cascades) Shasta Red Fir- Mountain Hemlock Forest Rivers and Streams	USFS
UCSA 166.44-W	3.05	30 x 4,432	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
UCSA 166.49-N	2.93	30 x 4,233	Regenerating Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
UCSA 167.34-N	1.63	30 x 2,397	Evergreen Forest Land Regenerating Evergreen Forest Land	Shasta Red Fir- Mountain Hemlock Forest	USFS

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 167.87-N	0.62	30 x 927	Evergreen Forest Land Regenerating Evergreen Forest Land	Shasta Red Fir- Mountain Hemlock Forest	USFS
UCSA 167.87-W	1.23	30 x 1,809	Evergreen Forest Land Regenerating Evergreen Forest Land	Shasta Red Fir- Mountain Hemlock Forest	USFS
UCSA 168.09-N	2.31	30 x 3,346	Evergreen Forest Land Regenerating Evergreen Forest Land	Shasta Red Fir- Mountain Hemlock Forest	USFS
UCSA 168.77-W	0.13	30 x 167	Evergreen Forest Land	Shasta Red Fir-Mountain Hemlock Forest	USFS
UCSA 168.78-N	0.05	30 x 90	Evergreen Forest Land Regenerating Evergreen Forest Land	Shasta Red Fir- Mountain Hemlock Forest	USFS
UCSA 168.88-N	2.30	30 x 3,327	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Roads, Corridors	USFS
UCSA 168.88-W	2.41	30 x 3,486	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Shasta Red Fir-Mountain Hemlock Forest Shasta Red Fir- Mountain Hemlock Forest Roads, Corridors	USFS/Private
UCSA 170.95-N	0.08	25 x 142	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 170.98-N	0.09	25 x 151	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 171.14-W	0.19	25 x 298	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 171.26-N	1.56	15 x 4,179	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private
UCSA 172.12-N	1.00	30 x 1,438	Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 172.49-N	0.32	30 x 455	Clearcut Forest Land Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS
UCSA 172.62-N	1.54	30 x 2,232	Evergreen Forest Land Regenerating Evergreen Forest Land Trans, Comm, Utilities Corridors	Douglas Fir Dominant - Mixed Conifer Douglas Fir Dominant - Mixed Conifer Roads, Corridors	USFS/Private

TABLE 8A-3

Uncleared Storage Areas Necessary for Construction of the PCGP Project

Name	Acres	Dimension	Land Use	Vegetation	Jurisdiction
UCSA 173.76-W	0.43	25 x 737	Regenerating Evergreen Forest Land	Douglas Fir Dominant - Mixed Conifer	USFS
UCSA 173.98-W	0.53	25 x 892	Herbaceous Rangeland Regenerating Evergreen Forest Land Streams and Canals	Grasslands (E. Cascades) Douglas Fir Dominant - Mixed Conifer Rivers and Streams	USFS
UCSA 222.80-N	2.62	390 x 383 (Irregular)	Cropland and Pasture Nonforested Wetlands	Agriculture Palustrine Unconsolidated Bottom (PUB)	Private

TABLE D-7

Rock Source and Permanent Disposal Sites Identified for Construction of the Pacific Connector Pipeline Project

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP Location	Purpose	Jurisdiction	Land Use	Vegetation
Coos County						
TEWA-11.90-W	0.10	11.90	Ingress/egress, staging, spoil storage, disposal	Private	Mixed forest land, regenerating evergreen forest land	Mixed conifer/mixed deciduous
TEWA 12.53-N	2.32	12.53	Disposal, staging	Private	Clearcut forest land, transportation, communication, utilities corridors	Mixed conifer/mixed deciduous, roads, corridors
TEWA 14.60-N	0.61	14.60	Disposal, staging, spoil storage	Private	Regenerating evergreen forest land, transportation, communication, utilities corridors	Mixed conifer/mixed deciduous, transportation, roads, corridors
TEWA 17.77-W	1.38	17.77	Steep slope staging, turnaround, disposal	Private	Clearcut forest land, transportation, communication, utilities corridors, regenerating evergreen forest land	Mixed conifer/mixed deciduous, grass-shrub- sapling or regenerating young forest, roads, corridors
TEWA 20.96	2.00	20.96	Disposal, staging	Private	Clearcut forest land, regenerating evergreen forest land	Douglas fir-W. Hemlock-W. red cedar
TEWA 27.86-N	0.47	27.86	Log landing, steep slope staging, spoil storage and disposal,	Private	Clearcut forest land, transportation, communication, utilities corridors, regenerating evergreen forest land	Douglas fir-W. Hemlock-W. red cedar, roads, corridors
TEWA 34.26-W	2.07	34.26	Staging, parking, truck turnaround, disposal	Private	Clearcut forest land, transportation, communication, utilities corridors	Douglas fir-W. Hemlock-W. red cedar, roads, corridors
TEWA 35.25-W	2.12	35.25	Disposal, log landing, ingress/egress, road crossing, steep slope staging, spoil storage	BLM-Coos Bay District	Evergreen forest land, regenerating evergreen forest land	Douglas fir-W, Hemlock W., red cedar
TEWA 38.86-W/ Sandy Creek	5.59	38.86	Rock source and	Private/	Strip mines, quarries, and	Douglas fir-W. Hemlock-W.
Quarry Site			disposal, staging, ingress/egress, spoil storage	BLM-Coos Bay District	gravel pits, clearcut forest land, regenerating evergreen forest land, transportation, communication, utilities corridors	Red cedar, roads, corridors, urban
TEWA 42.56-W (Plum Creek)	4.07	42.56	Disposal, log decking/storage/ loading, road crossing staging	Private	Regenerating evergreen forest land, clearcut forest land, transportation, communication, utilities corridors	Douglas fir-W. Hemlock-W. red cedar, roads, corridors
Douglas County						
Signal Tree Road Quarry – Sec. 3	1.22	45.86	Rock source and disposal; spoil storage, staging	BLM-Roseburg District	Quarries	Industrial
TEWA 45.84-W	0.58	45.84	Disposal, parking, staging	Private	Evergreen forest land, clearcut evergreen forestland, transportation, communication, utilities corridors	Douglas fir-W. Hemlock-W. red cedar, mixed conifer/mixed deciduous, roads, corridors

TABLE D-7

Rock Source and Permanent Disposal Sites Identified for Construction of the Pacific Connector Pipeline Project

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP Location	Purpose	Jurisdiction	Land Use	Vegetation
Signal Tree Road Quarry – Sec. 35	1.09	47	Rock source and disposal	BLM-Coos Bay District	Quarries	Industrial
Weaver Road Quarry Site 1	1.62	47	Rock source and disposal	BLM-Coos Bay District	Quarries	Industrial
Weaver Road Quarry Site 2	1.30	47	Rock source and disposal	BLM-Coos Bay District	Quarries	Industrial
Signal Tree Quarry Site – Sec. 15	1.75	47	Rock source and disposal	BLM-Roseburg District	Quarries	Industrial
TEWA 52.23-N	2.62	52.23	Disposal, rock source, road crossing	Private	Quarries	Industrial
TEWA 54.83-W	0.50	54.83	Disposal, steep slope staging, spoil storage	Private	Clearcut forest land	Douglas fir dominant – mixed conifer
Private Quarry Benedict Rd.	1.49	56.75	Rock source	Private	Quarries	Industrial
Rock Source and Disposal MP61.64 (DG-075) (Nichol Bros)	5.55	61.64	Disposal	Private	Clearcut	Regenerating, roads and corridors
Kent Creek Commercial Quarry	1.69	63.90	Rock source	Private	Quarries	Industrial
Private Quarry DG 105	10.79	67.00	Rock source	Private	Quarries	Industrial
Roth – Existing Quarry #1	0.77	72.61	Rock source and disposal	Private	Quarries	Industrial
Roth – Existing Quarry #2	0.34	72.61	Rock source and disposal	Private	Quarries	Industrial
TEWA 75.28-W (BLM Quarry Site)	0.48	75.28	Rock source, staging	BLM- Roseburg District	Abandoned quarry, Mixed forest land	Industrial, Mixed conifer/mixed deciduous
TEWA 77.72-N	1.08	77.72	Disposal, staging, pipe storage	Private	Mixed forest land, herbaceous rangeland, transportation, communication, utilities corridors, streams and canals, evergreen forest land	Mixed conifer/mixed deciduous, grasslands (W. Cascades), roads, corridors, rivers and streams, Douglas fir dominant - mixed conifer
TEWA 79.85-N (BLM Quarry Site)	3.52	79.85	Disposal, PI, spoil storage, log landing, steep slope staging	BLM- Roseburg District	Quarries, transportation, communication, utilities corridors, regenerating evergreen forest land	Roads, corridors, Douglas fir dominant - mixed conifer
Pct Quarry DG-176	2.22	81.45	Rock source	Private	Quarries, evergreen forest land	Industrial, Douglas fir dominant – mixed conifer
TEWA 84.19-W	1.06	84.19	Disposal, staging	Private	Herbaceous rangeland	Grasslands (W. Cascades)
TEWA 86.98-N	0.92	86.98	Disposal, log landing/ heliport, staging pipe storage, spoil storage	BLM- Roseburg District	Transportation, communication, utilities corridors, clearcut forest land, regenerating evergreen forest land	Douglas fir dominant - mixed conifer, roads, corridors
TEWA 91.66-W (BLM DG-210)	2.21	91.66	Disposal, steep slope staging, spoil storage	BLM- Roseburg District	Clearcut forest land	Douglas fir dominant – mixed conifer
TEWA 93.01	0.55	93.01	Disposal	Private and BLM-Roseburg District	Evergreen forest land	Douglas fir dominant – mixed conifer

TABLE D-7

Rock Source and Permanent Disposal Sites Identified for Construction of the Pacific Connector Pipeline Project

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP Location	Purpose	Jurisdiction	Land Use	Vegetation
TEWA 94.52-W(Reclaimed Quarry) (Pvt DG-155)	27.34	94.52	Milo pipe yard(pipe/contractor yard), stage, disposal	Private	Reclaimed quarry, mixed rangeland, transportation, communication, utilities corridors, Commercial and services, transitional areas, nonforested wetlands, herbaceous rangeland	Grasslands (W. Cascades),roads, corridors, urban, grass-shrub-sapling or regenerating young forest, palustrine emergent (PEM), palustrine unconsolidated bottom (pub), grass-shrub-sapling or regenerating young forest, mixed conifer/mixed deciduous
Rock Disposal MP 104.12 (C&D Pit)	3.36	104.12	Disposal	FS-Umpqua	Strip mines, quarries, and gravel pits, transportation, communication, utilities corridors, regenerating forest land	Industrial, roads and corridors, Douglas fir dominant – mixed conifer
Jackson County						
TEWA 110.73 (Peavine Quarry)	15.87	110.73	Staging, Parking, Disposal, hydrostatic discharge	FS-Umpqua	Strip mines, quarries, gravel pit and evergreen forest	Industrial and Douglas fir dominant - mixed conifer
Rock Source and Disposal MP119.51	7.66	119.51	Rock source and disposal	Private	Strip mines, quarries, gravel pit, regenerating evergreen forest land, evergreen forest land	Industrial and Douglas fir dominant - mixed conifer
TEWA 149.97-N	0.33	149.97	Ingress/egress, rock source and disposal, staging	Private	Deciduous forest land, transportation, communication, utilities corridors, mixed forestland	Oregon white oak forest, roads, corridors, mixed conifer/mixed deciduous
TEWA 150.31-W (Heppsie Mountain Quarry)	5.56	150.31	Ingress/egress, staging, spoil storage, parking, rock source and disposal	Private and BLM-Medford District	Strip mines, quarries, and gravel pits, mixed rangeland, evergreen forest land, mixed forest land, transportation, communication, utilities corridors, regenerating evergreen forest land, clearcut forest land, herbaceous rangeland	Grasslands (W. Cascades), industrial, Ponderosa Pine/white oak, roads, corridors, grass-shrub-sapling or regenerating young forest
TEWA 160.54-W (Big Elk Cinder Pit) (Ichabod Rock Quarry)	15.26	160.54	Log landing/decking/ hauling, ingress/egress, staging, rock source and disposal	FS-Rogue River- Siskiyou	Strip mines, quarries, and gravel pits, transportation, communication, utilities corridors, evergreen forest land,	Industrial, grasslands (W. Cascades), roads, corridors, true-fir hemlock montane, Douglas fir dominant - mixed conifer
Klamath County						
Rock Source and Disposal MP180.56	7.76	180.56	Rock source and disposal	Private	Strip mines, quarries, gravel pit, transportation communication and utilities corridors, and regenerating forest land	Industrial, roads and corridors, and ponderosa pine/white oak
Rock Source and Disposal MP180.71	2.95	180.71	Rock source and disposal	Private	Strip mines, quarries, gravel pits, clearcut forest land	Industrial, roads and corridors, and ponderosa pine/white oak
Rock Source and Disposal MP182.40	5.66	182.40	Rock source and disposal	Private	Quarries, gravel pits	Industrial

TABLE D-7

Rock Source and Permanent Disposal Sites Identified for Construction of the Pacific Connector Pipeline Project

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP Location	Purpose	Jurisdiction	Land Use	Vegetation
Rock Source and Disposal MP201.61	4.96	201.61	Disposal	Private	Quarries, gravel pits, transitional areas, communication and utilities corridors	Industrial, roads and corridors, and grasslands (E. Cascades)
Rock Source and Disposal MP224.95	7.60	224.95	Rock source and disposal	Private	Strip mines, quarries, gravel pits, shrub and brush rangeland, transportation communication and utilities corridors, evergreen forest land, transitional area, and	Sagebrush steppe, roads and corridors, western juniper woodland, and industrial
TEWA (18) Total a/	**24.99 a/**					
TEWA (7) (associated with existing quarries)	**73.62 a/**					
Existing Quarries and Rock Source and Disposal Sites (19) Total	**69.78**					
Total	**168.39**					

a/ The 98.61 (24.99 + 73.62) acres are included in the total TEWA acreage in Table 8A-2.

TABLE D-8

Landownership/Jurisdiction by Milepost

Begin MP	End MP	Jurisdiction	BLM District/National Forest/Reclamation/River Name/Department	Length Crossed (miles)
Coos County				
1.47	1.74	Private		0.27
1.74	4.13	State	Coos Bay	2.39
4.13	6.21	Private		2.08
6.21	6.44	State	Kentuck Slough	0.24
6.44	11.08	Private		4.63
11.08	11.18	State	Coos River	0.11
11.18	12.39	Private		1.21
8.58	11.08	Private		2.50
11.08	11.13	State	Catching Slough	0.05
11.13	17.04	Private		5.91
17.04	17.11	BLM	Coos Bay District	0.08
17.11	17.14	Private		0.02
17.14	17.31	BLM	Coos Bay District	0.18
17.31	17.40	Private		0.08
17.40	17.44	BLM	Coos Bay District	0.04
17.44	18.80	Private		1.36
18.80	18.87	BLM	Coos Bay District	0.07
18.87	20.04	Private		1.17
20.04	20.54	BLM	Coos Bay District	0.50
20.54	21.22	Private		0.68
21.22	21.81	BLM	Coos Bay District	0.59
21.81	23.19	Private		1.38
23.19	23.87	BLM	Coos Bay District	0.68
23.87	23.99	Private		0.11
23.99	24.36	BLM	Coos Bay District	0.38
24.36	25.53	Private		1.17
25.53	25.59	BLM	Coos Bay District	0.05
25.59	26.82	Private		1.23
26.82	27.07	BLM	Coos Bay District	0.26
27.07	27.11	Private		0.04
27.11	27.48	BLM	Coos Bay District	0.37
27.48	28.40	Private		0.92
28.40	28.79	BLM	Coos Bay District	0.39
28.79	31.58	Private		2.79
31.58	32.47	BLM	Coos Bay District	0.89
32.47	33.77	Private		1.30
33.77	34.21	BLM	Coos Bay District	0.44
34.21	35.12	Private		0.91
35.12	38.92	BLM	Coos Bay District	3.80
38.92	40.17	Private		1.25
40.17	40.22	BLM	Coos Bay District	0.04
40.22	41.35	Private		1.13
41.35	42.01	BLM	Coos Bay District	0.67
42.01	43.19	Private		1.18
43.19	43.50	BLM	Coos Bay District	0.30
43.50	44.63	Private		1.14
44.63	45.72	BLM	Coos Bay District	1.08
Douglas County				
45.72	46.90	Private		1.18
46.90	47.17	BLM	Roseburg District	0.27
47.17	48.28	Private		1.11
48.28	49.20	BLM	Roseburg District	0.92
49.20	51.04	Private		1.84
51.04	51.29	BLM	Roseburg District	0.25
51.29	52.61	Private		1.32
52.61	52.95	BLM	Roseburg District	0.34
52.95	53.11	Private		0.16
53.11	53.70	BLM	Roseburg District	0.60
53.70	54.38	Private		0.68
54.38	54.43	BLM	Roseburg District	0.05

TABLE D-8

Landownership/Jurisdiction by Milepost

Begin MP	End MP	Jurisdiction	BLM District/National Forest/Reclamation/River Name/Department	Length Crossed (miles)
54.43	60.85	Private		6.42
60.85	61.66	BLM	Roseburg District	0.81
61.66	64.37	Private		2.71
64.37	64.50	BLM	Roseburg District	0.13
64.50	64.61	Private		0.11
64.61	64.88	BLM	Roseburg District	0.27
64.88	75.47	Private		10.60
75.47	75.52	BLM	Roseburg District	0.05
75.52	76.02	Private		0.51
76.02	76.11	BLM	Roseburg District	0.09
76.11	78.17	Private		2.05
78.17	78.78	BLM	Roseburg District	0.61
78.78	79.64	Private		0.86
79.64	80.55	BLM	Roseburg District	0.91
80.55	82.71	Private		2.16
82.71	83.32	BLM	Roseburg District	0.61
83.32	84.91	Private		1.59
84.91	85.19	BLM	Roseburg District	0.28
85.19	85.95	Private		0.76
85.95	86.25	BLM	Roseburg District	0.30
86.25	86.97	Private		0.72
86.97	87.49	BLM	Roseburg District	0.52
87.49	89.84	Private		2.36
89.84	90.49	BLM	Roseburg District	0.65
90.49	91.25	Private		0.76
91.25	91.93	BLM	Roseburg District	0.67
91.93	93.03	Private		1.10
93.03	93.04	BLM	Roseburg District	0.01
93.04	93.64	Private		0.60
93.64	93.93	BLM	Roseburg District	0.29
93.93	95.15	Private		1.22
95.15	95.84	BLM	Roseburg District	0.68
95.84	97.07	Private		1.23
97.07	98.47	BLM	Roseburg District	1.40
98.47	99.30	Private		0.83
99.30	99.91	Forest Service	Umpqua NF	0.60
99.91	100.38	BLM	Roseburg District	0.47
100.38	100.67	Forest Service	Umpqua NF	0.29
100.67	101.23	Private		0.56
101.23	101.92	Forest Service	Umpqua NF	0.69
101.92	102.32	BLM	Roseburg District	0.40
102.32	102.84	Forest Service	Umpqua NF	0.52
102.84	104.10	Private		1.26
104.10	109.99	Forest Service	Umpqua NF	5.88
Jackson County				
109.99	113.20	Forest Service	Umpqua NF	3.21
113.20	115.11	Private		1.91
115.11	115.39	BLM	Medford District	0.29
115.39	115.42	Private		0.03
115.42	116.77	BLM	Medford District	1.35
116.77	116.84	Private		0.07
116.84	117.80	BLM	Medford District	0.96
117.80	118.91	Private		1.10
118.91	119.77	BLM	Medford District	0.86
119.77	120.27	Private		0.50
120.27	120.46	BLM	Medford District	0.19
120.46	121.25	Private		0.79
121.25	121.55	BLM	Medford District	0.30
121.55	122.62	Private		1.07
122.62	122.70	State	Gold River	0.07
122.70	123.33	Private		0.63
123.33	124.23	BLM	Medford District	0.91

TABLE D-8

Landownership/Jurisdiction by Milepost

Begin MP	End MP	Jurisdiction	BLM District/National Forest/Reclamation/River Name/Department	Length Crossed (miles)
124.23	124.36	State	Oregon Department of Forestry	0.13
124.36	125.55	BLM	Medford District	1.18
125.55	126.28	Private		0.73
126.28	126.60	BLM	Medford District	0.32
126.60	126.86	Private		0.26
126.86	127.11	BLM	Medford District	0.25
127.11	127.39	Private		0.28
127.39	128.42	BLM	Medford District	1.03
128.42	128.73	Private		0.32
128.73	129.44	BLM	Medford District	0.71
129.44	130.27	Private		0.82
130.27	130.29	BLM	Medford District	0.02
130.29	131.36	Private		1.08
131.36	131.78	BLM	Medford District	0.42
131.78	133.20	Private		1.42
133.20	133.45	BLM	Medford District	0.25
133.45	136.82	Private		3.37
136.82	137.12	BLM	Medford District	0.30
137.12	139.88	Private		2.76
139.88	140.57	BLM	Medford District	0.69
140.57	140.83	Private		0.26
140.83	141.92	BLM	Medford District	1.08
141.92	148.27	Private		6.36
148.27	149.90	BLM	Medford District	1.62
149.90	150.49	Private		0.60
150.49	151.65	BLM	Medford District	1.16
151.65	152.19	Private		0.54
152.19	153.81	BLM	Medford District	1.62
153.81	154.92	Forest Service	Rogue River-Siskiyou NF	1.11
154.92	155.45	Private		0.53
155.45	166.41	Forest Service	Rogue River-Siskiyou NF	10.90
Klamath County				
166.41	169.35	Forest Service	Rogue River-Siskiyou NF	3.01
169.35	170.04	Private		0.68
170.04	171.39	Forest Service	Fremont-Winema NF	1.36
171.39	171.59	Private		0.20
171.59	172.72	Forest Service	Fremont-Winema NF	1.13
172.72	173.11	Private		0.39
173.11	174.81	Forest Service	Fremont-Winema NF	1.70
174.81	174.95	Private		0.14
174.95	175.37	Forest Service	Fremont-Winema NF	0.43
175.37	176.15	Private		0.78
176.15	177.04	BLM	Lakeview District	0.89
177.04	179.58	Private		2.54
179.58	179.72	BLM	Lakeview District	0.15
179.72	199.27	Private		19.54
199.27	199.46	State	Klamath River	0.19
199.46	200.52	Private		1.07
200.52	200.54	Reclamation	Bureau of Reclamation	0.01
200.54	202.54	Private		2.01
202.54	202.84	Reclamation	Bureau of Reclamation	0.30
202.84	212.06	Private		9.21
212.06	212.11	State	Lost River	0.05
212.11	216.49	Private		4.39
216.49	216.75	BLM	Lakeview District	0.26
216.75	228.13	Private		11.38
			Total	**231.82**

a/ Because equations have been inserted to prevent the mileposts from changing, it is no longer possible to use the distance between mileposts as an accurate length (e.g., the centerline is now 231.82 miles long but the ending MP is 228.13).

APPENDIX E

BLM District and National Forest Consistency Forms

Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project Draft EIS

Appendix E

BLM District and National Forest Consistency Forms

Pacific Connector Gas Pipeline

Coos Bay, Roseburg, and Medford Districts and Klamath Falls Resource Area, Lakeview District, BLM Oregon; Umpqua, Rogue River, and Winema National Forests

Prepared for:

USDI Bureau of Land Management

USDA Forest Service

Prepared by:

North State Resources

Table of Contents

Pages

Tables

TABLE E-1 Coos Bay Approved Management Actions/Direction - 1995 3
TABLE E-2 Roseburg Approved Management Actions/Direction – 1995 47
TABLE E-3 Medford Approved Management Actions/Direction – 1995 97
TABLE E-4 Klamath Falls Approved Management Actions/Direction – 1995..... 153
TABLE E-5 Umpqua National Forest Land And Resource Management Plan 209
TABLE E-6 Rogue River National Forest Land And Resource Management Plan..... 258
TABLE E-7 Winema Management Actions/Direction – 1995..... 411

Appendix E. BLM District and National Forest Consistency Forms

To ensure the consistency of the Pacific Connector Gas Pipeline (PCGP) Project with the relevant BLM and Forest Service land management plans (LMP) was fully addressed and all inconsistencies identified, a detailed evaluation of LMP elements. For BLM LMPs, elements equate to management direction; for the Forest Service LMPs it equates to standards and guidelines. This appendix includes tables that document LMP consistency with each of the seven LMPs applicable to the PCGP Project; BLM (Coos Bay District, Roseburg District, Medford District and Klamath Falls Resource Area), Forest Service (Umpqua, Rogue River and Winema National Forests). Each table is organized to list all relevant LMP elements extracted from the respective LMP. For each element, a determination was made regarding (1) its applicability to the Project, (2) the consistency of the Project with the standard, and (3) in each table for each relevant element are the portion or portions of the DEIS that address the standard (expressed as EIS sections, EIS appendices, and POD attachments). the relevant location of the EIS where the element is addressed.

The applicability of each element was identified by relevant stage or stages of the PCGP Project (i.e., preconstruction, construction, restoration, and operation). The consistency of each standard was identified and expressed by adherence to agency-approved plans, designs, and procedures, application of agency-approved BMPs, careful and studied selection of the pipeline route, and implementation of agency-approved, off-site mitigation measures. This column is completed if a LMP amendment would be part of the agency decision-making process to ensure compliance with respective LMP. Column four identifies the specific LMP amendment that would be required.

Where certain sections of the LMP are not applicable, specific elements have been excluded to reduce the size of the tables (e.g., Adaptive Management Areas). In some instances individual LMPs have been updated or maintained and certain elements are no longer applicable (e.g., protection buffer species).
On each table, the specific elements are presented in column one by LMP section (topic). In column two ("Applicable") of each table, the applicability of each element was identified by relevant stage or stages of the PCGP Project as follows:

P	Pre-construction
C	Construction
R	Restoration (includes offsite mitigation actions)
O	Operation
N	Not Applicable to any stage

The majority of the relevant elements are applicable to more than one stage of the PCGP Project. In such cases, the codes are presented as above.

The consistency of each relevant element is expressed in column three ("Consistent") of each table as follows:

P	Consistent via agency-approved plans, designs & procedures
B	Consistent via rigorous application of BMPs
R	Consistent via careful and studied route selection
M	Consistent via offsite mitigation actions
A	Inconsistent, LMP amendment required

The majority of the relevant standards achieve consistency by adherence to more than one consistency criterion. In such cases, the codes are presented as above.

Included for each relevant element in column four of each table ("Comments") are the portion or portions of the DEIS that address the elemen, expressed as follows:

EIS section
EIS appendix
POD attachment

For each inconsistent Project action, the LMP plan amendment required to address the standard is specifically identified in column four.

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Key Watersheds			
In Key Watersheds, prepare watershed analyses prior to resource management activity, including timber harvest. Until completion of watershed analyses, proceed with minor activities—such as those categorically excluded under the NEPA regulations (except timber harvest)—contingent on their consistency with Aquatic Conservation Strategy objectives. Apply Riparian Reserve management actions/direction.	N		
Reduce existing road mileage within Key Watersheds. If funding is insufficient to implement reductions, do not construct (nor authorize through discretionary permits) a net increase in road mileage in Key Watersheds.	N		
Give highest priority to watershed restoration in Key Watersheds.	N		
Watershed Restoration			
Prepare watershed analyses and plans prior to activities within Riparian Reserves. See the Watershed Analysis section.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Focus watershed restoration on removing some roads and, where needed, upgrading those that remain in the system.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 25 POD Att. 29
Apply silvicultural treatments to restore large conifers in Riparian Reserves.	N		
Restore stream channel complexity. Instream structures will only be used in the short term and not as a mitigation measure.	P, R	P, B, M	EIS Sec. 1.4.2 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 EIS App. F POD Att. 29
Survey and Manage for Amphibians, Mammals, Bryophytes, Mollusks, Vascular Plants, Fungi, Lichens, and Arthropods			
Manage known sites (highest priority): Acquire information on these sites, make it available to all project planners, and use it to design or modify activities.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Manage known sites (highest priority): Protect known sites. For some species, apply specific management treatments such as prescribed fire.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Manage known sites (highest priority): For rare and endemic fungus species, temporarily withdraw known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.	P	P, R,A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Continue existing efforts to survey and manage rare and sensitive species habitat.	P	P, R,A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: For species without survey protocols, start immediately to design protocols and implement surveys.	N		
Survey prior to ground-disturbing activities and manage sites: Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for: • Del Norte salamander • Siskiyou Mountains salamander • Red tree voles These surveys will precede the design of all ground-disturbing activities that will be implemented in 1997 or later.	P	P,R,A	EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: For the other species listed in Table C-1 of Appendix C[1], begin development of survey protocols promptly and proceed with surveys as soon as possible. These surveys will be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the SEIS.	N		
Survey prior to ground-disturbing activities and manage sites: Conduct surveys at a scale most appropriate to the species.	P	P, A	EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Develop management actions/direction to manage habitat for the species on sites where they are located.	N		EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1

1 Appendix C, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Survey prior to ground-disturbing activities and manage sites: Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to, ground-disturbing activities are not a requirement.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Design these surveys for efficiency and develop standardized protocols.	N		
Conduct extensive surveys and manage sites: Begin these surveys by 1996.	N		
Conduct general regional surveys: Survey to acquire additional information and to determine necessary levels of protection for arthropods, fungi species not classed as rare and endemic, bryophytes, and lichens.	N		
Conduct general regional surveys: Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.	N		
Riparian Reserves			
Timber Management – Neither conduct nor allow timber harvest (including fuelwood cutting) in Riparian Reserves, except as follows: Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.	N		
Timber Management – Neither conduct nor allow timber harvest (including fuelwood cutting) in Riparian Reserves, except as follows: Remove salvage trees only when watershed analysis determines that present and future woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.	N		
Timber Management – Neither conduct nor allow timber harvest (including fuelwood cutting) in Riparian Reserves, except as follows: Apply silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Roads Management: Cooperate with federal, state, and county agencies and work with private parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.	P, C, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2 EIS App. J POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by completing watershed analyses including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in Riparian Reserves.	P	P	EIS Secs. 4.2.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by minimizing road and landing locations in Riparian Reserves.	P	P, R	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by preparing road design criteria, elements, and standards that govern construction and reconstruction.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by preparing operation and maintenance criteria that govern road operation, maintenance, and management.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.	C, R	B,M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by restricting sidecasting as necessary to prevent the introduction of sediment to streams.	C	B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by avoiding wetlands entirely when constructing new roads.	P, C	B, R	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by reconstructing roads and associated drainage features that pose a substantial risk.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by closing and stabilizing (or obliterating and stabilizing) roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.	N		
Roads Management: Design and construct new culverts, bridges, and other stream crossings and improve existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Roads Management: Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage).	C, R	B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Aquatic Conservation Strategy objectives. As a minimum, this plan will include provisions for the following activities: • inspections and maintenance during storm events; • inspections and maintenance after storm events; • road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian-wetland resources; • traffic regulation during wet periods to prevent damage to riparian-wetland resources; and • establishing the purpose of each road by developing a road management objective.	P, C, R,O	P, B,M	EIS Sec. 2.1.6 EIS Sec. 2.3.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 25
Grazing Management: Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Grazing Management: Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.	N		
Grazing Management: Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.	N		
Recreation Management: Design new recreational facilities within Riparian Reserves, including trails and dispersed sites, so as not to prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives.	N		
Recreation Management: Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures—such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures—are not effective, eliminate the practice or occupancy.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Recreation Management: Address attainment of Aquatic Conservation Strategy objectives in Wild and Scenic River and Wilderness management plans.	N		
Mineral Management: For any proposed locatable mining operation in Riparian Reserves— other than notice level or casual use require the following actions by the operator consistent with 43 CFR 3809 regulations: • Prepare a Plan of Operations, including a reclamation plan and reclamation bond for all mining operations in Riparian Reserves. Such plans and bonds will address the costs of removing facilities, equipment, and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet Aquatic Conservation Strategy objectives.	N		
Mineral Management: For any proposed locatable mining operation in Riparian Reserves— other than notice level or casual use require the following actions by the operator consistent with 43 CFR 3809 regulations: • Locate structures, support facilities, and roads outside Riparian Reserves. If no alternative to siting facilities in Riparian Reserves exists, locate in a way compatible with Aquatic Conservation Strategy objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in Riparian Reserves. When a road is no longer required for mineral or land management activities, it will be reclaimed. In any case, access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in Riparian Reserves.	N		
Minerals Management: For any proposed locatable mining operation in Riparian Reserves, other than notice level or casual use, require the following actions by the operator consistent with 43 Code of Federal Regulations 3809 regulations: • Avoid locating solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Reserves exists, if releases can be prevented, and if stability can be ensured, then: – Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics. – Locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Reserves. – Reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. – Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. – Require reclamation bonds adequate to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Mineral Management: Where an existing operator is in noncompliance at the notice level (i.e., causing unnecessary or undue degradation), require actions similar to those stated above to meet the intent of 43 CFR 3809.	N		
Mineral Management: For leasable mineral activity in Riparian Reserves, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities where leases do not exist. Where possible, adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives, consistent with existing lease terms and stipulations.	N		
Mineral Management: Allow development of salable minerals, such as sand and gravel, within Riparian Reserves only if Aquatic Conservation Strategy objectives can be met.	N		
Mineral Management: Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans, leases, and permits is needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Fire/Fuels Management: Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.	P, C,R	P, B,M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Fire/Fuels Management: Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations.	N		
Fire/Fuels Management: Minimize delivery of chemical retardant, foam, or other additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or following a review and recommendation by a resource advisor, when an escape would cause more long-term damage.	N		
Fire/Fuels Management: Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.	N		
Fire/Fuels Management: Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by a wildfire or when a prescribed fire is burning outside prescribed parameters.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Fire/Fuels Management: Until watershed analysis is completed for a watershed, suppress wildfire to avoid loss of habitat and to maintain future management options.	N		
Fire/Fuels Management: Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.	N		
Fire/Fuels Management: Consider rapid extinguishing of smoldering coarse woody debris and duff.	N		
Fire/Fuels Management: Locate and manage water-drafting sites (e.g., sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian habitat and water quality as consistent with Aquatic Conservation Strategy objectives.	N		
Lands: Issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing leases, permits, rights-of-way, and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.3, 2.1.5 & 2.1.6 EIS Sec. 4.1.3.5 EIS App. J POD Att. 25
Lands: Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS App. F EIS App. J POD Att. 29 LMP Amendment BLM-4
Lands: For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission), provide timely, written comments regarding maintenance of instream flows and habitat conditions and maintenance/ restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management, provide recommendations to the Commission that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves should be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Lands: For other hydroelectric and surface water development proposals in Tier 1 Key Watersheds, require instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds, give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies.	N		
General Riparian Area Management: Identify and attempt to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.	N		
General Riparian Area Management: Apply herbicides, insecticides, other toxicants, and other chemicals only in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	P, C, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
General Riparian Area Management: Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees onsite when needed to meet objectives for coarse woody debris retention.	P, C, O	P, B	EIS Sec. 2.6.2 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 20
Watershed and Habitat Restoration: Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 29
Watershed and Habitat Restoration: Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.	N		
Watershed and Habitat Restoration: Prevent watershed and habitat degradation rather than relying on mitigation measures or planned restoration.	N		
Fish and Wildlife Management: Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4.3 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 29

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Fish and Wildlife Management: Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.	N		
Fish and Wildlife Management: Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.	N		
Fish and Wildlife Management: Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest, and poaching that threaten the continued existence and distribution of native fish stocks inhabiting streams with adjacent or nearby federal lands.	N		
Late-Successional Reserves			
Develop Late-Successional Reserve assessments prior to habitat manipulation. These assessments may be developed as part of province-level planning or as stand-alone assessments. If developed to stand alone, the assessments will be closely coordinated with subsequent watershed analysis and province-level planning. SEIS ROD standards and guidelines should be refined at the province level prior to development of Late-Successional Reserve assessments.	P	P	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. H EIS App. J
Only in unusual circumstances will silvicultural treatments, including prescribed fire, precede preparation of this management assessment. Late-Successional Reserve assessments are subject to review by the Regional Ecosystem Office. Until Late-Successional Reserve assessments are completed, fire suppression activities should be guided by land allocation objectives in coordination with local resource management specialists.	N		
Projects and activities within Late-Successional Reserves (including restoration, recreation, projects for public safety, thinning, and salvage) may proceed in fiscal years 1995-96 using initial Late-Successional Reserve assessments done at a level of detail sufficient to assess whether the activities are consistent with the objectives of the Late-Successional Reserves.	N		
Plan and implement non-silvicultural activities inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat.	P, C, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-4
Using interdisciplinary teams, evaluate other activities not described below and document appropriate guidelines.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Request review by the Regional Ecosystem Office of all activities deemed to have potential adverse effects on Late-Successional Reserve objectives. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Silviculture: Plan and implement silvicultural treatments inside Late-Successional Reserves to be beneficial to the creation of late-successional habitat.	N		
Silviculture: If needed to create and maintain fate-successional forest conditions, conduct thinning operations in forest stands up to 80 years of age. This will be accomplished by precommercial and/or commercial thinning of stands regardless of origin (e.g., planted after logging or naturally regenerated after fire or blowdown).	N		
Salvage: Limit salvage of dead trees in Late-Successional Reserves to areas where stand-replacing events exceed 10 acres in size and canopy closure has been reduced to less than 40 percent.	N		
Salvage: Retain all standing live trees including those injured (e.g., scorched) but likely to survive.	N		
Salvage: Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.	N		
Salvage: Retain adequate quantities of coarse woody debris in a new stand so the future stand will contain amounts similar to naturally regenerated stands. Watershed-level or province-level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to coarse woody debris over the long term.	N		
Salvage: If essential to reduce future risk of fire or insect damage, conduct salvage that does not meet the preceding management actions/direction. Focus on those areas where there is high risk of large scale disturbance.	N		
Salvage: Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.	N		
Salvage: After disturbance in younger stands, develop direction for diameter and biomass retention consistent with the intention of achieving late-successional forest conditions. Where green trees, snags, and logs are present following disturbance, the green tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.	N		
Salvage: Retain logs present on the forest floor before a disturbance event.	N		
Salvage: Retain coarse woody debris to approximate the species composition of the original stand to help replicate pre-existing suitable habitat conditions.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Salvage: Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit deviations to as small an area as possible.	N		
Road Construction and Maintenance: Construct roads in Late-Successional Reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through unsuitable habitat where possible, and be designed to minimize adverse impacts. Alternative access methods—such as aerial logging—will be considered to provide access for activities in reserves.	P, C, R	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.6 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. H POD Att. 9 POD Att. 25
Road Construction and Maintenance: Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material onsite if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.	C, O	P, B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 20 POD Att. 25
Fuelwood Gathering: Permit fuelwood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, where trees are removed from the roadside to improve sight distance, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases, these activities will comply with management actions/direction for salvage and silvicultural activities.	N		
Mining: Assess the impacts of ongoing and proposed mining activities in Late-Successional Reserves.	N		
Mining: Include stipulations in mineral leases and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.	N		
Developments: Neither construct nor authorize new facilities that may adversely affect Late-Successional Reserves.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Developments: Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on Late-Successional Reserves.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-4
Developments: Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.	P	P, R	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H
Developments: Retain and maintain existing developments—such as campgrounds, utility corridors, and electronic sites— consistent with other management actions/direction for Late-Successional Reserves.	P, C, O	P, B	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Developments: Remove hazard trees along utility rights-of-way and trails and in other developed areas.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.2.2 POD Att. 20 POD Att. 25
Land Exchanges: Consider land exchanges in Late-Successional Reserves if they provide benefits equal to or better than current conditions.	N		
Land Exchanges: Consider land exchanges especially to improve area, distribution, and quality (e.g., connectivity, shape, and contribution to biodiversity) of Late-Successional Reserves, especially where public and private lands are intermingled.	N		
Habitat Improvement Projects: Design projects to improve conditions for fish, wildlife, and watersheds if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-4
Habitat Improvement Projects: Design projects for threatened or endangered species even if they result in some reduction of habitat quality for other late- successional species.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. M POD Att. 10 POD Att. 29 LMP Amendment BLM-4
Habitat Improvement Projects: Design and implement watershed restoration projects consistent with Late-Successional Reserve objectives.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-4
Range Management: In coordination with wildlife and fish biologists, implement range-related management activities that do not adversely affect late-successional habitat.	N		
Range Management: Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Late-Successional Reserve objectives.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Range Management: Evaluate effects of existing and proposed livestock management and handling facilities in Late-Successional Reserves to determine if reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.	N		
Fire Suppression and Prevention: As part of watershed analysis, plan fire management for each Late-Successional Reserve.	N		
Fire Suppression and Prevention: Emphasize maintaining late-successional habitat in wildfire suppression plans.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Fire Suppression and Prevention: Use minimum impact suppression methods for fuels management in accordance with guidelines for reducing risks of large-scale disturbances.	N		
Fire Suppression and Prevention: During actual fire suppression activities, consult an interdisciplinary team to assure that habitat damage is minimized.	N		
Fire Suppression and Prevention: Until a fire management plan is completed for a Late-Successional Reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options.	N		
Fire Suppression and Prevention: Prepare a specific fire management plan prior to any habitat manipulation activities in Late-Successional Reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the Late-Successional Reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office.	P	P, B	EIS Sec. 4.1.3.6 EIS App. H POD Att. 11 POD Att. 18
Fire Suppression and Prevention: Apply prescribed fire in a manner that retains the amount of coarse woody debris determined through watershed analysis.	N		
Fire Suppression and Prevention: Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.	N		
Fire Suppression and Prevention: Consider rapidly extinguishing smoldering coarse woody debris and duff.	C, O	B	EIS Sec. 4.1.3.6 EIS App. H POD Att. 11 POD Att. 18
Special Forest Products: Evaluate whether special forest product harvest activities have adverse effects on Late-Successional Reserve objectives.	N		
Special Forest Products: Prior to selling special forest products, ensure resource sustainability and protection of other resource values such as special status plant or animal species.	N		
Special Forest Products: Where special forest product activities are extensive, evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Recreational Uses: Use adjustment measures—such as education, use limitations, traffic control devices, or increased maintenance—when dispersed and developed recreation practices retard or prevent attainment of Late-Successional Reserve objectives.	N		
Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits: Consider access to nonfederal lands through Late-Successional Reserves and existing right-of-way agreements. Contracted rights, easements, and special/temporary use permits are valid uses in Late-Successional Reserves.	P	P	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 2.1.5 & 2.1.6 EIS Sec. 4.1.3.6 EIS App. H POD Att. 20 POD Att. 25
Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits: For all new rights-of-way proposals, design mitigation measures to reduce adverse effects on Late-Successional Reserves. Consider alternative routes that avoid Late-Successional Reserves. If rights-of-way must be routed through a reserve, design and locate them to have the least impact on late-successional habitat.	P, C, R	P, R, M	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.4 - 2.1.6 EIS Sec.3.4.3 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 20 POD Att. 25 POD Att. 29
Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits: Review all special/temporary use permits. When objectives of Late-Successional Reserves are not being met, attempt to reduce impacts through education or modification of existing permits.	C, O	B	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 4.1.3.6 EIS App. H
Non-native Species: If introduction of a non-native species is proposed, complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional objectives.	N		
Non-native Species: Evaluate impacts of non-native species (plant and animal) existing within reserves.	N		
Non-native Species: Develop plans and recommendations for eliminating or controlling non-native species that are inconsistent with Late-Successional Reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within Late-Successional Reserves.	P, C, R	P	EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. H POD Att. 9 POD Att. 14
Matrix (Connectivity/ Diversity Blocks and General Forest Management Area)			
Timber Resources: Conduct timber harvest and other silvicultural activities in that portion of the Matrix with suitable forest lands, according to management actions/direction summarized below and in the Timber section.	N		
Timber Resources: Provide a renewable supply of large down logs well distributed across the Matrix landscape in a manner that meets the needs of species and provides for ecological functions. Models will be developed for groups of plant associations and stand types that can be used as a baseline for developing prescriptions.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Timber Resources: A minimum of 120 linear feet of logs per acre, averaged over the cutting area and reflecting species mix of the unit, will be retained in the cutting area. All logs shall have bark intact, be at least 16 inches in diameter at the large end, and be at least 16 feet in length. Logs shall be distributed throughout the cutting area, and not piled or concentrated in a few areas. Decay class 1 and 2 logs will be credited toward the total. Where this management action/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.	N		
Timber Resources: In areas of partial harvest, apply the same basic management actions/direction, but they can be modified to reflect the timing of stand development cycles where partial harvest is practiced.	N		
Timber Resources: Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding) that might otherwise destroy the integrity of the substrate.	N		
Timber Resources: Retain 6-8 green conifer trees per acre in regeneration harvest units.	N		
Timber Resources: Retain snags within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.	N		
Timber Resources: In addition to the green tree retention management action/direction, retain green trees for snag recruitment in timber harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements.	N		
Timber Resources: Provide Connectivity/Diversity Blocks spaced throughout the Matrix. Manage the blocks as follows: • Maintain 25 to 30 percent of each block in late-successional forest at any point in time. Riparian Reserves and other allocations with late- successional forest count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.	N		
Timber Resources: Provide Connectivity/Diversity Blocks spaced throughout the Matrix. Manage the blocks as follows: • Manage available forest land on a 150-year area control rotation.	N		
Timber Resources: Provide Connectivity/Diversity Blocks spaced throughout the Matrix. Manage the blocks as follows: • When an area is regeneration harvested, retain 12-18 green trees per acre.	N		
Timber Resources: Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to minimize intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Timber Resources: Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.	N		
Timber Resources: Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to reduce the intensity and frequency of site treatments.	N		
Timber Resources: Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.	N		
Retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) spotted owl activity centers.	N		
Conform all management activities within the range of Port-Orford cedar to the guidelines described in the BLM Port-Orford Cedar Management Guidelines to mitigate damage caused by *Phytophthora lateralis*. Site-specific analysis for projects within the range of Port-Orford cedar will consider possible effects on the species.	P, C, O	P, B	EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. 9
Air Quality			
By the year 2000, reduce particulate matter emissions and impacts from prescribed burning by 50 percent from the baseline period (1976-1979). This will be accomplished by planning, conducting, monitoring, and, if necessary, adjusting prescribed fire activities in accordance with the State Implementation Plan and the Oregon Smoke Management Plan.	P, C, O	P, B	EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 9 POD Att. 18
Reduce broadcast burning in favor of lower intensity under burning. Use emission reduction mitigation measures and smoke dispersal techniques to the greatest extent practical. Wildfire hazard reduction, site preparation, and the use of prescribed fire for species habitat mitigation will be implemented in a manner consistent with ecosystem management.	N		
Where needed, use dust abatement measures on roads during BLM timber harvest operations or other BLM commodity hauling activity. Encourage dust abatement measures when haulers use BLM roads under permits and right-of-way agreements.	C	B	EIS Sec. 4.10.2.6 POD Att. 2 POD Att. 25
Promote burning of dry fuelwood by making available copies of Oregon Department of Environmental Quality publications to fuelwood purchasers.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Consider alternative emission reduction techniques whenever they are compatible with land allocation objectives and other management actions/direction. See Air Quality Analysis section of the FSEIS for alternative treatments that may be considered during fuels management project design.	N		
Water and Soils			
Continue to implement a nonpoint source management program in cooperation with the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality.	C, O	P, B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS App. J POD Att. 9 POD Att. 28
Continue coordination with the Oregon Department of Environmental Quality for implementation of best management practices that protect beneficial uses of water.	P, C, O	B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2 & 4.4.3 EIS App. J
Ensure consistency of management activities with Oregon's Statewide Water Quality Management Plan for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41).	P, C, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS App. J POD Att. 9
Protect floodplains and wetlands in accordance with Executive Orders 11988 and 11990 and BLM's Riparian-Wetlands Initiative for the 1990s.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4.2 EIS App. J POD Att. 28
Design and implement watershed restoration projects that promote long-term ecological integrity of ecosystems, conserve the genetic integrity of native species, and attain Aquatic Conservation Strategy objectives. See Aquatic Conservation Strategy for additional guidance.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 12 POD Att. 29

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Cooperate with federal, state, local, and tribal agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.	P	P, M	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4 EIS App. F EIS App. J POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 POD Att. 29
Prevent watershed degradation—rather than using mitigation or planned restoration—to correct foreseeable problems caused by management activities.	N		
Identify and attempt to obtain instream flows needed to maintain riparian resources, channel conditions, aquatic habitat, and water quality.	N		
Locate water-drafting sites to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat.	N		
Apply herbicides, insecticides, and other chemicals in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	P, C, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
Apply for water rights to support the needs for fire suppression, construction/maintenance (e.g., pump chances, water holes and reservoirs), recreation, and other programs.	N		
Apply Best Management Practices during all ground-and vegetation-disturbing activities.	C, O	P, B	EIS Sec. 2.4.2.1 & 2.4.2.2 POD Att. 9 POD Att. 20
Minimize disturbance of identified fragile sites (TPCC system Nonsuitable Woodlands and Suitable Woodlands).	N		
Apply fertilizer in the Matrix to enhance soil productivity.	C	B	EIS Sec. 2.4.2.1 POD Att. 9
Wildlife Habitat			

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations: Use the watershed analysis process to address wildlife habitat issues for individual watersheds. The analysis will help to resolve any concerns identified in applying management actions/direction in this section and those in the Special Status and SEIS Special Attention Species and Habitat section. Where appropriate, wildlife habitat enhancement opportunities will be identified through this process.	N		
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of wildlife habitat enhancement projects.	N		
All Land Use Allocations: Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate impacts associated with habitat manipulation, poaching, and other activities that threaten the continued existence and distribution of native wildlife inhabiting federal lands.	N		
Riparian Reserves: Design and implement wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.6.1.3 EIS App. F EIS App. J POD Att. 29
Riparian Reserves: Design, construct, and operate wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing wildlife interpretive and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.	N		
Matrix - General Forest Management Area: Retain 6-8 green conifer trees per acre after regeneration harvest. Retained trees will be distributed in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity	N		
Matrix - General Forest Management Area: In addition to the green tree retention management action/direction, retain green trees for snag recruitment in harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements.	N		
Matrix - Connectivity/Diversity Blocks: Maintain 25 to 30 percent of each block in late-successional forest at any point in time. The percentage of habitat will include habitat in other allocations, such as Riparian Reserves. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block should provide effective habitat to the extent possible.	N		
Matrix - Connectivity/Diversity Blocks: Retain 12-18 green conifer trees per acre when an area is regeneration harvested. Distribute the retained trees in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity. The management goal for the retained trees and subsequent density management is recovery of old-growth conditions in approximately 100 to 120 years.	N		

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
Matrix – Special Habitats: Using interdisciplinary teams, identify special habitat areas and determine relevant values for protection or management on a case-by-case basis. Of particular importance in these determinations will be the habitat of species that have protection buffers specified in the SEIS ROD.	N		
Matrix – Special Habitats: Use management practices—including fire—to obtain desired vegetation conditions in special habitats.	N		
Matrix - Raptors and Great Blue Herons: Maintain the integrity of nest sites, centers of activity, or rookeries.	N		
Matrix - Raptors and Great Blue Herons: Install nesting platforms, nest boxes, and other structures to enhance habitat as appropriate.	N		
Matrix – Special Buffers: Osprey - 1 to 5 acres, depending on site characteristics.	N		
Matrix – Special Buffers: Golden Eagle - Protect sufficient acreage around nest site to avoid human disturbance.	N		
Matrix – Special Buffers: Red-tailed Hawk - Up to 1 acre around nest site.	N		
Matrix – Special Buffers: Sharp-shinned Hawk - 10-acre management area surrounding nest site.	N		
Matrix – Special Buffers: Cooper's Hawk - 15-acre management area surrounding nest site.	N		
Matrix – Special Buffers: Great Blue Heron/Great Egret - 250-yard no-disturbance buffer around heron and egret colonies.	N		
Matrix – Roosevelt Elk: In elk habitat areas, close and rehabilitate roads unneeded for continued resource management or use. Within the ODFW Tioga Big Game Management Area (approximately 190,200 acres), the goal will be to maintain 1.1 miles of road per section per watershed with a maximum density of 2.9 miles per section per watershed when all classes of road are considered. In the remainder of the district, the goal will be to maintain a density of 2.9 miles of road per section per watershed. Roads to be closed or with restricted access would be primarily local roads and secondary or collector roads.	N		
Matrix – Roosevelt Elk: Close the following habitat areas to public motorized vehicle use: Dean Creek Elk Viewing Area, except for the developed parking area and uncontrolled access roads.	N		
Matrix – Roosevelt Elk: Use seasonal restrictions on public use and management activities where needed to minimize disturbance and harassment of herds.	N		
Matrix – Roosevelt Elk: Keep major game trails clear of slash accumulations caused by thinning projects.	N		
Matrix – Roosevelt Elk: Conduct forage seeding in habitat areas with appropriate seed beds and where compatible with other management objectives.	N		
Matrix – Roosevelt Elk: Maintain visual barriers along roads in high use big game areas.	N		

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
Matrix – Roosevelt Elk: Consider utilization of landings and roads for the creation of temporary (not to exceed 20 years) or permanent foraging areas where forage is lacking.	N		
Fish Habitat			
All Land Use Allocations: Use the watershed analysis process to address at-risk fish species and stocks and their habitat for individual watersheds. Where appropriate, fish habitat enhancement opportunities will be identified through this process.	N		
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife Wild Fish Policy during planning and implementation of fish habitat enhancement projects. Priority will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration.	N		
All Land Use Allocations: As identified through watershed analysis, rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.7.4.4 EIS App. F EIS App. J POD Att. 29
Riparian Reserves: Design and implement fish habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Riparian Reserves: Design, construct and operate fish interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish interpretative and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.	N		
Riparian Reserves: Identify instream flows needed to maintain riparian resources, channel conditions, and fish passage.	N		
Special Status and SEIS Special Attention Species Habitat			
All Land Use Allocations – Special Status Species: Review all proposed actions to determine whether or not special status species occupy or use the affected area or if habitat for such species is affected. Tables 2 and 3 in Appendix C[2] list the special status plant and animal species known or suspected to occur on the district.	P	P	EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M POD Att. 10

2 Appendix C: Special Status Species, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations – Special Status Species: Conduct field surveys according to protocols and other established procedures. This includes surveying during the proper season unless surveys are deemed unnecessary through watershed analysis, project planning, and environmental assessment. For example, field surveys may not be conducted in all cases depending on the number and timing of previous surveys conducted, whether previous surveys looked for all species that a new survey would, and the likelihood of potential habitat. The intensity of field surveys will also vary depending on the same factors.	P	P	EIS Sec. 1.5.4.1 EIS Sec. 4.4.4 EIS. Secs. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Consul/conference with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action that may affect federal listed or proposed species or their critical or essential habitat. Based on the results of consultation/conferencing, modify, relocate, or abandon the proposed action. Request technical assistance from one of these agencies for any proposed action that may affect federal candidate species or their habitat.	P,C, R	P,B,R,M	EIS Sec. 1.5.1 EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10.
All Land Use Allocations – Special Status Species: Coordinate with the USFWS, NMFS, and other appropriate agencies and organizations and jointly endeavor to recover federal listed and proposed plant and animal species and their habitats.	P, C, O	P, B	EIS Sec. 1.5.1 EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Modify, relocate, or abandon a proposed action to avoid contributing to the need to list federal candidate species, state listed species, Bureau sensitive species, or their habitats.	P, C	P, R	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 3.4.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Coordinate and cooperate with the State of Oregon to conserve state-listed species.	N		
All Land Use Allocations – Special Status Species: Identify impacts of proposed actions, if any, to Bureau sensitive and assessment species as a whole and clearly describe impacts in environmental analyses. As funding permits and as species conservation dictates, actively manage the Bureau sensitive and assessment species.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Retain under federal management, or other appropriate management organization, habitat essential for the survival or recovery of listed and proposed species. Retain habitat of proposed, candidate, or Bureau sensitive species where disposal would contribute to the need to list the species.	N		
All Land Use Allocations – Special Status Species: Where appropriate opportunities exist, acquire land to contribute to recovery, reduce the need to list, or enhance special status species habitat.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations – Special Status Species: Coordinate with other agencies and groups in management of species across landscapes. Coordination will be accomplished through conservation plans or similar agreements that identify actions to conserve single or multiple species and/or habitats. Such strategies could preclude the need for intensive inventories or modifications to some projects where the conservation plan provides adequate protection for the species and meets the intent of policy.	P	P	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs.1.5.4.1 & 1.5.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Where plans exist for species no longer on the special status list, continue with the prescribed conservation actions if determined to be required to avoid relisting or further consideration for listing. In the case of interagency plans or agreements, this determination will be mutually decided. Such plans may be modified as needed based on adequacy of existing range-wide conditions and conservation management.	N		
All Land Use Allocations – Special Status Species: Pursue opportunities for public education about conservation of species.	N		
All Land Use Allocations – Special Status Species: Where appropriate, pursue opportunities to increase the number of populations of species under BLM management through land acquisition and/or species reintroduction in coordination with other responsible agencies.	N		
Listed and Proposed Threatened and Endangered Species: Implement the land use allocations and management actions/direction of this proposed resource management plan that are designed to enhance and maintain habitat for threatened and endangered species.	C, R	B, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Secs. 2.1.3.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. F EIS App. K EIS App. M POD Att. 10 POD Att. 29 LSR Amendment BLM-4
Listed and Proposed Threatened and Endangered Species: Northern Spotted Owl (federal threatened species). Fall no trees within 0.25 mile of all active northern spotted owl nest sites from approximately March 1 to September 30 to avoid disturbance and harm to young owls.	P, C, O	P, R	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.2 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Northern Spotted Owl (federal threatened species). With minor exceptions, restrict human activities that could disturb owl nesting—especially use of large power equipment— within 0.25 mile of all active spotted owl nest sites from approximately March 1 to September 30. Restrictions on activities would usually not be required for owl nests and activity centers located near roads or in other areas of permanent human activity.	P, C, O	P, R	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 3.4.2.1 EIS Sec. 4.6.1.2 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (federal threatened species). Conduct two years of survey prior to any human disturbance of marbled murrelet habitat.	P	P, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. M LMP Amendment BLM-1
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (federal threatened species). Protect contiguous existing and recruitment habitat for marbled murrelets (i.e., stands that are capable of becoming marbled murrelet habitat within 25 years) within a 0.5 mile radius of any site where the birds' behavior indicates occupation (e.g., active nest, fecal ring or eggshell fragments, and birds flying below, through, into, or out of the forest canopy within or adjacent to a stand).	P, C, O	P, R, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. M LMP Amendment BLM-1
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (federal threatened species). Do not conduct nor allow harvest of timber within occupied marbled murrelet habitat—at least until completion of the Marbled Murrelet Recovery Plan.	C, A		EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. M LMP Amendment BLM-1
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (federal threatened species). During silvicultural treatments of non-habitat within the 0.5-mile circle, protect or enhance suitable or replacement habitat.	N		
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (federal threatened species). Amend or revise management direction as appropriate when the recovery plan is completed.	N		
Listed and Proposed Threatened and Endangered Species: ‘ Eagle (federal threatened species). Comply with the Pacific Bald Eagle Recovery and Implementation Plans and existing, site-specific habitat management plans.	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Listed and Proposed Threatened and Endangered Species: Bald Eagle (federal threatened species). Provide a 440-yard radius buffer around known and future nest sites. Protect all snags within 550 yards of nest and roost sites. Consider the acquisition of up to 120 acres every two miles along 5 th order and larger streams where no publically owned lands exist. Acquire privately-owned lands surrounding bald eagle nests when possible. Manage immediately adjacent lands to reduce the fire hazard in nesting areas.	P, C, O	P, B, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Peregrine Falcon (federal endangered species). Comply with the Peregrine Falcon Recovery Plan and existing, site-specific habitat management plans.	P, C, O	P, B, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Aleutian Canada Goose (federal threatened species). Comply with the Aleutian Canada Goose Recovery Plan and the New River ACEC Management Plan. Continue to explore opportunities for acquiring potential habitat in the New River area. Coordinate with the USFWS to acquire habitat and population information on Aleutian Canada geese in the New River area.	N		
Listed and Proposed Threatened and Endangered Species: Western Snowy Plover (federal threatened species). Coordinate with the Snowy Plover Working Group and the Recovery Team, when established, for management of plover habitat on district lands on the North Spit of Coos Bay and in the New River area. Consider acquisition of parcels within the district that could facilitate recovery of the species. Protect nesting areas from disturbance from human activities and predation. Continue to gather habitat and nesting information on the species in coordination with ODFW, the Oregon Heritage Program, the Dunes National Recreation Area, and USFWS. Continue to improve and maintain habitat for the snowy plover on the North Spit of Coos Bay and at New River through direction provided by the Snowy Plover Working Group and in line with the Recovery Plan when approved.	N		
Plants (Listed and Proposed Endangered and Threatened Species): Implement the land use allocations and management actions/direction of this proposed resource management plan that are designed to enhance and maintain habitat for all endangered and threatened species.	C, R	M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 2.1.4 EIS Secs. 4.1.3.3 & 4.1.3.4 Sec.4.7.1.6 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29 LSR Amendment BLM-3
Plants (Listed and Proposed Endangered and Threatened Species): Western lily *(Lilium occidentale)* (federal proposed). Participate in recovery efforts for the western lily. If populations are found on BLM-administered lands, management action/direction will be developed.	N		

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
Plants (Listed and Proposed Endangered and Threatened Species): Western lily *(Lilium occidentale)* (federal proposed). Participate in research efforts that may help recover the species, including experimental introduction, seed collection and propagation, inventories, and population monitoring.	N		
Special Areas			
Manage special areas for the previously designated areas (Cherry Creek ACEC/RNA, New River ACEC, Powers Environmental Education Area) in accordance with their guidelines in Table 3[3] until management plans have been completed.	N		
Develop site-specific management plans for new special areas as needed. Protect resource values in new areas pending completion of management plans (see Table 35 for management guidelines). Management plans will address other possible actions such as land acquisition, recreational development, use of prescribed fire, visitor use, and interpretation.	N		
Cultural Resources Including American Indian Values			
Evaluate cultural resource sites to determine their potential for contributing to public, cultural heritage, and/or scientific purposes.	P, C	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.11.1.1 EIS Sec. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 EIS App. J POD Att. 26
Investigate landscape features such as bogs, ponds, packrat middens, and cultural sites that contain information regarding long-term environmental change.	N		
Develop mechanisms for describing past landscapes and the role of humans in shaping those landscapes.	N		
Address the management of cultural resources through watershed analyses and project plans.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.11.3.3 & 4.11.4 EIS App. J POD Att. 26
Develop educational and interpretive programs—as part of the Adventures in the Past initiative—to increase public awareness and appreciation of cultural resources.	N		
Develop partnerships with local American Indian tribes and other interested parties to accomplish cultural resource objectives.	N		
Take appropriate law enforcement or other actions when necessary to protect cultural resources. Such actions may include physical protection measures such as riprapping and barrier installations to reduce deterioration.	C	B	EIS Secs. 4.11.4 & 4.11.5 POD Att. 26

3 Table 3: Management of Existing and New Special Areas, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Develop memoranda of understanding with federally recognized Indian tribes and other Indian groups to provide for appropriate consideration of their heritage and religious concerns. These groups may include the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indian.	N		
Acquire significant cultural resource properties for public, cultural heritage, and scientific purposes.	N		
Visual Resources			
Address visual resource management issues when conducting watershed analysis.	N		
Use the visual resource contrast rating system during project level planning to determine whether or not proposed activities will meet VRM objectives. Use mitigation measures to reduce visual contrasts.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.8.2.3 & 4.8.2.4 POD Att. 1 EIS App. F POD Att.29
Provide for natural ecological changes in VRM Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and must not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.	N		
Manage VRM Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.	N		
Manage VRM Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Manage VRM Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Wild and Scenic Rivers – Not Applicable, Excluded From Table			
Wilderness and Wilderness Study Areas– Not Applicable, Excluded From Table			
Rural Interface Areas			
Work with local governments to improve the BLM data base regarding private land planning/zoning designations and residential development near BLM-administered land.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Work with local governments to provide information to local planners regarding BLM land allocations in RIAs and the management objectives and guidelines for these lands.	N		
Work with local governments to develop design features and mitigation measures that will minimize the possibility of conflicts between private and federal land management.	N		
Work with local governments to monitor the effectiveness of design features and mitigation measures in RIAs.	N		
As a part of watershed analysis and project planning, work with local individuals and groups—including fire protection districts—to identify and address concerns related to possible impacts of proposed management activities on rural interface areas.	N		
Use design features and mitigation measures to avoid/minimize impacts to health, life, property, and quality of life. Examples include different harvest regimes, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning as opposed to broadcast burning. Monitor the effectiveness of design features and mitigation measures.	N		
Eliminate or mitigate public hazards such as abandoned mine tunnels and quarries.	N		
Manage rural interface areas using visual resource management class III standards (unless an area is classified as visual resource management class I or II).	N		
Reduce unauthorized public use of non-through or local roads within rural interface areas and within 0.25 mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate. These actions are needed to reduce public health and safety hazards, fire risk, and vandalism to private property.	N		
Encourage dust abatement measures when haulers use BLM roads under contracts, permits, and right-of-way agreements.	C	B	EIS Sec. 2.4.2.1 EIS Sec. 4.10.2.6 POD Att. 2 POD Att. 9 POD Att. 25 POD Att. 28
Where needed reduce natural fuel hazards on BLM-administered lands in rural interface areas.	N		
Socioeconomic Conditions			
Support and assist the State of Oregon Economic Development Department's efforts to help rural, resource-based communities develop and implement alternative economic strategies as a partial substitute for declining timber-based economies.	N		
Improve wildlife and fish habitat to enhance hunting and fishing opportunities and to increase the economic returns generated by these activities.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Improve viewing opportunities for watchable wildlife at the Dean Creek Elk Viewing Area, New River ACEC, and Coos Bay Shorelands.	N		
Plan and design forest management activities to produce a sustained yield of products to support local and regional economic activity. A diversity of forest products (timber and non-timber) will be offered to support large and small commercial operations and provide for personal use.	P, R	P, M, A	EIS Sec.1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 29
Pursue opportunities for development of resource-based attractions at other specific locations such as the Coos Bay Shorelands, New River ACEC, Cape Blanco, and Gregory Point (Bal'diyaka) pending the completion of activity plans and available funding. These areas offer unique sets of resources that have broad appeal to the tourism-orientated visitors to the area and offer potential for diversification of the local economy.	N		
Continue to participate as a member organization in Oregon Coastal Environments Awareness Network (OCEAN) to help foster educational and economic opportunities associated with the region's natural and cultural resource base.	N		
Continue partnership efforts to plan, develop, and operate the proposed Bal'diyaka Cultural Heritage Interpretive Center.	N		
Improve or develop numerous recreation sites, areas, trails, and Back Country Byways that can play a role in enhancing tourism activity within the district (see Recreation).	N		
Recreation - Not Applicable, Excluded from Table			
Timber Resources			
All Land Use Allocations: Conform all management activities within the range of Port-Orford-cedar to the guidelines described in the BLM Port-Orford-Cedar Management Guidelines to mitigate damage caused *by Phytophthora lateralis*. Site-specific analysis for projects within the range of Port-Orford-cedar will consider possible effects on the species.	P, C, O	P, B	EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. 9
Matrix: Declare an annual allowable sale quantity (ASQ) of 5.3 million cubic feet (32 million board feet).	N		
Matrix: Maintain a well-distributed pattern of early and mid-seral forest across the Matrix.	N		
Matrix: Apply silvicultural systems that are planned to produce, over time, forests with desired species composition, structural characteristics, and distribution of seral or age classes (see Appendix E[4]).	N		

4 Appendix E: Silvicultural Systems and Harvest Methods Used in the Proposed Resource Management Plan, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
Matrix: Develop plans for the locations and specific designs of timber harvests and other silvicultural treatments within the framework of watershed analyses.	N		
Matrix: Select logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality (See Appendix D[5]), and for meeting other land use objectives.	P	P	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.2.2 & 4.5.2.3 EIS App. J POD Att. 9 POD Att. 20 POD Att. 28
Matrix: Base silvicultural treatments and harvest designs on the functional characteristics of the ecosystem and on the characteristics of each forest stand and site. Treatments would be designed—as much as possible to prevent the development of undesirable stand characteristics. The principles of integrated pest management and integrated vegetation management would be employed to avoid the need for direct treatments. Herbicides would be used only as a last resort.	N		
Matrix: Plan harvest of marketable hardwood stands in the same manner as conifer stands, unless the land is otherwise constrained from timber management. Volume from projected hardwood harvest would be in addition to the allowable sale quantity estimate. Where hardwood stands became established following previous harvest of conifers, plan to re-establish a conifer stand on the site.	N		
Matrix: For unscheduled harvests, see the Riparian Reserves and Late-Successional Reserves sections.	N		
General Forest Management Area: Schedule regeneration harvests to assure that, over time, harvest occurs in stands at or above the age of volume growth culmination (i.e., culmination of mean annual increment). This refers to the age range which produces maximum average annual growth over the lifetime of a timber stand. In the planning area, culmination occurs between 60 and 80 years of age. To develop a desired age class distribution across the landscape and to provide for some commodity output, regeneration harvests will be scheduled in stands as young as 60 years.	N		
General Forest Management Area: Retain 6-8 green conifer trees per acre after regeneration harvest to provide a source of snag recruitment and a legacy for bridging past and future forests. Retained trees will be distributed in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity.	N		
General Forest Management Area: In addition to the green tree retention management action/direction, retain green trees for snag recruitment in harvest units where there is an identified, near-term (less than three decades) snag deficit. These trees do not count toward green-tree retention requirements.	N		

5 Appendix D: Best Management Practices for Maintaining Water Quality and Soil Productivity, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
Connectivity/Diversity Blocks: Maintain 25-30 percent of each block in late-successional forest at any point in time. The percentage of habitat will include habitat in other allocations such as Riparian Reserves. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block should provide effective habitat to the extent possible.	P, R	P, M, A	EIS Sec.1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 29
Connectivity/Diversity Blocks: Manage available forest land on a 150-year area control rotation. Regeneration harvests will occur at a rate of approximately 1/15 of the available acres per decade. Because of the limited size of operable areas within any given block, up to three decades of harvest could be removed at any one time from a single block to make a viable harvest unit. Eventually each connectivity/diversity block will have 4 to 5 different age class represented.	N		
Connectivity/Diversity Blocks: Retain 12-18 green conifer trees per acre when an area is regeneration harvested. Distribute the retained trees in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity. The management goal for the retained trees and subsequent density management would be the recovery of old-growth conditions in approximately 100 to 120 years.	N		
Special Forest Products– Not Applicable, Excluded From Table			
Energy and Minerals			
Riparian Reserves: For leasable minerals, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities where leases do not exist. Where possible, adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives consistent with existing lease terms and stipulations.	N		
Riparian Reserves: Allow development of salable minerals (such as sand and gravel) within Riparian Reserves only if Aquatic Conservation Strategy objectives can be met.	N		
All Land Use Allocations – Leasable Minerals: Use special stipulations for oil, gas, and geothermal leases to protect fragile areas or critical resource values (see Appendix G[6] for a list of mineral restrictions by resource value). Special stipulations may include: a. Seasonal restrictions to protect resources such as critical wildlife habitat and to prevent excessive erosion. b. Controlled surface use stipulations to protect valuable resources in small areas. c. No surface occupancy stipulations to protect valuable resources scattered over a large area while still providing an opportunity for exploration and development.	N		

6 Appendix G: Proposed Restrictions and Requirements on Mineral and Energy Exploration and Development Activity, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations – Leasable Minerals: Special stipulations may be waived by authorized BLM officials if the objective of a stipulation could be met in another way.	N		
All Land Use Allocations – Leasable Minerals: Provide opportunities for coal and geothermal exploration and development in areas with potential for occurrence. Coal activities are regulated under 43 CFR 3400, and geothermal activities are regulated under 43 CFR 3200.	N		
All Land Use Allocations – Locatable Minerals: Use general requirements in 43 CFR 3809 and site-specific guidelines to avoid unnecessary or undue degradation of resources on mining claims.	N		
All Land Use Allocations – Locatable Minerals: Require reclamation at the earliest feasible time for all surface-disturbing operations, whether conducted under a notice or approved plan of operations.	N		
All Land Use Allocations – Locatable Minerals: Allow activities exceeding casual use, but disturbing five acres or less, to proceed 15 days after a notice is filed with the Coos Bay BLM District.	N		
All Land Use Allocations – Locatable Minerals: Require an approved plan of operation before work can begin on projects disturbing more than five acres of special resource areas.	N		
All Land Use Allocations – Locatable Minerals: Require bonding of plans of operations to ensure mitigation measures are followed and reclamation of the disturbed lands is completed.	N		
All Land Use Allocations – Salable Minerals: Address quarry development, management, and reclamation needs through implementation planning.	P, C, R	P, B, R	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS App. J POD Att. 17
All Land Use Allocations – Salable Minerals: Emphasize long-term regional quarry use.	N		
All Land Use Allocations – Salable Minerals: Develop new quarry sites in locations consistent with overall management objectives and guidelines of the proposed resource management plan.	N		
All Land Use Allocations – Salable Minerals: Continue to use rock from existing quarries for construction and maintenance of timber sale access roads and other purposes.	P, C	P, B	EIS Sec. 2.4.2.2 EIS Sec. 4.2.2.4 POD Att. 9 POD Att. 17
All Land Use Allocations – Salable Minerals: Make salable minerals available for other government agencies if requested, and if the action is consistent with management direction for protection of other resources.	N		
All Land Use Allocations – Salable Minerals: Issue sales for mineral materials that provide for reclamation of mined lands pursuant to 43 CFR 3604 or 3610 regulations.	N		
All Land Use Allocations – Salable Minerals: Consider mineral materials permits on a case-by-case basis. Issue them at the discretion of the Area Manager.	P	P	EIS Sec. 2.4.2.2 POD Att. 9 POD Att. 17 POD Att. 28

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations – Reserved Federal Mineral Estate: Allow the reserved federal mineral estate to remain open for mineral development.	N		
All Land Use Allocations – Reserved Federal Mineral Estate: Allow development of locatable and salable minerals in accordance with restrictions determined by the surface owner/administrator.	N		
All Land Use Allocations – Reserved Federal Mineral Estate: Convey mineral interests owned by the United States where the surface is, or will be, in nonfederal ownership, to the existing or proposed owner of the surface estate only after a determination is made under Section 209(b) of FLPMA.	N		
Land Tenure Adjustments – Not Applicable, Excluded From Table			
Rights-of-Way			
Riparian Reserves: Issue rights-of-way to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing rights-of-way to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing rights-of-way will be based on the actual or potential impact and the ecological value of the riparian resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.5 & 2.1.6 EIS Secs. 3.4.3 & 3.4.4 EIS Sec. 4.1.3.5 EIS App. J
Late-Successional Reserves: Retain and maintain existing developments (such as utility corridors and electronic sites) consistent with other management actions/direction for Late-Successional Reserves.	P, C, O	P, B	EIS Sec. 1.4.2 EIS Secs. 3.4.3 & 3.4.4 EIS Sec. 4.1.3.6 EIS App. H
Other Land Use Allocations: Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors	P	P, R	EIS Secs. 2.1.2.1 & 2.1.2.2 EIS Secs. 2.3.2.3 EIS Sec. 4.10.2.6 EIS App. D
Other Land Use Allocations: Encourage applicants to consult the Western Regional Corridor Study in planning route locations.	P	P	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 3.4.3 & 3.4.4
Other Land Use Allocations: Consider new locations for rights-of-way projects on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing route or corridor would not be technically or economically feasible; and the proposed project would otherwise be consistent with this RMP and would minimize damage to the environment.	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 3.4.3 & 3.4.4
Other Land Use Allocations: Allow expansion of communications facilities on existing communication sites.	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.3.2.2 EIS Sec. 4.8.2.2 POD Att. 4

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Other Land Use Allocations: Consider new communication sites on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing, developed communication site would not be technically feasible; and the proposed facility would otherwise be consistent with this RMP and would minimize damage to the environment.	N		
Access			
Acquire access by obtaining easements, entering into new reciprocal right-of-way agreements, or amending existing reciprocal right-of-way agreements. Condemnation for access will be pursued when necessary.	N		
Acquire perpetual exclusive easements whenever possible to provide for public access and BLM control. Acquire temporary easements or nonexclusive easements, which do not provide for public access, consistent with management objectives and where no public access is needed.	N		
Continue to obtain access across lands of private companies or individuals who are a party (permittee) to existing reciprocal rights-of-way agreements through appropriate agreements. Whenever a willing permittee is identified and it is determined there is a need for public access, negotiations could be started to provide for the acquisition of public access rights.	N		
Emphasize acquisition for public access on major travel routes.	N		
Withdrawals – Not Applicable, Excluded From Table			
Roads			
Riparian Reserves: Develop and implement a Road Management Plan or a Transportation Management Plan that meets the Aquatic Conservation Strategy objectives.	P	P, B	EIS Sec. 2.1.6 EIS Sec. 2.3.2.1 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Key Watersheds: Reduce existing road mileage within Key Watersheds. If funding is insufficient to implement reductions, do not construct, or authorize through discretionary permits, a net increase in road mileage in Key Watersheds.	N		
Late Successional Reserves: Construct roads in Late Successional Reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, routed through Late Successional Reserves unsuitable habitat where possible, and designed to minimize adverse impacts. Alternative access—such as aerial logging—should be considered to provide access for activities in reserves.	P, C	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.6 EIS Secs.4.10.2.1 & 4.10.2.6 EIS App. H POD Att. 9 POD Att. 25

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations: Prepare a district wide road management plan after approval of the resource management plan. The management plan will specifically address recreation use, road densities, road closures, wildlife protection, water quality, Port-Orford-cedar management, timber management, construction and maintenance standards, fire suppression, and coordination with adjacent landowners. Address road management planning on a watershed basis consistent with Late-Successional Reserves, Riparian Reserves, and other major allocations. Specific road closures would be determined using standard analysis, public involvement, and notification procedures.	N		
All Land Use Allocations: Determine standards for new road construction during the project planning process. Standards will be the minimum necessary to meet resource and allocation objectives (e.g., recreation site, timber sale, and key watershed) while having minimal impacts on the environment.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Minimize new road construction in areas with fragile soils to reduce impacts to soils, water quality, and fisheries. Stabilize existing roads where they contribute to significant adverse effects on these resources.	P, C, R	P, B, M	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.2.2.1 & 4.2.2.2 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Conduct a geotechnical review on road design in areas of sensitive soils such as the serpentine and schists soils of Curry County. An inventory of existing unstable areas will be planned to stabilize those areas that pose sedimentation concerns or adversely affect other resources.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.2.2.1 & 4.2.2.2 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Specifically address—in the road management plan, watershed analysis, or in environmental assessment geotechnical review—options for stabilizing roads in sensitive soils and unstable areas.	P	P	EIS Sec. 4.1.3.5 EIS Secs. 4.2.2.1 & 4.2.2.2 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Sec. 4.3.3.1 EIS Sec. 4.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
All Land Use Allocations: Locate, design, construct, and maintain roads to standards that meet management objectives in accordance with the district road management plan.	P, C, R, O	P, B, R, M	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Follow Best Management Practices (see Appendix D[7]) for water quality and soil productivity to mitigate adverse effects on soils, water quality, fish, and riparian habitat during road construction and maintenance.	C, R, O	B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28
All Land Use Allocations: Reduce road density by closing minor collector and local roads in areas or watersheds where water quality degradation, big game harassment, or other road related resource problems have been identified.	N		
All Land Use Allocations: Acquire water rights for road management purposes.	N		
All Land Use Allocations: Avoid road construction in special areas and special habitats as an alternative to other geotechnical repairs.	N		
All Land Use Allocations: Manage non-through roads classified as local and located within rural interface areas and within 0.25 miles of existing dwellings to limit unauthorized public use activity that could contribute to public safety hazards, increased fire risk, and vandalism to private property. Gates and other types of traffic barriers (such as guardrails, berms, ditches, and log barricades) would be used as appropriate.	N		
All Land Use Allocations: Reduce the further spread of blackstain fungus through proper timing of roadside brushing.	P, C	P, B	EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
All Land Use Allocations: Consider the use of firewood sales as an option for the removal of roadside trees where they are obstructing sight distance.	N		
Noxious Weeds			
Late-Successional Reserves: Evaluate impacts of non-native plants (weeds) growing in Late-Successional Reserves.	P	P	EIS Sec. 2.6.2 EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. H POD Att. 14

7 Appendix D: Best Management Practices for Maintaining Water Quality and Soil Productivity, Coos Bay District Record of Decision and Resource Management Plan, May 1995

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Late-Successional Reserves: Develop plans and recommendations for eliminating or controlling non-native plants (weeds) that adversely affect Late-Successional Reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within reserves.	P	P, M	EIS Sec. 4.1.3.6 EIS Sec. 4.4.2.2 EIS Sec. 4.4.3.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. H POD Att. 14
All Land Use Allocations: Continue to survey BLM-administered land for noxious weed infestations, report infestations to the Oregon Department of Agriculture, and coordinate with them to reduce infestations.	P, C, O	P, B	EIS Sec. 1.5.4.1 EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 14
All Land Use Allocations: Use control methods that do not retard or prevent attainment of Aquatic Conservation Strategy Objectives.	C, R, O	B, M	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. J POD Att. 14
All Land Use Allocations: Apply integrated pest management methods (e.g., chemical, mechanical, manual, and/or biological) in accordance with BLM's multi-state environmental impact statement, Northwest Area Noxious Weed Control Program, as supplemented, and the related ROD.	C, R, O	B, M	EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 14
Hazardous Materials			
Minimize the use of hazardous materials and eliminate known hazardous waste on BLM-administered lands.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.2.3.2 EIS Sec. 4.3.2.1 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23
Identify, investigate, and arrange for removal of hazardous substances on BLM-administered land in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Emergency response will be as specified in the District Hazardous Materials Contingency Plan. The response will include cleanup, proper notifications, criminal investigations, risk assessment, and other actions consistent with the Act and the nature of the emergency.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Store, treat, and dispose of hazardous materials and wastes in accordance with the Resource Conservation and Recovery Act (RCRA) and other appropriate regulations.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
Use the Emergency Planning and Community Right-To-Know Act to coordinate emergency planning with other federal, state, and local jurisdictions concerning hazardous materials, emergency notifications, and required reporting of hazardous materials inventories and activities.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Ensure acquisitions are unencumbered by the existence of hazardous materials and features such as underground storage tanks following appropriate state and federal regulations.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 App. F POD Att. 29
Until hazardous materials on BLM-administered land are removed, protect employees, the public—and where possible the environment—from exposure to these materials.	C, O	P, B, M	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24
Provide information and education to the public regarding the dangers of exposure to hazardous materials and the need to dispose of hazardous materials properly.	C,O	P,B, M	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24
Investigate illegal hazardous materials activity on public lands, determine responsible parties, pursue recovery costs, and—where appropriate—prosecution under the laws pertaining to such activity.	N		
Fire/Fuels Management			
Address fire/fuels management for all land use allocations as part of watershed analysis and project planning. This will include determinations of the role of fire and the risk of large-scale, high intensity wildfires at the landscape level.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Coordinate fire management activities in rural interface areas with local governments, agencies, and landowners. During watershed analysis, identify additional factors that may affect hazard reduction goals. Minimize the impacts of wildfire suppression actions.	N		
Matrix: Plan and implement prescribed fire treatments to minimize intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions.	N		

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
Matrix: Plan and implement prescribed fire treatments to minimize consumption of litter and coarse woody debris.	N		
Matrix: Plan and implement prescribed fire treatments to minimize disturbance of soil and litter that may occur as a result of heavy equipment operation.	N		
Matrix: Plan and implement prescribed fire treatments to minimize frequency of treatments.	N		
All Land Use Allocations – Wildfire Suppression: Minimize the direct negative impacts of wildfire suppression on ecosystem management objectives.	N		
All Land Use Allocations – Wildfire Suppression: Respond to all wildfires by taking appropriate suppression responses. In most cases, responses will consist of aggressive initial attack to extinguish fires at the smallest size possible.	N		
All Land Use Allocations – Wildfire Suppression: For wildfires that escape initial attack, perform a Wildfire Situation Analysis to develop a suppression strategy to evaluate the damage induced by suppression activities compared to expected wildfire damage. Suppression tactics will consider: a. Public and firefighting personnel safety. b. Protection of specific attributes of each land use allocation. c. Coordination of wildfire suppression activities to avoid causing adverse impacts on federal and nonfederal lands. d. Appropriate use of suppression tools (such as aircraft, dozers, pumps, and other mechanized equipment) and clear definitions of any restrictions relating to their use. e. Potential adverse effects on meeting ecosystem management objectives. f. Protection of structural components such as snags, duff, and coarse woody debris to the extent possible.	N		
All Land Use Allocations – Fuels Management Using Prescribed Fire: Modify fuel profiles to lower the potential of fire ignition and rate of spread; protect and support land use allocation objectives by lowering the risk of high intensity, stand-replacing wildfires; and, adhere to smoke management and air quality standards.	N		

TABLE E-1

Coos Bay Approved Management Actions/Direction - 1995

Element	Applicability	Consistency	EIS Section
All Land Use Allocations – Fuels Management Using Prescribed Fire: Reduce hazards through methods such as prescribed burning; mechanical or manual manipulation of forest vegetation and debris; removal of forest vegetation and debris; and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following: a. Safety of firefighting personnel. b. Identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern. c. Developing a fuel profile that supports land allocation objectives. d. Reducing the risk of wildfire in a cost-efficient manner. e. Interagency cooperation to assure cost-effective fuel hazard reduction across the landscape. f. Adherence to smoke management and air quality standards. g. Consistency with objectives for land use allocations. h. Maintenance or restoration of ecosystem processes or structure. i. The natural role of fire in specific landscapes, current ecosystem needs, and wildfire hazard analysis included in the fire management plan.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: The use of prescribed fire will be based on the risk of high intensity wildfire and the associated cost and environmental impacts of using prescribed underburning to meet protection, restoration, and maintenance of critical stands that are currently susceptible to large-scale catastrophic wildfire.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: Underburning will be re-introduced across large areas over a period of time to create a mosaic of stand conditions. Treatments should be site-specific because some species with limited distributions are fire intolerant. The use of prescribed burning will be based on an interdisciplinary evaluation. Accordingly, funding authority must reflect the range of objectives identified for using fire under ecosystem management.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: Consider using prescribed fire to manage seral stage diversity through the development of fire-resistant stand mosaics by timing the application of fire.	N		
All Land Use Allocations – Fuels Management for Hazard Reduction: Modify fuel profiles to lower the potential of fire ignition and rate of spread; protect and support land allocation objectives by lowering the risk of high- intensity, stand-replacing wildfires; and, adhere to smoke management and air quality standards.	N		

TABLE E-1 **Coos Bay Approved Management Actions/Direction - 1995**			
Element	**Applicability**	**Consistency**	**EIS Section**
All Land Use Allocations – Fuels Management for Hazard Reduction: Reduce hazards through methods such as prescribed burning; mechanical or manual manipulation of forest vegetation and debris; removal of forest vegetation and debris; and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following: a. Providing for the safety of firefighting personnel. b. Identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern. c. Developing a fuel profile that supports land allocation objectives while seeking a balance between reducing the risk of wildfire and the cost efficiency, consistent with meeting land allocation objectives.	N		

This page intentionally left blank.

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Key Watersheds			
Prior to further resource management activity including timber harvest in Key Watersheds prepare watershed analyses. Until watershed analyses can be completed proceed with minor activities such as those categorically excluded under the National Environmental Policy Act regulations (except timber harvest) if they are consistent with Aquatic Conservation Strategy objectives. Apply Riparian Reserve management actions/direction.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Reduce existing road mileage within Key Watersheds. If funding is insufficient to implement reductions neither construct nor authorize through discretionary permits a net increase in road mileage in Key Watersheds.	N		
Give highest priority to watershed restoration in Key Watersheds.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 9 POD Att. 29
Watershed Analysis			
Prepare watershed analyses and plans prior to restoration activities. See Use of the Plan (watershed analysis discussion) section.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Focus watershed restoration on removing some roads and where needed upgrading those that remain in the system.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. F EIS App. J POD Att. 25 POD Att. 29
Apply silvicultural treatments to restore large conifers in Riparian Reserves.	N		
Restore stream channel complexity. In-stream structures will only be used in the short term and not as a mitigation measure.	P, R	P, B, M	EIS Sec. 1.4.2 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. F POD Att. 29
Survey and Manage for Amphibians Mammals Bryophytes Mollusks Vascular Plants Fungi Lichens and Arthropods			
Manage known sites (highest priority): Acquire and manage information on known sites make it available to all project planners and use it to design or modify activities.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Manage known sites (highest priority): Protect known sites. For some species apply specific management treatments such as prescribed fire.	P, C	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Manage known sites (highest priority): For rare and endemic fungus species temporarily withdraw 160 acres around known sites from ground disturbing activities until the sites can be thoroughly surveyed and site specific measures prescribed.	P		EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Manage known sites (highest priority): Establish management areas of all useable habitat up to 600 acres around two currently unprotected locations of *Oxiporous nobilissimus*. Protect these populations until the sites can be thoroughly surveyed and site specific measures prescribed. Protection will be undertaken immediately.	N		
Survey prior to activities and manage sites: Continue existing efforts to survey and manage rare and sensitive species habitat.	P	P, R, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to activities and manage sites: For species without survey protocols start immediately to design protocols and implement surveys.	N		
Survey prior to activities and manage sites: Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species survey for Del Norte Larch Mountain Shasta Siskiyou Mountains and Van Dyke's salamanders red tree voles and Lynx. These surveys will precede the design of all ground disturbing activities that will be implemented in 1997 or later.	P	P, R, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Secs. 4.7.4.1 - 4.7.4.4 EiS App. K EIS App. M LMP Amendment BLM/FS-1
Survey prior to activities and manage sites: For the other species listed in Table H-1 of Appendix H8 begin development of survey protocols in 1994 and proceed with surveys as soon as possible. These surveys will be completed prior to ground disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the SEIS.	N		

[8] Appendix H: Management for SEIS Special Attention Species, Roseburg District Record of Decision and Resource Management Plan, June 1995

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Survey prior to activities and manage sites: Conduct surveys at a scale most appropriate to the species.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to activities and manage sites: Develop management actions/direction to manage habitat for the species on sites where they are located.	N		
Survey prior to activities and manage sites: Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K
Conduct extensive surveys and manage sites: Conduct extensive surveys for the species to find high priority sites for species management. Specific surveys prior to ground disturbing activities are not a requirement.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Design these surveys for efficiency and develop standardized protocols.	N		
Conduct extensive surveys and manage sites: Begin these surveys by 1996.	N		
Conduct general regional surveys: Survey to acquire additional information and to determine necessary levels of protection for arthropods fungi species that were not classed as rare and endemic bryophytes and lichens.	N		
Conduct general regional surveys: Initiate these surveys no later than Fiscal Year 1996 and complete them within ten years.	N		
Riparian Reserves			
Timber Management: Neither conduct nor allow timber harvest including fuelwood cutting in Riparian Reserves with exception of the following: • Where catastrophic events such as fire flooding volcanic wind or insect damage result in degraded riparian conditions allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Timber Management: Neither conduct nor allow timber harvest including fuelwood cutting in Riparian Reserves with exception of the following: • Remove salvage trees only when watershed analysis determines that present and future woody debris needs are met and other Aquatic Conservation Strategy Objectives are not adversely affected.	N		
Timber Management: Neither conduct nor allow timber harvest including fuelwood cutting in Riparian Reserves with exception of the following: • Apply silvicultural practices for Riparian Reserves to control stocking reestablish and manage stands and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.	N		
Roads Management: Cooperate with federal state and county agencies and work with private parties with road use agreements to achieve consistency in road design, operation and maintenance necessary to attain Aquatic Conservation Strategy objectives.	P, C, O	P, B, R, M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2 EIS App. J POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by completing watershed analyses including appropriate geotechnical analyses (i.e. examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in Riparian Reserves.	P	P	EIS Secs. 4.2.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.2 & 4.4.4.3 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by minimizing road and landing locations in Riparian Reserves.	P	P, R	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by preparing road design criteria elements and standards that govern construction and reconstruction.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by preparing operation and maintenance criteria that govern road operation maintenance and management.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by minimizing disruption of natural hydrologic flow paths including diversion of streamflow and interception of surface and subsurface flow.	C, R	B, M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25 POD Att. 29

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by restricting sidecasting as necessary to prevent the introduction of sediment to streams.	C	B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by avoiding wetlands entirely when constructing new roads.	P, C	B, R	
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 25
Roads Management: Meet Aquatic Conservation Strategy objectives by reconstructing roads and associated drainage features that pose a substantial risk.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Meet Aquatic Conservation Strategy objectives by prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.	P,C,R,O	P,B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Meet Aquatic Conservation Strategy objectives by closing and stabilizing or obliterating and stabilizing roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.	P, C, R, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: Design and construct new culverts bridges and other stream crossings and improve existing culverts bridges and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100 year flood including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: Minimize sediment, delivery to streams from roads. Outsloping of the roadway surface is preferred except in cases where outsloping would increase sediment delivery to streams or where outsloping is not feasible or unsafe. Route road drainage away from potentially unstable channels, fills and hillslopes.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Provide and maintain fish passage at all road crossings of existing and potential fish bearing streams (e.g. streams which can be made available to anadromous fish by removing obstacles to passage).	C, R	B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Riparian Reserves: Develop and implement a Road Management Plan or a Transportation Management Plan that meets the Aquatic Conservation Strategy objectives. As a minimum this plan will include provisions for the following activities: • Inspections and maintenance during storm events. • Inspections and maintenance after storm events. • Road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources. • Traffic regulation during wet periods to prevent damage to riparian resources. • Establishing the purpose of each road by developing the road management objective.	P, C, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.3.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 25
Grazing Management: Through a planning and environmental analysis process appropriate to the action adjust or eliminate grazing practices that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Grazing Management: Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside Riparian Reserves ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met require relocation or removal of such facilities.	N		
Grazing Management: Limit livestock trailing bedding watering loading and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Recreation Management: Design new recreational facilities within Riparian Reserves including trails and dispersed sites so as not to prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves evaluate and mitigate impacts to ensure that these do not prevent and to the extent practicable contribute to attainment of Aquatic Conservation Strategy objectives.	N		
Recreation Management: Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education use limitations traffic control devices increased maintenance relocation of facilities and/or specific site closures are not effective eliminate the practice or occupancy.	N		
Recreation Management: Address attainment of Aquatic Conservation Strategy objectives in Wild and Scenic River and Wilderness management plans.	N		
Minerals Management: For any proposed locatable mining operation in Riparian Reserves other than notice level or casual use require the following actions by the operator consistent with 43 CFR 3809 regulations: • Prepare a Plan of Operations including a reclamation plan and reclamation bond for all mining operations in Riparian Reserves. Such plans and bonds will address the costs of removing facilities equipment and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet Aquatic Conservation Strategy objectives.	N		
Minerals Management: For any proposed locatable mining operation in Riparian Reserves other than notice level or casual use require the following actions by the operator consistent with 43 CFR 3809 regulations: • Locate structures support facilities and roads outside Riparian Reserves. If no alternative to locating facilities in Riparian Reserves exists locate in a way compatible with Aquatic Conservation Strategy objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in Riparian Reserves. When a road is no longer required for mineral or land management activities it will be reclaimed. In any case access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in Riparian Reserves.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Minerals Management: For any proposed locatable mining operation in Riparian Reserves other than notice level or casual use require the following actions by the operator consistent with 43 CFR 3809 regulations: • Avoid locating solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock spent ore tailings) facilities in Riparian Reserves exists if releases can be prevented and if stability can be ensured then: – Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics. – Locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term prohibit such facilities in Riparian Reserves. – Reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. – Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. – Require reclamation bonds adequate to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.	N		
Minerals Management: Where an existing operator is in noncompliance at the notice level (i.e. causing unnecessary or undue degradation) require actions similar to those stated above to meet the intent of 43 CFR 3809.	N		
Minerals Management: For leasable mineral activity in Riparian Reserves prohibit surface occupancy for oil gas and geothermal exploration and development activities where leases do not exist. Where possible adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives consistent with existing lease terms and stipulations.	N		
Minerals Management: Allow development of saleable minerals such as sand and gravel within Riparian Reserves only if Aquatic Conservation Strategy objectives can be met.	N		
Minerals Management: Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans leases and permits is needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Fire/Fuels Management: Design fuel treatment and fire suppression strategies, practices and activities to meet Aquatic Conservation Strategy objectives and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 EIS App. F EIS App. J POD Att. 11 POD Att. 18 POD Att. 29

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fire/Fuels Management: Locate incident bases camps helibases staging areas helispots and other centers for incident activities outside of Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location use conditions and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations.	N		
Fire/Fuels Management: Minimize delivery of chemical retardant foam or other additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist or following a review and recommendation by a resource advisor when an escape would cause more long-term damage.	N		
Fire/Fuels Management: Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 EIS App. J POD Att. 18 POD Att. 29
Fire/Fuels Management: Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by a wildfire or a prescribed fire burning outside prescribed parameters.	N		
Fire/Fuels Management: Limit the size of all wild fires. When watershed analysis and/or landscape analysis are completed and approved some natural fires may be allowed to burn under prescribed conditions.	N		
Fire/Fuels Management: Consider rapidly extinguishing smoldering coarse woody debris and duff.	N		
Fire/Fuels Management: Locate and manage water drafting sites (e.g. sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian habitat and water quality as consistent with Aquatic Conservation Strategy objectives.	N		
Lands: Issue leases, permits, rights-of-way and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing leases permits rights-of-way and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible eliminate the activity. Priority for modifying existing leases permits rights-of-way and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.3, 2.1.5 & 2.1.6 EIS Sec. 4.1.3.5 EIS App. J POD Att. 25
Lands: Use land acquisition exchange and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Lands: For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission) provide timely written comments regarding maintenance of instream flows and habitat conditions and maintenance/ restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management provide recommendations to the Commission that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves should be located operated and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Lands: For other hydroelectric and surface water development proposals in Tier One Key Watersheds require instream flows and habitat conditions that maintain or restore riparian resources favorable channel conditions and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources favorable channel conditions and fish passage. Coordinate this process with the appropriate state agencies.	N		
General Riparian Area Management: Identify and attempt to secure instream flows needed to maintain riparian resources channel conditions and aquatic habitat.	N		
General Riparian Area Management: Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on site when needed to meet Aquatic Conservation Strategy and Riparian Reserve objectives.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.2.2 & 4.5.2.3 POD Att. 20
General Riparian Area Management: Apply herbicides, insecticides other toxicants and other chemicals only in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	C, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.4 EIS Sec. 4.5.1.2 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.4 EIS App. J POD Att. 14 POD Att. 24
General Riparian Area Management: Locate water drafting sites to minimize adverse effects on stream channel stability sedimentation and instream flows needed to maintain riparian resources channel conditions and fish habitat.	N		
Watershed and Habitat Restoration: Prevent watershed and habitat degradation rather than relying on mitigation measures or planned restoration.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fish and Wildlife Management: Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4.3 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 29
Fish and Wildlife Management: Design construct and operate fish and wildlife interpretive and other user enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish and wildlife interpretative and other user enhancement facilities inside Riparian Reserves ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met relocate or close such facilities.	N		
Fish and Wildlife Management: Cooperate with federal tribal and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.	N		
Fish and Wildlife Management: Cooperate with federal tribal and state fish management agencies to identify and eliminate impacts associated with habitat manipulation fish stocking harvest and poaching that threaten the continued existence and distribution of native fish stocks inhabiting streams with adjacent or nearby federal lands.	N		
Late-Successional Reserves			
Develop Late-Successional Reserve assessments prior to habitat manipulation. See Management Assessments and Plans toward the end of this chapter for additional information.	P	P	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. H EIS App. J
Plan and implement non-silvicultural activities inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-3
Using interdisciplinary teams evaluate other activities not described below and document appropriate guidelines.	N		
Request review by the Regional Ecosystem Office of all activities deemed to have potential adverse effects on Late-Successional Reserve objectives. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.	P	P	EIS Sec. 4.1.3.6 EIS App.H
Silviculture: Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late-successional habitat.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Silviculture: If needed to create and maintain late-successional forest conditions conduct thinning operations in forest stands up to 80 years of age. This will be accomplished by precommercial or commercial thinning of stands regardless of origin (e.g. planted after logging or naturally regenerated after fire or blowdown).	N		
Salvage: Limit salvage of dead trees in Late-Successional Reserves to areas where stand replacing events exceed ten acres in size and canopy closure has been reduced to less than 40 percent.	N		
Salvage: Retain all standing live trees including those injured (e.g. scorched) but likely to survive.	N		
Salvage: Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.	N		
Salvage: Retain adequate coarse woody debris quantities in a new stand so that in the future it will still contain amounts similar to naturally regenerated stands. Watershed level or province level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to coarse woody debris over the long term.	N		
Salvage: In the Oregon Klamath Province if essential to reduce future risk of fire or insect damage conduct salvage that does not meet the preceding management actions/direction. Focus on those areas where there is high risk of large scale disturbance.	N		
Salvage: Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.	N		
Salvage: After disturbance in younger stands develop diameter and biomass retention direction consistent with the intention of achieving late-successional forest conditions. Where green trees snags and logs are present following disturbance the green tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.	N		
Salvage: Retain logs present on the forest floor before a disturbance event.	N		
Salvage: Retain coarse woody debris to approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.	N		
Salvage: Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit deviations to as small an area as possible.	N		
Road Construction and Maintenance: Construct roads in Late-Successional Reserves if the potential benefits of silviculture salvage and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines they will be kept to a minimum be routed through unsuitable habitat where possible and be designed to minimize adverse impacts. Alternative access methods such as aerial logging will be considered to provide access for activities in reserves.	P, C, R		EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 20 POD Att. 25

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Road Construction and Maintenance: Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 20 POD Att. 25
Fuelwood Gathering: Permit fuelwood gathering only in existing cull decks in areas where green trees are marked by silviculturists for thinning in areas where blowdown is blocking roads and in recently harvested timber sale units where down material will impede scheduled post sale activities or pose an unacceptable risk of future large scale disturbance. In all cases these activities will comply with management actions/ direction for salvage and silvicultural activities.	N		
Mining: Assess the impacts of ongoing and proposed mining activities in Late-Successional Reserves.	N		
Mining: Include stipulations in mineral leases and when legally possible require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.	N		
Developments: Neither construct nor authorize new facilities that may adversely affect Late-Successional Reserves.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Developments: Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on Late-Successional Reserves.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-3
Developments: Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.	P	P, R	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H
Developments: Retain and maintain existing developments such as campgrounds, utility corridors and electronic sites consistent with other management actions/direction for Late-Successional Reserves.	P, C, O	P, B	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H
Developments: Remove hazard trees along utility rights-of-way and trails and in other developed areas.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.2.2 POD Att. 20 POD Att. 25
Land Exchanges: Consider land exchanges in Late-Successional Reserves if they provide benefits equal to or better than current conditions.	N		
Land Exchanges: Consider land exchanges especially to improve area distribution and quality (e.g. connectivity shape and contribution to biodiversity) of Late-Successional Reserves especially where public and private lands are intermingled.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Habitat Improvement Projects: Design projects to improve conditions for fish, wildlife and watersheds if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 10 POD Att. 29 LMP Amendment BLM-3
Habitat Improvement Projects: Design projects for recovery of threatened or endangered species even if they result in some reduction of habitat quality for other late-successional species. These projects will be designed for least impact to late-successional species.	P, R	P, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Sec. 4.1.3.6 EIS Sec. 4.7.4.4 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-3
Habitat Improvement Projects: Design and implement watershed restoration projects consistent with Late-Successional Reserve objectives.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29 LMP Amendment BLM-3
Fire Suppression and Prevention: As part of watershed analysis or a late-Successional Reserve Assessment plan fire management for each Late-Successional Reserve.	N		
Fire Suppression and Prevention: Emphasize maintaining late-successional habitat in wildfire suppression plans.	N		
Fire Suppression and Prevention: Use minimum impact suppression methods for fuels management in accordance with guidelines for reducing risks of large scale disturbances.	N		
Fire Suppression and Prevention: During actual fire suppression activities consult resource specialists to assure that habitat damage is minimized.	N		
Fire Suppression and Prevention: Until a fire management plan is completed for a Late-Successional Reserve or group of reserves suppress wildfire to avoid loss of habitat and to maintain future management options.	N		
Fire Suppression and Prevention: Prepare a specific fire management plan prior to any habitat manipulation activities in Late-Successional Reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the Late-Successional Reserve. Until the plan is approved proposed activities will be subject to review by the Regional Ecosystem Office.	P	P	EIS Sec. 4.1.3.6 EIS App. H POD Att. 11 POD Att. 18

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fire Suppression and Prevention: Apply prescribed fire in a manner which retains the amount of coarse woody debris determined through watershed analysis.	C, O	B	EIS Sec. 4.1.3.6 EIS Sec. 4.4.4 EIS App. H POD Att. 11 POD Att. 18
Fire Suppression and Prevention: Limit the size of all wild fires. When watershed analysis or a Late-Successional Reserve Assessment is completed some natural fires may be allowed to burn under prescribed conditions.	N		
Fire Suppression and Prevention: Consider rapidly extinguishing smoldering coarse woody debris and duff.	C, O	B	EIS Sec. 4.1.3.6 EIS Sec. 4.4.4 EIS App. H POD Att. 11 POD Att. 18
Special Forest Products: Evaluate whether special forest product harvest activities have adverse effects on Late-Successional Reserve objectives.	N		
Special Forest Products: Prior to selling special forest products ensure resource sustainability and protection of other resource values such as special status plant or animal species.	N		
Special Forest Products: Where special forest product activities are extensive evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.	N		
Recreational Uses: Use adjustment measures such as education use limitations traffic control devices or increased maintenance when dispersed and developed recreation practices retard or prevent attainment of Late-Successional Reserve objectives.	N		
Rights-of-Way Contracted Rights Easements and Temporary Use Permits: Access to nonfederal lands through Late-Successional reserves will be considered and existing right-of-way agreements contracted rights easements and temporary use permits in Late-Successional Reserves will be recognized as valid uses.	N		
Rights-of-Way Contracted Rights Easements and Temporary Use Permits: For all new rights-of-way proposals, design mitigation measures to reduce adverse effects on Late-Successional Reserves. Consider alternative routes that avoid Late-Successional Reserves. If rights-of-way must be routed through a reserve design and locate them to have the least impact on late-successional habitat.	P, C, R	P, R, M	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 3.4.3 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 20 POD Att. 25 POD Att. 29
Rights-of-Way Contracted Rights Easements and Temporary Use Permits: Review all temporary use permits. When objectives of Late-Successional Reserves are not being met reduce impacts through education or modification of existing permits.	C, O	B	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 4.1.3.6 EIS App. H

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Nonnative Species: If introduction of a nonnative species is proposed complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional objectives.	N		
Nonnative Species: Evaluate impacts of nonnative species (plant and animal) existing within reserves.	N		
Nonnative Species: Develop plans and recommendations for eliminating or controlling nonnative species which are consistent with Late-Successional Reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within Late-Successional Reserves.	P, C, R	P	EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. H POD Att. 9 POD Att. 14
Adaptive Management Areas – Not Applicable, Excluded From Table			
Matrix (Connectivity/Diversity Blocks and General Forest Management Area)			
Conduct timber harvest and other silvicultural activities in that portion of the Matrix with suitable forest lands according to management actions/ direction summarized below and in the Timber section.	N		
Provide a renewable supply of large down logs well distributed across the Matrix landscape in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand. Models will be developed for groups of plant associations and stand types that can be used as a baseline for developing prescriptions.	N		
Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Down logs will reflect the species mix of the original stand. Where this management action/ direction cannot be met with existing coarse woody debris merchantable material will be used to make up the deficit.	N		
In areas of partial harvest (eg. Connectivity/ Diversity Blocks density management) apply the same basic management actions/direction as in Number 1 above but they can be modified to reflect the timing of stand development cycles where partial harvest is practiced.	N		
Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g. slash burning and yarding) which might otherwise destroy the integrity of the substrate.	N		
Retain green trees and snags throughout the General Forest Management Area: Retain six to eight green conifer trees per acre in regeneration harvest units.	N		
Retain green trees and snags throughout the General Forest Management Area: Retain snags within a timber harvest unit at levels sufficient to support species of cavity nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Retain green trees and snags throughout the General Forest Management Area: In addition to the previous green tree retention management action/direction retain green trees for snag recruitment in timber harvest units where there is an identified near term (less than three decades) snag deficit. These trees do not count toward green tree retention requirements.	N		
Provide Connectivity/Diversity Blocks spaced throughout the BLM Matrix. Manage the blocks as follows: Maintain 25 to 30 percent of each block in late-successional forest at any point in time. Inclusions of Riparian Reserves and other allocations with late-successional forest within the gross mapped Connectivity/Diversity Blocks count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.2 EIS Secs. 4.1.3.3 - 4.1.3.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 29
Provide Connectivity/Diversity Blocks spaced throughout the BLM Matrix. Manage the blocks as follows: Manage available forest land within each block on a 150 year area control rotation.	N		
Provide Connectivity/Diversity Blocks spaced throughout the BLM Matrix. Manage the blocks as follows: When an area is regeneration harvested retain 12 to 18 green trees per acre within harvest units.	N		
Modify site treatment practices particularly the use of fire and pesticides and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to minimize intensive burning unless appropriate for certain specific habitats communities or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris.	N		
Modify site treatment practices particularly the use of fire and pesticides and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.	N		
Modify site treatment practices particularly the use of fire and pesticides and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to reduce the intensity and frequency of site treatments.	N		
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.	N		
Air Quality			

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
By the year 2000 reduce particulate matter emissions and impacts from prescribed burning by 50 percent from the baseline period (1976-1979). This will be accomplished by planning conducting monitoring and if necessary adjusting prescribed fire activities in accordance with the Oregon State Implementation Plan and the Oregon Smoke Management Plan (see Fire section).	N		
Reduce broadcast burning in favor of lower intensity under burning. Use emission reduction mitigation measures and smoke dispersal techniques to the greatest extent practical. Wildfire hazard reduction site preparation and the use of prescribed fire for species habitat mitigation will be implemented in a manner consistent with ecosystem management.	N		
Where needed use dust abatement measures on roads during BLM timber harvest operations or other BLM commodity hauling activity. Encourage dust abatement measures when haulers use BLM roads under permits and right-of-way agreements.	C, R	B, M	EIS Sec. 4.10.2.6 POD Att. 2 POD Att. 25 POD Att. 29
Determine the cumulative effects of proposed forest management activities on local and subregional air quality and minimize impacts. Coordinate cumulative impact analysis with other federal agencies.	N		
As part of implementation planning prepare conformity determinations required by the Clean Air Act.	P	P	EIS Sec. 1.5.1.8 EIS Secs. 4.12.1.2 & 4.12.1.3 POD Att. 2
Perform an emissions tradeoff analysis to determine and quantify the effects of prescribed burning and other types of fuel management on reduction of wildfire emissions. This analysis will be performed at the same geographic scale as conformity determinations.	P	P	EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3
Consider alternative emission reduction techniques whenever they are compatible with land allocation objectives and other management actions/direction. See the Air Quality Analysis section of the FSEIS for alternative treatments that may be considered during fuels management project design.	N		
Water and Soils			
Improve and/or maintain soil and water conditions by closing selected areas to off highway vehicle use or limiting such use to existing roads and trails and/or limiting the period of use. See Recreation Off Highway Vehicles for additional details.	C, O	B, M	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Sec. 4.8.1.2 EIS Sec. 4.8.2.3 EIS Sec. 4.10.2.5 POD Att.9 POD Att. 19 POD Att. 25 POD Att. 29
Water: Conduct watershed analysis as described in Use of the Plan and in the SEIS ROD.	P	P, M	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J POD Att. 29

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Continue to implement a nonpoint source management program in cooperation with the U.S. Environmental Protection Agency and in existing agreement with the Oregon Department of Environmental Quality.	C, O	B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS App. J POD Att. 9 POD Att. 28
Water: Continue coordination with the Oregon Department of Environmental Quality for implementation of Best Management Practices which protect beneficial uses of water.	C, O	B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2 & 4.4.3 EIS App. J
Water: Ensure consistency of management activities with Oregon's Statewide Water Quality Management Plan for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41).	C, O	B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS App. J
Water: Protect floodplains and wetlands in accordance with Executive Orders 11988 and 11990 and BLM's Riparian-Wetlands Initiative for the 1990s (USDI BLM 1991a).	P, C, R, O	P, B, M	EIS Sec. 1.5.1.7 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4.2 EIS App. J POD Att. 28 POD Att. 29
Water: Design and implement watershed restoration projects that promote long-term ecological integrity of ecosystems conserve the genetic integrity of native species and attain Aquatic Conservation Strategy objectives. See Aquatic Conservation Strategy for additional guidance.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 29
Water: Cooperate with federal state local and tribal agencies and private landowners to develop watershed based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.	N		
Water: Prevent watershed degradation rather than using mitigation or planned restoration to correct foreseeable problems caused by management activities.	N		

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Water: Identify and attempt to obtain instream flows needed to maintain riparian resources channel conditions aquatic habitat and water quality.	N		
Water: Locate water drafting sites to minimize adverse effects on stream channel stability sedimentation and in-stream flows needed to maintain riparian resources channel conditions and fish habitat.	N		
Water: Apply herbicides insecticides and other chemicals in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	C, O	B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
Water: Apply for water rights to support the needs for fire suppression construction/maintenance (e.g. pump chances water holes and reservoirs) recreation and other programs.	N		
Water: Land management practices of adjacent landowners will be considered during site specific timber management planning and other specific activity and project planning.	N		
Water: Provide for protection of both surface water and ground water in planning for chemical uses. Chemicals used will include herbicides pesticides fertilizers and fire retardant chemicals. Application and monitoring of herbicides will be done in accordance with BLM's "Record of Decision Western Oregon Program Management of Competing Vegetation" 1991.	P, C, O	P, B	EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24 POD Att. 28
Water: Management in municipal watersheds is subject to agreement with the cities of Drain Riddle and Canyonville through memorandums of understanding and with the City of Myrtle Creek through a special use permit.	N		
Soils: Apply Best Management Practices during all ground and vegetation disturbing activities. See Appendix D [9]for a list of practices.	C, O	B, M	EIS Sec. 2.4.2.1 & 2.4.2.2 POD Att. 9 POD Att. 20 POD Att. 29

[9] Appendix D: Best Management Practices, Roseburg District Record of Decision and Resource Management Plan, June 1995

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Soils: Minimize disturbance of identified fragile sites. Appendix D[3] contains a summary of management guidance for fragile sites.	P, C, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.2.2.1 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Sec. 4.3.3 EIS Sec. 4.4.4.2 EIS Secs. 4.5.1.3 & 4.5.2.3 EIS Secs. 4.7.4.1 – 4.7.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. M POD Att. 9 POD Att. 10 POD Att. 25
Soils: Use silvicultural systems that are capable of maintaining or improving long-term site productivity of soils.	N		
Soils: Design logging systems to avoid or minimize adverse impacts to soils.	P	P	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.2.2 & 4.5.2.3 EIS App. J POD Att. 9 POD Att. 20 POD Att. 28
Soils: In forest management activities involving ground based systems, tractor skid trails, including existing skid trails, will be planned to have insignificant growth loss effect. Existing tractor trails will be used as much as possible and new trails will be limited to slopes less than 35 percent. Operation on these trails will minimize soil displacement and occur when soil moisture content provides the most resistance to compaction. Tractor trails including those from previous entries will be selectively tilled with a properly designed self-drafting winged subsoiler. Exceptions to this were included in Plan Maintenance in 2001.	P, C	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.1.6 EIS Sec. 4.1.3.5 EIS App. J POD Att. 9 POD Att. 18
Soils: The following guidelines will be followed when using track type equipment with a brush blade for mechanical site preparation: • Restrict use to areas with suitable soil types and slopes less than 35 percent.	N		
Soils: The following guidelines will be followed when using track type equipment with a brush blade for mechanical site preparation: • Avoid displacing duff layers and topsoil into piles or windrows.	N		
Soils: The following guidelines will be followed when using track type equipment with a brush blade for mechanical site preparation: • Minimize piling of large woody material.	N		
Soils: The following guidelines will be followed when using track type equipment with a brush blade for mechanical site preparation: • Limit machine use to one round trip over the same area.	N		

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Soils: The following guidelines will be followed when using track type equipment with a brush blade for mechanical site preparation: • Operate at soil moistures that maximize resistance to compaction. A low ground pressure backhoe/loader grapple or other special equipment or techniques that will achieve the same insignificant soil compaction may be used instead of the preceding techniques. All areas compacted during site preparation will be tilled with a properly designed self-drafting winged subsoiler.	N		
Wildlife Habitat			
All Land Use Allocations: Use the watershed analysis process to address wildlife habitat issues for individual watersheds. The analysis will help to resolve any concerns identified in applying management actions/direction in this section and those in the Special Status and SEIS Special Attention Species section. Where appropriate wildlife habitat enhancement opportunities will be identified through this process. Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of wildlife habitat enhancement projects.	N		
All Land Use Allocations: Cooperate with federal tribal and state wildlife management agencies to identify and eliminate impacts associated with habitat manipulation poaching and other activities that threaten the continued existence and distribution of native wildlife inhabiting federal lands.	N		
All Land Use Allocations: Avoid road construction in areas with high wildlife values.	N		
Riparian Reserves: Design construct and operate wildlife interpretive and other user enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing wildlife interpretative and other user enhancement facilities inside Riparian Reserves ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met relocate or close such facilities.	N		
Riparian Reserves: Cooperate with federal tribal and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.	N		
Special Habitats: Using interdisciplinary teams identify special habitat areas and determine relevance for values protection or management on a case by case basis. Of particular importance in these determinations will be the habitat of species for which the SEIS ROD provides protection buffers.	N		
Special Habitats: Use management practices including fire to obtain desired vegetation conditions in special habitats.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Special Habitats: Special habitat areas will be buffered by 100 to 200 feet to protect their plant community structure species composition and ecological processes. The special habitat buffer will be an area designated and managed for the protection or enhancement of the special habitat. Activities such as timber harvest timber salvage and prescribed burning will be permitted within the buffers when they are considered necessary for special habitat restoration and will benefit resident special habitat species. Water courses flowing into and out of wetland habitats will be maintained.	N		
Other Raptors Habitat: Known and future raptor nest sites not protected by other management recommendations will be protected by providing suitable habitat buffers and seasonal disturbance restrictions.	P, C, O	P, B, R	EIS Sec. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Wild Turkey Habitat: Consistent with underlying land use allocations all oak stands will be maintained except on conifer sites within designated turkey habitat utilizing a variety of methods including prescribed fire. A minimum of one ten acre stand of roosting habitat will be provided in each section of designated turkey habitat. Roosting habitat will contain the following components: • A scattering (eight to ten) of large (larger than 24" DBH) open limbed conifer trees on each acre. • Ponderosa pine when available will be preferred roost trees.	N		
Osprey Habitat: On BLM-administered lands within 1/4-mile of known osprey nest sites (2500 total acres) nest trees and adjacent perch trees will be protected and disturbance will be restricted between March 20 and August 31. Consistent with other land use allocations adequate nest and perch replacement trees for osprey will be retained within 1/4-mile of nest sites.	P, C, O	P, B, R	EIS Sec. 4.6.1.2 & 4.6.1.3
Fish Habitat			
All Land Use Allocations: Use the watershed analysis process to address at risk fish species and stocks and their habitat for individual watersheds. Where appropriate fish habitat enhancement opportunities will be identified through this process.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. M POD Att. 29
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife Wild Fish Policy during planning and implementation of fish habitat enhancement projects. Priority will be given to watersheds supporting at risk fish species and stocks and those requiring extensive restoration.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: As identified through watershed analysis rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures will include but not be limited to fish passage improvements instream structures using boulders and log placement to create spawning and rearing habitat placement of fine and coarse materials for over-wintering habitat and riparian rehabilitation to establish or release existing coniferous trees.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.7.4.4 EIS App. F EIS App. J POD Att. 29
All Land Use Allocations: Use existing and new water impoundments to provide recreational fishing opportunities where sufficient water quality and quantity exist and where consistent with aquatic conservation strategy and other management action/direction.	N		
All Land Use Allocations: See the Special Status and SEIS Special Attention Species section and Best Management Practices (Appendix D[10]) for additional fish habitat management actions/direction and conservation practices.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.7.4.4 EIS App. F EIS App. J POD Att. 29
Riparian Reserves: Design, construct and operate fish interpretive and other user enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish interpretative and other user enhancement facilities inside Riparian Reserves ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met relocate or close such facilities.	N		
Riparian Reserves: Cooperate with federal, tribal and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks inhabiting federal lands.	N		
Riparian Reserves: Cooperate with federal tribal and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.	N		
Special Status and SEIS Special Attention Species Habitat			
All Land Use Allocations – Special Status Species: Review all proposed actions to determine whether or not special status species occupy or use the affected area or if the habitat for such species is affected.	P	P	EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M POD Att. 10

[10] Appendix D: Best Management Practices, Roseburg District Record of Decision and Resource Management Plan, June 1995

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Conduct field surveys according to protocols and established procedures. This includes surveying during the proper season unless surveys are deemed unnecessary through watershed analysis project planning and environmental assessment. Field surveys may not be conducted in all cases depending on the number and timing of previous surveys conducted whether previous surveys looked for all species that would be included on a new survey and the likelihood of potential habitat. The intensity of field surveys will also vary depending on the same factors.	P	P	EIS Sec. 1.5.4.1 EIS Sec. 4.4.4 EIS. Secs. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Consult (formal informal conference or technical assistance as appropriate) with the U.S. Fish and Wildlife Service or National Marine Fisheries Service for any proposed action which may affect federal listed proposed or candidate species or critical or essential habitat. Based on the results of consultation modify relocate or abandon the proposed action.	N		
Special Status Species: Coordinate with the U.S. Fish and Wildlife Service National Marine Fisheries Service and other appropriate agencies and organizations and jointly endeavor to recover federal listed and proposed species and their habitats.	P, C, O	P, B, M	EIS Sec. 1.5.1 EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Modify, relocate or abandon a proposed action to avoid contributing to the need to list under the Endangered Species Act all federal candidate state listed species and bureau sensitive species or their habitats.	P, C	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 3.4.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Coordinate and cooperate with the state of Oregon to conserve state listed species.	N		
All Land Use Allocations – Special Status Species: Protect assessment species where possible so as not to increase their status. Assessment species will be included in all field inventory and clearance work and all new locations will be documented. They will be considered in all environmental analyses where impacts will be clearly identified.	N		
All Land Use Allocations – Special Status Species: Where it is biologically appropriate and consistent with species recovery plans, buffer special status species by 100 to 300 feet from all surface disturbance and harvest of timber.	P, C	P, B, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.7.1.6 EIS Sec. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M Pod Att. 10

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Retain under federal management or other appropriate management organization habitat essential for the survival or recovery of listed and proposed species. Retain habitat of candidate bureau sensitive and assessment species where disposal would contribute to the need to list the species.	N		
All Land Use Allocations – Special Status Species: Where appropriate opportunities exist acquire land to contribute to recovery reduce the need to list or enhance special status species habitat.	N		
All Land Use Allocations – Special Status Species: Coordinate with other agencies and groups in management of species across landscapes. Coordination will be accomplished through conservation plans or similar agreements which identify actions to conserve single or multiple species and/or habitats.	P	P	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 2.1.4 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29 LSR Amendment BLM-3
All Land Use Allocations – Special Status Species: Where plans exist for species no longer on the special status list continue with the prescribed conservation actions if determined to be necessary to avoid relisting or future consideration for listing. In the case of interagency plans or agreements this determination will be mutually decided. Such plans may be modified as needed based on adequacy of existing rangewide conditions and conservation management.	N		
All Land Use Allocations – Special Status Species: Pursue opportunities for public education about conservation of species.	N		
All Land Use Allocations – Special Status Species: Where appropriate pursue opportunities to increase the number of populations of species under BLM management through land acquisition and/or species reintroduction in coordination with other responsible agencies.	N		
Listed and Proposed Threatened and Endangered Species: Implement the land use allocations and management actions/direction of this Resource Management Plan which are designed to enhance and maintain habitat for all endangered and threatened species.	C, R, O	B, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 2.1.4 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29 LSR Amendment BLM-3

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Listed and Proposed Threatened and Endangered Species: Northern Spotted Owl – Retain 100 acres of the best northern spotted owl habitat as close to the nest site or owl activity center as possible for all known (as of January 1 1994) spotted owl activity centers. Human activity within 1/ 4-mile of nest sites which could disturb owl nesting activities will be restricted especially the use of large power equipment and falling of trees. Restrictions will apply from March 1 to September 30 or until non-nesting status is confirmed using protocol procedures. The retention of adequate habitat conditions for dispersal of the northern spotted owl will be taken into account during watershed analysis that addresses the issue of adjusting Riparian Reserve widths.	N		
Columbian White-tailed Deer: Timber harvest or other vegetation altering activities on all BLM-managed lands (12761 acres) within the general area of distribution will only occur if determined beneficial to Columbian White-tailed deer or until such time that definitive information is available describing the use level and value of these lands in the context of meeting recovery plan goals. Of the above acres 8830 acres occurring within the core habitat area for the species have been removed from the timber base. Acquisition of lands within the core area (primarily T. 26 S. and T. 27 S. R. 5 W.) for the Columbian white-tailed deer in Douglas County through exchange or purchase will be actively pursued. To provide long term recovery for the Columbian white-tailed deer the recovery plan identifies a need for 5500 acres of secure suitable habitat and a population of 1000 animals supported on secure habitat for down listing to occur. A Habitat Management Plan will be prepared for existing BLM-managed lands determined to be of significant value to Columbia white-tailed deer or any lands acquired specifically for this species. The Roseburg District has recently acquired approximately 6600 acres (included in above totals) of prime habitat for this species. A management plan for the area is currently under development. When adequate habitat is secured to meet recovery plan goals and the species is no longer listed lands outside the core area and not acquired primarily for Columbian white-tailed deer management will no longer be restricted as described above.	N		
Listed and Proposed Threatened and Endangered Species: Townsend's Big-eared Bat – Townsend's big-eared bat roosts and hibernacula will be protected and buffered by 600 feet to maintain the integrity of sites. Disturbance will be limited near roosts and hibernacula to prevent detrimental impact to colonies. The use of pesticides which are detrimental to prey species or their habitat within the normal hunting range of known bat nursery colonies and hibernacula will be restricted. The restriction will apply to an area within the normal hunting range of known nursery colonies and hibernacula. BLM will pursue acquisition of the Scott Mountain hibernaculum consisting of approximately ten acres. To maintain habitat integrity on BLM-administered lands adjacent to the Scott Mountain hibernaculum 36 acres will remain withdrawn from the timber base.	P, C, O	P, B, R	EIS Sec. 1.5.2.1 EIS Sec. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EiS Sec. 4.7.4.4 EIS App. M

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Listed and Proposed Threatened and Endangered Species – Marbled Murrelet: Conduct two years of survey prior to any physical disturbance of marbled murrelet habitat within zone II (approximately 50 miles from coast).	P	P, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. M LMP Amendment BLM-1
Listed and Proposed Threatened and Endangered Species – Marbled Murrelet: Protect contiguous existing and recruitment habitat for marbled murrelets (i.e. stands that are capable of becoming marbled murrelet habitat within 25 years) within a 0.5 mile radius of any site where the birds' behavior indicates occupation (e.g. active nest fecal ring or eggshell fragments and bird flying below through into or out of the forest canopy within or adjacent to a stand).	P, C, O	P, R, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. M LMP Amendment BLM-1
Listed and Proposed Threatened and Endangered Species – Marbled Murrelet: Neither conduct nor allow harvest of timber within occupied marbled murrelet habitat at least until completion of the Marbled Murrelet Recovery Plan.	N		
Listed and Proposed Threatened and Endangered Species – Marbled Murrelet: Human activity will be minimized or curtailed within occupied or nesting stands between March 1 and July 15. During silvicultural treatments of nonhabitat within the 0.5-mile circle protect or enhance suitable or replacement habitat. This has been updated to reflect current Biological Opinion issued by consultation with USFWS.	C, O	B, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.2 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. M LMP Amendment BLM-1
Listed and Proposed Threatened and Endangered Species – Marbled Murrelet: Amend or revise management direction as appropriate when the recovery plan is completed.	N		
Listed and Proposed Threatened and Endangered Species – Bald Eagle: Comply with the Pacific Bald Eagle Recovery and Implementation Plans and existing site specific habitat management plans.	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species – Bald Eagle: Manage 4658 acres along the major river corridors to develop or maintain forest structure needed to support nesting and foraging activities. These acres are withdrawn from the timber base.	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Listed and Proposed Threatened and Endangered Species – Bald Eagle: To meet recovery plan goals the currently existing six bald eagle nest territories and habitat (4658 acres) will be protected as well as any future occupied territories under the following management guidelines: • Maintain or attain the following stand characteristics on all lands managed for bald eagles: • Large conifer trees that are greater than 50 inches dbh and occur at a density of five to seven trees per acre. • Multi-storied canopy with at least 60 percent crown closure. • Remainder of the stand with conifer trees with an average dbh of 24 inches and an average density of 50 to 70 trees per acre.	N		
Listed and Proposed Threatened and Endangered Species – Bald Eagle: To meet recovery plan goals the currently existing six bald eagle nest territories and habitat (4658 acres) will be protected as well as any future occupied territories under the following management guidelines: • Avoid disturbance including logging mining and mineral leasing (except existing recreational use) within 1/2-mile of active nest sites which may adversely affect between the dates of February 15 and August 31 contingent on consultation under Sec. 7 of the Endangered Species Act.	N		.
Listed and Proposed Threatened and Endangered Species – Bald Eagle: To meet recovery plan goals the currently existing six bald eagle nest territories and habitat (4658 acres) will be protected as well as any future occupied territories under the following management guidelines: • Provide an appropriate level of fire protection on lands managed for bald eagles and restrict the use of insecticides within 1/2-mile of bald eagle sites.	N		
Listed and Proposed Threatened and Endangered Species – Bald Eagle: Retain ownership of all BLM designated bald eagle habitat and pursue conservation easements or acquisition of other lands occurring within known active or future nesting territories. Priority is placed on acquiring 261 acres within Cougar Creek and Woodruff Mountain nesting territories.	N		
Listed and Proposed Threatened and Endangered Species – Bald Eagle: Implementation of the Umpqua Corridor Habitat Management Plan will continue. Habitat management plans will be developed for all active nesting territories.	N		
Listed and Proposed Threatened and Endangered Species – Bald Eagle: Vehicle use on 1.5 miles of road at the head of Huntley Creek will be restricted from February 15 to August 31 to limit nest site disturbance.	C, O	B	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. M POD Att. 25
Listed and Proposed Threatened and Endangered Species – Peregrine Falcon: Comply with the Peregrine Falcon Recovery Plan and existing site specific habitat management plans. Known and potential (sites rated 7 or above) nesting cliffs will be managed to maintain site integrity.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. M POD Att. 25

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Listed and Proposed Threatened and Endangered Species – Peregrine Falcon: Although there are no known Peregrine falcon nesting sites on BLM-administered lands sites occupied in the future will have seasonal disturbance restrictions of 1/4-mile or greater around them. Actual areas restricted will depend on the activity and likely disturbance at the nest cliff. Pesticides that have a negative effect on prey species or their habitat will not be applied within two miles of active sites. Habitat management plans will be written for all active Peregrine falcon nest sites on BLM-administered lands. High potential sites will periodically be surveyed for occupancy and all future occupied sites will be monitored annually to determine occupancy nesting and production. Acquisition will be pursued for occupied nest sites occurring on adjacent private lands. Currently there is one active nest site suitable for BLM acquisition.	N		
Listed and Proposed Threatened and Endangered Species – Northern Goshawk: Retain 30 acre buffers of undisturbed habitat around active and alternative nest sites. Restrict human activity and disturbance within 1/4-mile of active sites between March and August or until such time as young have dispersed.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Listed and Proposed Threatened and Endangered Species: Umpqua Mariposa Lily (*Calochortus umpquaensis*) – Manage Umpqua mariposa lily habitat to increase numbers of plants in each of the populations known throughout the species range. A conservation strategy will be prepared in cooperation with the Medford District BLM Umpqua National Forest and provide a baseline against which human impacts on the U.S. Fish and Wildlife Service which will prescribe the following management actions at locations throughout the species range: • Acquisition of private land to increase habitat in federal ownership. • Securing voluntary protection by private landowners through cooperative agreements. • Designation of habitat as Areas of Critical Environmental Concern. • Installation of gates and fences. • Management of livestock grazing and Off Highway Vehicle use. • Collection of seed for long term storage. • Prescribed burning of habitat. • Girdling trees precommercial thinning and commercial thinning forest stands to produce gaps in forest habitat. • Monitoring habitat to determine population trends and the effects of management treatments. • Conducting demographic studies.	N		
Special Areas			
Management activities will be implemented in such a manner so as to be compatible with specific management objectives identified in site specific activity management plans. Management plans with specific management objectives have already been prepared for all existing Areas of Critical Environmental Concerns and Research Natural Areas. New plans will be prepared for new and expanded Special Areas. These new plans will define specific management objectives and address a wide spectrum of management activities such as land acquisition the role of fire and public outreach. Interim management will be provided areas without activity management plans to protect the natural features for which the areas were designated and preserve future management options.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Land acquisition will be pursued for the Beatty Creek Area of Critical Environmental Concern/Research Natural Area to block up ownership and improve management opportunities. Land acquisition for other Special Areas will be addressed in site specific management plans or activity level environmental assessments.	N		
Mineral withdrawal of all Areas of Critical Environmental Concern/Research Natural Areas. Mining will be permitted in other Special Areas with a plan of operations to avoid undue and unnecessary degradation.	N		
No salable mineral development and no surface occupancy for leasable minerals in Special Areas.	N		
Closure of Areas of Critical Environmental Concern/Research Natural Areas to Off Highway Vehicle use and the restriction of Off Highway Vehicle use to existing roads and trails in all other Special Areas.	N		
No timber harvest road construction or the operation of ground based fire suppression equipment off existing roads or other surface disturbing activity in Areas of Critical Environmental Concern/Research Natural Areas.	N		
Cultural Resources Including American Indian Values			
Conduct systematic inventories of areas likely to contain cultural resources.	N		
Evaluate cultural resource sites to determine their potential for contributing to public cultural heritage and/or scientific purposes.	P, C	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.11.1.1 EIS Sec. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 EIS App. J POD Att. 26
Develop cultural resource management plans for areas with fragile resources or intensive prehistoric or historic use. These areas will include Golden Bar the North Umpqua River corridor the Little River/Wolf Creek area the Middle Creek drainage Camas Valley the White Rock/Deadman Mountain/Deadman Creek area and the mining areas in the southern portion of the district.	N		
Develop educational and interpretive programs to increase public awareness and appreciation of cultural resources as part of the “Adventures in the Past” initiative.	N		
Develop partnerships with local Native American groups and other interested parties to accomplish cultural resource objectives.	N		
Monitor cultural resources being impacted by unauthorized use such as 35DO100 35DO147 35DO153 and 35DO435 and take appropriate law enforcement actions.	N		
Implement physical protection measures such as riprapping and barrier installations to reduce deterioration.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Develop memoranda of understanding with federally recognized Indian tribes and other Indian groups so that their heritage and religious concerns may be appropriately considered. These groups may include the Cow Creek Band of Umpqua Tribe of Indians the Confederated Tribes of the Siletz Indians the Confederated Tribes of Grand Ronde the Confederated Tribes of Coos Lower Umpqua and Siuslaw Indians and the Coquille Indian Tribe.	N		
Acquire significant cultural resource properties for public cultural heritage and scientific purposes. These properties include 35DO17 35DO19 35DO291 35DO431 and the portion of 35DO383 located on nonfederal land.	N		
Develop province level inventory plans.	N		
Investigate landscape features such as bogs ponds and packrat middens as well as cultural sites that contain information regarding long-term environmental change.	N		
Develop mechanisms for describing past landscapes and the role of humans in shaping those landscapes.	N		
Maintain an updated record of paleontological sites in the Roseburg District and manage the sites as appropriate.	N		
Visual Resources			
Address visual resource management issues when conducting landscape/watershed analysis environmental assessments or environmental impact statements.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. J POD Att. 1
Use the visual resource contrast rating system during project level planning to determine whether or not proposed activities will meet Visual Resource Management objectives. Use mitigation measures to reduce visual contrasts.	P, R	P, M	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. J POD Att. 1
Provide for natural ecological changes in Visual Resource Management Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape would be very low and must not attract attention. Changes should repeat the basic elements of form line color texture and scale found in the predominant natural features of the characteristic landscape.	N		
Manage Visual Resource Management Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form line color texture and scale found in the predominant natural features of the characteristic landscape.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Manage Visual Resource Management Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form line color texture and scale found in the predominant natural features of the characteristic landscape.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Manage Visual Resource Management Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However every attempt should be made to minimize the effect of the activities through careful location minimal disturbance and repeating the basic elements of form line color and texture.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Adhere to the following timber harvest scenarios to meet Visual Resource Management Class II III and IV objectives. Based on the visual resources rating system and site specific conditions these scenarios or others may be used. • VRM II: Timber management approaches to meet Visual Resource Management Class II objectives will employ single tree selection uneven-aged harvest retention of shelterwood overstory trees or group selection management in seen areas. Larger regeneration harvests will be in unseen areas. Fire suppression and fuels management standards will be established to meet Visual Resource Management Class II objectives.	N		
Adhere to the following timber harvest scenarios to meet Visual Resource Management Class II III and IV objectives. Based on the visual resources rating system and site specific conditions these scenarios or others may be used. • To permit screening of regeneration harvests and permit time for regrowth between sequential entries regeneration harvests will not remove more than 6.6 percent of any seen Visual Resource Management Class II area in a given decade.	N		
Adhere to the following timber harvest scenarios to meet Visual Resource Management Class II III and IV objectives. Based on the visual resources rating system and site specific conditions these scenarios or others may be used. • VRM III: Timber management approaches to meet Visual Resource Management Class III objectives will employ either short-term retention of shelterwood overstory trees or use of regeneration harvests which have less than ten acres of seen area and which do not disturb more than ten percent of the seen Visual Resource Management Class III area in any decade. Where possible regeneration harvests will be screened from key viewing points along major travel routes by uncut areas or by shelterwood units or young stands.	N		
Adhere to the following timber harvest scenarios to meet Visual Resource Management Class II III and IV objectives. Based on the visual resources rating system and site specific conditions these scenarios or others may be used. • VRM IV: No specific visual management constraints will apply to lands managed for Visual Resource Management Class IV objectives but mitigation of visual impacts will be incorporated where consistent with efficient timber harvest or other management activities.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Employ guidelines of the revised Oregon Forest Practices Act Section 17 in visually sensitive corridors along Interstate 5 and State Highways 38, 42 and 138.	N		
Monitor Visual Resource Management according to District Visual Resource Management monitoring procedures.	C, O	P, B	EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.8.2.3 POD Att. 1
Conduct Visual Resource Management inventories on newly acquired public lands.	N		
Wild and Scenic Rivers			
Undesignated Segments: Determine future manageable river segments which may be suitable for designation to the National Wild and Scenic River System.	N		
Undesignated Segments: Protect Outstandingly Remarkable Values identified on BLM-administered lands within the study corridors of eligible river segments studied and found suitable for inclusion as components of the National Wild and Scenic Rivers System.	N		
Undesignated Segments: Provide interim protective management for Outstandingly Remarkable Values identified on BLM-administered lands along river segments determined eligible but not studied for inclusion as components of the National Wild and Scenic Rivers System.	N		
Undesignated Segments: Manage the natural integrity of river related values to maintain or enhance the highest tentative classification determined for rivers found eligible or studied for suitability.	N		
Designated Segments: Revise the North Umpqua Wild and Scenic River Management Plan dated 1992 to address attainment of Aquatic Conservation Strategy Objectives.	N		
Designated Segments: Manage the Congressionally designated North Umpqua River segment as a Wild and Scenic River under the North Umpqua Wild and Scenic River Management Plan.	N		
Rural Interface Areas			
Work with local governments to improve the BLM data base regarding private land planning/zoning designations and residential development near BLM-administered land.	N		
Work with local governments to provide information to local planners regarding BLM land allocations in Rural Interface Areas and the management objectives and guidelines for these lands.	N		
Work with local governments to develop design features and mitigation measures that will minimize the possibility of conflicts between private and federal land management.	N		
Work with local governments to monitor the effectiveness of design features and mitigation measures in Rural Interface Areas.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
As a part of watershed analysis and project planning work with local individuals and groups including fire protection districts to identify and address concerns related to possible impacts of proposed management activities on rural interface areas.	N		
Use design features and mitigation measures to avoid/minimize impacts to health life and property and quality of life. The following timber management practices will not be applied on those lands: herbicide spraying clearcutting and broadcast burning.	N		
Manage rural interface areas using Visual Resource Management class III standards (unless an area is classified as Visual Resource Management class I or II).	N		
Socioeconomic Conditions			
Support and assist the state of Oregon Economic Development Department's efforts to help rural resource based communities develop and implement alternative economic strategies as a partial substitute for declining timber based economies.	N		
Improve wildlife and fish habitat to enhance hunting and fishing opportunities and to increase the economic returns generated by these activities.	N		
Improve viewing opportunities for watchable wildlife.	N		
Plan and design forest management activities to produce a sustained yield of products to support local and regional economic activity. A diversity of forest products (timber and non-timber) will be offered to support large and small commercial operations and provide for personal use.	P, R	P, M, A	EIS Sec.1.5.2.1 EIS Sec. 2.1.3.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 29
Recreation - Not Applicable, Excluded From Table			
All Land Use Allocations – General Off Highway Vehicle: An implementation plan for Off Highway vehicle management will be completed as outlined in BLM Manual 8342.	N		
All Land Use Allocations – General Recreation Management: Implement initiatives goals and objectives in BLM's Recreation 2000 Strategic Plan to the capabilities of the District.	N		
All Land Use Allocations – General Recreation Management: Maintain District recreation sites to a standard that protects the resource the public and the public investment and fosters pride of public ownership.	N		
All Land Use Allocations – General Recreation Management: Place increased emphasis on interpretive and informational signs maps and brochures.	N		
Timber Resources			

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations: Conform all management activities within the range of Port-Orford cedar to the guidelines described in the BLM Port-Orford cedar Management Policies to mitigate damage caused by *Phytophthora lateralis*. Site specific analyses for projects within the range of Port-Orford cedar will consider possible effects on the species.	P, C, O	P, B	EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. 9
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Declare an annual allowable sale quantity of 7.0 million cubic feet (45 million board feet).	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Apply silvicultural systems that are planned to produce over time forests which have desired species composition structural characteristics and distribution of seral or age classes (see Appendix E[11]).	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Develop plans for the locations and specific designs of timber harvests and other silvicultural treatments within the framework of watershed analyses.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Select logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription for protection of soil and water quality and for meeting other land use objectives.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Schedule regeneration harvests to assure that over time harvest will occur in stands at or above the age of volume growth culmination (i.e. culmination of mean annual increment). This refers to the age range which produces maximum average annual growth over the lifetime of a timber stand. In the planning area culmination occurs between 80 and 110 years of age. Regeneration harvests may be scheduled in stands as young as 60 years in order to develop a desired age class distribution across the landscape.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Base silvicultural treatments and harvest designs on the functional characteristics of the ecosystem and on the characteristics of each forest stand and site. Treatments will be designed as much as possible to prevent the development of undesirable species composition species dominance or other stand characteristics. The principles of integrated pest management and integrated vegetation management will be employed to avoid the need for direct treatments. Herbicides will be used only as a last resort.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Plan harvest of marketable hardwood stands in the same manner as conifer stands if the land is not otherwise constrained from timber management. Where hardwood trees became established following previous harvest of conifers plan to reestablish a conifer stand on the site.	N		

[11]Appendix E: Silvicultural Systems and Harvest Methods, Roseburg District Record of Decision and Resource Management Plan, June 1995

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Unscheduled Harvests - see Riparian Reserves and Late-Successional Reserves sections.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Timber sale contracts usually awarded on a competitive basis are the means of accomplishing all timber harvest and many forest development practices. The standard and special provisions (which include mitigating measures) in a contract set forth the performance standards to be followed by the contractor in carrying out the action in accordance with applicable laws regulations and policies. In contract preparation selection of special provisions is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. Standard provisions of the basic timber sale contract Bureau Form 5450-3 are applicable for all timber sales. Bureau manuals and manual supplements provide a variety of approved special provisions for use as appropriate in individual contracts. The combination of selected special provisions constitutes Section 41 of the timber sale contract. Maintaining or enhancing water quality and long-term soil/site productivity will be inherent in all timber harvest and production practices.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): The Allowable Sale Quantity has been calculated using a computer program called TRIM-PLUS. The sustainable Allowable Sale Quantity has been calculated in cubic feet. Timber sales under the plan will be sold according to cubic foot measure.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Accomplish timber harvest by the appropriate application of aerial cable or ground-yarding systems. The logging systems and the degree of log suspension are design features that will be employed for yarding efficiency watershed protection to minimize soil damage and to minimize damage to residual trees in partial cut operations. BLM Oregon Manual Supplement H-5420-1 will guide selection of harvesting techniques for timber sale contracts.	P, C	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.2.2 & 4.5.2.3 EIS App. J POD Att. 9 POD Att. 20 POD Att. 28
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Plan timber sales involving ground yarding systems with skid trails (including trails from previous harvest entries) to have insignificant (less than one percent) growth loss effect. Skid trails will affect less than ten percent of the land. Existing skid trails will be used as much as possible and new skid trails will be limited to slopes of less than 35 percent. Operation on these trails will minimize soil displacement and occur when soil moisture content provides the most resistance to compaction. Upon final harvest all compacted trails including skid trails from previous entries will be tilled with a properly designed self-drafting subsoiler. For entries other than final harvest skid trails will be selectively tilled.	P, C, R	P, B	EIS Sec. 2.4.21 & 2.4.2.2 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.2.2 & 4.5.2.3 POD Att. 9 POD Att. 20
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Harvest unit size will be determined at the appropriate level given the site specific management objectives such as watershed wildlife habitat enhancement or salvage of timber damaged by fire disease insects or wind. In addition economic logistical and safety considerations may influence size.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Accomplish regeneration harvests in such a way that the land can be adequately restocked within five years.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Apply commercial thinning in the matrix where practical and where research indicates increased gains in timber production are likely. The interval of treatment will range from 10 to 30 years varying by site class with poor sites having longer intervals.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Harvest trees from lands withdrawn from timber production under certain circumstances only when their harvest will be consistent with other plan guidelines.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Design to the extent consistent with other management direction forest products sales to encourage complete utilization of harvestable timber including noncommercial species.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use site preparation procedures to prepare newly harvested and inadequately stocked areas for planting new trees. Four types of site preparation treatments (prescribed burning herbicide application and mechanical and manual techniques) will be utilized. BLM's "Record of Decision Western Oregon Program - Management of Competing Vegetation" 1992 and BLM Oregon Manual Supplement H-54201 will be followed in selecting site preparation treatments using an integrated vegetation management approach.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use prevention as the preferred strategy in controlling competitive and unwanted vegetation. The goal is to prevent or reduce the need for future vegetation control by considering known ecological relationships on individual sites. Harvest activity will be designed to eliminate or reduce post harvest treatment. Prevention seeks to detect and ameliorate conditions that cause or favor the presence of competing or unwanted vegetation in the harvest units before it interferes with management objectives. Prevention is in contrast to treatment.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use herbicides where considered the most appropriate treatment to control grasses forbs brush and noncommercial tree species to increase seedling survival. Application and monitoring of herbicides will be done in accordance with BLM's "Record of Decision Western Oregon Program Management of Competing Vegetation" 1992.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Apply herbicides aerially and by several ground methods as site specifically appropriate. The method selected will depend on costs topography equipment limitations target plant species and their distribution potential environmental impacts and biological conditions. Most aerial herbicide applications will be accomplished by helicopters equipped with systems designed to limit herbicide application to the target areas. Current BLM policy prohibits aerial application of pesticides.	P, C, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Control stringently the timing of herbicide treatment in relation to specified weather conditions such as temperature humidity and wind. Continuous project inspection of spraying operations is required. There is full authority for ordering cessation of operations based on adverse field conditions. Both equipment and operators will be checked frequently by field project inspectors. Only registered chemicals will be used in accordance with label instructions on the container. Handling storage and application of chemicals will also be in accordance with the Oregon Forest Practices Rules.	P, C, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use manual site preparation consisting of brush pulling or cutting or hand piling of slash for burning.	C O	B	EIS Sec. 2.4.2.1 & 2.4.2.2 POD Att. 9 POD Att. 18 POD Att. 20
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use mechanical site preparation consisting of piling or windrowing of slash brush and unmerchantable stems. Track-type equipment with a brush blade will be restricted to areas with suitable soil types and slopes less than 35 percent.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Track-type tractor site preparation operations will meet the following minimum conditions: • Minimize piling of large woody material.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Track-type tractor site preparation operations will meet the following minimum conditions: • Avoid displacing duff layers and topsoil into piles or windrows.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Track-type tractor site preparation operations will meet the following minimum conditions: • Make only two machine passes (one round trip) over the same area.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Track-type tractor site preparation operations will meet the following minimum conditions: • Operate at soil moistures that maximize resistance to compaction. Special equipment or techniques that will achieve the same insignificant (less than one percent) growth loss result may be used instead of the preceding techniques especially on soils considered unsuitable for tractor type operations. All compacted areas will be tilled with a properly designed self drafting subsoiler equipment.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Convert lands identified as available for timber production but currently growing primarily brush or hardwoods to appropriate conifer species unless the hardwoods will produce a higher net monetary return than conifers. Such actions will meet relevant tests of economic feasibility or justification and will be consistent with other resource and land use allocation objectives of an alternative. Conversion could include harvest of existing merchantable trees slashing of nonmerchantable trees and other site preparation techniques as appropriate.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Achieve adequate reforestation as promptly as practical following timber harvest. Harvested areas will be planted with indigenous commercial coniferous species (e.g. Douglas-fir western hemlock and western redcedar etc.) generally within one year of the completion of harvesting and site preparation. Hardwoods will be encouraged on harvested sites where they will produce a higher net monetary return than conifers. Identified root disease centers will be planted with indigenous resistant tree species.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use planting stock from nursery grown seed collected on sites and at elevations similar to the specific project area. Genetically selected stock will also be nursery grown and used to the extent available in accordance with BLM's Western Oregon Tree Improvement Plan. Broad selection of parent trees for such stock is used to maintain genetic diversity.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS Secs. 4.5.1.3 & 4.5.2.3 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS Secs. 4.7.1.3 & 4.7.1.6 EIS App. F POD Att. 9 POD Att. 10 POD Att. 28 POD Att. 29
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Conduct post-treatment reforestation surveys to determine the rate of survival and if replanting or interplanting will be required to meet stocking standards.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Protect plantations by using treatments including protection of seedlings from the sun by shading and protection from damage by deer elk mountain beaver or other animals by placing plastic tubing or netting over the seedlings or by bud capping. Large populations of mountain beaver or pocket gophers will be reduced by several different methods when they cause significant damage to a plantation. The number of acres requiring each of these treatments will be determined annually in conjunction with normal reforestation surveys. Control within progeny test sites and other intensive study plots will also include porcupine or other animals causing significant damage. The appropriate treatments will be analyzed and determined through an interdisciplinary effort that will consider all resource objectives.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Promote the survival and establishment of coniferous seedlings through maintenance treatments. Release treatments reduce competition for light moisture and nutrients between surrounding vegetation and existing coniferous seedlings and promote dominance and growth of established coniferous trees. Faster growing hardwoods such as red alder bigleaf maple or vine maple overtop and suppress slower starting conifer seedlings. The degree and type of competition varies with the individual site. On dry sites grasses forbs and shrubs are strong competitors for water while elsewhere shrubs and/or hardwoods grow rapidly enough to shut out essential light and compete for water during the dry summer. With reduced competition the conifers rapidly grow beyond the point where they can be overtopped and further suppressed by surrounding vegetation. When this growth situation is achieved (approximately three to ten years after planting) there will be no further effort to control competing vegetation.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Use an integrated vegetation management approach in selection of maintenance and release treatments in conformance with BLM's "Record of Decision Western Oregon Program - Management of Competing Vegetation" 1992. Herbicides will be used to control competing vegetation when analysis shows their use to be the most appropriate treatment. See the previous discussion on site preparation for further discussion of herbicide use. Manual vegetation control methods (clearing around selected commercial trees using hand tools) will also be used when considered most appropriate to assure commercial tree growth.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Apply precommercial thinning to timber stands in the intensive timber production base that are overstocked. Thinning will generally be done between ten and 20 years of age. Average number of trees left will vary between 150 to 250 trees per acre depending on the alternative and individual stand prescription. Contract specifications will define desired density spatial arrangement and selection criteria for trees to be retained.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Fertilize areas precommercially or commercially thinned and portions of areas where stocking control is achieved through plantation spacing where increased wood yields will result. The average application is expected to be 200 pounds of nitrogen per acre beginning when the stand is precommercially thinned and at 15 year intervals thereafter until 20-25 years before final harvest. In addition to acceleration of growth for up to 15 years following treatment fertilization tends to reduce shock associated with thinning.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Manage top ranking plus trees intensively in the field to optimize cone production (thinning fertilization girdling and systemic insecticide treatment). The seed orchards for Douglas-fir and sugar pine will be managed to produce increasing yields of genetically selected seed. Minor species seed production plantations will also be planted in the seed orchards to ensure a dependable supply of seed for trees native to the Roseburg District.	N		
Matrix (General Forest Management Areas and Connectivity/Diversity Blocks): Apply pruning to selected young forest stands. This treatment can significantly increase the value of harvested timber. It reduces the proportion of juvenile wood in the tree and the number of knots caused by branches. The lower branches of the identified crop trees will usually be pruned to a height of approximately 18 feet.	N		
General Forest Management Area: Retain six to eight green conifer trees per acre after regeneration harvest to provide a source of snag recruitment and a legacy bridging past and future forests. Retained trees will be distributed in variable patterns (e.g. single trees clumps and stringers) to contribute to stand diversity.	N		
General Forest Management Area: In addition to the previous green tree retention management action/direction retain green trees for snag recruitment in harvest units where there is an identified near-term (less than three decades) snag deficit. These trees do not count toward green tree retention requirements.	N		

TABLE E-2 **Roseburg Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
General Forest Management Area: Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Existing decay class 1 and 2 logs count toward this requirement. Down logs will reflect the species mix of original stands. Where this management action/ direction cannot be met with existing coarse woody debris merchantable material will be used to make up the deficit.	N		
General Forest Management Area: Plan initial spacing of seedlings thinning and control of competing vegetation in the General Forest Management Area to maximize wood production by concentrating site resources on individual tree growth.	N		
General Forest Management Area: See Appendix E[12] for additional detailed management direction.			
Connectivity/Diversity Blocks: See Appendix E[7] for additional detailed management direction.			
Special Forest Products			
All Land Use Allocations: Establish specific guidelines for the management of individual Special Forest Products using interdisciplinary review as needed. Management guidelines will be based on the ecological characteristics of the Special Forest Products species and the requirements of associated plant animal and fungal species. Guidelines will include provisions that minimize changes in site productivity. Monitoring of harvest activities and the effects of harvest will be part of Special Forest Products management. Feasibility to harvest newly identified Special Forest Products species will receive interdisciplinary review.	N		
Riparian Reserves: Where catastrophic events result in degraded riparian conditions allow fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.	N		
Energy and Minerals			
All Land Use Allocations – Leasable Minerals: Use special stipulations for oil gas and geothermal leases to protect fragile areas or critical resource values (see Appendix G [13]for a list of mineral restrictions by resource value). Special stipulations may include seasonal restrictions to protect resources such as critical wildlife habitat prevent excessive erosion etc.; controlled surface use stipulations to protect valuable resources in small areas; and no surface occupancy stipulations to protect valuable resources scattered over a large area while still providing an opportunity for exploration and development. Special stipulations may be waived by authorized BLM officials if the objective of a stipulation could be met in another way.	N		
All Land Use Allocations – Locatable Minerals: Use general requirements in 43 CFR 3809 and site specific guidelines to avoid unnecessary or undue degradation of resources on mining claims.	N		

[12] Appendix E: Silvicultural Systems and Harvest Methods, Roseburg District Record of Decision and Resource Management Plan, June 1995
[13] Appendix G: Restrictions on Mineral and Energy Exploration and Development Activity, Roseburg District Record of Decision and Resource Management Plan, June 1995

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Locatable Minerals: Require reclamation at the earliest feasible time for all surface disturbing operations whether conducted under a notice or approved plan of operations.	N		
All Land Use Allocations – Saleable Minerals: Address quarry development management and reclamation needs through implementation planning.	P, C, R	P, B, R	EIS Sec. 2.4.2.2 EIS Sec. 4.2.2.4 POD Att. 9 POD Att. 17
All Land Use Allocations – Saleable Minerals: Emphasize long-term regional quarry use.	N		
All Land Use Allocations – Saleable Minerals: Develop new quarry sites in locations consistent with overall management objectives and guidelines of the Resource Management Plan. New quarry sites will not be developed unless no other reasonable alternative can be found.	N		
All Land Use Allocations – Saleable Minerals: Continue to use rock from existing quarries for construction and maintenance of timber sale access roads and other purposes.	P, C	P, B	EIS Sec. 2.4.2.2 EIS Sec. 4.2.2.4 POD Att. 9 POD Att. 17
Land Tenure Adjustments - – Not Applicable, Excluded From Table			
Rights-of-Way			
Riparian Reserves: Issue rights-of-way to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible adjust existing rights-of-way to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible eliminate the activity. Priority for modifying existing rights-of-way will be based on the actual or potential impact and the ecological value of the riparian resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.5 & 2.1.6 EIS Secs. 3.4.3 & 3.4.4 EIS Sec. 4.1.3.5 EIS App. J
Riparian Reserves: For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission) provide timely written comments regarding maintenance of instream flows and habitat conditions and maintenance/ restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management provide recommendations to the Commission that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves should be located operated and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Riparian Reserves: For other hydroelectric and surface water development proposals in Tier One Key Watersheds require instream flows and habitat conditions that maintain or restore riparian resources favorable channel conditions and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources favorable channel conditions and fish passage. Coordinate this process with the appropriate state agencies.	N		
Late-Successional Reserves: Retain and maintain existing developments such as utility corridors and electronic sites consistent with other management actions/direction for Late-Successional Reserves.	N		
Late-Successional Reserves: Remove hazard trees along utility right-of-way and in other developed areas.	C, O	B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.6 EIS App. H POD Att. 20
Other Land Use Allocations: Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors.	P	P, R	EIS Secs. 2.1.2.1 & 2.1.2.2 EIS Secs. 2.3.2.3 EIS Sec. 4.10.2.6 EIS App. D
Other Land Use Allocations: Encourage applicants to consult the Western Regional Corridor Study in planning route locations.	P	P, R	EIS Sec. 2.3.2.1 EIS Secs. 3.4.1 - 3.4.3
Other Land Use Allocations: Consider new locations for rights-of-way projects on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing route or corridor would not be technically or economically feasible; and the proposed project would otherwise be consistent with this Resource Management Plan and would minimize damage to the environment.	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 3.4.3 & 3.4.4
Other Land Use Allocations: Allow expansion of communications facilities on existing communication sites.	N		
Other Land Use Allocations: Consider new communication sites on a case-bycase basis. Applications may be approved where the applicant can demonstrate that use of an existing developed communication site would not be technically feasible; and the proposed facility would otherwise be consistent with this Resource Management Plan and would minimize damage to the environment.	N		
Access			
Acquire access by obtaining easements entering into new reciprocal right-of-way agreements or amending existing reciprocal right-of-way agreements. Condemnation for access will be pursued when necessary.	N		
Acquire perpetual exclusive easements whenever possible to provide for public access and BLM control. Acquire nonexclusive easements which do not provide for public access consistent with management objectives and where no public access is needed. Acquire temporary easements only when other options are not available.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Continue to obtain access across lands of private companies or individuals who are a party (permittee) to existing reciprocal rights-of-way agreements through appropriate agreements. Whenever a willing permittee is identified and it is determined there is a need for public access negotiations could be started to provide for the acquisition of public access rights.	N		
Emphasize acquisition for public access on major travel routes.	N		
Acquisition of easements will be required for access to all parcels in the planning area for resource management.	N		
Continue to provide all prospective purchasers of BLM timber with an equal opportunity of access when timber is offered for sale. This will most often be accomplished by reciprocal right-of-way agreements with private landowners or through federal ownership and control of roads. Reciprocal right-of-way agreements will continue to be used to identify conditions of use that are equitable and nondiscriminatory and facilitate management of the road network. Most of the lands where logging road right-of-way agreements are appropriate are now covered by reciprocal agreements. The 140 individual agreements and permits will continue to be subject to the regulations in effect when they were executed or assigned. The provisions of these agreements allow BLM only limited discretion to control the location of roads constructed by private parties across BLM-administered lands (and vice versa). This limited discretion allows BLM to object for only one environmental reason - excessive erosion damage. However future reciprocal right-of-way agreements could have different provisions depending on the regulations in effect at the time of their execution.	N		
Withdrawals – Not Applicable, Excluded From Table			
Noxious Weeds			
All Land Use Allocations: Continue to survey BLM-administered land for noxious weed infestations report infestations to the Oregon Department of Agriculture and work with the department to control infestations.	N		
All Land Use Allocations: Use control methods which do not retard or prevent attainment of Aquatic Conservation Strategy Objectives.	C, O	B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. J POD Att. 14
All Land Use Allocations: Apply integrated pest management methods (e.g. chemical mechanical manual and biological) in accordance with BLM's 1985 Northwest Area Noxious Weed Control Program Environmental Impact Statement 1987 Supplement and respective Records of Decision.	C, O	B	EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 14
Hazardous Materials			

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Identify investigate and arrange for removal of hazardous substances on BLM-administered land in accordance with the Comprehensive Environmental Response Compensation and Liability Act (the Act). Emergency response will be as specified in the District Hazardous Materials Contingency Plan. The response will include cleanup, proper notifications, criminal investigations, risk assessment and other actions consistent with the Act and the nature of the emergency.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Store, treat and dispose of hazardous materials in accordance with the Resource Conservation and Recovery Act and other appropriate regulations.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Use the Emergency Planning and Community Right-To-Know Act to coordinate emergency planning with state and local jurisdictions concerning hazardous materials emergency notifications and routine reporting of hazardous materials inventories.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Until hazardous wastes on BLM-administered land are removed protect employees and the public from exposure to these materials.	C, O	B	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24
Provide information to the public regarding the need to properly dispose of hazardous materials and the danger of becoming exposed to hazardous materials.	P, C, O	P, B	EIS Sec. 1.6 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Fire/Fuels Management			
Address fire/fuels management for all land use allocations as part of watershed analysis and project planning. This will include determinations of the role of fire and the risk of large-scale high intensity wildfires at the landscape level.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 29
Describe the need to use prescribed fire or other fuel management treatments to reduce fuel hazards and the risk of large scale high intensity fire while maintaining coarse woody debris down logs green tree retention and snags consistent with the natural role of fire and protection standards for each land allocation unit.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Coordinate fire management activities in rural interface areas with local governments, agencies and landowners. During watershed analysis identify additional factors which may affect hazard reduction goals. Minimize the impacts of wildfire suppression actions.	P, C, O, M	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.8.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 29
Riparian Reserves: Allow some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.	N		
Riparian Reserves: Rapidly extinguishing smoldering coarse woody debris and duff should be considered to preserve these ecosystem elements.	N		
Adaptive Management Areas: Explore and support opportunities to research the role and effects of fire management on ecosystem functions.	N		
Adaptive Management Areas: Emphasize fire/fuels management cooperation across agency and ownership boundaries.	N		
Adaptive Management Areas: Follow fire/fuels management actions/direction in this Resource Management Plan until Adaptive Management Area plans are completed and approved.	N		
Adaptive Management Areas: Use accepted wildfire suppression strategies and tactics and conform with specific agency policy.	N		
Matrix: Plan and implement prescribed fire treatments to minimize intensive burning unless appropriate for certain specific habitats, communities or stand conditions.	P, C, O	P, B	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.2.2 & 4.5.2.3 EIS App. H EIS App. J POD Att. 11 POD Att. 18
Matrix: Plan and implement prescribed fire treatments to minimize consumption of litter and coarse woody debris.	N		
Matrix: Plan and implement prescribed fire treatments to minimize disturbance of soil and litter that may occur as a result of heavy equipment operation.	N		
Matrix: Plan and implement prescribed fire treatments to minimize the frequency of treatments.	N		
All Land Use Allocations – Wildfire Suppression: Minimize the direct negative impacts of wildfire suppression on ecosystem management objectives.	N		
All Land Use Allocations – Wildfire Suppression: Respond to all wildfires by taking appropriate suppression responses. In most cases responses will consist of aggressive initial attack to extinguish fires at the smallest size possible.	N		

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Wildfire Suppression: For wildfires that escape initial attack perform a Wildfire Situation Analysis to develop a suppression strategy to evaluate the damage induced by suppression activities compared to expected wildfire damage. Suppression tactics will consider: • Public and firefighting personnel safety. • Protection of specific attributes of each land use allocation. • Coordination of wildfire suppression activities to avoid causing adverse impacts on federal and nonfederal lands. • Appropriate use of suppression tools such as aircraft dozers pumps and other mechanized equipment and clear definitions of any restrictions relating to their use. • The potential adverse effects on meeting ecosystem management objectives. • Protection of structural components such as snags duff and coarse woody debris to the extent possible.	N		
All Land Use Allocations – Fuels Management (including Hazard Reduction) Using Prescribed Fire: Modify fuel profiles in order to lower the potential of fire ignition and rate of spread; protect and support land use allocation objectives by lowering the risk of high intensity stand replacing wildfires; and adhere to smoke management and air quality standards.	C, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 11 POD Att. 18
All Land Use Allocations – Fuels Management (including Hazard Reduction) Using Prescribed Fire: Reduce hazards through methods such as prescribed burning mechanical or manual manipulation of forest vegetation and debris removal of forest vegetation and debris and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following: • Safety of firefighting personnel. • Identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern. • Developing a fuel profile that supports land allocation objectives. • Reducing the risk of wildfire in a cost efficiency manner. • Interagency cooperation to assure cost effective fuel hazard reduction across the landscape. • Adherence to smoke management and air quality standards. • Consistency with objectives for land use allocations. • Maintenance or restoration of ecosystem processes or structure. • The natural role of fire in specific landscapes current ecosystem needs and wildfire hazard analysis included in the fire management plan.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 29
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: The use of prescribed fire will be based on the risk of high intensity wildfire and the associated cost and environmental impacts of using prescribed underburning to meet protection restoration and maintenance of critical stands that are currently susceptible to large scale catastrophic wildfire.	C, R, O	B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 29

TABLE E-2

Roseburg Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: Underburning will be reintroduced across large areas over a period of time to create a mosaic of stand conditions. Treatments should be site specific treatments because some species with limited distributions are fire intolerant. The use of prescribed burning will be based on an interdisciplinary evaluation. Funding authority therefore must reflect the range of objectives identified for using fire under ecosystem management.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: Use prescribed fire to manage seral stage diversity through the development of fire resistant stand mosaics by timing the application of fire (e.g. every five to ten years).	N		
All Land Use Allocations – Fuels Management for Hazard Reduction: Modify fuel profiles in order to lower the potential of fire ignition and rate of spread; protect and support land allocation objectives by lowering the risk of high intensity stand replacing wildfires; and adhere to smoke management and air quality standards.	C, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 9 POD Att. 11 POD Att. 18
All Land Use Allocations – Fuels Management for Hazard Reduction: Reduce hazards through methods such as prescribed burning, mechanical or manual manipulation of forest vegetation, and debris removal of forest vegetation and debris and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following: • Providing for the safety of firefighting personnel. • Identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern. • Developing a fuel profile that supports land allocation objectives; and seeking a balance between reducing the risk of wildfire and the cost efficiency consistent with meeting land allocation objectives.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 29

This page intentionally left blank.

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Key Watersheds			
Prepare watershed analyses prior to further resource management activity including timber harvest in key watersheds. Until watershed analyses can be completed proceed with minor activities such as those categorically excluded under the National Environmental Policy Act (NEPA) regulations (except timber harvest) if they are consistent with Aquatic Conservation Strategy and riparian reserve objectives. Apply riparian reserve management actions/direction.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Reduce existing system and nonsystem road mileage outside roadless areas. If funding is insufficient to implement reductions there will be no net increase in the amount of roads in key watersheds.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 25 POD Att. 29
Give highest priority to watershed restoration in key watersheds.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 9 POD Att. 29
Watershed Restoration			
Prepare watershed analyses prior to restoration activities.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Restore watershed processes to recover degraded habitat.	P, R	P, M	EIS Sec. 2.1.4 EIS Secd. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 29
Focus watershed restoration on removing and upgrading roads.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 25 POD Att. 29
Apply silvicultural treatments to restore large conifers in riparian reserves.	R	M	EIS Sec.2.1.4 EIS Sec. 4.1.3.5 EIS App. J EIS App. F POD Att. 29

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Restore stream channel complexity. In-stream structures will only be used in the short term and not as a mitigation measure.	P, C, R	P, B, M	EIS Sec. 1.4.2 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 EIS App. F POD Att. 29

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Survey and Manage for Amphibians Mammals Bryophytes Mollusks Vascular Plants Fungi Lichens and Arthropods			
Manage known sites (highest priority): Acquire information on these sites make it available to all project planners and use it to design or modify activities.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Manage known sites (highest priority): Protect known sites. For some species apply specific management treatments such as prescribed fire.	P, C	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Manage known sites (highest priority): For rare and endemic fungus species temporarily withdraw known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Continue existing efforts to survey and manage rare and sensitive species habitat.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: For species without survey protocols start immediately to design protocols and implement surveys.	N		
Survey prior to ground-disturbing activities and manage sites: Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species survey for *Allotropa virgata Bensoniella oregana Cypripedium fasciculatum and Cypripedium montanum*. Survey for Del Norte salamanders Siskiyou Mountain salamanders and red tree voles. These surveys will precede the design of all ground-disturbing activities to be implemented in 1997 or later.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: For the other species listed in Appendix C[14] begin development of survey protocols promptly and proceed with surveys as soon as possible. These surveys will be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the FSEIS.	P, R	P, M , A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1

[14] Appendix C: Special Status Species Species to be Protected Through Survey and Manage Guidelines and Protection Buffer Species Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Survey prior to ground-disturbing activities and manage sites: Conduct surveys at a scale most appropriate to the species.	P, R	P, M A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Develop management actions/direction to manage habitat for the species on sites where they are located.	N		
Survey prior to ground-disturbing activities and manage sites: Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement.	P	P, A	EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K
Conduct extensive surveys and manage sites: Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.	P, R	P, M, A	EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K
Conduct extensive surveys and manage sites: Design these surveys for efficiency and develop standardized protocols.	N		
Conduct extensive surveys and manage sites: Begin these surveys by 1996.	N		
Conduct general regional surveys: Survey to acquire additional information and to determine necessary levels of protection for arthropods bryophytes lichens and fungi species that were not classed as rare and endemic.	N		
Conduct general regional surveys: Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.	N		
Riparian Reserves			
Timber Management: Prohibit timber harvest including fuelwood cutting in riparian reserves with the following exceptions: • Allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy and riparian reserve objectives where catastrophic events such as fire flooding volcanic wind or insect damage results in degraded riparian conditions.	N		
Timber Management: Prohibit timber harvest including fuelwood cutting in riparian reserves with the following exceptions: • Remove salvage trees only when watershed analysis determines that present and future woody debris needs are met and other Aquatic Conservation Strategy and riparian reserve objectives are not adversely affected.	N		

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Timber Management: Prohibit timber harvest including fuelwood cutting in riparian reserves with the following exceptions: • Apply silvicultural practices for riparian reserves to control stocking reestablish and manage stands and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy and riparian reserve objectives (see Appendix E[15]).	N		
Roads Management: Cooperate with Federal State and county agencies and work with private parties with road use agreements to achieve consistency in road design operation and maintenance necessary to attain Aquatic Conservation Strategy and riparian reserve objectives.	P, C, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2 EIS App. J POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by completing watershed analyses including appropriate geotechnical analyses (i.e. examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in Riparian Reserves.	P	P	EIS Secs. 4.2.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by minimizing road and landing locations in Riparian Reserves.	P	P, R	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by preparing road design criteria elements and standards that govern construction and reconstruction.	P	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by preparing operation and maintenance criteria that govern road operation maintenance and management.	P	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by minimizing disruption of natural hydrologic flow paths including diversion of streamflow and interception of surface and subsurface flow.	C, R	B, M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by restricting sidecasting as necessary to prevent the introduction of sediment to streams.	P, C	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25

[15] Appendix E: Silvicultural Systems Utilized in the Design of the Resource Management Plan Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: For each existing or planned road meet Aquatic Conservation Strategy objectives by avoiding wetlands entirely when constructing new roads.	P, C	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by reconstructing roads and associated drainage features that pose a substantial risk.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by: • Prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected. • Closing and stabilizing (or obliterating and stabilizing) roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: New culverts bridges and other stream crossings shall be constructed and existing culverts bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved to accommodate at least the 100-year flood including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels fills and hill slopes.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g. streams that can be made available to anadromous fish by removing obstacles to passage).	P, C, R	B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Aquatic Conservation Strategy objectives. As a minimum this plan will include provisions for the following activities: • Inspections and maintenance after storm events. • Inspections and maintenance during storm events. • Road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources. • Traffic regulation during wet periods to prevent damage to riparian resources. • Establishing the purpose of each road by developing the Road Management Objective.	P, C, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.3.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 25
Grazing Management: Through a planning and environmental analysis process appropriate to the action adjust or eliminate grazing practices that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	N		
Grazing Management: Locate new livestock handling and/or management facilities outside riparian reserves. For existing livestock handling facilities inside riparian reserves ensure that Aquatic Conservation Strategy and riparian reserve objectives are met. Where these objectives cannot be met require relocation or removal of such facilities.	N		
Grazing Management: Limit livestock trailing bedding watering loading and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy and riparian reserve objectives are met.	N		
Recreation Management: Design new recreational facilities within riparian reserves including trails and dispersed sites so as not to prevent meeting Aquatic Conservation Strategy and riparian reserve objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within riparian reserves evaluate and mitigate impacts to ensure that these do not prevent and to the practicable extent contribute to attainment of Aquatic Conservation Strategy and riparian reserve objectives.	N		
Recreation Management: Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives. Where adjustment measures such as education use limitations traffic control devices increased maintenance relocation of facilities and/or specific site closures are not effective eliminate the practice or occupancy.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Recreation Management: Address attainment of Aquatic Conservation Strategy and riparian reserve objectives in wild and scenic river and wilderness management plans.	N		
Energy and Minerals Management: Require a Plan of Operations including a reclamation plan and reclamation bond for all mining operations in riparian reserves. Such plans and bonds will address the costs of removing facilities equipment and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet Aquatic Conservation Strategy and riparian reserve objectives.	N		
Energy and Minerals Management: Locate structures support facilities and roads outside riparian reserves. If no alternative to siting facilities in riparian reserves exists locate in a way compatible with Aquatic Conservation Strategy and riparian reserve objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in riparian reserves. When a road is no longer required for mineral or land management activities it will be reclaimed. In any case access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in riparian reserves.	N		
Mineral Management: Avoid locating solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock spent ore and tailings) facilities in Riparian Reserves exists if releases can be prevented and if stability can be ensured then: • Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics. • Reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. • Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. • Require reclamation bonds adequate to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.	N		
Energy and Minerals Management: Where an existing operator is in noncompliance at the notice level (i.e. causing unnecessary or undue degradation) require actions similar to those stated above to meet the intent of 43 CFR 3809.	N		
Energy and Minerals Management: For leasable mineral activity in Riparian Reserves prohibit surface occupancy for oil gas and geothermal exploration and development activities where leases do not exist. Where possible modify the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy and riparian reserve objectives consistent with existing lease terms and stipulations.	N		
Energy and Minerals Management: Allow development of saleable minerals such as sand and gravel within riparian reserves only if Aquatic Conservation Strategy and riparian reserve objectives can be met.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fire Management: Design fuel treatment fire suppression strategies practices and activities to meet Aquatic Conservation Strategy and riparian reserve objectives and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 EIS App. F EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Fire Management: Locate incident bases camps helibases staging areas helispots and other centers for incident activities outside of riparian reserves. If the only suitable location for such activities is within the riparian reserve an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location use conditions and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations.	N		
Fire Management: Minimize delivery of chemical retardant foam or other additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exists or following a review and recommendation by a resource advisor when an escape would cause more long-term damage.	N		
Fire Management: Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, R	P, M	EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 EIS App. J POD Att. 18 POD Att. 29
Fire Management: Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy and riparian reserve objectives whenever riparian reserves are significantly damaged by a wildfire or a prescribed fire burning outside prescribed parameters.	N		
Fire Management: Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on watershed analysis and planning. Until watershed analysis is completed suppress wildfires to avoid loss of habitat and to maintain future management options.	N		
Fire Management: Consider rapidly extinguishing smoldering coarse woody debris and duff.	N		
Fire Management: Locate and manage water drafting sites (e.g. sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian habitat and water quality as consistent with Aquatic Conservation Strategy and riparian reserve objectives.	N		
Lands Management: Identify instream flows needed to maintain riparian resources channel conditions and fish passage.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Lands Management: Issue leases permits rights-of-way and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives. Where legally possible adjust existing leases permits rights-of-way and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy and riparian reserve objectives. If adjustments are not effective and where legally possible eliminate the activity. Priority for modifying existing leases permits rights-of-way and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.3, 2.1.5 & 2.1.6 EIS Sec. 4.1.3.5 EIS App. J POD Att. 25
Lands Management: Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.	N		
Lands Management: For proposed hydroelectric projects and other surface water development proposals under the jurisdiction of the Federal Energy Regulatory Commission (the Commission) provide timely written comments regarding maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of riparian reserves. For existing support facilities inside riparian reserves that are essential to proper management provide recommendations to the Commission that ensure Aquatic Conservation Strategy and riparian reserve objectives are met. Where these objectives cannot be met provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the riparian reserves should be located operated and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	N		
Lands Management: For hydroelectric and other surface water development proposals in Tier One key watersheds require instream flows and habitat conditions that maintain or restore riparian resources favorable channel conditions and fish passage. Coordinate this process with the appropriate State agencies. For other hydroelectric and surface water development proposals in all other watersheds give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources favorable channel conditions and fish passage. Coordinate this process with the appropriate State agencies.	N		
General Riparian Area Management: Identify and attempt to secure instream flows needed to maintain riparian resources channel conditions and aquatic habitat.	N		
General Riparian Area Management: Fell trees in riparian reserves when they pose a safety risk. Keep felled trees on site when needed to meet coarse woody debris objectives	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.2.2& 4.5.2.3 POD Att. 20

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
General Riparian Area Management: Apply herbicides insecticides other toxicants and other chemicals only in a way that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, C, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
General Riparian Area Management: Locate water drafting sites to minimize adverse effects on stream channel stability sedimentation and instream flows needed to maintain riparian resources channel conditions and fish habitat.	N		
Watershed and Habitat Restoration: Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems conserves the genetic integrity of native species and attains Aquatic Conservation Strategy and riparian reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 12 POD Att. 29
Watershed and Habitat Restoration: Cooperate with Federal State local and Tribal agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy and riparian reserve objectives.	N		
Watershed and Habitat Restoration: Prevent watershed and habitat degradation rather than relying on mitigation measures or planned restoration.	N		
Fish and Wildlife Management: Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Fish and Wildlife Management: Design construct and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives. For existing fish and wildlife interpretative and other user-enhancement facilities inside riparian reserves ensure that Aquatic Conservation Strategy and riparian reserve objectives are met. Where Aquatic Conservation Strategy and riparian reserve objectives cannot be met relocate or close such facilities.	N		
Fish and Wildlife Management: Cooperate with Federal Tribal and State wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy and riparian reserve objectives.	N		

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Fish and Wildlife Management: Cooperate with Federal Tribal and State fish management agencies to identify and eliminate impacts associated with habitat manipulation fish stocking harvest and poaching that threaten the continued existence and distribution of native fish stocks occurring on Federal lands.	N		
Late-Successional Reserves			
Develop late-successional reserve assessments prior to habitat manipulation (see Appendix A[16]).	P	P	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. H EIS App. J
A management assessment will be prepared for each large late-successional reserve (or group of smaller late-successional reserves) before habitat manipulation activities are designed and implemented. These assessments may be developed as part of province-level planning or as standalone assessments. If developed to stand alone the assessments will be closely coordinated with subsequent watershed analysis and province-level planning. SEIS ROD standards and guidelines should be refined at the province level prior to development of late-successional reserve assessments.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Silvicultural treatments for the establishment and maintenance of desired conifer and non-conifer species on units harvested prior to EIS App. H designation may precede completed management assessments (see C-12 of SEIS ROD). Only in unusual circumstances will other silvicultural treatments including prescribed fire precede preparation of this management assessment. Late-successional reserve assessments are subject to review by the Regional Ecosystem Office. Until late-successional reserve assessments are completed fire suppression activities should be guided by land allocation objectives in coordination with local resource management specialists.	N		
Projects and activities within late-successional reserves (including restoration recreation projects for public safety thinning and salvage) may proceed in fiscal years 1995-96 using initial late-successional reserve assessments done at a level of detail sufficient to assess whether the activities are consistent with the objectives of the late-successional reserves.	N		
Plan and implement non-silvicultural activities inside late-successional reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Using interdisciplinary teams evaluate other activities not described below and document appropriate guidelines.	N		

[16] Appendix A: Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl Standards and Guidelines for Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Request review by the Regional Ecosystem Office of all activities deemed to have potential adverse effects on late-successional reserve objectives. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Silviculture: Plan and implement silvicultural treatments inside late-successional reserves that are beneficial to the creation of late-successional habitat (see Appendix E[17]).	N		
Silviculture: If needed to create and maintain late-successional forest conditions conduct thinning operations in forest stands less than 80 years of age. This will be accomplished by precommercial or commercial thinning of stands regardless of origin (e.g. planted after logging or naturally regenerated after fire or blowdown).	N		
Silviculture: EIS App. Hs would be managed to reduce the risk of large scale disturbance such as from wildfire and the subsequent loss of habitat for old-growth associated species.	N		
Salvage: Limit salvage of dead trees in late-successional reserves to areas where stand-replacing events exceed ten acres in size and canopy closure has been reduced to less than 40 percent.	N		
Salvage: Retain all standing live trees including those injured (e.g. scorched) but likely to survive.	N		
Salvage: Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.	N		
Salvage: Retain adequate coarse woody debris quantities in a new stand so that in the future it will still contain amounts similar to naturally regenerated stands. Watershed-level or province-level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to coarse woody debris over the long term.	N		
Salvage: If an EIS App. H assessment indicates it is essential to reduce future risk of fire or insect damage conduct salvage that does not meet the preceding management actions/direction. Focus on those areas where there is high risk of large scale disturbance.	N		
Salvage: Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.	N		
Salvage: After disturbance in younger stands develop diameter and biomass retention direction consistent with the intention of achieving late-successional forest conditions. Where green trees snags and logs are present following disturbance the green-tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.	N		

[17] Appendix E: Silvicultural Systems Utilized in the Design of the Resource Management Plan Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Salvage: Retain logs present on the forest floor before a disturbance event.	N		
Salvage: Retain coarse woody debris to approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.	N		
Salvage: Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit deviations to as small an area as possible.	N		
Road Construction and Maintenance: Construct roads in late-successional reserves if the potential benefits of silviculture salvage and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines they will be kept to a minimum be routed through unsuitable habitat where possible and be designed to minimize adverse impacts. Alternate access methods such as aerial logging will be considered to provide access for activities in reserves.	P, C	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.6 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. H POD Att. 25
Road Construction and Maintenance: Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 20 POD Att. 25
Fuelwood Gathering: Permit fuelwood gathering only in existing cull decks in areas where green trees are marked by silviculturists for thinning in areas where blowdown is blocking roads and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance from high intensity wildfire. In all cases these activities will comply with management actions/direction for salvage and silvicultural activities.	N		
Energy and Minerals: Assess the impacts of ongoing and proposed mining activities in late-successional reserves.	N		
Energy and Minerals: Include stipulations in mineral leases and when legally possible require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.	N		
Developments: Neither construct nor authorize new facilities that may adversely affect late-successional reserves.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Developments: Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on late-successional reserves.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Developments: Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.	P	P, R	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H
Developments: Maintain existing developments such as campgrounds utility corridors and electronic sites consistent with other management actions/direction for late-successional reserves.	P, C, O	P, B	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Developments: Remove hazard trees along utility rights-of-way and trails and in other developed areas.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.2.2 POD Att. 20 POD Att. 25
Land Exchanges: Consider land exchanges in late-successional reserves if they provide benefits equal to or better than current conditions.	N		
Land Exchanges: Consider land exchanges especially to improve area distribution and quality (e.g. connectivity shape and contribution to biological diversity) of late-successional reserves especially where public and private lands are intermingled.	N		
Habitat Improvement Projects: Design projects to improve conditions for fish wildlife special status species, SEIS special attention species and watersheds if they provide late-successional habitat benefits or if their adverse effect on late-successional associated species is negligible.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS Sec. 4.7.4.4 EIS App. F EIS App. H POD Att. 29
Habitat Improvement Projects: Consider projects required for recovery of threatened or endangered species even if they result in some reduction of habitat quality for other late-successional species.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS Sec. 4.7.4.4 EIS App. F EIS App. H POD Att. 29
Habitat Improvement Projects: Design and implement watershed restoration projects consistent with late-successional reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Livestock Grazing: Through an interdisciplinary process implement range-related management activities that do not adversely affect late-successional habitat.	N		
Livestock Grazing: Through a planning and environmental analysis process appropriate to the action adjust or eliminate grazing practices that retard or prevent attainment of late-successional reserve objectives.	N		
Livestock Grazing: Evaluate effects of existing and proposed livestock management and handling facilities in late-successional reserves to determine if reserve objectives are met. Where objectives cannot be met relocate livestock management and/or handling facilities.	N		
Fire Suppression and Prevention: As part of watershed analysis or late-successional reserve assessments plan fire management for each late-successional reserve.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fire Suppression and Prevention: Emphasize maintaining late-successional habitat in wildfire suppression plans.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Fire Suppression and Prevention: Use minimum impact suppression methods for fuel management in accordance with guidelines for reducing risks of large-scale disturbances.	C, R, O	B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Fire Suppression and Prevention: During actual fire suppression activities consult an interdisciplinary team or environmental specialist to assure that habitat damage is minimized.	C, R, O	B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Fire Suppression and Prevention: Until a fire management plan is completed for a late-successional reserve or group of reserves suppress wildfire to avoid loss of habitat and to maintain future management options.	N		
Fire Suppression and Prevention: Prepare a specific fire management plan prior to any habitat manipulation activities in late-successional reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the late-successional reserve. Until the plan is approved proposed activities will be subject to review by the Regional Ecosystem Office.	N		
Fire Suppression and Prevention: Apply prescribed fire in a manner that retains the amount of coarse woody debris determined through watershed analysis.	C, O	B	EIS Sec. 4.1.3.6 EIS App. H EIS App. J POD Att. 11 POD Att. 18
Fire Suppression and Prevention: Limit the size of all fires until assessment or activity plans are completed.	N		
Fire Suppression and Prevention: Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.	N		
Fire Suppression and Prevention: Consider rapidly extinguishing smoldering coarse woody debris and duff.	N		
Special Forest Products: Evaluate whether special forest product harvest activities have adverse effects on late-successional reserve objectives.	N		
Special Forest Products: Prior to selling special forest products ensure resource sustainability and protection of other resource values such as special status plant or animal species.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Special Forest Products: Where special forest product activities are extensive evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.	N		
Recreational Uses: Use adjustment measures such as education use limitations traffic control devices or increased maintenance when dispersed and developed recreation practices retard or prevent attainment of late-successional reserve objectives.	N		
Rights-of-Way Contracted Rights Easements and Special/ Temporary Use Permits: Consider as valid uses access to nonfederal lands through late-successional reserves and existing rights-of-way agreements contracted rights easements and special/temporary use permits in late-successional reserves.	P	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 2.1.5 & 2.1.6 EIS Sec. 4.1.3.6 EIS App. H POD Att. 20 POD Att. 25
Rights-of-Way Contracted Rights Easements and Special/ Temporary Use Permits: For all new rights-of-way proposals design mitigation measures to reduce adverse effects on late-successional reserves. Consider alternate routes that avoid late-successional reserves. If rights-of-way must be routed through a reserve design and locate them to have the least impact on late-successional habitat.	P, R	P, R, M	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 3.4.3 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 20 POD Att. 25 POD Att. 29
Rights-of-Way Contracted Rights Easements and Special/ Temporary Use Permits: Review all special/temporary use permits. When objectives of late-successional reserves are not being met reduce impacts through education or modification of existing permits.	C, O	B	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 4.1.3.6 EIS App. H
Nonnative Species: If introduction of a nonnative species is proposed complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional objectives.	N		
Nonnative Species: Evaluate impacts of non-native species (plant and animal) existing within reserves.	N		
Nonnative Species: Develop plans and recommendations for eliminating or controlling nonnative species that are inconsistent with late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within late-successional reserves.	P, R	P, M	EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. H POD Att. 9 POD Att. 14 POD Att. 29
Applegate Adaptive Management Area – Not Applicable, Excluded From Table			
Managed Late-Successional Areas			

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Where sites are occupied by Siskiyou Mountain salamander or Del Norte salamander protect the site from ground disturbing activities. Designate a buffer of at least the height of one site-potential tree or a 100-foot horizontal distance whichever is greater surrounding the location. Within the site and the surrounding buffer maintain at least 40 percent canopy closure and avoid any activities that would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy.	N		
Matrix (General Forest Management Area and Connectivity/Diversity Blocks)			
General Forest Management Areas: Conduct timber harvest and other silvicultural activities in that portion of the Matrix with suitable forestlands according to management actions/ direction summarized below and in the Timber section (see Appendices E and F).	N		
General Forest Management Areas: Within the General Forest Management Area north of Grants Pass (northern GFMA) retain at least 6 to 8 green conifer trees per acre in regeneration harvest units.	N		
General Forest Management Areas: Within the General Forest Management Area south of Grants Pass (southern GFMA) retain at least 16 to 25 large green conifer trees per acre in regeneration harvest units.	N		
General Forest Management Areas: Where sites are occupied by Siskiyou Mountain Salamander or Del Norte Salamander protect the site from ground disturbing activities. Designate a buffer of at least the height of one site-potential tree or a 100-foot horizontal distance whichever is greater surrounding the location. Within the site and the surrounding buffer maintain at least 40 percent canopy closure and avoid any activities that would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy. These sites are referred to as managed late-successional reserves in the SEIS ROD.	N		
General Forest Management Areas: Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species survey for *Allotropa virgate, Bensoniella oregano, Cypripedium fasciculatum,* and Cypripedium montanum. Survey for Del Norte salamanders Siskiyou Mountain salamanders and red tree voles. These surveys will precede the design of all ground-disturbing activities to be implemented in 1997 or later.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Secs. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App.K EIS App. M LMP Amendment BLM/FS-1
General Forest Management Areas: Protect known occupied locations of *Ptilidium californicum* (Liverwort) by deferring timber harvest and avoiding removal of fallen trees and logs. The district has one known site at this time.	N		
General Forest Management Areas: If *Ulota meglospora* (Moss) *Aleuria rhenana* (Fungus) *Otidea leoporina Otidea onotica* and *Otidea smithii* (Fungi) are discovered defer ground-disturbing activities.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Connectivity/ Diversity (C/D) Blocks Spaced Throughout the Matrix Lands in the Northern GFMA: Maintain at least 25 to 30 percent of each block in late-successional forest. Riparian reserves and other allocations with late-successional forest count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.	N		
Connectivity/ Diversity (C/D) Blocks Spaced Throughout the Matrix Lands in the Northern GFMA: Retain at least 12 to 18 green conifer trees per acre in regeneration harvest units.	N		
Air Quality			
By the year 2000 reduce particulate matter emissions and impacts from prescribed burning by 50 percent from the baseline period (1976-1979). This will be accomplished by planning conducting monitoring and if necessary adjusting prescribed fire activities in accordance with the Oregon State Implementation Plan and the Oregon Smoke Management Plan.	P, C, O	P, B	EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 9 POD Att. 18
Minimize broadcast burning in favor of lower intensity underburning. Use emission reduction mitigation measures and smoke dispersal techniques to the greatest practical extent.	N		
Wildfire hazard reduction site preparation and the use of prescribed fire for species habitat mitigation will be implemented in a manner consistent with ecosystem management objectives.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Where appropriate use dust abatement measures during construction activities and on roads during BLM wood product removal or other BLM commodity hauling activity. Encourage dust abatement measures when haulers use BLM roads under permits and rights-of-way agreements.	C, R	B, M	EIS Sec. 4.10.2.6 POD Att. 2 POD Att. 25 POD Att. 29
Prepare conformity determinations required by the Clean Air Act as part of implementing planning.	P	P	EIS Sec. 1.5.1.8 EIS Secs. 4.12.1.2 & 4.12.1.3 POD Att. 2
Perform an emissions tradeoff analysis to determine and quantify the effects of prescribed burning and other types of fuel management on reduction of wildfire emissions. This analysis should be performed at the same geographic scale as conformity determinations.	P	P	EIS Sec. 1.5.1.8 EIS Secs. 4.12.1.2 & 4.12.1.3 POD Att. 2
For designated nonattainment areas where smoke from woodstoves has shown to be a major source of particulate matter directly affecting both health and visibility mitigation can include close permitted firewood cutting use on or before September 30 of each year to assure that firewood is not collected when it is wet and some curing time is available prior to burning.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
For designated nonattainment areas where smoke from woodstoves has shown to be a major source of particulate matter directly affecting both health and visibility mitigation can include coordinating the issuance of educational information with wood cutting permits that target proper gathering practices and ways to minimize adverse effects on air quality from inefficient burning wood.	N		
For designated nonattainment areas where smoke from woodstoves has shown to be a major source of particulate matter directly affecting both health and visibility mitigation can include cooperating with local air quality control agencies and other Federal land management agencies to assure uniform and accurate dissemination of public information and educational material on proper firewood use and enforcement of permit requirements across agency boundaries.	N		
Water and Soils			
Late-Successional Reserves: Consider watershed restoration projects if they provide late-successional habitat benefits or if their effect on late-successional associated species is neutral or beneficial. Design and implement watershed restoration projects in a manner that is consistent with late-successional reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
General: Improve and/or maintain soil and water conditions by closing selected areas to off-highway vehicle use and/ or limiting such use to existing or designated roads and trails.	P, C, R, O	B, M	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Sec. 4.8.1.2 EIS Sec. 4.8.2.3 EIS Sec. 4.10.2.5 POD Att. 9 POD Att. 19 POD Att. 25 POD Att. 29
Water: Continue to implement a nonpoint source management program in cooperation with the U. S. Environmental Protection Agency and the Oregon Department of Environmental Quality.	C, O	B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS App. J POD Att. 9 POD Att. 28
Water: Ensure consistency of management activities with Oregon's Statewide Water Quality Management Plan for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41). This includes consistency with Oregon's program for water quality limited streams in the planning area which are Bear Creek and its tributaries Little Butte Creek and Evans Creek.	C, O	B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS App. J

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Continue coordination with the Oregon Department of Environmental Quality for implementation of best management practices that protect beneficial uses of water.	C, O	B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2 & 4.4.3 EIS App. J
Water: Protect floodplains and wetlands in accordance with Executive Orders 11988 and 11990 and BLM's Riparian-Wetlands Initiative for the 1990s (USDI BLM 1991a).	P, C, R, O	P, B, M	EIS Sec. 1.5.1.7 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4.2 EIS App. J POD Att. 28 POD Att. 29
Water: Cooperate with Federal State local and Tribal agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy and riparian reserve objectives.	N		
Water: Prepare watershed plans in conjunction with and for the following community water systems where BLM administers a significant portion of land within the watershed: • city of Butte Falls • city of Glendale (section of Mill Creek) • city of Talent (Wagner Creek) and • city of Yreka.	N		
Water: Use watershed analysis to identify water quality concerns, watershed restoration opportunities and water monitoring strategies.	P, R	P, M	EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4 EIS App. F EIS App. J POD Att. 9 POD Att. 13 POD Att. 28 POD Att. 29
Water: Design and implement watershed restoration projects that promote long-term ecological integrity of ecosystems conserve the genetic integrity of native species and attain Aquatic Conservation Strategy and riparian reserve objectives (see Aquatic Conservation Strategy and Riparian Reserve sections for additional guidance).	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 29

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Manage uplands to minimize nonpoint source pollution and moderate extremes in streamflow by maintaining or improving hydrologic functions (e.g. infiltration instream flow groundwater quantity etc.).	C, R, O	B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Water: Prevent watershed degradation rather than using mitigation or planned restoration to correct foreseeable problems caused by management activities.	N		
Water: Defer the following areas (approximately 49636 acres) identified as having high watershed cumulative effects from management activities including timber harvest and other surface-disturbing activities for ten years starting from January 1993. Management activities of a limited nature (e.g. riparian fish or wildlife enhancement salvage etc.) could be permitted in these areas if the effects will not increase the cumulative effects. Watershed analysis plans will be prepared if rehabilitation is deemed appropriate. The following areas will be reevaluated during the next planning cycle or by January 2003. (See Map 5)	N		
Water: Designate four areas covering approximately 4000 acres as watershed monitoring areas and defer them from timber harvest and other management activities over the planning period. Tentative watershed selections are East Fork Bobby Creek Upper Star Gulch Upper Morine Creek and Pipe Fork. These watersheds when paired with like watersheds where management activities will occur will provide baseline information of the effects of management activities on water quality and quantity.	N		
Water: Identify instream flows needed to maintain riparian resources channel conditions aquatic habitat and water quality. Attempt to acquire or encourage the State of Oregon to acquire instream flow water rights.	N		
Water: Apply for water rights to support the needs for fire suppression construction/maintenance (e.g. pump chances water holes and reservoirs) grazing recreation and other programs.	N		
Water: Locate water drafting sites to minimize adverse effects on stream channel stability sedimentation and in-stream flows needed to maintain riparian resources channel conditions and fish habitat.	N		
Water: If herbicides insecticides and other chemicals are applied do so in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, C, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Soil: Apply best management practices during all ground- and vegetation-disturbing activities. See Appendix D [18]for a list of practices.	C, R, O	B, M	EIS Sec. 2.4.2 POD Att. 9 POD Att. 20 POD Att. 29
Soil: Utilize silvicultural systems that are capable of maintaining or improving long-term soil productivity	N		
Soil: Design logging systems to avoid or minimize adverse impacts to soils.	P	P	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.2.2 & 4.5.2.3 EIS App. J POD Att. 9 POD Att. 20 POD Att. 28
Soil: Provide a renewable supply of large down logs well distributed across the Matrix lands in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand. Models will be developed for groups of plant associations and stand types that can be used as a baseline for developing prescriptions.	C, O	B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.2.2 & 4.5.2.3 EIS App. J POD Att. 9 POD Att. 20 POD Att. 28
Soil: Leave a minimum of 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Where this management actions/direction cannot be met with existing coarse woody debris merchantable material will be used to make up the deficit.	N		
Soil: In areas of partial harvest apply the same basic management actions/direction but they can be modified to reflect the timing of stand development cycles.	N		
Soil: Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g. slash burning and yarding).	C, R, O	B, M	EIS Sec. 2.6.2 EIS Sec. 4.3.3.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 20 POD Att. 29

[18] Appendix D: Best Management Practices Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Soil: Use watershed analysis to determine appropriate amounts of coarse woody debris for site-specific conditions.	P, R	P, M	EIS Sec. 1.4.2 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. F EIS App. J POD Att.16 POD Att. 20 POD Att. 28 POD Att. 29
Soil: Manage lands dominated by fragile granitic and schist soils consistent with southern general forest management area guidelines. In addition limit surface-disturbing activities on all lands dominated by fragile granitic schist and pyroclastic soils (approximately 85300 acres) to maintain site productivity reduce soil erosion and minimize water quality degradation. These soils are scattered throughout the planning area however the largest concentrations of soils formed from decomposed schist and/or granite parent material occurs in Evans Snow Sugar and Meadow Creeks upper portions of Williams Creek and headwaters of Birdseye Creek. Soils formed in deeply weathered pyroclastic parent materials are predominantly in the foothills of the Cascades. (See Map 6 and Appendix D [19]for fragile soils mitigation measures.)	N		
Soil: While the goal of maintaining long-term soil productivity is inherent in all management practices it is recognized that some minor losses in productivity could result due to surface disturbances (soil compaction road construction etc.) caused by management activities. Implementing best management practices and minimizing disturbance of fragile areas will keep losses to a minimum (see Appendix D[7]).	C, R, O	B, M	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.2.2.1 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Sec. 4.3.3 EIS Sec. 4.4.4.2 EIS Secs. 4.5.1.3 & 4.5.2.3 EIS Secs. 4.7.4.1 – 4.7.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Wildlife Habitat			

[19] Appendix D: Best Management Practices Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Use the watershed analysis process to address wildlife habitat issues for individual watersheds. The analysis will help to resolve any concerns identified in applying management actions/direction in this section and those in the Special Status and SEIS Special Attention Species section. Where appropriate more site-specific habitat objectives and wildlife habitat enhancement opportunities will be identified through this process.	P, R	P, M	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.6.1.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. H EIS App. J POD Att. 29
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of wildlife habitat enhancement projects.	N		
All Land Use Allocations: Cooperate with Federal Tribal and State wildlife management agencies to identify and eliminate impacts associated with habitat manipulation poaching and other activities that threaten the continued existence and distribution of native wildlife inhabiting Federal lands.	N		
All Land Use Allocations: Land will be acquired to facilitate wildlife habitat management as appropriate.	N		
Riparian Reserves: Design and implement wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.6.1.3 EIS App. F EIS App. J POD Att. 29
Riparian Reserves: Design construct and operate wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives. For existing wildlife interpretative and other user-enhancement facilities inside riparian reserves ensure that Aquatic Conservation Strategy and riparian reserve objectives are met. Where Aquatic Conservation Strategy and riparian reserve objectives cannot be met relocate or close such facilities.	N		
Late-Successional Reserves: Design projects to improve conditions for wildlife if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS Sec. 4.6.1.3 EIS App. F EIS App. H POD Att. 10 POD Att. 29
Late-Successional Reserves: If introduction of a nonnative species is proposed complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional reserve objectives.	N		
Late-Successional Reserves: Evaluate impacts of nonnative species existing within late-successional reserves.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Late-Successional Reserves: Establish a one-quarter mile protection zone around known great gray owl nest sites and provide a 300 foot no-harvest buffer around meadows and natural openings. Develop a standardized protocol for surveys within one year.	N		
Cavity Users: Snag and green tree retention of lands allocated to timber management. Provide for 100 percent of optimum woodpecker populations. Snag and green tree retention on lands not allocated to timber management. Unmerchantable snags and culls would be retained unless safety hazard. Provide for 40 percent of the mean number of snags found in unentered stands.	N		
Coarse Woody Debris (CWD): CWD retention on lands allocated to timber management. CWD would be retained to approximate the mean levels found in unentered stands. Retain 120 linear feet per acre logs equal to or greater than 16 inches in diameter and 16 feet long.	N		
Special Habitats: Special habitats would be protected or enhanced for wildlife habitat with a 100 to 200 foot buffer. New road location. Roads would avoid special habitats and minimize effects to wetlands and riparian areas. Off-highway vehicle closure. Meadows and wetlands would be closed to off-highway vehicle use.	P, C, R, O	P, B, R, M	EIS Sec. 2.1.4 EIS Sec. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.7.1.6 EIS Secs. 4.10.2.5 & 4.10.2.6 EIS App. F EIS App. M POD Att. 9 POD Att. 10 POD Att. 25 POD Att. 29
Cliffs: Peregrine nests and potential peregrine nests would be protected.	N		
Talus Slopes: Sites where Del Norte and Siskiyou salamanders are found would be protected.	N		
Land Tenure: Land would be acquired to facilitate wildlife habitat management.	N		
Matrix: Within the General Forest Management Area north of Grants Pass (northern GFMA) retain at least 6to 8 green conifer trees per acre in regeneration harvest units.	N		
Matrix: Within the matrix provide snags and future sources of snags to maintain 100 percent of the potential population levels of white-headed and black-backed woodpeckers. Within the range of these species this level of snag retention will be added to the normal standards and guidelines for snag retention levels in the Matrix. It is assumed these snag levels are adequate to provide adequate habitat for pygmy nuthatches and flammulated owls.	N		
Matrix: Retain snags and green trees within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per-acre requirements met on average areas no larger than 40 acres.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix: In addition to the previous green-tree retention management actions/direction retain green trees for snag recruitment in timber harvest units where there is an identified near-term (less than three decades) snag deficit. These trees do not count toward the green-tree retention requirements.	N		
Matrix: Additional trees may need to be retained to contribute to bat roost sites on a site-specific basis.	N		
Raptors and Great Blue Heron: Protect nest sites centers of activity or rookeries as necessary to maintain the integrity of the site. Human disturbances that may disturb or interfere with nesting will be prohibited within one-quarter mile of active nesting areas between approximately March 1 and July 15.	P, C, O	P, R	EIS Sec. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Roosevelt Elk: Manage elk management areas (171,000 acres) to enhance elk habitat consistent with the objectives of other allocations (timber old-growth connectivity): • All roads except major collectors and arterials will be closed. New road construction will be minimized. • Limit motorized vehicle use to an open road density of 1.5 miles per square mile where possible. • Impose seasonal restrictions on activities if needed to avoid disturbance and harassment. • Maintain or enhance forage where appropriate by creating small openings in conifer stands of all ages prescribed burning seeding fertilizing underburning forest stands or other means. In Matrix lands priority would be given to utilizing portions of stands with little or no conifer stocking. • Manage the mix of forage areas thermal cover hiding cover and optimal cover to maintain or attain highly viable habitat condition for each of the four indices using the Wisdom Elk Model or equivalent model (see Appendix 2-WL-1 Draft RMP).	N		
Roosevelt Elk: Maintain target habitat conditions. Within selected elk management areas forage and cover would be managed to maintain habitat effect indices of at least 0.6.	N		
Roosevelt Elk: Within elk management areas, forage would be managed by creating small openings burning seeding fertilizing and other means.	N		
Roosevelt Elk: Lands would be acquired to facilitate habitat management.	N		
Deer and Elk Winter Range: Manage about 97100 acres of deer and elk winter range in the Cascade foothills as winter range with an emphasis on providing thermal cover and minimizing disturbances.	N		
Deer and Elk Winter Range: All roads except major collectors and arterials will be closed between November 15 and April 1. New road construction will be minimized.	N		
Deer and Elk Winter Range: Maintain at least 20 percent of these areas in thermal cover 70 percent canopy closure canopy height of at least 40 feet and large enough to avoid edge effects.	N		
Deer and Elk Winter Range: Restrict activities to avoid disturbance between approximately November 15 and April 1.	C, O	B	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Deer and Elk Winter Range: Where elk management areas overlap with winter range areas management directions for both areas will be applied.	N		
Deer and Elk Winter Range: Thermal cover. At least 20 percent of these areas would be maintained in thermal cover. Habitat management plans would be prepared unless incorporated into watershed analysis.	N		
Deer and Elk Winter Range: Activities would be restricted to avoid disturbance Nov. 15 to April 1.	C, O	B	EIS Secs. 4.6.1.2 & 4.6.1.3
Deer and Elk Winter Range: Permanent forage areas would be created only on lands not managed for timber.	N		
Special Habitats: Protect special habitats for plants and animals such as meadows, cliffs, caves, and talus slopes from disturbance as appropriate to the specific site. Generally the no harvest buffer will vary from 100-200 feet but could be increased or decreased based on site-specific circumstances and the objective to protect the special habitat values. Protection and necessary mitigation will be determined during activity planning.	P, C, O	P, B, R, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.3 & 4.1.3.4 EIS Sec. 4.1.3.6 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. H EIS App. K EIS App. J EIS App. M POD Att. 10 LMP Amendment BLM/FS-1
Special Habitats: Use management practices including fire to obtain desired vegetation conditions in special habitats.	C, R, O	B, M	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10 POD Att. 29
Oak Stands: White oak woodlands will be managed to maintain or enhance values for wildlife habitat range botanical values and biological diversity. Utilize prescribed fire to maintain habitat conditions within the white oak woodland communities.	N		
Golden Eagles: Protect approximately 30 acres around all golden eagle nest sites. Within those areas allow no timber harvest or other habitat removal. Human disturbance will be prohibited between approximately March 1 and July 15. No new roads will be constructed within the 30-acre core area around active nests.	N		
Fisheries Habitat			
Riparian Reserves: Design and implement fish habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 29

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Riparian Reserves: Design construct and operate fish interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives. For existing fish interpretative and other user-enhancement facilities inside riparian reserves ensure that Aquatic Conservation Strategy and riparian reserve objectives are met. Where Aquatic Conservation Strategy and riparian reserve objectives cannot be met relocate or close such facilities.	N		
Riparian Reserves: Cooperate with Federal Tribal and State fish management agencies to identify and eliminate impacts associated with habitat manipulation fish stocking harvest and poaching that threaten the continued existence and distribution of native fish stocks inhabiting Federal lands.	N		
Late-Successional Reserves: Design projects to improve conditions for fish if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS App. F POD Att. 29
All Land Use Allocations: Use the watershed analysis process to address at-risk fish species and stocks and their habitat for individual watersheds. Where appropriate fish habitat enhancement opportunities will be identified through this process.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. M POD Att. 29
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife Wild Fish Policy during planning and implementation of fish habitat enhancement projects. Priority will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration.	N		
All Land Use Allocations: As identified through watershed analysis, rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures would include but not be limited to fish passage improvements instream structures using boulders and log placement to create spawning and rearing habitat placement of fine and coarse materials for over-wintering habitat and riparian rehabilitation to establish or release existing coniferous trees. See Table 3[20] for a list of possible fish enhancement projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.7.4.4 EIS App. F EIS App. J POD Att. 29
All Land Use Allocations: Except for land tenure Zone 3 lands riparian and fish habitat will be retained unless land exchanges would improve management of fish wildlife or riparian habitat elsewhere.	N		
All Land Use Allocations: BLM would work with the Oregon Department of Fish and Wildlife to determine appropriate streamflows for instream water rights to maintain or enhance aquatic habitat particularly for special status species.	N		

[20] Table 3: Potential Fish Habitat Projects Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Best Management Practices (Appendix D[21]) will be implemented for water quality and soil productivity whenever appropriate and practical to minimize adverse effects of management actions on water quality, fish and riparian habitat.	C, R, O	B, M	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 POD Att. 29
All Land Use Allocations: BLM ownership in the watersheds shown on Table 4[22] would be blocked up where possible to improve watershed management for: • Federal candidate fish and amphibian species (Jenny Creek sucker Redband trout and Western pond turtle); • State of Oregon and American Fisheries Society sensitive fish species (coho salmon winter and summer steelhead); and • Prevent decline of other priority fish species in other watersheds.	N		
Special Status and SEIS Special Attention Species Habitat			
Late-Successional Reserves: Consider projects required for recovery of threatened or endangered animal and plant species even if they result in some reduction of habitat quality for late-successional species. These projects will be designed for least impact to late-successional species.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. K EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Review all proposed actions to determine whether or not special status species occupy or use the affected area or if habitat for such species could be affected.	P	P	EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Conduct field surveys according to current protocol. This includes surveying during the proper season. Field surveys may not be conducted in all cases depending on the number and timing of previous surveys conducted whether previous surveys looked for all species that a new survey would and the likelihood of potential habitat. The intensity of field surveys will also vary depending on the same factors.	P	P	EIS Sec. 1.5.4.1 EIS Sec. 4.4.4 EIS. Secs. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Consult/conference with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action that may affect Federally listed or proposed species or their critical or essential habitat. Based on the results of consultation modify relocate or abandon the proposed action. Request technical assistance from one of these agencies for any proposed action that may affect Federal candidate species or their habitat.	P	P	EIS Sec. 1.5.1 EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10

[21] Appendix D: Best Management Practices Record of Decision for the Medford District Resource Management Plan 1995

[22] Table 4: Acquisition Needs to Improve Watershed Management for Fish Production Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Coordinate with the USFWS, NMFS and other appropriate agencies and organizations and jointly endeavor to recover Federal listed and proposed plant and animal species and their habitats.	N		
All Land Use Allocations – Special Status Species: Modify, relocate or abandon proposed actions that contribute to the need to list Federal candidate species State listed species Bureau-sensitive species or their habitats.	P, C, R, O	P, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 3.4.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Coordinate with the State of Oregon to conserve State listed species.	N		
Special Status Species: Identify impacts of proposed actions if any to Bureau-sensitive and assessment species and clearly describe impacts in environmental analyses. As funding permits and as species conservation dictates assessment species will be actively managed.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. K EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Retain under Federal management (or other appropriate management organizations) habitat essential for the survival or recovery of listed and proposed species. Retain habitat of candidate or Bureau-sensitive species where disposal could contribute to the need to list the species.	N		
All Land Use Allocations – Special Status Species: Where appropriate opportunities exist acquire land to contribute to recovery reduce the need to list or enhance special status species habitat.	N		
All Land Use Allocations – Special Status Species: Coordinate with other agencies and groups in management of species across landscapes. Coordination will be accomplished through conservation plans or similar agreements that identify actions to conserve single or multiple species and/or habitats. Such strategies could preclude the need for intensive inventories or modifications to some projects where the conservation plan provides adequate protection for the species and meets the intent of policy.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs.1.5.4.1 & 1.5.4.4 EIS App. K EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Where plans exist for species no longer on the special status list continue with the prescribed conservation actions if determined to be required to avoid relisting or future consideration for listing. In the case of interagency plans or agreements this determination will be mutually decided. Such plans may be modified as needed based on adequacy of existing range-wide conditions and conservation management.	N		
All Land Use Allocations – Special Status Species: Pursue opportunities for public education about conservation of species.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Where appropriate pursue opportunities to increase the number of populations of species under BLM management through land acquisition and/or species reintroduction.	N		
All Land Use Allocations – Special Status Species: Integrate management of special status plants into watershed assessment looking at historic patterns and modeling to improve habitat for special status plants.	N		
All Land Use Allocations – Special Status Species: Implement prescribed burns to enhance habitat for special status plants.	N		
All Land Use Allocations – Special Status Species: Implement noxious weed control in habitat of special status plants.	C, R, O	B, M	EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec.4.7.4 POD Att. 9 POD Att. 10 POD Att. 14 POD Att. 29
All Land Use Allocations – Special Status Species: Develop and implement automated data bases for storage and retrieval of information on special status plants.	N		
All Land Use Allocations – Special Status Species: Design and schedule site-specific management prescriptions and projects to benefit individual species habitats in allotment management plans and recreational management plans.	N		
All Land Use Allocations – Special Status Species: Develop monitoring plans for special status plants and their habitats that schedule measurement and periodic evaluation of trend status and progress toward meeting recovery and conservation objectives.	N		
All Land Use Allocations – Special Status Species: Develop monitoring plans to determine viability of populations over time and effects of management actions.	N		
All Land Use Allocations – Special Status Species: Develop Conservation Agreements with USFWS on Federal candidate plants to act as recovery plans and prevent listing.	N		
All Land Use Allocations – Special Status Species: Develop and implement education and outreach plans to improve public understanding and awareness of the need to protect and manage special status plants. Develop botanical (Wildflower) viewing sites for the public as part of the Watchable Wildlife Program.	N		
All Land Use Allocations – Special Status Species: Collect seed from special status plant species for storage at Berry Botanic Garden Cryogenic Seed Bank.	N		
All Land Use Allocations – Special Status Species: Implement Rare Plants and Natural Plant Communities Fish and Wildlife 2000.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Identify and manage special habitat areas such as wetlands serpentine areas wet and dry meadows and rock cliffs where over 50 percent of the special status plants occur.	N		
All Land Use Allocations – Special Status Species: Where sites are occupied by Siskiyou Mountain Salamander or Del Norte Salamander protect the site from ground-disturbing activities. Designate a buffer of at least the height of one site-potential tree or a 100-foot horizontal distance whichever is greater surrounding the location. Within the site and the surrounding buffer maintain at least 40 percent canopy closure and avoid any activities that would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy. These sites are referred to as managed late-successional reserves in the SEIS ROD.	N		
All Land Use Allocations – Special Status Species: Conduct surveys for roosting bats. As an interim measure prohibit timber harvest within 250 feet of sites containing bats. Develop management standards and guidelines for each site.	N		
Listed and Proposed Threatened and Endangered Species: Implement the land use allocations and management actions/direction of this resource management plan that are designed to enhance and maintain habitat for threatened and endangered species.	P, R	P, M	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29
Listed and Proposed Threatened and Endangered Species: Northern Spotted Owl (Federal threatened species) • With minor exceptions restrict human activities that could disturb owl nesting especially timber falling and yarding and the use of large power equipment within one-quarter mile of all active northern spotted owl nest sites from approximately March 1 to September 30	C, O	B	EIS Sec. 1.5.1.1 EIS Sec. 4.6.1.2 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (Federal threatened species) • Conduct two years of survey prior to any human disturbance of marbled murrelet habitat within 50 miles of the coast.	N		
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (Federal threatened species) • Protect contiguous existing and recruitment habitat for marbled murrelets (i.e. stands which are capable of becoming marbled murrelet habitat within 25 years) within a 0.5 mile radius of any site where the birds' behavior indicates occupation (e.g. active nest fecal ring or eggshell fragments and birds flying below through into or out of the forest canopy within or adjacent to a stand).	N		
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (Federal threatened species) • During silvicultural treatments of nonhabitat within the 0.5 mile radius around occupied stands protect or enhance suitable or replacement habitat.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (Federal threatened species) • Neither conduct nor allow harvest of timber within occupied marbled murrelet habitat at least until completion of the Marbled Murrelet Recovery Plan.	N		
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (Federal threatened species) • Amend or revise management direction as appropriate when the Recovery Plan is completed.	N		
Listed and Proposed Threatened and Endangered Species: Marbled Murrelet (Federal threatened species) • Restrict human activities that could disturb marbled murrelet nesting.	N		
Listed and Proposed Threatened and Endangered Species: Bald Eagle (Federal Threatened Species) • Comply with the Pacific Bald Eagle Recovery and Implementation Plan and existing site-specific habitat management plans.	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Bald Eagle (Federal Threatened Species) • Within one-half mile of active bald eagle sites do not allow aerial use of herbicides or pesticides and minimize human disturbance between February 1 and August 15. Retain requisite forest habitat characteristics including large trees snags and at least 50 percent canopy closure. Prepare a site-specific management plan to provide more specific management guidelines for bald eagles.	P, C, O	P, B	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Bald Eagle (Federal Threatened Species) • Protect the core area around known bald eagle nest sites. In addition to the measures used in the one-half mile radius within the protected core area allow no planned timber harvest except to benefit bald eagle nest habitat no new road construction and no surface occupancy (NSO) for leasable minerals.	P, C, O	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Bald Eagle (Federal Threatened Species) • Retain two additional 80-acre areas with suitable nesting characteristics for future territory establishment consistent with the Pacific Bald Eagle Recovery Plan. One of these would be located along the wild section of the Rogue River in the vicinity of Whiskey Creek and the other would be in the Finley Bend area along the recreational section of the Rogue River. In addition manage one block of at least 80 acres for nesting habitat within one-half mile of each of the following water bodies to provide for future population expansion: Galesville Reservoir Illinois River Emigrant Lake Hyatt Lake Howard Prairie and Lost Creek reservoirs.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Listed and Proposed Threatened and Endangered Species: Bald Eagle (Federal Threatened Species) • Buffer around nest sites. Manage approximately 30-acre core area around nest sites. Retain older forests within 1/2-mile of nests. Develop HMP for sites. Seasonal restrictions. Avoid disturbance within 1/2-mile Feb. 1 - Aug. 15. Provide for future population expansion. Retain two 80-acre areas for future nest sites.	P, C, O	P, B, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Peregrine Falcon (Federal Endangered Species) • Comply with the Peregrine Falcon Recovery Plan and existing site-specific habitat management plans.	P, C, O	P, B, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Peregrine Falcon (Federal Endangered Species) • Minimize human disturbance with the potential to disturb nesting falcons within one mile of active peregrine falcon nest sites between January 1 and July 15. Prepare a site-specific management plan for each active site.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Peregrine Falcon (Federal Endangered Species) • The core area within one-half mile of active peregrine nest sites would receive additional protection. In addition to the measures used in the one-mile radius within the protected core area there would be no scheduled timber harvest no aerial application of herbicides or pesticides and no surface occupancy (NSO) for leasable minerals. There will be no new road construction unless the activity would not adversely affect the integrity of the site.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Listed and Proposed Threatened and Endangered Species: Peregrine Falcon (Federal Endangered Species) • Core area 1/2-mile around nest sites. No timber harvest no spraying no surface occupancy. Buffer around core area one mile. Manage for prey diversity. Seasonal restriction. Avoid disturbance Feb. 1 -Aug. 15. Provide for future population expansion. Maintain potential nests.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Townsend's big-eared bat: Protect within 250' of occupied sites develop management plan.	P, C, O	P, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Northern goshawk: Protect all nest sites.	P, C, O	P, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Siskiyou Mountain Salamander and Del Norte Salamander: Maintain 40% canopy closure within salamanders 100 feet of occupied sites. Avoid surface disturbing activities within 100 feet.	N		
Jenny Creek sucker and redband trout: Protect known sites. No timber harvest or surface-disturbing activities within steep canyon areas.	N		.

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Allotropa virigata: Protect known sites. Protect according to protocol.	P, C, O	P, R	EIS Secs. 4.5.1.2 & 4.5.1.3 This does not appear to be a sensitive or S&M species.
Cypripedium fasciculatum: Protect known sites. Protect according to protocol.	P, C, O	P, R	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App.M
Cypripedium montanum: Protect known sites. Protect according to protocol.	P, C, O	P, R	EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K
Special Areas – Not Applicable, Excluded From Table			
Forest Health			
Design and implement silvicultural treatments in stands that are in a condition or that will soon be in a condition which prevents management objectives from being achieved. Treatments are intended to restore the ability of stands to respond to other management and to reduce the risk of mortality from insects disease and wildfire. Treatments will consist of thinning of stands forest fertilization reduction of understory vegetation reduction of fuel ladders and restoration of more stable plant communities.	N		
Design forest condition restoration treatments to be consistent with the long-term objectives of the allocation in which the treatment is proposed. Develop treatments in an interdisciplinary manner.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App.H EIS App. J POD Att. 9 POD Att. 29
Design restoration treatments to maintain or improve soil productivity meet coarse woody debris and snag objectives, maintain or improve hydrologic functions, and maintain the natural richness of tree species.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App.H EIS App. J POD Att. 9 POD Att. 29
Develop forest condition restoration treatments at the stand level based on the combination of stand condition and trend on the functional characteristics of the ecosystem and on characteristics of the site.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App.H EIS App. J POD Att. 9 POD Att. 29

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Design treatments as much as possible to prevent the development of undesirable species composition species dominance or other stand characteristics. Design treatments to incorporate and restore ecosystem function. Employ the principles of integrated pest management and integrated vegetation management to avoid the need for direct treatments. Use herbicides only as a last resort.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App.H EIS App. J POD Att. 9 POD Att. 29
Off-Highway vehicle use will be limited to designated roads in areas which are infected with Port-Orford root disease.	N		
Riparian Reserves: Design and implement forest condition restoration treatments in a manner that contributes to the attainment of Aquatic Conservation Strategy and riparian reserve objectives.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 9 POD Att. 29
Late-Successional Reserves: Design and implement forest condition restoration treatments that provide habitat benefits for late-successional associated species or that have negligible effects on such species. Design treatments to be consistent with the EIS App. H assessment.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 9 POD Att. 29
Late-Successional Reserves: When possible avoid introducing nonnative plant species including grasses into late-successional reserves. If introduction of a nonnative species is proposed complete an assessment of the impacts and avoid any introduction that would retard or prevent achievement of late-successional reserve objectives.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.1 EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. H POD Att. 9 POD Att. 14
Late-Successional Reserves: Evaluate the impacts of nonnative plant species existing within late-successional reserves. Develop plans and recommendations for eliminating or controlling nonnative plant species that are inconsistent with late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species within the late-successional reserves.	P	P	EIS Sec. 2.4.2.1 EIS Sec. 2.6.1 EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. H POD Att. 9 POD Att. 14
Late-Successional Reserves: Prior to the use of prescribed fire as a forest condition restoration treatment develop an interdisciplinary fire management plan specifying how prescribed fire applications will meet the objectives of the late-successional reserve. Until the plan is approved proposed activities will be subject to review by the Regional Ecosystem Office. Apply prescribed fire in a manner that retains the amount of coarse woody debris determined to be appropriate for the site based on watershed analysis.	P, C, O	P, B	EIS Sec. 4.1.3.6 EIS Sec. 4.4.4 EIS Sec. 4.5.2.3 EIS App. H POD Att. 11 POD Att. 18
Adaptive Management Areas: Emphasize cooperation across agency and ownership boundaries.	N		

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Connectivity/ Diversity Blocks: Maintain 25 to 30 percent of each block in late-successional forest at any point in time. The percentage of habitats will include habitat in other allocations such as riparian reserves. The size and arrangement of habitat within a block should provide effective habitat to the extent possible.	N		
General Forest Management Area: Retain snags within forest condition restoration treatment units at levels sufficient to support species of cavity nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the matrix with per-acre requirements met on average areas no larger than 40 acres.	N		
Special Habitats: In project areas containing special wildlife and plant habitats (e.g. talus and meadows) maintain ecologically significant buffers around the special habitat. This could be increased decreased or manipulated based on site-specific circumstances. Ecologically significant buffers will be determined by interdisciplinary teams.	P, C, O	P, B, R, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.3 EIS Sec. 4.1.3.3 & 4.1.3.4 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10 LMP Amendment BLM/FS-1
Recreation – Not Applicable, Excluded from Table			
Wild and Scenic Rivers – Not Applicable, Excluded From Table			
Visual Resources			
Address visual resource management issues when conducting watershed analysis.	N		
Use the visual resource contrast rating system during project level planning to determine whether or not proposed activities will meet VRM objectives. Use mitigation measures to reduce visual contrasts.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.8.2.3 & 4.8.2.4 POD Att. 1 EIS App. F POD Att.29
Provide for natural ecological changes in VRM Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and must not attract attention. Changes should repeat the basic elements of form line color texture and scale found in the predominant natural features of the characteristic landscape.	N		.
Manage VRM Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form line color texture and scale found in the predominant natural features of the characteristic landscape.	N		
Manage VRM Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form line color texture and scale found in the predominant natural features of the characteristic landscape.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Manage VRM Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However every attempt should be made to minimize the effect of these activities through careful location minimal disturbance and should repeat the basic elements of form line color and texture.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Cultural Resources (Including Native American Values)			
Conduct paleo-environmental archaeological anthropological and historical studies.	N		
Conduct systematic inventories of areas likely to contain cultural resources.	N		
Evaluate archaeological and historical sites to determine their potential for contributing to public and scientific uses.	N		
Support ecosystem-based management by providing information about past ecological conditions past cultural/natural system interactions and differences among cultural and social groups regarding ecosystem management values.	N		
Develop project plans to preserve protect and enhance archaeological historical and traditional use sites and materials under the district's jurisdiction. This would include protection from wildfires.	P	P	EIS Sec. 4.11.1.1- 4.11.1.3 EIS Sec. 4.11.2 EIS Sec. 4.11.3.3 EIS Sec. 4.11.4 POD Att. 26
Increase public awareness and appreciation of cultural resources through development of education and interpretive programs.	N		
Develop methods and gather data to assess social and cultural ecosystem components of the environment for use in landscape-level analysis.	N		
Monitor cultural resources and take appropriate law enforcement action related to unauthorized use.	N		
Continue working with Native Americans to achieve the goals outlined in existing memoranda of understanding. Develop additional memoranda with Native American groups as needs arise.	N		
Acquire significant cultural resource properties for public cultural heritage and scientific purposes.	N		
Wilderness Study Areas– Not Applicable, Excluded From Table			
Timber Resources			
Matrix: Apply silvicultural systems that are planned to produce over time forests that have desired species composition structural characteristics and distribution of serial or age classes (See Appendix E[23] and Table 9[24] for details).	N		

[23] Appendix E: Silvicultural Systems Utilized in the Design of the Resource Management Plan Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Matrix: Matrix lands in the Medford District are divided into the northern general forest management area the southern general forest management area and connectivity/diversity blocks. Collectively these areas are referred to as the general forest management area. The line dividing the northern and southern GFMAs is meant to be flexible Also there will be local situations in the northern GFMA that should be managed along southern GFMA prescription guidelines and visa versa.	N		
Matrix: Declare an allowable sale quantity of 9.7 million cubic feet (57.1 million board feet).	N		
Retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1 1994) northern spotted owl activity centers.	N		
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management actions/direction will be applied in fifth field watersheds (20 to 200 square miles) in which Federal forestlands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all Federal land allocations in a watershed.) Within such an area protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.	N		
Provide a renewable supply of large live trees and snags well distributed across the Matrix lands in a manner that provides habitat for cavity using birds bats and other species; provides structure and habitat diversity; provides future sources of large down logs; and provides for other ecological functions. Retained live trees and snags will reflect the species mix of the original stand. Emphasize retention of the larger trees and snags available to provide the unique structure and functions associated with these large old trees.	N		
Retain snags and trees within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per-acre requirements met on average areas no larger than 40 acres.	N		
Modify site treatment practices particularly the use of fire and pesticides and modify harvest methods to minimize soil and litter disturbance.	P, C, O	P, B	EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.2 & 4.5.2.3 POD Att. 9 POD Att. 11 POD Att. 14 POD Att. 18 POD Att. 28
Plan and implement treatments to minimize intensive burning unless appropriate for specific habitats communities or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 & 4.1.3.6 EIS App. H EIS App. J POD Att. 18

[24] Table 9: General Features of Silvicultural Systems Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Plan and implement treatments to minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 POD Att. 9 POD Att. 28
Plan and implement treatments to reduce the intensity and frequency of site treatments.	N		
Retain some large hardwood trees where present in harvest units to provide habitat diversity.	N		
Connectivity/ Diversity Blocks Spaced Throughout the Matrix Lands in the Northern GFMA: Schedule regeneration harvests on a 150-year area control rotation.	N		
All Land Use Allocations: To mitigate damage caused by *Phytophthora lateralis* an introduced root disease that is fatal to Port-orford cedar all management activities occurring within the range of Port-orford cedar will conform to the guidelines described in the BLM Port-Orford Cedar Management Plan. Site specific analyses for projects within the range of Port-orford cedar will consider possible effects on the species.	N		
Special Forest Products– Not Applicable, Excluded From Table			
Energy and Minerals:			
See Tables 10[25] 11[26] and 12 [27]for restrictions on energy and mineral activities and Appendices G[28] H[29] and I[30] for leasing stipulations and operating standards pertinent to locatable and saleable minerals.	N		
Riparian Reserves: Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans leases and permits is needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	N		
Late-Successional Reserves: Assess the impacts of ongoing and proposed mining activities in late-successional reserves.	N		

[25] Table 10: Oil and Gas Lease Restrictions Record of Decision for the Medford District Resource Management Plan 1995
[26] Table 11: Geothermal Lease Restrictions Record of Decision for the Medford District Resource Management Plan 1995
[27] Table 12: Locatable Mineral Restrictions Record of Decision for the Medford District Resource Management Plan 1995
[28] Appendix G: Restrictions on Mineral and Energy Exploration and Development Activity Record of Decision for the Medford District Resource Management Plan 1995
[29] Appendix H: Locatable Minerals Surface Management 43 CFR 3809 Standards for Exploration Mining and Reclamation Record of Decision for the Medford District Resource Management Plan 1995
[30] Appendix I: Guidelines for Development of Saleable Mineral Resources Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Late-Successional Reserves: Include stipulations in mineral leases and when legally possible require operational constraints for locatable mineral activities to minimize detrimental effects on late-successional habitat.	N		
All Land Use Allocations – Leasable Minerals: Standard oil and gas lease stipulations are listed in Section 6 of "Offer to Lease and Lease for Oil and Gas" Form 3100-1.	N		
All Land Use Allocations – Leasable Minerals: Special stipulations will be attached to oil and gas leases to provide additional protection for fragile areas or critical resource values. A seasonal restriction could be used to protect critical wildlife habitat or prevent excessive erosion etc. A controlled-use stipulation could be used to protect valuable resources in very small areas. A no surface occupancy (NSO) stipulation could be used to protect valuable resources spread over a large area while still providing an opportunity for exploration and development. The NSO stipulation will be used within riparian reserves.	N		
All Land Use Allocations – Leasable Minerals: Special stipulations for leasable minerals are shown in Appendix G[31]. The special stipulations regarding seasonal restrictions controlled surface use and prohibiting surface occupancy could be waived by authorized BLM officials if the objective of the stipulation would be met in another manner or if the resource being protected was no longer present.	N		
All Land Use Allocations – Leasable Minerals: Tables 10[32] and 11[33] illustrate the Federal mineral estate in the planning area on which oil and gas and geothermal activities respectively would be restricted.			
All Land Use Allocations – Locatable Minerals: Areas not specifically withdrawn from mineral entry will continue to be open under the mining laws. Mineral exploration and development will be regulated under 43 CFR 3802 and 3809 to prevent "unnecessary or undue degradation."	N		
All Land Use Allocations – Locatable Minerals: All surface disturbance from operations whether conducted under a notice or plan of operations will be reclaimed at the earliest feasible time.	N		
All Land Use Allocations – Locatable Minerals: The standards that govern activities conducted under a notice of operations (affecting five acres or less) and those that govern activities under a plan of operations (affecting more than five acres) are shown in Appendix H[34].	N		

[31] Appendix G: Restrictions on Mineral and Energy Exploration and Development Activity Record of Decision for the Medford District Resource Management Plan 1995
[32] Table 10: Oil and Gas Lease Restrictions Record of Decision for the Medford District Resource Management Plan 1995
[33] Table 11: Geothermal Lease Restrictions Record of Decision for the Medford District Resource Management Plan 1995
[34] Appendix H: Locatable Minerals Surface Management 43 CFR 3809 Standards for Exploration Mining and Reclamation Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations – Locatable Minerals: All instream placer mining would be closed to suction dredging for the time specified in Oregon Guidelines for "Timing of In-Water Work" to protect fish and wildlife resources. Waivers could be granted by Oregon Department of Fish and Wildlife.	N		
All Land Use Allocations – Locatable Minerals: Mining operations within riparian reserves will be subject to mitigation measures whether conducted under a notice or a plan of operations. Mitigating measures will be developed to prevent degradation of water quality including siltation and water temperature and to comply with Executive Order 11190 (Protection of Wetlands). Road construction clearing vegetation hazard tree removal mining waste disposal and other surface-disturbing activities that would degrade water quality or riparian/wetland habitat will either be prohibited or require special mitigation. These activities within riparian reserves will be considered unnecessary or undue degradation unless acceptable mitigation measures are approved in advance. Mining activities will conform to best management practices (BMPs) to protect water quality (see Appendix D[35] and Aquatic Conservation Strategy and Riparian Reserve objectives).	N		
All Land Use Allocations – Locatable Minerals: Mining activities within EIS App. Hs will be designed to mitigate detrimental effects.	N		
All Land Use Allocations – Locatable Minerals: Mining operations will be allowed in designated ACECs but only in a manner that would not impair or degrade those significant resource values that lead to area of critical environmental concern (ACEC) designation. A plan of operations will be required in all designated ACECs. A plan of operations will not be approved if operations would irreparably damage those resource values for which the ACEC was designated.	N		
All Land Use Allocations – Locatable Minerals: Mining operations will not be allowed to disturb lands classified fragile nonsuitable woodlands under the timber production capability classification (TPCC) unless adequate mitigation measures are implemented to prevent slope failures damage to soil productivity or erosion.	N		
All Land Use Allocations – Locatable Minerals: Mining operations in lands classified VRM Class II will maintain the existing visual characteristics of the landscape. Evidence of exploration and development activities will be reclaimed to meet VRM Class II management objectives. All disturbed lands will be graded to near natural contours where practical and revegetated with native plants.	N		
All Land Use Allocations – Locatable Minerals: All mining activity employing suction dredges will comply with Oregon State Department of Environmental Quality Permit No. 0700.	N		
All Land Use Allocations – Locatable Minerals: All mining activities discharging waste water will comply with Oregon State Department of Environmental Quality Permit No. 0600.	N		

[35] Appendix D: Best Management Practices Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations – Locatable Minerals: A number of areas/sites have been proposed to be withdrawn from mineral entry under the mining laws. These areas/sites will also be closed to disposal of saleable minerals and be made available for exploration and development of leasable minerals with NSO stipulation or not at all. Withdrawals from mineral entry would be pursued for the areas/sites discussed below. • All existing withdrawals carried forward are listed in Table 13[36]; • Withdrawals from mineral entry will be pursued for research natural areas (RNOs) to protect the ecosystems being monitored as baseline data; • Rivers or streams eligible for inclusion in the Wild and Scenic Rivers Systems and proposed for designation as Wild will be withdrawn from mineral entry to conform with the Wild and Scenic Rivers Act upon designation; • A withdrawal from mineral entry will be pursued for that portion of the recreation section of the Rogue River downstream from Yew Wood Creek not presently withdrawn from mineral entry to conform with other segments of the designated river section and to conform with the existing management plan; • Mineral withdrawals will be pursued for all sites with significant capital improvements such as administrative sites reaches of streams with fish improvements and developed recreation sites following initiation of the investment; • A withdrawal from mineral entry will be pursued for the Jacksonville Trail System. BLM and the city of Jacksonville plan to establish a trail system for recreation purposes. Any mining would impair the trail improvements and scenic values; • A withdrawal from mineral entry will be pursued for Agate Flat a well-known agate collecting area frequented by rock clubs and collectors to keep the area open to the public; and • A withdrawal from mineral entry will be pursued for Galice Creek for recreational and cultural values.	N		
All Land Use Allocations – Salable Minerals: Saleable minerals including common varieties of sand gravel rock and stone will be made available for local governments private industry individuals and nonprofit organizations consistent with management objectives of other resources and consistent with the requirement that undue or unnecessary degradation be prevented. Most of these needs will be met from community pits located throughout the planning area.	N		
All Land Use Allocations – Salable Minerals: Rock quarries will continue to be used to provide rock for use in construction and maintenance of timber sale access roads and for other purposes. New quarry sites will be developed as needed if they are consistent with the management objectives of other resource values. All quarry development will include development and reclamation plans. Long-term regional quarry use will be emphasized. A districtwide quarry management plan will be developed to address development standards and reclamation goals.	P, C	P, B	EIS Sec. 2.4.2.2 EIS Sec. 4.2.2.4 POD Att. 9 POD Att. 17
All Land Use Allocations – Salable Minerals: Saleable mineral activities within riparian reserves will occur only if Aquatic Conservation Strategy objectives can be met. Activities within EIS App. Hs will be designed to mitigate detrimental effects.	N		

[36] Table 13: Existing Land Classifications and Withdrawals Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations – Salable Minerals: Guidelines and restrictions for development of saleable minerals are presented in Appendix I[37].	N		
All Land Use Allocations – Reserved Federal Mineral Estate: The reserved Federal mineral estate (Federal minerals underlying nonfederal surface) would continue to be open for mineral development in the same manner and degree as adjacent BLM-administered land. Conveyances of mineral interest owned by the United States where the surface is or will be in nonfederal ownership could be made to the existing or proposed owner of the surface estate consistent with FLPMA Section 209(b).	N		
Socioeconomic Conditions– Not Applicable, Excluded From Table			
Land Tenure Adjustments– Not Applicable, Excluded From Table			
Rights-of-Way			
Riparian Reserves: Issue rights-of-way to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives. Where legally possible adjust existing rights-of-way to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy and riparian reserve objectives. If adjustments are not effective and where legally possible eliminate the activity. Priority for modifying existing rights-of-way will be based on the actual or potential impact and the ecological value of the riparian resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.5 & 2.1.6 EIS Secs. 3.4.3 & 3.4.4 EIS Sec. 4.1.3.5 EIS App. J
Riparian Reserves: For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission) provide timely written comments regarding maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of riparian reserves. For existing support facilities inside riparian reserves that are essential to proper management provide recommendations to the Commission that ensure Aquatic Conservation Strategy and riparian reserve objectives are met. Where these objectives cannot be met provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the riparian reserves should be located operated and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	N		
Late-Successional Reserves: Remove hazard trees along utility rights-of-way and in other developed areas.	C, O	B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.6 EIS App. H POD Att. 20

[37] Appendix I: Guidelines for Development of Saleable Mineral Resources Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Other Land Use Allocations: Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors.	N		
Other Land Use Allocations: Encourage applicants to consult the Western Regional Corridor Study in planning route locations.	N		
Other Land Use Allocations: Consider new locations for rights-of-way projects on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing route or corridor would not be technically or economically feasible; and the proposed project would otherwise be consistent with this resource management plan and would minimize damage to the environment.	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 3.4.3 & 3.4.4
Other Land Use Allocations: Allow expansion of communications facilities on existing communication sites consistent with protection of threatened and endangered species.	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.3.2.2 EIS Sec. 4.8.2.2 POD Att. 4
Other Land Use Allocations: Consider new communication sites on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing developed communication site would not be technically feasible; and the proposed facility would otherwise be consistent with this proposed resource management plan and would minimize damage to the environment.	N		
Access– Not Applicable, Excluded From Table			
Withdrawals– Not Applicable, Excluded From Table			
Roads			
Riparian Reserves: Cooperate with Federal State and county agencies and work with parties with road use agreements to achieve consistency in road design operation and maintenance necessary to attain Aquatic Conservation Strategy and riparian reserve objectives.	P, C, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.5 EIS Secs.4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Riparian Reserves: Determine the influence of each road on the Aquatic Conservation Strategy and riparian reserve objectives through watershed analysis.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs.4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Riparian Reserves: Meet Aquatic Conservation Strategy and riparian reserve objectives by reconstructing roads and associated drainage features that pose a substantial risk.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Riparian Reserves: Meet Aquatic Conservation Strategy and riparian reserve objectives by prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Riparian Reserves: Meet Aquatic Conservation Strategy and riparian reserve objectives by closing and stabilizing or obliterating and stabilizing roads based on the ongoing and potential effects to Aquatic Conservation Strategy and riparian reserve objectives and considering short-term and long-term transportation needs.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Riparian Reserves: New culverts bridges and other stream crossings shall be constructed; and existing culverts bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved to accommodate at least the 100-year flood including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Riparian Reserves: Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels fills and hill slopes.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Riparian Reserves: Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g. streams that can be made available to anadromous fish by removing obstacles to passage).	C, R	B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Riparian Reserves: Develop and implement a Road Management Plan or a Transportation Management Plan that meets the Aquatic Conservation Strategy and riparian reserve objectives. As a minimum this plan will include provisions for the following activities: • inspections and maintenance during storm events; • inspections and maintenance after storm events; • road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources; • traffic regulation during wet periods to prevent damage to riparian resources; and • establishing the purpose of each road by developing the road management objective.	P, C, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.3.2.1 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Key Watersheds: Reduce existing road mileage within key watersheds. If funding is insufficient to implement reductions neither construct nor authorize through discretionary permits a net increase in road mileage in key watersheds.	N		
All Land Use Allocations: Prepare a districtwide road management plan. The management plan will specifically address recreation use road densities road closures wildlife protection water quality Port-Orford cedar management timber management construction and maintenance standards fire suppression access and coordination with adjacent landowners. Address road management planning on a watershed basis consistent with late-successional reserves riparian reserves and other major allocations. Specific road closures would be determined using standard analysis public involvement and notification procedures.	N		
All Land Use Allocations: Determine standards for new road construction during the project planning process. Standards will be the minimum necessary to meet resource and allocation objectives (e.g. recreation site timber sale key watershed etc.) while having minimal impacts on the environment.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Minimize new road construction in areas with fragile soils (granitic schist and pyroclastic soils) to reduce impacts to soils water quality and fisheries. Stabilize existing roads where they contribute to significant adverse effects on these resources.	P, C, R	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.2.2.1 & 4.2.2.2 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations: Locate, design, construct and maintain roads to standards that meet management objectives in accordance with the district road management plan.	P, C, R, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Follow best management practices (see Appendix D[38]) for water quality and soil productivity to mitigate adverse effects on soils water quality fish and riparian habitat during road construction and maintenance.	C, R, O	B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Reduce road density by closing minor collector and local roads in areas or watersheds where water quality degradation, big game harassment or other road related resource problems have been identified.	C, R, O	B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Acquire water rights for road management purposes.	N		
All Land Use Allocations: Specifically address either in the road management plan or in a watershed analysis stabilizing existing roads located on fragile granitic schist and pyroclastic soils (e.g. West Evans Creek and the Upper Lake Creek drainages) watersheds with water quality limited streams and other areas of the district where soil/water quality problems are known to exist.	N		
All Land Use Allocations: Avoid road construction in special areas and special habitats.	N		
All Land Use Allocations: Manage and design road systems to reduce public health and safety hazards fire risks and vandalism to public and private property. Of particular concern is unauthorized public use of nonthrough or "local" roads within rural interface areas and within one-quarter mile of existing dwellings. Gates and other types of traffic barriers such as guardrails berms ditches and log barricades will be used as appropriate.	N		
All Land Use Allocations: Reduce the further spread of blackstain fungus through proper timing of roadside brushing.	P, C	P, B	EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
All Land Use Allocations: Determine necessity of road systems to meet initial wildfire suppression objectives prior to any prepared closure or modification.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 29
Rural Interface Areas (RIA)			
Work with local governments to improve management of activities within RIA.	N		

[38] Appendix D: Best Management Practices Record of Decision for the Medford District Resource Management Plan 1995

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
As a part of watershed analysis and project planning, work with local individuals and groups including fire protection districts to identify and address concerns related to possible impacts of proposed management activities on rural interface areas.	N		
Use design features and mitigation measures to avoid/minimize impacts to health, life and property, and quality of life. Examples include different harvest regimes, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning as opposed to broadcast burning. Monitor the effectiveness of design features and mitigation measures.	N		
Eliminate or mitigate public hazards such as abandoned mine tunnels and quarries.	N		
Manage rural interface areas using visual resource management Class III standards (unless an area is otherwise classified as visual resource management Class I or II).	P, C, R, O	P, B, R	EIS Sec.4.8.2.3 POD Att. 1
Use dust abatement measures on roads during BLM timber harvest operations or other BLM commodity hauling. Encourage and enforce the use of dust abatement measures when haulers use BLM roads under permits and rights-of-way agreements.	C	B	EIS Sec. 4.10.2.6 POD Att. 2 POD Att. 25
Reduce natural fuel hazards on BLM-administered lands in rural interface areas.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 29
Protect resources on BLM-administered land from potential wildfires originating on adjacent private land by using prescribed fire to reduce fuel hazards. The use of low intensity underburning is the preferred technique.	N		
Fire Management			
Address fire/fuels management for all land use allocations as part of watershed analysis. This will include determinations of the role of fire and the risk of large-scale high intensity wildfires at the landscape level.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Coordinate fire management activities in rural interface areas with local governments agencies and landowners. During watershed analysis identify additional factors that may effect hazard reduction goals. Minimize the impacts of wildfire suppression actions.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.8.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Riparian Reserves: Determine the probable risk of large-scale high intensity wildfires which would prevent or delay the attainment of Aquatic Conservation Strategy and riparian reserve objectives through the period established for retention. Describe the need to use prescribed fire to reduce fuel hazards and the risk of large-scale high intensity wildfires.	N		
Riparian Reserves: Mop-up plans for both prescribed and wildfires should consider rapidly extinguishing smoldering coarse woody debris and duff.	N		
Late-Successional Reserves: Determine the probable risk of large-scale high intensity wildfires which would prevent or delay the attainment of resource management objectives through the period established for retention. Describe the need to use prescribed fire to reduce fuel hazards and the risk of large-scale high intensity wildfires.	N		
Late-Successional Reserves: Manage fuels in accordance with guidelines for reducing risks of large-scale disturbances. Use risk assessment as a tool to allow for interdisciplinary decision making such seeks to prioritize fuel treatment need based on potential loss of critical habitat.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Late-Successional Reserves: During fire suppression activities ensure that unacceptable habitat damage from suppression activities is minimized.	C, R, O	B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Late-Successional Reserves: Until a fire management plan is completed for a reserve or group of reserves suppress wildfire to avoid loss of habitat and to maintain future management options. Under an approved fire management plan allow some natural fires to burn when they are identified as being consistent with resource management objectives.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Late-Successional Reserves: Prepare a fire management plan as a component of the late-successional reserve assessment prior to any habitat manipulation activities. Specify fire suppression fuels management and prescribed fire use to meet resource objectives.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 18 POD Att. 29
Late-Successional Reserves: Apply prescribed fire based on the role of fire within each landscape in a manner consistent with ecosystem management objectives including fuel hazard reduction and retention of coarse woody debris.	C, O	B	EIS Sec. 2.6.2 EIS Sec. 4.1.3.6 EIS App. H POD Att. 11 POD Att. 18
Late-Successional Reserves: During wildfire suppression operations consider rapidly extinguishing smoldering coarse woody debris snags and duff in areas that are deficient of crucial stand components.	N		
Adaptive Management Areas: Explore and support opportunities to research the role and effects of fire management on ecosystem functions. Test the concepts of using prescribed fire to mitigate long term risk of conflagration type wildfires.	N		
Adaptive Management Areas: Emphasize fire/fuels management cooperation across agency and ownership boundaries.	N		
Matrix: Plan and implement prescribed fire treatments designed to minimize intensive burning unless appropriate for specific habitats, communities or stand conditions.	N		
Matrix: Plan and implement prescribed fire treatments designed to minimize consumption of litter and coarse woody debris.	N		
Matrix: Plan and implement prescribed fire treatments designed to minimize disturbance to soil and litter that may occur as a result of heavy equipment operations.	N		
Matrix: Plan and implement prescribed fire treatments designed to minimize the frequency of treatments.	N		
Wildfire Suppression: Minimize the direct negative impacts of wildfire suppression on ecosystem management objectives.	N		
Wildfire Suppression: Respond to all wildfires by taking appropriate suppression responses. In most cases responses will consist of aggressive initial attack to extinguish fires at the smallest size possible.	N		
Wildfire Suppression: For wildfires that escape initial attack perform a Wildfire Situation Analysis to develop a suppression strategy to evaluate the damage induced by suppression activities compared to expected wildfire damage.	N		
Wildfire Suppression: Rehabilitation plans should consider the use of available soil seed banks the use of native species and/or sterile aliens for both emergency and large scale wildfire rehabilitation work.	N		

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Fuels Management (including Hazard Reduction): Using prescribed fire throughout the planning area identify the need for prescribed fire to restore and/or maintain crucial wildlife habitat key plant associations plant communities and fire dependent/ adapted species emphasizing special status plant and animal habitat need.	N		
Fuels Management (including Hazard Reduction): Modify fuel profiles in order to lower the potential of fire ignition and rate of spread; protect and support land use allocation objectives by lowering the risk of high intensity stand-replacing wildfires; and adhere to smoke management and air quality standards.	N		
Fuels Management (including Hazard Reduction): Reduce both natural and activity based fuel hazards through methods such as prescribed burning mechanical or manual manipulation of forest vegetation and debris removal of forest vegetation and debris and combinations of these methods.	N		
Prescribed Fire Use for Ecosystem Maintenance and Restoration: Base the use of prescribed fire on the risk of high intensity wildfire and the associated cost and environmental impacts of using prescribed underburning to meet protection restoration and maintenance of crucial stands that are current susceptible to large-scale catastrophic wildfire.	N		
Prescribed Fire Use for Ecosystem Maintenance and Restoration: Reintroduce underburning across large areas of the landscape over a period of time to create a mosaic of stand conditions. Treatments should be site-specific because some species with limited distributions are fire intolerant.	N		
Prescribed Fire Use for Ecosystem Maintenance and Restoration: Identify opportunities to use prescribed fire to make stands more resistent to wildfire.	N		
Prescribed Fire Use for Ecosystem Maintenance and Restoration: Revise where appropriate landscape objectives for coarse woody debris down logs green-tree retention and snags consistent with the natural role of fire and protection standards through the Watershed Analysis Process.	N		
Livestock Grazing– Not Applicable, Excluded From Table			
Noxious Weeds			
Late-Successional Reserves: Evaluate impacts of nonnative plants (weeds) growing in late-successional reserves.	N		
Late-Successional Reserves: Develop plans and recommendations for eliminating or controlling nonnative plants (weeds) which adversely affect late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within late-successional reserves.	N		
All Land Use Allocations: Continue to survey BLM-administered land for noxious weed infestations report infestations to the Oregon Department of Agriculture (the department) and work with the department to reduce infestations.	N		

TABLE E-3

Medford Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Use control methods that do not retard or prevent attainment of Aquatic Conservation Strategy and riparian reserve objectives.	C, O	B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. J POD Att. 14
All Land Use Allocations: Apply integrated pest management methods (e.g. chemical mechanical manual and/or biological) in accordance with BLM's multistate environmental impact statement Northwest Area Noxious Weed Control Program 1986 as supplemented in 1987 and the related ROD.	C, O	B	EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 14
All Land Use Allocations: Place priority on elimination or reduction of noxious weeds occurring within special areas.	N		
Hazardous Materials			
Identify investigate and arrange for removal of hazardous substances on BLM-administered land in accordance with the Comprehensive Environmental Response Compensation and Liability Act. Emergency response will be as specified in the District Hazardous Materials Contingency Plan. The response will include cleanup proper notifications criminal investigations risk assessment and other actions consistent with the Act and the nature of the emergency.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Store treat and dispose of hazardous materials in accordance with the Resource Conservation and Recovery Act and other appropriate regulations.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Follow guidelines in the Emergency Planning and Community Right-To-Know Act to coordinate emergency planning with State and local jurisdictions concerning hazardous materials emergency notifications and routine reporting of hazardous material inventories.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Remove and replace if appropriate all existing underground storage tanks with above ground storage facilities following State and Federal regulations.	N		
Until hazardous materials on BLM-administered land are removed protect employees and the public from exposure to these materials.	C, O	B	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24

TABLE E-3 **Medford Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Provide information to the public regarding the need to properly dispose of hazardous materials and the danger of becoming exposed to hazardous materials.	C,O	B	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24

This page intentionally left blank.

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Key Watersheds			
Prior to further resource management activity, including timber harvest, in Key Watersheds, prepare watershed analyses. Until watershed analyses can be completed, proceed with minor activities, such as those categorically excluded under the National Environmental Policy Act regulations (except timber harvest), if they are consistent with Aquatic Conservation Strategy objectives. Apply Riparian Reserve management actions/direction.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Reduce existing road mileage within Key Watersheds. If funding is insufficient to implement reductions, neither construct nor authorize through discretionary permits a net increase in road mileage in Key Watersheds.	N		
Give highest priority to watershed restoration in Key Watersheds.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 9 POD Att. 29
Manage riparian-wetland areas to protect, maintain, or improve riparian-wetland habitat for wildlife and native plant diversity. Restore or maintain riparian-wetland areas so that 75 percent or more are in proper functioning condition by 1997. The overall objective is to achieve an advanced ecological status, except where resource management objectives, including proper functioning condition, will require an earlier successional stage, thus providing the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection. Proper functioning condition exists when adequate vegetation, landform, or large woody debris are present to: dissipate stream energy associated with high water flows; filter sediment, capture bedload and aid floodplain development; improve flood water retention and groundwater recharge; develop stabilizing root masses; create aquatic habitat; and insulate streams from summer and winter temperature extremes. Proper functioning condition is discussed in Chapter 3 in the Riparian Zones section.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 28 POD Att. 29
Watershed Analysis – Not Applicable, Excluded From Table			
Watershed Restoration			
Prepare watershed analyses and plans prior to restoration activities. Activities will be designed to restore watershed processes and recover degraded habitat. See Use of the Plan section.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Focus watershed restoration on removing some roads and, where needed, upgrading those that remain in the system.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 25 POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Apply silvicultural treatments to restore and retain large conifers in Riparian Reserves.	P, R	P, M	EIS Sec.2.1.4 EIS Sec. 4.1.3.5 EIS App. J EIS App. F POD Att. 29
Restore stream channel complexity. Instream structures will only be used in the short term and not as a mitigation measure.	P, R	P, B, M	EIS Sec. 1.4.2 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 EIS App. F POD Att. 29
Survey and Manage for Amphibians, Mammals, Bryophytes, Mollusks, Vascular Plants, Fungi, Lichens, and Arthropods:			
Manage known sites (highest priority): Acquire information on these sites, make it available to all project planners, and use it to design or modify activities.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Manage known sites (highest priority): Protect known sites. For some species, apply specific management treatments such as prescribed fire.	P, C	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K EIS App. M LMP Amendment BLM/FS-1
Manage known sites (highest priority): For rare and endemic fungus species, temporarily withdraw known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K POD Att. 29 LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Continue existing efforts to survey and manage rare and sensitive species habitat.	P, R	P, R, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K EIS App. M POD Att. 29 LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: For species without survey protocols, start immediately to design protocols and implement surveys.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Survey prior to ground-disturbing activities and manage sites: Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for: • Red tree voles • Lynx	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K POD Att. 29 LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: For the other species listed in Appendix C[1], begin development of survey protocols promptly and proceed with surveys as soon as possible. These surveys will be completed prior to ground disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the Supplemental Environmental Impact Statement.	P, R	P, A, M	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K POD Att. 29 LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Conduct surveys at a scale most appropriate to the species.	P, R	P, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K POD Att. 29 LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Develop management actions/direction to manage habitat for the species on sites where they are located.	N	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Survey prior to ground-disturbing activities and manage sites: Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.	P	P, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
Conduct extensive surveys and manage sites: Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement. Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.	P	P, A	EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K
Conduct extensive surveys and manage sites: Design these surveys for efficiency and develop standardized protocols.	N		
Conduct extensive surveys and manage sites: Begin these surveys by 1996.	N		
Conduct general regional surveys: Survey to acquire additional information and to determine necessary levels of protection for arthropods, fungi species that were not classed as rare and endemic, bryophytes, and lichens.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Conduct general regional surveys: Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.	N		
Riparian Reserves			
Timber Management – Neither conduct nor allow timber harvest, including fuelwood cutting, in Riparian Reserves, with exception of the following: • Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian-wetland conditions, allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.	N		
Timber Management – Neither conduct nor allow timber harvest, including fuelwood cutting, in Riparian Reserves, with exception of the following: • Remove salvage trees only when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.	N		
Timber Management – Neither conduct nor allow timber harvest, including fuelwood cutting, in Riparian Reserves, with exception of the following: • Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.	N		
Roads Management: Cooperate with federal, state, and county agencies and work with private parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.	P, C, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2 EIS App. J POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by completing watershed analyses including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in Riparian Reserves.	P	P	EIS Secs. 4.2.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by minimizing road and landing locations in Riparian Reserves.	P	P, R	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by preparing road design criteria, elements, and standards that govern construction and reconstruction.	P	P, M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25 POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by preparing operation and maintenance criteria that govern road operation, maintenance, and management.	P	P, M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.	C, R	B, M	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by restricting sidecasting as necessary to prevent the introduction of sediment to streams.	P, C	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Roads Management: For each existing or planned road, meet Aquatic Conservation Strategy objectives by avoiding wetlands entirely when constructing new roads.	P, C	P, B	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by reconstructing roads and associated drainage features that pose a substantial risk.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by closing and stabilizing (or obliterating and stabilizing) roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Design and construct new culverts, bridges, and other stream crossings and improve existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian-wetland resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping will increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.	P, C, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Roads Management: Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.	P, C, R	P, B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Roads Management: Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Aquatic Conservation Strategy objectives. As a minimum, this plan will include provisions for the following activities: • inspections and maintenance during storm events; • inspections and maintenance after storm events; • road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian-wetland resources; • traffic regulation during wet periods to prevent damage to riparian-wetland resources; and • establishing the purpose of each road by developing a road management objective.	P, C, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.3.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 25
Minerals Management: For any proposed locatable mining operation in Riparian Reserves, other than notice level or casual use, require the following actions by the operator consistent with 43 Code of Federal Regulations 3809 regulations: • Prepare a Plan of Operations, including a reclamation plan and reclamation bond for all mining operations in Riparian Reserves. Such plans and bonds will address the costs of removing facilities, equipment, and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet Aquatic Conservation Strategy objectives.	N		
Minerals Management: For any proposed locatable mining operation in Riparian Reserves, other than notice level or casual use, require the following actions by the operator consistent with 43 Code of Federal Regulations 3809 regulations: • Locate structures, support facilities, and roads outside Riparian Reserves. If no alternative to siting facilities in Riparian Reserves exists, locate in a way compatible with Aquatic Conservation Strategy objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in Riparian Reserves. When a road is no longer required for mineral or land management activities, it will be reclaimed. In any case, access roads will be constructed consistent with 43 Code of Federal Regulations 3809 and acceptable road construction standards and will minimize damage to resources in Riparian Reserves.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Minerals Management: For any proposed locatable mining operation in Riparian Reserves, other than notice level or casual use, require the following actions by the operator consistent with 43 Code of Federal Regulations 3809 regulations: • Avoid locating solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Reserves exists, if releases can be prevented, and if stability can be ensured, then: – Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics. – Locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Reserves. – Reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. – Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives. – Require reclamation bonds adequate to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.	N		
Minerals Management: Where an existing operator is in noncompliance at the notice level (that is, causing unnecessary or undue degradation), require actions similar to those stated above to meet the intent of 43 Code of Federal Regulations 3809.	N		
Minerals Management: For future leasable mineral activity in Riparian Reserves, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities unless it can be demonstrated that impacts will be acceptable or can be mitigated so that the objectives of the Aquatic Conservation Strategy can be met. Where possible, adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives, consistent with existing lease terms and stipulations.	N		
Minerals Management: Allow development of salable minerals, such as sand and gravel, within Riparian Reserves only if Aquatic Conservation Strategy objectives can be met.	N		
Minerals Management: Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans, leases and permits is needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Recreation Management: Design new recreational facilities within Riparian Reserves, including trails and dispersed sites, so as not to prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Recreation Management: Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.	N		
Recreation Management: Address attainment of Aquatic Conservation Strategy objectives in Wild and Scenic River and Wilderness management plans.	N		
Fire/Fuels Management: Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian-wetland ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 EIS App. F EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Fire/Fuels Management: Locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside of Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Use an interdisciplinary team to predetermine suitable incident base and helibase locations.	N		
Fire/Fuels Management: Minimize delivery of chemical retardant, foam, or other additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following a review and recommendation by a resource advisor, when an escape would cause more long-term damage.	N		
Fire/Fuels Management: Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 EIS App. J POD Att. 18 POD Att. 29
Fire/Fuels Management: Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by a wildfire or a prescribed fire burning outside prescribed parameters.	N		
Fire/Fuels Management: Limit the size of all wildfires to the extent practical.	N		
Fire/Fuels Management: Rapidly extinguishing smoldering coarse woody debris and duff should be considered to preserve these ecosystem elements.	N		
Fire/Fuels Management: Locate and manage water drafting sites (for example, sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian-wetland habitat and water quality as consistent with Aquatic Conservation Strategy objectives.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Lands: Identify instream flows needed to maintain riparian wetland resources, channel conditions, and fish passage in coordination with the Oregon Department of Fish and Wildlife, Department of Environmental Quality, and the Oregon Parks and Recreation Department.	N		
Lands: Issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing leases, permits, rights-of-way, and easements will be based on the actual or potential impact and the ecological value of the riparian-wetland resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.3, 2.1.5 & 2.1.6 EIS Sec. 4.1.3.5 EIS App. J POD Att. 25
Lands: Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.	N		
Lands: For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission, provide timely, written comments regarding maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity. Request the Federal Energy Regulatory Commission to locate proposed support facilities outside of Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management, provide recommendations to the Commission that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, provide recommendations to the Federal Energy Regulatory Commission that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves should be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Lands: For other hydroelectric and surface water development proposals in Tier 1 Key Watersheds, require instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds, give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies.	N		
Grazing Management: Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Aquatic Conservation Strategy objectives.	N		
Grazing Management: Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Grazing Management: Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.	N		
Watershed and Habitat Restoration: Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 29
Watershed and Habitat Restoration: Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29
Watershed and Habitat Restoration: Prevent watershed and habitat degradation rather than relying on mitigation measures or planned restoration.	N		
General Riparian Area Management: Identify and attempt to secure instream flows needed to maintain riparian resources, channel conditions, fish passage, and aquatic habitat in coordination with the Oregon Department of Fish and Wildlife, Department of Water Resources, Department of Environmental Quality, and the Oregon Parks and Recreation Department.	N		
General Riparian Area Management: Fall trees in Riparian Reserves when they pose a safety risk. Keep felled trees on site when needed to meet coarse woody debris objectives.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.2.2 & 4.5.2.3 POD Att. 20
General Riparian Area Management: Apply herbicides, insecticides, other toxicants, and other chemicals only in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.	P, C, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 EIS Sec. 4.6.1.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
General Riparian Area Management: Locate water drafting sites (sites where water is pumped to control or suppress fires or for road construction and maintenance) to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fish and Wildlife Management: Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4.3 EIS Sec. 4.6.2.3 EIS App. F EIS App. J POD Att. 29
Fish and Wildlife Management: Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish and wildlife interpretative and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.	N		
Fish and Wildlife Management: Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.	N		
Fish and Wildlife Management: Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks inhabiting streams with adjacent or nearby federal lands.	N		
Late-Successional/District Designated Reserves			
Plan and implement non-silvicultural activities inside Late-Successional Reserves/District Designated Reserve that are neutral or beneficial to the creation and maintenance of late-successional habitat.	P, R	P, M	EiS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Using interdisciplinary teams, evaluate other activities not described below and document appropriate guidelines.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Request review by the Regional Ecosystem Office of all activities deemed to have potential adverse effects on Late-Successional/District Designated Reserve objectives. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Provide Late-Successional/District Designated Reserves for biodiversity and old growth habitat on the east side by the designation of Miller Creek Canyon and Yainax Butte as areas of critical environmental concern (see the Special Areas section). Manage forest lands on the east side of the planning area under uneven-age harvest prescriptions that will provide for a diversity of structure and species composition.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Silviculture: Plan and implement silvicultural treatments inside Late-Successional/District Designated Reserves that are beneficial to the creation of late-successional habitat. If needed to create, maintain, or enhance late-successional forest conditions, conduct thinning operations in forest stands. This will be accomplished by pre-commercial thinning, commercial thinning, or selective harvesting of stands regardless of origin (for example, planted after logging or naturally regenerated after fire or blowdown).	N		
Silviculture: Large-scale disturbances, such as fire, are natural events and can eliminate spotted owl habitat on hundreds of thousands of acres. Certain risk management activities, if properly planned and implemented, may reduce the probability of these major stand-replacing events. Elevated risk levels are attributed to changes in the characteristics and distribution of the mixed-conifer forests resulting from past fire protection. These forests occur in drier environments, have had repeated insect infestations, and are susceptible to major fires. Risk reduction efforts are encouraged where they are consistent with the objectives for the Late-Successional/District Designated Reserves.	N		
Silviculture: Silvicultural activities aimed at reducing risk shall focus on younger stands in Late-Successional/ District Designated Reserves. The objective will be to accelerate development of late-successional conditions while making the future stand less susceptible to natural disturbances. Salvage activities should focus on the reduction of catastrophic insect, disease, and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible. However, the scale of salvage treatments should not generally result in degeneration of currently suitable owl habitat or other late-successional conditions.	N		
Silviculture: In some Late-Successional/District Designated Reserves, management that goes beyond these guidelines may be considered. Levels of risk in those Late-Successional/District Designated Reserves may be particularly high and may require additional measures. Consequently, management activities designed to reduce risk levels are encouraged in those Late-Successional/District Designated Reserves even if a portion of the activities must take place in currently late-successional habitat. While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat, the activities are clearly needed to reduce risks, and the activities will not prevent the Late-Successional/District Designated Reserve from playing an effective role in the objectives for which they were established.	N		
Salvage: Limit salvage of dead trees in Late-Successional/ District Designated Reserves to areas where stand-replacing events exceed ten acres in size and canopy closure has been reduced to less than 40 percent.	N		
Salvage: Retain all standing live trees including those injured (for example scorched) but likely to survive.	N		
Salvage: Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Salvage: Retain adequate coarse woody debris quantities in a new stand so that in the future it will still contain amounts similar to naturally regenerated stands. Watershed-level or province-level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to coarse woody debris over the long term.	N		
Salvage: If essential to reduce future risk of fire or insect damage, conduct salvage that does not meet the preceding management actions/ direction. Focus on those areas where there is high risk of large scale disturbance.	N		
Salvage: Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.	N		
Salvage: After disturbance in younger stands, develop diameter and biomass retention direction consistent with the intention of achieving late successional forest conditions. Where green trees, snags, and logs are present following disturbance, the green tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.	N		
Salvage: Retain logs present on the forest floor before a disturbance event.	N		
Salvage: Retain coarse woody debris to approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.	N		
Salvage: Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit deviations to as small an area as possible.	N		
Road Management: Construct roads in Late-Successional/District Designated Reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through unsuitable habitat where possible, and be designed to minimize adverse impacts. Alternative access methods, such as aerial logging, will be considered to provide access for activities in reserves.	P, C	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.6 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. H POD Att. 25
Road Management: Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.	C, O	b	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 20 POD Att. 25
Fuelwood Gathering: Permit fuelwood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases these activities will comply with management actions/direction for salvage and silvicultural activities.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Minerals Management: Assess the impacts of ongoing and proposed mining activities in Late-Successional/District Designated Reserves.	N		
Minerals Management: Include stipulations in mineral leases, mineral material disposals, and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.	N		
Developments: Neither construct nor authorize new facilities that may adversely affect Late-Successional/District Designated Reserves.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Developments: Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on Late-Successional/District Designated Reserves.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Developments: Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.	P	P, R	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H
Developments: Retain and maintain existing developments, such as campgrounds, utility corridors, and electronic sites, consistent with other management actions/direction for Late-Successional/District Designated Reserves.	P, C, O	P, B	EIS Sec. 2.1.2 EIS Sec. 4.1.3.6 EIS App. H
Developments: Remove hazard trees along utility rights-of-way and trails and in other developed areas.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.2.2 POD Att. 20 POD Att. 25
Recreational Uses: Use adjustment measures, such as education, use limitations, traffic control devices, or increased maintenance, when dispersed and developed recreation practices retard or prevent attainment of Late-Successional/District Designated Reserve objectives.	N		
Fuels Management: As part of watershed analysis, plan fire management for each Late-Successional/District Designated Reserve.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 29
Fuels Management: Emphasize maintaining late-successional habitat in wildfire suppression plans.	N		
Fuels Management: Use minimum impact suppression methods for fire management in accordance with guidelines for reducing risks of large-scale disturbances.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fuels Management: During actual fire suppression activities, consult an interdisciplinary team to assure that habitat damage is minimized. Until a fire management plan is completed for a Late-Successional/District Designated Reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options.	N		
Fuels Management: Prepare a specific fire management plan prior to any habitat manipulation activities in Late-Successional/District Designated Reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the Late-Successional/District Designated Reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office.	N		
Fuels Management: Apply prescribed fire in a manner which retains the amount of coarse woody debris determined through watershed analysis.	C, O	B	EIS Sec. 4.1.3.6 EIS App. H POD Att. 11 POD Att. 18
Fuels Management: Limit the size of all wildfires to the extent practicable.	N		
Fuels Management: Allow some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning. (See the 1994 Klamath Falls Resource Area Fire Management Environmental Assessment.)	N		
Fuels Management: Consider rapidly extinguishing smoldering coarse woody debris and duff.	N		
Lands: Consider land exchanges in Late-Successional/District Designated Reserves if they provide benefits equal to or better than current conditions.	N		
Lands: Consider land exchanges especially to improve area, distribution, and quality (for example connectivity, shape, and contribution to biodiversity) of Late-Successional/District Designated Reserves, especially where public and private lands are intermingled.	N		
Grazing Management: In coordination with wildlife and fish biologists, implement range related management activities that do not adversely affect late-successional habitat.	N		
Grazing Management: Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Late-Successional/District Designated Reserve objectives.	N		
Grazing Management: Evaluate effects of existing and proposed livestock management and handling facilities in Late-Successional/District Designated Reserves to determine if reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Habitat Improvement Projects: Design projects to improve conditions for fish, wildlife, and watersheds if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Habitat Improvement Projects: Design and implement watershed restoration projects consistent with Late-Successional/District Designated Reserve objectives.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Special Forest/Natural Products: Evaluate whether special forest/natural product harvest activities have adverse effects on Late-Successional/District Designated Reserve objectives.	N		
Special Forest/Natural Products: Prior to selling special forest products, ensure resource sustainability and protection of other resource values such as special status plant or animal species.	N		
Special Forest/Natural Products: Where special forest product activities are extensive, evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.	N		
Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits: Access to nonfederal lands through Late-Successional/District Designated Reserves will be considered and existing right-Of-way agreements, contracted rights, easements, and special/temporary use permits in Late-Successional/District Designated Reserves will be recognized as valid uses.	P	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 2.1.5 & 2.1.6 EIS Sec. 4.1.3.6 EIS App. H POD Att. 20 POD Att. 25
Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits: For all new rights-of-way proposals, design mitigation measures to reduce adverse effects on Late-Successional/District Designated Reserves. Consider alternative routes that avoid Late-Successional/District Designated Reserves. If rights-of-way must be routed through a reserve, design and locate them to have the least impact on late-successional habitat.	P, R	P, R, M	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 3.4.3 EIS Sec. 4.1.3.4 & 4.1.3.6 EIS App. F EIS App. H POD Att. 20 POD Att. 25 POD Att. 29
Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits: Review all special/temporary use permits. When objectives of Late-Successional/District Designated Reserves are not being met, reduce impacts through education or modification of existing permits.	N		
Non-native Species: If introduction of a non-native species is proposed, complete an assessment of impacts and avoid any introduction that will retard or prevent achievement of Late-Successional/District Designated Reserve objectives.	N		
Non-native Species: Evaluate impacts of non-native species (plant and animal) existing within reserves.	N		

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Non-native Species: Develop plans and recommendations for eliminating or controlling non-native species which are inconsistent with Late-Successional/District Designated Reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within Late-Successional/District Designated Reserves.	P, R	P, M	EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. H POD Att. 9 POD Att. 14 POD Att. 29
Matrix (General Forest Management Area) – West Side			
Apply the management actions/direction in the Special Status and Supplemental Environmental Impact Statement Special Attention Species section. Conduct timber harvest and other silvicultural activities in that portion of the Matrix with suitable forest lands, according to management actions/ direction summarized below, the Timber section, and Appendix E[39].	N		
A portion of BLM-administered forest lands will be available for maintenance of biological diversity, including old growth characteristics, and will not be subject to planned timber harvest. These forest lands include: nonsuitable woodlands, suitable woodlands-all categories, recreation sites, forest lands allocated for riparian-wetland area protection in Riparian Reserves, proposed areas of critical environmental concern and research natural areas, core areas around bald eagle and spotted owl nest sites, and other areas required for threatened and endangered species recovery. These forest lands total approximately 24,050 acres, of which 6,600 acres are currently old growth and 6,100 acres are mature forest.	N		
Designate the Klamath Canyon an Area of Critical Environmental Concern (see the Special Areas section) and manage for old growth and diversity of native plant communities, as well as for historic, cultural, scenic, fisheries, and wildlife populations.	N		
Manage the 23,550 acres of Matrix forest lands under uneven-age/multiple canopy management harvest prescriptions (see the Timber section). These forest lands will allow for migration and dispersal of organisms between the Late-Successional Reserves on U.S. Forest Service land to the north and the Klamath Canyon to the south (see Maps 3 and 4 in the map packet).	N		
Provide a renewable supply of large down logs well distributed across the Matrix landscape in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand. Models will be developed for groups of plant associations and stand types that can be used as a baseline for developing prescriptions.	N		
Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Down logs will reflect the species mix of the original stand. Where this management actions/direction cannot be met with existing coarse wood debris, merchantable material will be used to make up the deficit.	N		
In areas of partial harvest, apply the same basic management actions/decision, but they can be modified to reflect the timing of stand development cycles where partial harvest is practiced.	N		

[39] Appendix E: Timber Management, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Retain coarse woody debris already on the ground, and protect it to the extent compatible with ecosystem processes of the site, from disturbance during treatment (for example, underburning and yarding) that might otherwise destroy the integrity of the substrate.	C, O	B	EIS Sec. 2.6.2 EIS Sec. 4.3.3.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.2 & 4.5.2.3 POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 20
Retain 16 to 25 large green trees per acre where available.	N		
Retain snags within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 60 percent of potential population levels. Meet the 60 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.	N		
When an area is regeneration harvested, limit patch size to 3 acres.	N		
Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to minimize intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to leave the appropriate amount of litter and coarse woody debris for the site.	N		
Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.	N		
Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to reduce the intensity and frequency of site treatments.	N		
Matrix (Late-Successional/District Designated Reserve Buffers)			
Management in the buffers around the reserves will be designed to reduce the risk of natural disturbances. Old growth ecosystem prescriptions are harvest methods designed to facilitate the attainment or maintenance of old growth characteristics (see Appendix E[40]).	N		
Manage coarse woody debris, green trees, and snags in a manner that meets the intent of the management actions/direction for the Matrix.	N?		
Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbances.	N		
Minimize intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to leave the appropriate amount of litter and coarse woody debris for the site.	N		

[40] Appendix E: Timber Management, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.	C, R, O	B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 POD Att. 28
Reduce the intensity and frequency of site treatments.	N		
Explore and support opportunities to research the role and effects of fire/fuels management on ecosystem functions.	N		
Plan and implement non-silvicultural activities inside these areas that are neutral or beneficial to the creation and maintenance of late-successional habitat.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Using interdisciplinary teams, evaluate other activities not described below and document appropriate guidelines.	P	P	EIS Sec. 4.1.3.6 EIS App. H
Silviculture: Produce a sustainable supply of timber and other forest commodities.	N		
Silviculture: Plan and implement silvicultural treatments inside these areas that are beneficial to the creation or maintenance of late-successional habitat.	N		
Silviculture: Create and maintain late-successional forest conditions. Conduct thinning operations in forest stands. This will be accomplished by pre-commercial, commercial thinning, or selective harvesting of stands regardless of origin (for example, planted after logging or naturally regenerated after fire or blowdown).	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Silviculture: Large-scale disturbances, such as fire, are natural events and can eliminate spotted owl habitat on hundreds or thousands of acres. Certain risk management activities, if properly planned and implemented, may reduce the probability of these major stand-replacing events. Elevated risk levels are attributed to changes in the characteristics and distribution of the mixed-conifer forests resulting from past fire protection. These forests occur in drier environments, have had repeated insect infestations, and are susceptible to major fires. Risk reduction efforts are encouraged where they are consistent with the objectives for these areas.	N		
Silviculture: Silvicultural activities aimed at reducing risk shall focus on younger stands. The objective will be to accelerate development of late-successional conditions while making the future stand less susceptible to natural disturbances. Salvage activities should focus on the reduction of catastrophic insect, disease, and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible. However, the scale of salvage and other treatments should not generally result in degeneration of currently suitable owl habitat or other late-successional conditions.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Silviculture: In some of these areas, management that goes beyond these guidelines may be considered. Levels of risk in those areas may be particularly high and may require additional measures. Consequently, management activities designed to reduce risk levels are encouraged in those areas even if a portion of the activities must take place in current late-successional habitat. While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat; and the activities will not prevent these areas from playing an effective role in the objective for which they were established.	N		
Salvage: Down woody debris objectives will be the same as the rest of the Matrix.	N		
Salvage: Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.	N		
Salvage: Retain adequate coarse woody debris quantities in a new stand so that in the future it will still contain amounts similar to naturally regenerated stands. Watershed-level or province-level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to course woody debris over the long term.	N		
Salvage: If essential to reduce future risk of fire or insect damage, conduct salvage that does not meet the preceding management actions/direction. Focus on those areas where there is high risk or large scale disturbance.	N		
Salvage: Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.	N		
Salvage: After disturbance in younger stands, develop diameter and biomass retention direction consistent with the intention of achieving late-successional forest conditions. Where green tree, snags, and logs are present following disturbance, the green tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snag can be credited toward the amount of course woody debris biomass needed to achieve management objectives.	N		
Salvage: Retain logs present on the forest floor before a disturbance event.	N		
Salvage: Retain course woody debris to approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.	N		
Salvage: Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit the deviations to as small an area as possible.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Road Management: Construct roads in these areas if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through unsuitable habitat where possible, and be designed to minimize adverse impacts. Alternative access methods, such as aerial logging, will be considered to provide access for activities in reserves.	P, C	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.6 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. H POD Att. 9 POD Att. 25
Road Management: Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.2.1.3 EIS Sec. 4.5.2.2 & 4.2.2.3 POD Att. 20 POD Att. 25
Fuelwood Gathering: Permit fuelwood gathering only in existing cull decks in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases these activities will comply with management action/direction for salvage and silvicultural activities.	N		
Mineral Management: Assess the impacts of ongoing and proposed mining activities in these areas.	N		
Mineral Management: Include stipulations in mineral leases, mineral material deposits, and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.	N		
Developments: Neither construct nor authorize new facilities that may adversely affect these areas.	P	P	EIS Sec. 2.1.4 EIS Secs. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Developments: Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on these areas.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Developments: Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.	P	P, R	EIS Sec. 2.1.4 EIS Secs. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Developments: Retain and maintain existing developments, such as campgrounds, utility corridors, and electronic sites, consistent with other management actions/direction for these areas.	P, C, O	P, B	EIS Sec. 2.1.4 EIS Secs. 4.1.3.6 EIS App. F EIS App. H POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Developments: Remove hazard trees along utility rights-of-way and trails and in other developed areas.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.2.2 POD Att. 20 POD Att. 25
Matrix – Not Applicable, Excluded From Table			
Air Quality			
By the year 2000, reduce particulate matter emissions and impacts from prescribed burning by 50 percent from the baseline period (1976-1979). This will be accomplished by planning, conducting, monitoring, and, if necessary, adjusting prescribed fire activities in accordance with the Oregon State Implementation Plan and the Oregon Smoke Management Plan (see Fire section).	P, C, O	P, B	EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 9 POD Att. 18
Reduce broadcast burning in favor of lower intensity underburning. Use emission reduction mitigation measures and smoke dispersal techniques to the greatest extent practical. Wildfire hazard reduction, site preparation, and the use of prescribed fire for species habitat mitigation will be implemented in a manner consistent with ecosystem management.	N		
Where needed, use dust abatement measures on roads during BLM timber harvest operations or other BLM commodity hauling activity. Encourage dust abatement measures when haulers use BLM roads under permits and right-of-way agreements.	C, R	B, M	EIS Sec. 4.10.2.6 POD Att. 2 POD Att. 25 POD Att. 29
Determine the cumulative effects of proposed forest management activities on local and sub-regional air quality and minimize impacts. Coordinate cumulative impact analysis with other federal agencies.	N		
As part of implementation planning, prepare conformity determinations required by the Clean Air Act.	P	P	EIS Sec. 1.5.1.8 EIS Secs. 4.12.1.2 & 4.12.1.3 POD Att. 2
Perform an emissions trade-off analysis to determine and quantify the effects of prescribed burning and other types of fuel management on reduction of wildfire emissions. This analysis will be performed at the same geographic scale as conformity determinations.	P	P	EIS Sec. 1.5.1.8 EIS Secs. 4.12.1.2 & 4.12.1.3 POD Att. 2
Promote burning of dry fuelwood by making available copies of the Oregon Department of Environmental Quality publications to fuelwood purchasers.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
For those designated nonattainment areas that smoke from woodstove is shown to be a major source of particulate matter, which directly affects both health and visibility, and most of the wood burned comes from surrounding forest land mitigation should be developed that assures proper curing of the wood has occurred before sale off of federal land. Potential consideration to meet this objectives are: 1. Coordinate the issuance of educational information, with wood permits, that targets proper gather practices and way to minimize adverse effects on air quality from inefficient burning of the wood; 2. Cooperate with local air quality control agencies and other federal land management agencies to assure uniform and accurate dissemination of public information and educational material on proper firewood use and enforcement of permit requirements across agency boundaries.	N		
Water and Soils			
Improve and/or maintain soil and water conditions by closing selected areas to off-highway vehicle use and/or limiting such use to existing or designated roads and trails. See the Recreation Section, Off-Highway Vehicles, for additional details.	C, R, O	B, M	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.8.1.2 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. 9 POD Att. 19 POD Att. 25 POD Att. 29
Water: Comply with state water quality requirements to restore and maintain water quality necessary to protect identifiable beneficial uses as directed by the Clean Water Act, as amended.	P, C, R, O	P, B, M	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 28 POD Att. 29
Water: Comply with state laws and regulations pertaining to the beneficial uses identified by the states and any applicable water quality standards that have been established, as directed by the Federal Water Quality Act of 1987. The State of Oregon has established a list of beneficial uses for the Klamath Basin (Oregon Administrative Rules 340-41-962) and water quality standards that provide protection for those uses. Continue to implement a nonpoint source management program in cooperation with the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality to assure protection of water and water-dependent resources.	P, C, R, O	P, B, M	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS Sec. 4.6.2.3 & 4.6.2.4EIS App. J POD Att. 9 POD Att. 28 POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Design management practices to comply with Oregon's Antidegradation Policy, which describes the conditions under which water quality may be lowered and when it must be maintained or enhanced. The purposes of the Antidegradation Policy, which includes policies on high quality waters, water quality limited waters, and outstanding resources waters, is to protect, maintain, and enhance existing surface water quality to protect all existing beneficial uses.	P	P, B	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS Sec. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 28
Water: Continue coordination with the Oregon Department of Environmental Quality for implementation of best management practices which protect beneficial uses of water. Best management practices will be selected based on site-specific conditions, feasibility, and the water quality standards for potentially affected waters (see Appendix D[41]). Mining, timber, grazing, recreation, off-highway vehicle use, and other activities will be regulated to protect water quality and riparian-wetland areas.	P, C, R, O	P, B, M	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2 & 4.4.3 EIS App. J POD Att. 29
Water: Ensure consistency of management activities with the Oregon Water Management Program for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41).	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.4.3 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS App. J
Water: Watershed analysis will provide the mechanism for consideration, incorporation and implementation of the above into land and water resource management planning.	P		EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS App. J
Water: Permit no degradation of water quality if it will interfere with or become injurious to the established beneficial uses of water within those segments of a river designated under the National Wild and Scenic Rivers Act.	N		
Water: Protect flood plains and wetlands in accordance with Executive Orders 11988 and 11990.	P, C, R, O	P, B, M	EIS Sec. 1.5.1.7 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4.2 EIS App. J POD Att. 28 POD Att. 29

[41] Appendix D: Best Management Practices, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Follow a four tier approach to land and water resource management: regional, physiographic or river basin, watershed, and site specific or project level. Under this approach, analysis starts at the watershed level. The planning units will be physiographic province or river basin, consisting of a number of watersheds. Watershed based planning will be implemented and, over time, the BLM will switch from existing planning units to the provinces or modify the boundaries of current planning units to be more compatible with the watershed based approach.	N		
Water: Watershed analysis will provide the basis for cumulative effects analysis.	P	P	EIS Sec. 1.4.3.2 EIS Sec. 1.4.3.4 EIS Secs. 1.5.1 - 1.5.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2 & 4.4.2.2 EIS Secs. 4.4.3.2 & 4.4.4.2 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.14.2.4 EIS Sec. 4.14.3 EIS App. J POD Att. 9 POD Att. 28
Water: Evaluate proposed projects or management actions for their cumulative effects on water quality, runoff, and stream channel conditions. The results from the cumulative effects analysis will influence final decisions both on activity scheduling and on the application of design features and mitigation measures, including best management practices.	P	P	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Sec. 4.14.2.4 EIS Sec. 4.14.3 EIS App. J POD Att. 9 POD Att. 25 POD Att. 28
Water: Refer to the Riparian Reserves section earlier in this Chapter for additional guidance. In general, guidance for Riparian Reserves supersedes guidance for riparian-wetland areas in this section and in best management practices Appendix D[42]. In some instances, however, guidance in this section and in Appendix D[5] is more restrictive than that stipulated in the Record of Decision for Riparian Reserves. In those instances, the more restrictive guidance will be followed.	P	P	EIS Sec. 1.5.2.1 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4.2 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. J
Water: Emphasize, in accordance with the Riparian-Wetland Initiative for the 1990s, the following in management of riparian-wetland areas: protection of riparian-wetland areas and associated uplands; rehabilitation and maintenance of riparian-wetland areas; and partnership and cooperative rehabilitation and management of riparian-wetland areas.	N		

[42] Appendix D: Best Management Practices, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Manage riparian-wetland areas to protect, maintain, or improve riparian habitat for wildlife and native plant diversity. Restore or maintain riparian-wetland areas so that 75 percent or more are in proper functioning condition by 1997. The overall objective is to achieve an advanced ecological status, except where resource management objectives, including proper functioning condition, will require an earlier successional stage, thus providing the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection. Proper functioning condition exists when adequate vegetation, landform, or large woody debris are present to: dissipate stream energy associated with high water flows; filter sediment, capture bedload and aid floodplain development; improve flood water retention and groundwater recharge; develop stabilizing root masses; create aquatic habitat; and insulate streams from summer and winter temperature extremes.	N		
Water: Achieve riparian-wetland area improvement and maintenance objectives through the management of existing uses, wherever feasible.	N		
Water: Ensure that new resource management plans and activity plans, and revisions of existing plans incorporate, as applicable, practices that enhance or maintain properly functioning riparian systems and maintain, restore or enhance water quality, and result in water quality that meets or exceeds State water quality standards.	N		
Water: Prescribe management of riparian-wetland values based on site-specific characteristics and settings.	N		
Water: Give special attention to monitoring and evaluating management activities in riparian-wetland areas and revise management practices where site-specific objectives are not being met.	N		
Water: Cooperate with and encourage the involvement of interested federal, state and local governments, organizations and private parties to share information, implement management, coordinate activities, and provide education on the value, productivity and management of riparian-wetland areas.	N		
Water: Retain riparian-wetland areas in public ownership unless disposal would be in the public interest, as determined by land use planning.	N		
Water: Identify, encourage, and support research and studies needed to ensure that riparian-wetland area management objectives can be properly defined and met.	N		
Water: Provide environmental education materials to schools and other publics relating to riparian-wetland management.	N		
Water: Incorporate into the resources area's grazing management program, as appropriate, any additional requirements, goals, and objectives devised as a result of the Eastside Ecosystem Management Project and/or Healthy Rangelands record of decision.	N		
Water: Achieve watershed and riparian-wetland management objectives through improved livestock distribution and management through fencing, brush control, spring and other water source development, and through changes in livestock numbers and/or season of use. Maintain existing exclosures where appropriate to meet identified resource management objectives.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water: Continue implementation of the Gerber Riparian Demonstration Area Plan. Develop an interpretive program to showcase the intensive multiple use management systems currently being used to bring about improvements in riparian-wetland conditions.	N		
Soils: Protect watersheds according to the Federal Land Policy and Management Act (1976). Minimize soil erosion and rehabilitate eroded areas, as an overall goal, to maintain and enhance watershed condition and soil productivity and reduce nonpoint source pollution that could result from management and land use activities.	P, C, R, O	P, B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Soils: Locate and analyze areas prone to erosion in watershed analysis. Management opportunities identified for these areas will be evaluated to determine potential impacts. Best management practices or mitigating measures will be identified and incorporated into future proposed activities (see Appendix D[43] for more information). Proposed activities will also be evaluated under the National Environmental Policy Act, as appropriate, for their effects on soils.	P, R	P, B, R, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Soils: Include corrective measures, such as construction of erosion control structures, allocation of proper levels of vegetation use by livestock and wildlife, forest or other land treatments measures and control or mitigation of activities that may contribute to soil erosion and degradation of watershed condition.	P, C, R, O	P, B, M	EIS Sec. 1.5.1 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Soils: Rehabilitate headcuts and gullies on watershed uplands where feasible.	N		
Soils: Rehabilitate burned areas with critical or severe erosion hazards or other environmental concerns.	N		
Soils: Implement treatment projects, such as juniper thinning or brush control, to improve perennial grass cover conditions or wildlife habitat.	N		

[43] Appendix D: Best Management Practices, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Soils: Apply best management practices during all ground and vegetation disturbing activities. See Appendix D[6] for a list of practices.	C, O	B	EIS Sec. 2.4.2.1 & 2.4.2.2 POD Att. 9 POD Att. 20
Soils: Minimize disturbance of identified fragile sites. Appendix D[6] contains management guidance for fragile sites.	P, C, O	P, R, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.2.2.1 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Sec. 4.3.3 EIS Sec. 4.4.4.2 EIS Secs. 4.5.1.3 & 4.5.2.3 EIS Secs. 4.7.4.1 – 4.7.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. K EIS App. M POD Att. 9 POD Att. 25
Soils: Exclude fragile nonsuitable sites from the timber production base to minimize soil erosion and the effects of land management activities on surface waters.	N		
Soils: Incorporate, as applicable, in grazing-related plans and activities practices that maintain or achieve healthy, properly functioning uplands. Uplands function properly when vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. The functioning condition of uplands results from the interaction of geology, soil, climate, water, biological activity, and landform.	N		
Soils: Manage uplands to provide the following functions within site capabilities, consistent with Appendix D[6] and consistent with other management direction: • The vegetation canopy allows moisture from typical storm events to reach the soil surface. • Standing vegetation captures blowing or drifting snow. • Organic material (plant litter, standing vegetation) protects the soil surface form raindrop impact. • Coarse rock fragments protect the soil surface from raindrop impact. • Water is not restricted from infiltrating the soil surface (for example, organic matter is present and no physical soil crusting, capping, or sealing of the surface is present). • Subsurface soil conditions support infiltration rates (for example, compaction layers and evident of frost heave are uncommon). • Standing vegetation and plant litter detain overland flow and trap sediment. • Surface roughness detains overland flow. • Evidence of excessive overland flow (rills and gullies, pedestalling), wind erosion or other soil movement is uncommon. • Plant cover and litter protect the soil surface from the evaporative effects of sun and wind. • Plants are vigorous and productive and consist of desirable species.	N		
Wildlife Habitat			

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Except where public safety is a concern, snags will be retained on lands not allocated to timber production at 100 percent of optimum population potential for cavity nesters. Where relevant to meeting cavity nester objectives, some green trees will be girdled or topped (having the top cut or blasted) or managed to create snags. Timber sale contracts will encourage retention of all snags and non-merchantable trees that could be left safely in timber harvest areas.	N		
Leave all soft snags except where unacceptable for safety, logging system, or burning considerations.	N		
Leave scattered hard snags and green trees, both to provide the current needs of hard-snag dependent species and to serve as a source of future soft snags. Where available, green trees retained will be cull trees. If cull trees are not available, sound trees will be retained for this purpose. At least half of reserved wildlife trees will be future snags (green culls, or sound trees).	N		
All Land Use Allocations: Use the watershed analysis process to address wildlife habitat issues for individual watersheds. The analysis will help to resolve any concerns identified in applying management actions/direction in this section and those in the Special Status and Supplemental Environmental Impact Statement Special Attention Species section. Other wildlife enhancement opportunities may be or have been identified through an interagency or cooperative effects (such as Coordinated Resource Management Plan, Challenge Cost Share, or existing Habitat Management Plans).	P, R	P, M	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS Sec. 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.6.1.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. H EIS App. J POD Att. 29
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of wildlife habitat enhancement projects.	N		
All Land Use Allocations: Cooperate with federal, tribal, and state wildlife management agencies to identify and mitigate impacts associated with habitat manipulation, poaching, and other management activities that threaten the continued existence and distribution of native wildlife inhabiting federal lands.	N		
All Land Use Allocations: Cooperate with the Oregon Department of Fish and Wildlife on any wildlife research, inventory, or monitoring conducted on Klamath Falls Resource Area-administered lands, as well as for their assistance in developing an educational program to increase public awareness of wildlife (for example Watchable Wildlife and Fish and Wildlife 2000).	N		
All Land Use Allocations: Continue ongoing animal damage control activities conducted by the Animal and Plant Health Inspection Service/Animal Damage Control according to the annual work plan. This includes control for predation on wildlife, livestock, crops, timber, and conifer seedlings. This may also involve control of wildlife causing damage to facilities or special habitats.	N		

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations: Reduce open road density to 1.5 miles or less per section as a road system management goal in accordance with other management activities. Existing off-highway vehicle closures in big game winter ranges will remain in effect throughout the plan (see the Recreation section for more details). Other important and sensitive wildlife habitats (special habitat features, project areas) will be evaluated for seasonal road closures. Some roads could remain open for administrative use, forest product removal, or access for mineral exploration and development. Road closures could be achieved using a variety of methods, such as gates, cables, boulders, obliteration or other.	N		
Riparian Reserves: Design, construct and operate wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing wildlife interpretative and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.	N		
Late-Successional/District Designated Reserves: Manage the system of 80 to 100-acre Late-Successional/District Designated Reserves to provide a diverse mosaic of habitats across the west side of the planning area. These areas will not be subject to planned timber harvest but harvest will be allowed to attain or maintain old growth characteristics. These forest lands total 1,600 acres, most of which are currently old growth or mature forest.	N		
Late-Successional/District Designated Reserves: Reintroduce fire as a natural disturbance factor through prescribed burning.	N		
Matrix (General Forest Management Area) – West Side: Use old growth ecosystem prescriptions in one quarter mile buffers around each late-Successional! District Designated Reserve. These buffer areas will provide an additional component of habitat diversity. The gross BLM-administered acreage in these areas is 3,800 acres. Old growth ecosystem prescriptions are harvest methods designed to facilitate the attainment or maintenance of old growth characteristics (see Appendix E[44]).	N		
Matrix (General Forest Management Area) – West Side: On lands available for timber harvest, retain snags, live green cull trees, and green merchantable trees to provide nest sites for a minimum of 60 percent of optimal cavity nester populations, both for present needs and long-term sustainability. This retention level corresponds to approximately 1.9 snags per acre (or 190 snags per 100 acres).	N		
Matrix (General Forest Management Area) – East Side: On lands available for timber harvest, retain snags, live green cull trees, and green merchantable trees to provide nest sites for a minimum of 60 percent of optimal cavity nester populations, both for present needs and long-term sustainability. This retention level corresponds to approximately 1.4 snags per acre (or 140 snags per 100 acres) in forested habitat.	N		

[44] Appendix E: Timber Management, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Matrix (General Forest Management Area) – East Side: Use prescribed fire as a favored tool for site preparation, fuel reduction, and to restore or retain natural ecological processes through site disturbance.	N		
Matrix (General Forest Management Area) – East Side: On lands east of Highway 97, manage range and riparian-wetland areas in the Gerber Block for a mosaic of native plant communities. This mosaic will allow for migration and dispersal of organisms between BIM-administered lands and adjacent U.S. Forest Service-administered lands. Reintroduce fire as a natural disturbance factor through prescribed burning.	N		
Special Habitats: Manage special habitats, such as lakes, talus slopes, meadows, and wetlands (see Table 1 in Appendix B[45]) to protect their primary habitat values; however, rock quarries could be developed on cliffs or talus slopes not occupied by special status species. Consider wildlife values in the development and rehabilitation of rock quarries. Actions that will benefit wildlife include: constructing cavities for raptors and other species in quarry walls during development, or in abandoned quarries; and piling large boulders at the base of slopes or in waste areas to create cavities for mammals.	N		
Special Habitats: Buffer special habitats from surface disturbance and timber harvest if necessary to protect primary values.	N		
Special Habitats: Use management practices, including prescribed fire or timber harvest, to obtain desired vegetation conditions in special habitats.	N		
Deer, Elk, and Antelope: Design thinning projects to maintain existing major game trails free of slash accumulations that impede big game movement.	N		
Deer, Elk, and Antelope: Conduct forage seeding in habitat areas with appropriate seed beds and where compatible with other management objectives.	R	B	EIS Secs. 4.6.1.2 & 4.6.1.3
Deer, Elk, and Antelope: Use seasonal restrictions on public use and management activities where needed to minimize disturbance and harassment of herds during critical use periods (for example, birthing areas, winter range, etc.).	P, C, O	P, B	EIS Secs. 4.6.1.2 & 4.6.1.3
Deer, Elk, and Antelope: Use patch cut harvesting in big game habitat only where silviculturally essential to accomplish relevant forest management or other resource objectives (such as providing small patch openings). Keep existing major game trails slash free in pre-commercial thinning units. Maintain or improve all seasonal ranges throughout the planning area through a variety of habitat projects and practices.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. F POD Att. 29

[45] Appendix B: Summary of Land Allocations and Management Actions/Directions, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Deer, Elk, and Antelope: Conduct forage seedlings on up to 40 percent of appropriate habitat in harvest areas. Fertilize up to 50 percent of appropriate habitat in deer winter range. Create forage openings up to 5 acres in closed canopy areas. Create and/or maintain forage openings in closed canopy areas on summer and winter ranges. Provide visual barriers up to 25 feet wide along roads in harvest areas. Avoid constructing connecting or through roads in winter ranges. Continue existing seasonal off-highway vehicle closures in big game winter ranges. On lands available for timber production, maintain 40 percent in hiding and thermal cover.	N		
Deer, Elk, and Antelope: Conduct thinnings of encroaching juniper to protect and improve forage areas for big game. These thinnings will protect old growth juniper and be designed to consider edge effect, escape cover, and proper unit size.	N		
Furbearers: Conduct systematic inventory of furbearers such as pine marten, beaver, and otter.	N		
Golden Eagle (Protected): Provide a buffer of up to 30 acres around known and future nest sites and restrict some management activity near nest sites between January 1 and August 31.	N		
Osprey: Restrict some management activity within % mile of known nest sites between May 1 and August 1; develop nest structures to improve nesting opportunities in suitable habitat.	N		
Osprey: Provide snags or green culls for perch/nest sites along all suitable (fish-bearing) waterbodies. Provide up to a 5-acre buffer around known and future nest sites.	N		
Accipiters: Provide up to a 15-acre buffer for some management activities around known and future activity centers.	N		
Prairie Falcon: Provide up to a 15-acre buffer for some management activities around known and future activity centers.	N		
Red-tailed Hawk: Provide up to a 5-acre buffer for some management activities around known and future nest sites.	N		
Other Raptors: Maintain the integrity of nest sites and centers of activity.	N		
Woodpeckers: Manage for 60 percent of optimum population potential on all lands allocated to timber production. Lands not allocated to timber production will be managed at 100 percent of optimum population potential.	N		
Sandhill Crane: Conduct systematic nest surveys and construct artificial nest structures to optimize nesting potential.	N		
Sandhill Crane: Restrict some management activities within 200 feet of nest sites from April 1 to August 1.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Waterfowl: Where necessary, acquire water rights, consistent with Oregon State water laws in important waterfowl production areas; as opportunities arise, private lands in important waterfowl habitat will be obtained through exchange or other mutual agreement. Allow livestock grazing in waterfowl nesting habitat only under guidelines set by an interdisciplinary team process. If necessary, initiate a predator control program to enhance nesting success and production, within guidelines of the established animal damage control environmental impact statement.	N		
Wild Turkey: Rehabilitate and improve meadows with native plants and grasses in suitable habitat and plant small food plots with high yield grains and grasses in disturbed areas. Create and/or maintain open forage areas up to 3 acres in appropriate habitat. Maintain hardwoods to maximize mast production in up to 50 percent of harvested acres. In suitable habitat provide 2 roost sites (approximately 1/8 to 1/4 acre) per 40 acres of harvest area. Minimize open roads and avoid new road construction within %mile of nest and roost sites.	N		
Other Upland Gameblrds: Maintain clumps of mature conifers on major ridges to provide winter habitat for grouse. Install guzzlers in cooperation with the Oregon Department of Fish and Wildlife to benefit upland game-birds and other wildlife. Continue to introduce red-legged partridge/chukar, pheasant, and turkey in cooperation with the Oregon Department of Fish and Wildlife.	N		
Trout: Develop a coordinated recreation management plan to include tributaries of the Jenny Creek watershed; install instream structures in areas lacking sufficient habitat; stock suitable waterbodies that are below carrying capacity and/or areas above barriers; timber sale contracts would require, when practical, removal of debris that obstructs fish passage or would degrade the stream channel; retain large woody debris in and adjacent to the stream channel; improve trout habitat and/or maintain through minimal impact grazing system; use riparian-wetland exclosures to enhance streamside habitat; remove debris jams that impede migration; modify or replace culverts that block migration; and block up ownership when possible on lands with trout bearing streams.	P, R	P, B	EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Fish Habitat			
All Land Use Allocations: Use the watershed analysis process to address at-risk fish species and stocks and their habitat for individual watersheds. Where appropriate, fish habitat enhancement opportunities will be identified through this process or through coordinated resource management plans.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. M POD Att. 29

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of fish habitat enhancement projects. Priority will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration. As identified through watershed analysis, rehabilitate streams and other waters to enhance natural populations of resident Possible rehabilitation measures will include, but not be limited to, fish passage improvements, instream structures using boulders and log placement to create spawning and rearing habitat, placement of fine and coarse materials for overwintering habitat, and establishment or release of riparian-wetland trees.	N		
All Land Use Allocations: Enhance warm water fisheries in reservoirs or ponds where fish populations provide forage for eagles or osprey or where recreational needs can be fulfilled.	N		
Riparian Reserves: Design, construct, and operate fish interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish interpretative and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.	N		
Special Status and Supplemental Environmental Impact Statement Special Attention Species Habitat			
All Land Use Allocations – Special Status Species: Protect the following sites from grazing: known and newly discovered sites of the following mollusk species will be protected from grazing by all practicable steps to ensure that the local populations of the species will not be impacted. These species include: *Fluminicola n.* sp. 1, *Flumincola n.* sp. 11, *Fluminicola n.* sp. 19, *Fluminicola n.* sp. 20, *Fluminicola n.* sp. 3, and *Fluminicola seminalis*. Freshwater mollusks in the family *Hydrobiidae* (to which the genus *Fluminicola* belong) are known to exist in the resource area. Tentative identification of mollusks collected at several sites in the resource area has been made. Further investigation is required for more positive identification of which species of *Fluminicola* are present in the resource area. Implementation of protection actions will be initiated after watershed analysis and appropriate National Environmental Policy Act decisions.	N		
All Land Use Allocations – Special Status Species: Review all proposed actions to determine whether or not special status species occupy or use the affected area or if habitat for such species is affected.	P	P	EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Conduct field surveys according to protocols and other established procedures. This includes surveying during the proper season unless surveys are deemed unnecessary through watershed analysis, project planning, and environmental assessment. For example, field surveys may not be conducted in all cases depending on the number and timing of previous surveys conducted, whether previous surveys looked for all species that a new survey would look for, and the likelihood of potential habitat. The intensity of field surveys will also vary depending on the same factors.	P	P	EIS Sec. 1.5.4.1 EIS Sec. 4.4.4 EIS. Secs. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App. M POD Att. 10

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Consult/conference with the U.S. Fish and Wildlife Service or National Marine Fisheries Service for any proposed action which may effect federal listed or proposed species or their critical or essential habitat. Based on the results of consultation/conferencing, modify, relocate, or abandon the proposed action. Request technical assistance from one of these agencies for any proposed action which may affect federal candidate species or their habitat.	P	P	EIS Sec. 1.5.1 EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Coordinate with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and other appropriate agencies and organizations and jointly endeavor to recover federal listed and proposed plant and animal species and their habitats.	P, C, O	P, B	EIS Sec. 1.5.1 EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Modify, relocate, or abandon a proposed action to avoid contributing to the need to list federal candidate species, state listed species, or Bureau sensitive species.	P, C	P, R	EIS Sec. 1.5.3.5 EIS Sec. 3.4.3 EIS Sec. 4.7.4.1 – 4.7.4.4 EIS App. K EIS App M POD Att. 10
All Land Use Allocations – Special Status Species: Coordinate and cooperate with the state of Oregon to conserve state listed species.	P, C, R, O	P, M	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.7.3.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. M POD Att. 29
All Land Use Allocations – Special Status Species: Identify impacts of proposed actions, if any, to bureau assessment species as a whole and clearly describe impacts in environmental analyses. As funding permits and as species conservation dictates, Bureau assessment species will be actively managed.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Special Status Species: Retain under federal management, or other appropriate management organization, habitat essential for the survival or recovery of listed species. Retain habitat of candidate or Bureau sensitive species where disposal will contribute to the need to list the species.	P	P	EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Where appropriate opportunities exist, acquire land to contribute to recovery, reduce the need to list, or enhance special status species habitat.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Special Status Species: Where appropriate, pursue opportunities to increase the number of populations of species under BLM management through land acquisition and/or species reintroduction in coordination with other responsible agencies.	N		
All Land Use Allocations – Special Status Species: Coordinate with other agencies and groups in management of species across landscapes. Coordination will be accomplished through conservation plans or similar agreements which identify actions to conserve single or multiple species and/or habitats. Such strategies could preclude the need for intensive inventories or modifications to some projects where the conservation plan provides adequate protection for the species and meets the intent of policy.	p	P	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec.1.5.4.1 & 1.5.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Where plans exist for species no longer on the special status list, continue with the prescribed conservation actions if determined to be required to avoid relisting or future consideration for listing. In the case of interagency plans or agreements, this determination will be mutually decided. Such plans may be modified as needed based on adequacy of existing range-wide conditions and conservation management.	N		
All Land Use Allocations – Special Status Species: Pursue opportunities for public education about conservation of species.	N		
All Land Use Allocations – Special Status Species: In addition to protection of federally listed or proposed threatened or endangered plant or animal species, manage areas to restore and retain biological diversity to provide protection for clusters of federal candidate category 1 and 2, state listed, Bureau sensitive, and Bureau assessment species. Modify or constrain Bureau management actions and permitted actions to the extent considered necessary to avoid contributing to the need to list federal candidate category 1 and 2, state listed, state candidate, and Bureau sensitive species.	P	P, R	EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Monitor and manage habitats of federally listed or proposed threatened or endangered species as required by law. Prior to any vegetation or ground manipulation, or any disposal of BLM-administered land, conduct a review of the affected site(s) or tract(s) for such plants and animals.	P, C	P	EIS Secs. 4.7.1 & 4.7.4 EIS App. M POD Att. 10
All Land Use Allocations – Special Status Species: Conduct general inventories for special status species where needed to determine species distribution and status. Conduct monitoring of these species populations to determine their requirements and trends. Prepare management plans when necessary, and implement active management where needed to prevent listing or to conserve the species. Report population and occurrence data to the Oregon Natural Heritage Program.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Listed, Proposed, or Candidate Threatened and Endangered Species: Implement the land use allocations and management actions/direction of this resource management plan which are designed to enhance and maintain habitat for threatened and endangered species.	C, R, O	B, M	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.4 EIS Sec. 4.1.3.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. M POD Att. 10 POD Att. 29
All Land Use Allocations – Northern Spotted Owl (federal threatened species): In the Matrix, retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) spotted owl activity centers.	N		
All Land Use Allocations – Northern Spotted Owl (federal threatened species): Fall no trees within 1/4 mile of all active northern spotted owl nest sites from approximately March 1 to September 30 to avoid disturbance and harm to young owls.	P, C, O	P, R	EIS Sec. 1.5.1.1 EIS Sec. 4.6.1.2 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Northern Spotted Owl (federal threatened species): With minor exceptions, restrict human activities that could disturb owl nesting, especially use of large power equipment, within ¼ mile of all active spotted owl nest sites from approximately March 1 to September 30. Restrictions on activities will usually not be required for owl nests and activity centers located near roads or in other areas of permanent human activity.	P, C, O	P, R	EIS Sec. 1.5.1.1 EIS Sec. 4.6.1.2 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Northern Spotted Owl (federal threatened species): Continue the Surveyor Mountain study to monitor spotted owl density, northern goshawk, and other old growth species and their response to harvest prescriptions.	N		
All Land Use Allocations – Bald Eagle (federal threatened species): Protect known and potential habitat sites identified in the Pacific Bald Eagle Recovery Plan. Provide a buffer of up to 30 acres around nest sites and restrict management activity near nest sites between January 1 and August 31. Coordinate with the Oregon Department of Fish and Wildlife to maintain optimum fish populations in reservoirs providing potential nesting and foraging sites. All management activities will be consistent with objectives identified in the recovery plan and the Working Implementation Plan for Bald Eagle Recovery in Oregon and Washington.	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Bald Eagle (federal threatened species): Provide snags for perching and protect those snags within ¼ mile of nest, roost, and known forage sites. Retain old growth characteristics in existing and potential habitat, including large trees and snags, to provide for future population expansion. Acquire easements or ownership of private lands within 1/2 mile of existing or potential habitat that aids in meeting recovery plans; also specifically evaluate acquisition of the Algoma and Swan Lake nest sites as recommended in the recovery plan. Conduct fuels reduction management actions to help reduce potential loss of habitat to catastrophic wildfire occurrences.	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Bald Eagle (federal threatened species): Write and implement a site-specific habitat management plan for bald eagle nest sites and major use areas in the Klamath Falls Resource Area, incorporating those management actions identified in the Working Implementation Plan for Bald Eagle Recovery in Oregon and Washington for which the BLM is responsible.	N		
All Land Use Allocations – Peregrine Falcon (federal endangered species): • Comply with the Pacific Coast Recovery Plan for Peregrine Falcons and any other site-specific habitat management plans. • Provide a buffer of up to 30 acres around known and future sites; survey for presence in potential nesting habitat and cooperate with the Oregon Department of Fish and Wildlife to reintroduce peregrines into the Klamath River Canyon. • Restrict new roads and other management activities within ½ mile of existing and potential nest sites. Protect potential habitat in cliff areas of upper Klamath River Canyon.	N		
All Land Use Allocations – Northern Goshawk (Federal Candidate Category 2): Provide up to a 30-acre buffer around known and future activity centers.	P, C, O	P, R	EIS Secs. 4.6.1.2 & 4.6.1.3
All Land Use Allocations – Townsend's Big-eared Bat (Federal Candidate Category 2): When available, obtain through exchange or other mutual agreement private lands that support bat populations or contain potential habitat change or other mutual agreement private lands that support bat populations or contain potential habitat. Continue the Salt Caves seasonal habitat closure from May 1 to September 15.	N		
All Land Use Allocations – Townsend's Big-eared Bat (Federal Candidate Category 2): Buffer current and future use sites up to 20 acres. Restrict management activities within V4 mile of occupied sites.	P, C, O	P, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Townsend's Big-eared Bat (Federal Candidate Category 2): Conduct an inventory of Townsend's big-eared bats in all potential habitat. To optimize big-eared bat populations, minimize detrimental human disturbance in habitat used by the bat. As opportunities arise, obtain through exchange or other mutual agreement, private lands with habitat that support big-eared bat populations or have the potential for use by the bat.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Western Sage Grouse (Federal Candidate Category 2): Conduct surveys in cooperation with the Oregon Department of Fish and Wildlife.	N		
All Land Use Allocations – Western Sage Grouse (Federal Candidate Category 2): Inventory, monitor, and manage important habitats for those characteristics important for grouse.	N		
All Land Use Allocations – Western Sage Grouse (Federal Candidate Category 2): Provide a buffer around lek sites up to 20 acres; institute a seasonal restriction on surface disturbing activity of up to V4 mile around lek sites from March 1 through May 1.	N		
All Land Use Allocations – Western Sage Grouse (Federal Candidate Category 2): Prohibit the removal of large tracts of sagebrush in and near important sage grouse use areas.	N		

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations – Amphibians and Reptiles: Conduct inventories for special status reptiles and amphibians in the planning area. Inventory and documentation of non-status reptiles and amphibians will also take place during this time.	P	P	EIS Sec. 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Shortnose Sucker (Endangered), Lost River Sucker (Endangered), Klamath Largescale Sucker (Candidate), and Western Pond Turtle (Candidate): Provide a buffer of up to 300 feet around waterbodies used by these species. Maintain riparian crown cover in accordance with best management practices and riparian-wetland areas.	P, C, R, O	P, B, R	EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.1.3 & 4.7.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Redband Trout (Candidate): Provide a buffer of up to 300 feet around waterbodies used by this species. Maintain riparian crown cover in accordance with best management practices and riparian-wetland areas.	P, C, R, O	P, B, R	EIS Secs. 4.6.2.2 & 4.6.2.3 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – *Astragalus applegatei* (federal endangered): Although there are known populations within the planning area, none of these populations have been found on BLM-administered lands.	N		
All Land Use Allocations – Supplemental Environmental Impact Statement Special Attention Species – Survey and Manage: Implement the survey and manage provision of the Supplemental Environmental Impact Statement Record of Decision within the range of Supplemental Environmental Impact Statement special attention species and the particular habitats that they are known to occupy. Appendix C[46] shows which species are covered by this provision, and which of the following four categories and management actions/direction are to be applied to each:	P	P, R, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 4.1.3.4 EIS Secs. 4.7.4.3 & 4.7.4.4 EIS App. K LMP Amendment BLM/FS-1
All Land Use Allocations – Supplemental Environmental Impact Statement Special Attention Species – Roosting Bats: Conduct surveys to determine the presence of roosting bats, including fringed myotis, silver-haired bats, long-eared myotis, long-legged myotis, and pallid bats. Surveys will be conducted according to protocol defined in the Supplemental Environmental Impact Statement Record of Decision and in any subsequent revisions to protocol.	P	P	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
All Land Use Allocations – Supplemental Environmental Impact Statement Special Attention Species – Roosting Bats: As an interim measure, allow no timber harvest within 250 feet of sites containing bats. Develop mitigation measures in project or activity plans involving these sites. The intent of these measures is to protect sites from destruction, vandalism, disturbance from road construction or blasting, or any other activity that could change cave or mine temperatures or drainage patterns.	P, C, R, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M

[46] Appendix C: Management for the Supplemental Environmental Impact Statement Special Attention Species, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Supplemental Environmental Impact Statement Special Attention Species – Roosting Bats: When Townsend's big-eared bats are found on federal land, notify the Oregon Department of Fish and Wildlife. Develop management prescriptions for these sites that include special consideration for potential impacts on this species. See the management actions/direction for Townsend's big-eared bats listed in the Special Status Species section.	P	P	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. M
Late-Successional/District Designated Reserves: Design projects for recovery of threatened or endangered animal and plant species even if they result in some reduction of habitat quality for late-successional species. These projects will be designed for least impact to late-successional species.	P	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. M POD Att. 10 POD Att. 29
Late-Successional/District Designated Reserves: Design projects to maintain health of the habitat for the long term.	P	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 29
Special Areas			
Develop site-specific management plans for new special areas as needed. Protect resource values in new areas pending completion of management plans. Management plans will address other possible actions such as land acquisition, use of prescribed fire, and interpretation.	N		
Apply the guidelines of the prevailing land use allocation(s) to candidate areas of critical environmental concern that were dropped from further consideration. See Appendix F[47] for a list of these areas and the land use allocations under which they will be managed.	N		
Use minimum impact suppression activities during wildfires.	N		
Areas of Critical Environmental Concern: Miller Creek: 2,000 acres, from Gerber dam to the Goodlow Rim, 200 feet either side of canyon rim. Maintain, protect, or restore natural processes, wildlife, and scenic values. Not available for planned timber harvest; restrict grazing; mineral leasing subject to no surface occupancy; close area to off-highway vehicle use (except Round Valley Road area); provide for primitive and semiprimitive recreation opportunities, including a trail along Miller Creek.	N		

[47] Appendix F: Special Areas, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Areas of Critical Environmental Concern: Upper Klamath River: 4,960 acres, 11 miles of the Klamath River canyon from rim to rim extending from J.C. Boyle powerhouse to the Oregon-California State line. Maintain, protect, or restore historic, cultural, scenic, fisheries, wildlife populations and habitat. Not available for planned timber harvest; limit off-highway vehicle use to designated roads; no developments allowed to enhance the potential for grazing; mineral leasing subject to no surface occupancy, not available for hydroelectric development. Manage area for semi-primitive motorized recreation opportunities.	N		
Areas of Critical Environmental Concern: Yainax Butte: 720 acres, isolated mountain eight miles south of Beatty, Oregon. Maintain, protect, or restore natural processes and systems. Not available for planned timber harvest; open to grazing, but fence if necessary to protect plant communities from grazing; limit off-highway vehicle use to existing roads; mineral leasing subject to no surface occupancy. Manage area for semi-primitive motorized recreation opportunities.	N		
Areas of Critical Environmental Concern/Research Natural Area: Old Baldy: 520 acres (Klamath Falls Resource Area +160 acres Medford District BLM). High elevation mixed conifer forests and associated brush fields to fill Research Natural Area cell. Preserve, protect, or restore natural processes or system. No timber harvest, firewood, or salvage· sales; closed to off-highway vehicle use; area to remain free of cattle use with no developments allowed to enhance the potential for grazing. Mineral leasing Subject to no surface occupancy; closed to mineral entry. Manage area for semiprimitive non-motorized recreation opportunities.	N		
Clover Creek: 30 acres; an area adjacent to a tributary of Spencer Creek used by elementary classes for educational purposes (annual forestry tour). Manage and maintain area for educational values as presented in forestry tour and for recreation. Consider development of adjacent area for parking of large vehicles (busses) and provide day-use facilities. Make parking area available as a winter snow-park. Restrict timber harvest; open to off-highway vehicle use; open to grazing use; mineral leasing subject to no surface occupancy.	N		
Surveyor Forest Area: 150 acres; an area adjacent to Surveyor Recreation site, old growth, mixed conifer forest with meadows along the headwaters of Johnson Creek. Manage and maintain educational values, natural processes, scenic values, and wildlife habitat. Not available for planned timber harvest; limit off-highway vehicle use to designated roads; control grazing by fencing; mineral leasing subject to no surface occupancy. Manage area for semi-primitive recreation opportunities. Develop informational,\ educational, interpretive trail to highlight old growth education and riparian-wetland ecosystems.	N		
Special Botanical/Habitat Areas: Alkali Lake: 240 acres; wetland area in Yonna Valley between Dairy and Bonanza, Oregon. Protect, maintain, and/or restore wildlife habitat area. Open to off-highway vehicle use (no public access); actively pursue land exchange and legal access opportunities; mineral leasing subject to no surface occupancy; control grazing by fencing.	N		
Special Botanical/Habitat Areas: Tunnel Creek Wetlands: 280 acres; Lodgepole pine swamp located between Keno Road and Buck Lake. Protect, maintain, and/or restore natural systems or processes. Restrict timber harvest; limit off-highway vehicle use to designated roads; control grazing by fencing; mineral leasing subject to no surface occupancy.	N		

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Special Botanical/Habitat Areas: Bumpheads: 50 acres; volcanic formations at the south end of the Gerber Block. Preserve, protect, or restore natural processes or system, and scenic resources; limit off-highway vehicle use to existing roads; control grazing by fencing; mineral leasing subject to no surface occupancy.	N		
The following two areas, while not falling into one of the above land use allocations, will receive special management attention (see Appendix F[48]). • Pacific Crest National Scenic Trail • Spencer Creek	P, C, R, O	P, B, R, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.8.1.3 EIS Sec. 4.14.2.8 EIS App. F EIS App. H EIS App. J POD Att. 1 POD Att. 29
Cultural Resources Including American Indian Values			
Identify and evaluate Native American traditional use areas requiring protection and management during watershed analysis or site-specific planning.	P	P	EIS Sec. 4.1.3.5 EIS Secs. 4.11.1.1 - 4.11.1.3 EIS Sec. 4.11.3.3 EIS Sec. 4.11.4 EIS App. J POD Att. 26
Evaluate cultural resource sites to determine their potential for contributing to public, cultural heritage, and/or scientific purposes. Evaluate the Klamath River Canyon and lands on Bryant Mountain for nomination to the National Register of Historic Places as Archaeological Districts.	P, C	P, B, R	EIS Sec. 4.1.3.5 EIS Sec. 4.11.1.1 EIS Sec. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 EIS App. J POD Att. 26
Investigate landscape features such as bogs, ponds, and packrat middens, and cultural sites that contain information regarding long-term environmental change.	N		
Develop mechanisms for describing past landscapes and the role of humans in shaping those landscapes, Address the management of cultural resources through watershed analyses and project plans.	N		
Develop educational and interpretive programs to increase public awareness and appreciation of cultural resources, as part of the "Adventures in the Past" initiative, and the "Heritage Education" program.	N		
Develop partnerships with local American Indian tribes and other interested parties to accomplish cultural resource objectives.	N		
Take appropriate law enforcement or other actions when necessary to protect cultural resources. (Such actions may include physical protection measures such as riprapping and barrier installations to reduce deterioration.)	N		

[48] Appendix F: Special Areas, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Work with federally recognized American Indian tribes to develop Memoranda Of Understanding so that their heritage and religious concerns may be appropriately considered. These tribes may include but are not limited to the Klamath Tribes, the Shasta Tribe, the Modoc Tribe of Oklahoma, and the Consolidated Modoc and Paiute Tribe.	N		
Consider acquiring significant cultural resource properties for public, cultural heritage, and scientific purposes.	N		
Visual Resources			
Address visual resource management issues when conducting watershed analysis,	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. J POD Att. 1
Use the visual resource contrast rating system during project level planning to determine whether or not proposed activities will meet Visual Resource Management objectives. Use mitigation measures to reduce visual contrasts.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.8.2.3 & 4.8.2.4 POD Att. 1 EIS App. F POD Att.29
Provide for natural ecological changes in Visual Resource Management Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and must not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.	N		
Manage Visual Resource Management Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.	N		
Manage Visual Resource Management Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line color, texture, and scale found in the predominant natural features of the characteristic landscape.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Manage Visual Resource Management Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture.	P, C, R, O	P, B, R	EIS Sec. 4.8.2.3 POD Att. 1
Wild and Scenic Rivers – Not Applicable, Excluded From Table			
Wilderness and Wilderness Study Areas – Not Applicable, Excluded From Table			

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Rural Interface Areas			
Work with local governments to improve the BLM data base regarding private land planning/zoning designations and residential development near BLM-administered land.	N		
Work with local governments to provide information to local planners regarding BLM land allocations in rural interface areas and the management objectives and guidelines for these lands.	N		
Work with local governments to develop design features and mitigation measures that will minimize the possibility of conflicts between private and federal land management.	N		
Work with local governments to monitor the effectiveness of design features and mitigation measures in rural interface areas.	N		
As a part of watershed analysis and project planning, work with local individuals and groups, including fire protection districts, to identify and address concerns related to possible impacts of proposed management activities on rural interface areas.	N		
Use design features and mitigation measures to avoid/minimize impacts to health, life, and property and quality of life. Examples include different harvest regimes, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning of low to moderate intensity prescribed burns. Monitor the effectiveness of design features and mitigation measures.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS App. F POD Att. 9 POD Att. 28 POD Att. 29
Eliminate or mitigate public hazards such as abandoned mine tunnels and quarries.	N		
Manage within 1/4 mile of rural interface areas using no less than visual resource management Class III standards (unless an area is classified as visual resource management Class I or II).	P, C, R, O	P, B, R	EIS Sec.4.8.2.3 POD Att. 1
Reduce unauthorized public use of non-through or "local" roads within rural interface areas and within ¼ mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate. These actions are needed to reduce public health and safety hazards, fire risk, vandalism to private property, and will be used on an as needed basis.	P, C, R, O	P, B	EIS Secs. 4.10.2.2 & 4.10.2.6 POD Att. 25
Reduce natural fuel hazards on BLM-administered lands in rural interface areas.	N		
Socioeconomic Conditions – Not Applicable, Excluded From Table			
Recreation – Not Applicable, Excluded From Table			
Forest Condition Restoration (Forest Health Restoration)			

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Design and implement silvicultural treatments in stands that exhibit deteriorating conditions. Treatments are intended to restore the ability of stands to respond to other management and to reduce the risk of mortality from drought, insects, disease, and wildfire. Treatments will consist of thinning of stands, prescribed fire, forest fertilization, reduction of understory vegetation, reduction of ladder fuels, and restoration of more stable plant communities.	N		
All Land Use Allocations Design forest condition restoration treatments to be consistent with the long-term objectives of the allocation in which the treatment is proposed. Develop treatments in an interdisciplinary manner.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App.H EIS App. J POD Att. 9 POD Att. 29
All Land Use Allocations Maintain the natural richness of tree species (conifers and hardwoods).	N		
All Land Use Allocations Develop forest condition restoration treatments at the stand level based on the combination of stand condition and trend, on the functional characteristics of the ecosystem, and on characteristics of the site. Design treatments, as much as possible, to prevent the development of undesirable species composition, species dominance, stand density, or other stand characteristics. Employ the principles of integrated pest management and integrated vegetation management to avoid the need for direct treatments. Use herbicides only as a last resort.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. F EIS App.H EIS App. J POD Att. 9 POD Att. 29
Riparian Reserves: Design and implement forest condition restoration treatments in a manner that contributes to the attainment of Aquatic Conservation Strategy objectives.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 9 POD Att. 29
Late-Successional/District Designated Reserves: Design and implement forest condition restoration treatments if they provide habitat benefits for late-successional associated species or if the effects on such species are negligible.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 9 POD Att. 29
Late-Successional/District Designated Reserves: Prior to the use of prescribed fire as a forest condition restoration treatment, develop an interdisciplinary fire management plan specifying how prescribed fire applications will meet the objectives of the Late-Successional Reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office. Apply prescribed fire in a manner which retains the needed amount of coarse woody debris as determined through watershed analysis.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Area) - West and East Sides: Retain snags within forest condition restoration treatment units at levels sufficient to support species of cavity-nesting birds at 60 percent of potential population levels. Meet the 60 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.	N		
Matrix (General Forest Management Area) - West and East Sides: Special Habitats. In project areas containing special wildlife habitats (for example, talus and meadows) maintain 100 to 200 foot buffers around the special habitat. This could be increased, decreased, or manipulated based on site-specific circumstances. Ecologically significant buffers will be determined by interdisciplinary teams.	N		
Timber Resources – Not Applicable, Excluded From Table			
Special Forest/Natural Products – Not Applicable, Excluded From Table			
Energy and Minerals – Not Applicable, Excluded From Table			
Grazing Management – Not Applicable, Excluded From Table			
Wild Horse Management – Not Applicable, Excluded From Table			
Land Tenure Adjustments – Not Applicable, Excluded From Table			
Rights-of-Way			
Riparian Reserves: Issue rights-of-way to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing rights-of-way to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing rights-of-way will be based on the actual or potential impact and the ecological value of the riparian-wetland resources affected.	P, C, O	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.5 & 2.1.6 EIS Secs. 3.4.3 & 3.4.4 EIS Sec. 4.1.3.5 EIS App. J
Riparian Reserves: The right-of-way application for the Salt Caves hydroelectric project is denied based on the Secretary of Interior's designation of the upper Klamath River as scenic. The outcome of litigation between the City of Klamath Falls and the Secretary of the Interior could change this decision.	N		
Late-Successional/District Designated Reserves: Retain and maintain existing developments, such as utility corridors and electronic sites, consistent with other management actions/direction for late-Successional/District Designated Reserves.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Late-Successional/District Designated Reserves: Review on a case-by-case basis new development proposals. They may be approved when adverse effects can be minimized and mitigated.	P, R	P, M	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 3.4.3 & 3.4.4 EIS Sec. 4.1.3.6 EIS App. H
Late-Successional/District Designated Reserves: Remove hazard trees along utility rights-of-way and in other developed areas.	C, O	B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 4.1.3.6 EIS App. H POD Att. 20
Other Land Use Allocations: Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors.	P	P, R	EIS Secs. 2.1.2.1 & 2.1.2.2 EIS Secs. 2.3.2.3 EIS Sec. 4.10.2.6 EIS App. D
Other Land Use Allocations: Encourage applicants to consult the Western Regional Corridor Study in planning route locations.	N		
Other Land Use Allocations: Consider new locations for rights-of-way projects on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing route or corridor will not be technically or economically feasible; and the proposed project will otherwise be consistent with this resource management plan and will minimize damage to the environment.	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 3.4.3 & 3.4.4
Other Land Use Allocations: Allow expansion of communications facilities on existing communication sites.	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.3.2.2 EIS Sec. 4.8.2.2 POD Att. 4
Other Land Use Allocations: Consider new communication sites on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing, developed communication site will not be technically feasible; and the proposed facility will otherwise be consistent with this resource management plan and will minimize damage to the environment.	P	P	EIS Sec. 2.1.2.2 EIS Sec. 4.3.2.2 POD Att. 4
Other Land Use Allocations - Alternative Energy Projects: Issuance of a right-of-way grant for alternative energy (pumped storage, wind, etc.) are acceptable so long as the proposal is consistent with other resource values and management objectives. Consistency will be determined by appropriate site-specific National Environmental Policy Act analysis.	N		
Access – Not Applicable, Excluded From Table			
Withdrawals – Not Applicable, Excluded From Table			
Roads			

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Prepare a district wide road management plan after approval of the resource management plan. The management plan will specifically address recreation use, road densities, road closures. wildlife protection, water quality, timber management, construction and maintenance standards, fire suppression, and coordination with adjacent landowners. Address road management planning on a watershed basis consistent with Late-Successional Reserves, Riparian Reserves, and other major allocations. Specific road closures will be determined using standard analysis, public involvement, and notification procedures.	N		
All Land Use Allocations: Existing off-highway vehicle closures in big game winter ranges will remain in effect throughout the plan (see the Recreation section for more details). Other important and sensitive wildlife habitats (special habitat features, project areas) will be evaluated for seasonal road closures. Some roads could remain open for administrative use, forest product removal, or access for mineral exploration and development. Road closures could be achieved using a variety of methods, such as gates, cables, boulders, obliteration, or other.	N		
All Land Use Allocations: Determine standards for new road construction during the project planning process. Standards will be the minimum necessary to meet resource and allocation objectives (for example, recreation site, timber sale, key watershed, etc.) while having minimal impacts on the environment.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Minimize new road construction in areas with fragile soils to reduce impacts to soils, water quality, and fisheries. Stabilize existing roads where they contribute to significant adverse effects on these resources.	P, C, R	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.2.2.1 & 4.2.2.2 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
All Land Use Allocations: Locate, design, construct, and maintain roads to standards that meet management objectives in accordance with the district road management plan.	P, C, R, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25POD Att. 25
All Land Use Allocations: Follow best management practices (see Appendix D[49]) for water quality and soil productivity to mitigate adverse effects on soils, water quality, fish, and riparian-wetland habitat during road construction and maintenance.	C, R, O	B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28
All Land Use Allocations: Reduce road density by closing minor collector and local roads in areas or watersheds where water quality degradation, big game harassment, or other road related resource problems have been identified.	N		
All Land Use Allocations: Acquire water rights for road management purposes consistent with Oregon State Water laws.	N		

[49] Appendix D: Best Management Practices, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Specifically address, either in the road management plan or in a watershed analysis, stabilizing existing roads located in drainages, watersheds with water quality limited streams, and other parts of the resource area where soil/water quality problems are known to exist.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.5 EIS Sec. 4.4.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
All Land Use Allocations: Avoid road construction in special areas and special habitats.	N		
All Land Use Allocations: Manage non-through roads classified as local and located within rural interface areas and within one quarter mile of existing dwellings to limit unauthorized public use activity that could contribute to public safety hazards, increased fire risk, and vandalism to private property. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate.	P, C, R, O	P, B, R	EIS Sec. 2.4.2.1 EIS Sec. 4.10.2.6 POD Att. 19 POD Att. 25
All Land Use Allocations: Reduce the further spread of blackstain fungus through proper timing of roadside brushing.	P, C	P, B	EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Key Watersheds: Reduce existing road mileage within key watersheds. If funding is insufficient to implement reductions, neither construct nor authorize through discretionary permits a net increase in road mileage in Key Watersheds.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 25 POD Att. 28 POD Att. 29
Noxious Weeds			
All Land Use Allocations: Continue to survey BLM-administered land for noxious weed infestations, report infestations to the Oregon Department of Agriculture, and work with the Department of Agriculture to reduce infestations.	P, C, R, O	P, B	EIS Sec. 1.5.4.1 EIS Sec. 2.6.2 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 14
All Land Use Allocations: Use control methods which do not retard or prevent attainment of Aquatic Conservation Strategy Objectives.	C, O	B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. J POD Att. 14

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations: Apply integrated pest management methods (for example, chemical, mechanical, manual, and/or biological) in accordance with the BLM's multi-state environmental impact statement, Northwest Area Noxious Weed Control Program, 1985, as supplemented in 1987, and the related Record of Decision, and as described in the Noxious Weed Strategy for Oregon/Washington (July 1994). Local direction for the planning area is from an integrated weed control plan and environmental assessment decision record of July 1993.	C, O	B	EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 14
All Land Use Allocations: Design management actions to minimize the potential for noxious weed invasion and/or dominance of the affected area.	N		
Late-Successional/District Designated Reserves: Evaluate impacts of non-native plants (weeds) growing in late-Successional/District Designated Reserves.	N		
Hazardous Material			
Identify, investigate, and arrange for removal of hazardous substances on BLM-administered land in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act. Emergency response will be as specified in the District Hazardous Materials Contingency Plan. The response will include cleanup, proper notifications, criminal investigations, risk assessment, and other actions consistent with the Act and the nature of the emergency.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Store, treat and dispose of hazardous materials in accordance with the Resource Conservation and Recovery Act and other appropriate regulations.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Use the Emergency Planning and Community Right-To-Know Act to coordinate emergency planning with state and local jurisdictions concerning hazardous materials, emergency notifications, and routine reporting of hazardous materials inventories.	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec. 4.3.2.1 EIS Sec. 4.4.2.2 EIS Sec. 4.4.4.2 POD Att. 5 POD Att. 23 POD Att. 24
Until hazardous materials on BLM-administered land are removed, protect employees and the public from exposure to these materials.	C, O	B	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Provide information to the public regarding the need to properly dispose of hazardous materials and the danger of becoming exposed to hazardous materials.	C, O	B	EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.2 POD Att. 5 POD Att. 9 POD Att. 23 POD Att. 24
Fire/Fuels Management			
Address fire/fuels management for all land use allocations as part of watershed analysis and project planning. This will include determinations of the role of fire and the risk of large-scale, high intensity wildfires at the landscape level.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Describe the need to use prescribed fire of other fuel management treatments to reduce fuel hazards and the risk of large-scale, high intensity fire, while maintaining coarse woody debris, down logs, green tree retention, and snags, consistent with the natural role of fire and protection standards for each land allocation unit.	N		
Coordinate fire management activities in rural interface areas with local governments, agencies, and landowners. During watershed analysis, identify additional factors which may affect hazard reduction goals. Minimize the impacts of wildfire suppression actions.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.8.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.4.4 EIS App. F EIS App. H EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Following election by the interdisciplinary team, prescribed burning will be conducted using management ignition to reduce wildfire hazards in locations adjacent to rural interface areas.	N		
The management of wildland fire will be conducted following the process and guidelines within the Klamath Falls Resource Area Fire Management Environmental Assessment (Environmental Assessment OR-014-94-09, Finding of No Significant Impact, May 1994 and Decision Record, June 1994.) The Fire Environmental Assessment assessed/assesses the impacts of wildfire as a historic natural process, current wildfire suppression methods, and how prescribed fire mimicking a natural function, is to be conducted on areas selected by random process for ecosystem management, utilizing both management ignitions and/or prescribed natural fire (see Table 1 in Appendix B[50] and Table 19[51]).	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 POD Att.11 .

[50] Appendix B: Summary of Land Allocations and Management Actions/Directions, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4 **Klamath Falls Approved Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
All Land Use Allocations – Wildfire Suppression: Minimize the direct negative impacts of wildfire suppression on ecosystem management objectives.	N		
All Land Use Allocations – Wildfire Suppression: Respond to all wildfires by taking appropriate suppression actions. In most cases, response will consist of aggressive initial attack to extinguish fires at the smallest size possible.	N		
All Land Use Allocations – Wildfire Suppression: For wildfires that escape initial attack, preform a Wildfire Situation Analysis to develop a suppression strategy to evaluate the damage induces by suppression activities compared to expected wildfire damage. Suppression tactics will consider: • Public and firefighting personnel safety; • Protection of specific attributes of each land use allocation; • Coordination of wildfire suppression activities to avoid causing adverse impacts on federal and nonfederal lands; • Appropriate use of suppression tools such as aircraft, dozers, pumps and other mechanized equipment, and clear definitions of any restrictions relating to their use; • The potential adverse affects on meeting ecosystem management objectives; and • Protection of structural components such as snags, duff, and coarse woody debris to the extent possible.	N		
All Land Use Allocations – Fuels Management (Including Hazard Reduction) Using Prescribed Fire: Modify fuel profiles in order to lower the potential of fire ignition and rate of spread; protect and support land use allocation objectives by lowering the risk of high intensity, stand-replacing wildfires; and, adhere to smoke management and air quality standards.	N		

[51] Table 19: Fire Management Acres, Klamath Falls Resource Area Record of Decision and Resource Management Plana and Rangeland Program Summary, June 1995

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
All Land Use Allocations – Fuels Management (Including Hazard Reduction) Using Prescribed Fire: Reduce hazards through methods such as prescribed burning, mechanical or manual manipulation of forest vegetation and debris, removal of forest vegetation and debris, and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following: • safety of fire fighting personnel; • identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern; • consumption of litter and coarse woody debris that are in excess of historic fuel levels that existed prior to attempted fire suppression; • developing a fuel profile that supports land allocation objectives; and seeking a balance between reducing the risk of wildfire and the cost efficiency consistent with meeting land allocation objectives; • interagency cooperation to assure cost effective fuel hazard reduction across the landscape; • adherence to smoke management and air quality standards; • consistency with objectives for land use allocations; • maintenance or restoration of ecosystem processes or structure; and • the natural role of fire in specific landscapes, current ecosystem needs, and wildfire hazard analysis included in the fire management plan.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: The use of prescribed fire will be based on the risk of high intensity wildfire and the associated cost and environmental impacts of using prescribed underburning to meet protection, restoration, and maintenance of critical stands that are current susceptible to large-scale catastrophic wildfire.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: Introduce prescribed fire across large areas over a period of time to create a mosaic of vegetation conditions. Treatments should be site-specific treatments because some species with limited distributions are fire intolerant. The use prescribed burning will be based on an interdisciplinary evaluation. Funding authority, therefore, must reflect the range of objectives identified for using fire under ecosystem management.	N		
All Land Use Allocations – Prescribed Fire Use for Ecosystem Maintenance and Restoration: Use prescribed fire to manage seral stage diversity through the development of fire resistant vegetation mosaics by timing the application of fire (for example, every five to ten years).	N		
Riparian Reserves: Allow some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning. In Riparian Reserves, the goal of wildfire suppression is to limit the size of all fires. When watershed and/or landscape analysis, or province-level plans are completed and approved, some natural fires may be allowed to burn under prescribed conditions.	N		
Late-Successional/District Designated Reserves: Until a fire management plan is completed for a Late-Successional/District Designated Reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options. Then some natural fires may be allowed to burn under prescribed conditions.	N		

TABLE E-4

Klamath Falls Approved Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Matrix (General Forest Management Area) - West and East Sides: Plan and implement prescribed fire treatments to minimize: • Intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions; • consumption of litter and coarse woody debris that are in excess of historic fuel levels that existed prior to attempted fire suppression; and • disturbance of soil and litter that may occur as a result of heavy equipment operation.	N		
Matrix (General Forest Management Area) - West and East Sides: Identify levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern.	N		

This page intentionally left blank.

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Recreation			
Developed Recreation: Evaluate and authorize service by the private sector on National Forest lands that complement National Forest objectives.	N		
Developed Recreation: New recreation residence sites will not be permitted, except as allowed by Forest Service regulations.	N		
Developed Recreation: Consider the needs of elderly and physically challenged users in all construction or reconstruction of developed facilities in accordance with FSM direction.	N		
Developed Recreation: Continue to use sampling at developed sites as funds permit to determine visitor origin, extent of use and kinds of activities.	N		
Developed Recreation: Sites will be administered and maintained to provide visitor safety, sanitation, and protection of facility and site resources.	N		
Developed Recreation: Sites shall be managed to the following ROS classes: rural at Diamond Lake fee sites; roaded natural at non-fee developed sites; roaded natural on the remainder of the Forest.	N		
Developed Recreation: Existing sites shall be maintained or reconstructed to assigned ROS standards.	N		
Developed Recreation: Potential developed sites and acres shown in List IV-2[52] and on the accompanying inventory map in the map packet shall be reserved for recreation occupancy and managed to the following standards: • The ROS direction for both the existing and future condition shall be (1) rural for Diamond Lake sites; (2) roaded natural for Lemolo, Clearwater, North Umpqua River corridor, Little River, South Umpqua, and Brice/Sharps; and (3) roaded modified for other North Umpqua Ranger District sites.	N		
Developed Recreation: Potential developed sites and acres shown in List IV-2[1] and on the accompanying inventory map in the map packet shall be reserved for recreation occupancy and managed to the following standards: • Visual resource direction within the sites shall be partial retention and views from the sites will be managed to the sensitivity level of the corridor in which they are located.	N		

[52] List IV-2: Potential Developed Sites, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Developed Recreation: Potential developed sites and acres shown in List IV-2[1] and on the accompanying inventory map in the map packet shall be reserved for recreation occupancy and managed to the following standards: • Conceptual site plans shall be approved before any resource development occurs. Roads developed by projects shall be located to serve the planned recreation use as well as other resource needs. Mature and old growth timber may only be removed selectively to make the site safe for recreation occupancy. There will be no programmed salvage or harvest on these sites. Young conifers and hardwoods shall be utilized as necessary to provide future campsite screening and visually attractive cover.	N		
Developed Recreation: Recreation old growth groves and acres shown in List IV-3[53] shall be managed to provide for their high interpretive values.	N		
Dispersed Roaded and Unroaded Recreation: Emphasize "pack-in/pack-out" policy to reduce management costs and resource impacts.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4[3] displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: • Manage to ROS roaded natural.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4 [54]displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: • Visual quality objective is modification in foreground seen areas and partial retention within the site and along the access trail.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4[3] displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: • Programmed harvest which meets the visual requirements is allowed.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4[3] displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: • Timber management activities (sale location, scheduling, harvest, timber stand improvement actions) should provide for the protection of activities that attract recreationists, such as huckleberry picking or wildlife viewing.	N		

[53] List IV-3: Recreation Old Growth Groves Inventory, Umpqua National Forest Land And Resource Management Plan
[54] List IV-4: Roaded Dispersed Recreation Sites and Special Features, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Dispersed Roaded and Unroaded Recreation: The Oregon Cascades Recreation Area (OCRA) shall be jointly managed by the Deschutes, Willamette and Umpqua National Forests as directed by the management plan shown in Appendix E[55], and SPM no harvest and SPNM no harvest.	N		
Dispersed Roaded and Unroaded Recreation: Unroaded recreation management areas (URMA - MA1) shall be managed in accordance with SPM-no harvest, SPNM-no harvest and unroaded concentrated direction.	N		
Dispersed Roaded and Unroaded Recreation: Special interest areas shown in List IV-5[56] shall be managed for public recreation emphasizing their special values.	N		
Layng Creek Watershed: Overnight camping, swimming and developed recreation sites will not be allowed.	N		
Layng Creek Watershed: Dispersed day use is permitted, but increased usage shall not be encouraged.	N		
Layng Creek Watershed: Control recreational vehicle use on roads during wet periods through a travel management plan. In the interim, wet-period travel will be restricted to paved or rocked roads.	N		
Layng Creek Watershed: ROS class for the Layng Creek municipal watershed is roaded modified, except for a portion of Hardesty Mountain, which is semi-primitive non-motorized.	N		
Off-Road Vehicles: Provide opportunities for ORV use on appropriate National Forest System lands. The use of off-road vehicles on the Forest shall conform to guidance in EO 11644 as amended by EO 11989 (FSM 2355.01) and Appendix F[57].	N		
Off-Road Vehicles: Manage ORV use to minimize: a) disturbance to Wildlife habitat, b) recreation use conflicts, c) damage to soil and water resources, and d) damage to vegetation.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Sec. 4.3.3 EIS Sec. 4.5.1.3 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. 9 POD Att.19 POD Att. 25

[55] Appendix E: Oregon Cascades Recreation Area Management Plan, Umpqua National Forest Land And Resource Management

[56] List IV-5: Special Interest Areas, Umpqua National Forest Land And Resource Management Plan

[57] Appendix F: Recreation Travelway Management Guide, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Off-Road Vehicles: Site-specific recreational vehicle use will be in accordance with Appendix F[6], titled Recreation Travelway Management Guide This document is a summary of prescriptive direction for motorized and non-motorized vehicles. Also see the Facilities (Transportation) standards and guidelines for additional discussion of road use, including licensing requirements.	N		
Off-Road Vehicles: A travel management plan will be prepared within three years of signature of the Forest Plan and will specify closures and restrictions of use on non-roaded areas, roads, and trails based on the broad direction summarized in Appendix F[6] in the Forest Plan.	N		
Off-Road Vehicles: Vehicle travel off roads is prohibited in the Layng Creek municipal watershed.	N		
Trails: Selected potential trail corridors, shown on the inventory map on file in the Supervisor's Office, shall be given consideration for their integrity during ground-disturbing activities and management direction for the area. Those corridors will be cleared of any debris and slash caused by industrial activities.	N		
Trails: Existing system trail tread must be relocated, reconstructed or restored after logging activities are concluded Logging slash will be cleaned up and signing restored.	N		
Trails: In programming construction and reconstruction of trails, priorities shall be based in part on estimated use, public demand, other resource compatibility and ROS needs.	N		
Trails: Full trail management for hikers will be allowed on existing system trails in the Layng Creek municipal watershed.	N		
Visual Resources			
Direction on the assignment of VQO's is contained in Management Area descriptions. Additional Visual resource direction for some recreation inventories is located in forestwide recreation standards and guidelines.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
The Visual resource is defined by visual inventory units which are an aggregation of three inventory components: • Distance Zone – fg, foreground – mg, middleground – bg, background • Sensitivity Level – 1, highest sensitivity – 2, average sensitivity – 3, low sensitivity • Variety Class – A, distinctive – B, common – C, minimal The sensitivity level assignments of routes, use areas and waterbodies on the Forest are shown in list IV-6 [58]and on the Forest Plan Inventory Map at the National Forest Headquarters. Routes and use areas within Management Areas 1 and 6 allocated in the Forest Plan but not shown in the inventory of sensitive routes, water bodies, and use areas shall be assigned Sensitivity Level 2. Exterior views from use areas, routes and waterbodies within these management areas shall be managed in accordance with specific direction in contained in Management Area Descriptions.	N		
Minimum Level: The minimum acceptable level of Visual quality shall be 'maximum modification.'	N		
Exception/Mitigation: Proposed exceptions to meeting assigned VQOs will be identified through project environmental analysis and amendment procedures described in Forest Plan Chapter Five. Examples of some exceptions are areas where past management practices make it impractical to meet the adopted visual quality objectives (VQO), or areas where catastrophic loss is imminent or has occurred. Visual mitigation measures shall be developed for areas when VQOs are not met so that projected future visual conditions are consistent with the Forest Plan. Mitigation measures also include visual rehabilitation considerations for landscapes which presently do not meet assigned Visual quality objectives. Rehabilitation is described in Department of Agriculture Handbook 462.	P, R	P, B	EIS Sec. 4.8.1.3 EIS Sec. 4.8.2.2 & 4.8.2.3 POD Att. 1
Duration of Visual Impact: The duration objective pertaining to ground disturbance shown in Agriculture Handbook 462 for retention shall be modified to be the same as partial retention. Within R and PR objective areas, duration shall be an evaluation criterion during project environmental analysis Management techniques shall be explored during the analysis process to attain duration objectives.	N		

[58] List IV-6 : Inventory of Sensitivity Level 1 and 2 Routes, Water Bodies and Use Areas, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Created Openings: Created openings (timber harvest Units) shall be shaped and blended to the extent practicable with the natural terrain. Openings shall be located to achieve the desired combination of multiple use considerations. A harvest unit will no longer be considered a created opening for Visual resource purposes when the stand averages 20 feet tall in foreground and middleground distance zones. In background distance zone the average height of vegetation shall be 4.5 feet. Table IV-1[59] describes the standards for each visual quality objective. Regeneration harvest shall be scheduled at an even and fair share rate Within viewsheds as shown in the 'Maximum % Created Openings at Any One Time' column.	N		
Visual Enhancement: Visual enhancement, as described in Department of Agriculture Handbook 462, shall be routinely considered in applicable landscapes, consistent with other resource standards and guidelines.	N		
Visual Diversity: Where a suitable environment exists, hardwood species should be retained or planted as a minor component of the stand on Sensitivity Level 1 and 2 routes after ground-disturbing activities. Seed grass to create temporary openings on some regeneration units occurring within 300 feet of those sensitive routes.	N		
Viewshed Planning: Viewshed (corridor) plans will be developed on Sensitivity Level 1 and 2 routes. USDA Handbook 559 and other accepted reference works or field models shall be used as guidance.	N		
Activity Slash: Activity slash within viewsheds shall be treated commensurate with the VQO. Areas within 500 feet of sensitive routes shall have high priority for treatment viewsheds should be treated in a manner that avoids soil color contrast or denudation of the site. Slash treatment shall meet the general landscape management guidelines stated in Agriculture Handbooks 462 and 608, applicable fuels handbooks, fire and soils guidelines in this document, and best field experience.	N		
Recreation Access Routes: The views from the Recreational Access Routes inventory shown in the List IV-7 [60]shall be managed as priority for visual enhancement and rehabilitation. Those Sensitivity Level 3 routes shall be afforded an extra degree of sensitive treatment within the foreground ordinarily not applied to other Level 3 routes.	N		
Scenic Byways Program: The Forest shall actively cooperate in nominating existing highly scenic roadways to the Chief for inclusion in the National Forest Scenic Byways Program.	N		
Wild/Scenic/Recreation Rivers – Not Applicable, Excluded From Table			
Cultural Resources			

[59] Table IV-1: Standards of Visual Quality Objectives, Umpqua National Forest Land And Resource Management Plan
[60] List IV-7: Recreational Access Routes, Umpqua National Forest Land And Resource Management Plan

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Inventory all areas where ground-disturbing activities are planned in order to discover all reasonably locatable cultural resources.	P	P	EIS Sec. 1.5.4.7 EIS Sec. 4.11.1.1 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
Evaluate all sites discovered during reconnaissance against the criteria for eligibility to the National Register of Historic Places. A plan will be developed within three years of the Record of Decision (ROD) to evaluate all other cultural resources by theme groups, agreements, or other cost-effective means as the Forestwide cultural resource inventory of the Umpqua NF nears completion. Results of the survey and evaluation of any discovered cultural resources will be sent to the State Historic Preservation Officer (SHPO) office. Documentation will be included in the project environmental analyses, in compliance with NHPA and NEPA.	P	P	EIS Sec. 1.5.4.7 EIS Sec. 4.11.1.1 EIS Sec. 4.11.2 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
Nominations will be scheduled incidentally or thematically until completion of the Forest-wide inventory of cultural resources. Nominate cultural resources that meet the appropriate criteria to the National Register of Historic Places.	N		
Protect the resources considered eligible for the National Register of Historic Places by (a) making reasonable efforts to avoid adverse Impacts to the resources or (b) developing a procedure to conserve the values through proper scientific study. Protection plans may include physical protection such as fences and bafflers, scientific study and collection, patrol, and site motoring, proper use or removal of signs, maintaining site anonymity, and/or increasing public understanding and support through education. Protect eligible cultural resources from vandalism and natural destruction. Cultural resource management will ensure that significant properties (and the records which document them) are protected from unauthorized uses and possible degradation of the resource. Protection and management of traditional Native American religious uses will be coordinated with Native American groups, most notably the Cow Creek Band of Umpqua Indians.	P, C, O	P, R	EIS Sec. 1.5.1.5 EIS Sec.1.5.4.7 EIS Sec. 4.11.1.1 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. 26
Decisions on the maintenance level for eligible historic structures will be based on an analysis of Utility, Interpretive value, public Interest, existing site or area allocation, funding sources, existing agreements, etc. Eligible historic uses will be maintained or the resultant adverse effect will be mitigated.	N		
Displays, Interpretive trails, video and audio recordings, brochures, tours, and signing are appropriate Interpretive means. Cultural resource sites may be developed for educational purposes to the extent that the integrity of the resource is maintained. Use will be carefully monitored to prevent degradation.	N		
Assign cultural resources to appropriate management categories for present and future uses such as Interpretation, scientific Investigation, adaptive uses, and preservation In place for developing future scientific needs.	N		
Wilderness – Not Applicable, Excluded From Table			
Fisheries			

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Maintain all effective shading vegetation on perennial streams. Utilize silvicultural practices to establish shade on perennial streams where currently lacking.	P, C, R, O	P, B, A	EIS Sec. 2.1.3.5 EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.14.3.1 EIS App. J POD Att. 9 LMP Amendment UNF-1
Maintain or improve soil stability adjacent to all streams. When slope stability risks are high or very high, use stability buffer specifications found In Standard and Guideline Number 4, under the Soil Productivity Section.	P, C, R, O	P, B	EIS Sec. 2.4.2.2 EIS Sec. 4.2.3.1 EIS Sec. 4.3.3.1 POD Att. 9 POD Att. 28
Retain all existing instream large woody material, streamside snags, and streamside downed material within riparian areas of perennial streams (Class I, II, and III streams) that will not create a blockage to fish passage. Retain standing trees which are likely to fall into the stream In the future.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att.16 POD Att. 20 POD Att. 28 POD Att. 29
Protect riparian area from prescribed fire and equipment when treating slash in adjacent harvest unit where practical.	N		
Fall timber directionally away from riparian areas to protect full width of residual vegetation where practical.	C, O	B	EIS Sec. 2.6.2 EIS Secs. 4.5.2.2 & 4.5.2.3 POD Att. 20
Do not apply pesticides within the riparian area.	C, O	B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. J POD Att.14
All fish-producing streams (Class I and II) will be Inventoried Within ten years of signature of the Record of Decision for this Forest Plan, using the sub-basin analysis procedure and With limiting factors determined.	N		
Streams or portions of streams, where fish production is demonstrably below potential due to habitat restrictions, will be rehabilitated using whatever measures are appropriate based on the analysis. Some examples are riparian plantings, blasting of pools, off-channel developments, fish passage projects, and instream structures Develop fish habitat enhancement plans for all Class I streams within two years of completion of the sub-basin analysis.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 29

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Keep total fine sediment (<1. 0 millimeter) to less than 20 percent by weight in spawning gravels.	P, C, R, O	P, B, M	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Secs. 4.6.2.3 & 4.6.2.4 POD Att. 9 POD Att. 28 POD Att. 29
Design new stream crossings to provide for unimpeded fish passage and correct existing passage problems on a prioritized schedule.	P, R	P, M	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Encourage KV collection for fish habitat improvement projects by including stream reaches and potential pond sites within timber sale area boundaries. The locations and types of stream improvements shall be based on the sub-basin analysis procedure where such analysis is completed.	N		
Locate new roads outside riparian areas; preferably on ridgetops, except where a stream crossing is necessary. Road reconstruction should not further degrade riparian areas.	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att.9 POD Att. 25
Wildlife Habitat And Threatened, Endangered, or Sensitive Species			
Woody material (slash) to provide wildlife cover will be retained on 10 percent of the area of all regeneration harvest units. (Not applicable to 500 feet each Side of visual Sensitivity Level 1 and 2 routes.)	P,R, C	P,B,R	EIS Sec 4.6.1.2 POD Att. 9
Down, dead woody material (20 feet or more in length) and a minimum of 12 Inches in diameter at the small end) will be left at the rate of two per acre on each unit that is regeneration harvested. Additional material will be left when logs have little or no commercial value and do not produce an unacceptable fire hazard.	P,R,C	P,B,R	EIS Sec 4.6.1.2 POD Att. 9
Harvest units shall be designed with Irregular shapes or boundaries, to the extent practicable, to increase the amount of edge habitat. (Refer to Visual standards and guidelines.)	N		
Native hardwood trees or tree-like shrubs will be maintained on at least 10 percent of the area on all regeneration harvest and commercial/pre-commercial thinning units. This standard applies in areas where hardwoods are a natural component of conifer stands and is intended to ensure that hardwoods will continue to be represented in the regenerating conifer stands. If mature conifers are not retained, an adequate hardwood reproduction will be protected during the various cultural treatments. (Refer to Visual standards and guidelines.)	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Established big game travel lanes will not have their character altered through precommercial thinning.	N		
Any management activity that will negatively affect plant or animal species listed on the Regional Forester's Sensitive Species list, or their habitat will be modified to either avoid (preferable) or minimize the impact. Activities will not be permitted If they will result in the loss of a colony or subpopulation that is important In the natural distribution of the species.	P, C, R, O	P, B, R	EIS Sec. 3.4.3 EIS Sec. 4.6.1.3 EIS Sec. 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10
Activities will not be permitted that damage the plants or growing site of those species listed as Category 2 plants In the 1985 or subsequent Plant Notice of Review, USDI Fish and Wildlife Service.	N		
Active raptor nest sites identified In project planning or during project work should be protected from human disturbance until fledging or nesting is complete (see prescriptions and other standards for threatened, endangered or sensitive raptors)	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. L
All proposed activities within areas designated for management under the bald eagle or peregrine falcon prescription will first be coordinated With the USDI Fish and Wildlife Service as required by consultation procedures.	P	P	EIS Sec. 1.5.3.5 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
If additional sites occupied by a species classified as threatened or endangered under the Endangered Species Act of 1974 are discovered, these sites will be managed as directed by the appropriate recovery plan or draft recovery plan. Any activity that may Impact the species will be coordinated with the USDI Fish and Wildlife Service as required by consultation procedures.	P, C, O	P, B, R	EIS Sec. 1.5.3.5 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10 POD Att. 12
Activities that may impact species listed as threatened or endangered by the State of Oregon will be submitted for review to the Oregon Department of Agriculture (plants) or the Oregon Department of Fish and Wildlife (animals).	P	P	EIS Sec. 1.5.4.1 EIS Sec. 1.5.4.4 EIS Sec. 4.7.3.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10 POD Att. 12
The Forest will consult and cooperate with the USDI Fish and Wildlife Service, the Oregon Department of Fish and Wildlife, and/or the Oregon Department of Agriculture to prepare 'species guides', or Similar references, for selected species. Guides will contain goals and management direction based on the distribution and biology of the species and will provide guidance In such a manner as to not Impair existence of, or recovery of, any threatened or endangered species.	N		
Pileated Woodpecker Habitats - Provide one habitat area for every 12,000 to 13,000 acres of suitable habitat. Habitats will be distributed In such a way that any given habitat unit will be connected to two or more other Suitable habitats. For a description of the habitat requirements see Prescription C5-VII (pileated woodpecker).	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Pine Marten Habitats - Provide one habitat area for every 4,000 to 5,000 acres of suitable habitat. Habitat will be distributed in such a way that any given habitat unit will be connected to two or more other suitable habitats. For a description of the habitat requirements see Prescriptions C5-IX and C5-X (pine marten).	N		
Nesting, non-network (FEIS) northern spotted owl pairs will be protected during timber harvest by deferring harvest within a five-chain radius of the nest tree. Additionally, activities such as road construction, felling and yarding within a ten-chain radius of an active next tree will not occur between April 1 through August 15, annually. If a nest remains unoccupied for five consecutive years, these restrictions will no longer apply	N		
Stage 6 vegetation - Within each RSA, efforts should be made to retain 10 percent of the acreage In Stage 6 vegetation. In preparing and evaluating timber sale alternatives, consideration should be given to the conservation of large contiguous stands of Stage 6 vegetation, 15 acres or greater.	N		
When planning timber sales in Important big game areas, a habitat effectiveness model (A Model to Evaluate Elk Habitat in Western Oregon' or similar model) will be used to compare the Impact of various alternatives on big game habitat	N		
When possible, wildlife trees (snags and green culls) will be left standing in areas of timber harvest. This habitat will be in addition to that provided by Implementing the snag habitat prescriptions.	N		
Range – Not Applicable, Excluded From Table			
Timber/Vegetation Management – Not Applicable, Excluded From Table			
Water Quality/Riparian Areas			
Forestwide Resource Programs: All effective shading vegetation will be maintained on perennial streams (Class I, II, or III), unless a site-specific assessment shows that shade removal will not result in water temperature Increase or aquatic habitat degradation on downstream fish-producing streams. Shade may be removed from nonfishery (Class III) streams with July low flow less than 1/2 inch deep, on any stream reach farther than 1/2 mile from a fish-producing stream (Class I or II). This exception must be determined for each stream, and be consistent with other riparian objectives. (See Water Temperature Guidelines for Small Streams, in 'Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality' stored in the Umpqua National Forest Planning Record.	P, C, R, O	P, B, A	EIS Sec. 2.1.3.5 EIS Sec. 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS Sec. 4.14.3.1 EIS App. J POD Att. 9 POD Att. 28 LMP Amendment UNF-1

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Forestwide Resource Programs: Existing and Introduced woody material will be maintained In streams except when: 1) the material will float downstream and cause unacceptable damage during a 25-year flow event, or 2) the woody material contributes to unacceptable turbidity, dissolved oxygen, or other water quality Impacts which outweigh benefits of the wood to fish habitat or channel stability (reference 'Guidelines for the Management of Woody Material in Small Channels,' in 'Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality' stored In the Umpqua National Forest Planning Record. Woody material, Including slash from timber harvest activities, will not usually be removed from streams with a drainage area of 100 acres or less (for example, timber sale contract clause C6.5).	P, C, R, O	P, B	EIS Sec.2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 POD Att. 28 EIS App. J
Forestwide Resource Programs: Down and stable woody material, including tree boles, roots, and limbs will not be removed from perennial streams (Class I, II, and III) except on the recommendation of a fishery biologist or hydrologist. Where timber harvest occurs in riparian areas of any stream, stable unmerchantable wood affecting the flood channel or hills lope stability will not be yarded.	P, C, R, O	P, B	EIS Sec.2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 POD Att. 28 EIS App. J
Forestwide Resource Programs: The entry of large stable wood Into fish-producing (Class I and II) streams will be maintained or Increased by maintaining standing trees (green, dying, or dead) which are likely to reach the water when they fall. Some standing trees will be left on other streams (Class III and IV) where necessary to maintain a source of large woody material.	P, C, R, O	P, B	EIS Secs. 2.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 POD Att. 16 POD Att. 20 POD Att. 28
Forestwide Resource Programs: Stream course protection will be used instead of mitigation, to maintain water quality. Stream channels with a defined bank and at least seasonal surface flow will be designated for stream course protection on timber sale area maps (for example Timber Sale Contract Clause B6.5) during timber harvest, and will be provided similar protection during other management activities. Logs should be fully suspended when yarded or hauled across protected stream courses, except at designated crossings.	P, C, O	P, B	EIS Sec. 2.3.2.3 EIS Sec. 2.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 POD Att. 28
Forestwide Resource Programs: Directional failing methods will be used, where effective, to meet riparian objectives during timber harvest (for example, timber sale contract clauses C6.51 and C641).	N		
Forestwide Resource Programs: Vegetation and dead woody material in riparian units (Class I, II, III, and IV streams) will be protected from prescribed fire. Where mitigation is more effective than protecting seasonal (Class IV) streams, stable woody material (plus seeding and planting) will be used to mitigate temporary soil erosion and ravel. Mitigation will be planned and effectively implemented before the runoff season which follows project activities. Mitigation should not be planned in lieu of protection where Fish Habitat prescriptions including C2-IV, VI and C2-X apply.	P, C, R, O	P, B, M	EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.5.2.3 EIS App. F EIS App. J POD Att. 9 POD Att. 18 POD Att. 28 POD Att. 29

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Forestwide Resource Programs: Pesticides and fertilizer will not be used in riparian units, except along seasonal (Class IV) streams during the season when flow does not occur. Herbicides will be applied in a manner which protects vegetation necessary for meeting riparian objectives.	P, C, R, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 14 POD Att. 24
Forestwide Resource Programs: Forest Service transportation of pesticides, petroleum products, dust palliatives, fertilizers, and other potentially hazardous materials will follow procedures of the Umpqua National Forest Spill Prevention and Response Plan.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.5.1.3 POD Att. 9 POD Att. 24
Forestwide Resource Programs: Site preparation, release, and precommercial thinning will not be applied in riparian units along perennial streams, except to meet riparian objectives. Usually no precommercial thinning will be done within an average of 100 feet of fish-producing streams or within 50 feet of other perennial streams. (See riparian prescriptions for specific distances.)	P, C, R, O	P, B, R, M, A	EIS Sec. 2.1.3.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.5.2.3 EIS App. J POD Att. 9 POD Att. 20 POD Att. 28 POD Att. 29 LMP Amendments UNF-1 & UNF-2.
Forestwide Resource Programs: Streams In the Steamboat Management Area will be designated for stream course protection In timber sale area maps and will display stream class (I, II, III, or IV) and riparian risk (a, b, or c), as shown In Table IV-14[61], Protection Requirements for Stream courses and Riparian Areas Within the Steamboat Management Area Risk to riparian objectives will be assigned during environmental analysis, based on mass movement potential and difficulty in protecting riparian vegetation during timber harvest or Similar activity. Low risk Class Ic-IIIc streams are assigned fish habitat prescription C2-IV and no-harvest C2-IX. Low risk Class IVc streams are assigned harvest fish habitat prescription C2-VI High risk streams (a) are protected by soil productivity standard #7. Moderate risk streams (b) are protected by soil productivity standard #9 In addition, streams are protected by the fish habitat riparian prescriptions listed In Table IV-14[15]. For example, seasonal moderate risk Class IV streams are assigned no-harvest prescription C2-X (SBT Fish IV).	N		

[61] Table IV-14: Protection Requirements for Stream courses and Riparian Areas, Steamboat Management Area (MA 12) (Assigned Prescription), Umpqua National Forest Land And Resource Management Plan

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Forestwide Resource Programs: The application of Best Management Practices for the protection of water quality and beneficial uses (fish habitat or potable water, for example) will be monitored on ground-disturbing activities. Specific BMPs will be listed for each activity unit at the time of environmental analysis. On that unit, each Item will be monitored for accomplishment at the close of the activity (for example, release of a subdivision In the timber sale contract).	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 9 POD Att. 13 POD Att. 28
Forestwide Resource Programs: Floodplain and wetland actions require a formal declaration and public notification under Executive Orders 11988 and 11990. The minimum areas considered as floodplains and wetlands are perennial streams and wet meadows, respectively, inventoried in forest ecoclass maps, in the Planning Record. Only lands meeting the definitions of floodplains and wetlands in the executive orders, as determined by environmental analysis, will be subject to evaluation and declaration. The following recurring activities on the Umpqua National Forest have been evaluated and formally declared in Chapter Four of the FEIS for the Forest's Land and Resource Management Plan. a. timber harvest, b. the minimum road construction necessary to cross perennial streams, c. rights-of-way acquisition and conveyance, and d. activities which are permitted or qualify for exemptions from permit under Section 404 of the Clean Water Act (PL 92-500). These activities, when conducted according to applicable prescriptions and standards/ guidelines specified in the Forest Plan, will not significantly affect (or be affected by) floodplains or wetlands. Specific floodplain and wetland declarations will be made for activities not declared In the FEIS for the Forest Plan. Examples are land exchanges, campground construction, building construction In floodplains and wetlands, and road construction affecting wetlands (wet meadows).	P, R	P, B, R, M, A	EIS Sec. 1.5.1.7 EIS Sec. 2.1.3.5 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Secs. 4.1.3.4 - 4.1.3.6 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. H EIS App. J POD Att. 28 POD Att. 29 LMP Amendment UNF-4
Forestwide Resource Programs: Activities In wetlands, lakes and perennial streams ('waters of the United States') are subject to provisions of the Federal Clean Water Act, as amended, and Oregon's Removal-FIJI Law (ORS 541.605 - 541.695). Development of wetlands by removing, filling or alteration of more than 50 cubic yards of material must be done under permit from the Oregon Division of State Lands. Where required by section 404 of the Clean Water Act and the Removal-Fill Law, permits will be obtained from the US Army Corps of Engineers and the Oregon Division of State Lands for removal, filling or alteration of lakes, streams and wetlands.	P, C, R	P, B, M	EIS Sec. 1.5.1.7 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 28 POD Att. 29
Forestwide Resource Programs: Water uses on National Forest streams will be compatible with the instream needs and reserved rights of the United States. Unreserved nights for compatible uses will be obtained from the Oregon Water Resources Department.	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Forestwide Resource Programs: Treatment will be provided for point source discharges of sewage and other waste entering Forest lakes, streams and groundwater. Treatment, testing, and reporting will meet, at a minimum, the applicable standards of the Oregon Department of Environmental Quality and US Environmental Protection Agency.	N		
Forestwide Resource Programs: Public drinking water on the Forest will meet the facility water quality testing and reporting requirements of the Safe Drinking Water Act (PL- 93-523).	N		
Forestwide Resource Programs: Oil and gas leasing and exploration activities will be conducted in a manner which will meet riparian objectives, maintain fish and Wildlife habitat, and maintain water quality and quantity.	N		
Forestwide Resource Programs: Energy transmission corridors and hydroelectric facilities will be managed In a manner which will meet riparian objectives and maintain fish and wildlife habitat, and water quality and quantity.	N		
Forestwide Resource Programs: Domestic and public water supply intakes will be located on Total Resource Inventory (TRI) Aquatic Sub-system maps. Water quality and flow will be protected when planning activities which will affect domestic and public water supplies.	N		
Forestwide Resource Programs: Comply with State requirements in accordance with the Clean Water Act for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act, regulations, and Federal guidance issued thereto.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 9 POD Att. 13 POD Att. 28
Forestwide Resource Programs: In cooperation with the State of Oregon, the Forest will use the following process: a. Select and design BMPs based on site-specific conditions, technical, economic, and Institutional feasibility, and the water quality standards for those waters potentially Impacted. b. Implement and enforce BMPs. c. Monitor to ensure that practices are correctly applied as designed. d. Monitor to determine the effectiveness of practices In meeting design expectations and In attaining water quality standards. e. Evaluate monitoring results and mitigate where necessary to minimize Impacts from activities where BMPs do not perform as expected f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.	P, C, R, O	P, B, M	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 9 POD Att. 13 POD Att. 28 POD Att. 29

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Forestwide Resource Programs: Use the existing agreed-upon process to Implement the State Water Quality Management Plan on lands administered by the USDA Forest Service as described in memorandum of understanding (MOU) between the Oregon Department of Environmental Quality and U.S. Department of Agriculture, Forest Service (2/12/79 and 12/7/82), and 'Attachments A and B' referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest Lands In the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal Lands, respectively).	N		
Watershed Cumulative Effects and Water Quality: In watersheds where project scoping identifies an issue regarding the cumulative effects of activities on water quality or stream channels, a cumulative effects assessment will be made. This will include land in all ownerships in the watershed. Activities on National Forest System lands in these watersheds should be dispersed In time and space at least to the extent necessary to protect beneficial uses of water and aquatic habitat. On intermingled ownerships, scheduling efforts will be coordinated to the extent practicable.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.14.2.4 EIS Sec. 4.14.3.4 EIS Sec. 4.14.4 EIS App. J
Watershed Cumulative Effects and Water Quality: Before issues are identified regarding cumulative effects of activities on water quality or stream channels, the beneficial uses of downstream waters will be identified. Special attention should be given to identifying those characteristics of the stream which are unique, sensitive and closest to the activity The effects of previous activities on beneficial uses, if not part of the cumulative effects assessment, should be Identified.	P	P	EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS Sec. 4.14.2.4 EIS App. J
Watershed Cumulative Effects and Water Quality: Beneficial uses of water and aquatic habitats will not be degraded by turbidity, sediment, or scoured stream channels caused by timber harvest, road construction and related activities. To reduce or avoid unacceptable cumulative effects that can result from surface erosion, landslides, and/or debris torrents, timber harvest and associated activities will be evaluated during project planning. This evaluation will be done on watershed analysis areas, which are generally 1000- to 5000-acre watersheds affecting fishery streams.	P, C, R, O	P, B, R, M	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS Sec. 4.14.2.4 EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Watershed Cumulative Effects and Water Quality: The Umpqua Sediment Index Analysis (USIA) or a comparable procedure will be used when 10 percent or more of soils have a high risk of surface erosion or mass wasting as given In USIA. The potential cumulative effects of these erosional processes will be evaluated and displayed relative to beneficial uses, identified during scoping. The USIA procedure is described In the publication titled 'Umpqua National Forest Plan Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality' stored In the Umpqua National Forest Planning Record.	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Watershed Cumulative Effects and Water Quality: In the Steamboat Management Area, the cumulative effects of landslides, debris torrents and surface erosion will be evaluated and displayed for all watershed analysis areas (generally 1,000- to 5,000-acre watersheds affecting fishery streams). The 'Umpqua Sediment Index Analysis' or a comparable procedure will be used. The USIA procedure is described in the document 'Umpqua National Forest Standard and Guideline Procedures For Watershed Cumulative Effects and Water Quality'. This document is stored In the Umpqua National Forest Planning Record.	N		
Watershed Cumulative Effects and Water Quality: Beneficial uses of water and aquatic habitats will not be degraded by Increased peak flows and resulting channel scour, caused by timber harvest, road construction and related activities. Project scoping will Identify peak flows as an issue. If more than 25 percent of watershed analysis areas (generally 1,000 to 5,000 acres affecting fishery streams) will have been harvested when activities are completed. Peak flow increases will be estimated only from lands In the transient snow zone, between 2,000 and 5,000 feet elevation.	P, C, R, O	P, B, R, M	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS Sec. 4.14.2.4 EIS App. J POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Watershed Cumulative Effects and Water Quality: If scoping Identifies peak flows as an Issue, the 'Hydrologic Recovery Percentage' (HRP) or similar procedure will be used to calculate hydrologic condition of project planning drainages. When activities are planned which will reduce hydrologic condition below 75 percent recovery (using HRP or equivalent measure), the potential cumulative effect of increased peak flows will be displayed and evaluated. Evaluation of potential cumulative effects will consider landslide risk, stream channel stability and beneficial uses affected. The HRP procedure is described in the document 'Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality'. This document is stored in the Umpqua National Forest Planning Record.	N		
Watershed Cumulative Effects and Water Quality: Infiltration of snowmelt and rain should not be decreased on deep pumice soils common to the North Umpqua River aquifer. Subsurface water should not be intercepted on deep pumice soils. On Soil Resource Inventory mapping units 90, 92, 94, 901, 902, 921, 924, 932, 942, 943, and 946 the following standards will be applied to maintain the high summer flow characteristics of streams: a. Permanent roads and landings on inventoried aquifer lands will occupy less than 5 percent of land area or a road density of 5.3 miles/square mile and will not disrupt natural drainage or Intercept and transfer subsurface water to surface channels. b. Drainage structures (relief culverts or drain dips) on new or reconstructed roads will be placed no more than 100 feet from perennial or intermittent streams. c. Soil productivity standards With respect to detrimental compaction will be applied.	N		
Layng Creek Municipal Watershed: Use of all chemicals within the Layng Creek Municipal Watershed will be coordinated with and acceptable to the City of Cottage Grove.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Layng Creek Municipal Watershed: Maintain water quality on all lands, according special attention to lands prone to erosion and mass failure In the Layng Creek Municipal Watershed. A normal watershed restoration program will be implemented. Watershed enhancement activities are encouraged.	N		
Layng Creek Municipal Watershed: Woody residues in fishery streams will be managed in favor of reducing turbidity risks.	N		
Soil Productivity			
The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) within an activity area (e g., cutting Unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be In detrimental condition and are included as part of this 20 percent. Criteria for unacceptable soli conditions are: a. Detrimental compaction: A physical change to soil resulting from mechanical forces such as weight and vibration that Increase soli bulk density and decreases soil porosity. 1. Volcanic ash/pumice soils· An Increase In soil bulk density of 20 percent or more over the undisturbed level. 2. Other soils· An Increase in soil bulk density of 15 percent or more over the undisturbed level, or a macropore space reduction of 50 percent or more. b. Detrimental puddling: The physical change to soil structure that results when traffic ruts and molds a soil to a depth of 6 Inches or more. c. Detrimental displacement: The horizontal removal by mechanical means of 50 percent or more of the A 1 or AC horizons from 100 square feet and where one dimension is at least 5 feet (an area at least 5 by 20 feet). d. Severely burned: A surface soil condition where the top layer has significantly changed color (usually more red) and the next half-inch contains blackened or charred organic matter because of soil heating.	P, C, R, O	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Sec. 4.14.2.3 EIS Secs. 4.14.3.1 & 4.14.3.4 POD Att. 9 LMP Amendment UNF-3
To meet acceptable levels of surface soil loss resulting from gravity, water, or wind action on land dedicated to the production of vegetation, provide for at least a minimum amount of effective ground cover to exist within the first year following the end of a ground-disturbing activity, as specified in Table IV-15[62].	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Surface organic material (litter, duff and wood) needed to maintain soil productivity will be planned for all ground-disturbing activities, including post-wildfire activity. Minimum litter and duff needed for mineral soils with cold climatic conditions, low nutrient levels, and/or low water holding capacities will be similar to the amount of effective ground cover needed for soils with high to very high erosion hazard ratings. (See Table IV-15[17].)	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Sec. 4.5.2.3 EIS App. F POD Att. 9 POD Att. 20 POD Att. 29

[62] Table IV-15: Minimum Ground Cover Requirements, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Large woody material (LWM) needed to maintain long-term soil productivity shall be left on site following regeneration harvest, catastrophic salvage, and site preparation in all forest ecoclasses. This material provides sites for a wide variety of flora and fauna that are part of the essential network of nutrient recyclers and nitrogen accumulators. The amount, condition, and distribution of LWM needed are not clearly established with current research. The recommendations in Table IV-16[63] reflect the current best estimate based on linked data and experience. Up to 60 percent of the total required woody material may be left as 'standing wood' (green culls and/or snags) at regeneration harvest. In shelterwood units, up to 100 percent of total required woody material may be left as 'standing wood' at initial harvest entry.	N		
Soil mass movement potentials shall be evaluated on all project areas. A risk and hazard analysis shall be made by an interdisciplinary team process when there is a chance of triggering mass movement events which either: a. Have the potential risk of one or more 300-square-yard and larger mass movement event for a period of 15 years following an activity, Or b. Have the potential hazard to damage life, property, facilities, soil, water, and/or fishery values. Decisions regarding the nature of the proposed activities should consider the results of this risk-and-hazard analysis and ensure that minimum soil, water, and fish habitat standards and guidelines are met. When management activities would significantly increase the potential risk or hazards in items (a) and (b), alternative prescription(s) will be developed and evaluated.	P	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9
Areas Identified as high risk for mass movement will be delineated and permanently stored on District Inventory maps.	N		
Timber harvest and road building activities planned on Soil Resource Inventory (SRI) Mapping Units 21, 211, 212, 213, 215, 242, 342, 412, 71, and 712 are to have no timber cutting (Including salvage) and no road or trail construction within a slope stability buffer zone along all streams where sideslope gradients exceed 50 percent. This no-cut stability buffer will start from the streambank or from the upslope terrace edge, when present It will extend upslope for a distance that is three times the average slope gradients exceeding 50 percent (slope distance measured in feet). The no-cut buffer requirement can be waived or modified following documented, Site-specific soil, geologic, and watershed Investigations when little risk to soil, stream habitat or other related values exist.	N		
All lands classified as unsuitable due to Irreversible soil damage, Including all steep (greater than 60 percent gradient), granitic soils found In SRI Mapping Units 61, 612, 617, 621, 623, 624, 631, and 673, will not have tree cutting or any other ground-disturbing activities that likely will Increase the risk of mass movements.	N		

[63] Table IV-16: Specifications For Large Woody Material, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
SRI mapping Units with landtypes 8, 31, 41, 46, 51, 91, and 96 on slopes exceeding 60 percent have scattered sites with high mass movement potentials. When these landtypes are encountered during project planning, site-specific soil, geologic and watershed evaluations for movement risk and hazards shall be made. Pages 71-78 of the SRI report display the landtype component by percent area for each SRI mapping Unit.	N		
Project analysis will address how the proposed activities plan to meet soil standards and guidelines. Mitigation measures (or additional alternatives) will be developed and evaluated when detrimental soil conditions are expected as a result of the proposed action	P, R	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment UNF-3
During and after ground-disturbing activities, soil conditions will be monitored to determine if sod management objectives are being met.	C, R, O	B	EIS Sec. 2.4.2.1 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. J POD Att. 9
Plan and conduct restoration projects on lands where range, road construction, timber harvest, or other management activities cause soil and watershed conditions that do not meet standards and guidelines. Evaluate for use of KV funds.	P, R	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F EIS App. J POD Att. 29 LMP Amendments UNF-1 to UNF-4.
Designed erosion control measures should have effective ground cover and erosion control structures applied on construction sites, Including new road construction and reconstruction, by the beginning of the rainy season. Erosion control measures and drainage structures will be maintained current with operations. Any soil disturbed during the rainy season In excess of 0.5 acre will have effective ground cover provided Forestwide, the rainy season is considered to be November 1 through April 30. Effective ground cover is considered to be the amount of cover necessary for maintaining a disturbed Site In a low hazard category for erosional processes See Table IV-12[64] for minimum requirements for effective ground cover material. Alternate erosion control measures may be substituted for effective ground cover if considered equal by the Forest Service	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 28

[64] Table IV-12: Forest Growth and Mortality (From Suitable Lands), Umpqua National Forest Land And Resource Management Plan

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Site-specific analysis will be performed and documented for activities which affect evapotranspiration within the runoff source area (watershed) of active slump/earthflow areas. The analysis will, at a minimum, recommend ways to schedule or mitigate effects of the proposed activity on earthflow movement.	N		
Soil chemical and physical characteristics should be evaluated to aid in the prioritization of fertilization projects.	N		
Erosion control needs will be identified where developed areas, including recreation sites, roads, trails, rockpits and others, produce erosion/sedimentation that may affect water quality and beneficial uses In surface waters (lakes, streams, springs, ponds).	P, C, R, O	P, B, M	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 28 POD Att. 29
Layng Creek Municipal Watershed: Identify and carefully manage lands associated with high Soil erosion and/or high landslide risk to maintain water quality. Watershed restoration activities on such lands should be encouraged.	N		
Experimental Forest – Not Applicable, Excluded From Table			
Research Natural Areas – Not Applicable, Excluded From Table			
Minerals/Geology – Not Applicable, Excluded From Table			
Lands			
Land Uses: Land use evaluation, permit issuance, fees, and administration will be in accordance With 36 CFR 251 and current management direction.	P	P, B, R, A	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 2.1.3.5 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 4.1.3.4 – 4.1.3.6 EIS App. H EIS App. J LMP Amendments UNF-1 – UNF-4
Land Uses: In considering land use applications, the benefits to the public as a whole will be given higher priority. All applications will be processed in a timely manner.	P	P	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.5 & 2.1.6
Land Uses: Priority will be given to cost-sharing and easement exchanges in the administration of the land use program.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Land Uses: Land use terms, conditions or stipulations will be adequate to protect land and other resource values. Forest Service approval is required for the location of all developments, designs, and plans for the construction of facilities.	P	P, B, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 2.1.3.5 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 4.1.3.4 LMP Amendments UNF-1 – UNF-4
Land Uses: Land to be used will be suitable for the proposed use and limited in size consistent with the intended use. National Forest land will not be made available for private development when suitable private land is available to support needs.	P	P, R, A	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Sec. 2.1.3.5 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 4.1.3.4 – 4.1.3.6 EIS App. H EIS App. J LMP Amendments UNF-1 – UNF-4
Land Uses: New permits will be Issued through a competitive process If there is a competitive Interest If additional recreation services or facilities are determined to be needed and could be provided by the private sector, the Forest will explore the opportunity to do this by expanding existing permits or issuing permits for a new service or facility.	N		
Landownership: Consistent with Forest Plan direction, landownership adjustments will be made based upon a determination of the ownership pattern within the Forest boundary which will best resolve conflicting uses with adjacent landowners and Improve resource management efficiency.	N		
Landownership: The Small Tracts Act (P.L 97-465/96 Stat. 2535 1/12/83) will be utilized as needed to resolve cases which are within the authority of the Act.	N		
Land Lines: Maintenance of existing posted landlines will be the top priority in annual program formulation.	N		
Land Lines: Unposted property lines between National Forest System lands and those managed by the Bureau of Land Management will be marked and agreed upon between appropriate line managers as impacting projects are planned.	N		
Facilities: Transportation System			
Transportation System Construction and Reconstruction: Road density should be the most economical system necessary to meet land management objectives. Evaluation of road development alternatives will be made for the planned uses considering safety, costs of transportation, and effects upon lands and resources	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Transportation System Construction and Reconstruction: Road design standards will be based on the following criteria: Resource management objectives, environmental constraints, safety, physical environmental factors, traffic requirements, traffic service levels, vehicle characteristics, road users, and economics. Road design criteria will be documented for all roads on or added to the Forest Transportation System. Arterial and collector roads will be designed for traffic service levels A, B, or C. Local roads will be designed for traffic service levels C or D Design standards will follow the guidelines in the Road Preconstruction Handbook.	P	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.6.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Transportation System Construction and Reconstruction: Stream crossings adequate for fish passage will be incorporated into the design and construction of all new roads crossing streams which support fisheries. An analysis will be made of fishery values versus various alternatives for these types of structures. Inadequate structures on existing roads will be programmed for replacement providing there has been an analysis of the fishery values and the additional costs.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 25 POD Att. 28 POD Att. 29
Transportation System Construction and Reconstruction: Planned road construction activities, in areas with known or potential slope stability, erosion and drainage concerns, should be implemented only after soil, water, geotechnical engineering and geological evaluations have been made.	P, C	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.2.2.2 & 4.2.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System Construction and Reconstruction: Designed erosion control measures should have effective ground cover and erosion control structures applied on construction sites, including new road construction and reconstruction, by the beginning of the rainy season. Erosion control measures and drainage structures will be maintained current with operations. Any soil disturbed during the rainy season m excess of 0.5 acre will have effective ground cover provided. Forestwide, the rainy season is considered to be November 1 through April 30. Effective ground cover is considered to be the amount of cover necessary for maintaining a disturbed site In a low hazard category for erosional processes See Table IV-15[65] In the 5011 Productivity standards and guidelines section for a definition of effective ground cover material. Alternate erosion control measures may be substituted for effective ground cover if considered equal by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System Construction and Reconstruction: Prior to Implementing major reconstruction work (continuous segments of realignment, significant betterment, or change in surfacing type), alternatives will be analyzed for resolving road capacity, safety, road surface structural, or life-cycle cost concerns. Alternatives considered should be traffic management, spot reconstruction, or complete reconstruction.	N		

[65] Table IV-15: Minimum Ground Cover Requirements, Umpqua National Forest Land And Resource Management Plan

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System Construction and Reconstruction: During project transportation planning, aerial or long-span yarding systems should be considered where feasible, as alternatives to construction of new roads on steep or highly erosive slopes, where there is a potential of affecting water quality and the beneficial uses of water. These should be considered where roads are being planned on side slopes over 50 percent, or where high mass wasting potential or highly erosive soils have been Identified. These systems should also be considered where they can contribute to other resource objectives such as visual, wildlife, and recreation.	P	P, B, R	EIS Sec. 4.1.3.5 EIS Secs. 4.2.2.2 & 4.2.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 1 POD Att. 25
Transportation System Construction and Reconstruction: Proposed airfields and heliports must first be evaluated through the environmental assessment process and conform to all Federal Aviation Administration (FAA) guidelines and standards applicable at the time of construction.	N		
Transportation System Management and Maintenance: All Forest development roads will be maintained to protect the resources, perpetuate the intended road management objective, and protect the investment in the facility. These roads will be maintained In accordance with maintenance standards in FSH 7709.15, Transportation System Maintenance Handbook. Road maintenance planning and priorities should emphasize the maintenance of: a. Drainage and erosion control structures and features, including bridges, on all Forest development roads b. Signs and traffic control devices. c. Arterial and collector roads. d. Trailhead and recreation site access roads, and campground roads.	P, C, R, O	P, B, M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: Management of roads will be in accordance with the Highway Safety Act on roads intended to be used by the public for travel with normal passenger cars (normally roads in Maintenance Levels 3 through 5).	N		
Transportation System Management and Maintenance: Road ditches that show no sign of erosion (e.g., grassed-in, rocky, etc.) should not be disturbed by road maintenance unless necessary to maintain drainage.	C, O	B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System Management and Maintenance: Forest development roads will be managed with a mix of traffic management strategies to accomplish road management objectives and to reduce road user conflicts.	N		
Transportation System Management and Maintenance: Roads may be made available for different user groups at different times, or otherwise restricted. All Forest development roads are subject to short-term traffic restrictions and/or closures, due to seasonal or unusual weather conditions, safety hazards, emergency traffic, or when necessary to permit reconstruction and maintenance	P,C,R,O	P,B,M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: Roads will not be used if their use causes irreparable damage to the road or unacceptable impacts to adjacent resources (36 CFR 261). Damage is exclusive of normal wear, involves a reduction In the ability of a road or roadway structure to carry traffic, and cannot be corrected by normal maintenance practices.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System Management and Maintenance: Vehicle load, weight, height, length, and width limitations may be Imposed (36 CFR 212.7). Variance from these limitations will require a permit or other written authorization.	P, C, O	P, B. M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: All State of Oregon traffic rules and regulations apply on all open Forest development roads (roads in Maintenance Levels 2 through 5), except where Federal orders under 36 CFR 261 have been Issued (36 CFR 212).	P, C, R, O	P, B, M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: Road entrance management information that visually communicates to Forest visitors the road conditions and purpose of the road, such as mixed traffic, passenger car use, high clearance vehicles only, or logging use only, will be provided for each Forest development road. Emphasis will be on providing this Information at the entrance of roads not maintained for passenger cars.	N		
Transportation System Management and Maintenance: Assure short-term (temporary) roads are closed within one year of when the timber purchaser has completed contractual requirements for the portion of the timber sale served by the road. Re-establish vegetation cover to put land back into production within ten years of contract, lease, or permit termination on roads not remaining a permanent part of the Forest transportation system.	N		
Transportation System Management and Maintenance: Forest development roads will generally be open to use by vehicles licensed for highway travel, except when closed for one of the following reasons: a. The mode of access causes unacceptable damage to, or negates adequate protection and management of Forest resources. b. Safety hazards to the road user exist. c. Prescriptions in this Forest Plan recommend closures. d. To provide security to contractors/cooperators, special use permittees, private land owners, and Forest Service administrative facilities. e. Road maintenance costs to keep a road open are high compared to existing or expected use of the road. Roads closed for one of the above reasons may be closed either seasonally or year-around. Seasonal closures are preferred over year-around closures, wherever feasible, consistent with Forest Plan prescriptions, and If the objectives of the closure can be met. The Forest Supervisor, under the authority of 36 CFR 261, may enter into cooperative road closures during hunting season with the Oregon Department of Fish and Wildlife for protection of Forest resources.	P,C, R, O	P, B, M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: Some open roads will only be maintained for high clearance vehicle use (Maintenance Level 2). Roads with seasonal road closures will be maintained In accordance with Maintenance Level 2 through 5 standards. Roads closed for one year or more (year-around closure) will be generally maintained to Maintenance Level 1 standards, except for those closed to provide security to administrative facilities, which may be maintained to a higher level.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Transportation System Management and Maintenance: During development and subsequent review of District Travel Management Plans (Appendix F[66]), existing road closures will be evaluated as to the specific objectives to be accomplished by the closure, the type of closure device used, and the need to continue the closure Prior to blocking or closing an existing Forest development road the following will be documented: a. Reason or objective for the closure. b. The closure period (seasonal or year-around). c. Exceptions to the closure; I.e. who or what type of vehicle may use the road, and under what circumstances d. The type of closure device (physical barriers, signing, natural barrier, or locked gate). Law enforcement needs and prescriptions will be identified prior to Issuing regulatory closures.	N		
Transportation System Management and Maintenance: Advisory devices and natural barriers (earth berms, rocks, brush, etc.) are preferred over regulatory road closures and locked gates where It is necessary to close roads. Use an advisory sign (or poster) near locked gates to describe the reason for the closure. Notify the public before closing an existing open road with a locked gate (except for emergencies). Give sufficient lead time in the notice. Use advisory signs in advance of road closures where adequate turnarounds for public traffic is not available at the closure or where significant inconvenience to the public may occur.	P, C, R, O	P, B, R, M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: Various road management techniques and strategies may be used to accomplish land and resource management goals and prescriptions in this plan. Following their development, the travel management plans will be reviewed annually and updated every two years, if necessary. Guidelines for travel management planning is in Appendix F[21].	N		
Transportation System Management and Maintenance: Some closed roads (Maintenance Level 1) may be converted to other uses such as all-terrain vehicle (ATV) routes, and special purposes trails. Some roads In Maintenance Levels 2 through 5 may be closed to highway legal vehicle use during the winter, when sufficient snow depth exists, for use as winter sports trails (Nordic skiing, snowmobiles, etc.). See Forestwide standards and guidelines for dispersed recreation, and Appendix F[21], for additional guidelines for use of closed roads.	C, R, O	P, B, R, M	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System Management and Maintenance: Existing airfields or heliports are to be operated and maintained using existing direction documented In appropriate Forest Service manuals and handbooks.	N		
Transportation System Management and Maintenance: Input and comment will be requested from facility users, the FAA and the Oregon Aeronautics Division of the Department of Transportation on any proposed closure of an airfield or heliport. Closure of any aviation facility will be In conformance with Forest Service and FFA standards.	N		
Facilities - Corridors			

[66] Appendix F: Recreation Travelway Management Guide, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Utility Corridors: The four existing utility Corridors are shown on the utility Corridor map (see Figure IV-3[67]). The Forest Service will coordinate with the Federal Energy Regulatory Commission (FERC) and Pacific Power and Light in the maintenance of the Corridors authorized under FERC license. The corridors authorized by Forest Service special use permits will be maintained as stated in the authorizing document.	N		
Utility Corridors: The western regional Corridor study of 1986 by the Western Utility Group Identified two additional Corridors on the Umpqua National Forest. A maximum of three additional potential utility corridors, known as 'windows', will be considered for future utilities. These windows are shown on the Utility Corridor Map[20] and as described below. Any future proposal to construct a utility line within these 'windows' will require a separate environmental analysis or EIS: a. Windigo Pass Utility Window: The possibility for a utility Corridor exists through Windigo Pass outside of the OCRA. This 1,000-foot window, 500 feet on each side of Forest Road No 60, follows the boundary of the two parts of the OCRA As the boundary of the OCRA follows the curvature of Forest Road No. 60, the construction of a power transmission line totally within the boundary of this Window may not be practical. However, Section 4(e) of The Oregon Wilderness Act of 1984, which established the OCRA, states, "Within the recreation area, the Secretary may permit, under appropriate regulations, those limited activities and facilities which he determines necessary for resource protection and management and for visitor safety and comfort, including .. (6) public services land occupancies, Including power transmission lines, provided there is no feasible alternative location, and, the Secretary finds that it is In the public interest to locate such facilities Within the recreation area." b. Upper Highway 138 Window: This Window, near State Highway 138, will need future study and analysis, as only a narrow strip between the boundaries of Crater Lake National Park and Mt Thieisen Wilderness/ OCRA is available. c. Red Butte Window: This proposal connects a power transmission line from Red Butte to the Soda Springs-Roseburg line. The maximum Width of this corridor will be 600 feet.	N		
Utility Corridors: Any new proposed utility corridors will be planned on an Interagency basis and coordinated between the affected National Forests. The three canal corridors on the North Umpqua River, Clearwater River and Fish Creek, which supply water to Pacific Power and Light's Toketee power installation will be operated according to the license granted by the Federal Energy Regulatory Commission (#1927).	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Secs. 3.4.3
Transportation Corridors: The three existing transportation corridors are shown on the transportation map (see Figure-IV-4[68]). These corridors are Oregon State Highway 138, (North Umpqua Highway segment); State Highway 230 (Diamond Lake West Highway); and Douglas County Road 1 (part of the Tiller Trail Highway).	N		

[67] Figure IV-3: Utility Corridors (Power), Umpqua National Forest Land And Resource Management Plan
[68] Figure IV-4: Umpqua National Forest Transportations System, Umpqua National Forest Land And Resource Management Plan

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Transportation Corridors: Procedures for the coordination of maintenance, signing, right-of-way grants, access control, any reconstruction and other matters relating to the portions of Oregon State Highways 138 and 230 Within the Forest will be in accordance with the current Memorandum of Understanding between Region SIX, USDA Forest Service, and Oregon Department of Transportation, Highway Division.	N		
Transportation Corridors: Procedures for the coordination of planning, design, and construction of Forest highway projects within, adjacent to, or serving the Forest will be In accordance With the Memorandum of Understanding between the Federal Highway Administration and the U.S. Forest Service (FSM 1535).	N		
Transportation Corridors – Windigo Pass Transportation Window: The possibility of a transportation corridor exists along Forest Development Road (FDR) 60 between Highways 138 and 58, including the window outside of the OCRA through Windigo Pass. This potential transportation Corridor, or window, is shown on the transportation map. The Windigo Pass Road (FDR 60), from Its junction With FDR 6020 at Umli on the Deschutes National Forest south to its Junction with FDR 6000-700 at the south end of the OCRA on the Umpqua National Forest, will be managed as follows:	N		
Transportation Corridors – Windigo Pass Transportation Window: There is no immediate need to improve this road. The road is adequate to handle the existing low volume of traffic use. The Windigo Pass Road will be managed at its current design and maintenance standards for the foreseeable future.	N		
Transportation Corridors – Windigo Pass Transportation Window: The road may be Improved in the future as needed to accommodate Increased traffic demands Any future upgrading of the road or Improvement In road standards will be undertaken only after further NEPA documentation and public Involvement Involving both the Umpqua and the Deschutes National Forests.	N		
Transportation Corridors – Windigo Pass Transportation Window: The road will be maintained during the winter as a snowmobile route, and left unplowed for standard highway type vehicles.	N		
Transportation Corridors – Windigo Pass Transportation Window: The Windigo Pass Road (FDR 60), from Its Junction With Highway 138 to Its junction With FDR 6000-700 at the south end of the OCRA on the Umpqua National Forest, may be upgraded, including paving, to meet traffic needs.	N		
Transportation Corridors: Any major upgrading of existing transportation corridors will be coordinated between the National Forest and the agency proposing the project, With the appropriate environmental reviews as required by NEPA.	N		
Transportation Corridors: Visual resource management direction for the existing transportation corridors and the potential Corridor through Windigo Pass is contained in the Forest-Wide Standards and Guidelines for Visual Resource.	N		
Facilities - Administrative Sites – Not Applicable, Excluded			

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection			
Fire Management: Wildfires that threaten life, property, public safety, Improvements, or investments will receive aggressive suppression action using an appropriate suppression response.	N		
Fire Management: All wildfires will require the use of the appropriate suppression response. This will provide the option of applying the appropriate strategy to all areas of the Forest, using cost efficiency and meeting resource management objectives.	N		
Fire Management: Wildfires that escape initial action and threaten to exceed established limits will require that an Escaped Fire Situation Analysis (EFSA) be prepared. This analysis will measure the cost of suppression against the resource loss potential, with emphasis on minimizing the cost and resource losses	N		
Fire Management: Levels and methods of fuels treatment will be guided by the protection and resource objectives within the management area. The Forest fuels appraisal process will be available for use to assist in making this determination. Reducing fuel loadings through marketing strategies will be explored.	N		
Fire Management: Prescribed fire is a management tool that may be used to meet management and vegetation objectives, and to maintain desired fuel profiles In all ecosystems. It will be utilized after an analysis Indicates that it will be cost effective and will meet resource management objectives. The analysis will include air quality considerations such as Increased utilization of slash, reduction of acres to be burned for hazard reduction, and ignition and burning techniques to save as much of the fuels 3' to 8.9' diameter as possible.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 18 POD Att. 29
Fire Management: Unplanned Ignitions (lightning-caused) may be used for prescribed fires when (1) a prescribed fire plan has been prepared and approved and (2) the fire is burning Within prescribed parameters. (For exceptions to this policy, see Standard #9.)	N		
Fire Management: Burning plans will be prepared In advance of ignition and approved by the appropriate line officer for each prescribed fire. A prescribed fire exceeding both prescribed parameters and line-holding capabilities will be declared a wildfire and appropriate suppression response will be Initiated.	P, C, R, O	P, B, M	EIS Secs. 2.1.4 & 2.1.6 EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS App. F POD Att. 18 POD Att. 29

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Fire Management: Air quality will be emphasized during prescribed fire planning. Mitigating measures will be considered, including extending the burning season to spread emissions throughout the year and the avoidance of burning near recreation areas during peak use periods. All burning will be planned and conducted to comply with applicable air quality laws and regulations and coordinated with appropriate air quality regulatory agencies.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. F POD Att. 9 POD Att. 18 POD Att. 29
Fire Management: Planned Ignitions will be considered in wilderness only when an extensive analysis has determined: (1) the area has been Significantly altered from its natural state due to fire exclusion and (2) the probability of lightning Ignition returning the area to its natural state is low. The need for any scheduled Ignition in wildernesses will be addressed In the individual wilderness management plans.	N		
Fire Management: All human-caused unplanned ignitions in wilderness will be declared a wildfire. Natural unplanned Ignitions In wilderness will be permitted to burn if prescribed In an approved management plan.	N		
Fire Management: During timber sale planning, the value of old growth timber stands for wildfire protection should be considered. Efforts to leave these old growth stands adjacent to plantations for wildfire suppression strategies should be considered whenever possible.	N		
Pest Management: Integrated Pest Management (IPM) prevention and suppression strategies will be utilized to manage pests within the constraints of laws and regulations and to meet forest management objectives. Methods may Include management practices (cultural or silvicultural), regulatory measures, biological, mechanical, manual, prescribed fire, and/or chemical treatments.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. F POD Att. 14 POD Att. 24 POD Att. 29
Pest Management: Special procedures will be implemented when pesticides are used, including the certification of contractors and Forest Service crew leaders. All pesticide use will be reviewed and approved before application by administrative representatives who are certified for pesticide use. Public notification will be given in advance of all applications	P, C, R, O	P, B	EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. 14 POD Att. 24
Law Enforcement: Law enforcement will be a cooperative effort between the Forest Service, other Federal agencies, State, and local law enforcement, within the scope and responsibilities of each agency.	N		
Law Enforcement: Emphasis will be placed on preventing violations of laws and regulations through the proper administration of Forest Service permits and contracts and an aggressive public information program.	N		
Law Enforcement: Known Violations of laws or regulations will be promptly investigated and appropriate action initiated. Reporting procedures outlined in FSM 5340.3 will be followed.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Human Resources – Not Applicable, Excluded From Table			
Management Area 1: Provides opportunities for unroaded recreation primarily In semi-primitive settings. Not Applicable, Excluded From Table			
Management Area 2: Provides an appropriate environment for concentrated developed recreation activities in the areas immediately surrounding Diamond and Lemolo Lakes. Not Applicable, Excluded From Table			
Management Area 3: Provides an appropriate area for future development of a winter sports site on Mount Bailey, Insures that prescriptions assigned will provide for management of the area in condition suitable for ski area development. Insures that prescriptions assigned will provide for management of the area in a condition suitable for ski area development. Not Applicable, Excluded From Table			
Management Area 4: Manage to preserve the natural character of these lands In a manner consistent with the Wilderness Act of 1964 and the Oregon Wilderness Act of 1984. Not Applicable, Excluded From Table			
Management Area 5: Manage the Oregon Cascades Recreation Area (OCRA) consistent With the intent of the Oregon Wilderness Act. Not Applicable, Excluded From Table			
Management Area 6: Provides for the protection and enjoyment of remarkable designated special Interest areas. Not Applicable, Excluded From Table			
Management Area 7: Manage the North Umpqua River, as designated In the Oregon Omnibus Wild and Scenic Rivers Act of 1988, for the protection of remarkably outstanding features for the benefit and enjoyment of people. Not Applicable, Excluded From Table			
Management Area 8: Manage as an experimental forest dedicated to basic and applied research on the function and operation of forest ecosystems In both natural and disturbed states. Not Applicable, Excluded From Table			
Management Area 9: Manage established and Identified potential research natural areas (RNOs) in the system of nationwide RNOs. Not Applicable, Excluded From Table			
Management Area 10: Produce timber on a cost-efficient sustainable basis consistent with other resource objectives for wildlife habitat, riparian habitat and water quality, visual quality, and recreation. Not Applicable, Excluded From Table			
Management Area 11: Provide big game winter range habitat and timber production consistent with other resource objectives for wildlife habitat, riparian habitat and water quality, visual quality, and recreation. Not Applicable, Excluded From Table			
Management Area 12: Provides additional management direction to maintain or enhance the fisheries resource of Steamboat Creek and Its tributaries consistent with the intent of the 1984 amendment to the Wild And Scenic Rivers Act. Not Applicable, Excluded From Table			
Management Area 13: Provides additional emphasis for the orderly exploration, development, extraction, and production of mineral resources on lands within the Fairview-Bohemia mineralized area.			
Management Area 14: Manage undeveloped Intact ecosystems for their ecological values with a focus on preservation of the genetic base of natural plants and animals and maintenance of natural processes. Not Applicable, Excluded From Table			
Prescription A1-I: Recreation, Semi-Primitive Non-Motorized - No Harvest Not Applicable, Excluded From Table			

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Prescription A1-IV: Recreation, Semi-Primitive Motorized - No Harvest Not Applicable, Excluded From Table			
Prescription A1-V: Recreation - Unroaded Concentrated Not Applicable, Excluded From Table			
Prescription A3-I: North Umpqua Viewshed Not Applicable, Excluded From Table			
Prescription A4-I: Recreation - Concentrated Developed Not Applicable, Excluded From Table			
Prescription A4-II: Recreation – Winter Sports Site - Not Applicable, Excluded From Table			
Prescription A4-IV: Recreation – Existing Developed Sites at Less Than Standard-Service Level - Not Applicable, Excluded From Table			
Prescription A4-V: Recreation Maintenance Levels Than Standard-Service Level - Not Applicable, Excluded From Table			
Prescription A4-V: Recreation Maintenance Level - Not Applicable, Excluded From Table			
Prescription A5-II: Recreation, Special Interest Areas - Not Applicable, Excluded From Table			
Prescription B1-II: Wilderness WRS Primitive - Not Applicable, Excluded From Table			
Prescription B1-III: Wilderness WRS Semi-Primitive - Not Applicable, Excluded From Table			
Prescription C1-I: Old Growth Groves (Recreation Use) - Not Applicable, Excluded From Table			
Prescription C1-II: Spotted Owl (Dedicated) - Not Applicable, Excluded From Table			
Prescription C2-I: Riparian Area Class I and II Streams, Lakes and Ponds			
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sides lopes, or serving as existing or future fish habitat source (woody material for Class I and II streams) Sanitary facilities are discouraged in riparian areas and must adequately treat wastes consistent With DEQ regulations. Existing recreation developments are maintaining existing water quality, fish, and Wildlife habitat. Before Investment In new campgrounds or other facilities are undertaken, a floodplains and wetland determination and assessment of Impacts, With public notice, are necessary on these streams and wetlands.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wilderness: All Wilderness activities are compatible In riparian areas, Including natural fire, trail construction and use, and research	N		
Wildlife and Fish: All fish habitat improvement projects, structural wildlife improvements and snag preservation are compatible In riparian areas and are encouraged. Provide structural and nonstructural improvement projects to maintain or Increase the present population of salmonids. These areas are suitable for winter range cover for big game, except the Layng Creek watershed.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.3 & 4.5.2.3 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 16 POD Att. 20 POD Att. 29
Range: Livestock use is permitted when consistent With allotment management plans, If riparian objectives are met. Locate watering structures and sailing, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: No timber harvest, site preparation, release, planting, precommercial thinning, firewood cutting or pesticide use are permitted except to meet riparian objectives. Salvage harvest is restricted to catastrophic occurrences (>50 percent of existing stand), when timber not necessary for fish habitat, water quality, wildlife habitat or soil productivity may be removed In consultation with a fishery biologist or hydrologist. Yarding corridors are permitted at designated locations with full log suspension over the streambank and protected vegetation corridors must minimize disturbance to riparian vegetation and meet riparian objectives. If effective shade or fish habitat is reduced, shade or habitat restoration is necessary for mitigation. Maintain existing deciduous/ conifer mix of riparian vegetation Maintain existing channel profile through vegetation rootmat In banks, and with stable woody material In the channel.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement. Where existing shade or channel stability has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Emphasize watershed Improvement In riparian areas where appropriate.	P, R	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 - 4.1.36 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-1, UNF-3 & UNF-4.

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Minerals: Rehabilitation of existing rock quarries or pits by seeding and planning is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Panning or dredging in or adjacent to streams is compatible when carried out in accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives. Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of Significant Wildlife or fisheries value Special use applications must show compatibility with riparian objectives before awarded.	N		
Facilities: Allow for free fish passage on all Class I and II streams and lakes. Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, to replace effective shade, and to protect water crossings from flood peaks and resulting channel impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit. Pesticides may not be used In the riparian unit. Buildings and other structures should conform to management direction In timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible. Before investment In new buildings or other facilities are undertaken, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	N		
Protection: Activities which minimize both prescribed fire and wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams These measures Include hand piling slash, not burning, burning one side of a Unit at a time, low-intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Insect and disease control practices are allowed when riparian objectives can be met.	N		
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round In perennial streams). Fire retardant may not be applied to fish-producing (Class I and II) streams or lakes.	N		
Prescription C2-II: Riparian Area Class III Streams, Lakes and Ponds			

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sideslopes, or serving as aquatic food source. Sanitary faculties are discouraged and must adequately treat wastes consistent With State DEQ regulations Existing recreation developments are maintaining existing water quality, fish and Wildlife habitat Before investment In new campgrounds and other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All wilderness activities are compatible in riparian areas, including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All structural wildlife Improvements and snag preservation are compatible in riparian areas and are encouraged. These areas are suitable for winter range cover for big game, except in the Layng Creek watershed.	N		
Range: livestock use is permitted when consistent with allotment management plans and If riparian objectives are met. Locate watering structures and sailing, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, natural regeneration and uneven-aged management is preferred. No site preparation, release, planting, precommercial thinning, firewood cutting or pesticide use are permitted except to meet riparian objectives. Yarding corridors are permitted at designated locations With full log suspension over the streambank and protected vegetation. Condors must minimize disturbance to riparian vegetation and meet riparian objectives.	N		
Timber: If effective shade or channel stability are reduced, shade or channel restoration is necessary for mitigation. Maintain existing deciduous/conifer mix of riparian vegetation. Maintain existing channel profile through vegetation rootmat In banks, and stable woody material In the channel.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement.	P, R	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-2 & UNF-3

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soil and Water: Where existing shade or channel stability has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Emphasize watershed improvement and watershed restoration In riparian areas where appropriate.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendment UNF-1
Minerals: Rehabilitation of existing rock quarries or Pits by seeding and planting is compatible and desirable extraction or storage of common minerals, Including use and construction of rock pits, is discouraged in riparian areas when riparian objectives cannot be met. Panning or dredging In or adjacent to streams is compatible when carried out In accordance With Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives. Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of Impacts, With public notice, are necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of significant wildlife or fisheries value Special use applications must show compatibility With riparian objectives before being awarded.	N		
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, effective shade is replaced, and protection is provided at water crossings from flood peaks and their resulting channel impacts.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Facilities: Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit. Pesticides may not be used In the riparian unit. Buildings and other structures should conform to management direction in timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible.	P, C, R, O	P, B, R, A	EIS Sec. 2.1.3.5 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS App. J LMP Amendment UNF-2.

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Before investment In new buildings or other faculties, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	P	P	EIS Sec. 1.5.1.7 EIS Secs. 1.5.3.3 & 1.5.4.3 EIS Sec. 1.5.4.9 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4.1 EIS App. J
Protection: Activities which minimize both prescribed fire and wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams. These measures include hand piling slash, not burning, burning one side of a unit at a time, low-intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Insect and disease control practices allowed when riparian objectives can be met.	N		
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round In perennial streams).	P, C, R, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.2.4 EIS App. J POD Att. 14
Prescription C2-III: Riparian Area Class IV Streams, Lakes and Ponds			
Recreation: Recreation Improvements and trail locations are designed to protect vegetation which is stabilizing channels, banks and sideslopes. Sanitary facilities are discouraged; If necessary, they must adequately treat wastes consistent with State DEQ regulations. Existing recreation developments are maintaining existing water quality and wildlife habitat.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All Wilderness activities are compatible In riparian areas, Including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All wildfire activities are compatible In riparian areas, Including use as winter range forage or cover, consistent With riparian objectives.	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Livestock use is permitted when consistent with allotment management plans If riparian objectives are met. Locate watering structures and salting, holding and loading areas outside riparian areas. Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, protection of understory, natural regeneration and all-aged limber management is preferred. Special logging procedures, including jacking to directionally fall trees, will be used where effective Where natural regeneration is not practical, planting for timber management and riparian protection is encouraged No commercial or personal-use firewood cutting permitted. No firewood cutting or gathering for onsite use permitted.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement. Where existing shade or channel stability has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Emphasize watershed Improvement in riparian areas where appropriate.	P, R	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 - 4.1.36 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-1 - UNF-4.
Minerals: Rehabilitation of existing rock quarries or pits by seeding and planting is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Recreational panning or dredging In or adjacent to streams is compatible when carried out In accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives Special stipulations will be required for mineral leases when needed to protect riparian habitat Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: Encourage the acquisition of riparian lands that may be of significant wildlife or riparian value Special use applications must show compatibility With riparian objectives before being awarded.	N		
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, and to protect water crossings from flood peaks and resulting channel impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian area. Pesticides may not be used In the riparian unit during the season when flow occurs. Buildings and other structures should conform to management direction In timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Activities which minimize both prescribed fire and Wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization Utilize the appropriate suppression responses that will minimize damage to riparian vegetation Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams These measures Include handpillng slash, not burning, burning one Side of a unit at a time, low-Intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, R, C, O	P, R, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Insect and disease control practices allowed when riparian objectives can be met	N		
Protection: No pesticide use is permitted in riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round In perennial streams).	N		
Prescription C2-IV: Fish Habitat Class I and II Streams, Lakes and Ponds			
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sideslopes, or serving as existing or future fish habitat source (woody material for Class I and II streams). Sanitary facilities are discouraged In riparian areas and must adequately treat wastes consistent with DEQ regulations. Existing recreation developments are maintaining existing water quality, fish, and wildlife habitat. Before investment In new campgrounds or other facilities are undertaken, a floodplain and wetland determination and assessment of impacts, with public notice, are necessary on these streams and wetlands.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent with riparian objectives.	N		
Wilderness: All Wilderness activities are compatible in riparian areas, Including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All fish habitat Improvement projects, structural wildlife Improvements and snag preservation are compatible In riparian areas, and encouraged. Provide structural and nonstructural improvement projects where It has been determined that fish production is below potential due to habitat restrictions. These areas are Suitable for winter range cover for big game	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 29
Wildlife and Fish: Write fish habitat management plans for major drainages within two years of completion of sub-basin analysis for those drainages	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Range: Livestock use is permitted when consistent with allotment management plans if riparian objectives are met. Locate watering structures and salting, as well as holding and loading areas outside riparian areas. Direct trailing across, but not along, watercourses within the riparian area.	N		
Timber: No timber harvest, site preparation, release, planting, precommercial thinning, firewood cutting or pesticide use are permitted except to meet riparian objectives. Salvage harvest is restricted to catastrophic occurrences (>50 percent of existing stand), when timber not necessary for fish habitat, water quality, wildlife habitat or soil productivity may be removed in consultation with a fishery biologist or hydrologist. Yarding corridors are permitted at designated locations with full log suspension over the streambank and protected vegetation Corridors must minimize disturbance to riparian vegetation and meet riparian objectives. If effective shade or fish habitat is reduced, shade or habitat restoration is necessary for mitigation Maintain existing deciduous/conifer mix of riparian vegetation Maintain existing channel profile through vegetation rootmat In banks, and with stable woody material In the channel.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement. Where existing shade has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs Plant rapid-growing conifers on drier upper banks to provide long-term shade. Inventory and actively rehabilitate all Identified bank and sideslope failures, channel downcutting, and unshaded stream reaches to Improve existing water quality.	P, R	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 - 4.1.36 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-1, UNF-3 & UNF-4.
Minerals: Rehabilitation of existing rock quarries or Pits by seeding and planting is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Recreational panning or dredging in or adjacent to streams is compatible when earned out In accordance With Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of Impacts, With public notice, is necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of Significant wildlife or fisheries value Special use applications must show compatibility With riparian objectives before being awarded.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Facilities: Allow for free fish passage on all Class I and II streams and lakes. Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, to replace effective shade, and to protect water crossings from flood peaks and resulting channel impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit.	P, C, R, O	P, B, M, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.1.3.5 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-1 & UNF-2
Facilities: Pesticides may not be used in the riparian Unit. Buildings and other structures should conform to management direction in timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible. Before Investment In new campgrounds or other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, is necessary on these streams and wetlands.	N		
Protection: Activities which minimize both prescribed fire and wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams. These measures include handpiling slash, not burning, burning one side of a unit at a time, low-intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Insect and disease control practices are allowed when riparian objectives can be met.	P, C, R, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.3 & 4.6.2.4 EIS App. J POD Att. 14
Protection: No pesticide use is permitted in riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round in perennial streams). Fire retardant may not be applied to fish-producing (Class I and II) streams or lakes.	P, C, R, O	P, B	EIS Sec. 2.7.3 EIS Sec. 4.1.3.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.3 & 4.6.2.4 EIS App. J POD Att. 14
Prescription C2-V: Fish Habitat Class III Streams			

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sideslopes, or serving as aquatic food source. Sanitary facilities are discouraged and must adequately treat wastes consistent with State DEQ regulations Existing recreation developments are maintaining existing water quality, fish, and wildlife habitat Before Investment In new campgrounds and other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All wilderness activities are compatible In riparian areas, including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All structural wildlife improvements and snag preservation are compatible In riparian areas and are encouraged These areas are suitable for winter range cover for big game.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 29
Range: Livestock use is permitted when consistent With allotment management plans and if riparian objectives are met. Locate watering structures and salting, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, natural regeneration and uneven-aged management is preferred. No site preparation, release, planting, precommercial thinning, firewood cutting or use, or pesticide use are permitted except to meet riparian objectives. Yarding Corridors are permitted at designated locations With full log suspension over the streambank and protected vegetation corridors must minimize disturbance to riparian vegetation and meet riparian objectives. If effective shade or channel stability are reduced, shade or channel restoration is necessary for mitigation. Maintain existing deciduous/conifer mix of riparian vegetation. Maintain existing channel profile through vegetation rootmat In banks, and stable woody material In the channel	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams Plant vegetation where necessary to minimize soil movement. Where existing shade has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Inventory and actively rehabilitate all identified bank and sideslope failures, channel downcutting, and unshaded stream reaches to Improve existing water quality.	P, R	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 - 4.1.36 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-1, UNF-3 & UNF-4.

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Rehabilitation of existing rock quarries or pits by seeding and planting is compatible and desirable Extraction or storage of common minerals, including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Recreational panning or dredging in or adjacent to streams is compatible when carried out In accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives. Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of impacts, with public notice, is necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of significant Wildlife or fisheries value. Special use applications must show compatibility with riparian objectives before being awarded	N		
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, effective shade is replaced, and protection is provided at water crossings from flood peaks and their resulting channel impacts.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Facilities: Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores Within the riparian unit. Pesticides may not be used in the riparian unit. Buildings and other structures should conform to management direction in timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible. Before investment In new buildings or other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	P, C, R, O	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.7.3 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.2.4 EIS App. J POD Att. 14 LMP Amendment UNF-2
Protection: Activities which minimize both prescribed fire and Wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams These measures include handpiling slash, not burning, burning one Side of a unit at a time, low-Intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Insect and disease control practices allowed when riparian objectives can be met.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round 10 perennial streams).	N		
Prescription C2-IV: Fish Habitat Class IV Streams			
Recreation: Recreation Improvements and trail locations are designed to protect vegetation which is stabilizing channels, banks and sideslopes. Sanitary facilities are discouraged; If necessary, they must adequately treat wastes consistent with State DEQ regulations Existing recreation developments are maintaining existing water quality and Wildlife habitat.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent with riparian objectives	N		
Wilderness: All Wilderness activities are compatible In riparian areas, Including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All wildlife activities are compatible In riparian areas, Including use as winter range forage or cover, consistent With riparian objectives	N		
Range: Livestock use is permitted when consistent With allotment management plans and meets other resource objectives. Locate watering structures and salting, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, protection of understory natural regeneration, and all-aged timber management is preferred. Special logging procedures, Including Jacking to directionally fall trees, will be used where effective. The chief difference between this prescription and C2-11J is that slash and residual vegetation will be protected from prescribed fire In MA 12, the NO-harvest Prescription C2-X will be used where burning risks are high. Where natural regeneration is not practical, planting for timber management and riparian protection is encouraged. No pesticide use is permitted in riparian units during the season when flow occurs.	N		
Timber: No commercial or personal-use firewood cutting permitted. No firewood cutting or gathering for onsite use permitted.	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams Plant vegetation where necessary to minimize Soil movement Where existing shade has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Inventory and actively rehabilitate all Identified bank and sideslope failures, channel downcutting, and unshaded stream reaches to Improve existing water quality.	P, R	P, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 - 4.1.36 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments UNF-1, UNF-3 & UNF-4.
Minerals: Rehabilitation of existing rock quarries or Pits by seeding and planting is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock Pits, is discouraged In riparian areas when riparian objectives cannot be met. Panning or dredging in or adjacent to streams is compatible when carried out In accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and other riparian objectives Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: Encourage the acquisition of riparian lands that may be of significant Wildlife or riparian value. Special use applications must show compatibility With riparian objectives before being awarded.	N		
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, and to protect water crossings from flood peaks and resulting channel Impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores Within the riparian area. Pesticides may not be used In the riparian unit during the season when flow occurs. Buildings and other structures should conform to management direction In timber and recreation program elements for vegetation disturbance and sanitation, respectively Open canals and Site occupancy related to hydropower projects are not compatible.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Activities which minimize both prescribed fire and Wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and stream bank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams. These measures Include handpiling slash, not burning, burning one Side of a unit at a time, low-Intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 29 LMP Amendments UNF-1 - UNF-3.
Protection: Insect and disease control practices allowed when riparian objectives can be met.	N		

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round in perennial streams).	N		
Prescription C2-VII: North and South Umpqua/Steamboat Fish Resting Holes – Not Applicable, Excluded From Table			
Prescription C2-VIII: Riparian Class I Streams with Demonstrated Unique Anadromous Fish Populations – Not Applicable, Excluded From Table			
Prescription C2-IX, Steamboat Fish Habitat Class III Streams – Not Applicable, Excluded From Table			
Prescription C2-X, Steamboat Fish Habitat Class IV Streams – Not Applicable, Excluded From Table			
Prescription C3-I: Peregrine Falcon			
Recreation: No new trails or other recreation facilities will be constructed within 5 miles of nest site. Public access and use may be restricted January 1 - July 31 each year.	N		
Recreation: ORV use closed during January 1 - July 31	N		
Visual: Minimum visual quality objective is partial retention within areas, and as directed by Forestwide visual standards and guidelines.	N		
Wildlife and Fish: These sites are high priority for annual monitoring. Any proposed enhancement project or management technique must be reviewed and coordinated with the USDI Fish and Wildlife Service.	N		
Range: The area within a 20-chaln radius of any nest site will be excluded from any future range allotments. No special use livestock structures permitted.	N		
Timber: No programmed harvest Within the Immediate vicinity of the nest site. Restrict timber harvest activity between January 1 - July 31 as needed to reduce disturbance during nesting season. Within a 5-mile radius of nest Site, If determined necessary, restrict timber sale activity during January 1 - July 31. Review all timber sales in the 1.5-mlle zone With USDI Fish and Wildlife Service	P,C	P	EIS 4.6.1.2 & 4.6.1.3 MIS Report
Timber: Within three-mile radius of nest, manage harvest schedule to provide a diversity of age classes. Maintain 50 percent of the stands In pole size or larger. Where possible, leave five or more hardwoods per acre in regeneration units. Modify herbicide application to provide at least 25 percent of the original hardwood component. Manage snags at 40 percent or more of potential population capacity.	N		
Timber: Firewood cutting limited to same specifications as timber harvest activities. Gathering of firewood is limited to that needed for onsite use.	N		
Soil and Water: Activities prohibited as described above in timber element. Soil and water enhancement permissible if snags are not removed.	N		

TABLE E-5

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Subject to determination of values, including mineral values, all area within the boundaries of the site will be considered for recommendation for withdrawal from mineral entry If necessary to maintain the Integrity of existing cliff or tree nest Sites, Extraction of common variety minerals shall not be permitted.	N		
Lands: These lands should not be considered available for exchange or transfer Land acquisitions are encouraged.	N		
Facilities: Roads Within 5 miles may be blocked permanently or closed to use January 1 – July 31, If needed to reduce disturbance during nesting season Road construction or reconstruction within 1.5 miles will not normally take place during January 1 - July 31 New utility and transportation corridors will be discouraged. Where no reasonable alternatives exist, Corridors will be located to Impose the least Impact as determined In the EA process.	N		
Protection: High priority areas for fire suppression using appropriate suppression response. Law enforcement protection is high Priority.	N		
Protection: No use of chemicals to control Insect and disease outbreaks Within the 1.5-mile radius except under recommendation from US Fish and Wildlife Service.	N		
Prescription C3-II: Bald Eagle, Maintained – Not Applicable, Excluded From Table			
Prescription C4-I: Winter Range – Normal – Not Applicable, Excluded From Table			
Prescription C4-II: Four-Part Winter Range - Optimum – Not Applicable, Excluded From Table			
Prescription C5-I: Wildlife - Unique Habitat – Not Applicable, Excluded From Table			
Prescription C5-III: Wildlife - Mosaic Habitats – Not Applicable, Excluded From Table			
Prescription C5-V: Wildlife – Management of Unsuitable Timberlands – Not Applicable, Excluded From Table			
Prescription C5-VI: Wildlife – Snag Management Areas – Not Applicable, Excluded From Table			
Prescription C5-VII: Wildlife – Pileated-Woodpecker – Not Applicable, Excluded From Table			
Prescription C5-VIII: Wildlife – Pileated-Woodpecker – Not Applicable, Excluded From Table			
Prescription C5-IX: Wildlife - Pine Marten, Dedicated - Not Applicable, Excluded From Table			
Prescription C5-X: Wildlife - Pine Marten (Managed) - Not Applicable, Excluded From Table			
Prescription E1-I: Timber - Intensive PNV, Not Applicable, Excluded From Table			
Prescription E1-II: Timber - Intensive Volume - Not Applicable, Excluded From Table			

TABLE E-5 **Umpqua National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Prescription E1-IV: Low Intensity Timber Management - Not Applicable, Excluded From Table			
Prescription E1-V: Timber - Intensive Short Rotation - Not Applicable, Excluded From Table			
Prescription E2-1: Research Natural Area - Not Applicable, Excluded From Table			
Prescription E2-II: Undeveloped Ecosystems - Not Applicable, Excluded From Table			
Prescription E3-I: Experimental Forest - Not Applicable, Excluded From Table			
Prescription F1-II: Layng Creek Municipal Watershed - 1989 Plan - Not Applicable, Excluded From Table			
Prescription J1-II: Maintenance of Existing Conditions - Not Applicable, Excluded From Table			

This page intentionally left blank.

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minimum Management 01			
Recreation - Roaded Natural: Manage the area for at least Maximum Modification Visual Quality Objective. Assess the impacts to visual resources in the project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation - Roaded Natural: Manage any trails that pass through this management area in a manner not m conflict with good stewardship management.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trawls, from adverse Impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed “area of effect” of prefects or elsewhere Document results of the investigation/ Inventory in the project environmental analysis Inventory of non-prefect areas will be guided by the Forest’s cultural resource inventory strategy.	N		
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist, to determine their potential archaeological, historical or cultural significance. Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance or implementing appropriate mitigation procedures to reduce the adverse Impact to the resource	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may Include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management. Coordinate cultural resource management with appropriate State and Federal agencies	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places: eligible properties will be nominated to the National Register.	N		
Recreation - Roaded Natural: Off-road vehicle recreation use on roads, trails or areas is permissible if not in conflict with strategy goals and objectives.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish And Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed In cooperation with the USDI Fish and Wildlife Service. Oregon Department of Fish and Wildlife. Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish And Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans	P, C, R, O	P, B, R, M, A	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29 RRNF-7
Wildlife, Fish And Plants: Biological evaluations (FSM 2672 4) shall be prepared for each project authorized, funded or conducted on the Forest The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species The biological evaluation consists of five steps: a. Pre-field review of existing information, b. Field reconnaissance of the project area; c. Determination of whether local populations of listed and PETS species will be affected by a project, d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish And Plants: If endangered, threatened or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671 4. No adverse impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670 31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29
Wildlife, Fish And Plants: Northern Spotted Owl – Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide. In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation. During the planning and scheduling phase of any project activity that may impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of impact and to provide for protective measures.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish And Plants: Osprey - Protect active nests dung the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish And Plants: Goshawk - Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of an active nest. Each nest sate is assumed potentially active until June 1 If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist. Goshawk nests will be protected within a 25-acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish And Plants: Woodpeckers - (Cavity Nesters) Cavity nesting habitat will be allowed to occur at natural levels on coniferous forest lands This should provide 100 percent of the potential population level for cavity nesting species. This may require leaving green trees standing as well, in order to maintain the snags throughout the rotation Soft snags will not be removed except for protection or human safety. Snags should be uniformly distributed insofar as practical. Land areas containing activities which impact amounts of large woody maternal (LWM) on the site shall have LWM management prescription(s). The prescription will not only be site specific but will also consider maintenance of LWM in perpetuity. At a minimum, a "moderate" amount of LWM will be left after project completion. The moderate range is 10 to 20 pieces of Class I and II logs per acre and all existing Class III, IV and V logs, except for incidental amounts removed during management activities.	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29
Wildlife, Fish And Plants: Resident Trout and Steelhead –Water quality law establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to fully utilize potential smelt production capability of Forest anadromous streams and resident fish in other streams and lakes. Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives Natural debris, plus trees needed for a future supply, will be maintained and managed to 1) enhance stream channel and bank structure so as to protect water quality, and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. L POD Att. 29
Wildlife, Fish And Plants: Deer and Elk - Maintain summer range to provide forage, hiding and thermal cover. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish And Plants: Bald Eagle - Develop a Bald Eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply. Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates. 1) Primary Zone-All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant: 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15.blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet: 4) A communal roost is any stand of trees m which eagles regularly roost together The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible. Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish And Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found. The site plan design will be tailored to in the landscape and the use patterns established by the birds. The following may be included m the Plan 1) Delineate the nest site (eyrie): 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie; 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January; 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie; 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie: 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and tertiary zones (approximately a three-mile radius of the eyrie): 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support lays, bandtail pigeon and other passerine birds. Biological evaluation and informal consolation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Range: Provide annual permittee plans for livestock distribution and use patterns.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented in FSM 2210.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the Integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Forage utilization standards will be incorporated In allotment management plans Allotment management plans may Include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock Utilization for grass and grass like species is based on the percent of plant weight removed. Utilization for shrub species is based on Incidence of use, weight, and/or twig length (e g. utilization is 50 percent If 50 out of 100 leaders are browsed) Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		
RANGE MANAGEMENT INTENSITY Minimum 1/ / Extensive 2/ / Intensive 3/ **Forested Areas** -Satisfactory Condition: 40% / 45% / 50% -Unsatisfactory Condition: 0-30% / 0-35% / 0-40% **Grasslands** -Satisfactory Condition: 50% / 55% / 60% -Unsatisfactory Condition: 0-30% / 0-35% / 0-40% **Shrublands** -Satisfactory Condition: 40% / 45% / 50% -Unsatisfactory Condition: 0-25% / 0-30% / 0-35% 1/ Minimum - Minimum amount of improvements; simple grazing system 2/ Extensive - Most or all improvements are non-structural; rotation grazing systems used. 3/ Wide variety of structural and non-structural improvements; rotation grazing systems used.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Rehabilitate areas that have been impacted by catastrophic occurrences.	N		
Timber: In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot. Strive for a natural seed source from a variety of species.	N		
Timber: Timber harvest is not programmed and would normally not occur except for the following situations: to eliminate hazards; removal incidental to construction or maintenance of improvements; minor unavoidable inclusions to logical management units; or in the case of natural catastrophe; and research and administrative studies when removal of such timber is not detrimental to achieving the goals of the management area.	N		
Water: Evaluate effects of proposed projects on stream courses in all environmental analyses. Discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analyses.	P	P	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 34041) and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987) regulations, and federal guidance issued thereto.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on sate specific conditions, technical, economic, and institutional feasibility, and water quaky standards for those waters potentially Impacted; b. Implement and enforce BMPs; c. Monitor to Insure that practices are correctly applied as designed, Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards; d. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected; e. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards; f. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described in Memorandums of Understanding between 1) the Oregon Department of Environmental Quaky and US. Department of Agriculture, Forest Service (2/12/79 and 12/7/82), and Attachments A and B' referred to in thus MOU (Implementation Plan for Water Quaky Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Aquaculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: The following requirements will be employed in project implementation when proposed projects may affect streams: a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods needed, b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26), c. Locate springs that may be affected and evaluate for appropriate levels of protection. Thus would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water nights for development of non-reserved uses.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, B, M, R, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mrnera1 resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed in a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to protect riparian and fishery values: meet State water quality standards, and insure that disturbed areas are reclaimed Insofar as practicable to a productive condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives. Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource input.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Human and Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human and Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to increase awareness and participation will be used.	N		
Human and Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise the traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human and Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human and Community Development: Identify opportunities for the Forest to coordinate resource activities with the interest of adjacent communities.	N		
Lands: Revise all special use permits to be consistent with the direction in thus management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility corridors when applications for rights-of-ways from public or private entities are received. Analyze any additional corridors with an environmental analysis.	N		
Lands: Use control measures to prohibit livestock access to chemically treated corridors.	N		
Lands: Direct applications for electronic sties toward use of sites in the following order: a. Utilizing residual capacity of existing sites, b. Develop new sites identified in the Forest-wide Electronic Site Plan.	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.3.2.2 POD Att. 4
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, peddling, severe burning, mass wasting and surface soil erosion In project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are Likely to result In detrimental displacement, compaction, mass wasting or erosion.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices including roads and landings. Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue River National Forest landside, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9
Soils: Design management activities to retain effective ground cover The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined In the Rogue River National Forest Soil Resource Inventory. a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soil; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sties.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Facilities: The Access Management Objectives Process, as described In Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria. These in turn will be used to develop: a. Road and Trail Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-Road Vehicle Management Strategies, h. Travel Maps and i. Closure Orders.			

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Within sensitive soil resource Inventory land types as shown m Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	N		
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Provide a low level of prevention activities limited primarily to public contact through patrol and fire prevention signing at campgrounds, rest areas, main access road junctions and information centers.	N		
Protection: Use prescription fire to obtain desired ecological characteristics of the area	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response m accordance with the Rogue Rover National Forest Fire Management Pokey and Plan.	N		
Backcountry Non-Motorized 03 – Not Applicable, Excluded From Table			
Developed Recreation 04			
Recreation - Roaded Natural: Provide recreation developments at levels two through five (see Glossary for definitions).	N		
Recreation - Roaded Natural: Manage the area for Modification Visual Quality Objective.	N		
Recreation - Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Natural: Utilize private enterprise and other public agencies to manage National Forest recreation sites if warranted for efficient operation.	N		

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Recreation - Roaded Natural: Prohibit hunting in this area.	N		
Recreation - Roaded Natural: Construct and operate facilities and sites to protect capital investments and public health and safety.	N		
Recreation - Roaded Natural: Off-road vehicles and standard vehicles shall only be permitted on the roads or trails not closed to such use.	N		
Recreation - Roaded Natural: Use fertilizer and seeding to maintain and enhance recreation sites or trails not closed to motorized use.	N		
Recreation - Roaded Natural: Recreation residences will not exceed the present level.	N		
Recreation - Roaded Natural: Assess the impacts to visual resources in all project environmental analysis. Analyze visual values in terms of degradation, maintenance or enhancement.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes In all project environmental analysts.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed 'area of effect' of projects or elsewhere Document results of the investigation/Inventory in the project environmental analysis Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.			
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse Impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under an intensive recreation management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Emphasis will be on habitat improvement for watchable wildlife and maintaining or improving fish habitat. If significant changes in recreation use are planned because of changes in facilities or access, this will be coordinated with the State's Departments of Fish and Wildlife.	P, R	P, M	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.8.1.3 EIS App. F POD Att. 19 POD Att. 29
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.8.1.3 EIS App. F POD Att. 19 POD Att. 29
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning. At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Resident Trout and Steelhead – Water quality law establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to fully utilize potential smolt production capability of Forest anadromous streams and resident fish in other streams and lakes Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives Natural debris, plus trees needed for a future supply, will be maintained and managed to 1) enhance stream channel and bank structure so as to protect water quality, and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, B, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. L POD Att. 29
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle sate management plan for each nesting or roosting area as it is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660foot radius around the nest. The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone _ All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant; 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles, Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest; 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking. timber harvest, road and water access into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees in which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found. The site plan design will be tailored to fit the landscape and the use patterns established by the bards The following may be included in the Plan. 1) Delineate the nest site (eyrie); 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie; 3) Withdraw the nest sate from mineral entry, 4) Restrict management activities and recreational use to September through January, 5) Allow no structural developments within the primary zone unless it benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie; 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie. 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and tertiary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphasis towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine bards. Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Where these lands fall within grazing allotment boundaries, portions with heavy use and development will be excluded from the allotment or classified as unusable range.	N		
Range: Developed recreation areas adjacent to rangelands will have livestock control, mainly fences or natural barriers to restrict livestock.	N		
Range: Small pasture allotments for individually owned recreation stock will not be allowed in this management area.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented in FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Timber: Timber will be managed on a nonscheduled basis to meet recreation objectives. Objectives will be to: a. Reduce risk of public injury from hazardous frees and vegetation. b. Maintain or improve visual quality associated with the recreational experience of the area. c. Salvage and prevent catastrophic destruction of the vegetative cover (insects, diseases, fire, wind).	N		
Timber: Tractor logging will be done in a way, such as skidding over the snow, that prevents injuries to root systems and the spread of disease.	N		
Timber: Fuelwood gathering will normally be limited to cleaning up management activities.	N		
Timber: Manage vegetation on recreation sites, except for ski areas and snow play areas, to meet the following objectives: a. Understory screening with emphasis on broad leaf species. b. Multi-layered canopies c. Provide shade on approximately 60 percent of the area. d. Maintain a healthy, vigorous stand. e. Maintain clumpy, irregular spacing. f. Maintain or create a natural looking stand.	N		
Timber: Manage vegetation on ski and snow play areas to meet the needs of the activities while being compatible with other resource values.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the Distinct Ranger.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists designated by the Forest Supervisor Reviewer for feasibility, silvicultural compatibility and economics.	N		
Timber: All silvicultural prescriptions and logging plans will be reviewed by a landscape architect for feasibility, silvicultural compatibility and the ability to meet developed recreation objectives.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Utilization standards for timber harvested will meet the standards as stated In the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and m Table 3-6 Standards m timber sale contracts may vary depending on markets and costs of harvesting.	N		
Timber: In seed collections, no seed lot shall be represented by fewer than 15 families of trees from that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Water: Evaluate effects of proposed projects on stream courses. In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. • Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, I needed.	P	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. • Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26);	P, R	P, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS App. F EIS App. J POD Att. 29 LMP Amendment RRNF-5
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. • Locate springs that may be affected and evaluate for appropriate levels of protection. This would usually require consultation with soil, water or geology specialists.	P	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Sec. 4.2.2.5 EIS Sec. 4.4.1.2 POD. Att. 3 POD Att. 9
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. • In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.5 EIS App. J

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Areas not already withdrawn will be recommended for withdrawal from mineral entry.	N		
Minerals: Prohibit aggregate source development.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Human And Community Development: Inform the general public, including minorities and the underprivileged. of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Human And Community Development: Consider the needs of the handicapped in the design of facilities.	N		
Human And Community Development: Maintain and promote the HOST program.	N		
Human And Community Development: Promote volunteer programs.	N		
Lands: Mark area boundaries.	P, C, O, R	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Direct applications for electronic sites toward use of sites In the following order. a. Utilizing residual capacity of existing sites b. Developing new sites identified in the Forest-wide Electronic Site Plan	N		
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	N		
Soils: Alternative management practices will be developed or mitigation measures planned and implemented when activities are likely to result In detrimental displacement, compaction, mass wasting or erosion.	N		
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue River National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	N		
Soils: Rehabilitate adversely impacted sites.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: The Access Management Objectives Process, as described in Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trail Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trawl Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-Road Vehicle Management Strategies, h. Travel Maps and i. Closure Orders	N		
Facilities: Water, sewer, and electrical systems are necessary for many facilities provided. This infrastructure shall be constructed and maintained to provide safe service without detracting from the experience provided at the site.	N		
Facilities: Signing is necessary to provide user information and safe use of sites. The following guidelines apply: a. Traffic signing shall meet applicable standards to provide for safe use by intended vehicles during inclement weather and hours of darkness. Where allowable under those standards, standards, pavement markings will be used in lieu of signs. b. Informational and interpretive signing shall be constructed as necessary to facilitate use of sites.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	N		
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service.	N		
Facilities: When new facilities are constructed and when existing facilities are substantially reconstructed, provisions shall be made for use by the physically handicapped.	N		
Facilities: Vegetation shall be established on substantial areas of disturbed ground within one year of completion of construction or other ground disturbing activities.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Suppress pest outbreaks with a minimum of disturbance to protect developments and/or users. Favor biological and silvicultural treatments where possible.	N		
Protection: Utilize integrated Pest Management strategies to prevent unacceptable losses. Monitor trees in developed sites for hazard to facilities and users. Remove hazard trees.	N		

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: Provide a high level of fire prevention activities consisting of public contact through the use of media, including the use of low watt AM radio stations providing information emphasizing fire prevention as a part of the overall message. High visibility prevention activities include signing and personal public contact at all campgrounds and dispersed recreation areas, rest areas, main road junctions, heavily used public access points, information centers and local businesses.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Prescribed fire may be used to reduce hazardous fuel concentrations at the periphery of the site and to form fuelbreaks adjacent to high use, high fire occurrence areas. Burning will be planned so as to have a minimum impact on use of the recreation opportunities in the area.	N		
Protection: Design hazard reduction activities so that they are compatible with management strategy objectives.	N		
Protection: Slash disposal and other post-sale cleanup activities will be completed in cuffing areas prior to the beginning of the next recreation season. Some slash may be left for firewood for recreational use.	N		
Protection: Conduct prescribed burning in such a manner that It will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Protection: Recreation sites may be used as fire camps. However, fire camp activities shall not cause site damage. Appoint a resource specialist to advise the Incident Commander and/or Logistics Section Chief on the best use of the site.	N		
Special Interest Areas 05 – Not Applicable, Excluded From Table			
Foreground Retention 06			
Recreation - Roaded Natural: Manage the area for Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short term departure from Retention. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	P, C, O, R	P, B, R, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-2

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Design management activities to meet visual quality objective when viewed from travel routes and critical viewpoints.	P	P, B, R, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-2
Recreation - Roaded Natural: Design all projects with assistance of a landscape architect.	P, R	P, R, M, A	EIS Sec. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F POD Att. 1 POD Att. 29 LMP Amendment RRNF-2
Recreation - Roaded Natural: Correct unacceptable form, line, color or texture as a result of management activities either during the operation or within one year after completion of the activity.	P, R	P, B, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-2
Recreation - Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Natural: Provide for dispersed recreation activities such as hunting, fishing, gathering of forest products and scenic driving.	N		
Recreation - Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with visual resource values.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all protect environmental analysis.	P, R	P, B, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-2

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Off-road vehicle use is permitted if evidence of use meets the visual quality objective. When this activity begins to adversely impact the visual qualities of these areas, restrictions will be imposed on off-road vehicle activities. These restrictions may include prohibition on types of equipment used, seasonal closures or total closures.	N		
Recreation - Roaded Natural: View shed plans will be prepared to provide project level direction for implementing the Forest Plan.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere Document results of the investigation/ inventory in the protect environmental analysts Inventory of non-project areas will be guarded by the Forest's cultural resource Inventory strategy.	N		
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse Impacts to sign& cant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	P, C, O	P, B, R	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. 26
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under an intensive recreation management strategy.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	N		
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size / Number 15+ / 179 17+ / 36 25+ / 3 Total / 218 Siskiyou and Cascade True Fir Size / Number 15+ / 143 17+ / 11 25+ / 3 Total / 157	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand. Trees selected for retention should maximize use of the stands cull component. If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements. The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time Operational accomplishment will be Included as a monitoring item in the forest plan.	P, C, O, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide hiding and thermal cover Timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet Hiding cover need not be continuous but gaps between screens should not exceed one quarter of a mile A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Range: Livestock grazing will be allowed.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Allow range Improvements that meet Retention Visual Quality Objectives.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range where compatible with Foreground Retention objectives.	N		
Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		
RANGE MANAGEMENT INTENSITY	N		

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements, simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Timber harvest will be scheduled in thus management strategy.	N		
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219.27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Sate preparation - chemical, mechanical, biological and manual; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual: f. Precommercial thinning; g. Commercial thinning, h. Salvage mortality as necessary, i. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		
Timber: The selection of the appropriate silvicultural system will be guarded by the following criteria: a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives.	N		
Timber: Utilize uneven-aged management if specific site and vegetation characteristics lend the area to this type of management.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Manage the area for an overall mix of size classes of trees for visual as well as biological diversity. The following mix of size class types can be used as a guideline. The specific distribution will be determined in a project implementation plan. Size Class — % of Land Area 30”-36” — 30 22”-30” — 30 16”-22” — 15 9”-16” — 15 0”-9” — 10	N		
Timber: Emphasize the viewing of large diameter Douglas-fir, ponderosa pine, sugarpine or Shasta fir species. Emphasize other species where appropriate. Plan for dispersal of target trees to give the overall Character of large trees to the whole area.	N		
Timber: Design “created openings” to meet the visual quality objective. The size of a created opening could vary from less than l/4 acre in the immediate foreground (generally within 200 feet of a travel route) to 3 acres in the distant foreground. The size of created openings adjacent to trails generally will be much less than this.	N		
Timber: The timber harvested area will no longer be considered a created opening for visual purposes when trees are 20 feet in height.	N		
Timber: Provide a variety of views into the forest and the adjacent landscape. Provide irregular shaped openings to create the overall impression of an undisturbed landscape. Emphasize a mix of deciduous shrub and ground cover species such as dogwood or vine maple.	N		
Timber: As a guideline, no more than 3.3 percent of the viewed area per decade, or 6.6 percent at any one time, will be in a created opening condition.	N		
Timber: Permit created openings along a route of not more than 600 ft. per mile and not more than 300 feet continuously.	N		
Timber: Utilize irregular spacing when thinning.	N		
Timber: Create irregular patterns with plantings with a blend of tree species, approximating natural stands In seed collections no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Emphasize a high edge per acre ratio on all even-aged units.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: Stumps visible from and within 200 feet of critical travel routes or viewpoints will be a maximum height of 12 inches on the high side of the stump.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the District Ranger and Landscape Architect.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended stocking will be addressed with sate specific silvicultural prescriptions.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists and landscape architect Review for feasibility, silviculture compatibility and economics.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
UTILIZATION STANDARDS	N		

Type Tree	Minimum dbh.	Minimum Top dib
First Decade Existing mature trees, except lodge-pole pine (first and future decades)	9	6
Existing commercial thinning size trees and lodgepole pine	7	4
Future Decades All species, except surviving stands of first decade existing mature	7	4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Sec. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, B, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Manage existing aggregate sources in compliance with approved Rock Resource Development Plan and an environmental analysis.	N		
Minerals: Rehabilitate aggregate source sites to meet Retention Visual Quality Objective.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result in detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment RRNF-6

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5..1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Facilities: The Access Management Objectives Process, as described in Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: The road system necessary for management of this area will be planned and constructed to minimize the number of intersections with the State Highway, County Road, or Forest Arterial Road along which the scenic management corridor is located. Where possible, local road access for logging will be from the “back side” using spurs from road systems parallel to the Highway.	N		
Facilities: Landscape architect and traffic engineering input will be required for design and operation of intersections of Forest roads with the Highway.	N		
Facilities: Where it is necessary to close a Forest route intersecting the Highway on a seasonal or intermittent basis, the closure shall be designed to achieve the visual qualify objective as viewed from the Highway.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service. Vegetation shall be reestablished within one year.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Facilities: Power lines and other utilities shall be constructed, operated, and maintained to achieve the visual quality objective as viewed from the Highway.	P, C, R, O	P, B, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Sec. 4.1.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD At. 19 LMP Amendment RRNF-4
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	N		
Protection: Utilize integrated Pest Management strategies to prevent unacceptable damage in visual corridors. Manual, mechanical end cultural methods are emphasized.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Provide a high level of fire prevention activities consisting of public contact through the use of media, including the use of low watt AM radio stations providing information emphasizing fire prevention is a part of the overall message. High visibility prevention activities include signing and personal public contact et all campgrounds and dispersed recreation areas, rest areas, main road junctions, heavily used public access points, information centers and local businesses.	N		
Protection: Prescription fire is not generally compatible with this management area.	N		
Protection: Treat activity fuels to a level which meets protection standards end resource objectives in a cost-efficient manner.	N		
Protection: Hazard reduction activities will be compatible with management are objectives.	N		
Protection: Design fuelbreaks to meet the natural characteristics of the area.	N		
Protection: Integrate fuelbreak construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Foreground Partial Retention 07			
Recreation – Roaded Natural: Manage the area for Partial Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short-term departure from Partial Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	P, C, O, R	P, B, R, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec.3.4.1.31 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-3
Recreation – Roaded Natural: Design management activities to meet visual quality objective when viewed from travel routes and critical viewpoints.	P	P, B, R, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec.3.4.1.31 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD At. 19 LMP Amendment RRNF-3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation – Roaded Natural: Design projects having high visual impacts with assistance of a landscape architect.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F POD Att. 1 POD Att. 29
Recreation – Roaded Natural: Correct unacceptable form, fine, color or texture as a result of management activities either during the operation or within two years after completion of the activity.	P, R	P, B, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec.3.4.1.31 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-3
Recreation – Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation – Roaded Natural: Provide for dispersed recreation activities such as hunting, fishing gathering of forest products and scenic driving.	N		
Recreation – Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with visual resource values.	N		
Recreation – Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation – Roaded Natural: Off-road vehicle use is permitted if evidence of use meets the visual quality objective. When this activity begins to adversely impact the visual qualities of these areas, restrictions will be imposed on off-road vehicle activities. These restrictions may include prohibition on types of equipment used, seasonal closures or total closures.	N		
Recreation – Roaded Natural: Viewshed plans will be prepared to provide project level direction for implementing the Forest Plan.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed “area of effect” of projects or elsewhere. Document results of the investigation/ inventory in the protect environmental analysts Inventory of non-project areas will be guarded by the Forest’s cultural resource Inventory strategy.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse Impacts to sign& cant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under a foreground partial retention management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.8.1.3 EIS App. F POD Att. 19 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service (PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size / Number 15+ / 179 17+ / 36 25+ / 3 Total / 218 Siskiyou and Cascade True Fir Size / Number 15+ / 143 17+ / 11 25+ / 3 Total / 157	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand Trees selected for retention should maximize use of the stands cull component If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time Operational accomplishment will be Included as a monitoring item in the forest plan.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide hiding and thermal cover. Timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use. Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet Hiding cover need not be continuous but gaps between screens should not exceed one quarter of a mile. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Range: Livestock grazing will be allowed. Grazing may be encouraged to provide added scenic variety.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Allow range improvements that meet partial retention.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range where this is compatible with Foreground Partial Retention objectives.	N		
Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		
RANGE MANAGEMENT INTENSITY	N		

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements; simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Timber harvest will be scheduled in thus management strategy.	N		
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219.27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219.27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Sate preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting. Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		
The even-aged silvicultural system will be the most commonly used system in coniferous forests The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives.	N		
Timber: Utilize uneven-aged management if specific site and vegetation characteristics lend the area to this type of management.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Manage the area for an overall mix of size classes of trees. The following mix of size class types should be achieved as the overall long term objective for the viewshed: Size Class — % of Land Area 22”-30” — 43 16”-22” — 21 9”-16” — 22 0”-9” — 14	N		
Timber: Emphasize the viewing of large diameter Douglas-fir, ponderosa pine, sugar pine or Shasta fir. Emphasize other species where appropriate. Plan for dispersal of target trees to give the overall character of large trees to the whole area.	N		
Timber: Design “created openings” to meet visual quality objective. The normal maximum size of “created openings” is 5 acres along roads and 3 acres along trails. Unit size applies to all even-aged regeneration units. Exceptions can be designed through the environmental analysis process.	N		
Timber: The timber harvested area will no longer be considered a created opening for visual purposes when trees are 20 feet in height.	N		
Timber: Provide a variety of views into the forest and the adjacent landscape.	N		
Timber: Provide irregular shaped openings to create the overall impression of an undisturbed landscape.	N		
Timber: Created openings will be no more than 4.8 percent of the viewed area per decade with a maximum of 9.6 percent at any one time.	N		
Timber: Permit created openings along a route of not more than 800 ft. per mile and not more than 450 ft. continuously.	N		
Timber: Emphasize a mix of deciduous shrub and ground cover species such as dogwood or vine maple.	N		
Timber: Utilize irregular spacing when thinning.	N		
Timber: Create irregular patterns with plantings with a blend of tree species, approximating natural stands In seed collections no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Emphasize a high edge per acre ratio on all even-aged units.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the District Ranger and Landscape Architect.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended stocking will be addressed with sate specific silvicultural prescriptions.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists and landscape architect Review for feasibility, silviculture compatibility and economics.	N		
Timber: All silvicultural prescriptions and logging plans will be reviewed by a landscape architect for feasibility silvicultural compatibility and the ability to meet the foreground partial retention Visual Qualify Objective.	P	P, B, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 3.4.1.31 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 1 POD Att. 20 LMP Amendment RRNF-3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		
UTILIZATION STANDARDS	N		

Type Tree	Minimum dbh	Minimum Top dib.
First Decade Existing mature trees, except lodge-pole pine (first and future decades)	9	6
Existing commercial thinning size trees and lodgepole pine	7	4
Future Decades All species, except surviving stands of first decade existing mature	7	4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Rehabilitate aggregate source sites to meet Partial Retention Visual Quality Objectives.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sites toward use of sites in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	N		
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, C, R	P, B, R, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5..1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: The road system necessary for management of this area will be planned and constructed to minimize the number of intersections with the State Highway, County Road, or Forest Arterial Road along which the scenic management corridor is located. Where possible, local road access for logging will be from the “back side” using spurs from road systems parallel to the highway.	N		
Facilities: Landscape architect and traffic engineering input will be required for design and operation of intersections of Forest roads with the Highway.	N		
Facilities: Where it is necessary to close a Forest route intersecting the Highway on a seasonal or intermittent basis, the closure shall be designed to achieve the visual quality objective as viewed from the Highway.	N		
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P, R	EIS Sec. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Facilities: Power lines and other utilities shall be constructed, operated, and maintained to achieve the visual quality objective as viewed from the Highway.	P, C, R, O	P, B, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Sec. 4.1.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD At. 19 LMP Amendment RRNF-3
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	N		
Protection: Utilize integrated Pest Management strategies to prevent unacceptable damage in visual corridors. Manual, mechanical end cultural methods are emphasized.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Use prescription fire to obtain the dewed ecological characteristics of the area.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives In a cost-effluent manner.	N		
Protection: Hazard reduction activities will be compatible with management area objectives.	N		
Protection: Design fuel breaks to meet the natural characteristics of the area.	N		
Protection: Integrate fuel break construction with vegetation management projects.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Middleground Retention 08 – Not Applicable, Excluded From Table			
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Middleground Partial Retention 09			
Recreation – Roaded Natural: Manage the area for Partial Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short term departure from partial retention. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	P, C, R, O	P, B, R, A	EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 19 LMP Amendment RRNF-4
Recreation - Roaded Natural: Design recreation developments to meet Partial Retention Visual Quality Objectives when viewed from travel routes and critical viewpoints.	N		
Recreation - Roaded Natural: Design projects having high visual impacts with assistance of a landscape architect.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F POD Att. 1 POD Att. 29
Recreation - Roaded Natural: Provide for dispersed recreation activities such as hunting, fishing, gathering of forest products and scenic driving.	N		
Recreation - Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with visual resource values.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	P	P, A	EIS Sec. 2.1.3.6 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 19 LMP Amendment RRNF-4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Viewshed plans will be prepared to provide project level direction for implementing the Forest Plan.	N		
Recreation - Roaded Natural: Investigate area to Inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigational inventory in the project environmental analysts Inventory of non-project areas will be guided by the Forest's cultural Inventory strategy.	P	P	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. 26
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	P, C, R, O	P, B	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. 26
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	P	P	EIS Sec. 4.11.3.3
Recreation - Roaded Natural: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	P, C, R, O	P, B, R	EIS Sec. 3.4.3 EIS Sec. 4.11.3.3 EIS Sec. 4.11.4 POD Att. 26
Recreation - Roaded Natural: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	P, C, O	P, B, R	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. 26
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	P	P	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Sec. 4.11.3.3 EIS Sec. 4.11.5

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Off-road vehicle recreation use on roads, trails or areas is permissible, if not in conflict with strategy goals and objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Sec. 4.3.2.1 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. 9 POD Att.19 POD Att. 25
Wilderness: This element is not applicable under a middleground partial retention management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.8.1.3 EIS App. F POD Att. 19 POD Att. 29
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Biological evaluations (FSM 2672 4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size / Number 15+ / 179 17+ / 36 25+ / 3 Total / 218 Siskiyou and Cascade True Fir Size / Number 15+ / 143 17+ / 11 25+ / 3 Total / 157	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand Trees selected for retention should maximize use of the stands cull component If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time Operational accomplishment will be Included as a monitoring item in the forest plan.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide forage, hiding and thermal cover at or above 20 percent level In addition, where consistent with the goal statement of this strategy, maintain 40 percent of each 500-l,000-acre area of non-critical deer and elk wintering area in a condition to provide for thermal cover Timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet Hiding cover need not be continuous but gaps between screens should not exceed one-quarter of a mile A restricted operating period from April 1 to June 30 may be Imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Permit livestock grazing on transitory ranges under the following situations: a. Where forage occurs in natural stands or as a result of site disturbance and/or timber canopy removal on a periodic basis. b. Where disturbed sites and/or areas under timber management can be seeded with species which improve forage production and does not restrict tree establishment and growth. (FSM 2521.02, RR Supplement #6, 2173) c. On forest plantations when livestock will not damage the young trees.	N		
Range: Permit livestock grazing on primary and secondary range.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Allow range improvements.	N		
Range: Allow increases In permitted grazing use to capture increases in transitory range where this is compatible with Middleground Partial Retention objectives.	N		
Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
RANGE MANAGEMENT INTENSITY	N		

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements, simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Timber harvest will be scheduled.	N		
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219 27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Site preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual and prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		
Timber: Provide a mosaic of vegetative textures with natural shaped openings that are evident but are not dominant.	N		
Timber: The normal maximum size of “created openings” is 15 acres. Unit size applies to all even-aged regression units. Exceptions can be designed through the environmental analysis process.	N		
Timber: Created openings will be separated by areas generally not classed as created openings. The areas between created openings shall contain one or more logical harvest units. These areas shall be large enough and contain a stand structure to meet resource requirements of the management area. The total area of created openings contiguous to 30 acre or larger natural openings should normally be limited to an area not exceeding l/3 the size of the natural opening and not occupying more than l/3 of the natural opening perimeter. Openings should not be created adjacent to any natural openings unless adequate vegetation along the edge can be developed or retained in sufficient density to protect values and visual management objectives. The determination of adequate vegetation will be made by an appropriate interdisciplinary team.	N		
Timber: The timber harvested area will no longer be considered a created opening for visual purposes when trees are 20 feet in height and free to grow.	N		
Timber: Provide a minimum of 600 feet between created openings.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Created openings will be no more than 7 percent of the viewed area per decade with a maximum of 14 percent at any one time.	N		
Timber: Emphasize a high edge per-acre ratio on all even-aged units.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the Distinct Ranger.	Yes? P, R	P, B, M	EIS Secs. 1.5.2.1 & 1.5.2.2 EIS Sec. 2.4.2.1 EIS Sec. 2.1.4 EIS App. F POD Att. 9 POD Att. 20 POD Att. 29
Timber: The logging system design for umber sales will be reviewed by logging systems specialists designated by the Forest Supervisor Review for feasibility, silvicultural compatibility and economics.	N		
Timber: The even-aged silvicultural system will be the most commonly used system m coniferous forests. The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven-aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives Identified for this management area.	N		
Timber: Strive for reasonably balanced acreage in each age class to obtain diversity in each locator area.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended (full) stocking will be addressed with site-specific silvicultural prescriptions.	N		
Timber: Set harvest treatment priorities by cut categories on each District so that the stands most needing treatment are done first, wherever reasonably possible.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Maintain a blend of tree species approximating natural stands In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: All silvicultural prescriptions and logging plans will be reviewed by a landscape architect for feasibility, silvicultural compatibility and the ability to meet middleground partial/ retention Visual Quality Objective.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
UTILIZATION STANDARDS	N		

Type Tree	Minimum dbh.	Minimum Top dib
First Decade Existing mature trees, except lodge-pole pine (first and future decades)	9	6
Existing commercial thinning size trees and lodgepole pine	7	4
Future Decades All species, except surviving stands of first decade existing mature	7	4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted; b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards; e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected; f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards; g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Rehabilitate aggregate source sites to meet Retention Visual Quality Objective.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	N		
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment RRNF-6
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trail Design Elements, b. Road and Trail Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	P	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.6.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Facilities: Road clearing and excavation shall be designed to fit the natural patterns of form, line and texture of the landscape and meet the visual quality objective.	P	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 20 POD Att. 25
Facilities: New helispots, rock pits, and borrow areas will meet the visual quality objective.	N		
Facilities: Existing roads and facilities that do not meet the visual quality objective shall be identified. Long term plans shall be implemented to rehabilitate these facilities.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management b. Temporary roads will be planned, located, surveyed, designed, constructed, and operated utilizing the same procedures for renewing, decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 - 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 EIS Sec. 4.2.3.1 EIS Sec. 4.3.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	P	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 9 POD Att. 14 POD Att. 24
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	P, C, O, R	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 9 POD Att. 14 POD Att. 24
Protection: Utilize integrated Pest Management strategies to prevent unacceptable damage in visual corridors. Manual, mechanical end cultural methods are emphasized.	P, C, O, R	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.8.2.3 POD Att. 9 POD Att. 14 POD Att. 24
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Use prescription fire to obtain the desired ecological characteristics of the area.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Secs. 4.1.3.5 EIS Sec. 4.5.2.3 EIS App. J POD Att. 11 POD Att. 18
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18
Protection: Design fuel breaks to meet the natural characteristics of the area.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Protection: Integrate fuel break construction with vegetation management projects.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	P, C, R, O	P, B	EIS Sec. 1.5.1.8 EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. H EIS App. J POD Att. 9 POD Att. 18

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Wild River 10 – Not Applicable, Excluded From Table			
Scenic River – Not Applicable, Excluded From Table			
Botanical Area 12 – Not Applicable, Excluded From Table			
Wilderness 13 – Not Applicable, Excluded From Table			
Big Game Winter Range 14			
Recreation - Roaded Modified: Manage the area for Modification Visual Qualify Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation - Roaded Modified: Allow for dispersed recreation activities such as hunting, fishing and the gathering of forest products	N		
Recreation - Roaded Modified: Manage trails, motorized and nonmotorized recreation use, dispersed occupancy sites and activities to minimize conflict with wildlife management activities and winter range values.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.8.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 19 POD Att. 25
Recreation - Roaded Modified: Allow off-road vehicle use only on designated roads and trails when it will not conflict with big game winter range values.	N		
Recreation - Roaded Modified: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes In all project environmental analysts.	N		
Recreation - Roaded Modified: Control vehicle access in big game winter range as needed between November 1 and April 30 to prevent biological stress.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.8.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 19 POD Att. 25
Recreation - Roaded Modified: Rehabilitate deteriorated recreation use areas.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Modified: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed features is addressed in an environmental analysis The environmental analysis shall propose alternative management practices and mitigation measures where appropriate	N		
Recreation - Roaded Modified: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed “area of effect” of projects or elsewhere. Document results of the investigation/ inventory in the protect environmental analysts Inventory of non-project areas will be guarded by the Forest’s cultural resource Inventory strategy.	N		
Recreation - Roaded Modified: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Modified: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Modified: Mitigate potential adverse Impacts to sign& cant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Modified: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Modified: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Modified: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Modified: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under a big game winter range management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Manage big game winter range habitat to provide a minimum of 50 percent thermal cover on each 500 to 1000 acres analysis area. At least two-thirds of the thermal cover (30 percent of the analysis area) should meet optimal thermal cover requirements.	P, C, R, O		EIS Sec. 3.4.2.13 EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Provide a minimum of 20 percent of each analysis area as forage area by maintaining or improving forage conditions with emphasis on increasing the variety and quality of plants available for forage and a mixture of age classes of shrubs.	P, R	P	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Where foraging areas are created, the units will be irregular in shape and designed so that any point in the unit is no more than 600 feet from cover. Hiding/thermal cover will be maintained immediately adjacent to the foraging site. If more than one unit is treated in a single year, the units should be at least 600 feet apart. As an opening is reestablished with trees and qualifies as cover, adjacent areas can be harvested to maintain forage producing areas.	P, R	P	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Forage improvement activities will be coordinated with State Fish and Game Departments.	P, R	P	EIS Sec. 1.5.4.4 EIS Secs. 4.6.1.2 & 4.6.1.3 .
Wildlife, Fish and Plants: Because winter range habitat is used year round by elk and deer, a restricted operating period from April 1 to June 30 may be imposed in identified fawning or calving areas.	P, C, O	P	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Allow wildlife habitat improvement projects	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. F POD Att. 19 POD Att. 29
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size / Number 15+ / 179 17+ / 36 25+ / 3 Total / 218 Siskiyou and Cascade True Fir Size / Number 15+ / 143 17+ / 11 25+ / 3 Total / 157	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand Trees selected for retention should maximize use of the stands cull component If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time.	P, C, O, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Range: Permit livestock grazing as long as sufficient forage is left for wildlife during the winter season.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Design range improvements complimentary to elk winter range management.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range caused by timber cutting compatible with winter range management objectives.	N		
Range: Prescribe kind and amount of grass and browse seeding in silviculture prescriptions.	N		
Range: Permit grazing on disturbed sites and/or areas under timber management which can be seeded with species to improve forage production and does not restrict tree establishment and growth. (FSM 2521.02, RR Supplement #6, 2/73).	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		
RANGE MANAGEMENT INTENSITY	N		

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements, simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Timber: Timber harvest will be scheduled.	N		
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219 27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Site preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual and prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Opening size and stocking levels need to be restricted on the sensitive land types shown in the following table.	N		

LANDTYPE	ENVIRONMENTAL ZONE	SLOPE BREAK	LANDTYPE	ENVIRONMENTAL ZONE	SLOPE BREAK
5			236		>65%
9			236H		"
			239		"
409					
54	III	>65%	80	II	>65%
59	II		82	II	
515	II		87	I	>55%
519	II		88	II, III	>65%
542	III		89	I, II	"
543	III	>65%	800	II	"
545	II, III		802	II	"
545	II, III		802	II	"
557	II		804	II	"
560	III		808	II	"
571	II		820	II	"
			822	III	"
61	II		824	III	"
62	III		828	II	"
69	I, II, III		829	II, III	"
609	I, II		843	III	"
619	I, II, III		884	III	"
629	II, III		888	II	"
639	II, III	>30%	892	II	"
689	I, II, III	"	898	II	"
699	II				
			99	II, III	
71	II	>65%	969	II	
705	II	"	979	II	
793	II, III				
795	II				

Timber: Logging unit size for regeneration and vegetation management for sate conversion treatments, normally will not exceed 15 acres and no more than 30 percent of the sensitive area will be treated. Openings and percent of area treated will be distributed relative to the stability characteristics of the landscape. Adjacent lands in sensitive sites can be reentered when (1) minimum stocking for the site reaches 12 feet in height, or (2) 70 percent of ground is covered with trees and brush 12 feet in height. Deviations will be supported with a fully documents environmental analysis. Precommercial stand maintenance and precommercial thinning is not subject to the limitations shown in (1) and (2) above.	N		
Timber: For commercial intermediate treatments, stocking may be reduced to minimum stocking level for the site or 50 percent of existing level, whichever is greater Deviations will be supported with a fully documented environmental analysis.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Opening size limitations for other land types not shown above are as follows. a. Where stand conditions permit, the size of created openings will be between 30 and 60 acres. b. Limit created openings with tree sizes of less than 4 5 feet tall to a maximum of 17 percent of the area Exceptions are permitted when natural catastrophic situations such as fires, windstorms, or Insect and disease attacks occur. c. A harvested area of commercial forest will no longer be considered a created opening for silvicultural purposes when stocking surveys carried out in accordance with Regional instructions indicate prescribed crop tree stocking at or above 4 5 feet in height and free to grow.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended stocking will be addressed with site specific silvicultural perceptions.	N		
Timber: The logging system design for umber sales will be reviewed by logging systems specialists designated by the Forest Supervisor Review for feasibility, silvicultural compatibility and economics.	N		
Timber: The even-aged silvicultural system will be the most commonly used system m coniferous forests. The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven-aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives.	N		
Timber: Set harvest treatment priorities by cut categories on each District so that the stands most needing treatment are done first, wherever reasonably possible.	N		
Timber: Coordinate chemical and fertilizer use with the Oregon Department of Fish and Wildlife and California Department of Fish and Game.	N		
Timber: Design and schedule timber sales to accomplish forage and thermal cover ratio specified under “Wildlife, Fish And Plants” of this management strategy.	N		

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Timber: Create forage units that are irregular in shape and design so that any point is no more than 600 feet from cover. Maintain hiding cover immediately adjacent to the forage site.	N		
Timber: Slash shall be managed to facilitate big game movement and forage production.	N		
Timber: Firewood gathering will be coordinated with winter road closures and season restrictions will apply during the winter and spring. Firewood gathering will be allowed in conjunction with timber management activities or in designated fuelwood gathering areas.	N		
Timber: Maintain a blend of tree species approximating natural stands In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
UTILIZATION STANDARDS	N		

Type Tree	Minimum dbh.	Minimum Top dib
First Decade Existing mature trees, except lodge-pole pine (first and future decades)	9	6
Existing commercial thinning size trees and lodgepole pine	7	4
Future Decades All species, except surviving stands of first decade existing mature	7	4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed, b. Consider relation of protect to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26), c. Locate springs that may be affected and evaluate for appropriate levels of protection. This would usually require consultation with soil, water or geology specialists, d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring play for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged. of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment RRNF-6
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: Between the end of the big game hunting seasons (approximately November 1 and April 30), the following Road Traffic Management Strategies will be utilized to limit the number of roads open to vehicle traffic to approximately l-1/2 miles per square mile of land. a. Encourage or accept use of arterial and collector roads. b. Accept use of local roads necessary for operating active timber sales or for current year spring access for site preparation and reforestation activities. c. Discourage, eliminate or prohibit all other use of local roads. d. Allow off-road vehicle use only on designated roads and trails when It will not conflict with winter range values.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 19 POD Att. 25
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management. b. Temporary roads will be planned, located, surveyed, designed, constructed, and operated utilizing the same procedures for renewing, decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads. c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P	EIS Sec. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Aggressively suppress insects and diseases using the most cost-effective suppression strategies when outbreaks threaten resource management objectives Includes stump treatment for root rots, application of pesticides for defoliators and cone insects, etc., as necessary.	N		
Protection: Practice high intensity prevention activities such as monitoring pest populations to be forewarned of outbreaks, stump removal for root rots, stocking control, species selection for plantings, timely salvage of weather damaged timber, etc.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Maintain natural fuel loadings at a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Hazard reduction activities will be compatible with management area objectives.	N		
Protection: Design fuel breaks to meet the natural characteristics of the area.	N		
Protection: Integrate fuel break construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Old Growth 15 – Not Applicable, Excluded From Table			
Mature Habitat 16 – Not Applicable, Excluded From Table			
Primary Range 17 – Not Applicable, Excluded From Table			
Secondary Range 18 – Not Applicable, Excluded From Table			
Spotted Owl Habitat 19			
Recreation - Semi-Primitive Motorized: Manage the area for Modification Visual Quality Objective.	N		
Recreation - Semi-Primitive Motorized: Allow for dispersed recreation activities such as hunting, hiking and the gathering of forest products.	N		
Recreation - Semi-Primitive Motorized: Manage trails and dispersed occupancy sites in a manner not in conflict with range management activities and forage resource values.	N		
Recreation - Semi-Primitive Motorized: Discourage or prohibit recreation use where public safety is threatened.	N		
Recreation - Semi-Primitive Motorized: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation - Semi-Primitive Motorized: Off-road vehicle recreation use allowed only on designated roads and trails.	N		
Recreation - Semi-Primitive Motorized: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Semi-Primitive Motorized: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed features is addressed in an environmental analysis. The environmental analysis shall propose alternative management practices and mitigation measures where appropriate.	N		
Recreation - Semi-Primitive Motorized: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the project environmental analysis. Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.	N		
Recreation - Semi-Primitive Motorized: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group. If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Semi-Primitive Motorized: Assess the impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Semi-Primitive Motorized: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the property.	N		
Recreation - Semi-Primitive Motorized: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Semi-Primitive Motorized: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Semi-Primitive Motorized: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Semi-Primitive Motorized: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under an spotted owl habitat management strategy.	N		
Wilderness: Project plans will assure that Wilderness boundaries are not violated.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - Amount of suitable habitat - The intent is to insure that breeding pairs in areas designed for spotted owls have sufficient habitat within their home ranges to meet overall life needs for survival and successful reproduction. The amounts of suitable spotted owl habitat at each designated habitat area will vary by physiographic province. The acreages should occur in at least one 300-acre stand of habitat that includes the nest site. Other habitats within 1.5 miles of the nest site should be as contiguous as possible. The following amounts of suitable spotted owl habitat designated per site are: 1,500 acres within 1.5 miles of nest site in the Cascade Mountains and 1,000 acres within 1.5 miles of nest site in the Siskiyou Mountains. Habitat areas may vary from the acreage objective if approved by the Regional Forester. A habitat area may be larger than the acreage objective for a suitable habitat, if it meets at least one of the following two criteria: 1) the area contains more than one breeding pair of spotted owls, and it has been demonstrated that the reproductive rate, on average over time, has exceeded that necessary to replace the breeding adults; and 2) the area is a key link in the network. A key link is defined as a spotted owl habitat area which, if not designated, would result in a separation of the network contrary to spacing guidelines. Key links should be larger than the spotted owl habitat area acreage objective, especially where the local landscape contains little spotted owl habitat in lands unsuitable for timber production or in reserved lands, and where the general forest landscape is heavily fragmented. Designated spotted owl habitat areas may contain less than the acreage objective for habitat where: 1) Breeding success within the previous two years has been documented and the amount and quality of spotted owl habitat has not declined significantly within the pair's home range during the previous two years; 2) The habitat area is necessary to meet spacing requirements and less than the suitable habitat acreage objective exists; 3) In addition, if acreage of suitable habitat is less than 1,000 acres and meets one of the above criteria, potential habitat that will bring the total existing and potential habitat to 1,000 acres shall be added.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - Spacing of designated habitat areas - The intent is to insure that reproductive individuals are well distributed so they can interact with others in the planning area (the regional population). The ability to interact provides for recolonization of unoccupied habitats, interchange of genetic resources, and resilience of populations to normal fluctuations in births and deaths. Distances between habitat areas within clusters of three or more spotted owl habitat areas shall be not more than 1.5 miles measures edge to edge. Distances between clusters of three or more spotted owl habitat areas or between habitats in land unsuitable for timber production that can support at least three pairs, shall be not more than 12 miles measured edge to edge. Distances between all other habitat areas (cluster, single, or habitat area within land unsuitable for timber that could support at least one pair) shall be not more than six miles measured edge to edge. Distances between spotted owl habitat areas may be extended 20 percent (that is, up to 7.2 miles for singles and 14.4 miles for clusters). This variation applies only where needed to locate a habitat area at a site with higher level of spotted owl occupancy (i.e., contains pair, rather than single bird) than would be otherwise available. Each designated habitat area should link to at least three other areas within the spacing standards. These three other areas can be other designated spotted owl habitat areas, or suitable spotted owl habitat in lands unsuitable for timber production. A cluster is not considered to be three distinct areas for the purpose of this positioning. Spacing standards apply across boundaries of adjacent National Forests. National Forests adjacent to other ownerships having suitable spotted owl habitat that will be maintained over time should provide habitats to help insure distribution across ownership boundaries; and, as far as practicable, coordinate their efforts to identify and designate habitat areas. In this regard, other ownerships include, but are not restricted to, USDI Bureau of Land Management and USDI National Park Service.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish and Plants: Northern Spotted owl - Threatened and Endangered Species - No spotted owl habitat management activity shall adversely affect Federally-listed threatened or endangered species or their habitats.	P, C, R, O	P, B, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish and Plants: Northern Spotted owl - Identification of suitable habitat – The intent is to provide consistency and accuracy in identifying forest stand conditions that constitute suitable habitat for spotted owls. Its principal application will be in inventory, mapping and monitoring to assure that the right kinds of habitat are being designated or counted as appropriate.	P	P	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - Vegetation types - Vegetation types in which spotted owl habitat occurs are: • Spruce/Cedar/Hemlock Forest • Cedar/Hemlock/Douglas-fir • Mixed Conifer Forest • California Mixed Evergreen Forest • Silver fir/Douglas-fir Forest • Red fir Forest • Ponderosa Shrub Forest with – White fir/Grand fir – Fir/Hemlock Forest – Grand fir/Douglas-fir Forest – Douglas-fir Forest	P	P	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Wildlife, Fish and Plants: Northern Spotted owl - Stand structures - The following structural characteristics identify forest stands suitable for spotted owls. These conditions occur at different ages for each vegetation type and location; but, in general, they occur in stands considered to be mature and old-growth: 1) Relatively large diameter of dominant trees in the stand; 2) Multi-layered canopy of trees with a moderate to high canopy closure in overstory, mid-story and understory layers; 3) Large, tall trees with cavities, broken tops, mistletoe, or platforms of branches capable of holding accumulated organic matter suitable for nesting; 4) Dead standing trees and fallen decayed trees to support abundant populations of prey species, especially northern flying squirrel and woodrat; 5) Stands with the above conditions and larger than 60 acres in area.	P	P	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Wildlife, Fish and Plants: Northern Spotted owl - The Forest will specify the inventory and mapping criteria used to identify suitable spotted owl habitat in Forest planning, subject to approval by the Regional Forester.	P	P, B	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Wildlife, Fish and Plants: Northern Spotted owl - Suitable habitat (vegetation types and structural or developmental stages) shall be identified in the Forest Plan for inventory, mapping and monitoring purposes in accordance with the general description above.	P	P	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - The intent in locating designated habitat areas is to designate spotted owl habitat areas without unnecessary restrictions of other uses of the forest, to the extent possible while meeting the management requirement for spotted owl population viability. The criteria for locating designated habitat areas is as follows: 1) Map spotted owl habitat in the following land use designations: lands withdrawn by Chief's authority or higher, other lands unsuitable for timber production, lands suitable for timber production with reduced yields and lands suitable for timber production with full yields; 2) Map the known locations of spotted owls and show locations of breeding pairs, pairs with verified non-breeding status or breeding status unknown, and other spotted owl sighting; 3) Identify areas in land unsuitable for timber production that have at least the specified acres of habitat within 1.5 miles from a central point in Oregon, and 2.1 miles from a central point in Washington; 4) Access the distribution of habitat relative to spacing standards to determine if additional spotted owl habitat areas need to be designated. If designation is necessary, use mapped owl locations as the priorities for selecting spotted owl habitat areas in lands suitable for timber production; 5) Designate spotted owl habitat areas on lands suitable for timber production if needed to meet the spacing standard. If a verified breeding pair is located closer than six miles from the edge of lands unsuitable for timber production, that areas can be designated if there are no verified breeding pairs within the adjacent lands unsuitable for timber production. The preference is to provide spotted owl habitat areas in a cluster arrangement. Use reduced yield lands before full yield lands where compatible with other criteria; 6) Use the following priorities in designating spotted owl habitat area on lands suitable for timber production (listed in decreasing order of priority): Verified occupancy by breeding pairs within the last five years. If verification is not based on data from the current year, the site should meet, or approximately meet, Regional standards for habitat amounts and characteristics, remained stable since the year of verification. Verified occupancy by breeding pairs more than five years ago. If verification is not based on data from the current year, the site should meet Regional standards for habitat amounts and characteristics, or the habitat amounts and characteristics must have remained stable since the year of verification. Verified occupancy by pairs; verified non-breeding, or breeding status or success unknown. If verification is not based on data from the current year, the site should meet or approximately meet Regional standards for habitat amounts and characteristics, or the habitat amounts and characteristics must have remained stable since the year of verification. Presence of spotted owls; pair status unknown. Areas with an appropriate amount of suitable owl habitat, within the radius prescribed, where the presence or absence of owls is unknown. An appropriate amount of habitat is that specified in Standard and Guideline 1. Amount of Suitable Habitat in Designated Areas.	P	P	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Wildlife, Fish and Plants: Northern Spotted owl - Implementation of these standards and guidelines shall be achieved in a cost-effective manner. Their application will result in designation of spotted owl habitat capable of supporting pairs of spotted owls through time. The Regional Forester will approve National Forest spotted owl habitat networks which result from the application of these standards and guidelines.	C, O	B	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - Develop wildlife and fish projects that take advantage of the unique characteristics of spotted owl habitat.	P, R	P, B, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 7 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Sec. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. J EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk - Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of an active nest.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk - Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk - Goshawk nests will be protected within a 25-acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Cavity nesting habitat will be allowed to occur at natural levels on coniferous forest lands. This should provide for 100 percent of the potential population level for cavity nesting species. This may require leaving green trees standing as well, in order to maintain the snags through the rotation. Soft snags will not be removed except for protection or human safety. Snags should be uniformly distributed insofar as practical. Land areas containing activities which impact amounts of large woody material (LWM) on the site shall have LWM management prescription(s). The prescription will not only be site specific but will also consider maintenance of LWM in perpetuity. At a minimum, a 'moderate" amount of LWM will be left after project completion. The moderate range is 10 to 20 pieces of Class I and II logs per acre and all existing Class III, IV and V logs, except for incidental amounts removed during management activities.	P, C, O	P, B, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L
Wildlife, Fish and Plants: Resident Trout and Steelhead – Water quality law establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to fully utilize potential smolt production capability of Forest anadromous streams and resident fish in other streams and lakes. Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives. Natural debris, plus trees needed for a future supply, will be maintained and managed to: 1) enhance stream channel and bank structure so as to protect water quality; and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. L POD Att. 29
Deer and Elk - Maintain summer range to provide forage, hiding and thermal cover. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Evaluate the effects of proposed projects on wildlife habitat in all environmental analysis. Discuss pertinent components of the habitat such as edge, migration routes, vegetation diversity and microclimate. Specify mitigation measures when the area is disturbed.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. F EIS App. H EIS App. J POD Att. 29
Range: Livestock grazing is permitted at levels which maintain the desired spotted owl habitat characteristics and species composition of the understory. Forage utilization will be limited to that not needed to maintain indigenous plant species. Exotic plants cannot be introduced.	N		
Range: Salt blocks or water developments are allowed if livestock use does not change the plant composition.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns. Where conflicts cannot be resolved or mitigated, relocation and/or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented in FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Allow range improvements.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range caused by timber cutting where this is compatible with the suitable owl habitat management objectives.	N		
Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock. Utilization for grass and grasslike species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) is:	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
RANGE MANAGEMENT INTENSITY	N		

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements; simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: There will not be any scheduled volume from these areas.	N		
Timber: Timber harvest can only take place if it benefits the spotted owl habitat. The exception will be that timber harvest will be allowed in catastrophic situations such as salvage of fire or insect damage and to prevent the spread of insects and disease to areas managed for other purposes providing the owl habitat needs are not compromised or to meet the management area objectives. Salvage operations will require a project environmental analysis and be designed to minimize impact on resources. Restoration of such an area will be designed to return it to a natural state.	N		
Timber: In the event of a need for access for salvaging timber from catastrophes, nonground based systems, such as helicopter, are preferred.	N		
Timber: Firewood gathering and cutting compatible with objectives of the area will be permitted.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturist and reviewed by the District Ranger.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists designated by the Forest Supervisor. Review for feasibility, silvicultural compatibility and economics.	N		
Timber: Maintain a blend of tree species approximating natural stands. In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone. In addition, no family of parent trees shall represent greater than 20 percent of a seed lot. Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, I needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Prohibit development of aggregate rock sources.	N		
Minerals: Prohibit expansion of existing aggregate sources.	N		
Minerals: Rehabilitate aggregate sources as they are closed.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to: protect riparian and fishery values; meet State water quality standards; and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing sites b. Develop new sates identified in the Forest-wade Electronic Site Plan	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.3.2.2 POD Att. 4
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment RRNF-6
Soils: No more than 10 percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	P	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.6.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service. Vegetation shall be reestablished within one year.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	P	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 9 POD Att. 14 POD Att. 24
Protection: Provide a low level of prevention activities limited primarily to public contact through patrol and fire prevention signing at campgrounds, rest areas, main access road junctions and information centers.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Use prescription fire to obtain desired ecological characteristics of the area.	P, C, R, O	P, B	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Sec. 4.1.3.5 EIS Sec. 4.5.2.3 EIS App. J POD Att. 11 POD Att. 18
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	P, C, R, O	P, B	EIS Sec. 1.5.1.8 EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. H EIS App. J POD Att. 9 POD Att. 18
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Timber Suitable 1 20			
Recreation – Roaded Modified: Manage the area for Modification Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation – Roaded Modified: Allow for dispersed recreation activities such as hunting, fishing and the gathering of forest products.	N		
Recreation – Roaded Modified: Manage trails and dispersed occupancy sites in a manner not in conflict with timber management activities and timber resource values.	N		
Recreation – Roaded Modified: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes In all project environmental analysis.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation – Roaded Modified: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed features is addressed in an environmental analysis. The environmental analysis shall propose alternative management practices and mitigation measures where appropriate.	N		
Recreation – Roaded Modified: Rehabilitate deteriorated recreation use areas.	N		
Recreation – Roaded Modified: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the project environmental analysis. Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.	N		
Recreation – Roaded Modified: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation – Roaded Modified: Assess the impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation – Roaded Modified: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the property.	N		
Recreation – Roaded Modified: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation – Roaded Modified: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation – Roaded Modified: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation – Roaded Modified: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Recreation – Roaded Modified: Off-road vehicle recreation use is permitted when not in conflict with timber management or other resource objectives.	N		
Wilderness: This element is not applicable under a timber management strategy.	N		
Wilderness: Project plans will assure that Wilderness boundaries are not violated.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	N		
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service (PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670 31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Northern Spotted Owl – Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, M, A	EIS Secs. 1.5.1.1 & 1.5.2.1 EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. H EIS App. L POD Att. 29 LMP Amendment RRNF-7
Wildlife, Fish and Plants: Osprey – Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 40 percent of the potential population levels for cavity nesting species. The distribution of numbers and size class necessary to meet 40 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size / Number 15+ / 119 17+ / 24 25+ / 2 Total / 145 Siskiyou and Cascade True Fir Size / Number 15+ / 95 17+ / 7 25+ / 2 Total / 104	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand. Trees selected for retention should maximize use of the stand's cull component. If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class. (i.e. if 25" trees are not available go to 17" trees). Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements. The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs, except for incidental amounts removed during management activities. Additional green merchantable trees will not be designated unless none of the other categories exist. The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true fir working groups the life span is 20 years. The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated. Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand. Information for the prescription will be provided by a wildlife biologist based on site by site needs. A certified silviculturist will validate the data and include it in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements. The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres including adjacent existing harvest units. The objective is to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where current standards were not met. Where past timber harvest activities created clearcuts, the acreage within a 900 foot "edge" adjacent to an uncut timber stand will be used to compute the number of wildlife trees needed to bring this common boundary "edge', area up to a minimum 20 percent potential population level for cavity nesting species. Excess cull trees and snags in the adjacent uncut stand, (being managed at the 40 percent level), if available, can be applied to the number of wildlife trees needed in the "edge" area. If no culls or snags are available, green merchantable trees may be marked and managed for wildlife tree needs in this uncut area.	P, C, O, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) On existing large shelterwood areas it is assumed that natural mortality will occur to meet the 20 percent potential population levels needed as a minimum, however, if there are excess cull trees and snags in adjacent stands, they can be used to bring the biological potential up to 40 percent. The minimum 20 percent biological potential level will not be met for two or more decades on the area beyond the 900 foot "edge", on existing clearcut areas. By that time natural mortality will begin to occur in the new stands and sufficient trees will be managed for wildlife needs.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App.F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands. Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until 5-10 years after project completion (sale closure), in order to capture any mortality that may occur during that time. Adequacy of wildlife tree levels will be monitored as a part of the Forest Plan.	P, C, R, O	P, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide 20 percent forage, and at least 20 percent thermal cover for an area generally 500 to 1,000 acres. To the extent possible, timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use. Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet. Hiding cover need not be continuous but gaps between screens should not exceed one-quarter of a mile. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Range: Permit livestock grazing on transitory ranges under the following situations: a. Where forage occurs in natural stands or as a result of site disturbance and/or timber canopy removal on a periodic basis. b. Where disturbed sites and/or areas under timber management can be seeded with species which improve forage production and does not restrict tree establishment and growth. (FSM 2521.02, RR Supplement #6, 2/73). c. On forest plantations when livestock will not damage the young trees.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Develop structural and non-structural range improvements.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range caused by timber cutting where this is compatible with the timber management objectives.	N		
Range: Prescribe kind and amount of vegetative seeding in silviculture prescriptions.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock. Utilization for grass and grasslike species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) is:	N		
RANGE MANAGEMENT INTENSITY Minimum 1/ / Extensive 2/ / Intensive 3/ **Forested Areas** -Satisfactory Condition: 40% / 45% / 50% -Unsatisfactory Condition: 0-30% / 0-35% / 0-40% **Grasslands** -Satisfactory Condition: 50% / 55% / 60% -Unsatisfactory Condition: 0-30% / 0-35% / 0-40% **Shrublands** -Satisfactory Condition: 40% / 45% / 50% -Unsatisfactory Condition: 0-25% / 0-30% / 0-35% 1/ Minimum - Minimum amount of improvements; simple grazing system. 2/ Extensive - Most or all improvements are non-structural; rotation grazing systems used. 3/ Wide variety of structural and non-structural improvements; rotation grazing systems used.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219 27(c)(l)).	N		
Timber: The landscape will be predominated by a mosaic of even-aged managed timber stands although even and uneven aged management are accepted systems in this strategy. Silvicultural practices employed to accomplish management goals may include the following: a. Site preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual and prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription, k. Pruning.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities if in keeping with the goals and objectives of this management strategy.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists designated by the Forest Supervisor. Content review will be for feasibility, silvicultural compatibility and economics.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: The even-aged silvicultural system will be the most commonly used system in coniferous forests The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives identified for this management area.	N		
Timber: Forest openings created by the application of even-aged silviculture shall be limited to a maximum size of 60 acres in the Douglas-fir forest type and to a maximum size of 40 acres on all other lands of the Forest. Exceptions are permitted in the following cases: a. When natural catastrophic situations such as fires, windstorms, or insect and disease attacks occur. b. On an individual timber sale basis after 60-day, public notice and review by the Regional Forester.	N		
Timber: When any one of the criteria described below is met and will produce a more desirable combination of benefits, the limits may be exceeded by not more than 50 percent without review by the Regional Forester or 60-day public notice. a. When larger created openings will reduce the disturbance to soil, water, fish or riparian resources, or residual vegetation by: (1) allowing economically feasible logging systems that reduce landing and road construction, or (2) locating roads away from unstable soils, and (3) by reducing soil and vegetation disturbance from dragging logs. b. Where groups of dwarf mistletoe or root rot disease infected trees need to be incorporated into the created opening to avoid infection of susceptible conifer reproduction and their inclusion cannot be achieved by centering the created opening over the area of infection. c. Where visual quality objectives require shaping and blending of openings to fit landform. d. Where larger units are needed to achieve silviculture objectives in existing areas of regeneration cutting by the shelterwood method and where destruction of the newly created stand of reproduction would occur as a result of delayed removal of shelter trees. This exception applies only to existing shelterwood units and shelterwood units under contract prior to approval of Forest Plan.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Created openings will be separated by areas generally not classed as created openings. The areas between created openings shall contain one or more logical harvest units. These areas shall be large enough and contain a stand structure to meet resource requirements of the management area. The total area of created openings contiguous to 30-acre or larger natural openings should normally be limited to an area not exceeding 1/3 the size of the natural opening and not occupying more than 1/3 of the natural opening perimeter. When openings are created adjacent to natural openings, they should be designed to retain and manage adequate vegetation along the edge in sufficient density to retain wildlife values and visual management objectives. The determination of adequate vegetation will be made by an appropriate interdisciplinary team.	N		
Timber: A harvested area of commercial forest will no longer be considered a created opening for silvicultural purposes when stocking surveys carried out in accordance with Regional instructions indicate prescribed crop tree stocking at or above 4.5 feet in height and free to grow.	N		
Timber: Strive for a reasonably balanced acreage in each age class (i.e. 20 percent of each 500 to 1,000 acre area in stands 40 feet tall with 70 percent crown closure) to obtain biological diversity and thermal cover.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended (full) stocking will be addressed with site-specific silvicultural prescriptions.	N		
Timber: Set harvest treatment priorities by cut categories on each District so that the stands most needing treatment are done first, wherever reasonably possible.	N		
Timber: Maintain a blend of tree species approximating natural stands In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house-logs, etc., available on an as-needed basis consistent with resource objectives of affected management areas.	N		
Timber: Provide access to potential fuelwood or bring the fuelwood to convenient points in timber sale or thinning areas through the utilization of appropriate timber sale clauses or the modification of fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public should be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to needs of public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood inventory.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		
UTILIZATION STANDARDS	N		

Type Tree	Minimum dbh.	Minimum Top dib
First Decade Existing mature trees, except lodge-pole pine (first and future decades)	9	6
Existing commercial thinning size trees and lodgepole pine	7	4
Future Decades All species, except surviving stands of first decade existing mature	7	4

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, I needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: Allow for watershed restoration projects.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged. of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Use control measures to prohibit livestock access to chemically treated corridors.	N		
Lands: Direct applications for electronic sites toward use of sites in the following order. a. Utilizing residual capacity of existing Sites b. Develop new sites identified in the Forest-wade Electronic Site Plan	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.3.2.2 POD Att. 4
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment RRNF-6
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Aggressively suppress insects and diseases using the most cost-effective suppression strategies when outbreaks threaten resource management objectives Includes stump treatment for root rots, application of pesticides for defoliators and cone insects, etc., as necessary.	N		
Protection: Practice high intensity prevention activities such as monitoring pest populations to be forewarned of outbreaks, stump removal for root rots, stocking control, species selection for plantings, timely salvage of weather damaged timber, etc.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Maintain natural fuel loadings at a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 11 POD Att. 18 POD Att. 29
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Secs. 4.1.3.5 EIS Sec. 4.5.2.3 EIS App. J POD Att. 11 POD Att. 18
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18

TABLE E-6 **Rogue River National Forest Land And Resource Management Plan**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: Design fuel breaks to meet the natural characteristics of the area.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Protection: Integrate fuel break construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Timber Suitable 2 – Not Applicable, Excluded From Table			
Restricted Watershed 22 – Not Applicable, Excluded From Table			
Managed Watershed – Not Applicable, Excluded From Table			
Research Natural Areas – Not Applicable, Excluded From Table			
Restricted Riparian 26			
Recreation - Roaded Natural: Manage the area for Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis. The environmental analysis shall propose alternative management practices and mitigation measures where appropriate.	N		
Recreation - Roaded Natural: Allow for dispersed recreation activities such as dispersed camping, hunting, fishing and the gathering of forest products.	N		
Recreation - Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with fisheries resource values.	N		
Recreation - Roaded Natural: Discourage or prohibit recreation use where public safety is threatened.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Restrict vehicle use to roads and trails except where prohibited.	N		
Recreation - Roaded Natural: Prohibit new developed recreation sites.	N		
Recreation - Roaded Natural: Portions of riparian areas suffering resource damage from recreation use will be rehabilitated and may be closed.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the project environmental analysis. Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.	N		
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist, to determine their potential archaeological, historical or cultural significance. Evaluate cultural resources on a project-specific basis or by thematic/multiresource group. If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the integrity of the resource is maintained. Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management. Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under a riparian strategy.	N		
Wilderness: Project plans will assure that Wilderness boundaries are not violated.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Permit fish projects that enhance the resource values.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Sec. 4.8.1.3 EIS App. F POD Att. 19 POD Att. 29
Wildlife, Fish and Plants: Resident Trout and Steelhead are selected species. The Clean Water Act establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to utilize fully potential smolt production capability of Forest anadromous streams and resident fish in other streams and lakes. Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives. Protect streams and lakes from detrimental changes in water temperature, blockages of water courses and deposits of sediment. Natural debris, plus trees needed for a future supply, will be maintained and managed to 1) enhance stream channel and bank structure so as to protect water quality, and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, B, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. J EIS App. L POD Att. 29
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Biological evaluations (FSM 2672 4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671 4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670 31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219 27(a)(8)).	P, C, R, O	P, B, R, M	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 12 POD Att. 29
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32). Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning. At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R, M	EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD to the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide. In the event that a pair of northern spotted owls are found in an area not identified prior to September 1, 1981, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species; (2) providing insight into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation. If a nesting pair of owls is found during a scheduled timber sale or other activity outside a SOHA, a biological assessment for sensitive species will be made and protective measures will be instituted to protect the nest site until after fledging.	N		
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Goshawk - Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of an active nest.	N		
Wildlife, Fish and Plants: Goshawk - Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist.	N		
Wildlife, Fish and Plants: Goshawk - Goshawk nests will be protected within a 25-acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	N		
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 100 percent of the potential population levels for cavity nesting species. The distribution of numbers and size class necessary to meet 100 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size / Number 15+ / 298 17+ / 60 25+ / 5 Total / 363 Siskiyou and Cascade True Fir Size / Number 15+ / 238 17+ / 18 25+ / 5 Total / 261	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand. Trees selected for retention should maximize use of the stand's cull component. If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e. if 25" trees are not available go to 17" trees). Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements. The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs, except for incidental amounts removed during management activities. Additional green merchantable trees will not be designated unless none of the other categories exist. The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true fir working groups the life span is 20 years. The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated. Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand. Information for the prescription will be provided by a wildlife biologist based on site by site needs. A certified silviculturist will validate the data and include it in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements. The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres including adjacent existing harvest units. The objective is to provide well distributed habitat, and to allow adjacent stands to provide the needed wildlife trees for past harvest units where current standards were not met. Where past harvest units were very large, the adjacent stands within 900 feet will be managed at higher wildlife tree levels to bring the overall area to at least the 40 percent level. When the past harvest units were of such magnitude that the above methods cannot bring the entire area to 40 percent level, the remaining shortage will not be provided for, but will be tracked for the purpose of monitoring the forest plan. Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands. Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time. Operational accomplishment will be included as a monitoring item in the forest plan.	P, C, O, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App .F POD Att. 16 POD Att. 20 POD Att. 29 EIS App. L
Wildlife, Fish and Plants: Deer and Elk - Maintain deer and elk summer range to provide forage, hiding and thermal cover. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.7.1.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L
Range: Livestock grazing will be permitted but will be managed to meet the goal of protecting the productivity of habitat values in riparian areas.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Protecting and enhancing riparian area values will be addressed in each Allotment Management Plan as it is revised and/or updated. Specific objectives will be determined for riparian areas within grazing allotments. A measurable desired future riparian condition will be established based upon existing and potential vegetation conditions. When the current riparian condition is less than that desired, grazing systems and associated structural improvements will be designed and implemented to meet those objectives. Measurable objectives will be set for key parameters such as streambank stability, sedimentation, and vegetation condition. The Allotment Management Plan will describe the monitoring needed to determine if the desired rate of improvement is occurring.	N		
Range: Allotment Management Plans currently not meeting Forest Plan direction will be revised on a priority basis under a schedule established by the Forest Supervisor.	N		
Range: Prohibit salting within the management area.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock. Utilization for grass and grasslike species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) is:	N		
RANGE MANAGEMENT INTENSITY Minimum 1/ / Extensive 2/ / Intensive 3/ **Forested Areas** -Satisfactory Condition: 40% / 45% / 50% -Unsatisfactory Condition: 0-30% / 0-35% / 0-40% **Grasslands** -Satisfactory Condition: 50% / 55% / 60% -Unsatisfactory Condition: 0-30% / 0-35% / 0-40% **Shrublands** -Satisfactory Condition: 40% / 45% / 50% -Unsatisfactory Condition: 0-25% / 0-30% / 0-35% 1/ Minimum - Minimum amount of improvements; simple grazing system. 2/ Extensive - Most or all improvements are non-structural; rotation grazing systems used. 3/ Wide variety of structural and non-structural improvements; rotation grazing systems used.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Timber harvest is not programmed and would normally not occur except for the following situations: to eliminate hazards, removal incidental to construction or maintenance of improvements, minor unavoidable inclusions to logical management units, or in the case of natural catastrophe, when removal of such timber is not detrimental to achieving the goals of the management area.	N		
Timber: Maintain vegetation characteristics needed for fish habitat and water quality protection. a. For areas normally dominated by trees, at least 80 percent of the normal tree crown cover will be retained over the length of the stream in the project area. The 80 percent figure was established to allow cross stream logging where logical. The intent of this is to cause less disturbance to watersheds by eliminating roads. b. An exception can be made for catastrophes. When shading vegetation along a stream is removed and creates an opening, recovery will be considered sufficient when the shade is reestablished. In all cases water temperatures must be maintained at acceptable levels.	N		
Timber: Maintain a blend of tree species approximating natural stands. In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone. In addition, no family of parent trees shall represent greater than 20 percent of a seed lot. Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Fuelwood and other miscellaneous forest products will be available only when consistent with riparian habitat management objectives.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis, Discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4.3.2 & 1.4.3.4 EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and "Attachments A and 8' referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and US Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed, b. Locate springs that may be affected and evaluate for appropriate levels of protection. This would usually require consultation with soil, water or geology specialists, c. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring play for watersheds.	P, R	P, B, R, M, A	EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.2.2.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS App. F EIS App. J POD. Att. 3 POD Att. 9 POD Att. 23 POD Att. 24 POD Att. 28 POD Att. 29 LMP Amendment RRNF-5
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Allow watershed improvement projects. However, those which involve removal of debris from streams will normally be restricted to removal of man-caused debris only.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 POD Att. 9 POD Att. 13 POD Att. 28
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Prohibit development of new, permanent aggregate sources	N		
Minerals: Prohibit expansion of existing aggregate sources.	N		
Minerals: Rehabilitate aggregate sources as they are closed.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to: protect riparian and fishery values; meet State water quality standards; and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received. Analyze any additional corridors with an environmental analysis.	P	P, R	EIS Sec. 1.4.2 EIS Secs. 1.5.1 & 1.5.2 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R, A	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.6 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 41.3.4 POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28 LMP Amendments RRNF-2 to RRNF-7
Lands: Establish and maintain property boundaries.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, M, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 29 LMP Amendment RRNF-6
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5..1 EIS Sec. 2.1.3.6 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 LMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.2.2.2 POD Att. 9

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Design management activities to retain effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Twenty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils. b. Ten percent exposure on high or severe erosion hazard soils. c. Seven percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: Geotechnical input is required for road location, design, and management.	P	P	EIS Sec. 3.4.3 EIS Sec. 4.2.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Facilities: Temporary roads will be planned, located, surveyed, designed, constructed, and operated utilizing the same procedures for renewing, decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Roads may be closed seasonally to prevent resource damage.	P, C, O	P	EIS Sec. 2.4.2.1 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25 POD Att. 29

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Off-Road Vehicles will be restricted to: a. Trails on which the use will neither damage the trail nor the soils. b. Roads closed to highway vehicles on which ORV use will neither damage the road nor the soils.	N		
Facilities: Over snow vehicle use of roads is acceptable when sufficient snow is present to close roads to highway vehicles.	N		
Facilities: Where existing roads or trails are adversely impacting water quality, steps will be taken to mitigate the problem.	P, C, O, R	P, B	EIS Sec. 2.1.4 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F EIS App. J POD Att. 9 POD Att. 25
Facilities: Prohibit pit toilets, vault toilets, sewage disposal of any kind, and waste disposal of any kind within this management area.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 POD Att. 9 POD Att. 23
Facilities: Helispots and transmission corridors should be located outside this management area.	P	P, R, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.6 EIS Sec. 2.3.2.3 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS App. J LMP Amendment RRNF-5
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Permit the use of heavy equipment to construct firelines if it results in less total impact on the environment. A resource advisor should be appointed in all such situations to advise the incident commander on the location and standard of equipment work, and rehabilitation techniques.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Secs. 4.1.3.5 EIS Sec. 4.5.2.3 EIS App. J POD Att. 11 POD Att. 18

TABLE E-6

Rogue River National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18
Protection: Use prescription fire to obtain the desired ecological characteristics of the area.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.2.3 EIS App. H EIS App. J POD Att. 18
Protection: Provide for a protective strip of undisturbed surface between the prescribed burn area and specified water courses, considering local topographic, vegetative and soil characteristics.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. J POD Att. 9 POD Att. 18
Protection: Avoid high intensity prescribed fires on soils that are highly erodible and/or are subject to the development of hydrophobic (non-wettable) conditions.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9 POD Att. 18
Protection: Construction and maintenance of fuel breaks will be permitted provided low impact methods such as hand tools are used.	P, R	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.6 EIS App. F EIS App. H POD Att. 11 POD Att. 29
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	P, C, R, O	P, B	EIS Sec. 1.5.1.8 EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. H EIS App. J POD Att. 9 POD Att. 18

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Air Quality			
Management activities shall be planned to maintain air quality at a level adequate for the protection and use of the national forest resources and to meet or to exceed applicable Federal and State standards and regulations (36 CFR 219.27[a][12]).	P	P	EIS Sec. 1.5.1.8 EIS Sec. 1.5.4.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 2
The Forest shall coordinate with the appropriate air quality regulatory agencies. Prescribed burning operations shall comply with the procedures identified in the Smoke Management Operations Plan (Oregon State Forestry Directive 1-4-1-601).	P, C, O	P, B	EIS Sec. 1.5.4.3 EIS Sec.4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 2 POD Att. 9 POD Att. 18
The Forest shall demonstrate reasonable progress in reducing total suspended particulate (TSP) emissions from prescribed fire.	N		
The best available predictive methods and models and the most cost efficient technology should be used to minimize the impact of prescribed burning on smoke-sensitive areas and designated Federal Class I areas.	P, C, O	P, B	EIS Sec.4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 2 POD Att. 9 POD Att. 18
Three basic strategies may be used to manage prescribed fire smoke: reduction, dilution, and avoidance. The strategy of reduction focuses on reducing the amount of smoke (particulates) produced by increasing the efficiency of burning and reducing the amount of fuel consumed by fire. This may be accomplished by such methods as: 1. Increasing wood utilization standards and the continued use of WM and PUM specifications (yarding or piling unmerchantable material), consistent with the objectives for large woody materia1,'in timber sale contracts. 2. Specifying logging methods that reduce timber breakage and minimize creation of unmerchantable debris (for example, directional felling and tree lining). 3. Selecting fuel moisture parameters that reduce the total consumption of fuel and reduce the smoldering phase of combustion. 4. Selecting ignition (fire-starting) methods and techniques that lower TSP production. 5. Utilizing alternative slash treatment methods, such as chipping or burying, in place of prescribed fire. 6. Requiring, where feasible, prompt and vigorous mop-up (extinguishing remnant traces of fire to prevent its recurrence) 7. Increasing the air supply to slash piles and burn bays (specially created areas along roads for accumulating and treating slash). 8. Changing the merchantability specifications of logs.	P, C, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 9 POD Att. 11 POD Att. 18 POD Att. 20

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Three basic strategies may be used to manage prescribed fire smoke: reduction, dilution, and avoidance. The third strategy, avoidance, may also be used in a Forest smoke management program. This strategy involves the selection of on-site and meteorological conditions that will put the smoke either up and over smoke-sensitive areas or away from these areas. Practices that may be followed include: 1. Burning when wind direction is favorable to avoid smoke-sensitive areas. 2. Selecting a combination of burning prescription parameters to generate an elevated plume that exceeds the ceiling of the smoke-sensitive area and then moves quickly over or away from the area 3. Using the combination of terrain elevation and inversion layers to prevent smoke from settling into sensitive areas.	P, C, O	P, B	EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 18
Public understanding of prescribed fire and smoke management will be most helpful in ensuring that any one of the strategies, or a combination of strategies, is successful. Some measures that may be employed include: 1. Educating the public as to the objectives of prescribed fire use in the local environment, the steps taken to reduce smoke, and how smoke is managed. 2. Informing the public before the ignition of potentially troublesome units	N		
Coordination with other local agencies that also are responsible for maintaining air quality is a key in ensuring a viable air quality maintenance program for the Forest Some measures that may be taken to ensure overall air quality are: 1. Cooperating with local air pollution authorities in monitoring activities that may result in new or modified sources of emissions which may impact Class I areas. 2. Completing review of any air quality studies that are part of new source permits.	N		
Cultural Resources			
The Forest will comply with all applicable legal requirements for management of cultural resources, including the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, the American Indian Religious Freedom Act of 1978, and the Archaeological Resources Protection Act of 1979.	P, C, O	P, B, R	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Sec. 4.11.5 POD Att. 26
The Forest cultural resource overview shall be maintained and updated.	N		
A cultural resource inventory program will be conducted under the supervision of a professional archaeologist on a project-specific level before ground-disturbing activities occur, in compliance with applicable Federal historic preservation legislation. The results of project-level cultural resource inventories shall be documented in a cultural resource report and in the project planning records.	P	P	EIS Sec. 1.5.4.7 EIS Sec. 4.11.2 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
The significance of inventoried sites shall be evaluated by applying the criteria for eligibility to the National Register of Historic Places; qualifying sites ('eligible' cultural resources) should be nominated.	P	P	EIS Sec. 1.5.4.7 EIS Sec. 4.11.1.1 EIS Sec. 4.11.2 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
The effects of all management activities on significant cultural resources shall be considered, and measures shall be developed to avoid or mitigate any adverse effects. Measures shall be developed in consultation with the Oregon State Historic Preservation Officer (SHPO) and, if necessary, the National Advisory Council to protect significant sites from adverse effects due to ground-disturbing project activities	N		
Eligible cultural resources will be considered for protection from degradation due to vandalism, unauthorized public use, and natural deterioration. They should be monitored by means of a recurring inventory to assess whether their condition has been affected by vandalism, unauthorized use, and natural deterioration. Stabilization or rehabilitation may be carried out on significant sites which have been damaged.	N		
Antiquities permits may be issued to qualifying academic institutions or other organizations and individuals for the study and research of cultural resource sites.	N		
Suitable cultural resource properties may be interpreted for the recreational use and educational benefit of the general public. Preferred methods include brochures, signs, displays, interpretative trails, tours, and video or slide programs.	N		
Any long-term management of cultural resources shall be coordinated as necessary with the State Historic Preservation Office, the Klamath Tribe, and other groups or individuals.	P, C, O	P, R	EIS Sec. 1.5.1.5 EIS Sec. 1.5.4.7 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Sec. 4.11.5 POD Att. 26
Cultural resources shall be managed according to the following priorities: Non impactive data collection (including mapping, photo documentation, and reporting) to preserve cultural resources for future scientific study and to guide development of the cultural resource program.	N		
Cultural resources shall be managed according to the following priorities: Encouragement of understanding and ownership of the cultural resource program through public information efforts with special emphasis for members of the Klamath Tribe and local publics.	N		
Cultural resources shall be managed according to the following priorities: Adaptive use of historical structures by considering them for interpretative purposes; for example, administrative sites, residences, and interpretative centers.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Cultural resources shall be managed according to the following priorities: Adherence to a consultation process with the Klamath Tribe, recognizing the tribe's interest in sites related to Its tribal history.	N		
Cultural resources shall be managed according to the following priorities: When cultural resource sites are damaged, controlled data recovery by means of testing, excavating, and analyses will be done in consultation with the Klamath Tribe.	N		
Management of culturally significant, traditional use, and religious sites shall be coordinated with the Klamath Tribe. Information about planned project activities shall be presented to the Klamath Tribe for coordination concerning effects on these sites.	N		
Facilities			
Transportation System: Development and management of the Forest transportation system shall be in accordance with an approved transportation system plan. This plan shall be the official description of the transportation system. The plan consists of a series of base maps showing the location of each facility and an inventory record defining their characteristics.	P, C, O, R	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25 POD Att. 29
Transportation System: Management of the Forest transportation system shall be in accordance with an approved Forest road management plan The purpose of this plan is to determine the proper combination of development, traffic management, and maintenance of the existing road system to meet the management area objectives the best. This plan shall contain specific road management objectives, multiyear development plans, traffic management and maintenance plans, and the road plans of other agencies.	P, C, O	P, B	EIS Sec. 4.10.2.6 POD Att. 25
Transportation System: Temporary roads may be constructed where there is a one-time need for a transportation facility. After the need is fulfilled, the road shall be closed and returned to vegetative production. Temporally roads left from past activities shall be evaluated as they are encountered during project-level analysis	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System: Roads shall be constructed and maintained to the standards and levels necessary to meet the resource management objectives.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System: All roads shall have approved road management objectives contained in the road management plan. These objectives state the intended purpose of the road; the resource objectives sewed; and the selected design, maintenance, and operation criteria that apply to the road.	P	P	EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Transportation System: Road construction, reconstruction, maintenance, and signing shall be in accordance with management area objectives, and should meet recognized engineering standards contained in Forest Service manuals, design handbooks, and other technical guides.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Transportation System: Existing roads not needed for future transportation purposes shall be closed and returned to vegetative productivity.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F POD Att. 25 POD Att. 29
Transportation System: Whenever practical, roads should be located in areas with the lowest erosion potential.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.2.2.1 & 4.2.2.2 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 25
Transportation System: Road construction activities shall be scheduled to minimize soil erosion when heavy rain or heavy surface runoff is most likely to occur.	P, C, O	P	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System: Where existing roads or trails are affecting air and water quality, steps should be taken to mitigate the problem.	C, O	M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. F EIS App. J POD Att. 25 POD Att. 29
Transportation System: Road drainage shall be designed and maintained to minimize road runoff sediment directly into riparian areas	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25
Transportation System: Culverts or bridges shall be of adequate size to accommodate anticipated high stream flows and fish passage.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. F EIS App. J POD Att. 25 POD Att. 28 POD Att. 29
Transportation System: Stream crossings should not change floodplain or stream flow characteristics.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 28 POD Att. 29

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Transportation System: Stream crossing construction shall be scheduled during low stream flow and/or outside spawning periods.	P, C, R, O	P, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Transportation System: Traffic management shall be considered as an alternative to road reconstruction when the existing facility is inadequate for mixed traffic.	N		
Transportation System: All new major transportation and utility facilities should be placed within or beside existing corridors to the extent practicable.	P	P, R, A	EIS Sec. 2.1.3.7 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.1.3.4 EIS Sec. 4.10.2.6 LMP Amendment WNF-1
Transportation System: Road construction or reconstruction activities within an existing utility corridor shall be coordinated with the appropriate utility company to determine which precautions are necessary to safely cross the corridor.	P, C, O	P	EIS Secs. 2.3.2.1 EIS Sec. 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 25
Transportation System: Existing roads not needed for access should be closed until access is required. Roads should be closed based on one or all of the following criteria: (1) need to protect the road, soil and water, or wildlife; (2) expected access need or road use; (3) safety of expected users; (4) need to protect cultural resources; (5) need to maintain or improve habitat effectiveness for wildlife; (6) need to provide planned recreation experience opportunities; and (7) reduction in road maintenance costs.	N		
Administrative Sites – Site Planning: An approved site development plan must be completed before expenditure of funds on new construction or additions to existing structures, including utilities.	N		
Administrative Sites – Site Planning: New facilities and additions to existing facilities shall be designed to provide barrier-free access.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Acquisition, use, and disposal of Forest facilities (including historic structures) shall be in accordance with an approved facilities master plan.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Design standards shall be based on site management objectives, including environmental constraints, user safety, national and local uniform building codes, traffic requirements and economics.	P	P, B	EIS Sec. 2.4.2.3 POD Att. 9
Administrative Sites – Construction, Reconstruction, and Operational Management: All new sites shall be planned, constructed, and managed to provide the anticipated uses safely with a minimum impact to adjacent uses and landowners. Completed projects shall include provisions for reducing adverse environmental effects of sight, sound, odor, and drainage.	P, C, O	P, B	EIS Sec. 2.4.2.3 EIS Sec. 2.7.3 POD Att. 9

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Administrative Sites – Construction, Reconstruction, and Operational Management: Site or structure closures may be implemented to meet health and safety needs or to reduce damage and maintenance costs.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Facility condition surveys shall be conducted to determine maintenance needs and to identify needed corrective actions.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Building maintenance funds and quarters collections will be allocated to cover operation, maintenance, and management proposals for facilities, and shall be guided by the following: (1) health and safety--hazard elimination; (2) prevention of further deterioration--of facilities, grounds maintenance, and other site improvement; (3) program support maintenance that contributes to increased resource production and/or decreased unit costs for projects; (4) energy conservation; and (5) compliance with other laws and regulations.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Protection, stabilization, preservation, rehabilitation, restoration, and reconstruction of buildings and structures that are on, or have been nominated to, the National Register of Historic Places shall follow the Secretary of the Interior's standards for historic preservation projects.	N		
Administrative Sites – Temporary Structures: Construction of 'temporary facilities' should normally be discouraged. Structures planned and constructed as 'temporary' shall be removed or obliterated when the need is satisfied. Methods used and timing should be in accordance with the project plan. Structures that subsequently are needed for additional use or are not removed or obliterated as planned shall be included in the site plan.	N		
Fish, Wildlife, and Sensitive Plants			
At the Forest level, fish and wildlife habitat shall be managed to maintain viable populations of all existing native and desired non-native plant and animal species. Distribution of habitat shall provide for species viability and maintenance of populations throughout their existing range on the Forest.	P, C, R, O	P, R, M	EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. F EIS App. L POD Att. 10 POD Att. 29
Endangered, Threatened, or Sensitive Species: Endangered, threatened, and sensitive species shall be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife (animals), and Oregon Department of Agriculture (plants). Legal and biological requirements for the conservation of endangered and threatened species and species proposed for listing as threatened or endangered status shall be met.	P, C, R, O	P, B, R	EIS Sec. 1.5.3.5 EIS Sec. 1.5.4.1 & 1.5.4.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Endangered, Threatened, or Sensitive Species: Habitat for existing federally classified threatened and endangered species shall be managed to achieve objectives of recovery plans.	P, C, O	P, R	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Sec. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. J EIS App. L POD Att. 10
Endangered, Threatened, or Sensitive Species: All Forest Service projects, programs, and activities conducted, funded, or permitted shall be reviewed for possible effects on threatened, endangered, and sensitive species of animals and plants.	P	P	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. J EIS App. L POD Att. 10
Endangered, Threatened, or Sensitive Species: Biological evaluations shall be prepared for each project authorized, funded, or conducted on National Forest System land to determine the possible effects the proposed activity will have on endangered, threatened, proposed, or sensitive species.	P	P	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10
Endangered, Threatened, or Sensitive Species: If endangered, threatened, or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205). Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27[a][8]).	P, C, O	P, B, R	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 2.1.4 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10 POD Att. 12
Endangered, Threatened, or Sensitive Species: Lists of endangered, threatened, and sensitive plant and animal species shall be maintained and updated periodically as new information is collected. Pertinent information shall be submitted to the Regional Office for updating the Regional Forester's Sensitive Species Lists and to the appropriate agencies for inclusion in statewide data bases.	N		
Endangered, Threatened, or Sensitive Species: Forest personnel shall not identify (to the public) specific location information that could, jeopardize the welfare of an endangered, threatened, proposed, or sensitive species.	N		

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Endangered, Threatened, or Sensitive Species: Habitat use of the Winema National Forest by these species shall be evaluated. Habitat requirements sufficient to maintain the species shall be provided.	P	P, R	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H EIS App. J EIS App. L POD Att. 10
Endangered, Threatened, or Sensitive Species: Where appropriate, standards and guidelines developed by the Oregon Department of Fish and Wildlife may be used for species that are considered sensitive by ODFW and that are on the Regional Forester's Sensitive Species List.	P, C, R, O	P, B	EIS Sec. 1.5.4.4 EIS Sec. 4.7.3.2 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 10
Endangered, Threatened, or Sensitive Species: Where appropriate, standards and guidelines developed by the Klamath Tribe may be used for species that are considered to have traditional cultural significance to the Klamath Tribe.	N		
Raptors and Colonial Nesting Birds: Active roost and nest sites (including rookeries) shall be protected from disturbing human activities during their respective nesting seasons. Table 4-12[69] indicates protection zones and nesting and roosting seasons of some important bird species on the Winema National Forest. Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive, and nest site restrictions may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist. Site management guides shall be developed for all consistently occupied (more than two years) nest sites, roosts, and rookeries	P, C, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 - 4.7.4.4 EIS App. K EIS App. L
Deer and Elk Habitat: Deer (mule and black-tailed deer) habitat shall be managed, considering all factors such as roads, cover, forage, water distribution, and livestock competition so that habitat capability to support deer is maintained or improved. On limited site-specific instances, short-term decreases (less than 10 years) are acceptable to achieve long-term benefits. Effects shall usually be calculated for projects on areas ranging from 8,000 to 60,000 acres. Habitat suitability models, such as the Interagency Technical Advisory Committee Mule Deer Model, 1985 as amended, may be used in projects such as but not limited to timber sales, grazing plans, road construction and water development.	P, C, R, O	P, B, R	EIS Secs. 4.6.1.2 & 4.6.1.3

[69] Table 4-12: Important Wildlife Nesting and Roosting Seasons and Required Protection Zones, Winema Land and Resource Management Plan

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Deer and Elk Habitat: Road access will be restricted and human activities will be discouraged between May 1 and June 30 in areas that have been identified as having traditional elk calving, only an area on the north end of Klamath District has been identified. Migration corridors of continuous coniferous cover no less than 600 feet wide will be retained to access calving areas as they are identified. Riparian areas and old-growth areas may contribute to migration corridors. As other elk calving areas are identified, this standard will be applied.	P, C, O	P	EIS Secs. 4.6.1.2 & 4.6.1.3
Deer and Elk Habitat: With the exception of calving areas, habitat east of Highway 97 will not be managed specifically for elk until completion of a cooperative elk study and the cooperative development of elk management guidelines.	P	P	EIS Secs. 4.6.1.2 & 4.6.1.3
Deer and Elk Habitat: The Forest shall provide a minimum of 30 percent of Its area as cover for deer. Generally 15 percent of the area will be hiding cover, 10 percent will be thermal cover, and 5 percent will be cover for fawning. Whenever possible, all cover also will be hiding cover. A short-term (10-year) reduction of cover to 15 percent of an area may be justified on a project-specific basis if reduction below 30 percent cover will provide long-term (greater than 10 years) benefits for deer.	P	P	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3
Deer and Elk Habitat: To provide adequate diversity of forage structure for deer, activities shall be planned to achieve multiple age classes in the brush vegetative component.	P	P	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3
Deer and Elk Habitat: Wildlife forage will be allocated firstly to meet the needs of big game, secondly to meet the needs of other animals.	P	P	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3
Fish and Aquatic Habitat: Streams shall be managed to maintain or to improve the present level of native fish habitat capability. Stream inventories shall be maintained and updated to: assess habitat capability; monitor changes due to natural or management-related events; and identify opportunities for rehabilitation or enhancement.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.2 & 2.4.2.3 EIS Sec. 4.1.3.5 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Fish and Aquatic Habitat: Fisheries habitat enhancement shall be conducted according to Forest basin priorities. Basin priorities and plans should be prepared in cooperation with the Klamath Tribe and the Oregon Department of Fish and Wildlife. The plans will evaluate the current condition of habitat, fish populations, opportunities for enhancement, and the associated costs and benefits. Enhancement projects shall be monitored to evaluate effectiveness. Emphasis will be placed on maintenance or improvement of spawning, rearing, and migration habitats.	P, R	P, B, M	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 29

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Wildlife Tree (Snag) Habitat: Habitat capability for woodpeckers (indicators for cavity-nesting species) shall be continually maintained throughout the Forest at not less than 40 percent of potential population levels (Thomas et al1979) in all forested lands except lodgepole pine. In lodgepole pine, the decrease in large diameter trees because of catastrophic mountain pine beetle infestation may preclude achieving the 40 percent level. In lodgepole pine, the highest potential population level possible shall be achieved up to the 40 percent level. With the possible exception of lodgepole pine. This will result in maintenance of self-sustaining populations of cavity-nesting species.	P, C, O	P, R	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. L POD Att. 16 POD Att. 20
Wildlife Tree (Snag) Habitat: In new sale areas, additional individual wildlife trees or wildlife tree clumps shall be left to offset lower numbers in older units in the vicinity. In these situations, the objective is to maintain an average 40 percent habitat level within as small an area as feasible (such as a small drainage basin).	N		
Wildlife Tree (Snag) Habitat: Established for forests in Region 6, wildlife tree management standards shall be followed (1920/2600 letter from Regional Forester dated September 9, 1988). This direction provides, in part, that snag densities needed to meet Management Requirement direction for cavity excavators must be provided within land areas that are generally no larger than normal unit size (not more than 40 acres). These densities will be maintained through the full rotation on these areas by providing for green replacement trees that will become snags of adequate size when existing snags fall.	P, C, O	P, R	EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Secs. 4.7.4.1 & 4.7.4.2 EIS Sec. 4.7.4.4 EIS App. H POD Att. 16 POD Att. 20
Wildlife Tree (Snag) Habitat: Tables 4-13[70] and 4-14[71] should be used to meet the 40 percent habitat capability level. Table 4-13[2] identifies the number of acres of clumps needed to produce snags at the 40 percent level per 40 acres based on the Forest average for major timber working groups from the timber inventory. Table 4-14[3] identifies the number of snags and green trees needed per 40 acres to meet the objective 40 percent level.	N		
Wildlife Tree (Snag) Habitat: Snags with the largest diameter breast height (DBH) last longer and make the best wildlife habitat, and should be selected whenever possible. However, wildlife trees that will continue to grow for another 30 years to 35 years before becoming snags may be of smaller diameter than those which die at the beginning of a rotation. Snags with diameters (DBH) over 20 inches meet the standard and guideline for large woody material.	P	P, R	EIS Sec. 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. H
Wildlife Tree (Snag) Habitat: Wildlife trees designated in riparian areas may be counted toward snag objectives only if they are excess to those needed to provide shade in stream corridors (essential shade trees shall not be killed to provide snag habitat) or large woody debris requirements.	P, C, O	P, B	EIS Sec. 4.1.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. J POD Att. 16 POD Att. 20

[70] Table 4-13: Estimated Acres for Each 40 Acres to Produce a 40 Percent Potential Population Level for Cavity Nesters, Winema Land and Resource Management Plan

[71] Table 4-14: Number of Snags and Greet Trees for Each 40 Acres to Produce a 40 Percent Potential Population Level for Cavity Nesters, Winema Land and Resource Management Plan

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Wildlife Tree (Snag) Habitat: Wildlife trees should be clumped where this technique is usable and feasible and meets the 40 percent standard. Individual trees may be used If stand conditions preclude clumping and safety considerations are met.	P	P, R	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. H EIS App. J POD Att. 16 POD Att. 20
Wildlife Tree (Snag) Habitat: Designated wildlife trees or wildlife tree clumps shall be protected from woodcutting and Forest management activities.	P, C, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att.16 POD Att. 20
Dead and Down Woody Material: Class I or II logs shall be left to maintain dead and down woody material habitat. This material shall be left in the following numbers and size classes by working group. 1. Ponderosa Pine: two or more logs/acre, 12 inches or greater diameter at the small end, greater than 8 feet long. 2. Pine Associated: SM or more logs/acre, 12 inches or greater diameter at the small end, greater than 8 feet long. 3. Mixed Conifer: six or more logs/acre, 12 inches or greater diameter at the small end, greater than 8 feet long. 4. Lodgepole Pine: 10 or more logs/acre, 6 inches or greater diameter at large end, greater than 8 feet long.	N		
Dead and Down Woody Material: Charring of down material should be minimized in prescribed burning where practicable. The suitability of logs as vertebrate and invertebrate habitat is reduced by charring.	P, C, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 POD Att. 9 POD Att. 18
Dead and Down Woody Material: Live or dead standing trees shall be left to become down material when Class I and II logs are not available on the ground. Since these live or dead trees will become dead and down woody material habitat, they must be in addition to the snag or green tree replacement habitat requirements.	P, C, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS App. H EIS App. J POD Att. 9 POD Att. 16 POD Att. 20
Dead and Down Woody Material: To provide habitat for small animals, at least one pile of slash or natural piles of limbs shall be retained per acre. Slash piles should be at least 3 feet in height and 6 feet in diameter.	C, O	B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 POD Att. 9 POD Att. 20
Cliffs, Caves, and Talus Habitat: Individual projects shall be designed to protect the value of cliffs (including rimrock), caves, and talus habitat for wildlife. Protection shall include vegetative protection zones: at least 200 feet adjacent to cliff, cave, and talus habitat receiving nesting or denning use by mammals; and at least 200 feet adjacent to this habitat receiving nesting or rearing use by birds.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.2 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.3

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Cliffs, Caves, and Talus Habitat: Rock quarries should be located at sites exhibiting the least desirable characteristics as wildlife habitat.	N		
Hardwood Habitat: Maintain or enhance hardwood (aspen and cottonwood) production on the Forest. Maintain a variety of hardwood age classes on the Forest. Hardwood stands mixed with conifers make a substantial contribution to visual, wildlife habitat, and vegetative diversity.	N		
Meadows: Protect and enhance meadows as a forest habitat component. Protection and enhancement includes stopping or reversing forest tree encroachment. A buffer of shrub or tree vegetation may need to be preserved on the perimeter of the opening.	N		
Miscellaneous Wildlife Sites: During the life of this Forest Plan, habitat sites will be found. These sites will have special value for wildlife or botanical resources, and are not otherwise addressed in the standards and guidelines. Management of these sites should be dealt with individually as part of the environmental analysis process for specific management activities. Each Ranger District shall maintain a list of sites to be considered for special management consideration as Wildlife or Botanical Sites at the next revision of the Forest Plan	N		
Plant Collecting (Including Sensitive Species): Federally listed threatened and endangered species are protected by the Federal Endangered Species Act (1982 amendments). The Forest Service cannot issue permits to collect these species for any purpose. This authority is granted only to the US. Fish and Wildlife Service.	N		
Plant Collecting (Including Sensitive Species): The Forest Supervisor may issue permits to collect sensitive or restricted plants or plant pans for legitimate scientific or educational purposes. Such collection must not jeopardize the continued vigor or existence of a plant population. Sensitive or restricted plants shall not be collected for commercial or personal use.	N		
Plant Collecting (Including Sensitive Species): Collecting plants or plant parts for any commercial purpose requires a commercial use permit issued by the Ranger District where the collecting activity is proposed. District rangers shall issue or deny commercial permits after review of a proposal presented by the collecting party. When evaluating applications for commercial collecting permits, consideration shall be given to the impacts on all Forest resources, including plant and animal diversity.	N		
Plant Collecting (Including Sensitive Species): Botanical collection permits may be issued by the Forest Supervisor to authorize collection of species other than endangered, threatened, sensitive, or restricted species.	N		
Plant Collecting (Including Sensitive Species): The above standards and guidelines regarding plant collection do not apply to the harvest of trees for timber and firewood.	N		
Lands			

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
National Forest System and non-Federal lands inside and adjacent to the Winema National Forest boundary shall be classified into one of the five landownership planning groups listed below. The Forest may develop more specific adjustment plans by area or with specific ownerships as a supplement to the Forest Plan. Group 1 - Congressional Direction This group includes those lands in which Congress has directly or indirectly instructed the Forest Service to retain in ownership and to acquire non-Federal lands for a designated purpose, such as wilderness or wild and scenic rivers. Acquisition of less than fee (full) title would be considered if direction and land management objectives could be met. Group 2 - Special Management Areas This group includes those lands that the Forest Service has recognized the need for a special kind of management through the land and resource management planning process. Examples include special interest, roadless recreation, and research natural areas. The landownership direction is to retain National Forest System ownership and to acquire non-Federal land as the opportunity and/or need arises. Acquisition of less than fee title would be considered if land management objectives could be met. Group 3 - General Forest This group includes lands that are characteristically general forestland or general rangeland where management direction emphasizes commodity production. These lands will be available for land adjustment and will usually provide most of the land considered in exchange projects. The basis for group 3 is the assumption that lands in this group will be managed to provide similar types of outputs, whether in private or public ownership. Landownership direction is to acquire and to dispose of lands as necessary to facilitate exchanges. Group 4 - Isolated National Forest Tracts and Intensively Developed Non-Federal Land Land in this group consists of (1) small isolated tracts of National Forest land situated away from contiguous blocks of National Forest land; and (2) non-Federal lands that are managed for intensive uses such as agriculture, residential subdivision, industrial development, ditch lines, and State and county highways. Landownership direction for this group characteristically is to make National Forest land available for acquisition of non-Federal lands in groups 1, 2, or 3. Non-Federal lands in this group will generally not be acquired. Group 5 - Lands Needing Further Study This group includes situations where more intensive study and planning are necessary before landownership decisions can be made. The primary factor that determines the need for intensive study is the necessity for close coordination with local and State governments. Intensive study generally involves private expansion around National Forest ownership Examples are: residential community growth, industrial development, or conversion of timberlands and rangelands to a more intense type of agriculture.	N		
Land Line Location: Property boundary surveys, posting, and marking shall be accomplished to support planned or ongoing resource projects (such as timber harvest) to solve or to prevent trespass and to identify administrative and private land boundaries. Adjacent landowners should be encouraged to share the costs of surveying common boundaries.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Land Line Location: Land surveying shall be accomplished in accordance with existing objectives, priorities, and standards.	P	P, B	EIS Sec. 2.4.2.1 POD Att. 20 POD Att. 21
Land Line Location: To protect the values of congressionally designated areas like wilderness, national parks, and wild and scenic rivers, boundaries shall be located before project implementation.	N		
Rights-of-Way: Appropriate rights-of-way shall be acquired for all roads and trails necessary for the operation and administration of the Forest.	N		
Rights-of-Way: In areas where national forest intermixes with large areas of private land or other land under a single ownership, the Forest Service should enter into a Road Rights-of-way Construction and Use Agreement for cost-sharing any joint road system. (This should be done when It is feasible and advantageous to the United States.) Roads within agreement areas shall be added to the agreement by supplement before commercial use commences.	N		
Special Uses: Special use management provides for the use and occupancy of National Forest land when such use is consistent with Forest management area goals and objectives. This use should be permitted only by law, when such uses are in the public interest, and when such uses cannot be served by reasonable development on private land. Special use applications shall be evaluated through environmental analysis before the permit is issued, and appropriate site-specific requirements and mitigation measures shall be developed and included in the permit.	P, R	P, B, M, A	EIS Sec. 1.4.2 EIS Secs. 1.5.1 - 1.5.4 EIS Sec. 2.1.3.7 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 3.4.3 EIS Sec. 4.1.3.3 - 4.1.3.6 EIS App. F EIS App. H EIS App. J POD Att. 29 LMP Amendments WNF-1 to WNF-5.
Special Uses: Private landowners shall be granted reasonable access across National Forest System land, subject to applicable regulations and policies. Where reasonable access alternatives across other ownerships exist, authorization to cross National Forest land will not be granted.	N		
Special Uses: Existing withdrawals shall be reviewed by 1991 to determine whether, and for how long, the continuation of the existing withdrawals would be consistent with the statutory objectives of the programs for which the lands were dedicated.	N		
Special Uses: All special-use permits shall be revised when renewed to reflect Forest Plan direction.	N		
Special Uses: All recreation special uses shall be compatible with the Recreation Opportunity Spectrum classification of the area. Facilities shall be designed to meet the designated services to be provided. The number of permits for a specific use should be limited in order to create or to maintain economical operations, to reduce administrative costs, and to provide high quality services. Prospective permittees must demonstrate that they have the financial resources to undertake the proposed venture, or the permit shall not be issued.	N		
Special Uses: All special uses shall be inspected to ensure compliance with the permit.	P, C, R, O	P, B	EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.6.2

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Special Uses: In project planning and execution, care should be taken to prevent damage to permitted uses, such as summer homes, water developments, and private utilities.	P	P, B, R	EIS Sec. 2.4.2.2 POD Att. 9
Special Uses: The facilities located within existing transportation and utility corridors shall be managed by the agency that acquired the rights-of-way, in accordance with the requirements of the easement, special-use permit, or authorization.	P, C, O	P, B	EIS Secs. 2.1.5 & 2.1.6
Special Uses: Additional transportation and utility corridors that major utilities may need shall be designated through an interagency environmental analysis following procedures in the Regional Guide. Future corridor planning and subsequent environmental analysis shall be in accordance with management area goals and objectives. These areas have management goals or environmental constraints that are not, or may not be, compatible with certain types of utility or transportation facilities.	N		
Special Uses: To avoid the proliferation of rights-of-way, the use of existing corridors shall be considered first in determining the best location for a new utility proposal. New transportation and utility proposals shall be accommodated within existing corridors to the maximum extent feasible.	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.2.1 EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3
Special Uses: Existing sites used for electromagnetic communications shall be protected from interferences generated by power transmission lines This may require the power transmission lines to be rerouted or redesigned to protect those sites, or it may otherwise require the proponent of the power line to equitably mitigate the uses established for those sites.	N		
Special Uses: The following actions should be taken in connection with electronic sites: 1. Develop site plans for existing sites which have facilities in place. 2. Identify potential sites for future development during environmental analyses. 3. Develop site plans for new sites prior to development. 4. Issue new permits to direct use of the sites in the following order: a. Utilize residual capacity of existing sites; b. Utilize identified potential sites; and c. Utilize other sites deemed suitable through environmental analysis after preparation of a site plan	N		
Special Uses: Utilities should be designed and located so that they are not highly visible from sensitive transportation corridors or other sensitive viewer locations.	P, R	P, R, M, A	EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Sec. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F POD Att. 1 POD Att. 29 LMP Amendments WNF-2 & WNF-3
Special Uses: Utility lines shall be buried when it is technically and economically feasible.	P, C	P, B	EIS Sec. 2.4.2.1 POD Att. 9

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Minerals and Energy – Not Applicable, Excluded From Table			
Native American Rights and Claims			
The Forest is committed to fulfilling its obligations as an agency of the United States under the Klamath Treaty of 1864. Since management of the forest may affect the resources on which the tribe depends for exercise of its treaty rights, the Forest will determine through the NEPA process whether each land and/or resource management decision may affect resources subject to the tribe's treaty rights. The Forest, through the NEPA process, will analyze, disclose, and consider potential effects on the tribe.	P	P, R	EIS Sec. 1.4.2 EIS Sec. 1.5.1.5 EIS Sec. 4.11.1.2 EIS Sec. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. 26
All management activity on former reservation lands shall meet applicable requirements of the Klamath Treaty of 1864, the Act of August 13, 1954, as amended (Termination of Federal Supervision of the Klamath Tribe), the Restoration Act, and the terms of the Consent Decree of 1981. Appendix D[72] contains the major portions of the treaty and consent decree.	P, C, O	P, B, R	EIS Sec. 1.4.2 EIS Sec. 1.5.1.5 EIS Sec. 4.11.1.2 EIS Sec. 4.11.2.2 EIS Sec. 4.11.5 POD Att. 26
The Forest will inform and invite participation from the Klamath Tribe in planning of resource management activities. This will include holding an annual coordination meeting with the tribe to discuss anticipated projects. This meeting will be used to identify interest in specific projects.	P, C, O	P	EIS Sec. 1.5.1.5 EIS Sec. 4.11.1.2 POD Att. 26
The American Indian Religious Freedom Act shall be complied with on all Forest land.	P, C, O	P	EIS Sec. 1.5.1.5 EIS Sec. 4.11.1.2 EIS Sec. 4.11.4 POD Att. 26
Protection			
Fire Management: All wildfires shall receive an appropriate suppression response. The response shall be safe, timely, and cost efficient and shall meet management objectives for the area, including objectives for plant and animal diversity.	N		
Fire Management: Using the lowest cost suppression option, aggressive suppression action shall be applied to control and extinguish wildfires that threaten life, private properly, public safety, improvements, or investments.	N		
Fire Management: An escaped fire situation analysis shall be prepared for any wildfire that escapes initial attack and/or threatens to exceed established parameters, or is no longer consistent with fire management direction.	N		
Fire Management: Retardant drops shall be carefully controlled in proximity to open bodies of water (lakes and streams) to preclude retardant from entering lakes or live streams.	N		

[72] Appendix D: Klamath Indian Treaty and Consent Decree, Winema Land and Resource Management Plan

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Fire Management: Utility companies shall be notified of any fire situation originating on or threatening their permitted use area to ensure the safety of firefighters and to allow utilities to be prepared to temporarily suspend use if needed.	N		
Fire Management: Prescribed fire may be used in natural fuels: to reduce fire hazard; to enhance diversity in the structure and composition of plant communities: to enhance the production and protection of commercial timber yields: and to enhance other resource outputs such as wildlife habitat, forage, and browse. Prescribed fire may include both planned and unplanned ignitions.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 9 POD Att. 18
Fire Management: Prescribed fire in wilderness (see 'Protection,' Management Area 6 - Wilderness).	N		
Fire Management: Proposed activity units (harvest, thinning, conversion, and release, for example) should be designed and coordinated on the ground. This is done to consider size, shape, location, timing, spatial distribution, and management risk for fire management and other resource requirements and to help make the fuel treatment and fire protection of the units as practical and economical as possible.	N		
Fire Management: Fuel treatments shall conform with all Federal and State standards and regulations for air quality.	P, C, O	P, B	EIS Sec. 1.5.1.8 EIS Sec. 1.5.4.3 EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 2 POD Att. 9 POD Att. 11 POD Att. 18
Fire Management: Prescribed fire prescriptions shall be consistent with management area objectives.	P	P, B	EIS Secs. 4.5.1.3 & 4.5.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. 2 POD Att. 18
Integrated Pest Management: All planned activities shall include integrated pest management practices. All insect and disease control projects shall be carried out in ways that meet management area objectives	P, C, R, O	P, B	EIS Sec. 2.7.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. H EIS App. J POD Att. 9 POD Att. 14

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Integrated Pest Management: Silvicultural methods and cultural treatments should be applied to reduce susceptibility to hazards of insects and disease. If normal insect surveillance indicates the threat of an epidemic, project-level detection and control operations, including coordination with other landownerships, shall be accomplished on a forestwide basis.	P, C, R, O	P, B	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.2 & 4.5.2.3 POD Att. 14
Integrated Pest Management: The Forest Plan incorporates the Pacific Northwest Region's FEIS for Managing Competing and Unwanted Vegetation. In implementing the Forest Plan through project activities, the Forest will comply with the Record of Decision issued by the Regional Forester dated December 8, 1988, and the Mediated Agreement of August 1989. Use of all vegetation management techniques is allowed only when other methods are ineffective, or will unreasonably increase project costs Emphasis must be on prevention and early treatment of unwanted vegetation and on full public involvement in all aspects of project planning and implementation. Information about the vegetation management FEIS, ROD, and Mediated Agreement is available at the Forest Supervisor's Office.	N		
Noxious Weed Control: Treatment priorities and strategies shall be in accordance with the Oregon State Comprehensive Classification List: • 'A' Classification (isolated distribution) - eradicate existing populations; • 'B' Classification (general distribution) - intensively control or eradicate; and • 'C' Classification (general distribution) - control or (It feasible) eradicate.	N		
Noxious Weed Control: Under any funding level, funds available for weed control activities shall be distributed in the following order: 1. Cooperation with the Oregon State Department of Agriculture; 2. Treatment of Forest infestations through internal funding; and 3. Treatment of waived private lands within Forest boundaries through internal funding.	N		
Noxious Weed Control: In project planning, all available methods of control (for example, manual, mechanical, biological, chemical, cultural, fire, and regulatory methods) shall be fully considered.	P	P, B	EIS Sec. 2.7.3 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS App. H EIS App. J POD Att. 14
Law Enforcement: Aggressive, appropriate actions will be taken to enforce Federal laws, rules, and regulations as set forth in Titles 16, 18, and 21 of the U.S. Federal Code as they pertain to lands managed by the US. Forest Service. These actions will be accomplished by professional law enforcement persons within the Forest Service.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Law Enforcement: Priorities for law enforcement will be: 1. Protection of employees and the public from harassment, bodily injury, and/or death while using the national forest or working on the national forest; 2. Timber theft in the form of sawlogs and firewood; 3. Drug manufacturing and the related violence and contamination; and 4. Cultural resource theft and vandalism and the related losses.	N		
Law Enforcement: The goals of the Forest Law Enforcement Program are: (1) to ensure compliance with Federal laws and regulations pertaining to the national forests; (2) to provide for the protection of the Forest's property and resources: (3) to provide for the safety of Forest visitors and their property in a cooperative effort with local law enforcement agencies; and (4) to provide for the safety of Forest Service employees. These goals will be accomplished by: 1. Prevention - Preventing violations through voluntary compliance by Forest users is the main objective of the program. This can normally be accomplished by means of education. 2. Cooperation - Cooperative Law Enforcement is authorized by Public Law 92-82. Under this law, the Forest Service will reimburse the cooperator for those extraordinary expenditures incurred by providing additional services requested by the Forest Service for recreational users. 3. Enforcement - Line officers are responsible to assure that effective action is taken against persons violating Federal laws and regulations on the Forest.	N		
Range – Not Applicable, Excluded From Table			
Recreation			
The Forest shall coordinate with adjacent forests and other recreation providers (public and private) to provide a full range of recreation settings and opportunities.	N		
An interpretative plan shall be developed for each district to coordinate efforts to provide interpretation of natural and cultural features and management activities and to provide outdoor education. Interpretative facilities, techniques, and materials selected shall be compatible with the assigned Recreation Opportunity Spectrum (ROS) classes and development levels.	N		
The public shall be informed of recreation opportunities and conditions on a continual basis using a variety of media.	N		
Construction and reconstruction projects shall be planned and implemented as outlined in the Region 6 (R-6) Recreation, Facilities, and Trails Development Process.	N		
Only facility designs that are approved for use in R-6 and that are compatible with the ROS class and designed development level shall be installed. All recreation signs shall be in accordance with applicable Regional standards.	N		
New facilities shall be designed to be barrier-free to the extent feasible. Selected existing facilities shall be modified to remove barriers.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
The project feasibility report shall include estimates of existing and potential demand for the type, design, and location of proposed recreation facilities. Demand estimates should be based on market surveys, customer surveys, or user group requests.	N		
New or reconstructed sno-parks should be designed in accordance with the Oregon Department of Transportation 'Guidelines and Criteria for Designating Sno-parks.' Designs and snow-plowing needs should be coordinated with local State or county highway maintenance departments.	N		
Areas that are important to Forest visitors include undeveloped campsites; places with scenic, geologic, or biological values; and other areas that receive significant dispersed recreation use. These special places shall be identified and evaluated for significance during project planning. These areas shall be considered for protection and/or enhancement in project design.	N		
The Forest shall emphasize educating dispersed area users to the principles of minimum-impact use of the Forest, such as the 'Pack it Out,' 'Without a Trace,' and Tread Lightly' programs.	N		
Off-road vehicle (ORV) use shall be managed to: minimize resource damage; promote user safety; minimize conflicts with others; and, be compatible with management area objectives. Where ORV use is causing resource or facility damage, use may be restricted or prohibited. An ORV implementation schedule shall be developed with user groups to designate ORV travelways and to list restricted and closed areas.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.3.2.1 & 4.3.2.5 EIS Sec. 4.3.3 EIS Sec. 4.5.1.3 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. 9 POD Att.19 POD Att. 25
Trails shall be planned, designed, constructed, and maintained as recreation facilities that complement the objectives of the management areas being served, in accordance with documented trail management objectives.	N		
The Forest trail system shall be designed to provide users with a wide range of ROS and WRS settings and difficulty levels. The system shall provide for a wide variety of user types, including both summer and winter users.	N		
A trail management plan shall be developed for each district. These plans shall include a trail inventory, trail management objectives for each trail, and a prioritized listing of construction and reconstruction needs.	N		
Trails and related facilities shall be protected with appropriate mitigation measures during management activities. Measures that may be used to mitigate effects of activities include vegetative screening, temporary or permanent rerouting, temporary closure, interpretative signing, and modification of treatments along the trail corridor.	N		

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Trail and road locations shall be planned to minimize conflicts. New road crossings of existing trails should be avoided.	??		
Displacement of system trails by new roads or other management activities should be avoided. Where displacement occurs, trails shall be relocated to maintain the integrity of the system and to ensure the quality of the recreation experience.	??		
An automated recreation information system (RGRIM) shall be maintained. This includes an inventory of facilities and a record of estimated use by site or area.	N		
Scenic Resources			
A higher visual quality objective than that stated in the management area may be met when consistent with management area objectives.	N		
Treatment of catastrophic occurrences, such as insect or disease outbreaks or major wildfires, may suggest a deviation from scenic management direction. This will be documented through the environmental analysis process before implementation.	N		
Landscape architects should assist with the planning and design of those projects that have the potential to affect the scenic resources, especially considering cumulative effects.	P, R	P, R, M, A	EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Sec. 3.4.1.32 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS Secs. 4.14.2.8 & 4.14.3 EIS App. F POD Att. 1 POD Att. 29 LMP Amendments WNF-2 & WNF-3
All management activities, as practicable, shall be shaped and blended to fit the natural landscape character as viewed from background distances.	N		
Inventories of visual quality shall be maintained or updated; existing visual condition and desired condition, as a minimum, shall be mapped. Use and demand for scenic quality will be reflected in mapping.	N		
Evidence of management activities throughout project implementation, such as signing, tagging, tree marking, and staking, should be located to minimize negative effects on scenery and recreation settings. These should be removed following completion of projects.	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.8.1.3 & 4.8.2.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 20 POD Att. 21 POD Att. 28

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
During project environmental analyses, identified existing conditions that do not meet scenic management direction shall be considered for rehabilitation.	P, R	P, M, A	EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.3 & 4.8.2.3 EIS App. F POD Att. 1 POD Att. 29 LMP Amendments WNF-2 & WNF-3
For project planning, the 'National Forest Landscape Management Series' handbooks may be used for technical guidance.	N		
The State Highway 140 viewshed Implementation Guide shall be used for guidance in project planning within that viewshed.	N		
Soil and Water			
The Forest shall cooperate with local Soil and Water Conservation Districts and other agencies to improve soil, water, and riparian resources.	N		
Cooperative snow courses, buffers, and improvements shall be protected as required by current agreement with the Soil Conservation Service. Existing sites include: Billie Creek, Chemult, Cold Springs, Fourmile Lake, Sevenmile Marsh, and Taylor Butte.	N		
Land management activities shall be planned and conducted to maintain or to improve soil productivity and stability.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.4 EIS Sec. 4.3.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS App. F POD Att. 9 POD Att. 20 POD Att. 28 POD Att. 29 LMP Amendments WNF-4 & WNF-5
Forest management activities shall meet or exceed the stated objectives in the Organic Act of 1897, the Multiple Use Sustained Yield Act of 1960, and the National Forest Management Act of 1976. Floodplains and wetlands on the Forest shall be managed according to Executive Order 11 988 (Floodplain Management) and Executive Order 11 990 (Protection of Wetlands).	P, C, R, O	P, B, R, M, A	EIS Secs. 1.4.2 & 1.4.3 EIS Secs. 1.5.1 - 1.5.3 EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 – 2.4.2.3 EIS Sec. 4.1.3.4 EIS App. F POD Att. 9 POD Att. 28 POD Att. 29 LMP Amendments WNF-1 – WNF-5 LMP Amendment BLM/FS-1

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
The current Soil Resource Inventory shall be revised and updated as needed to meet management needs.	N		
Detrimental Soil Conditions: The cumulative effects of detrimental soil conditions should not exceed 20 percent of the total acreage within the activity area: any reason for exceeding the limitation shall be documented in an environmental assessment. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil from all activities (including roads, skid trails, and landings). Sites where the standards for displacement, puddling, and compaction are not currently met will require rehabilitation such as ripping, backblading, or fertilization. The potential for creating detrimental soil conditions will be specifically addressed through project environmental analyses. If needed, alternative management practices will be developed, and mitigating measures will be planned and implemented.	P, C, R, O	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.7 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Sec. 4.14.2.3 EIS Secs. 4.14.3.1 & 4.14.3.4 POD Att. 9 LMP Amendments WNF-4 & WNF-5
Detrimental Soil Conditions: Detrimental conditions occur when one or more of the following criteria are exceeded. 1. Compaction: Detrimental compaction is that beyond the following limits--(a) on volcanic ash/pumice soils, an increase in soil bulk density of 20 percent or more over the undisturbed level; (b) on other soils, an increase in soil bulk density of 15 percent or more over the undisturbed level, a macropore space reduction of 50 percent or more, and/or a reduction below the 15 percent level as measured by an air permeameter. 2. Puddling: Soil puddling is a physical change in soil properties due to shearing forces that destroy soil structure and reduce porosity. 3. Displacement: Detrimental displacement is the removal of more than 50 percent of the topsoil- or humus-enriched AI or AC horizons from an area of 100 square feet or more which is at least 5 feet in width. 4. Severely burned soil: Leave a minimum of 90 percent of a project area unaffected by severely burned conditions, Soils are considered to be severely burned when the top layer of mineral soil is significantly changed in color, usually to a reddish color, and the next 0 5 inch is blackened from organic matter charred by heat conducted through the top layer.	P, C, R, O	P, B, A	EIS Sec. 1.5.2.1 EIS Secs. 2.1.3.7 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 LMP Amendments WNF-4 & WNF-5
Soil Erosion: To stay within acceptable levels of soil loss and meet soil management objectives, the minimum percent effective ground cover after any soil disturbing activity should be as follows in Table 4-18[73]. Exceptions to these standards may be made after completing the environmental assessment process with input from a soil specialist.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 POD Att. 9
Soil Erosion: Tractor logging should generally not be prescribed when slopes exceed 35 percent.	N		
Organic Residues: Management activities should be planned to retain small woody (dead and down) material to sustain soil nutrients and a healthy forest ecosystem. As a goal, 10 tons or more per acre of 9-inch diameter or smaller woody material should be maintained where practicable.	P	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Sec. 4.5.2.3 POD Att. 9 POD Att. 20

[73] Table 4-18: Minimum Percent Effective Ground Cover, Winema Land and Resource Management Plan

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Riparian Ecosystems (Streams, Stream-Side Areas, Floodplains, and Wetlands): For those projects that could adversely affect riparian ecosystems, water quality, or stream structure and function, specific objectives for the management of riparian areas shall be developed during project environmental analysis. These objectives will be based on: stream classification, site-specific topographic and vegetative characteristics, water quality standards and goals, and other resource objectives (as appropriate).	P	P, A	EIS Sec. 2.1.3.7 EIS Sec. 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.4.4.1 EIS App. J POD Att. 28 LMP Amendments WNF-1 & WNF-5.
Riparian Ecosystems (Streams, Stream-Side Areas, Floodplains, and Wetlands): In riparian ecosystems, hydrologic conditions and riparian habitat shall be maintained or improved.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. F EIS App. J POD Att. 28 POD Att. 29 LMP Amendment WNF-5
Riparian Ecosystems (Streams, Stream-Side Areas, Floodplains, and Wetlands): No management practices shall be permitted within riparian areas that cause detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment which seriously and adversely affect water conditions or fish habitat.	P	P, B, A	EIS Sec. 2.1.3.7 EIS Sec. 2.4.2.2 EIS Secs. 4.1.3.4 & 4.1.3.5 EIS Sec. 4.4.4.1 EIS App. J POD Att. 9 POD Att. 28 LMP Amendment WNF-5
Riparian Ecosystems – Vegetation Management: Sufficient amounts of ground cover should be maintained within a riparian area to prevent erosion and the direct movement of potential pollutants into a stream. Refer to table 4-18[74].	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.5.1.3 POD Att. 9 POD Att. 28
Riparian Ecosystems – Vegetation Management: Riparian areas should be managed to maintain stream banks in a stable condition along at least 85 percent of a stream's length in any given drainage.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29

[74] Table 4-18: Minimum Percent Effective Ground Cover, Winema Land and Resource Management Plan

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Riparian Ecosystems – Vegetation Management: In stream-side areas for Class I, II, and III streams, present and future sources of large woody material should be provided. Existing instream material should be maintained or enhanced. Specific quantitative criteria should be developed on a stream-by-stream basis.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 16 POD Att. 20 POD Att. 28 POD Att. 29
Riparian Ecosystems – Vegetation Management: Vegetation should be managed to provide adequate shading in areas along streams to meet State of Oregon temperature standards. Shade may be provided by overhanging grasses, shrubs, trees, and topography.	P, C, R, O	P, B, M	EIS Sec. 1.5.4.3 EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Riparian Ecosystems – Vegetation Management: Riparian areas should be managed to maintain or achieve a range forage condition class of good.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.5.1.3 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Riparian Ecosystems – Vegetation Management: Riparian areas should be managed to maintain or improve the habitat of fish and aquatic and terrestrial wildlife. Vegetation and natural debris should be maintained and managed to: (1) maintain or enhance stream channel and bank structure so as to maintain or enhance water quality and (2) provide structural fish habitat to support natural populations of fish in Class I and II streams.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.5.1.3 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Riparian Ecosystems: Management activities shall meet the aquatic resource protection standards of Oregon's Removal-Fill Law (ORs 541.695) unless otherwise exempted.	P, C, R	P, B	EIS Sec. 1.5.1.7 EIS Sec. 1.5.3.3 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS App. J POD Att. 28

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Riparian Ecosystems: New water developments and reconstruction of existing developments shall be coordinated through the environmental analysis process. Water developments may need to be fenced to protect riparian vegetation and wildlife habitat from damage by livestock or other resource activities.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Stream-Side Areas and Floodplains: Activities that could have short-term adverse effects on floodplain values may occur only if specific mitigation measures designed to minimize the effects are implemented and documented in project planning records. Natural floodplain characteristics shall be restored shortly after the activity has stopped. Floodplain values include those characteristics of a floodplain that facilitate the safe passage of flood flows with minimal damage on-site or downstream. Vegetation, topography, and other features that contribute to the safe dissipation and release of peak flows and maintenance of base flows should be maintained or improved.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Secs. 4.6.2.3 & 4.6.2.4 EIS App. F EIS App. J POD Att. 9 POD Att. 28 POD Att. 29
Stream-Side Areas and Floodplains: Intensity of harvest treatments and spatial distribution of cutting units shall ensure that hydrologic conditions are maintained or improved.	N		
Water Quality (Best Management Practices): The Forest shall comply with State requirements in accordance with the Clean Water Act for protecting waters of the State of Oregon through planning, applying, and monitoring Best Management Practices (BMPs) in conformance with the Clean Water Act, regulations, and Federal guidance.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 9 POD Att. 13 POD Att. 28
Water Quality (Best Management Practices): In cooperation with the State of Oregon, the Forest shall use the following process: 1. Select and design BMPs based on site-specific conditions; technical, economic, and institutional feasibility; and the water quality standards for those waters potentially impacted. 2. Implement and enforce BMPs. 3. Monitor to ensure that practices are correctly applied as designed. 4. Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards. 5. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected 6. Adjust BMP design standards and application when it is found that beneficial uses (including domestic, recreation, irrigation, industrial, and fish and wildlife habitat uses) are not being protected and water quality standards are not being achieved to the desired level or if it is found that BMPs are more restrictive than necessary. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water Quality (Best Management Practices): Use the existing arranged process to implement the State Water Quality Management Plan on lands administered by the Forest Service as described in Memoranda of Understanding (MOU) between the Oregon Department of Environmental Quality and U.S. Department of Agriculture, Forest Service (February 12, 1979, and December 7, 1982), and 'Attachments A and B' referred to in this MOU ('Implementation Plan for Water Quality Planning on National Forest Lands in the Pacific Northwest' (December 1978) and 'Best Management Practices for Range and Grazing Activities on Federal Lands,' respectively).	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.6.2 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 POD Att. 9 POD Att. 13 POD Att. 28
Water Quality (Best Management Practices): Individual, general Best Management Practices are described in 'General Water Quality Best Management Practices,' Pacific Northwest Region, November 1988. Site specific BMPs are developed at the project level.	P	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 POD Att. 9 POD Att. 13 POD Att. 24 POD Att. 28
Water Quality (Best Management Practices): BMPs relating to protection of water quality shall be followed for any chemical application projects. In the event of an accidental spill of hazardous materials, procedures shall be followed as set forth in the Oil and Hazardous Substances Pollution Contingency Plan.	P, C, R, O	P, B	EIS Sec. 1.5.1.7 EIS Secs. 1.5.4.3 & 1.5.4.9 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.4.2.2 & 4.4.3.2 POD Att. 9 POD Att. 14 POD Att. 24 POD Att. 28
Water Quality (Best Management Practices): Management activities in and around Class I and II streams shall not cause a measurable water temperature increase when the existing stream temperatures are 58 degrees F or greater, or cause more than a 2 degrees F increase due to cumulative effects when the existing stream temperatures are 56 degrees F or less.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Water Quality (Best Management Practices): No more than 10 percent increase over natural stream turbidities should occur. Temporary changes to the above standard may occur, but must be transitory in nature. Changes as a result of management activities must be minimal and adequately monitored.	P, C	P, B	EIS Sec. 2.4.2.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Secs. 4.6.2.3 & 4.6.2.4 POD Att. 9 POD Att. 13 POD Att. 28

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Water Quality (Best Management Practices): Management activities in and around Class III and IV streams will not contribute to the deterioration of water quality for downstream Class I and II streams. However, these activities are allowed, provided the standards for Class I and II streams continue to be met.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.4.2.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 28 POD Att. 29
Water Quality (Best Management Practices): Management activities, particularly timing of road building and timber harvest, shall be scheduled to minimize long-term detrimental changes in watershed conditions. Spatial distribution and timing of activities will be the principle factors used to avoid unacceptable cumulative impacts.	P, C, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS Sec. 4.14.2.4 EIS App. J POD Att. 9 POD Att. 20 POD Att. 25 POD Att. 28
Water Quality (Best Management Practices): Areas in which water quality is being adversely affected shall be given high priority for treatment to minimize the effects and eliminate the cause.	P, C, R, O	P, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 28 POD Att. 29
Water Quality (Best Management Practices): Effluents shall be disposed of in a manner which will prevent the contamination of surface or subsurface water. Sewage treatment and disposal facilities shall be approved by the Oregon Department of Environmental Quality or Its contract agents and shall be in compliance with the rules of the Environmental Quality Commission.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 POD Att. 9 POD Att. 13 POD Att. 23
Instream Flow: Wetland, floodplain, riparian, and watershed characteristics shall be maintained to provide for storage and routing of ground and surface water, including floodwaters.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.4.2.2 & 4.4.3.2 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. H EIS App. J POD Att. 9 POD Att. 28 POD Att. 29

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Instream Flow: The Forest shall follow national and regional policy when obtaining water rights, protecting existing water rights, and protecting instream flows.	N		
Instream Flow: The Forest shall conform with any minimum stream flow established by law.	N		
Cumulative Effects: A cumulative effects assessment shall be made in watersheds where project scoping identifies an issue or concern regarding the cumulative effects of activities on water quality or stream structure and function. This will include land in all ownerships in the watershed. Activities on National Forest System lands in these watersheds should be dispersed in time and space to the extent practicable and at least to the extent necessary to meet management requirements. On intermingled ownerships, scheduling efforts shall be coordinated to the extent practicable.	P	P	EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Secs. 4.14 .2.4 & 4.14.3.4 EIS App. H EIS App. J
Coordinate Federal Water Claim: The Forest will coordinate the development, timing, and content of its water rights claim in the Klamath Basin Adjudication with those of the Klamath Tribe and other Federal agencies (including U S Fish and Wildlife Service, National Parks Service, and US. Bureau of Reclamation).	N		
Timber: Programmed timber harvest activities shall occur only on lands classified as suited for timber production However, harvest activities may occur on other lands for the following purposes: 1. Removal of timber from road locations. 2. Construction or protection of capital improvements like campgrounds, buildings, fuelbreaks, and dispersed recreation sites; or projects designed to enhance other resource values. 3. Removal of hazards to human life and health. 4. Removal of timber killed by catastrophic events, such as fife, windthrow, drought, insects or disease (36 CFR 219.27[c][1]). The decision to salvage harvest an area shall be based on an analysis of existing conditions following the disturbance. 5. Where small inclusions in harvest units that otherwise are suitable will allow use of more logical management units and road locations resulting in less resource impacts. 6. As part of a research study to test the feasibility of silvicultural and harvesting practices that could be successful on these lands.	N		
Timber: During project-level planning, the inventory of suitable lands shall be corrected as needed using the following process: 1. Boundary adjustments to refine mapping lines shall be documented in the project planning records and maintained in the Ranger District resource inventory system. 2. Where changes in classification are needed, the analysis and rationale for the needed change shall be documented by the Ranger District and sent to the Forest Supervisor for inclusion in the Forest planning process records. These changes shall be reviewed by the Forest Supervisor for consistency, and amendments will be made to the Forest Plan as needed.	N		
Timber: The selection of the appropriate harvest cutting method shall be guided by the criteria provided in the Regional Guide on page 3-2.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Timber: A silvicultural prescription shall be written for all stands scheduled for silvicultural treatment. A prescription will describe the proposed treatment following an analysis of present stand conditions, physical site factors, management direction, and silvicultural objectives. Information needed to evaluate stand conditions and to develop and verify silvicultural prescriptions should be gathered from a stand examination or other type of adequate data collection survey.	N		
Timber: Logging systems shall be compatible with silvicultural systems and resource protection objectives. Timber sales requiring special logging systems shall be planned by a person trained in logging systems.	P	P, B	EIS Sec. 2.4.2.1 POD Att. 9 POD Att. 20
Timber: Tractor logging generally should not be prescribed when slopes exceed 35 percent.	N		
Timber: Forest openings created by the application of even-aged silviculture shall not exceed 40 acres. The openings should be shaped or blended with the natural terrain to achieve scenic, plant and animal diversity, and wildlife habitat objectives to the extent practicable. Exceptions are permitted for catastrophic events (such as windstorms, or insect and disease attacks) or on an individual basis after a 60-day public notice period and review by the Regional Forester. In addition, the 40-acre limit may be exceeded by as much as 50 percent without necessitating review by the Regional Forester or a 60-day public notice when exceeding the lima will produce a more desirable combination of net public benefits and when any one of the following criteria is met: 1. When a larger created opening will enable the use of an economically feasible logging system that will lessen the disturbance to soil, water, wildlife, fish, riparian resources, or residual vegetation. 2. When created openings meeting this size limit cannot completely encompass groups of trees infected with dwarf mistletoe or root disease and, therefore, need to be expanded to include these trees in order to avoid infection of adjacent susceptible timber. 3. Where visual quality objectives require shaping and blending of openings to fit the landform. 4. When larger openings are needed to achieve regeneration objectives in harvest areas being cut by the shelterwood method and when destruction of the newly created stand of reproduction would occur as a result of delayed removal of shelter trees. This exception applies only to existing sheltewood units and shelterwood units under contract before approval of the Forest Plan. Newly planned shelterwood units should not exceed the opening size limitations.	N		
Timber: Created openings shall be separated by areas generally not classed as created openings. The areas between created openings shall contain one or more logical harvest units. These areas shall be large enough and contain a stand structure to meet resource requirements. Resource requirements may include needs for wildlife habitat, watershed, scenic management, and other resources.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Timber: Created openings adjacent to 30-acre or larger natural openings should be limited to an area not exceeding one-third the size of the natural opening and not occupying more than one-third of the natural opening perimeter. Openings created adjacent to any natural openings should be designed to protect wildlife values and visual quality levels.	N		
Timber: A harvest area shall no longer be considered a created opening for silvicultural purposes when stocking surveys carried out in accordance with Regional instructions indicate prescribed crop tree stocking at or above 4.5 feet in height and free to grow. Where other resource management considerations are limiting, such as wildlife habitat and scenic requirements, a created opening shall no longer be considered an opening when the vegetation in it meets the management area prescription objectives.	N		
Timber: Acreage of continuous stand management activity in any one decade for uneven-aged management treatments, intermediate treatments for even-aged stands, overwood removal treatments, and precommercial thinning shall be determined through the interdisciplinary process considering wildlife, scenic, and other resource standards and guidelines for the management area.	N		
Timber: Lands should be reforested within five years of final harvest, except where permanent openings are created for wildlife habitat improvement, vistas, recreation uses, and similar practices Five years after final harvest means five years after clearcutting, five years after final overstory removal, five years after seed tree removal in seed tree harvesting, or five years after selection harvesting where stocking is reduced below minimum levels.	N		
Timber: A regeneration prescription shall contain the minimum number, size distribution, and species composition of planned regeneration. The prescription shall plan to prevent unwanted vegetation and animal damage to the seedlings. The prescription shall plan for monitoring the plantation, and aggressive action shall be taken to eliminate unwanted vegetative competition, animal damage, and any other threat that would prevent meeting the reforestation objective.	N		
Timber: Natural regeneration opportunities should be prescribed where experience indicates natural regeneration will be successful meeting the standards of 13-11 above.	N		
Timber: With a goal of satisfactory stocking within three years, site preparation units should be planted within one year of scarification, except where such units have been prepared for natural regeneration.	N		
Timber: Regional or local stocking guides shall be used to assess stocking adequacy on all regeneration units prior to certifying them as satisfactorily reforested	N		
Timber: Where stocking levels are lower than optimum but above minimums, interplanting should be done when it is a manageable and economically feasible method to meet growth requirements.	N		
Timber: Stocking level control shall be based on Regional or local site-specific stocking guides.	N		
Timber: Stocking level control should be maintained on all acres with a programmed harvest.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Timber: Existing stands of seedlings and saplings less than 5 inches DBH may be precommercially thinned. Existing stands of poles that exceed 5 inches DBH should be planned for commercial thinning.	N		
Timber: Clearcuts may be prescribed when. 1. Regenerating shade-intolerant species and planning to reforest by natural regeneration or planting; 2. Regenerating shade-intermediate tolerance species and planning to reforest by planting; 3. Regenerating shade-intolerant species in heavily diseased or insect infested stands; or 4. Openings created in the forest do not conflict with wildlife, scenic, or other management objectives.	N		
Timber: Seed tree harvests may be prescribed when: 1. Regenerating shade-intolerant species; 2. Regenerating shade-intolerant species and planning to supplement planted stock with natural seeding of another species; 3. Regenerating shade-intolerant species where anticipated mortality will be high and supplementing planted stock to ensure adequate stocking is achieved; 4. Regenerating in areas physically unsuited for plantings such as rocky areas or areas with high potential for animal damage (also see 13-13); or 5. Openings created in the forest do not conflict with wildlife, scenic, or other management objectives.	N		
Timber: Shelterwood harvests may be prescribed when: 1. Sites need amelioration (for example, reduction in temperature extremes) for establishment of desired species. 2. Sites need to be modified to reduce the potential for animal damage or vegetative competition. 3. Scenic, wildlife, or other management objectives can best be met by delaying removal of all trees in an area.	N		
Timber: Final removal of shelter trees should occur as rapidly as possible, providing the following criteria are met: 1. Reproduction no longer requires protection of overstory shelter trees. 2. Reproduction has gone through a minimum of two growing seasons, is healthy, and meets or exceeds minimum stocking levels. 3. Removal of overstory shelter trees meets other resource objectives.	N		
Timber: Uneven-aged management shall be the preferred silvicultural system on climax ponderosa pine stands and on healthy pine associated stands.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Even-aged stands of ponderosa pine and pine associated stands should be treated to develop uneven-aged stand structures whenever possible.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Uneven-aged pine associated stands should be planted as needed to maintain at least 50 percent ponderosa pine species composition.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Uneven-aged management should be used where stands are free of dwarf mistletoe and root rots. Where stands are lightly infected, uneven-aged management shall be employed only where the dwarf mistletoe and root rot can be managed to maintain stand growth within 80 percent of its disease-free potential. Disease centers should be managed using even-aged silvicultural practices at a large enough scale to prevent reinfection from the perimeter. In stands with small scattered disease centers, group selection may be an appropriate silvicultural practice as long as the disease centers are effectively treated to prevent spread. A recordkeeping system will be developed to record the location and past treatment of known disease centers to schedule future treatments to control and to prevent the spread of the disease.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Silvicultural prescriptions should be designed to maintain or to improve the existing size class diversity and uneven-aged structure.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Group selection may be used to: treat diseased stands, convert even-aged stands to uneven-aged stand structures, and maintain or develop early successional species such as ponderosa pine in the pine associated and mixed conifer stands. Group selections shall be 0.25 acre to 2 acres in size.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Timber harvest should not occur before the stand density equals 45 percent of the maximum stand density index or 60 percent maximum basal area.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Individual tree selection shall not reduce stocking levels below 25 percent of the maximum stand density index or 45 percent maximum basal area.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Timber harvest and post-sale activities should generally be planned on a 30-year entry cycle for individual tree selection and on a 20-year cycle for group selection. All post sale activities should be completed within five years following the harvest entry.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Stands should not be salvage logged at other than the prescribed entry cycle; the exception is where wildfire, bark beetles, disease, or other conditions have created catastrophic mortality.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Timber marking guidelines should be developed which retain the most vigorous trees of best quality. First priority for leave trees are those with demonstrated good vigor. Second priority is those trees which will produce high value products in the future.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Following each commercial harvest entry, post-sale activities should emphasize natural regeneration and stocking level control. Where natural regeneration is a planned objective, post-sale activities should be closely coordinated to produce disturbance to the litter and vegetation as necessary for natural regeneration to occur.	N		

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Selection harvest units should be planted as needed to maintain stocking levels and to maintain disease-free healthy stands.	N		
Timber harvest, fuels treatment, and site preparation activities should strive not to damage residual crop trees.	N		
Stands receiving overstory removal treatments should meet or exceed minimum crop tree stocking following completion of harvest and post-sale activities.	N		
Prescriptions for regeneration harvest should feature maintenance of existing reproduction that has crop tree potential.	N		
Minimum utilization standards to be used in timber harvest operations for all commercial species shall be: (1) 9 inch DBH to a 6 inch top for regeneration harvest, (2) 7 inch DBH to a 5 inch top for commercial thinning and selection harvest, and (3) 7 inch DBH to a 4 inch top for all lodgepole pine harvest.	N		
Where individual market areas or specific products present opportunities for utilizing a higher proportion of the tree, these standards could be exceeded. In some cases, other resource objectives may require leaving a higher proportion of woody material on site. These utilization standards do not apply to materials left to meet fish, wildlife, and soil management objectives.	N		
Miscellaneous forest products such as poles, boughs, Christmas trees, and house logs should be made available to the level compatible with meeting management area objectives.	N		
Management Area 1 -Semiprimitive Recreation – Not Applicable, Excluded From Table			
Management Area 1A – Yamsay Mountain Semiprimitive Recreation Area – Not Applicable, Excluded From Table			
Management Area 1 B – Brown Mountain Semiprimitive Recreation Area – Not Applicable, Excluded From Table			
Management Area 1 C – Pelican Butte Semiprimitive Recreation Area			
Management Area 2 - Developed Recreation			
Recreation: Areas shall generally be managed to provide roaded natural or rural Recreation Opportunity Spectrum (ROS) settings	N		
Recreation: Motorized vehicles shall be restricted to designated routes and areas. Some trails or areas may be designated for nonmotorized activities only, such as hiking, biking, or cross-county skiing.	N		
Recreation: A site plan for any recreation development shall be prepared before construction. The plan shall be prepared or reviewed by a journey-level landscape architect and approved by the Forest Supervisor. 'As built' site plans for existing sites shall be prepared or updated to show current and proposed facilities.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Recreation: Developed recreation sites shall be designed, administered, and maintained to provide a quality experience for the visitor, to provide for public health and safety, to protect the site resources and facilities, and to minimize operation and maintenance costs (FSM 2330).	N		
Recreation: Existing sites should be upgraded and/or expanded to accommodate user needs before new sites are constructed. Compatible facilities and sites should be concentrated in recreation complexes to provide a variety of opportunities in one area and to minimize operating costs.	N		
Recreation: New or additional facilities to add capacity shall be planned when the average weekend use exceeds 90 percent of the designed persons-at-one-time (PAOT) of the site or when use for the managed peak use season exceeds 90 percent of the Practical Maximum Capacity.	N		
Scenic: Management activities in the environment surrounding recreation sites shall achieve the retention visual quality level, except in lodgepole pine salvage areas.	N P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.7 EIS Sec. 2.1.4 EIS Sec. 4.1.3.4 EIS Sec. 4.8.1.3 EIS Secs. 4.8.2.2 & 4.8.2.3 EIS App. F POD Att. 2 POD Att. 29 LMP Amendments WNF-1 to WNF-3
Timber: Timber harvest shall not be programmed.	N		
Timber: Timber management activities shall be utilized to maintain overall, healthy stand conditions and to maintain or to enhance recreational values in accordance with an approved vegetation management plan. Such activities within existing sites normally shall occur during non-use or low-use periods	N		
Timber: Hazardous trees or limbs will be removed before opening sites to public use.	N		
Water, Soil, and Air: Comply with State requirements in accordance with the Clean Water Act for protection of waters of the State of Oregon, including the antidegradation policy for high quality waters, through implementation of General Water Quality Best Management Practices.	N		
Water, Soil, and Air: In areas with concentrated recreation use, the percent of area impacted by detrimental soil conditions (compaction) may exceed forestwide standards. Facilities should be designed and arranged to concentrate and to direct traffic flow to reduce impacts. Site-hardening measures used should be appropriate for the designed development level.	N		
Minerals and Energy: Salable mineral material sources should not be developed.	N		
Minerals and Energy: Dead and down logs for firewood may be gathered within a recreation area or site for use in that area.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Lands: Landownership classification group 2 applies to this management area.	N		
Lands: This management area is an avoidance area for new transportation and utility corridors.	N		
Facilities: With full consideration to public safety, roads and trails shall be constructed and maintained to standards that are consistent with recreation opportunities and the level of service needed.	N P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 9 POD Att. 19 POD Att. 25
Facilities: New facilities shall be designed to blend with the natural setting and to visually complement existing structures.	N		
Protection: All wildfires shall be aggressively suppressed by using low-impact methods as much as practical. During high fire danger periods, rapid attack may be appropriate, using all available tactics to ensure public safety and to protect improvements.	N		
Protection: Fuel treatment methods that minimize adverse effects like removal and chipping shall be used within developments. Treatment normally would occur during non-use or low-use periods.	N		
Management Area 2A – Developed Recreation, Low Level Development – Not Applicable, Excluded From Table			
Management Area 2B – Developed Recreation, Moderate Level Development – Not Applicable, Excluded From Table			
Management Area 2C – Developed Recreation, High Level Development – Not Applicable, Excluded From Table			
Management Area 2D – Developed Recreation, Special-Use Permit Areas – Not Applicable, Excluded From Table			
Management Area 3 - Scenic Management			
Recreation: The area shall be managed to provide a semiprimitive or roaded natural recreation opportunity setting.	N		
Recreation: Recreation facilities may be placed in this management area, provided they are designed to achieve the visual quality objectives.	N		
Recreation: Viewshed guides shall be prepared to provide project-level direction for Forest Plan implementation. These guides shall provide guidance regarding the following elements: large trees, distinctive bark, spring and fall color, variety of tree species, shrubs and ground covers, emphasis on special landscape features, vista creation, rotation of view openings, and rehabilitation needs.	N		
Recreation: Because of existing negative visual elements like skid roads, activity residues, or cable corridors, landscapes or portions of landscapes not meeting visual quality objectives should be rehabilitated with consideration for the resource values present.	N		
Recreation: Enhancement of selected areas or views may be conducted through vegetative manipulation, landform alteration, or inclusion of structural elements when needed to achieve objectives of the management area.	N		

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Range: Structural and nonstructural range improvements shall be constructed of native materials or designed to blend with the landscape.	N		
Timber: Timber harvest shall be programmed.	N		
Timber: A mix of naturally occurring species should be maintained in regenerated harvest units in pine associated and mixed conifer working groups with emphasis on ponderosa pine, Douglas-fir, and sugar pine.	N		
Timber: Aspen, ponderosa pine, and white fir should be emphasized where they occur in predominantly lodgepole stands. Presence of ponderosa pine in ecotones should be maintained.	N		
Timber: Screening vegetation should be perpetuated for areas such as rock quarries, road cut and fill slopes, utility ways, structures, or unhealed harvest areas.	P, C, R, O	P, B, A	EIS Secs. 2.1.3.7 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1 2 & 4.8.1.3 EIS Secs. 4.8.2.2 - 4.8.2.4 EIS Sec. 4.12.2.5 POD Att. 2 LMP Amendments WNF-1 to WNF-3
Timber: Created openings shall be shaped to appear natural in the landscape.	N		
Timber: Size of timber harvest units should be in scale with the surrounding landscape character, considering distance from viewer and dispersion needs to achieve desired variety.	N		
Timber: Clumps or islands of vegetation/leave trees within natural-shaped clearcut units may be retained to reduce contrast of visual elements.	N		
Timber: Individual tree selection, group selection, or combinations of both shall be used to achieve the desired future condition in ponderosa pine and pine associated species.	N		
Timber: In ponderosa pine and pine associated species where uneven-aged management is applied, from 30 percent to 35 percent of an area shall be considered for treatment at any one time, and treatments shall be dispersed over the total area. All lands should be entered, as needed, on a 20- to 30-year cutting cycle.	N		
Timber: Management of armillana root rot in mixed conifer and mountain pine beetle in lodgepole pine should focus on long-term diversity and visual quality achievement. Consideration should be given to short-term mitigation such as design of harvest units (which includes maintenance of vegetated clumps). Some natural mortality also should be accepted until stand conversion can be implemented over time.	N		
Minerals and Energy: New salable mineral material sources should not be developed.	N		
Minerals and Energy: Existing mineral material sources should not be expanded into scenic areas.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Minerals and Energy: Existing mineral material sources shall be analyzed for short-term mitigations to achieve scenic objectives and long-term rehabilitation measures. Partial rehabilitation of a material source should be considered when that part no longer is of use for development.	N		
Minerals and Energy: Reasonable access for the exploration and/or development of locatable and leasable minerals shall be allowed but shall be highly controlled to protect scenic values.	N		
Minerals and Energy: Except for road access, surface occupancy should not be allowed.	N		
Lands: Landownership classification group 3 applies to this management area. Disposal of lands should occur only if lands of equal or higher scenic quality shall be acquired.	N		
Lands: Special-use permits shall be permitted for structures that existed before designation of lands to scenic emphasis. Rehabilitation should be emphasized for any structures that do not blend with the landscape.	N		
Lands: New special uses may be permitted when they are consistent with the management objectives and are justified through an environmental analysis.	P	P, B, A	EIS Secs. 2.1.5 & 2.1.6 EIS Sec. 2.1.3.7 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 LMP Amendments WNF-1 to WNF-4.
Lands: This management area is an avoidance area for new transportation and utility corridors.	P	P, R, A	EIS Sec. 2.1.3.7 EIS Sec. 4.1.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIs Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 LMP Amendment WNF-1
Facilities: Roads, parking lots, and other necessary facilities shall be designed to flow with the typical lines and slopes in the landscape and/or shall be screened by natural vegetation	P, R	P, B, R	EIS Secs. 2.3.2.2 & 2.3.2.3 EIS Sec. 2.4.2.3 EIS Sec. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 1 POD Att. 25
Facilities: Closed roads should appear natural with large logs and boulders partially buried to blend with the area and should be tilled and revegetated with trees, shrubs and grasses, as appropriate to the location.	N		
Management Area 3A – Scenic Management, Foreground Retention			

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Scenic: Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) will not be noticeable one year after the work has been completed.	C, R, O	B, A	EIS Sec. 2.1.3.7 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 18 POD Att. 20 LMP Amendments WNF-1 & WNF-2.
Timber: Large tree character will be perpetually retained in the foreground retention area in all species, except lodgepole pine, through maintaining three to five large diameter trees (between 30 inches and 36 inches DBH) on the average per acre. These should be distributed in groupings for greatest visual effect. Some areas may have high numbers of large diameter trees, and other areas may have fewer small clumps. Openings may or may not have mature large-diameter trees, if not, more trees will be retained on other acres to maintain the three-to-five-trees-per-acre average in the foreground overall.	P, C, R, O	P, B, A	EIS Sec. 2.3.2.1 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.1.2 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. H EIS App. J POD Att. 16 POD Att. 20 LMP Amendment WNF--2.
Timber: In ponderosa pine and pine associated areas where uneven-aged management will prevail, the objective is to achieve a healthy, multi-aged forest with timber stands that contain a variety of tree sizes up to 36 inches DBH following harvest. At least three canopy levels or size classes are present within each stand.	N		
Timber: For even-aged and group selection management, the long-term objective is to achieve the mix of tree size classes shown in Table 4-22[75].	N		
Timber: Stumps, If visible, shall be cut to approximately 6 inches or less in height on the uphill side of the stump.	C, O	B	EIS Sec. 2.4.2.1 POD Att. 1 POD Att. 9 POD Att. 20
Timber: Thinning units should be irregularly marked (vary the density of leave trees) in the immediate foreground to break up the viewing distance and to provide diversity.	N		
Timber: Landings, decks, major skid roads, temporary roads, and slash piles shall be located to utilize vegetative or landform screening opportunities. These should be located away from critical line-of-sight viewing areas.	P	P, R	EIS Sec. 2.4.2.1 EIS Secs. 4.8.1.3 & 4.8.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 1 POD Att. 9 POD Att. 20 POD Att. 25

[75] Table 4-22: Scenic Foreground Retention Tree Size Class Objectives: Even-Aged and Group Selection Management Strategies, Winema Land and Resource Management Plan

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Protection: Fire suppression efforts in the immediate foreground should use low-impact methods. If heavy equipment is needed on high-intensity fires, rehabilitation may be needed to mitigate the effect on the visual resource.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. 9 POD Att. 11
Protection: Harvest residues resulting from management activities should not be evident after residues treatment.	C, R, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. 1 POD Att. 9 POD Att. 20
Management Area 3B – Scenic Management, Foreground Partial Retention			
Scenic: Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) should not be noticeable from two to three years after the work has been completed.	C, R, O	B, A	EIS Sec. 2.1.3.7 EIS Sec. 2.4.2.1 EIS Sec. 4.1.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. 1 POD Att. 9 POD Att. 18 POD Att. 20 LMP Amendment WNF-3
Timber: Large tree character will be retained in the foreground area in all species, except lodgepole pine, through maintaining three to five large diameter trees (between 24 inches and 30 inches DBH) on the average per acre. These should be distributed in groupings for greatest visual effect. Some areas may have high numbers of large diameter trees, and other areas may have fewer small clumps. Openings may or may not have mature large diameter trees; if not, more trees will be retained on other acres to maintain the three-to-five trees-per-acre average in the foreground overall.	P, C, R, O	P, B, A	EIS Sec. 2.3.2.1 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.5.1.2 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. H EIS App. J POD Att. 9 POD Att. 16 POD Att. 20 LMP Amendment WNF-3
Timber: In ponderosa pine and pine associated areas where uneven-aged management will prevail, the objective is to achieve a healthy, multi-aged forest with timber stands that contain a variety of size classes up to 30 inches DBH following harvest. At least three canopy levels or size classes are present within each stand.	N		
Timber: For even-aged and group selection management, the long-term objective is to achieve the mix of tree size classes shown in Table 4-24[76].	N		
Timber: Stumps, if visible, shall be cut to approximately 6 inches or less in height on the uphill side of the tree.	Yes? C, O	B	EIS Sec. 2.4.2.1 POD Att. 1 POD Att. 9 POD Att. 20
Timber: Thinning units should be irregularly marked (vary the density of leave trees) in the immediate foreground to break up the viewing distance and to provide diversity.	N		

[76] Table 4-24: Scenic Foreground Partial Retention Tree Size Class Objectives: Even-Aged and Group Selection Management Strategies, Winema Land and Resource Management Plan

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Timber: Landings, decks, major skid roads, temporary roads, and slash piles should be located to the rear of the stands to use vegetative or landform screening opportunities. These should be located away from critical line-of-sight viewing areas.	P	P, R	EIS Sec. 2.4.2.1 EIS Secs. 4.8.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. 1 POD Att. 9 POD Att. 20 POD Att. 25
Protection: Harvest residues resulting from stand management activities may be evident but should blend, where possible, with the surrounding landscape characteristics.	C, R, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. 1 POD Att. 9 POD Att. 20
Protection: Hand tools are the preferred method for fire suppression in the immediate foreground. Mitigation or rehabilitation measures may be necessary for high-intensity fires.	P, C, R, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. 9 POD Att. 11
Management Area 3C – Scenic Management, Middleground Partial Retention – Not Applicable, Excluded From Table			
Management Area 4 - Unique Management Areas – Not Applicable, Excluded From Table			
Management Intensity 4A – The Pinnacles and Devils Garden Geologic Areas – Not Applicable, Excluded From Table			
Management Intensity 4B - Mare's Egg Spring Botanical Area – Not Applicable, Excluded From Table			
Management Intensity 4C – Williamson River Gorge Scenic Area – Not Applicable, Excluded From Table			
Management Area 5 - Sycan National Wild and Scenic River – Not Applicable, Excluded From Table			
Management Area 6 – Wilderness – Not Applicable, Excluded From Table			
Management Area 6A – Mount Thielsen Wilderness – Not Applicable, Excluded From Table			
Management Area 6B – Sky Lakes Wilderness – Not Applicable, Excluded From Table			
Management Area 6C – Mountain Lakes Wilderness – Not Applicable, Excluded From Table			
Management Area 7 – Old-Growth Ecosystems – Not Applicable, Excluded From Table			
Management Area 8 - Riparian Areas			
Recreation: The area shall be managed for a full range of recreation opportunity settings.	N		
Recreation: Primary recreation emphasis shall be placed in dispersed recreation.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Recreation: The visual quality level shall be consistent with adjacent area objectives, and typically will be partial retention or better as a result of other riparian area standards and guidelines.	N		
Recreation: Recreation facilities placed in riparian areas shall be designed to protect riparian values.	N		
Wildlife and Fish: Dead woody material and cavity-nester habitat shall be provided by managing dead trees at the 80 percent potential population level for cavity nesters (Thomas 1979) in forested areas Green trees shall be managed for future replacements for dead trees.	N?		
Wildlife and Fish: New roads within 0.25 mile of a riparian area shall be located in a manner as to provide for greatest topographic and vegetative screening of the riparian area.	P	P, R	Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.1.3.5 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 1 POD Att. 25
Wildlife and Fish: Wildlife habitat improvements may be permitted.	P, R	P, M	EIS Sec. 2.1.4 EIS Secs. 4.1.3.5 & 4.1.3.6 EIS Sec. 4.6.1.3 EIS App. F EIS App. H EIS App. J POD Att. 29
Range: Where a combination of high soil moisture and fine soil texture results in stream banks susceptible to early season trampling damage, grazing shall be delayed to a late season period (Claly and Webster 1989).	N		
Range: Where stream banks or channels are highly erodible, the stubble height at the end of the grazing period shall exceed 4 inches. Under extreme conditions, the area may need permanent protection or removal of grazing for long periods (Claly and Webster 1989).	N		
Range: Water developments for livestock or wildlife in riparian areas shall be designed to protect riparian values.	N		
Range: Salting areas shall be located on uplands outside of riparian areas.	N		
Range: Sheep bedding areas shall be located on uplands outside of riparian areas.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Soil and Water: Riparian area management objectives shall be described for a specific zone along a stream or wetland within the proposed project area. As a minimum, the following areas shall be evaluated during the preparation of the objectives: 1. an area within 100 feet of the normal high water line of Class I, II, or 111 streams (for protection of water quality and wildlife habitat); 2. an area within 25 feet on each side of Class IV streams; 3. any timbered area within 200 feet of wet meadows (to provide wildlife hiding cover); 4. the entire area of a wetland, including the farthest reaches of the riparian vegetative influence; and 5. any seeps and springs	P	P	EIS Sec. 4.1.3.5 EIS Secs. 4.4.1.2, 4.4.2.2 & 4.4.3.2 EIS Secs. 4.6.1.3 & 4.6.2.4 EIS App. J
Soil and Water: The cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil.	P, C, R, O	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.7 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.4 EIS Secs. 4.3.3.1 & 4.3.3.2 EIS Sec. 4.14.2.3 EIS Secs. 4.14.3.1 & 4.14.3.4 POD Att. 9 LMP Amendment WNF-5
Soil and Water: Fish habitat and riparian area improvement projects shall be permitted.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F EIS App. J POD Att. 29
Timber: Timber harvest shall not be programmed within 100 feet of Class I and II streams and within 50 feet of Class III streams. In other riparian areas, timber harvest shall be programmed.	N		
Timber: Stocking level control may be delayed If necessary to provide big game cover or habitat diversity.	N		
Timber: Directional fell and yard away from all stream channels (classes I-IV) and wet areas. Logs yarded over streams shall be fully suspended where practicable.	N		
Timber: Landings should not be located within riparian associations as defined by 'Riparian Zone Associations' (R6 Ecol TP-279-87, Kovalchik).	N		
Timber: Uneven-aged management in the ponderosa pine, pine associated, and mixed conifer working groups shall be designed to maintain healthy, multistoried stands that contain various size classes up to 36 inches DEH following harvest. The lodgepole pine working group shall receive a variety of silvicultural treatments to meet the management area objectives.	N		
Timber: Existing stands of hardwood species should be protected or enhanced.	N		

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Minerals and Energy: New salable mineral material sources should not be developed, and existing developments should not be expanded into riparian areas.	N		
Minerals and Energy: Reasonable access for the exploration and/or development of locatable and leasable minerals shall be allowed but shall be highly controlled to protect riparian values.	N		
Minerals and Energy: Except for road access, surface occupancy should not be allowed.	N		
Lands: Landownership classification group III applies to this management area. Disposal of lands shall occur only if riparian lands of equal or higher quality shall be acquired.	N		
Facilities: New road construction in riparian areas should be avoided. Where road construction is unavoidable, roads should cross riparian areas perpendicular to the landform. System and temporary roads should not be constructed through the length of a riparian area System and temporary roads crossing a riparian area shall not alter stream or ground water flow characteristics to a degree that will adversely affect the riparian characteristics.	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. J POD Att. 9 POD Att. 25 POD Att. 28
Facilities: Existing roads within riparian areas should be evaluated for opportunities to reduce impacts on riparian values.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Facilities: New water developments and reconstruction of developments for road dust abatement and fire control, for example, in riparian areas shall be designed to protect riparian values.	P	P	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.1.3.5 EIS Sec. 4.10.2.6 EIS App. J POD Att. 2 POD Att. 9 POD Att. 28
Protection: Wildfire suppression methods that minimize effects on the soil and on riparian ecosystems shall be used. High-impact methods shall be used only on fires that threaten human life and property and riparian resources.	N		
Management Area 8A – Riparian Areas Adjacent to Class I, II, and III Streams			
Recreation: Vehicles, including off-road vehicles, shall not be allowed in stream channels or on sensitive stream banks.	N		
Wildlife and Fish: Water use during low water periods shall be limited to emergency fire suppression situations only.	P, C, O	P, B	EIS Sec. 2.4.2.2 POD Att. 2 POD Att. 13

TABLE E-7

Winema Management Actions/Direction – 1995

Element	Applicable	Consistency	Comment
Wildlife and Fish: Fish habitat improvements may be permitted but must be coordinated with range, watershed, and recreation resources, and the Oregon Department of Fish and Wildlife.	P, R	P, M	EIS Sec.1.5.1 EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Wildlife and Fish: Shrubs and trees shall be managed to maintain at least 50 percent of the riparian area in hiding cover for big game.	N		
Wildlife and Fish: Wildlife improvements encouraging streamside cover may be permitted.	P, R	P, M	EIS Sec. 2.1.4 EIS Sec. 4.1.3.5 EIS App. F EIS App. J POD Att. 29
Wildlife and Fish: Reservoirs may be planned for fisheries and other compatible uses where feasible.	N		
Range: Livestock shall be managed so that no more than 5 percent of the stream banks in a stream reach (see glossary) exhibit degradation caused or perpetuated by livestock.	N		
Timber: All logging slash/residue shall be removed from within the high water level. Large logs may be left or introduced as large woody debris.	N		
Timber: Created openings, which may be necessary to treat lodgepole pine, shall not occur directly across a stream from an existing opening. Openings shall not encompass more than 600 feet of a stream length.	N		
Timber: Selected hardwoods or conifer trees adjacent to the stream channel shall be retained.	N		
Facilities: To provide for fish passage, arch culverts, bridges, or similar open bottom structures should be required on permanent road crossings on all Class I and II perennial streams.	N		
Protection: Heavy equipment generally shall not be allowed in stream channels. Based on resource analysis, exceptions such as dry crossings or fords may be allowed upon approval of appropriate line officer or designated resource adviser.	N		
Protection: Fuels shall be disposed of so that they will not reach stream courses. Slash piles shall not be located within the normal high-water flow area of either natural or created drainages.	N		
Protection: Only low intensity fire should be prescribed within 100 feet horizontal distance on either side of Class I, 11, or III stream channels.	N		
Management Area 8B – Riparian Areas Adjacent to Class IV Streams – Not Applicable, Excluded From Table			
Management Area 8C – Moist and Wet Meadows – Not Applicable, Excluded From Table			

TABLE E-7 **Winema Management Actions/Direction – 1995**			
Element	**Applicable**	**Consistency**	**Comment**
Management Area 8D - Moist and Wet Forested Riparian Areas (Hardwood, Lodgepole, or Other Conifer) – Not Applicable, Excluded From Table			
Management Area 9 – Bald Eagle Habitat – Not Applicable, Excluded From Table			
Management Area 9A – Bald Eagle Nest Sites and Recovery Sites – Not Applicable, Excluded From Table			
Management Area 9B – Bald Eagle Replacement Habitat – Not Applicable, Excluded From Table			
Management Area 9C – Bald Eagle Winter Roosting Habitat – Not Applicable, Excluded From Table			
Management Area 10 – Big Game Winter Range – Not Applicable, Excluded From Table			
Management Area 12 - Timber Production – Not Applicable, Excluded From Table			
Management Area 13 - Research Natural Areas– Not Applicable, Excluded From Table			
Management Area 14 - Minimum Management – Not Applicable, Excluded From Table			
Management Area 15 - Upper Williamson – Not Applicable, Excluded From Table			

APPENDIX F

BLM and Forest Service Compensatory Mitigation Plan

Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

Draft EIS

Appendix F

BLM and Forest Service Compensatory Mitigation Plan

Pacific Connector Gas Pipeline

Coos Bay, Roseburg, and Medford Districts and Klamath Falls Resource Area, Lakeview District, BLM Oregon; Umpqua, Rogue River, and Winema National Forests

Prepared for:

USDI Bureau of Land Management

USDA Forest Service

Prepared by:

North State Resources

Table of Contents

1.0 INTRODUCTION AND BACKGROUND 1

2.0 SUMMARY OF MITIGATION ACTIONS BY MITIGATION GROUP AND PROJECT TYPE 5

3.0 DESCRIPTION OF PROPOSED BLM MITIGATION ACTIONS BY FIFTH-FIELD WATERSHED 17

4.0 DESCRIPTION OF PROPOSED FOREST SERVICE MITIGATION ACTIONS BY FIFTH-FIELD WATERSHED 61

5.0 SUMMARY OF TOTAL MITIGATION IN FIFTH-FIELD WATERSHEDS WHERE BOTH THE BLM AND FOREST SERVICE PROPOSE MITIGATION ACTIONS 101

6.0 MAPS OF MITIGATION ACTIONS FOR EACH ADMINISTRATIVE UNIT OF THE BLM AND FOREST SERVICE 112

7.0 REFERENCES 122

8.0 ATTACHMENTS 123

Attachments

Attachment 1. BLM Mitigation Summary v.2

Attachment 2. FS Supplemental Mitigation Report 3_1_11v12

Tables

TABLE 2.1 **Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type** 6

TABLE 3-1a **Mitigation Actions Proposed in the North Fork Coquille Watershed on the BLM Coos Bay District** 17

TABLE 3-1b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 18

TABLE 3-2a **Mitigation Actions Proposed in the East Fork Coquille River Watershed on the BLM Coos Bay District** 20

TABLE 3-2b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 21

TABLE 3-3a **Mitigation Actions Proposed in the Middle Fork Coquille River Watershed on the BLM Coos Bay and Roseburg Districts** 24

TABLE 3-3b **Comparison of PCGP Impacts and Offsite Mitigation Actions** a/ b/ 26

TABLE 3-4a **Mitigation Actions Proposed in the Olalla-Lookingglass Watershed on the BLM Roseburg District** 29

TABLE 3-4b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 30

TABLE 3-5a **Mitigation Actions Proposed in the Clark Branch South Umpqua Watershed on the BLM Roseburg District** 32

TABLE 3-5b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 33
TABLE 3-6a **Mitigation Actions Proposed in the Myrtle Creek Watershed on the BLM Roseburg District** 34
TABLE 3-6b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 35
TABLE 3-7a **Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the BLM Roseburg District** 37
TABLE 3-7b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 40
TABLE 3-8a **Mitigation Actions Proposed in the Trail Creek Watershed on the BLM Medford District** 42
TABLE 3-8b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 44
TABLE 3-9a **Mitigation Actions Proposed in the Shady Cove-Rogue River Watershed on the BLM Medford District** 46
TABLE 3-9b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 47
TABLE 3-10a **Mitigation Actions Proposed in the Big Butte Creek Watershed on the BLM Medford District** 49
TABLE 3-10b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 49
TABLE 3-11a **Mitigation Actions Proposed in the Little Butte Creek Watershed on the BLM Medford District** 51
TABLE 3-11b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 53
TABLE 3-12a **Mitigation Actions Proposed in the Spencer Creek Watershed on the BLM Lakeview District** 55
TABLE 3-12b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 57
TABLE 4-1a **Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the Umpqua NF** 61
TABLE 4-1b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 66
TABLE 4-2a **Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF** 68
TABLE 4-2b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 75
TABLE 4-3a **Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF** 77
TABLE 4-3b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 83
TABLE 4-4a **Mitigation Actions Proposed in the Trail Creek Watershed on the Umpqua NF** 85
TABLE 4-4b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 88
TABLE 4-5 **Mitigation Actions Proposed in the Big Butte Creek Watershed on the Rogue River NF** 89
TABLE 4-6a **Mitigation Actions Proposed in the Little Butte Creek Watershed on the Rogue River NF** 89
TABLE 4-6b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 93

TABLE 4-7a **Mitigation Actions Proposed in the Spencer Creek Watershed on the Winema NF** 95

TABLE 4-7b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 98

TABLE 5-1a **Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the BLM Roseburg District and the Umpqua NF** 101

TABLE 5-1b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 102

TABLE 5-2a **Mitigation Actions Proposed in the Trail Creek Watershed on the BLM Medford District and the Umpqua NF** 104

TABLE 5-2b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 104

TABLE 5-3a **Mitigation Actions Proposed in the Little Butte Creek Watershed on the BLM Medford District and the Rogue River NF** 106

TABLE 5-3b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 107

TABLE 5-4a **Mitigation Actions Proposed in the Spencer Creek Watershed on the BLM Lakeview District and the Winema NF** 109

TABLE 5-4b **Comparison of PCGP Impacts and Offsite Mitigation Actions** 110

Figures and Maps

Figure 3-1a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the North Fork Coquille River Watershed 18

Figure 3-1b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the North Fork Coquille River Watershed 19

Figure 3-2a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the East Fork Coquille River Watershed 22

Figure 3-2b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the East Fork Coquille River Watershed 22

Figure 3-2c. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR in the East Fork Coquille River Watershed 23

Figure 3-3a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Middle Fork Coquille River Watershed 27

Figure 3-3b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Middle Fork Coquille Watershed 28

Figure 3-3c. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR in the Middle Fork Coquille Watershed 28

Figure 3-4a. Comparison of PCGP Impacts and Offsite Mitigation in the Olalla-Lookingglass Watershed 30

Figure 3-4b. Comparison of PCGP Impacts and Offsite Mitigation in LSR in the Olalla-Lookingglass Watershed 31

Figure 3-5. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Clarks Branch South Umpqua Watershed 33

Figure 3-6a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Myrtle Creek Watershed 35
Figure 3-6b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Myrtle Creek Watershed 36
Figure 3-7a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Days Creek South Umpqua Watershed 40
Figure 3-7b. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR in the Days Creek South Umpqua Watershed 41
Figure 3-8a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Trail Creek Watershed 45
Figure 3-8b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Trail Creek Watershed 45
Figure 3-9a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Shady Cove Rogue River Watershed 48
Figure 3-9b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Shady Cove Rogue River Watershed 48
Figure 3-10a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Big Butte Creek Watershed 50
Figure 3-10b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Big Butte Creek Watershed 50
Figure 3-11a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Little Butte Creek Watershed 53
Figure 3-11b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Little Butte Creek Watershed 54
Figure 3-12a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Spencer Creek Watershed 58
Figure 3-12b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian reserves in the Spencer Creek Watershed 59
Figure 4-1a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Days Creek South Umpqua Watershed 66
Figure 4-1b. Comparison of PCGP Impacts and Offsite Mitigation Actions within LSR in the Days Creek South Umpqua Watershed 67
Figure 4-2a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Elk Creek South Umpqua Watershed 75
Figure 4-2b. Comparison of PCGP Impacts and Offsite Mitigation Actions within LSR in the Elk Creek South Umpqua Watershed 76
Figure 4-3a. Comparison of PCGP Impacts and Offsite Aquatic Mitigation Actions in the Upper Cow Creek Watershed 83
Figure 4-3b. Comparison of PCGP Impacts and Offsite Mitigation Actions within LSR in the Upper Cow Creek Watershed 84

Figure 4-4. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Trail Creek watershed 88
Figure 4-6a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Little Butte Creek Watershed 93
Figure 4-6b. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR within the Little Butte Creek Watershed 94
Figure 4-6c. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves within the Little Butte Creek Watershed 94
Figure 4-7a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Spencer Creek Watershed 98
Figure 4-7b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Spencer Creek Watershed 99
Figure 5-1a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Days Creek South Umpqua Watershed 102
Figure 5-1b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in LSR in the Days Creek South Umpqua Watershed 103
Figure 5-1c. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Days Creek South Umpqua Watershed 103
Figure 5-2a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Trail Creek Watershed 105
Figure 5-2b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Trail Creek Watershed 105
Figure 5-3a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Little Butte Creek Watershed 107
Figure 5-3b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in LSR in the Little Butte Creek Watershed 108
Figure 5-3c. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Little Butte Creek Watershed 108
Figure 5-4a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Spencer Creek Watershed 110
Figure 5-4b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Spencer Creek Watershed 111
Figure 6-1. Map of Mitigation Actions on the BLM Coos Bay District 113
Figure 6-2. Map of Mitigation Actions on the BLM Roseburg District 114
Figure 6-3. Map of Mitigation Actions on the BLM Medford District 115
Figure 6-4. Map of Mitigation Actions on the BLM Lakeview District 116
Figure 6-5. Map of Mitigation Actions on the Umpqua National Forest 117
Figure 6-6. Map of Snag Creation Mitigation Actions on the Umpqua National Forest 118
Figure 6-7. Map of Mitigation Actions on the Rogue River National Forest 119
Figure 6-8. Map of Mitigation Actions on the Winema National Forest 120

Figure 6-9. Map of Visual Mitigation Actions on the Winema National Forest..... 121

1.0 INTRODUCTION AND BACKGROUND

BLM and Forest Service interdisciplinary teams have developed compensatory mitigation plans (CMP) for the PCGP Project specific to the BLM (four BLM districts) and the Forest Service (three national forests). The CMPs are based on the respective Land Management Plans (LMP), the recommendations of the 2008 and draft (2010) northern spotted owl (NSO) recovery plans, applicable Late Successional Reserve Assessments (LSRA) and 5th field Watershed Analyses (WA) for watersheds where impacts of the PCGP Project would occur. Members of the interagency team used common sense, professional judgment and knowledge of the affected landscapes to develop the mitigation actions described in this appendix. The CMPs discussed in this appendix are based on previous versions that were developed by the BLM and Forest Service and essentially the same as those described in section 2.1.4 of the DEIS.[1] These previous versions are included in this appendix as Attachments 1 and 2. They have been included because they provide a history of the development of the mitigation actions, summaries of the conditions and issues in each of the affected watersheds, and the strategy and rationale that were used in developing the actions. A central provision of the BLM and Forest Service mitigation plan is that it is to remain adaptable to new information and changed conditions.

This appendix is organized by landscapes (i.e., watersheds); central themes emerged on each landscape that drove the design of mitigation actions.

On the BLM Coos Bay District in the watersheds of the North Fork, East Fork, and Middle Fork Coquille Rivers current conditions include high road densities, sediment delivery to stream systems from roads, and high stream temperatures. Conditions also include the threat of stand replacing fire in Late-Successional Reserve (LSR) 261, fragmented habitats, and blockages of fish passage by roads and loss of pool habitat for over wintering juvenile salmonids. Desired conditions include reduced risk of stand-replacement fire in Late-Successional and Old Growth (LSOG) forest habitats, and achievement of Aquatic Conservation Strategy (ACS) objectives, (USDA FS; USDI BLM 1994b; USDA FS; USDI BLM et.al. 1998b). Mitigation actions are intended to reduce the risk of catastrophic fire by increasing available water sources, improve fish habitat through culvert removal and adding large woody debris (LWD) to streams, and reduce road-related sediment delivery to streams through road surfacing and storm proofing. Additional information on watershed conditions and the development of mitigation actions on the Coos Bay District is included in Attachment 1 of this appendix.

On the BLM Roseburg District in the watersheds of Olalla-Lookingglass, Myrtle Creek, and South Umpqua River current conditions include high road densities, sediment delivery to stream systems from roads, and high stream temperatures. Current conditions also include the threat of stand replacing fire in LSR 223, fragmentation from past logging, blockages of fish passage by roads and loss of pool habitat for over wintering juvenile salmonids. Desired conditions include reduced risk of stand-replacement fire in LSOG habitats, and achievement of ACS objectives, (USDA FS; USDI BLM 1994b; USDA FS; USDI BLM 1999). Mitigation actions are intended

[1] The Forest Service March 2011 mitigation summary was based on the previous filing by the applicant for an LNG import facility. However since the proposed pipeline location is essentially the same as previously filed, the proposed mitigation actions have not changed. The BLM March 2012 mitigation summary is based on the proposed export facility filed by the applicant in 2011 and also has not changed. The acres and miles of the PCGP Project listed in the reports for each watershed may be slightly different than listed in Chapter 2 of the DEIS since some minor variations were made to the proposed route in the 2013 filing.

to reduce the risk of catastrophic fire through fuel hazard reduction, improve fish habitat through culvert removal and adding LWD to streams, and reduce road-related sediment delivery to streams through road surfacing, storm-proofing, and drainage repair. Additional information on watershed conditions and the development of mitigation actions on the Roseburg District is included in Attachment 1 of this appendix.

On the BLM Medford District in the watersheds of Trail Creek, Shady Cove-Rogue River, Big Butte Creek and Little Butte Creek current conditions include high road densities, sediment delivery to stream systems from roads, and high stream temperatures (Little Butte Creek). Little Butte Creek is a Tier 1 Key Watershed. Current conditions also include the threat of stand replacing fire in LSOG habitat, fragmentation from past logging, and the lack of LWD in streams. Desired conditions include reduced risk of stand-replacement fire in LSOG habitats, and achievement of ACS objectives, (USDA FS; USDI BLM 1994b). Mitigation actions are intended to reduce the risk of catastrophic fire through fuel hazard reduction and improved water sources, improve fish habitat through adding LWD to streams, and reduce road-related sediment delivery to streams through road surfacing, storm proofing, and drainage repair. Additional information on watershed conditions and the development of mitigation actions on the Medford District is included in Attachment 1 of this appendix.

On the BLM Lakeview District in the Spencer Creek Watershed current conditions include sediment delivery to stream systems from roads, and high stream temperatures. Current conditions in this Tier 1 Key Watershed also include the threat of stand replacing fire in LSOG habitat and riparian reserves, and fragmentation from past logging. Desired conditions include reduced risk of stand-replacement fire in LSOG habitats, and achievement of ACS objectives, (USDA FS; USDI BLM 1994b). Mitigation actions are intended to reduce the risk of catastrophic fire through fuel hazard reduction, improve riparian habitat through riparian thinning, and reduce road-related sediment delivery to streams through road closures and drainage repair. Additional information on watershed conditions and the development of mitigation actions on the Lakeview District is included in Attachment 1 of this appendix.

On the Rogue River National Forest (NF) in the watershed of Little Butte Creek, a Tier 1 Key Watershed that also includes part of LSR 227, current conditions include high road densities, high stand densities, sediment delivery to stream systems from roads and high stream temperatures (USDA FS; USDI BLM 1997; USDA FS; USDI BLM; USDI FWS 1998a). Desired conditions include reduced stand densities, development of late-successional stand characteristics in LSR 227 and achievement of ACS objectives (USDA-FS: RRNF LRMP 1990; USDA FS; USDI BLM 1994b). Mitigations actions in the Little Butte Creek watershed are intended to reduce road densities by decommissioning roads, accelerate the development of interior stand conditions, and restore LSOG stand characteristics and aquatic systems. Additional information on watershed conditions and the development of mitigation actions on the Rogue River NF is included in Attachment 2 of this appendix.

On the Umpqua NF in the watersheds of East Fork Cow Creek, Elk Creek and Trail Creek including portions of LSR 223, current conditions include high stand densities and the threat of stand replacing fire in LSR 223, fragmented habitats, sediment delivery to stream systems from roads, blockages of fish passage by roads and the presence of non-native invasive species (UNF 1995; UNF 1995b; USDA FS; USDI BLM; USDI FWS 1999). Desired conditions include reduced risk of stand-replacement fire in LSOG habitats, reduction of fragmentation, restoration

of native species, and achievement of ACS objectives (USDA-FS: UNF LRMP 1990; USDA FS; USDI BLM 1994b; UNF 1995; UNF 1995b; USDA FS; USDI BLM; 1999). Mitigation actions are intended to reduce the risk of catastrophic fire by integrated stand density reduction and fuels management projects that build off of the Project corridor, provide fish passage at key stream crossings, restore native plant species by eliminating non-native invasive species, and reduce road-related sediment delivery to streams. Additional information on watershed conditions and the development of mitigation actions on the Umpqua NF is included in Attachment 2 of this appendix.

On the Winema NF in Spencer Creek, a Tier 1 Key Watershed, current conditions include high road densities, sediment in streams and high stream temperatures (USDA FS WNF 1995 Executive Summary). Desired conditions include reduced road densities and achievement of Aquatic Conservation Strategy (ACS) objectives (USDA-FS_WNF_LRMP 1990; USDA FS; USDI BLM 1994b). The primary objective of proposed mitigation actions is to improve aquatic conditions in the Spencer Creek watershed by decommissioning roads and restoring aquatic habitats. Riparian plantings and in-stream log placement are also planned to further reduce sediment and stream temperature. Additional information on watershed conditions and the development of mitigation actions on the Winema NF is included in Attachment 2 of this appendix.

Proposed mitigation actions are intended to be responsive to LMP objectives that include:

- Compliance with the ACS as specified in the respective LMPs
- Habitat for Threatened or Endangered (T&E) species including NSO, marbled murrelets (MAMU) and Coho salmon
- Mitigation of impacts on LSRs
- Specific resource issues as they occur by watershed

Offsite mitigation is a supplemental mitigation to address important issues or LMP objectives/management direction/standards and guidelines that cannot be acceptably mitigated on-site.

Section 2 of this appendix summarizes the different types of mitigation actions being proposed, the rationale for the actions, and the short-term adverse and long-term beneficial environmental consequences. Sections 3 and 4 describe the proposed actions for each administrative unit and fifth-field watershed. Section 5 summarizes the proposed mitigation actions in watersheds where both the BLM and Forest Service are proposing actions. Section 6 contains maps of the proposed mitigation actions by administrative unit. Section 7 contains a list of references.

This page intentionally left blank.

2.0 SUMMARY OF MITIGATION ACTIONS BY MITIGATION GROUP AND PROJECT TYPE

Table 2-1 summarizes all of the compensatory mitigation actions proposed by the BLM and Forest Service for the Project. The actions are summarized by Mitigation Group and Project Type. The table also provides an estimated amount of each Project Type along with the rationale for the projects and a brief discussion of potential short-term adverse impacts and long-term benefits. Each Project Type is only listed once even though some Project Types could fit into more than one Mitigation Group. For example, the Riparian Vegetation Fuels Reduction Project Type, which is in the Stand Density and Fuels Reduction and Fuel Break Mitigation Group, could also have been included in the Aquatic and Riparian Habitat Mitigation Group. The Project Types were only listed once in order to avoid confusion and double counting of mitigation actions. In placing the Project Types into a Mitigation Group, the main objective of the Project Type was the determining factor.

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
Aquatic and Riparian Habitat			The Project will remove riparian vegetation and cross streams. Aquatic restorations are aimed accomplishing objectives of the ACS and offsetting project impacts at the watershed scale. Proposed projects are located in the fifth-field watersheds affected by the Project, but because of the checkerboard nature of BLM lands, feasible projects may not be located in the same sub-watersheds as the PCGP Project.	
	Large Woody Debris (LWD) In-stream	29.76 Miles	Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010) This is responsive to ACS objectives 2, 3, 4 and 5.	**Short-term adverse effects**: In-stream LWD refers to logs (typically greater than 20 inches in diameter), limbs, or root wads that intrude into a stream channel. Placing this material in-stream can be accomplished with ground equipment such as excavators and/or helicopters. These activities have the potential to increase suspended sediment in streams and impact riparian vegetation as a result of heavy equipment use or the dragging of materials (e.g. logs) in the stream channel. Short-term impacts to water quality would occur in the form of suspended sediment and turbidity increases during implementation. However, no lasting measureable effect to water quality would occur, as any sediment plume created, would quickly dissipate as soon as in-stream activities stop. In-stream work is done during summer low flow periods when turbidity plumes are an infrequently occurring event. Project design features (PDF) would include Best Management Practices (BMP) that would prevent any indirect effects to salmonids and other stream fish from project related sediment. The placement of restoration materials in the stream by using cable systems, excavators, or helicopters would create noise that could disturb both the NSO and MAMUs. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for both these species. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects**: Placing structure in streams affects channel morphology, the routing and storage of water and sediment, and provides structure and complexity to stream systems. Complex pools and side channels created by LWD provide overwintering habitat to stream salmonids and other aquatic organisms (Solazzi 2000). They also provide cover from predators during summer low flow periods when predation is at its highest. Providing more stream channel structure results in better over wintering habitat, improved summer pool habitat, and more abundant spawning gravels.

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
	Fish Passage	14 Projects	Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS Objectives 1, 2, 3 and 9 (USDA FS; USDI BLM 2012).	**Short-term adverse effects**: Removing old culverts and restoring stream/road crossings would result in short-term adverse effects similar to the effects described previously for in-stream LWD projects; both actions involve the use of heavy equipment in and around the stream channel. Similarly the work would be done during low summer flow periods to minimize impacts to aquatic species and PDFs would be designed to minimize disturbance for NSO and MAMU. **Long-term beneficial effects**: Stream crossing replacement would directly improve stream connectivity and habitat for aquatic species by immediately restoring access to formerly inaccessible habitats. Indirectly, these projects would reduce potential sediment levels in the long-term by decreasing the potential for road failure. Stream crossing projects also reduce stream velocities by increasing stream crossing sizes, eliminating flow restrictions and allowing passage to additional reaches of habitat by removing barriers to aquatic species which improves access to spawning and rearing habitat and allows unrestricted movement throughout stream reaches during seasonal changes in water levels (Hoffman 2007).
	Stream / Road Crossings	58 Sites	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which will help offset the impact of shade removal at pipeline crossings. This work is typically accomplished in association with road decommissioning.	
	Riparian Planting	0.5 Miles	Riparian planting reestablishes willows and other riparian vegetation in areas where prior land use has removed existing vegetation. Riparian plantings reestablish shade, increase bank stability and, over time, contribute to restored riparian plan plant communities.	**Short-term adverse effects**: Riparian planting and fencing are typically done by hand and as such would not measurably impact stream sedimentation of erosion, riparian vegetation, water quality, aquatic habitats or any T&E species. Riparian fencing may require vegetation removal along the fence line but would not adversely affect water quality, channel substrate or bank conditions. **Long-term beneficial effects**: These projects directly affect riparian vegetation and would increase the health of riparian areas by promoting species diversity. Planting riparian vegetation decreases areas of bare soil and provides a sediment filtering buffer. A diverse native riparian plant community consisting of annuals, perennials, woody shrubs, and trees, provides a large variety of habitat features including food sources, shade, and large wood, and rooting depths which provide stream bank stability. Diverse, healthy vegetation has a major influence on stream channel shape and size; well-vegetated streams tend to be narrow and deep due to the binding nature of plants and their root systems (Comfort 2005). Excluding livestock access from the stream channel and riparian
	Fencing	6.4 Miles	Fencing restricts cattle grazing in sensitive riparian ecosystems. This allows riparian vegetation to be reestablished and eliminates hoof damage to stream banks.	

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
				area would improve ecological conditions within the riparian areas. Livestock tend to congregate in riparian areas due to the presence of water and green vegetation and cooler temperatures throughout the drier months. Livestock trample and graze riparian vegetation, resulting in stream bank erosion and loss of biological diversity (Belsky 1999). Excluding livestock from the riparian area would allow vegetation to reestablish and increase the likelihood of success of native shrub and tree plantings (Sarr 2002).
Road Sediment Reduction			The Project may cause sediment transport from construction clearing and use of roads by the Project. Road sediment reduction projects are aimed at reducing the chronic contributions of fine-grained sediment from road surfaces and fill failures to stream systems.	
Road Sediment Reduction	Road Decommis-sioning	98.46 Miles	Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning will increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project occur. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (USDA FS; USDI BLM 1994b: p. B-11, C-7).	**Short-term adverse effects:** Road decommissioning methods generally include actions utilizing mechanized construction equipment to physically stabilize the road prism, restore natural drainage patterns, and allow for revegetation of the roadbed. Mechanized construction equipment might include excavators, backhoes and truck mounted loaders. Road closure is a method of preventing access to a road so that regular maintenance is no longer needed and future erosion is largely prevented by restoring drainage patterns if necessary and eliminating road traffic. Road Decommissioning has the potential to cause short-term degradation of water quality by increasing sediment delivery to streams as roads are de-compacted by heavy equipment, culverts and cross drains are removed, and other restoration activities are implemented. The use of heavy mechanized equipment near streams could disturb the stream influence zone, deliver sediment, create turbidity, and cause stream bank erosion. There is also the potential of an accidental fuel/oil spill. These projects may cause a short-term degradation of water quality due to sediment input and chemical contamination. Stream bank condition and habitat substrate may also be adversely affected in the short-term. However, with careful project design and seasonal timing, these affects are expected to be of a limited extent and duration. Road decommissioning would create noise from heavy equipment that could disturb both the NSO and MAMU. The potential for disturbance is mainly
	Road Closure	17.95 Miles	Road closure reduces fine-grained sediments by eliminating traffic impacts.	

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
				associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for both these species. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects:** Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition, road maintenance dollars would be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2001) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads. Beneficial effects to fisheries include long-term improvements to fish habitat and riparian areas, restored fish passage for all life histories of threatened and proposed species, re-established connectivity of fish populations above and below man-made barriers, restoration of hydrologic function, and more natural routing of wood and sediment through stream systems. Road decommissioning would also benefit many species of wildlife including NSOs and MAMUs through reduced disturbance from the elimination of road traffic and long-term benefits as decommissioned roads become reforested reducing fragmentation of habitat.
	Road Surfacing and Drainage Improvement	80.55 Miles	Road surfacing reduces sediment by capping existing fine textured sediments in the running surface of a gravel road with coarser rock or by paving. Paving all but eliminates traffic-generated sediments. Drainage repair reestablishes out-sloping, cross-drains and in some cases ditchlines to ditch-relief culverts. These actions have the effect of getting water off the road before it can enter stream courses. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (USDA FS; USDI BLM 1994b: p. B-11, C-7).	**Short-term adverse effects:** Road improvements including surfacing, drainage repair, storm proofing, stabilization, and culvert replacement may result in short-term, construction-related increases in sediment. Sediment affects are expected to be of limited extent and duration and can be minimized or eliminated through the application of PDFs and BMPs. Road improvements would create noise from heavy equipment that could disturb both NSOs and MAMUs. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for both these species. These PDFs
	Storm-proofing	13.78 Miles	Storm-proofing reduces sediment from roads by increasing the resistance of a road to failure during high intensity rainfall events.	

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
			Storm-proofing strategies include improving drainage, reducing diversion potential at culverts, outsloping road surfaces and replacing culverts with hardened low water fords.	would reduce impacts from noise to acceptable levels. **Long-term beneficial effects:** Road improvement projects reduce erosion from existing road surfaces, cut banks and fill slopes, and reduce the probability of failure through improvement of road surface stability and drainage. In the long-term, road improvements reduce both chronic and episodic erosion and sedimentation. Drainage improvements, such as out-sloping, reduce or eliminate chronic sources of road erosion and fine sediment delivery resulting in long-term improvements in water quality and aquatic habitat.
	Stabilization and Culvert Replacement	5 sites	Road stabilization and culvert replacement reduce road-related sediment by stabilizing or removing failing cut and fill slopes. Culvert replacement reduces sediment by replacing undersized or failing culverts with culverts that are appropriate to pass debris at higher flows. This reduces the probability of fill failure associated with plugged culverts.	
Fire Suppression	Suppression Capacity	26 Sites	The Project will create fire suppression complexity by creation of a continuous corridor of early seral plant communities. High intensity stand-replacement fire has been identified as the single largest factor causing the loss of late successional and old growth forests in the first 15 years of implementation of the NWFP (USDA FS; USDI BLM 2011). These projects include Heli-ponds (3) and pumper access / dry hydrant pumper connections at water sources. High intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Fire control is necessary to protect LSRs and habitat for T&E species should a wildfire occur. Construction of the Project would remove both mature and developing stands and would increase fire suppression complexity however; the corridor also provides a fuel break. Quick response time is imperative for successful control in wildfire situations during initial attack. Pump chance developments and helicopter dipping ponds provide readily available water sources to support fire suppression efforts.	**Short-term adverse effects**: Fire suppression capacity projects include the use of heavy equipment especially for the construction of heli-ponds which may be as large as 500,000 gallons. Soil erosion risk would increase with the proposed activities because bare soil would be exposed during implementation. Impacts caused by heavy equipment would increase the amount of detrimental soil damage within the treatment areas. By employing appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. Fire suppression capacity projects would create noise from heavy equipment that could disturb both the NSOs and MAMUs. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for both of these species. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects**: Pump chance developments and helicopter dipping ponds provide readily available water sources to support fire suppression efforts. These projects would help to reduce the threat of losing late-successional habitat to stand-replacement fire.
Stand Density and Fuels Reduction and Fuel			The Project will create fire suppression complexity by creation of a continuous corridor of early seral plant communities. The Project will also remove late successional stands in the corridor construction areas and indirectly affect LSOG habitat in stands adjacent to the project. Both mature stands and developing	

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
Break			stands would be removed during Project construction. Density management integrated with fuels reduction will increase longevity of existing mature stands by reducing losses from disease, insects, and fire. Density management in younger stands will accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Impacts to mature and developing stands will exceed the life of this project by many decades. LSRAs have identified the importance of density management to control losses to stand replacing fire. The proposed ridge line pipeline route intersects an area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation action would assist in protection and restoration of the LSRs and associated LSOG habitat values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners, and public.	
	Integrated Stand Density and Fuels Reduction	6563 Acres	WAs and LSRAs for landscapes in in Southwest Oregon have noted shifts from forests dominated by fire-resistant LSOG stands to fire-prone early and mid-seral forests (USDA FS; USDI BLM et al. 1998; USDA FS USDI BLM 1999). Use of fuels reduction and stand density management are appropriate tools to reduce the risk of high intensity stand replacement fires in these forests (Forest Service and BLM 1994b). Management activities that reduce the risk of natural disturbance adjacent to KOACs are also appropriate (USDA FS; USDI BLM 1994b: p. C-11). Stand density reductions in riparian zones have the dual benefit of reducing the risk of stand-replacing fire, while also accelerating the development of late successional stand conditions by accelerating growth of remaining trees. This project would create a fuel break on federal lands that stretches from Milo to Shady Cove Oregon.	**Short-term adverse effects**: Integrated stand density and fuels reduction activities include the use of heavy equipment for cutting, skidding, slash piling, under-burning and hauling forest vegetation. Soil erosion risk would increase with the proposed activities because bare soil would be exposed during implementation. As the amount of bare/compacted soil increases, so does the risk of soil movement. Impacts caused by heavy equipment would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. Stand density fuels reduction treatments would not be expected to adversely affect NSO nesting habitat since the treatments would not remove constituent elements of their nesting habitat. The proposed harvest treatments could temporarily impact acres of dispersal habitat. This habitat would be impacted by reduction of canopy cover as well as the loss of some LWD, shrubs and snags, which provide habitat for prey species. Although the dispersal habitat within these treatment areas would be reduced in quality, the projects would be designed so that the areas would still function as dispersal habitat. Integrated stand density treatments would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated with breeding
	Under-burning	2035 Acres	Under-burning is a component of the integrated stand density reduction. This provides a mechanism to maintain shaded fuel breaks created by mechanically thinning stands. It also reintroduces fire on selected landscapes as recommended in various WAs and LSRAs.	
	Pre-commercial Thinning	1039 Acres	Pre-commercial thinning reduces stand density in overstocked young stands. This reduces the risk of stand replacing fire, increases the resilience of remaining trees to low intensity fire and accelerates the development of late successional stand	

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
			characteristics.	behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. Under-burning and burning of slash piles can impact air and visual quality during burning activities. All burning would be scheduled in conjunction with the State of Oregon to comply with the Oregon Smoke Implementation Plan and to minimize any adverse effects on air quality. Burning prescriptions would be developed to minimize the potential for adverse effects. Implementation of these measures would ensure compliance with the federal Clean Air Act. **Long-term beneficial effects**: By creating less dense stands with less tree competition, residual trees would benefit from the increased availability of sunlight, nutrients and water. With the increase of available nutrients, trees should be more vigorous and less susceptible to large scale insect/disease out-breaks. The proposed treatments would move the vegetation towards conditions that would have occurred under a natural disturbance regime. This would lower flame lengths, reduce fire spread and lower the probability of tree mortality in the event of a wildfire, leading to more successful suppression efforts. Aerial delivered retardant or water would be more effective in lighter fuels and a more open canopy, making it safer for firefighters to successfully anchor and contain wildfires. These actions would reduce the threat of losing LSOG habitat to fire.
	Riparian Vegetation Fuels Reduction	70 Acres/ 6 Miles	Fuels reduction in riparian areas reduces the risk of stand replacement fire and accelerates the development of late successional stand characteristics.	
Terrestrial / Upland Habitat Improvement			The Project will remove snags and LSOG habitat, and will create a vector for noxious weeds. Terrestrial mitigations are intended to offset the loss of snags, future recruitment of LWD and eradicate noxious weed populations.	
	Habitat Planting	620 Acres	The Dead Indian Plateau region is one of three known sites for Mardon Skipper butterflies in the world. It is also adjacent to a known site for Short-horned Grasshoppers. Both species are on the Regional Forester's Sensitive Species list. The pipeline requirement of a permanent open corridor provides a unique opportunity to develop habitat for these two species. Planting the corridor with plants preferred by these species has the potential to increase the habitat and local range for both species. Rehabilitation of disturbed sites is required under various BMP guidelines. Results would be immediate in stabilizing the local habitat and location would be in the pipeline.	**Short-term adverse effects**: This activity would take place within the Project corridor and would not result in any additional adverse impacts. **Long-term beneficial effects**: Beneficial impacts include helping to re-vegetate and stabilize the Project corridor and improving habitat for several listed or sensitive insect species.

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
			The Project may also impact habitat of *Fritillaria gentneri* which is listed as Endangered under the federal ESA. Out-planting to suitable habitat locations is recommended in the recovery plan for *Fritillaria gentneri*.	
	LWD Upland Placement	470 Acres	These projects are intended to mitigate for the loss of recruitment of LWD to adjacent stands and within Project corridor. The Project will forgo the development of LWD for the life of the Project and for decades after. LWD is a constituent element of habitat for NSO and is a significant component of late successional forest ecosystems. Replacement of LWD will partially mitigate for the barrier effect of the Project corridor by creating structure across the corridor for use by a diverse assemblage of wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID snag model) (Marcot et. al. 2002). This type of mitigation project is consistent with NWFP Standards and Guidelines page C-11 (USDA FS; USDI BLM 1994b). Acres that can be treated are necessarily limited by LWD available from the corridor.	**Short-term adverse effects**: Placement of LWD within and adjacent to the Project corridor would typically be done with heavy equipment that would drag the material into place. Heavy equipment use would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. LWD placement would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects**: Beneficial effects include improving habitat for late-successional species and providing for long-term soil productivity.
	Snag Creation	1,029 Acres	The creation of snags is intended to mitigate the loss of snag habitats within, and adjacent to the Project corridor. The Project would prevent development of large snags during the life of the Project and for decades after. Corridor construction will result in loss of snag habitat on approximately 775 acres of BLM and NFS lands. WAs and LSRAs indicate many areas traversed by the Project are far below historic levels of snag habitat due of past management actions. The Project would add to those cumulative impacts. As snags are a critical component of LSRs, replacement is needed. Snag requirements are specifically outlined in the BLM and Forest Service LMPs. Replacement would be immediate, though there would be a 10-year delay as snag decay occurs. Snag management is discussed in the NWFP for LSRs on pages C-14 and 15 (USDA FS; USDI BLM 1994b). Snag management levels incorporated into these mitigation projects are based on BLM and Forest Service guidelines. The function and benefits of snags are also discussed in the South Cascades LSRA - chapter 3 (USDA FS;	**Short-term adverse effects:** Snag creation typically employs the use of chainsaws or inoculum to kill live trees. As such there is little if any ground disturbance and only minimal noise disturbance. The potential for noise disturbance is mainly associated with breeding behavior at active NSO nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. Any adverse environmental impacts would be de minimus and very short-term. **Long-term beneficial effects**: Beneficial impacts include the improvement of habitat for snag dependent species and in particular those species dependent on late successional forests. Long-term benefits would also accrue as the created snags decay over time and eventually provide for LWD on the forest floor improving habitat for many other species and contributing to long-term soil productivity.

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
			USDI BLM 1998a).	
	Noxious Weed Treatments	6 Road Miles, 127 Acres	The construction and operation of the Project has the potential to create vectors for noxious weeds. These treatments are intended to reduce populations of noxious weeds that are in close proximity to the Project corridor, as well as restore meadow habitats in the fifth-field watersheds that are currently impacted by noxious weeds.	**Short-term adverse effects:** Treatments typically involve the cutting, pulling or spraying of noxious weeds. Since the work is typically done by hand there is minimal if any ground or noise disturbance. All activities would be conducted consistent with the most recent direction and plans for weed management and integrated vegetation management on BLM and Forest Service lands to minimize adverse impacts to plant and animal communities as well as water quality and aquatic habitats. **Long-term beneficial effects**: Long-term benefits would include restoration of native plant populations and species diversity. Restoring native plant communities and increasing vegetation diversity generally contributes to restoring habitat for a broad group of animal species.
Visual Impacts on the Clover Creek Road		113 Acres	The Project will create a hard visual line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway. Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with the landscape. Thinning of commercial sized material may be accomplished with a commercial timber sale. The mitigation is intended to supplement funding for the non-commercial part of that work for visual purposes that could not otherwise be accomplished.	**Short-term adverse effects**: The activities associated with thinning and fuels treatments and resulting short-term adverse impacts would be similar to the impacts of the integrated stand density treatments described previously. **Long-term beneficial effects**: The proposed activity would help mitigate the adverse visual impacts of the Project along these road segments and would also create a fuel break and defensible space that could be used in helping to suppress high intensity wildfires.
Reallocation of Matrix Lands to Late Successional Reserves		1896 Acres	This mitigation group contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the Project. It also compensates for the removal of occupied MAMU habitat and suitable roosting, nesting and foraging NSO habitat. In addition, the selected parcel reduces the potential edge effects caused by management of matrix lands adjacent to occupied MAMU sites by reallocating the entire parcel to LSR. Reallocation of matrix lands to LSR also contributes to ACS objectives and may benefit S&M species by providing additional habitat that is managed to create LSOG stand conditions over time. Since the land reallocated to LSR on BLM-managed O&C and/or the CBWR lands matrix timber base, there is a need to	**Short-term adverse effects**: The reallocation of matrix lands to LSR is an administrative action that would not have any immediate environmental consequences on the ground. **Long-term beneficial effects**: The proposed reallocation would change the management direction of approximately 1,896 acres from one of multiple uses with an emphasis on timber management to a management emphasis focusing on the creation and maintenance of late-successional forest habitat. Over time, this reallocation would benefit species dependent on late-successional forests through management actions that would be designed to improve or maintain LSOG habitat conditions.

TABLE 2.1

Summary of BLM and Forest Service Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental consequences a/
			replace those lands with other timber-producing lands to ensure that BLM continues to comply with statutes, regulations and policies for these lands. It is expected these lands would be acquired by the applicant and conveyed to the BLM to be managed as part of the matrix.	

a/ For all project types additional field surveys for T&E species, Special Status species, and Heritage Resources would be completed where necessary before implementation. In addition, consultations with the USFWS and NOAA Fisheries would also be completed as necessary prior to implementation. All future decision making under NEPA for these projects would be completed consistent with the CEQ Regulations (40 CFR 1500-1508) and would tier to this EIS.

This page intentionally left blank.

3.0 DESCRIPTION OF PROPOSED BLM MITIGATION ACTIONS BY FIFTH-FIELD WATERSHED

The following tables and figures describe the proposed mitigation actions by BLM administrative unit and fifth-field watershed. The Project impacts include the corridor, temporary extra work areas (TEWA), uncleared storage areas (UCSA) and associated roads and other ancillary areas subject to BLM authorization. Quantities are approximate estimates. Maps of the proposed mitigation actions are included in section 6 of this appendix.

TABLE 3-1a

Mitigation Actions Proposed in the North Fork Coquille Watershed on the BLM Coos Bay District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Coos Bay BLM	North Fork Coquille River	Aquatic and Riparian Habitat	LWD In-stream	Steinnon Creek and North Fork Coquille River Watershed In-stream LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project corridor. Implementation of the PCGP Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	3.7	miles
Coos Bay BLM	North Fork Coquille River	Road Sediment Reduction	Road Surfacing	Bridge Approach paving - Woodward & Alder Creek Roads	Road-related sediment has negatively this watershed. While BMPs would be implemented, construction of the Project would likely cause sediment to enter stream channels and may affect aquatic habitat. Surfacing the bridge approach would reduce, if not eliminate sediment input to Coho salmon and, steelhead and cutthroat trout habitat from these locations.	2	ea.

TABLE 3-1b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Coos Bay District-North Fork Coquille Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	2.9	42.5	0.0	16.6	6
LWD In-stream	3.7	33.6	19.1	33.6	
Road Resurfacing/Repair	0.1	0.2	0.0	0.2	2

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Note: LWD In-stream acres based on a 75' wide treatment area

Figure 3-1a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the North Fork Coquille River Watershed

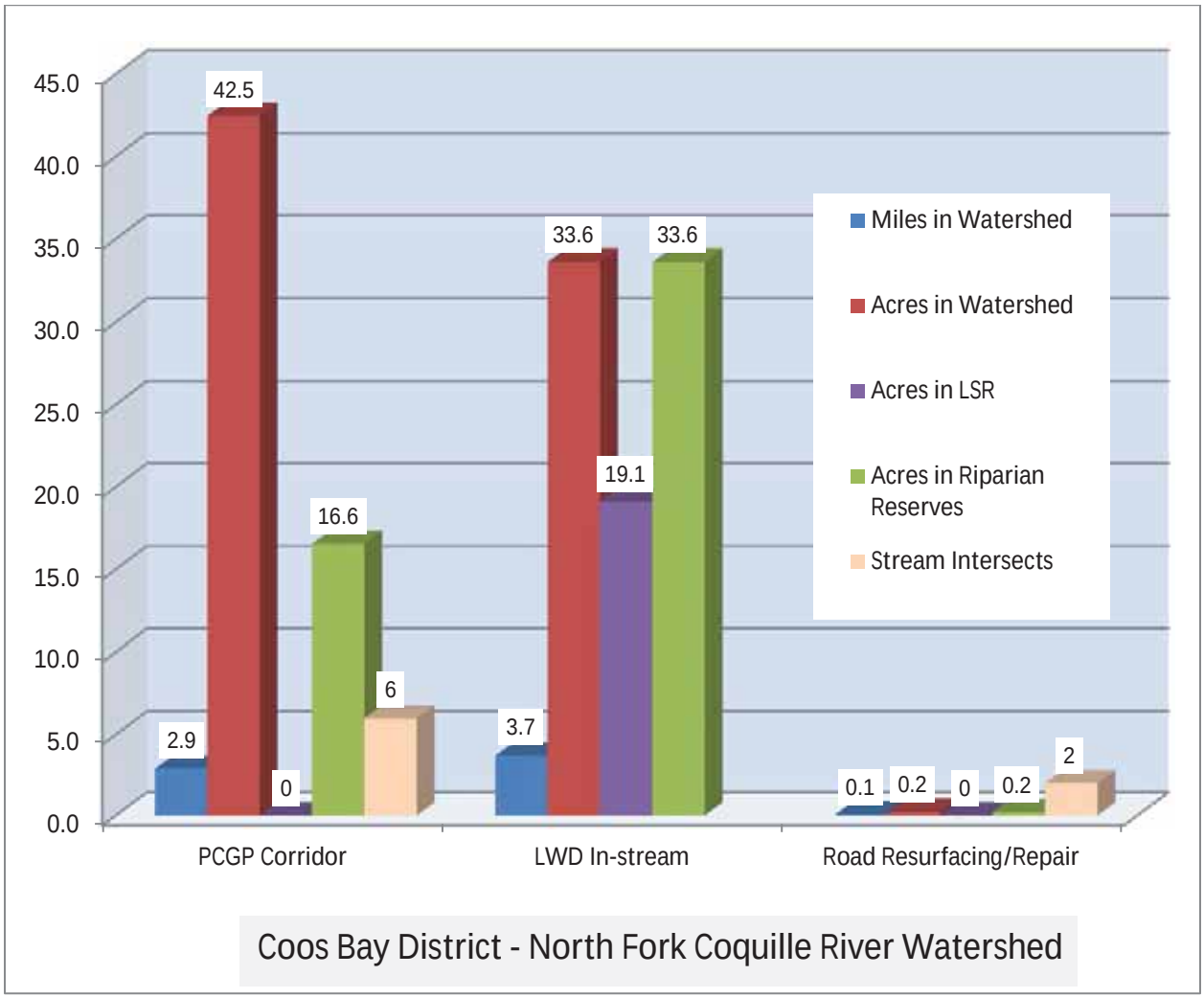


Figure 3-1b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the North Fork Coquille River Watershed

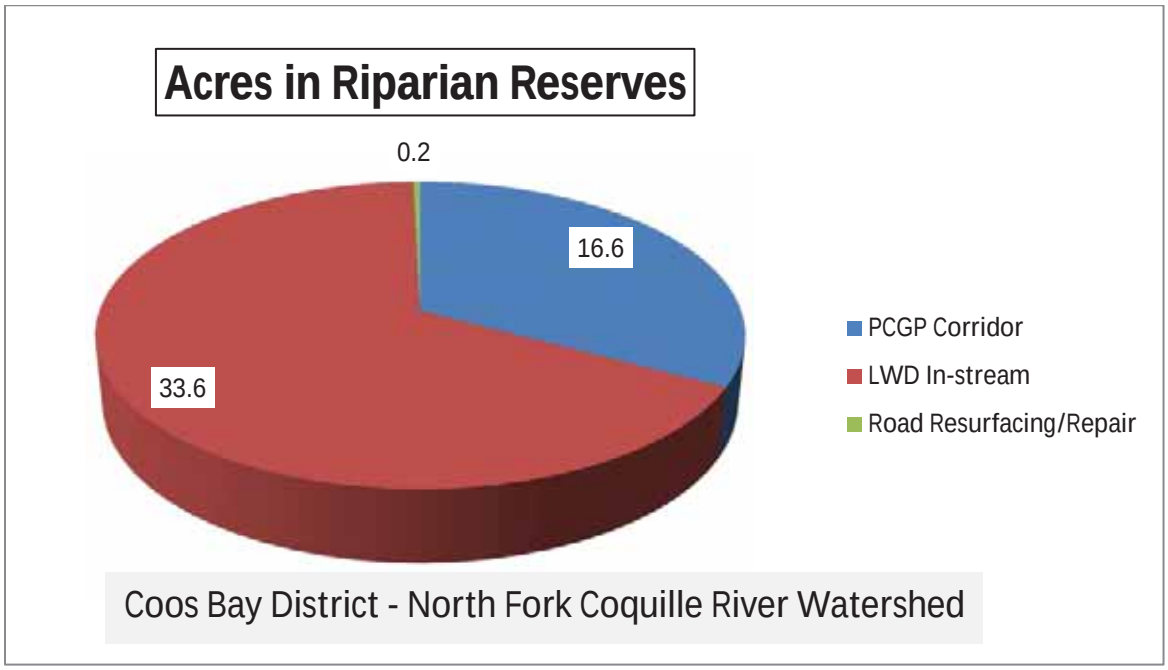


TABLE 3-2a

Mitigation Actions Proposed in the East Fork Coquille River Watershed on the BLM Coos Bay District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Coos Bay BLM	East Fork Coquille River	Reallocation of Matrix Lands to LSR	Land Re-Allocation from Matrix to LSR	LSR Reallocation and Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the Project. The action also compensates for the removal of occupied MAMU habitat and suitable NSO owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of matrix lands adjacent to occupied MAMU sites by reallocating the entire parcel to LSR.	180	acres
Coos Bay BLM	East Fork Coquille River	Aquatic and Riparian Habitat	LWD In-stream	Yankee Run In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project corridor. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.7	miles
Coos Bay BLM	East Fork Coquille River	Fire suppression	Suppression Capacity	Heli-Pond Construction	High intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Project construction would require removal of both mature and developing stands and would increase fire suppression options however the corridor also provides a fuel break. Within this watershed, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in these watersheds are low in the	2	ea.

TABLE 3-2a

Mitigation Actions Proposed in the East Fork Coquille River Watershed on the BLM Coos Bay District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					drainage and accessible only by truck. Heli-ponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect LSRs and T&E species habitat should a wildfire occur.		
Coos Bay BLM	East Fork Coquille River	Road Sediment Reduction	Road Surfacing	Road Surfacing - Yankee Run Spurs, Yankee Run Mainline, and South Fork Elk Creek	Road-related sediment has negatively impacted this watershed. The effects of the Project would be similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM roads which are parallel to Yankee Run Creek and South Fork Elk Creek would reduce if not eliminate road - related sediment input to habitat for Coho salmon and, steelhead and cutthroat trout from these locations.	5.5	miles

TABLE 3-2b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Coos Bay District-East Fork Coquille Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	2.8	43.7	21.7	4.5	2
LWD In-stream	2.7	25.0	2.8	25.0	
Road Resurfacing/Repair	5.5	13.3	0.8	8.1	29

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LWD In-stream acres based on a 75' wide treatment area.
Road Resurfacing/Repair acres based on a 20' wide treatment area.

Figure 3-2a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the East Fork Coquille River Watershed

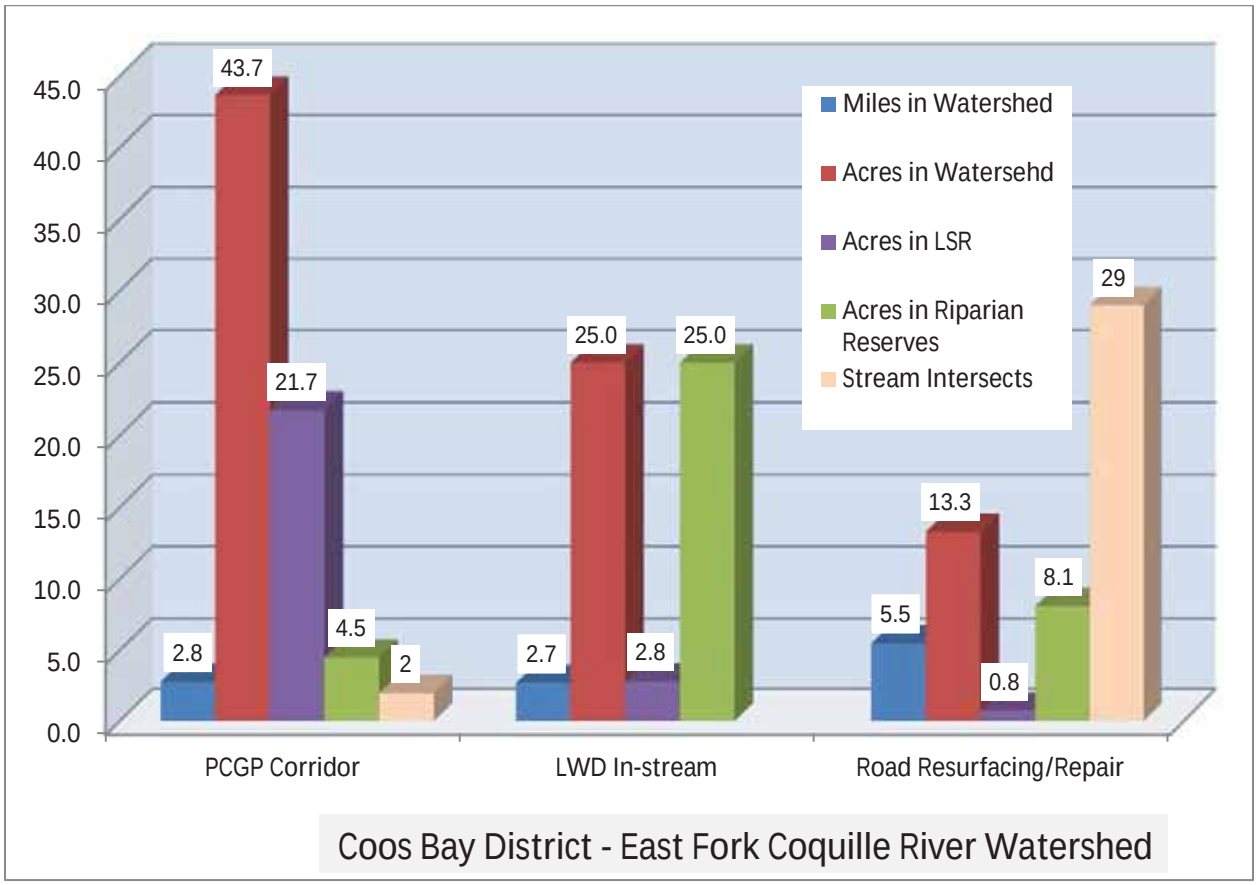


Figure 3-2b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the East Fork Coquille River Watershed

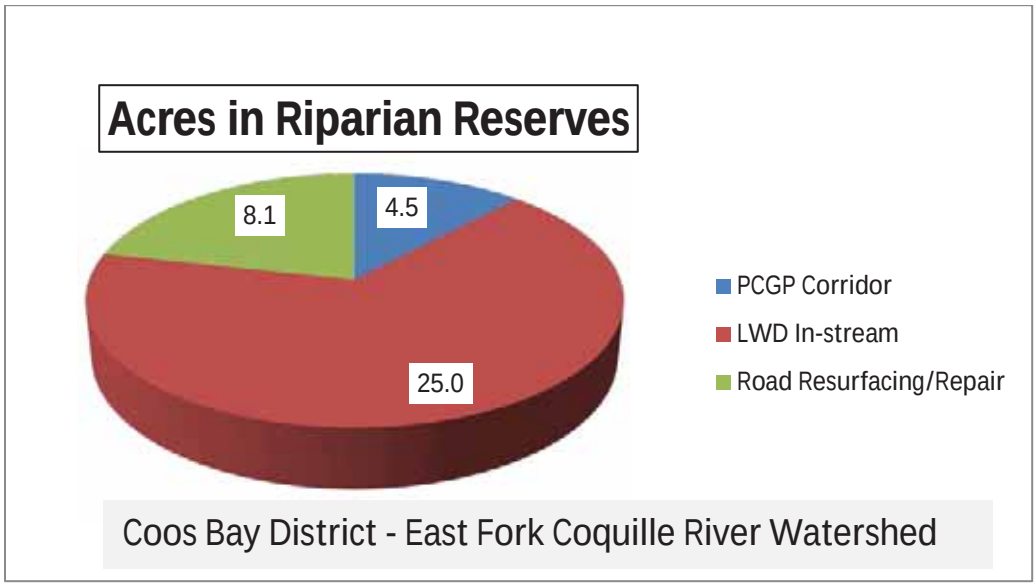


Figure 3-2c. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR in the East Fork Coquille River Watershed

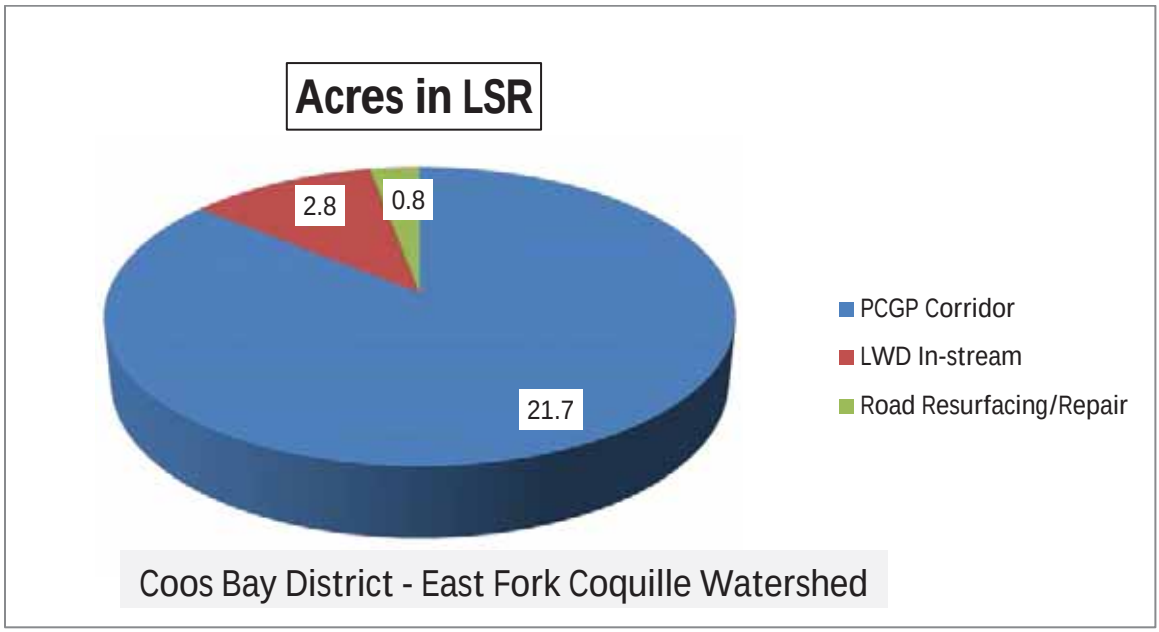


TABLE 3-3a

Mitigation Actions Proposed in the Middle Fork Coquille River Watershed on the BLM Coos Bay and Roseburg Districts

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Coos Bay BLM	Middle Fork Coquille River	Reallocation of Matrix Lands to LSR	Land Re-Allocation from Matrix to LSR	Coos Bay BLM	This action contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the Project. The action also compensates for the removal of occupied MAMU habitat and suitable NSO habitat. In addition, the selected parcel reduces the potential edge effects caused by management of matrix lands adjacent to occupied MAMU sites by reallocating the entire parcel to LSR.	207	acres
Coos Bay BLM	Middle Fork Coquille River	Aquatic and Riparian Habitat	LWD In-stream	Upper Rock Creek In-stream LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project. There are approximately 7.3 miles of Project corridor and 9 stream crossings in this watershed. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.1	miles
Coos Bay BLM	Middle Fork Coquille River	Fire suppression	Suppression Capacity	Heli-Pond Construction	High intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Construction of the Project and associated activities removes both mature and developing stands and would increase fire suppression complexity, however the corridor also provides a fuel break. Within this watershed, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire	1	ea.

TABLE 3-3a

Mitigation Actions Proposed in the Middle Fork Coquille River Watershed on the BLM Coos Bay and Roseburg Districts

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					situations during initial attack. Most water sources in this watershed are low in the drainage and accessible only by truck. Heli-ponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect LSRs and T&E species habitat should a wildfire occur.		
Coos Bay BLM	Middle Fork Coquille River	Road Sediment Reduction	Road Surfacing	Road Surfacing - Fall Creek System and Bridge Approach paving - Sandy & Jones Creek Roads	Road-related sediment has negatively impacted this watershed. There are approximately 7.3 miles of Project corridor and 9 stream crossings in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Surfacing the BLM road which is parallel to Fall Creek and paving the bridge approach on the Sandy and Jones Creek Roads would reduce if not eliminate sediment input to Coho salmon, and steelhead and cutthroat trout habitat from these locations.	0.9	miles
Roseburg BLM	Middle Fork Coquille River	Aquatic and Riparian Habitat	Fish Passage	Loveseat Creek Culvert Removal	Man-made barriers to fish passage have negatively affected access to habitat in this watershed. The culvert at this location is a fish barrier to resident fish. Removing the culvert and associated road fill would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the Project corridor. Sediment introductions to the stream network would also cease.	1	project
Roseburg BLM	Middle Fork Coquille River	Aquatic and Riparian Habitat	LWD In-stream	Middle Fork Coquille and Twelvemile Creek In-stream LWD Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project corridor. There are approximately 7.3 miles of Project corridor and 9 stream crossings in this watershed. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key	2.6	miles

TABLE 3-3a

Mitigation Actions Proposed in the Middle Fork Coquille River Watershed on the BLM Coos Bay and Roseburg Districts

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat.		
Roseburg BLM	Middle Fork Coquille River	Road Sediment Reduction	Road Drainage and Surface Enhancement	Camas Mountain Road Drainage and Surface Enhancement	Road-related sediment and stream network extension from ditch-lines have negatively impacted this watershed. There are approximately 7.3 miles of Project corridor and 9 stream crossings in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Roads in this watershed are a source of chronic sediment delivery to fish bearing streams. Two BLM roads (9.1 and 9.2) currently show signs of water rutting and stream network extension. Storm-proofing and blocking the road would reduce the potential for sediment-laden water to be carried off the road surface and into the ditch where it could be transmitted to the stream network.	3.5	miles

TABLE 3-3b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Coos Bay District Middle Fork Coquille Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	6.8	123.7	46.9	15.8	9
LWD In-stream	4.7	42.7	4.4	42.7	
Road Resurfacing/Repair	4.4	10.7	1.5	2.8	10

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LWD In-stream acres based on a 75' wide treatment area.
Road Resurfacing/Repair acres based on a 20' wide treatment area.

Figure 3-3a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Middle Fork Coquille River Watershed

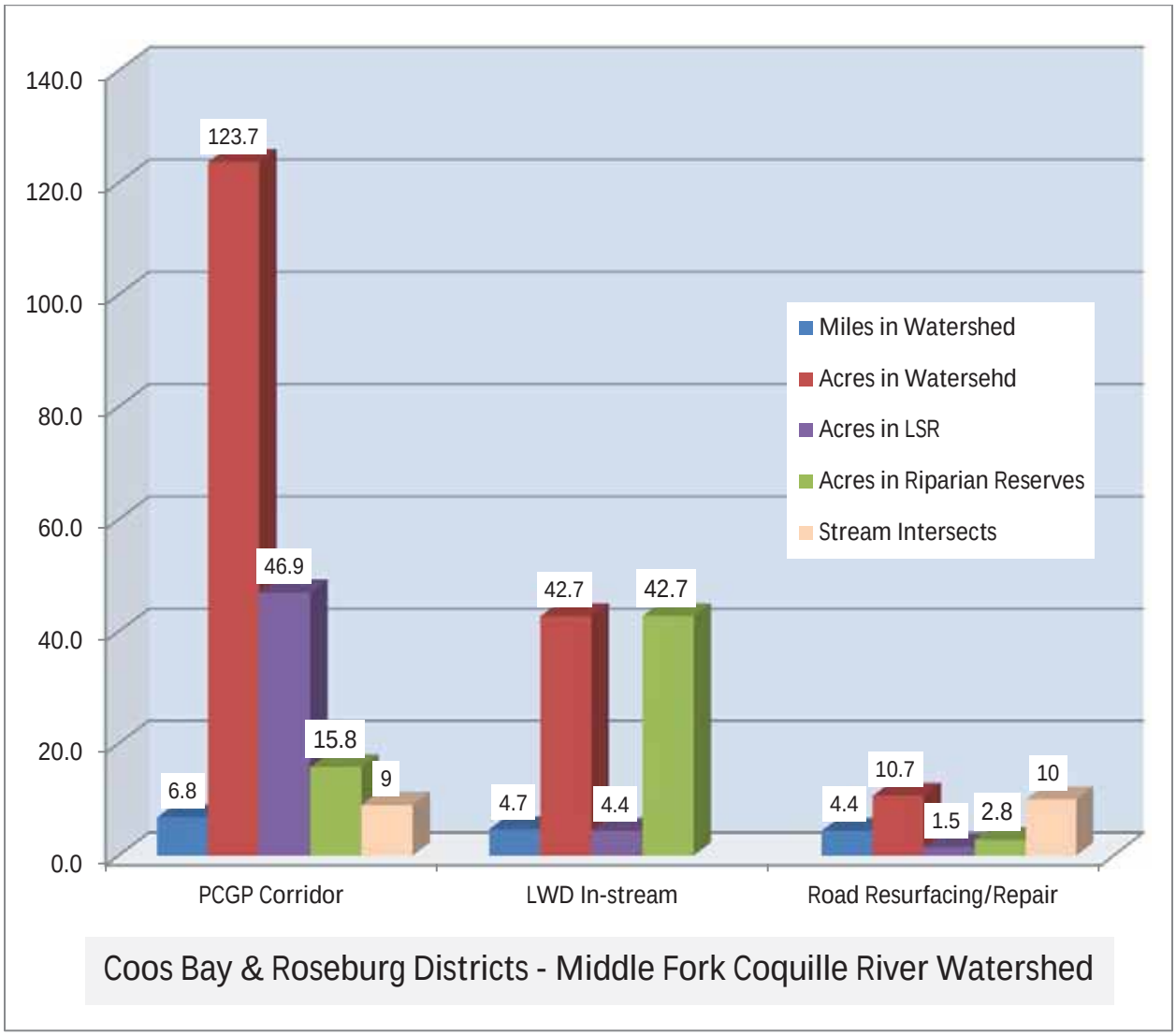


Figure 3-3b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Middle Fork Coquille Watershed

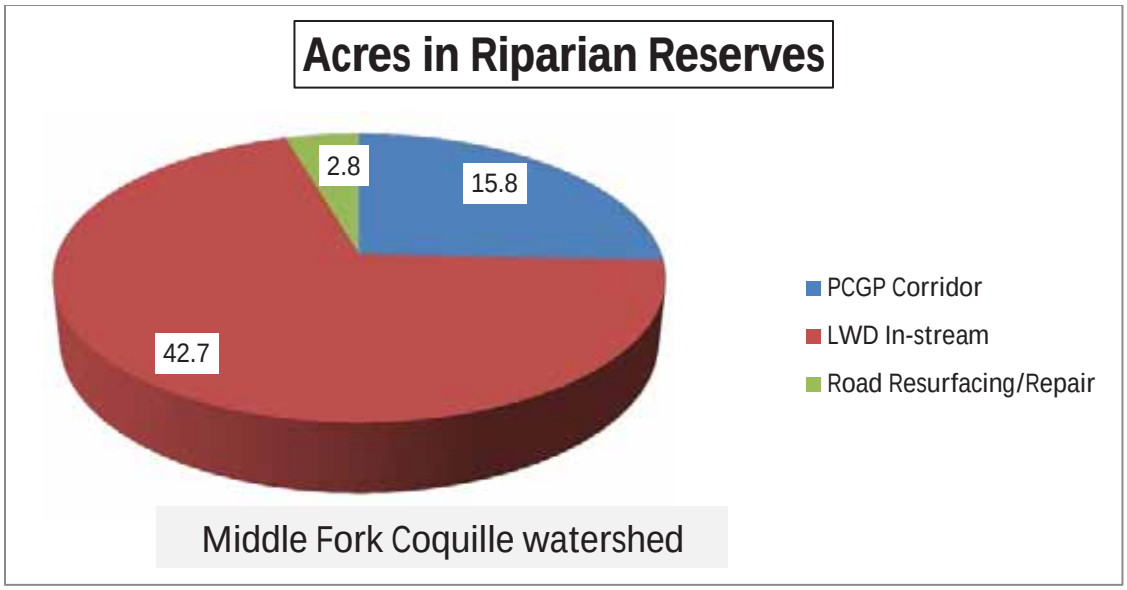


Figure 3-3c. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR in the Middle Fork Coquille Watershed

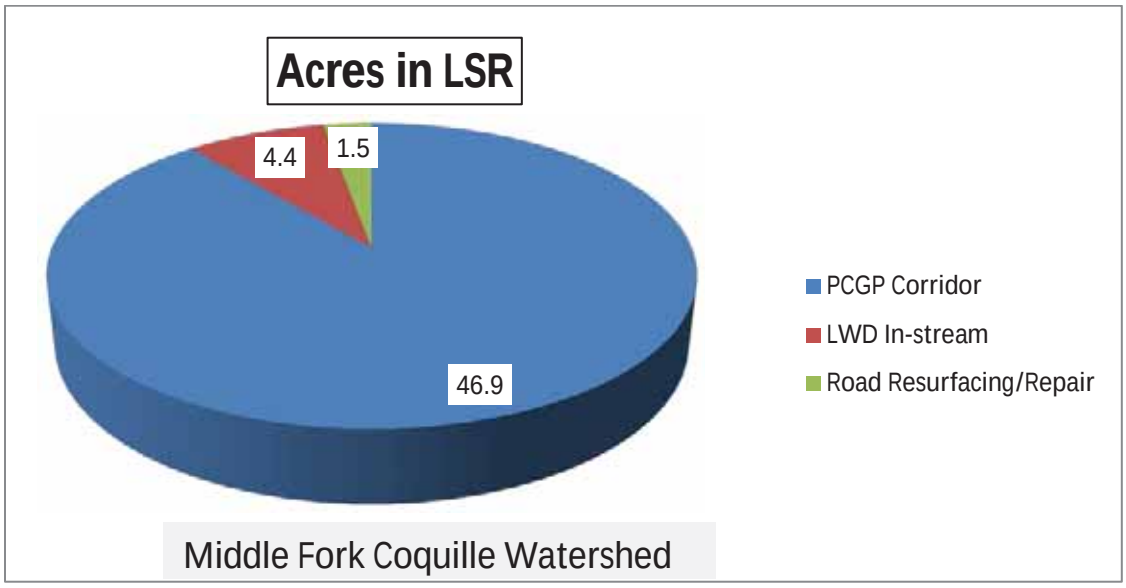


TABLE 3-4a

Mitigation Actions Proposed in the Olalla-Lookingglass Watershed on the BLM Roseburg District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Roseburg BLM	Olalla-Lookingglass	Reallocation of Matrix Lands to LSR	Land Re-Allocation from Matrix to LSR	Roseburg BLM	This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres of acres and habitat from the construction and operation of the Project. In addition to impacts to Mapped LSR, this action compensates for impacts to 3 unmapped LSRs (KOACs).	409	acres
Roseburg BLM	Olalla-Lookingglass	Aquatic and Riparian Habitat	LWD In-stream	Olalla Creek In-stream LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project corridor. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	1.2	miles
Roseburg BLM	Olalla-Lookingglass	Road Sediment Reduction	Road Stabilization	Olalla Tie Road Renovation	Sediment from roads is a primary concern in this watershed. Roads in this watershed are a source of chronic sediment delivery to fish bearing streams. Additionally, there are several landslides crossing the road which need to be stabilized. Stabilizing these conditions would reduce the delivery of road-related sediments to channels.	1	project

TABLE 3-4b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Roseburg District Olalla-Lookingglass Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	1.3	24.5	4.3	0.0	0
LWD In-stream	1.2	7.3	6.7	7.3	
Road Stabilization	0.3	0.9	0.9	0.9	2

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LWD In-stream acres based on a 50' wide treatment area.
Road Stabilization acres based on a 30' wide treatment area.

Figure 3-4a. Comparison of PCGP Impacts and Offsite Mitigation in the Olalla-Lookingglass Watershed

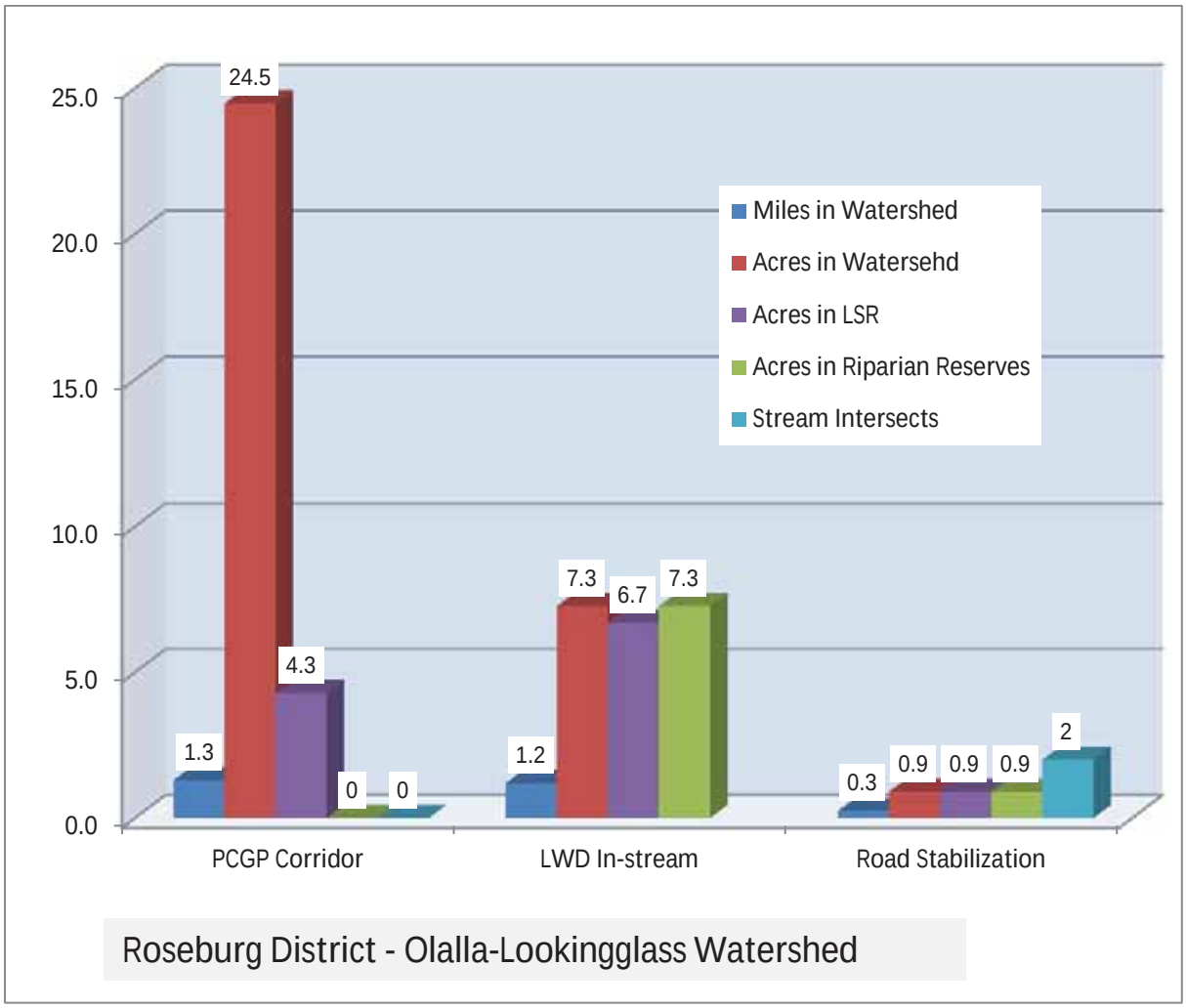


Figure 3-4b. Comparison of PCGP Impacts and Offsite Mitigation in LSR in the Olalla-Lookingglass Watershed

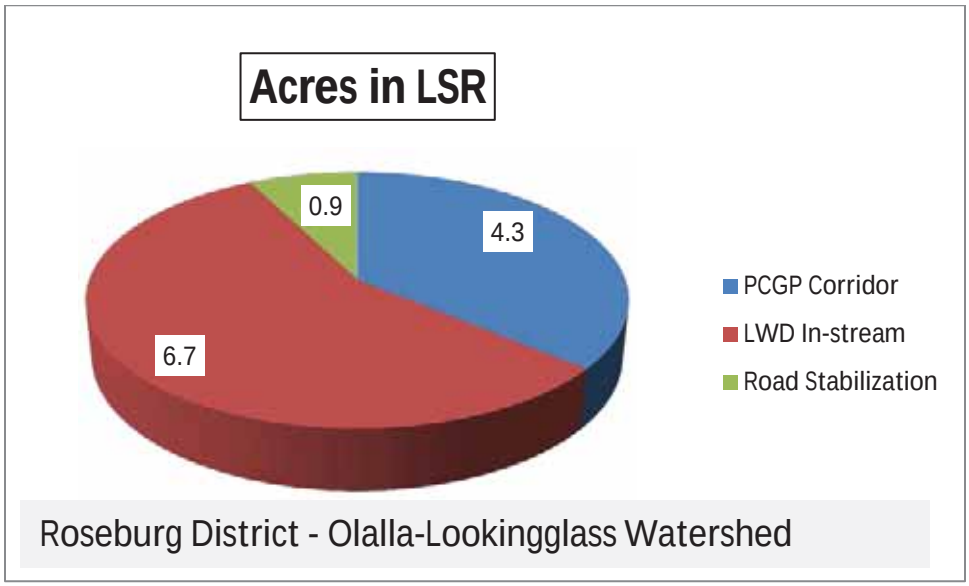


TABLE 3-5a

Mitigation Actions Proposed in the Clark Branch South Umpqua Watershed on the BLM Roseburg District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Roseburg BLM	Clark Branch South Umpqua	Aquatic and Riparian Habitat	Fish Passage	Rice Creek Culvert Replacements	Man-made barriers to fish passage have negatively affected access to habitat in this watershed. Both culverts are undersized and obstruct anadromous and resident fish passage. Replacing the culverts with ones properly sized for the stream would allow for proper fish passage along with reducing the risk for culverts plugging and causing road fill failures.	2	sites
Roseburg BLM	Clark Branch South Umpqua	Road Sediment Reduction	Road Drainage - Culvert Replacement	East Fork Willis Creek Tributary Culvert Replacement	Sediment is one of the primary water quality problems in this watershed. WAs prepared by BLM clearly indicate that the sediment turbidity habitat indicator is at risk or more likely not functioning properly. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Culvert is plugged, old, undersized, shot-gunned, and eroding road fill. Culvert has poor alignment with the stream at the outlet. Replacing the culvert with a properly sized one would reduce the risk of road fill failure.	1	project
Roseburg BLM	Clark Branch South Umpqua	Road Sediment Reduction	Road Drainage - Culvert Replacement	Judd Creek Culvert Removal	Sediment is one of the primary water quality problems in this watershed. WAs prepared by BLM clearly indicate that the sediment turbidity habitat indicator is at risk or more likely not functioning properly. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. This culvert is undersized and has a large amount of road fill associated with it. Pulling the culvert and fill material and storm-proofing the road would prevent a plugged culvert. A plugged culvert could cause the road fill to fail which could deliver sediment downstream to fish bearing reaches. The road is blocked by a landslide just beyond so access would not be lost. Access to the stream crossing is gradually being lost due to soil slumping and vegetation growth.	1	project

TABLE 3-5b **Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/**					
BLM Roseburg District Clarks Branch South Umpqua Watershed	**Miles in Watershed**	**Acres in Watershed**	**Acres in LSR**	**Acres in Riparian Reserves**	**Stream Intersects**
PCGP Corridor	0.6	11.3	0.0	0.1	0
Fish Passage		0.4	0.0	0.4	2
Culvert Replacement		0.4	0.0	0.4	2

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: Fish Passage and Culvert Replacement acres based on an estimate of 0.2 acres/site

Figure 3-5. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Clarks Branch South Umpqua Watershed

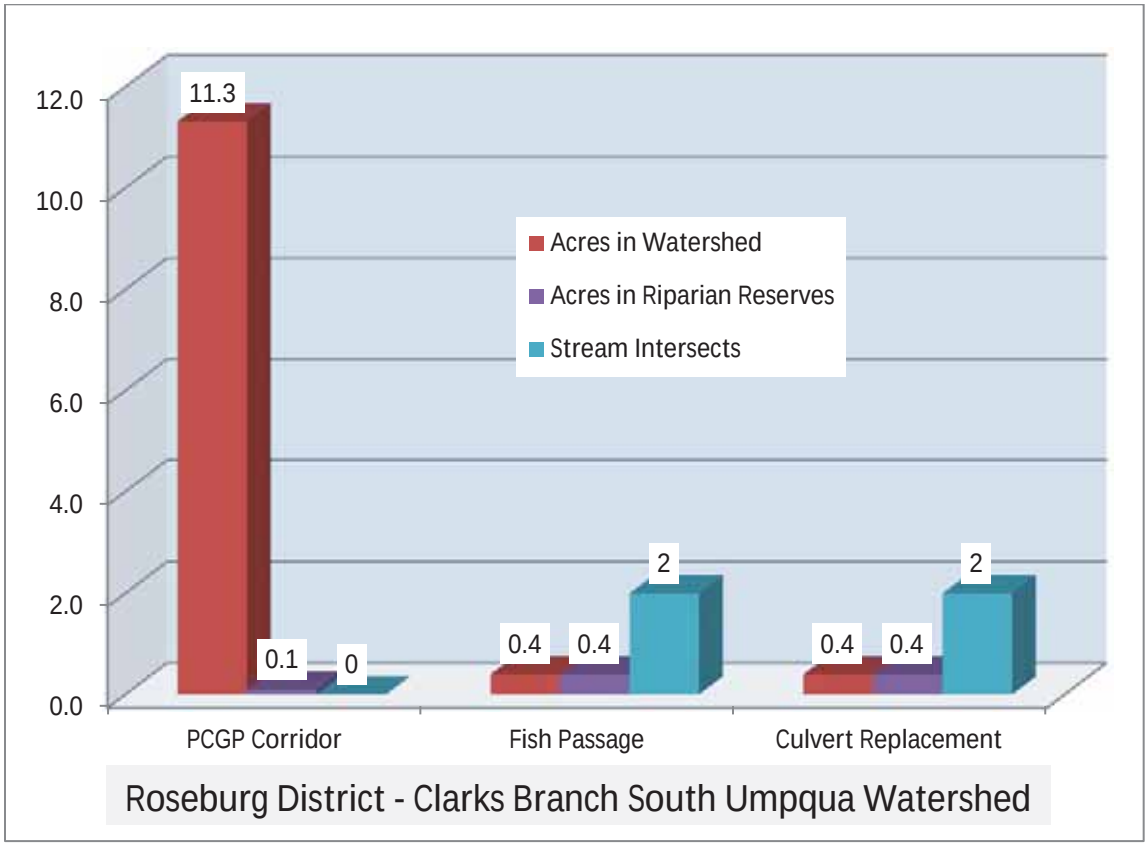


TABLE 3-6a

Mitigation Actions Proposed in the Myrtle Creek Watershed on the BLM Roseburg District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Roseburg BLM	Myrtle Creek	Aquatic and Riparian Habitat	Fish Passage	Slide Creek Culvert Replacement	Man-made barriers to fish passage have negatively affected access to habitat in this watershed. Culvert is perched, undersized, and a fish barrier for anadromous and resident fish. Replacing a fish barrier culvert with one that would pass adult and juvenile salmonids at a range of flows would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, undersized culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter into the stream network.	1	project
Roseburg BLM	Myrtle Creek.	Road Sediment Reduction	Road Drainage and Surface Enhancement	Ben Branch Road Drainage and Surface Enhancement	Sediment in streams is a limiting factor in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Roads in this watershed are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair would reduce sediment delivery to fish bearing streams.	1.0	miles
Roseburg BLM	Myrtle Creek.	Road Sediment Reduction	Road Stabilization	South Myrtle Hill Slide Repair	Sediment in streams is a limiting factor in this watershed. There are approximately 3.4 miles of Project corridor in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Stabilizing the failure would prevent future sediment delivery and catastrophic slope failure.	1	project

TABLE 3-6b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Roseburg District Myrtle Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	2.5	86.9	1.1	4.2	0
Fish Passage		0.2	0.0	0.2	1
Road Resurfacing	1.0	2.4	0.0	1.4	6
Road Stabilization	0.3	0.9	0.0	0.9	1

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: Fish Passage acres based on an estimate of 0.2 acres/site
Road Resurfacing/Stabilization acres based on a 30' treatment area

Figure 3-6a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Myrtle Creek Watershed

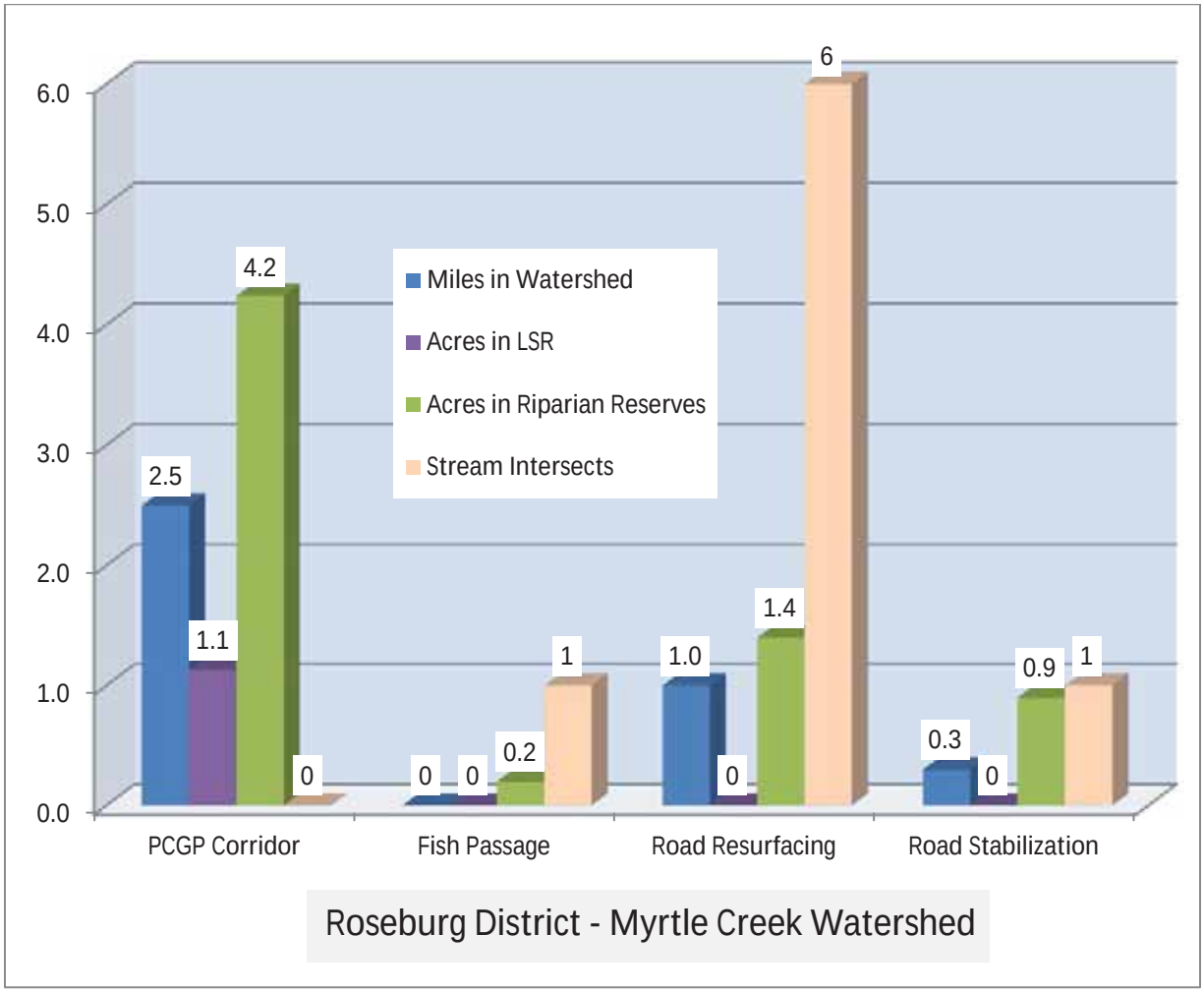


Figure 3-6b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Myrtle Creek Watershed

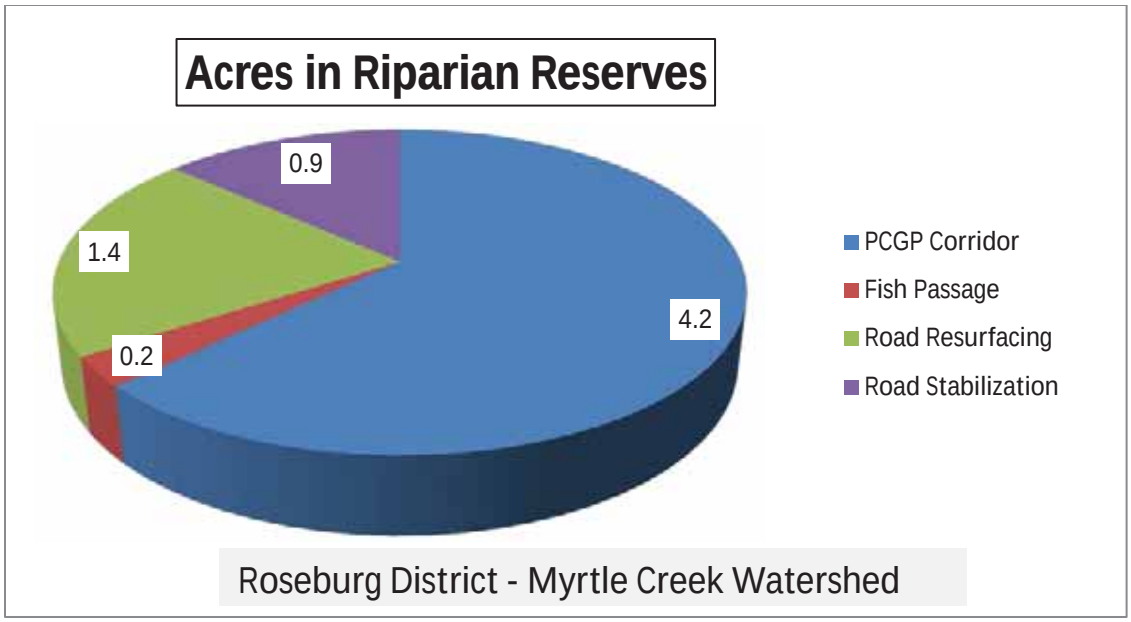


TABLE 3-7a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the BLM Roseburg District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Roseburg BLM	Days Creek. South Umpqua	Aquatic and Riparian Habitat	Fish Passage	Beal Creek Culvert Replacement	Man-made barriers to fish passage have negatively affected access to aquatic habitat in this watershed. Both culverts are undersized and obstruct anadromous and resident fish passage. Replacing the culverts with ones properly sized for the stream would allow for proper fish passage along with reducing the risk for culverts plugging and causing road fill failures.	2	sites
Roseburg BLM	Days Creek. South Umpqua	Aquatic and Riparian Habitat	LWD In-stream	Days Creek In-stream LWD	The South Umpqua River watershed is a Tier 1 Key Watershed. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project. There are approximately 6.23 miles of Project corridor and 3 stream crossings in this watershed. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	0.4	miles
Roseburg BLM	Days Creek. South Umpqua	Aquatic and Riparian Habitat	LWD In-stream	West Fork Canyon	The South Umpqua River watershed is a Tier 1 Key Watershed. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project. There are approximately 6.23 miles of Project corridor and 3 stream crossings in this watershed. Implementation of the Project would result in the removal of LWD from the Riparian	0.8	miles

TABLE 3-7a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the BLM Roseburg District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.		
Roseburg BLM	Days Creek. South Umpqua	Fire suppression	Suppression Capacity	Dry Hydrants	By installing dry hydrants, the water source is disturbed the one time but there are several advantages. Fire vehicles would not need to be really close to the water to fill, decreasing risk of contamination, and they can fill out of some water sources that would otherwise need to be modified for use. Areas that have had restoration work for fish populations could still be safety accessed for fire suppression. Over all, better water sources would improve suppression success and therefore help protect natural resources.	6	sites
Roseburg BLM	Days Creek. South Umpqua	Road Sediment Reduction	Road storm-proofing	31-4-3.2 Road Storm-proofing	The South Umpqua River watershed is a Tier 1 Key Watershed. Sediment is likely the most limiting factor to aquatic function in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. If culverts fail, substantial sediment could be transported to Shively Creek. Removing culverts would prevent crossing failures that deposit fine road sediments in stream channels. This project should occur before road becomes too overgrown for heavy equipment access.	1	project
Roseburg BLM	Days Creek. South Umpqua	Road Sediment Reduction	Road Drainage and Surface	South Umpqua Road	The South Umpqua River watershed is a Tier 1 Key Watershed. There are	10	miles

TABLE 3-7a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the BLM Roseburg District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
			Enhancement	Drainage and Surface Enhancement	approximately 6.23 miles of Project corridor and 3 stream crossings in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Sediment is likely the most limiting factor to aquatic function in this watershed. Roads in this watershed are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair would reduce sediment delivery to fish bearing streams.		
Roseburg BLM	Days Creek. South Umpqua	Stand Density Fuel Break	Fuels Reduction	Days Creek South Umpqua Hazardous Fuel Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project and associated activities removes both mature and developing stands and would increase fire suppression options however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This project is part of the Days Creek to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	1000	acres

TABLE 3-7b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Roseburg District Days Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	6.6	186.6	57.5	8.9	1
Fish Passage		0.2	0.0	0.2	1
Hazardous Fuels Reduction		1000.0	305.0	78.0	
Road Resurfacing	10.0	24.2	15.8	3.2	14
LWD In-stream	1.2	7.3	0.0	7.3	1

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: Fish Passage acres based on an estimate of 0.2 acres/site
Road Resurfacing/Stabilization acres based on a 20' treatment area
Hazardous Fuels Reduction Acres in Riparian Reserves is estimated

Figure 3-7a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Days Creek South Umpqua Watershed

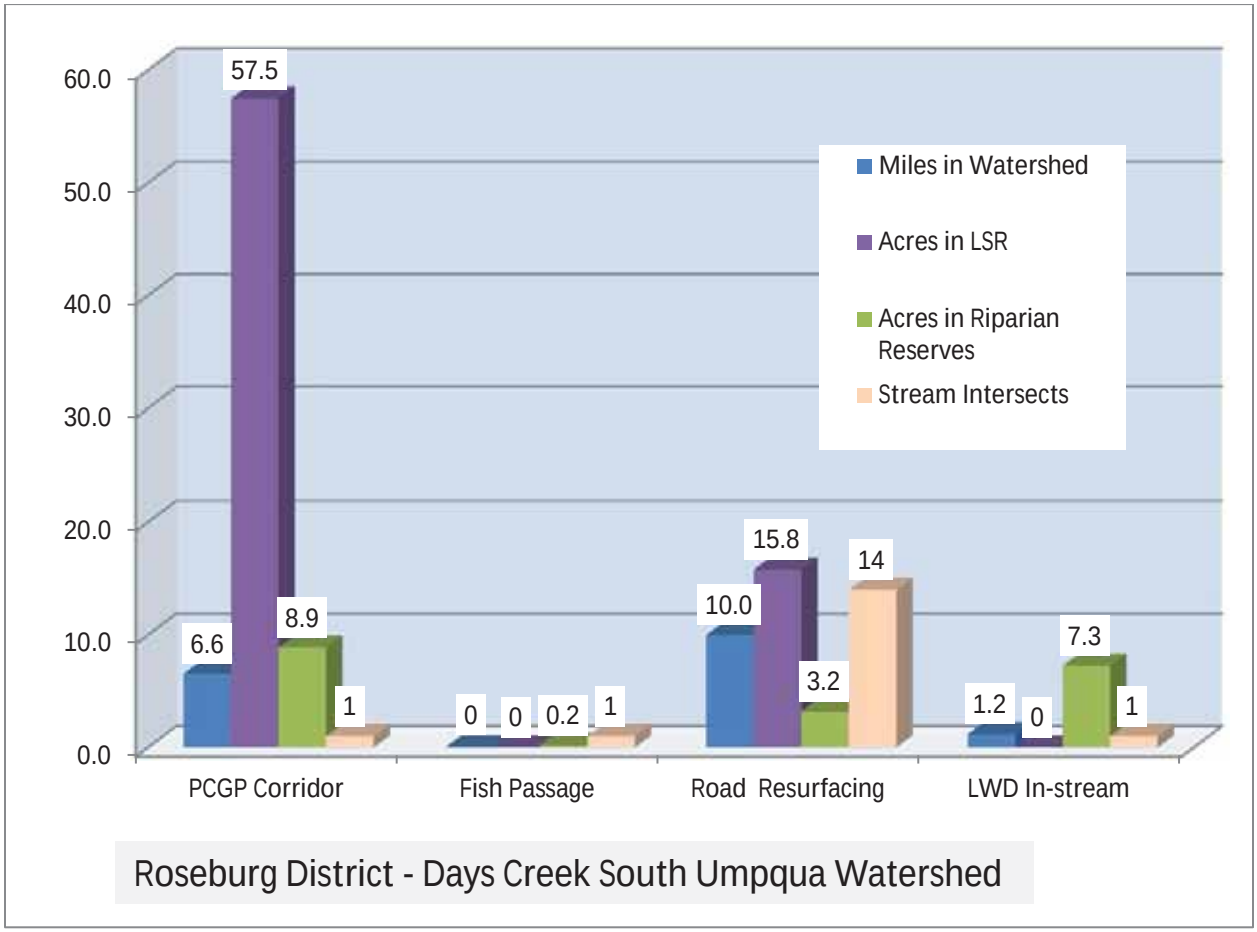


Figure 3-7b. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR in the Days Creek South Umpqua Watershed

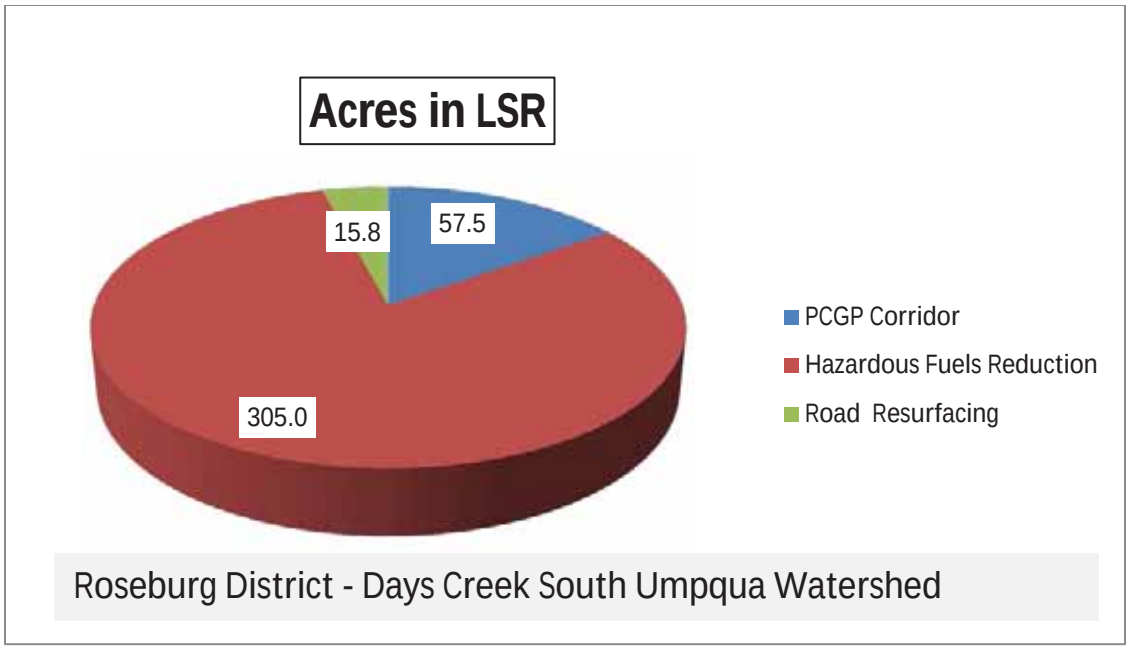


TABLE 3-8a

Mitigation Actions Proposed in the Trail Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Medford BLM	Trail Creek.	Aquatic and Riparian Habitat	LWD In-stream	Trail Creek LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.6	miles

TABLE 3-8a

Mitigation Actions Proposed in the Trail Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Medford BLM	Trail Creek.	Fire suppression	Suppression Capacity	Trail Creek Pump Chance	Construction of the Project would increase fire suppression complexity in the watershed. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	8	sites
Medford BLM	Trail Creek.	Road Sediment Reduction	Road storm-proofing	Trail Creek Road Storm-proofing	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including possible impacts to flow and sediment regimes. Storm-proofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	4.3	miles
Medford BLM	Trail Creek.	Road Sediment Reduction	Road Decommissioning	Trail Creek Road Decommissioning	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity and by reducing road density.	2.7	miles
Medford BLM	Trail Creek.	Road Sediment Reduction	Road Surfacing	Trail Creek Road Resurface	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	16.3	miles

TABLE 3-8a

Mitigation Actions Proposed in the Trail Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Medford BLM	Trail Creek.	Stand Density Fuel Break	Fuels Reduction	Trail Creek Fuel Hazard Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	687	acres
Medford BLM	Trail Creek.	Stand Density Fuel Break	Fuels Reduction	Trail Creek. Fuels Hazard Maintenance	This provides a mechanism for maintenance of fuel breaks over time for the life of the project.	687	acres

TABLE 3-8b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Medford District Trail Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	3.9	74.2	0.0	5.1	2
Hazardous Fuels Reduction	0.0	687.0	0.0	78.0	0
Road Decommissioning	2.7	6.5	0.0	2.0	9
Road Resurfacing - Storm-proofing	20.6	49.9	0.0	8.5	39
LWD In-stream	2.6	15.8	0.0	15.8	0

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LWD In-stream acres based on an estimate of a 50' wide treatment area
Road Resurfacing/Stabilization acres based on a 20' treatment area

Figure 3-8a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Trail Creek Watershed

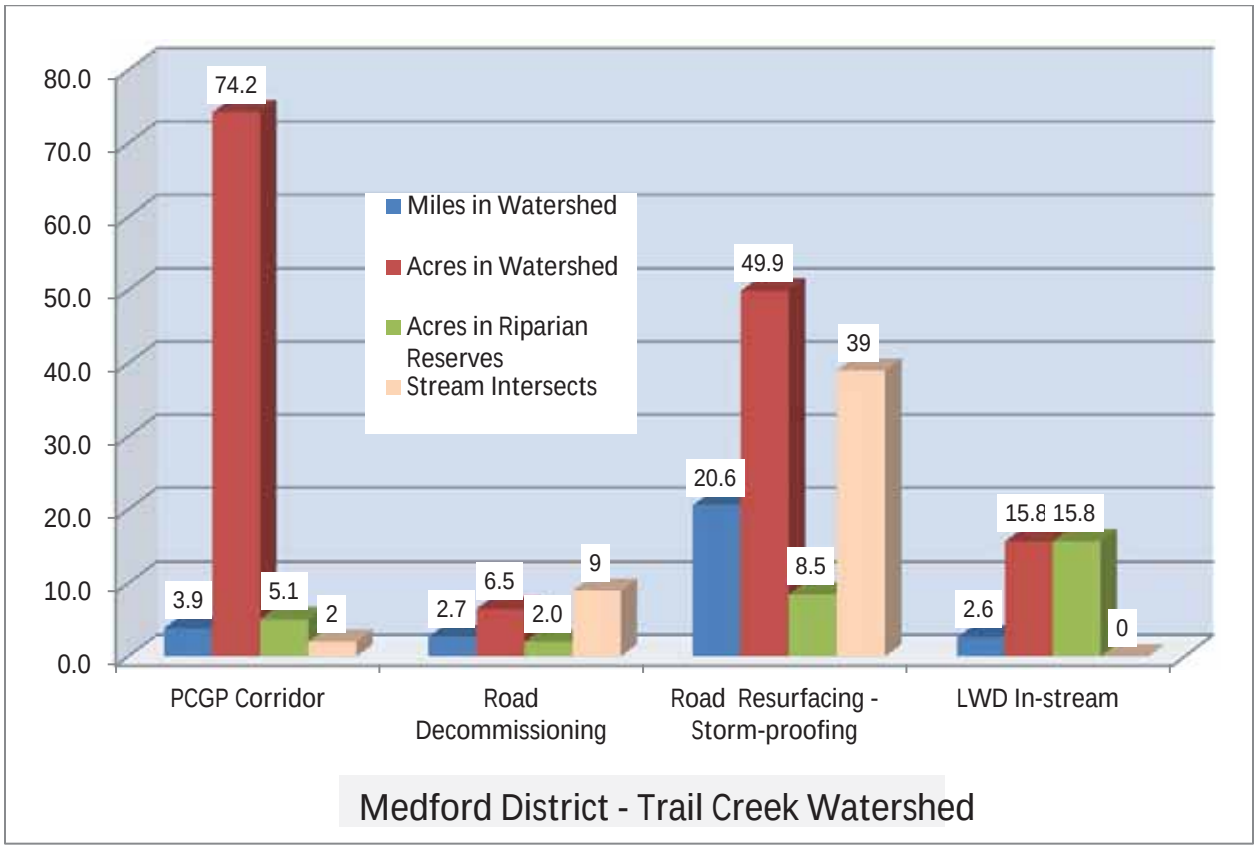


Figure 3-8b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Trail Creek Watershed

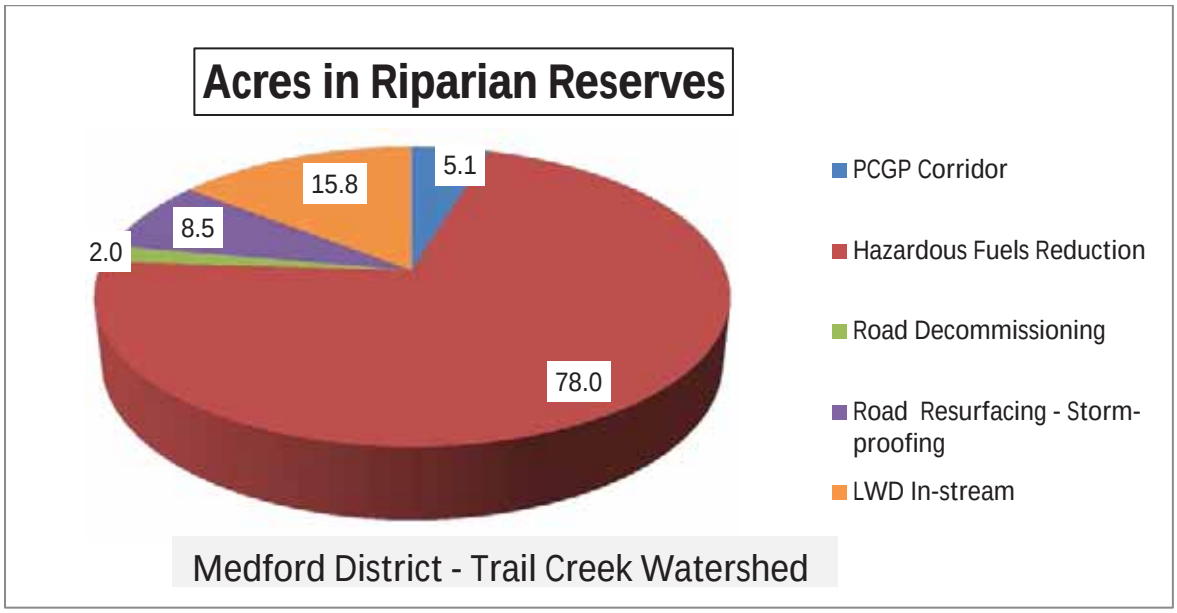


TABLE 3-9a

Mitigation Actions Proposed in the Shady Cove-Rogue River Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Medford BLM	Shady Cove Rogue River	Aquatic and Riparian Habitat	LWD In-stream	Shady Cove LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.5	miles
Medford BLM	Shady Cove Rogue River	Road Sediment Reduction	Road Drainage and Surface Enhancement	Shady Cove Road Improvement	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	1.0	mile
Medford BLM	Shady Cove Rogue River	Road Sediment Reduction	Road Surfacing	Shady Cove Road Resurface	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	1.5	miles
Medford BLM	Shady Cove Rogue River	Stand Density Fuel Break	Fuels Reduction	Shady Cove Fuel Hazard Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels	866	acres

TABLE 3-9a

Mitigation Actions Proposed in the Shady Cove-Rogue River Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.		
Medford BLM	Shady Cove Rogue River	Stand Density Fuel Break	Fuels Reduction	Shady Cove Fuel Hazard Maintenance	This provides a mechanism for maintenance of fuel breaks over time for the life of the Project.	866	acres

TABLE 3-9b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Medford District Shady Cove Rogue River Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	4.4	75.5	0.0	4.8	7
Hazardous Fuels Reduction	0.0	866.0	0.0	206.0	0
Road Resurfacing - Improvement	2.5	6.1	0.0	0.7	3
LWD In-stream	2.5	15.2	0.0	15.2	0

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LWD In-stream acres based on an estimate of a 50' wide treatment area
Road Resurfacing - Improvement acres based on a 20' treatment area

Figure 3-9a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Shady Cove Rogue River Watershed

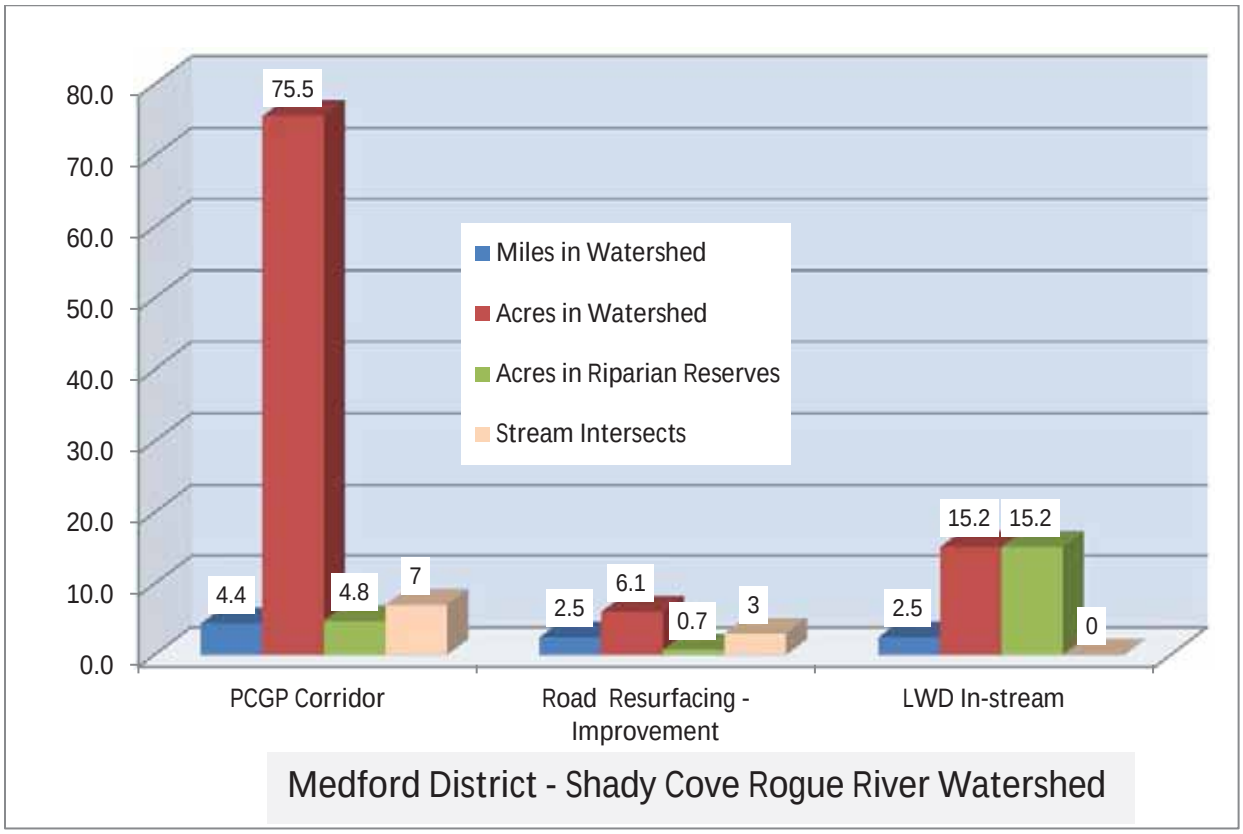


Figure 3-9b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Shady Cove Rogue River Watershed

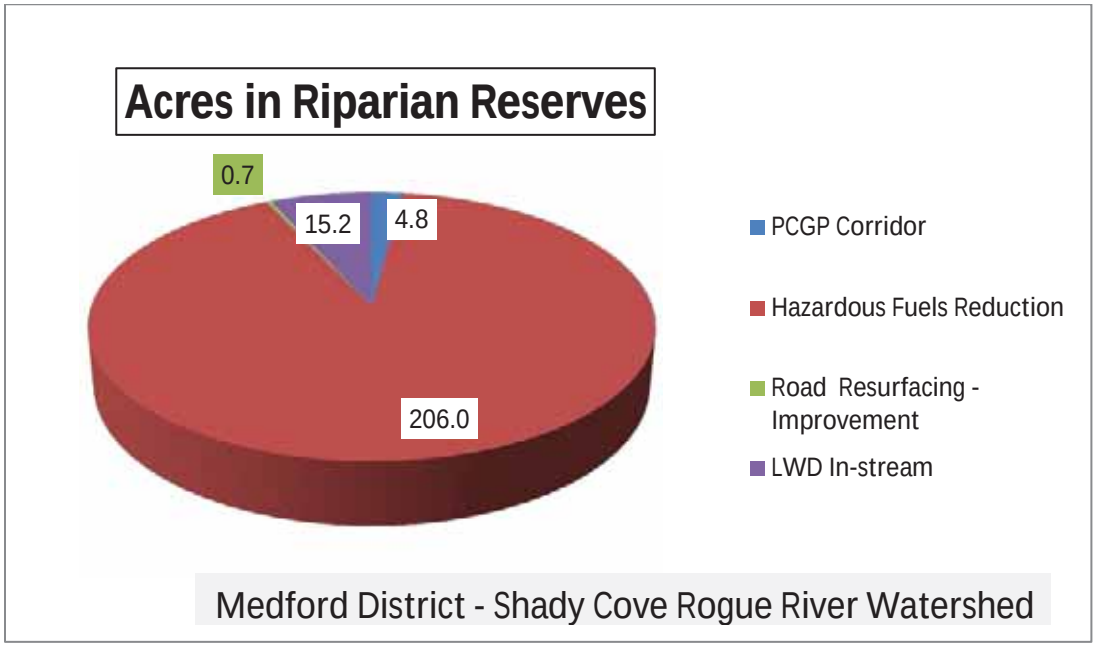


TABLE 3-10a

Mitigation Actions Proposed in the Big Butte Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Medford BLM	Big Butte Creek.	Fire suppression	Suppression Capacity	Big Butte Creek Pump Chance	Construction of the Project would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	1	sites
Medford BLM	Big Butte Creek.	Road Sediment Reduction	Road storm--proofing	Big Butte Creek. Road Storm-proofing	Sediment was identified by the Upper Rogue Watershed Council as a factor that limited aquatic habitat in this watershed. The effects of the Project are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	6.4	miles
Medford BLM	Big Butte Creek.	Terrestrial Habitat Improvement	Habitat Planting	Big Butte Creek. Fritillaria Habitat	The Project may impact habitat of Fritillaria gentneri. Out-planting to suitable habitat locations is recommended in the recovery plan for this species.	600	acres

TABLE 3-10b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Medford District Big Butte Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	0.7	11.7	0.0	6.9	4
Road Storm-proofing	6.4	15.5	0.0	2.1	10

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: Road Stormproofing acres based on a 20' wide treatment area

Figure 3-10a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Big Butte Creek Watershed

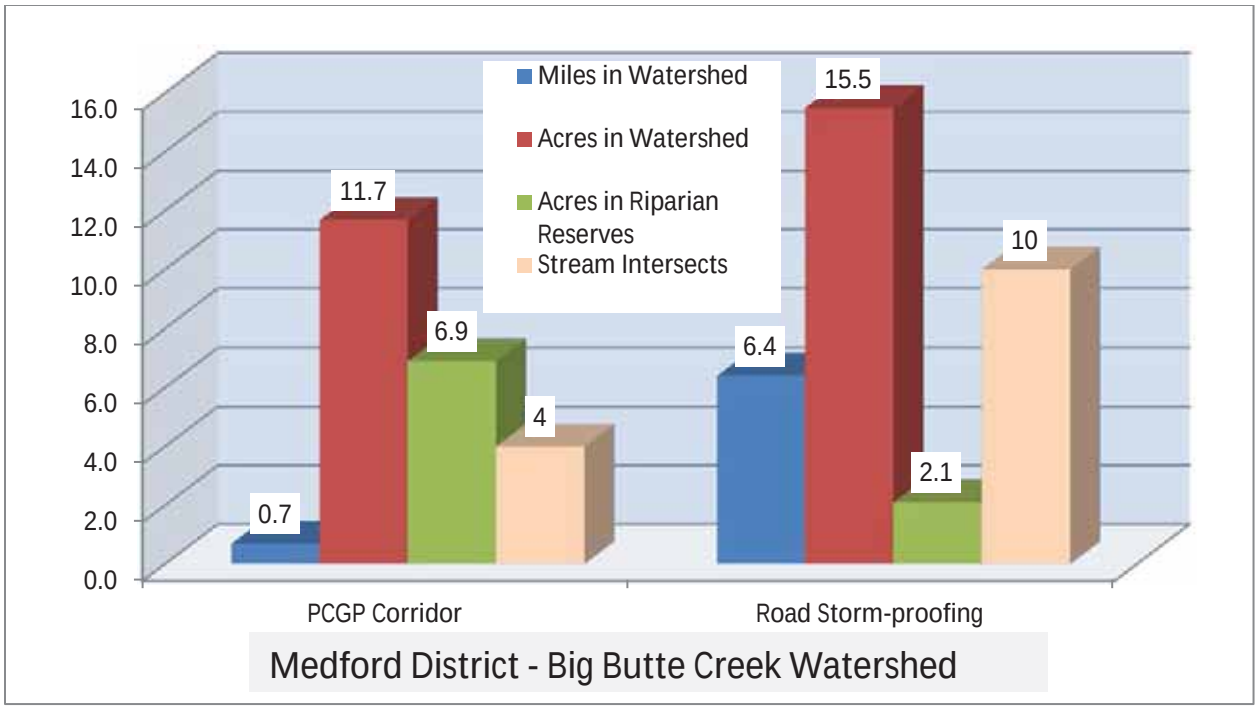


Figure 3-10b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Big Butte Creek Watershed

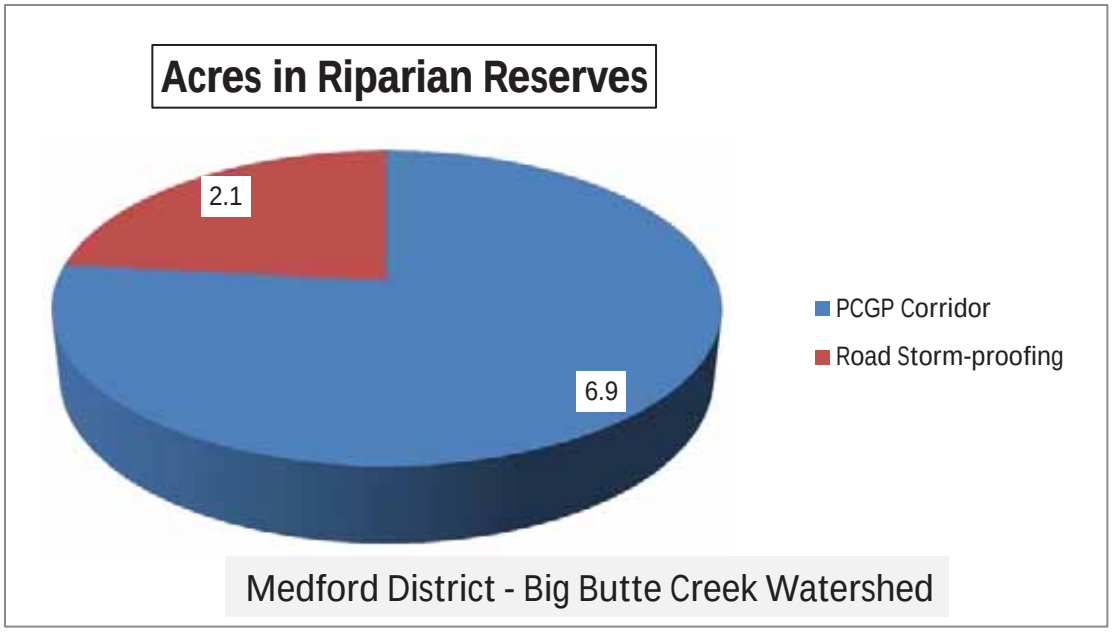


TABLE 3-11a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Medford BLM	Little Butte Creek	Aquatic and Riparian Habitat	Fish Passage	Little Butte Creek Fish Screen	Irrigation diversions have negatively impacted fisheries in Little Butte Creek watershed by causing entrapment. There is a private irrigation ditch with an unscreened diversion and associated push up dam on BLM land in the lower 1.5 miles of Lost Creek. The unscreened ditch is currently accessible to juvenile and adult fish, creating a stranding hazard with limited return access to the main channel. The push up dam is constructed at the beginning of the irrigation season and removed at the end of the season. This stream provides habitat for Coho salmon and steelhead trout; building a push up dam in Lost Creek each season disturbs the bed and banks of the channel, generates sediment and creates an unnecessary disturbance during steelhead spawning season. Creating a permanent diversion structure, possibly in the form of a boulder weir, would divert water without yearly maintenance and would provide for both upstream and downstream fish passage.	1	site
Medford BLM	Little Butte Creek	Aquatic and Riparian Habitat	LWD In-stream	Lost Creek In-stream LWD	The Little Butte Creek watershed is a Tier 1 Key Watershed. Lost Creek provides habitat for Coho salmon and steelhead trout. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Project. Implementation of the Project would result in the removal of LWD from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes	8.6	miles

TABLE 3-11a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					to the accomplishment of ACS objectives.		
Medford BLM	Little Butte Creek	Fire suppression	Suppression Capacity	Little Butte Creek Pump Chance	Construction of the Project would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	8	sites
Medford BLM	Little Butte Creek	Road Sediment Reduction	Road Drainage and Surface Enhancement	Little Butte Creek Road Improvement	The Little Butte Creek watershed is a Tier 1 Key Watershed. Sediment has been identified by the Little Butte Creek Watershed Council as a limiting factor for aquatic habitat in this watershed. The Project has approximately 6 miles of corridor and 7 stream crossings on BLM lands in this watershed. The effects of the Project are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	3.5	miles
Medford BLM	Little Butte Creek	Road Sediment Reduction	Road Decommissioning	Little Butte Creek Road Decommissioning	The Little Butte Creek watershed is a Tier 1 Key Watershed. Sediment has been identified by the Little Butte Creek Watershed Council as a limiting factor for aquatic habitat in this watershed. There are approximately 6 miles of the Project corridor and 7 stream crossings on BLM lands in this watershed. The effects of the Project are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity by reducing road density.	13.0	miles
Medford BLM	Little Butte Creek	Road Sediment Reduction	Road Surfacing	Little Butte Creek Road Resurfacing	The Little Butte Creek watershed is a Tier 1 Key Watershed. The Project has approximately 6 miles of corridor and 7 stream crossings on BLM lands in this watershed. The effects of the Project are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-	18.3	miles

TABLE 3-11a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the BLM Medford District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					related sediment that could be delivered to stream channels.		

TABLE 3-11b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Medford District Little Butte Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	6.0	107.9	0.0	8.4	7
Road Decommissioning	13.0	31.5	0.3	3.5	16
Road Resurfacing - Improvement	21.9	52.1	0.5	11.4	52
LWD In-stream	8.6	15.2	0.4	15.2	0

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LWD In-stream acres based on an estimate of a 50' wide treatment area
Road Resurfacing - Improvement acres based on a 20' wide treatment area

Figure 3-11a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Little Butte Creek Watershed

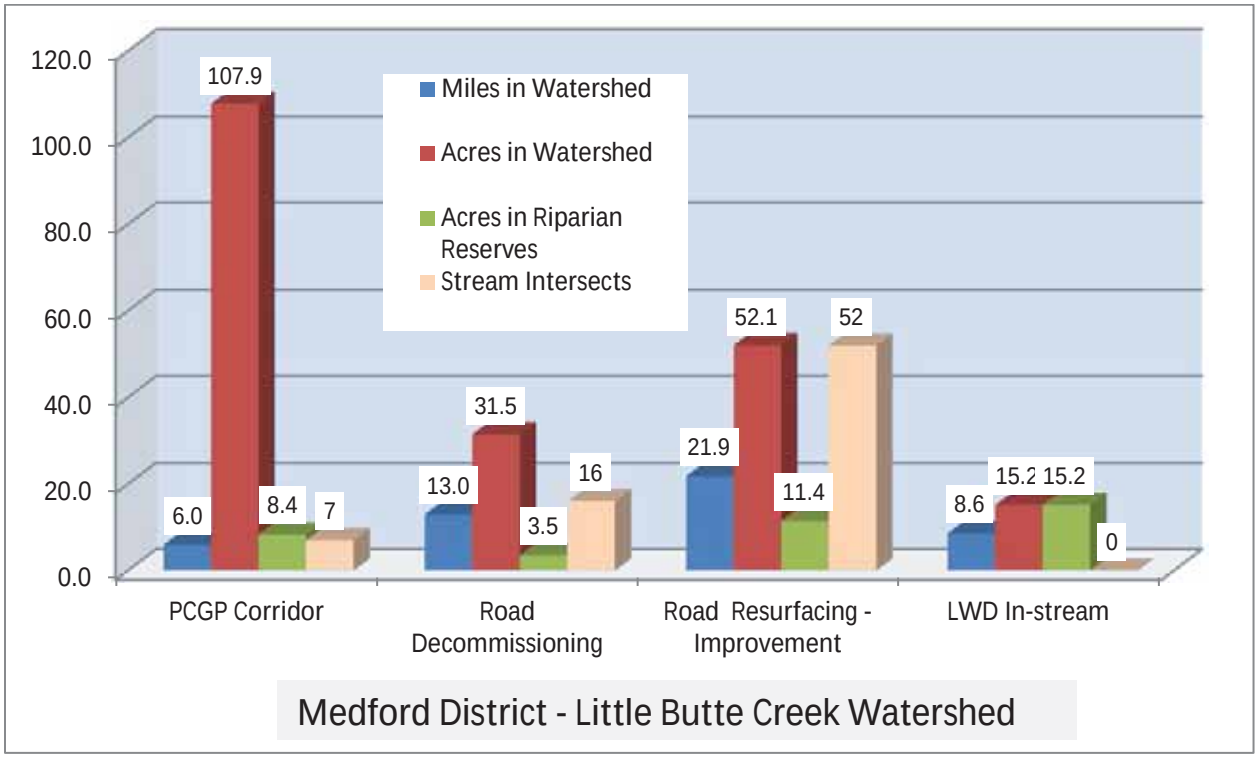


Figure 3-11b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Little Butte Creek Watershed

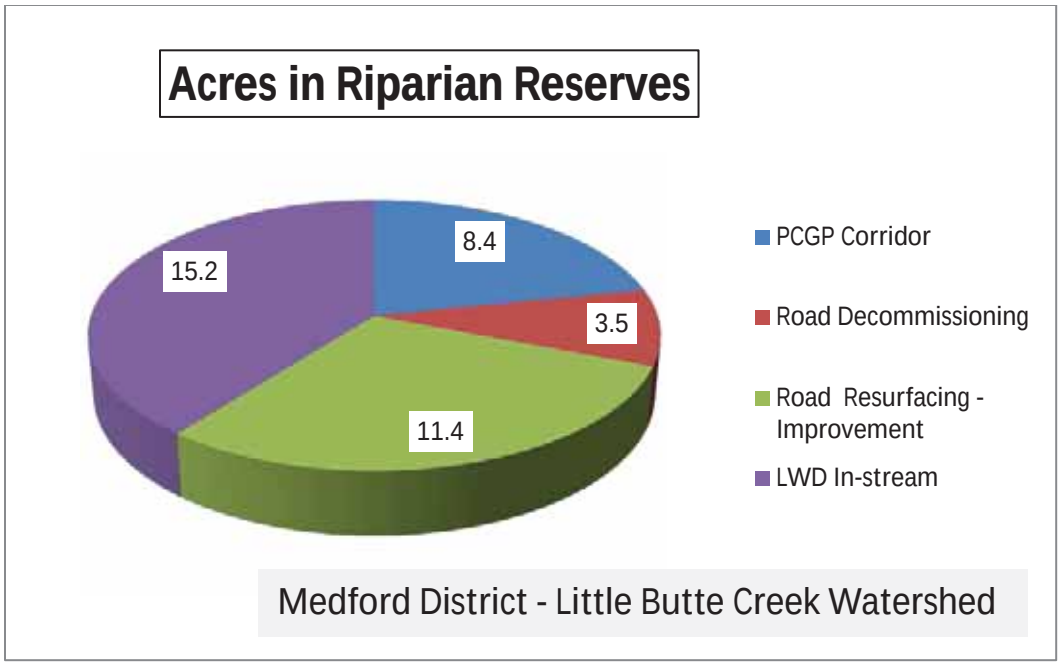


TABLE 3-12a

Mitigation Actions Proposed in the Spencer Creek Watershed on the BLM Lakeview District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Lakeview BLM	Spencer Creek	Stand Density Fuel Break	Riparian Vegetation	Upper Spencer Creek And Miners Creek LSR/Riparian treatment	The Spencer Creek watershed is a Tier 1 Key Watershed. Implementation of the Project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves in this watershed. This project would thin, pile and burn dense white fir understory vegetation and fall occasional trees into these stream channels to function as LWD. This would enhance forest health and diversity with these Riparian Reserve and associated LSR by restoring stand density to more natural and sustainable levels. This contributes to forest health and sustainability of riparian reserves by increasing resistance to insect and disease losses and reducing the risk of stand replacing fire. LWD in stream channels contributes to meeting water quality and TMDL targets and provides habitat for sensitive fish and invertebrate species.	6.0	miles

TABLE 3-12a

Mitigation Actions Proposed in the Spencer Creek Watershed on the BLM Lakeview District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Lakeview BLM	Spencer Creek	Stand Density Fuel Break	Riparian Vegetation	Tributary Creek Riparian Thinning	The Spencer Creek watershed is a Tier 1 Key Watershed. Implementation of the Project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. Thinning would restore forest health and diversity in riparian reserves and stands near streams that are currently overstocked. Thinning would be done in a way that emulates the natural “patchiness” of disturbance events.	70	acres
Lakeview BLM	Spencer Creek	Road Sediment Reduction	Road Drainage - Culvert Replacement	Keno Access Road Repair and Culvert Replacement	The Spencer Creek watershed is a Tier 1 Key Watershed. Although BMPs and other project measures would be implemented, the Project would have road-like watershed impacts if constructed, including mobilization of sediment and possible alteration of hydrologic regimes. The existing stream crossing (culvert) is undersized in both length and diameter, therefore it ability to meet ACS objectives is minimized. The culvert underlying the existing road bed periodically causes erosion of the road prism and adjacent upland and riparian areas. Replacement of the culvert would allow stabilization of the road shoulder and reduce sediment input to Miner's Creek and ultimately into Spencer Creek. If this work is not completed, the condition would eventually lead to increased sedimentation. Replacement of this drainage structure would decrease road-related erosion, increase the hydrologic capacity of the crossing and enhance aquatic connectivity for fish and other aquatic organisms.	1	site
Lakeview BLM	Spencer Creek	Road Sediment Reduction	Road Drainage	Spencer Creek Drainage Improvements and Sediment Trap Removal	The Spencer Creek watershed is a Tier 1 Key Watershed. Although BMPs and other project measures would be implemented, the Project would have watershed impacts if constructed, including mobilization of sediment and possible alteration of hydrologic regimes. The project also uses a number of roads for access and construction. Drainage improvements and removing non-functioning cross drains and sediment traps at selected locations would benefit	15	sites

TABLE 3-12a

Mitigation Actions Proposed in the Spencer Creek Watershed on the BLM Lakeview District

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					aquatic habitat/connectivity by restoring drainage and reducing sediment transport.		
Lakeview BLM	Spencer Creek	Road Sediment Reduction	Road Closure	Spencer Creek Repair Existing Road Closure	Roads negatively impact wildlife in this watershed. Implementation of the Project would have road-like impacts on wildlife and require use of a large number of permanent and temporary roads and other access routes. Road closures (barricades) were established in the watershed to reduce road density to meet LMP objectives for both the aquatic conservation strategy and reduce impacts to wildlife. This project repairs the existing closure structures to ensure that road closures remain effective. Spencer Creek is a Tier 1 Key Watershed. Maintaining road closures also reduces sediment by keeping closed roads re-vegetated.	12	sites
Lakeview BLM	Spencer Creek	Stand Density Fuel Break	Stand Density Habitat	Upper Spencer Creek LSR Density Mgt.	Implementation of the Project would require removal of LSOG forest habitat, including critical habitat for NSO. Stand density management reduces the risk of stand replacing fire and accelerates the development of late-successional stand conditions which may benefit NSO.	270	acres

TABLE 3-12b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

BLM Lakeview District Spencer Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor	1.0	14.9	0.0	2.1	5
Riparian Thinning		70.0	11.0	70.0	
LSR Riparian Treatment	6.0	72.7	6.9	47.8	
LSR Density Management	0.0	270.0	95.0	33.0	
Road Closures				1.7	3

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: LSR Riparian Treatment acres based on an estimate of a 100' wide treatment area

Figure 3-12a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Spencer Creek Watershed

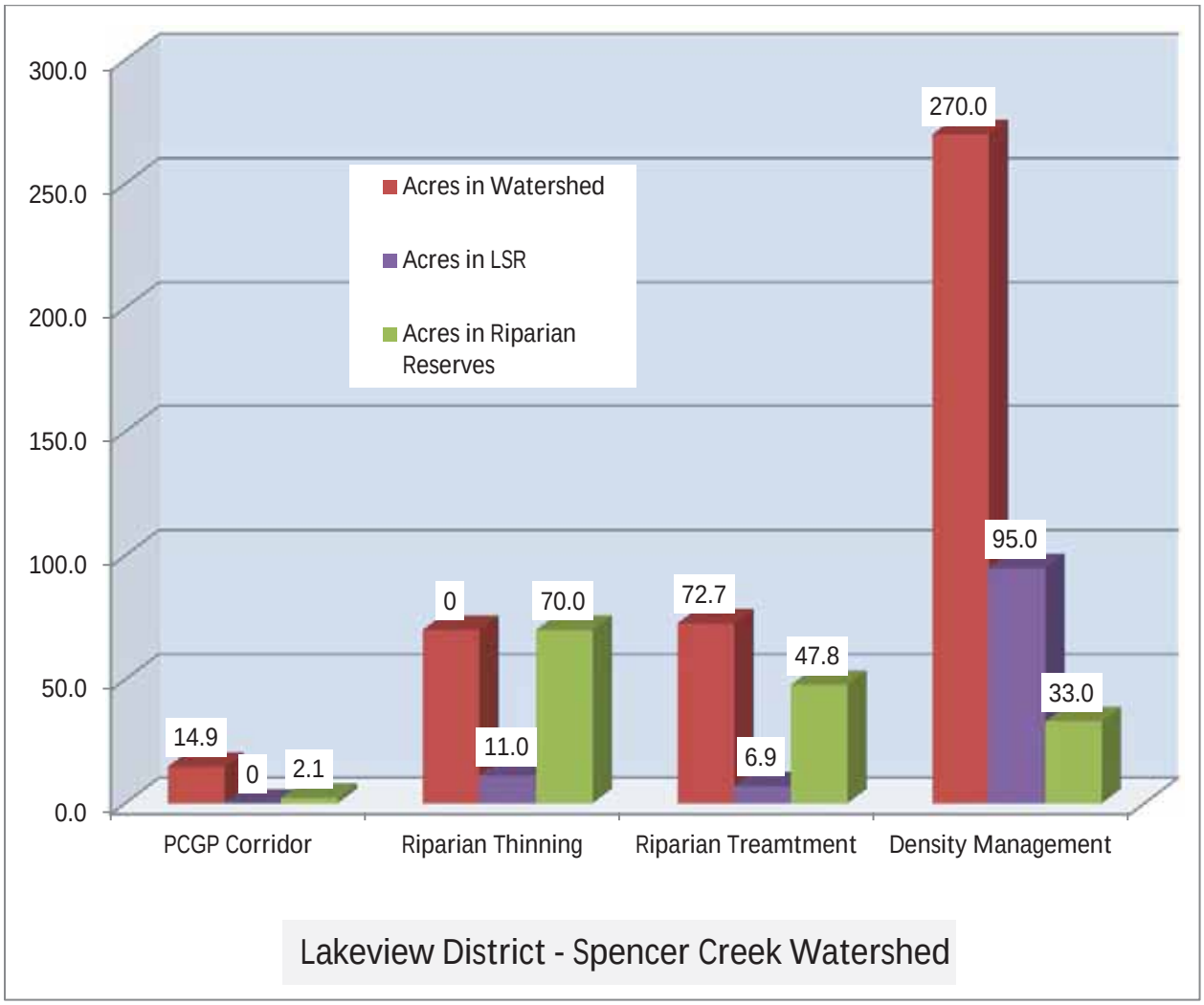
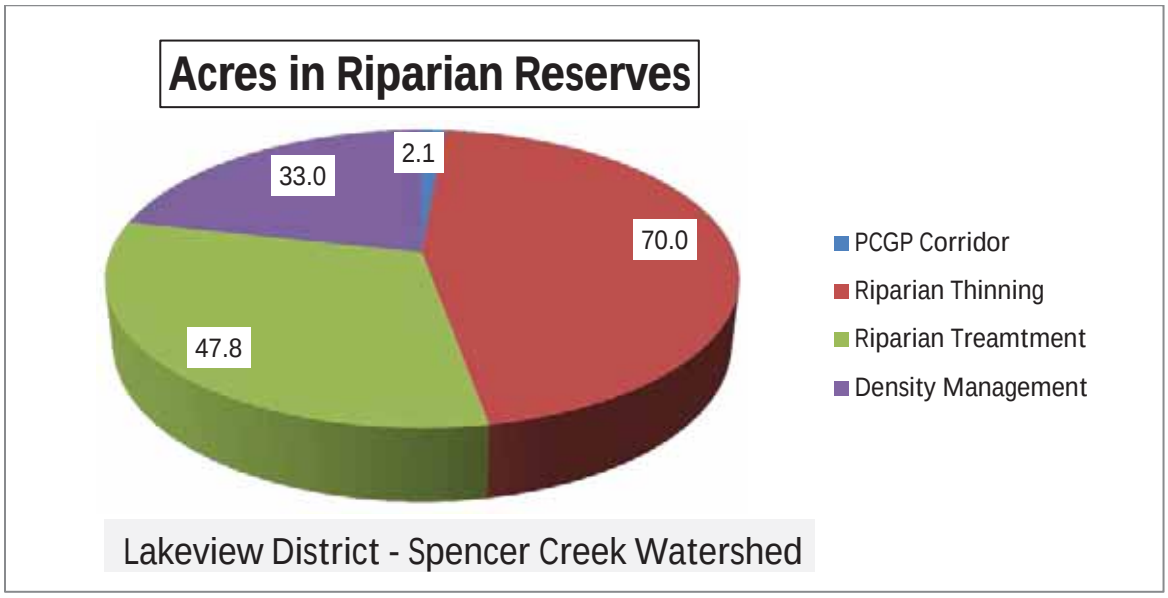


Figure 3-12b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian reserves in the Spencer Creek Watershed



This page intentionally left blank.

4.0 DESCRIPTION OF PROPOSED FOREST SERVICE MITIGATION ACTIONS BY FIFTH-FIELD WATERSHED

The following tables and figures describe the proposed mitigation actions by Forest Service administrative unit and fifth-field watershed. The Project impacts include the corridor, the TEWAs, and the UCSAs. Quantities are approximate estimates. Maps of the proposed mitigation actions are included in section 5 of this appendix.

TABLE 4-1a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Days Creek South Umpqua	Road sediment reduction	Road Closure	Days Creek South Umpqua Road Closure	Mowing and maintenance of the Project corridor, temporary road construction, and road use are direct disturbance impacts to wildlife. Road closure would mitigate some of those impacts, improve interior stand connectivity and benefit aquatic habitats over time.	0.5	Miles
Umpqua NF	Days Creek South Umpqua	Stand Density Fuel Break	Fuels Reduction	Days Creek South Umpqua Matrix Integrated Fuels Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on BLM's Roseburg District.	150.3	Acres

TABLE 4-1a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Days Creek South Umpqua	Stand Density Fuel Break	Fuels Reduction	Days Creek South Umpqua LSR Integrated Fuels Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on BLM lands.	231.5	Acres
Umpqua NF	Days Creek South Umpqua	Stand Density Fuel Break	Pre-commercial Thinning	Days Creek South Umpqua LSR Pre-commercial Thinning	The Project would cause direct impacts to existing and developing interior habitat. The Project would result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the Project corridor. Maintenance of the corridor would provide a continued vector for predators, early-seral species and non-native species. Also the project would result in a direct loss in biological services provided by attributes of mature forest for many decades past the life of the PCGP Project. Both mature stands and developing stands would be removed during Project construction. Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to the Project. Thinning of young stands is a recognized treatment within LRSs if designed to accelerate development of late-successional habitat characteristics (USDA FS; USDI BLM 1994b Pages B-11, C-11, C1-2, and C-17).	52.8	Acres

TABLE 4-1a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Days Creek South Umpqua	Stand Density Fuel Break	Under-burn	Days Creek South Umpqua LSR Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of the PCGP Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with LSOG habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable habitat late-seral forest. The proposed ridge line pipeline route intersects an area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation action would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.	125	Acres

TABLE 4-1a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Days Creek South Umpqua	Stand Density Fuel Break	Under-burn	Days Creek South Umpqua Matrix Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with late-successional habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable LSOG habitat. The proposed ridge line pipeline route intersects an area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.	102	Acres

TABLE 4-1a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Days Creek South Umpqua	Terrestrial Habitat Improvement	Snag Creation	Days Creek South Umpqua LSR Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the Project right-of-way. The project prevents development of large snags during the life of the project and for decades after. Project construction would result in loss of snag habitat on approximately 775 acres.. This project would add to those cumulative impacts. As snags are a critical component of LSRs and NSO habitat, replacement is needed. Snag requirements are specifically outlined in the Umpqua NF LMP. Replacement would be immediate though there would be a 10-year delay as snag decay develops. Snag Management is discussed in the NWFP for LSRs on pages C-14 and 15 (USDA FS; USDI BLM 1994b). Snag management levels are based on the Forest's Plant Association Guidelines. .	31.8	Acres
Umpqua NF	Days Creek South Umpqua	Terrestrial Habitat Improvement	Snag Creation	Days Creek South Umpqua Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres.. Data relies on information from the Cow Creek WA, an adjacent watershed which suggests the watershed is far below historic levels of snag habitat due to past management actions. This project would add to those cumulative impacts. As snags are a critical component of LSRs and NSO habitat, replacement is needed. Snag requirements are specifically outlined in the Forests' LMP. Replacement would be immediate though there would be a 10-year delay as snag decay develops. Snag management levels are based on the Forest's Plant Association Guidelines.	15.7	Acres

TABLE 4-1b **Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/**			
Umpqua NF-Days Creek South Umpqua Watershed	**Acres in Watershed**	**Acres in LSR**	**Snag Acres**
PCGP Corridor Impacts	74.1	31.4	21.2
Hazardous Fuels Reduction	381.8	231.5	
Under-burning	227.0	125.0	
Pre-commercial Thinning	52.8	52.8	
Snag Creation	47.5	31.8	47.5

a/ PCGP Impacts Data Source: 2013 PCGP License Application and USFS GIS files
b/ Offsite Mitigation Actions Data Source: USFS GIS files

Figure 4-1a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Days Creek South Umpqua Watershed

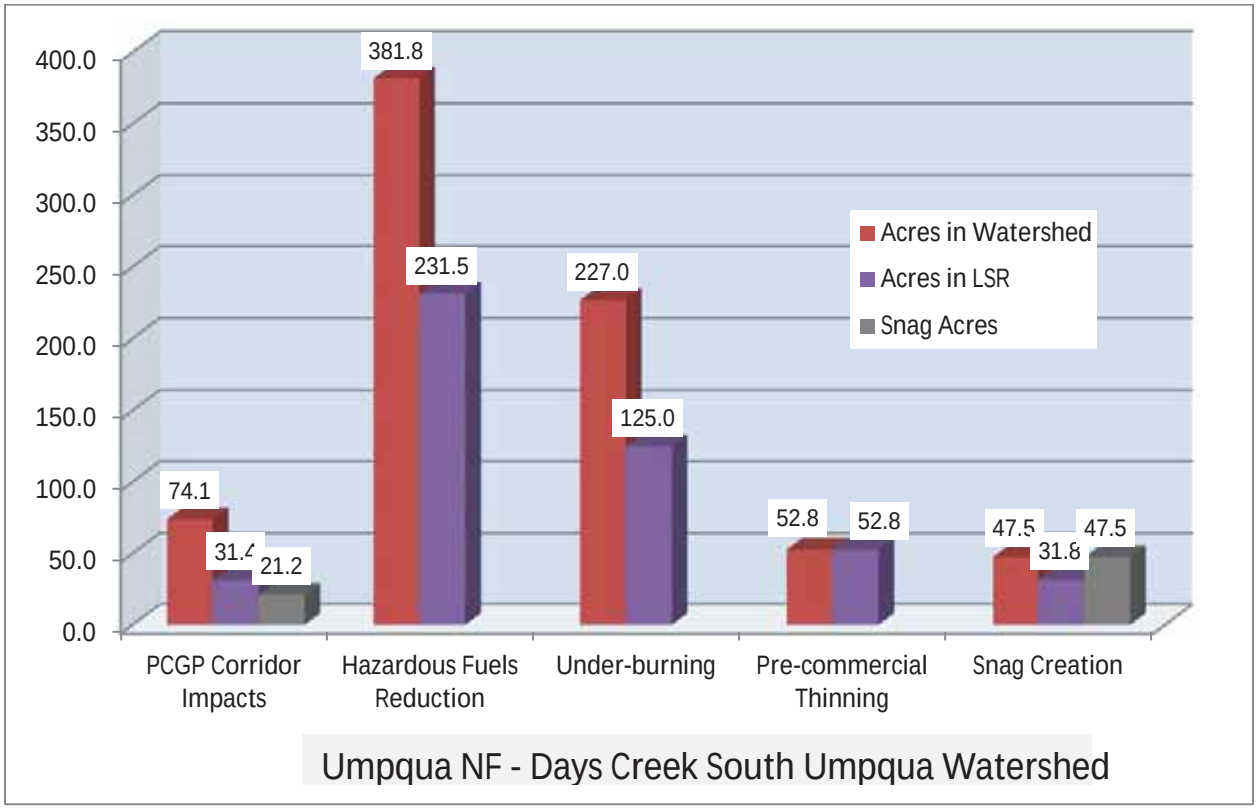


Figure 4-1b. Comparison of PCGP Impacts and Offsite Mitigation Actions within LSR in the Days Creek South Umpqua Watershed

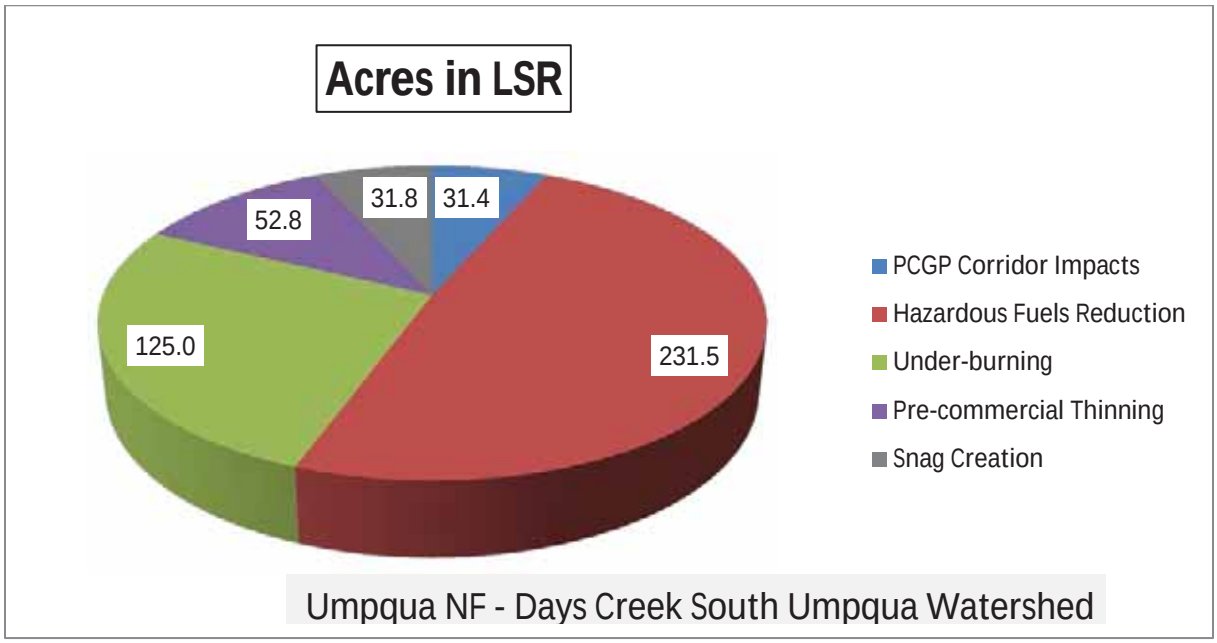


TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Elk Creek South Umpqua	Aquatic and Riparian Habitat	Fish Passage	Elk Creek Fish Passage Culverts	Restoring stream crossings reconnects aquatic habitats in this watershed by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which would help offset the impact of shade removal where the Project affects streams and riparian areas.	3	Sites
Umpqua NF	Elk Creek South Umpqua	Road sediment reduction	Road Storm-proofing	Elk Creek Road Storm-proofing	Sediment has been identified as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including possible impacts to flow and sediment regimes. Storm-proofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	1.6	Miles
Umpqua NF	Elk Creek South Umpqua	Road sediment reduction	Road Closure	Elk Creek Road Close	Close roads and remove culverts and treat weeds Mowing and maintenance of pipeline corridor, temporary road construction, and road use are direct disturbance impacts to wildlife. Road closure would mitigate some of those impacts, improve interior stand connectivity and benefit aquatic habitats over time.	2.8	Miles
Umpqua NF	Elk Creek South Umpqua	Road sediment reduction	Road Decommissioning	Elk Creek Road Decommissioning	A construction corridor 75-95 feet wide with additional work areas would be cleared. Of this, width, a 30-foot wide portion of the corridor would be maintained in early successional habitat. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads in conjunction with pre-commercial thinning treatments (see other	2.8	Miles

TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					mitigations) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in Riparian Reserves reduces sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9 (USDA FS; USDI BLM 1994b page C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement within the Project corridor.		
Umpqua NF	Elk Creek South Umpqua	Stand Density Fuel Break	Fuels Reduction	Elk Creek LSR Integrated fuels	High intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on BLM lands.	896.6	Acres
Umpqua NF	Elk Creek South Umpqua	Stand Density Fuel Break	Fuels Reduction	Elk Creek Matrix Integrated Fuels Reduction	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change.	170.3	Acres

TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed ridge line pipeline route intersects and area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of LSOG habitat. This mitigation provides multiple resources values for the LSR, NFS, adjacent private landowners and public. This segment is part of the Days Creek to Shady Cove fuel break and ties in with similar projects on BLM lands.		
Umpqua NF	Elk Creek South Umpqua	Stand Density Fuel Break	Pre-commercial Thinning	Elk Creek LSR Pre-commercial thinning	There would be direct impacts to existing interior, developing interior habitat. The Project would result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the corridor. Maintenance of Project corridor would provide a continued vector for predators, early-seral species and non-native species. Also the Project would result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of the Project. Both mature stands and developing stands would be removed during Project construction. Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to Project construction.	368.3	Acres

TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					Thinning of young stands is a recognized treatment within LRSs if designed to accelerate development of late-successional habitat characteristics (USDA FS; USDI BLM 1994b Pages B-11, C-11, C1-2, and C-17).		
Umpqua NF	Elk Creek South Umpqua	Stand Density Fuel Break	Under-burn	Elk Creek LSR Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the Project. The proposed mitigation is centered on the ecological values associated with LSOG habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable LSOG forest habitat. The proposed ridge line pipeline route intersects an area that has had reoccurring lighting	472	Acres

TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.		
Umpqua NF	Elk Creek South Umpqua	Stand Density Fuel Break	Under-burn	Elk Creek Matrix Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with late-successional habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable LSOG forest habitat. The proposed ridge line pipeline	115	Acres

TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					route intersects an area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.		
Umpqua NF	Elk Creek South Umpqua	Terrestrial Habitat Improvement	LWD Upland Placement	Elk Creek LSR LWD Placement	Mitigate for the loss of recruitment of LWD to adjacent stands and within the Project corridor zone. The Project would forgo the development of LWD for the life of the Project and for decades after. LWD is a critical component of Mature Forest ecosystems. LWD replacement would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID) (Marcot et. al. 2002). Acres that can be treated are necessarily limited by material available from the corridor.	102	Acres
Umpqua NF	Elk Creek South Umpqua	Terrestrial Habitat Improvement	Noxious Weed Treatment	Elk Creek Meadow Noxious Weeds	Mitigate impacts to unique habitats (e.g., meadows) impacted by the Project. There would be loss of forest habitat buffering the unique habitats and disruption to soil horizons enhancing the opportunities for non-native plant species.	105.5	Acres
Umpqua NF	Elk Creek South Umpqua	Terrestrial Habitat Improvement	Noxious Weed Treatment	Elk Creek Roadside Noxious Weeds	Mitigate impacts to unique habitats (e.g., meadows) impacted by the Project. There would be loss of forest habitat buffering the unique habitats and disruption to soil horizons enhancing the opportunities for non-native plant species.	6.7	Miles
Umpqua	Elk Creek	Terrestrial	Snag Creation	Elk Creek LSR	Mitigate immediate and future	66.3	Acres

TABLE 4-2a

Mitigation Actions Proposed in the Elk Creek South Umpqua Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
NF	South Umpqua	Habitat Improvement		Snag Creation	impacts to snag habitat from the clearing of the Project corridor. The Project prevents development of large snags during the life of the Project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres. Data relies on the Cow Creek WA prepared for an adjacent watershed which suggests the watershed is far below historic levels of snag habitat due to past management actions. This project would add to those cumulative impacts. As snags are a critical component of LSR and NSO habitat, replacement is needed. Snag requirements are specifically outlined in the Forests' LMP. Replacement would be immediate though there would be a 10-year delay as snag decay develops. Snag Management is discussed in the NWFP for LSRs on pages C-14 and 15 (USDA FS; USDI BLM 1994b). Snag management levels are based on the Forest's Plant Association Guidelines.		
Umpqua NF	Elk Creek South Umpqua	Terrestrial Habitat Improvement	Snag Creation	Elk Creek Matrix Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the Project corridor. The project prevents development of large snags during the life of the Project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres of Project. This project would add to those cumulative impacts. Snag requirements are specifically outlined in the Umpqua NF LMP. Replacement would be immediate though there would be a 10 year delay as snag decay develops. Snag management levels are based on the Forest's Plant Association Guidelines.	13.2	Acres

TABLE 4-2b **Comparison of PCGP Impacts and Offsite Mitigation Actions** a/ b/			
Umpqua NF-Elk Creek South Umpqua Watershed	**Acres in Watershed**	**Acres in LSR**	**Snag Acres**
PCGP Corridor Impacts	32.5	21.5	32.5
Hazardous Fuels Reduction	1066.9	896.6	
Under-burning	587.0	472.0	
Road Decommissioning	17.0		
LWD Placement	102.0	102.0	
Pre-commercial Thinning	368.3	368.3	
Sang Creation	69.5	66.3	69.5

a/ PCGP Impacts Data Source: 2013 PCGP License Application and USFS GIS files
b/ Offsite Mitigation Actions Data Source: USFS GIS files

Figure 4-2a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Elk Creek South Umpqua Watershed

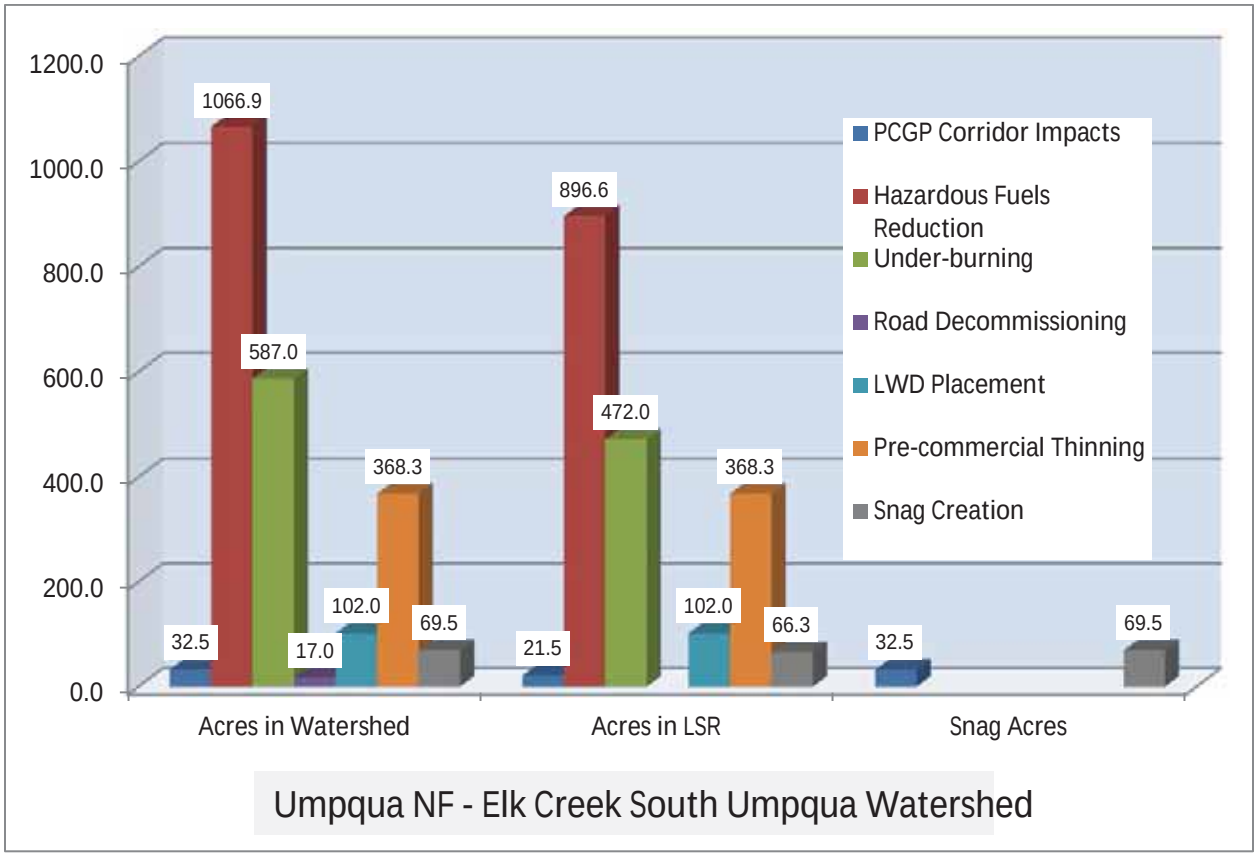


Figure 4-2b. Comparison of PCGP Impacts and Offsite Mitigation Actions within LSR in the Elk Creek South Umpqua Watershed

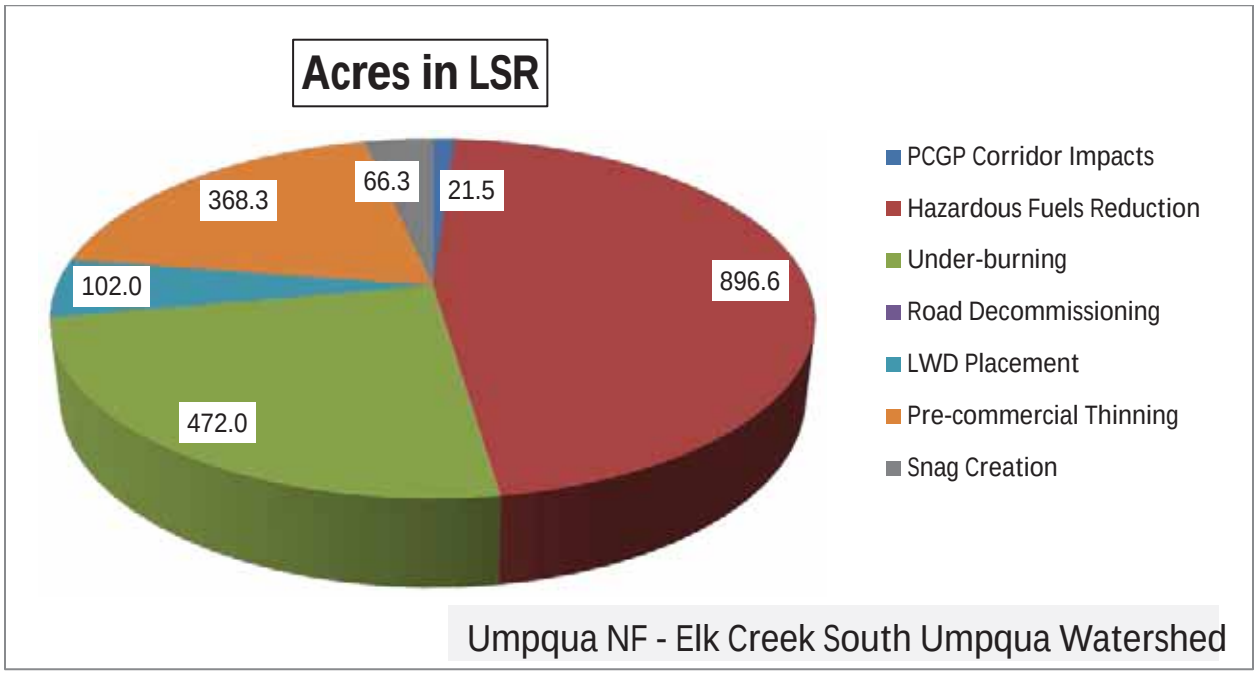


TABLE 4-3a

Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Upper Cow Creek	Aquatic and Riparian Habitat	Fish Passage	Upper Cow Creek Fish Passage Culverts	Restoring stream crossings in this watershed reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting intended to offset Project impacts associated with shade removal.	4	Site
Umpqua NF	Upper Cow Creek	Road sediment reduction	Road Closure	Upper Cow Creek Road Closure	Close roads, remove culverts, and treat weeds Mowing and maintenance of Project corridor, temporary road construction, and road use are direct disturbance impacts to wildlife. Road closure would mitigate some of those impacts, improve interior stand connectivity and benefit aquatic habitats over time.	2.6	Miles
Umpqua NF	Upper Cow Creek	Road sediment reduction	Road Decommissioning	Upper Cow Creek Road Decommissioning	A construction corridor 75-95 wide with additional work areas would be cleared. Of this, a 30-foot wide route along the corridor would be maintained in early successional habitat. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads in conjunction with pre-commercial thinning treatments (see other mitigation actions) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in Riparian Reserves sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9 (USDA FS; USDI BLM 1994b page C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement	4.3	Miles

TABLE 4-3a

Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					within the pipeline corridor.		
Umpqua NF	Upper Cow Creek	Stand Density Fuel Break	Fuels Reduction	Upper Cow Creek LSR Integrated Fuels Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on BLM lands.	971.9	Acres
Umpqua NF	Upper Cow Creek	Stand Density Fuel Break	Fuels Reduction	Upper Cow Creek Matrix Integrated Fuels Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on BLM lands.	606.1	Acres
Umpqua NF	Upper Cow Creek	Stand Density Fuel Break	Under-burn	Upper Cow Creek LSR Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would	531	Acres

TABLE 4-3a

Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the Project. The proposed mitigation is centered on the ecological values associated with late-successional habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable LSOG habitat. The proposed ridge line pipeline route intersects an area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the LSOG habitat forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.		
Umpqua NF	Upper Cow Creek	Stand Density Fuel Break	Under-burn	Upper Cow Creek Matrix Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire.	410	Acres

TABLE 4-3a

Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					Density management in younger stands would accelerate development of LSOG habitat. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with late-successional habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable LSOG habitat. The proposed ridge line pipeline route intersects and area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.		
Umpqua NF	Upper Cow Creek	Terrestrial Habitat Improvement	LWD Upland Placement	Upper Cow Creek LSR LWD Placement	Mitigate for the loss of recruitment of LWD to adjacent stands and within the Project corridor. The Project would forgo the development of LWD for the life of the Project and for decades after. LWD is a critical component of Mature Forest ecosystems. Replacement of	61.6	Acres

TABLE 4-3a

Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					LWD would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID) (Marcot et. al. 2002). Acres that can be treated are necessarily limited by material available from the corridor.		
Umpqua NF	Upper Cow Creek	Terrestrial Habitat Improvement	Noxious Weed Treatment	Upper Cow Creek Meadow Noxious Weeds	Mitigate impacts to unique habitats (e.g., meadows) impacted by the Project. There would be loss of forest habitat buffering the unique habitats and disruption to soil horizons enhancing the opportunities for non-native plant species.	21.3	Acres
Umpqua NF	Upper Cow Creek	Terrestrial Habitat Improvement	Snag Creation	Upper Cow Creek LSR Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the Project corridor. The Project prevents development of large snags during the life of the Project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres. Data relies on the Cow Creek WA which suggests this watershed is far below historic levels of snag habitat due of past management actions. This Project would add to those cumulative impacts. As snags are a critical component of LSRs and NSO habitat, replacement is needed. Snag requirements are specifically outlined in the Umpqua NF LMP. Replacement would be immediate though there would be a 10 year delay as snag decay develops. Snag Management is discussed in the NWFP for LSRs on pages C-14 and 15 (USDA FS; USDI BLM 1994b). Snag management levels are based	91.1	Acres

TABLE 4-3a

Mitigation Actions Proposed in the Upper Cow Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					on the Forest's Plant Association Guidelines.		
Umpqua NF	Upper Cow Creek	Terrestrial Habitat Improvement	Snag Creation	Upper Cow Creek Matrix Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the Project corridor. The Project prevents development of large snags during the life of the project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres. Data relies on the Cow Creek WA which suggests this watershed is far below historic levels of snag habitat due of past management actions. This Project would add to those cumulative impacts. Snag requirements are specifically outlined in the Umpqua NF LMP. Replacement would be immediate though there would be a 10 year delay as snag decay develops. Snag management levels are based on the Forest's Plant Association Guidelines.	13.8	Acres
Umpqua NF	Upper Cow Creek	Reallocation of Matrix Lands to LSR	Reallocation of Matrix to LSR	LSR 223 Addition	This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres of habitat from the construction and operation of the Project.	588	Acres

TABLE 4-3b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Umpqua NF Upper Cow Creek Watershed	**Miles in Watershed**	**Acres in Watershed**	**Acres in LSR**	**Acres in Riparian Reserves**
PCGP Corridor	4.4	75.5	38.6	10.7
Road Decommissioning	4.3	10.4	1.9	0.2
Road Closures	2.6	6.3	0.5	0.7
Hazardous Fuels Reduction		1578.0	971.9	235.6
Under-burning		941.0	531.0	140.5
LWD Placement		61.6	61.6	4.9
Snag Creation		104.9	91.1	0.0

a/ PCGP Impacts Data Source: 2013 PCGP License Application and USFS GIS files
b/ Offsite Mitigation Actions Data Source: USFS GIS files
Note: Road Decommissioning/closure acres based on a 20' wide treatment area
Under-burning acres in in Riparian Reserves is an estimate

Figure 4-3a. Comparison of PCGP Impacts and Offsite Aquatic Mitigation Actions in the Upper Cow Creek Watershed

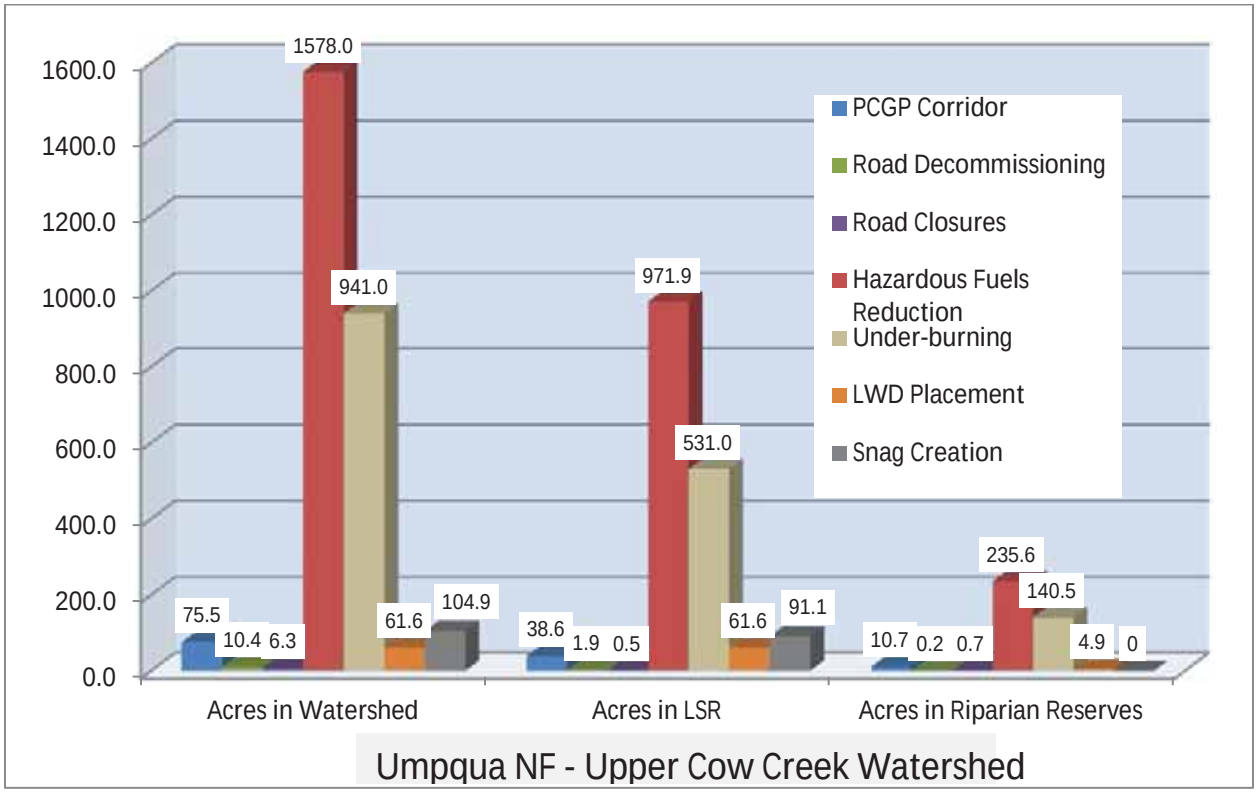


Figure 4-3b. Comparison of PCGP Impacts and Offsite Mitigation Actions within LSR in the Upper Cow Creek Watershed

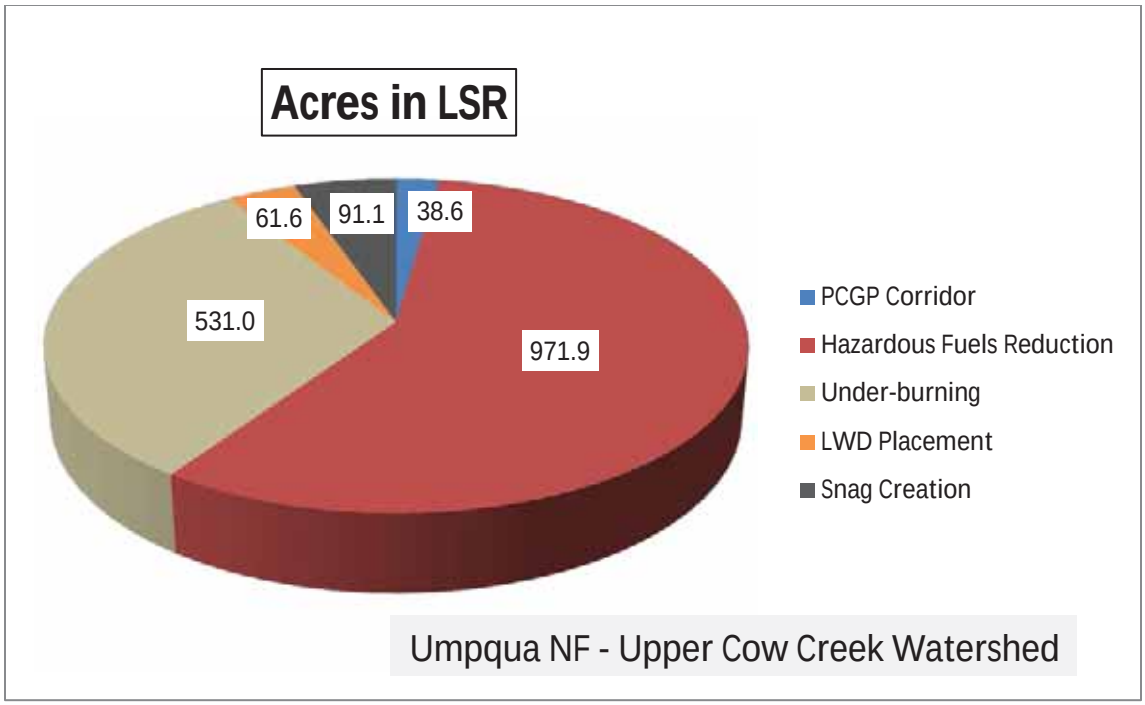


Figure 4-3c. Comparison of PCGP Impacts and Offsite Mitigation Actions within Riparian Reserves in the Upper Cow Creek Watershed

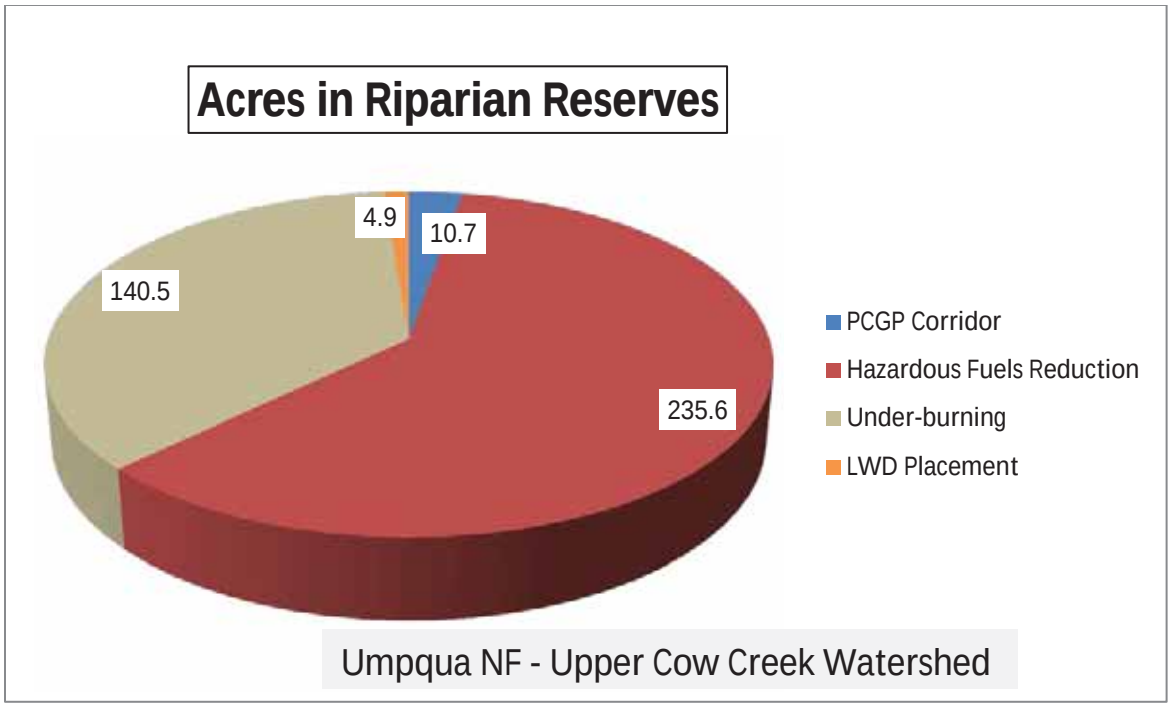


TABLE 4-4a

Mitigation Actions Proposed in the Trail Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Umpqua NF	Trail Creek	Road sediment reduction	Road Decommissioning	Trail Creek Road Decommissioning	A construction corridor 75-95 wide with additional work areas would be cleared. Of this, a 30-foot wide route along the Project corridor would be maintained in early successional habitat. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads in conjunction with pre commercial thinning treatments (see other mitigations) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in riparian reduces sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9 (USDA FS; USDI BLM 1994b page C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement within the construction corridor.	1.1	Miles
Umpqua NF	Trail Creek	Road sediment reduction	Road Storm-proofing	Trail Creek Storm-proofing	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in this watershed. The effects of the Project are similar to a road, including possible impacts to flow and sediment regimes. Storm-proofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	0.5	Miles
Umpqua NF	Trail Creek	Stand Density Fuel Break	Fuels Reduction	Trail Creek Matrix Integrated Fuels Reduction	High intensity fire has been identified as the single factor most impacting LSOG forest habitat on federal lands in the area of the NWFP. Construction of the Project removes both mature and developing stands and would	414.2	Acres

TABLE 4-4a

Mitigation Actions Proposed in the Trail Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					increase fire suppression complexity however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on BLM lands.		
Umpqua NF	Trail Creek	Stand Density Fuel Break	Under-burn	Trail Creek Matrix Under-burn	Both mature stands and developing stands would be removed during Project construction. Impacts to mature and developing stands would exceed the life of this Project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG habitat . Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG habitat is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG habitat so this is not a 1-1 replacement. LSRAs have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with LSOG habitat. The values to associated species, many other ecosystem goods and services components such as micro-organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to	280	Acres

TABLE 4-4a

Mitigation Actions Proposed in the Trail Creek Watershed on the Umpqua NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					establish appropriate level of mitigation for the loss of irreplaceable LSOG habitat. The proposed ridge line pipeline route intersects and area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, NFS lands, adjacent private landowners and public.		
Umpqua NF	Trail Creek	Terrestrial Habitat Improvement	Snag Creation	Trail Creek Matrix Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the Project corridor. The Project prevents development of large snags during the life of the Project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres. This project would add to those cumulative impacts. As snags are a critical component of LSRs and NSO habitat, replacement is needed. Snag requirements are specifically outlined in the Rogue River NF LMP. Replacement would be immediate though there would be a 10 year delay as snag decay develops. Snag Management is discussed in the NWFP for LSRs on pages C-14 and 15 (USDA FS; USDI BLM 1994b). Snag management levels are based on the Forest's Plant Association Guidelines.	108.6	Acres

TABLE 4-4b **Comparison of PCGP Impacts and Offsite Mitigation Actions** a/ b/				
Umpqua NF-Trail Creek Watershed	**Miles in Watershed**	**Acres in Watershed**	**Acres in Riparian Reserves**	**Acres in LSR**
PCGP Corridor Impacts	2.1	50.2	0.0	0.0
Hazardous Fuels Reduction		414.2	148.0	0.0
Snag Creation		108.6	0.0	0.0
Road Sediment Reduction	1.6	3.9	0.2	0.0

a/ PCGP Impacts Data Source: 2013 PCGP License Application and USFS GIS files
b/ Offsite Mitigation Actions Data Source: USFS GIS files
Note: Road Sediment Reduction acres based on an estimate of a 20' wide treatment area

Figure 4-4. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Trail Creek watershed

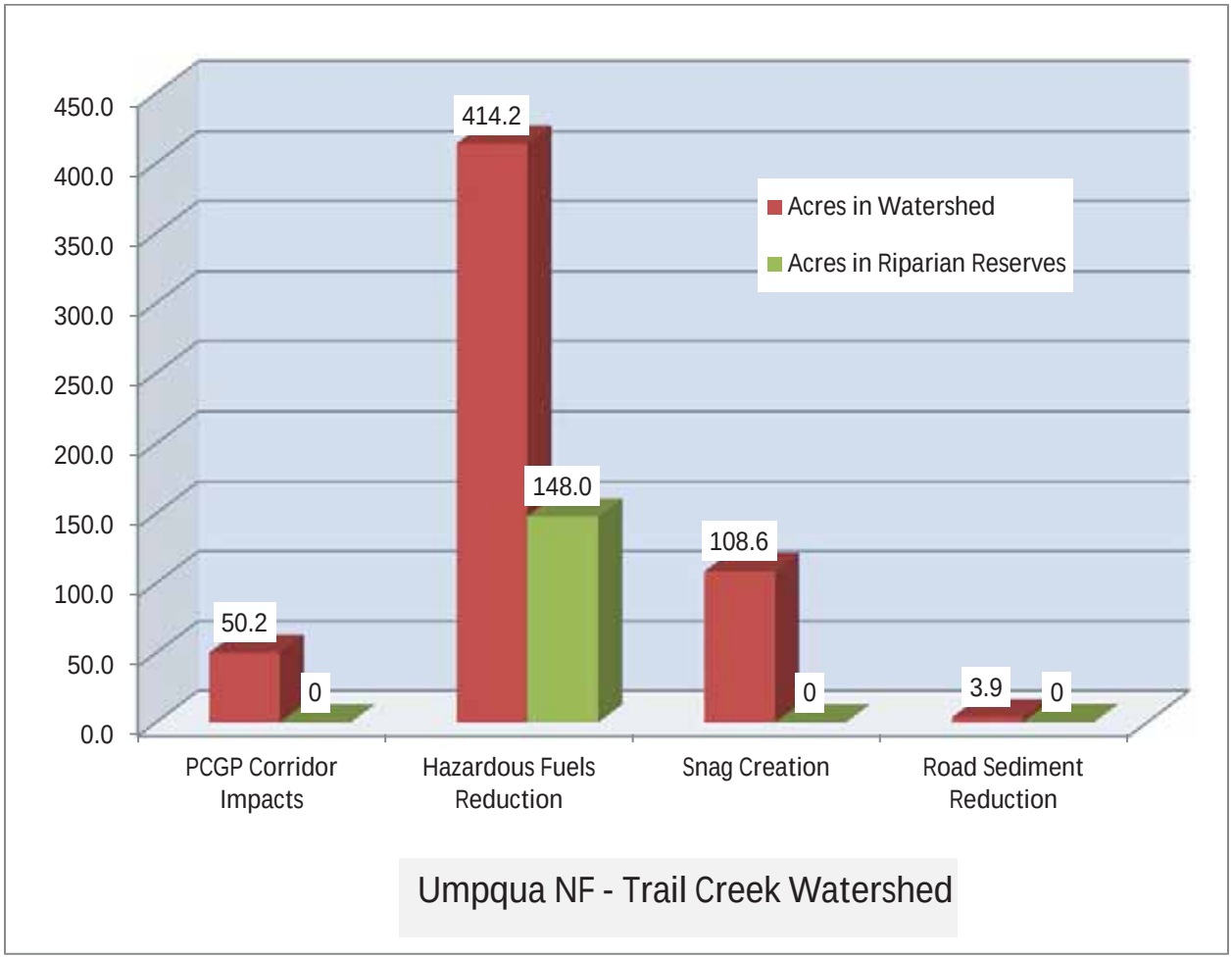


TABLE 4-5

Mitigation Actions Proposed in the Big Butte Creek Watershed on the Rogue River NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
RRNF	Big Butte Creek	Reallocation of Matrix Lands to LSR	Reallocation of Matrix to LSR	LSR 227 Addition	This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres of acres and habitat from the construction and operation of the Project.	512	Acres

TABLE 4-6a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the Rogue River NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Rogue River NF	Little Butte Creek	Aquatic and Riparian Habitat	LWD In-stream	SF Little Butte Creek LWD	Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future in-stream LWD. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time.	1.5	Mile
Rogue River NF	Little Butte Creek	Aquatic and Riparian Habitat	Stream Crossing Repair	Little Butte Creek Stream Crossing Decommissioning	Restoring stream crossings in this watershed reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting intended to offset Project impacts associated with shade removal.	32	Sites
Rogue River NF	Little Butte Creek	Road sediment reduction	Road Decommissioning	Little Butte Creek Road Decommissioning	A construction corridor 75-95 wide with additional work areas would be cleared. Of this, a 30-foot wide route along the Project corridor would be maintained in early successional habitat. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation.	53.2	Miles

TABLE 4-6a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the Rogue River NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads in conjunction with pre-commercial thinning treatments (see other mitigations) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in Riparian Reserves reduces sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9. The Little Butte Creek watershed is a Key Watershed and road reduction is a major objective (USDA FS; USDI BLM 1994b page C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement within the construction corridor.		
Rogue River NF	Little Butte Creek	Stand Density Fuel Break	Pre-commercial Thinning	Little Butte Cr LSR Pre-commercial Thin	There would be direct impacts to existing interior, developing interior habitat. The Project would result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Maintenance of Project corridor would provide a continued vector for predators, early-seral species and non-native species. Also the Project would result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands would be removed during Project construction. Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to Project construction. Thinning of young stands is a recognized	617.8	Acres

TABLE 4-6a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the Rogue River NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					treatment within LRSs if designed to accelerate development of late-successional habitat characteristics (USDA FS; USDI BLM 1994b Pages B-11, C-11, C1-2, and C-17).		
Rogue River NF	Little Butte Creek	Terrestrial Habitat Improvement	Habitat Planting	Little Butte Creek Mardon Skipper Butterfly	The Dead Indian Plateau region is one of three known sites for Mardon Skipper butterflies in the world. This region also encompasses a known site for Short-horned Grasshoppers. Both species are on the Forest's Sensitive Species list. The Project would require a permanent open corridor that provides a unique opportunity to develop habitat for these skippers and grasshoppers. Planting the corridor with plants preferred by these Sensitive Species has the potential to increase the habitat and local range for these two species. Rehabilitation of disturbed sites is required under various BMP guidelines. Use of specific plant species has no additional problems. Results would be immediate in stabilizing the local habitat.	20	Acres
Rogue River NF	Little Butte Creek	Terrestrial Habitat Improvement	LWD Upland Placement	Little Butte Creek LSR LWD Placement	Mitigate for the loss of recruitment of LWD to adjacent stands and within the Project corridor. The Project would forgo the development of LWD for the life of the Project and for decades after. LWD is a critical component of Mature Forest ecosystems. Replacement of LWD would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID) (Marcot et. al. 2002). Acres that can be treated are necessarily limited	306	Acres

TABLE 4-6a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the Rogue River NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					by material available from the corridor.		
Rogue River NF	Little Butte Creek	Terrestrial Habitat Improvement	Snag Creation	Little Butte Creek LSR Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the Project corridor. The Project prevents development of large snags during the life of the project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres. This project would add to those cumulative impacts. As snags are a critical component of LSRs and NSO habitat, replacement is needed. Snag requirements are specifically outlined in the Rogue River NF LMP. There would be a 10 year delay as snag decay develops. Snag management is required in the Forests' LMP (4-20), with levels set under the various management directions. Snag Management is discussed in the NWFP for LSRs on pages C-14 and 15 (USDA FS; USDI BLM 1994b). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSRA, chapter 3 (USDA FS; USDI BLM 1998a).	622	Acres
Rogue River NF	Little Butte Creek	Reallocation of Matrix Lands to LSR	Reallocation of Matrix to LSR	LSR 227 Addition	This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres of acres and habitat from the construction and operation of the Project.	12	Acres

TABLE 4-6b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Rogue River NF-Little Butte Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves
PCGP Corridor Impacts	13.7	279.5	279.5	8.7
LWD In-stream	1.5	9.1	9.1	9.1
Road Decommissioning	53.2	129.0	129.0	9.4
Pre-commercial Thinning		617.8	617.8	59.0
LWD Placement		306.0	306.0	7.1
Snag Creation		622.0	622.0	89.7

a/ PCGP Impacts Data Source: 2013 PCGP License Application and USFS GIS files
b/ Offsite Mitigation Actions Data Source: USFS GIS files
Note: LWD In-stream acres based on an estimate of a 50' wide treatment area
Road Decommissioning acres based on as estimate of a 20' wide treatment area

Figure 4-6a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Little Butte Creek Watershed

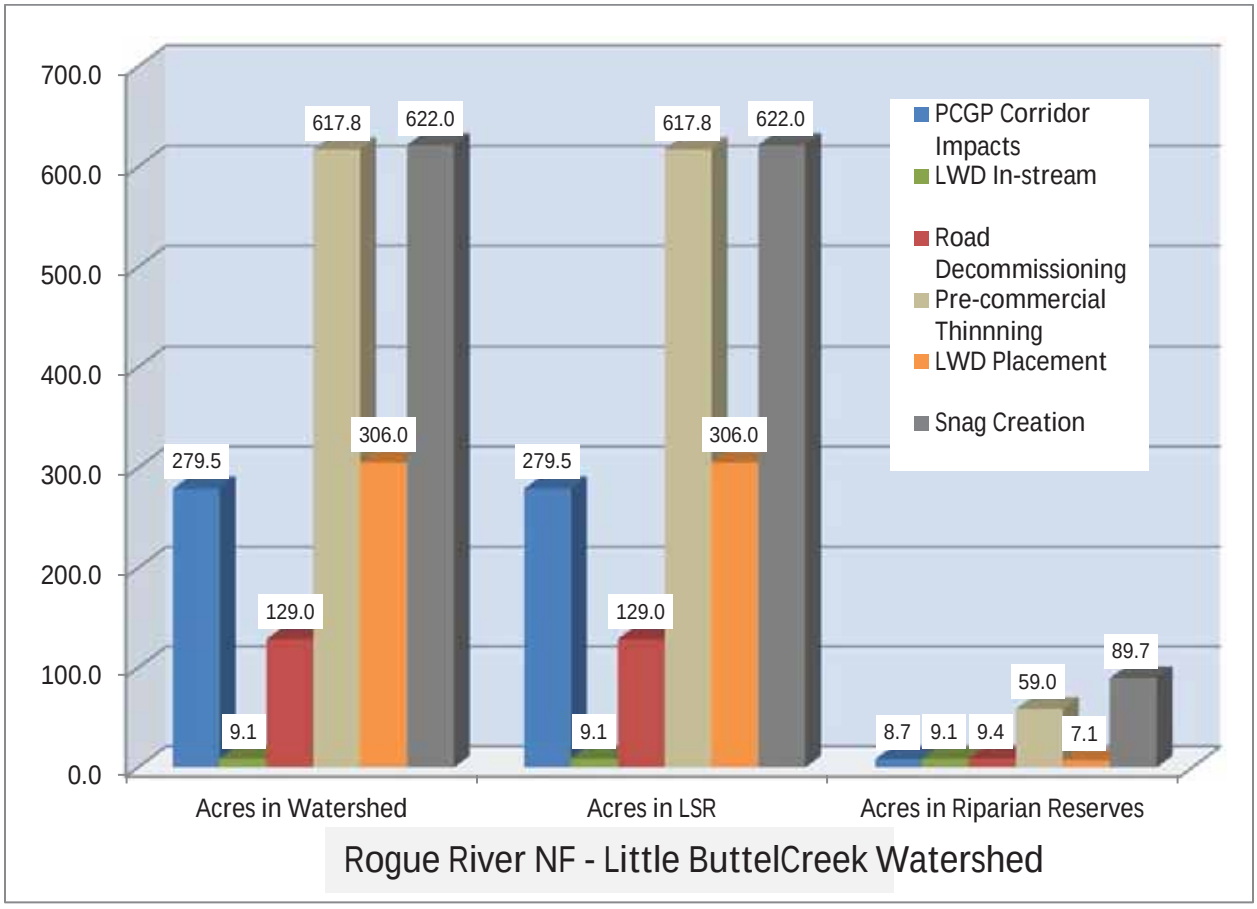


Figure 4-6b. Comparison of PCGP Impacts and Offsite Mitigation Actions in LSR within the Little Butte Creek Watershed

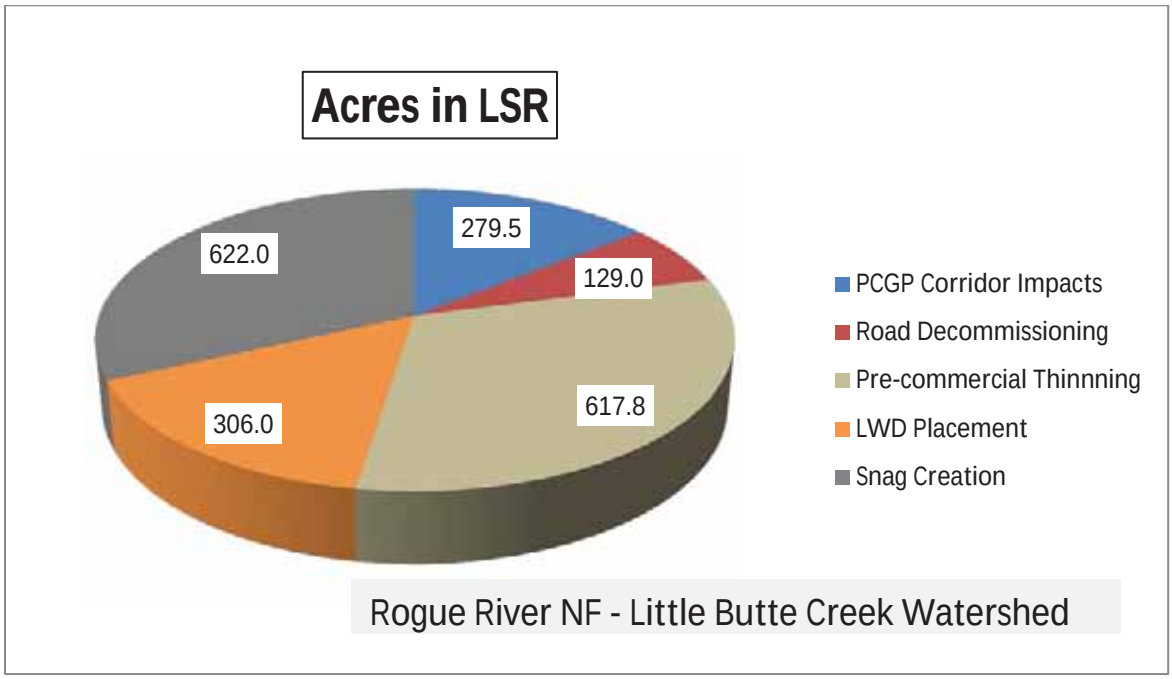


Figure 4-6c. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves within the Little Butte Creek Watershed

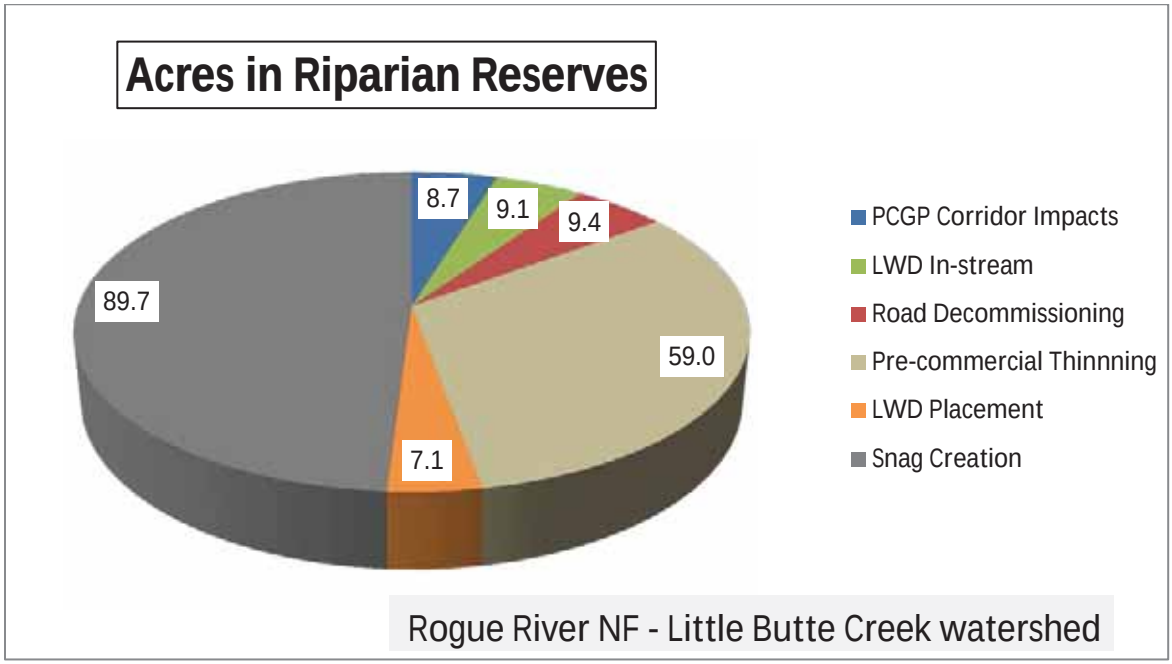


TABLE 4-7a

Mitigation Actions Proposed in the Spencer Creek Watershed on the Winema NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
Winema NF	Spencer Creek	Aquatic and Riparian Habitat	Riparian Planting	Spencer Creek Riparian Planting	This action is directed at the reach of Spencer Creek just upstream of Buck Lake. This is a meadow site that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving Riparian Reserves and associated riparian and aquatic habitat. Shade provided by the plantings would contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation would increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats.	0.5	Mile
Winema NF	Spencer Creek	Aquatic and Riparian Habitat	Fencing	Spencer Creek Fencing	This fence would serve to divide the Buck Indian Allotment into two pastures on either side of Clover Creek Road. This fence would keep cattle from grazing newly re-vegetated areas in the Project corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and re-vegetation objectives are met. It would also serve to separate anticipated increased cattle grazing of the corridor from the road; greatly reducing a safety hazard for vehicles traveling the Clover Creek Road. This fence would require 7-9 cattle guard crossings for Forest Roads intersecting the fence	6.4	Miles
Winema NF	Spencer Creek	Aquatic and Riparian Habitat	LWD In-stream	Spencer Creek In-stream LWD	Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future in-stream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time. The BLM completed placement of LWD on 3 miles of Spencer Creek below this reach in 2013.	1.0	Mile

TABLE 4-7a

Mitigation Actions Proposed in the Spencer Creek Watershed on the Winema NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					Addition of this segment of Spencer Creek would complete the stream rehabilitation on the reach of Spencer Creek that would be affected by the Project. Logs from the Project corridor would be used for the project. An estimated 75 pieces of LWD are needed. A helicopter would be used to place the logs.		
Winema NF	Spencer Creek	Aquatic and Riparian Habitat	Stream Crossing Repair	Spencer Creek Ford Hardening and Interpretive Sign	The Project corridor would cross Spencer Creek upstream of Buck Lake. This crossing is at the uppermost reach of the perennial portion of Spencer Creek which is occupied by redband trout, a sensitive species. Both NMFS and ODF&W recognize that Spencer Creek provided historical habitat for Federally listed Southern Oregon/Northern California Coast Coho salmon. Additionally, in the event that fish passage is reestablished as part of the FERC relicensing process for the Klamath River hydropower project, steelhead are expected to re-colonize Spencer Creek. Improving habitat quality by hardening an existing low-water ford across Spencer Creek provides the opportunity to be pro-active in providing quality habitat for SONC Coho, mitigating for any detrimental effects to other SONC Coho habitats, while improving habitat for redband trout and other aquatic species. Spencer Creek appears on the Oregon DEQ 303(d) list as water quality impaired from increased sedimentation. Improvements at this location would immediately benefit all downstream aquatic habitats and the species associated with those habitats. This includes interpretive signage.	1	Site
Winema NF	Spencer Creek	Aquatic and Riparian Habitat	Stream Crossing Repair	Spencer Creek Stream Crossing Decommissioning	Removing and/or decommissioning stream crossings in this watershed reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting intended to offset Project	25	Sites

TABLE 4-7a

Mitigation Actions Proposed in the Spencer Creek Watershed on the Winema NF

Admin Unit	Watershed	Mitigation Group	Project Type	Project Name	Project Rationale	Quantity	Unit
					impacts associated with shade removal.		
Winema NF	Spencer Creek	Road sediment reduction	Road Decommissioning	Spencer Creek Road Decommissioning	A construction corridor 75-95 wide with additional work areas would be cleared. Of this, a 30-foot wide route along the pipeline route would be maintained in early successional habitat. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads in conjunction with pre-commercial thinning treatments (see other mitigations) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in riparian reduces sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9 (USDA FS; USDI BLM 1994b page C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement within the Project corridor.	21.4	Miles
Winema NF	Spencer Creek	Visuals	Stand Density Reduction	Clover Creek Visual Mgt.	The Project corridor would create a hard line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway. Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with landscape. Thinning of commercial sized material may be accomplished with a commercial timber sale. The mitigation is intended to supplement funding for the non-commercial part of that work for visual purposes that could not otherwise be accomplished.	113.5	Acres

TABLE 4-7b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Winema NF-Spencer Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian Reserves	Stream Intersects
PCGP Corridor Impacts	6.1	92.8	0.0	7.0	5.0
LWD In-stream	1.0	6.0	0.0	6.0	
Road Decommissioning	21.4	52.0	23.5	7.5	25.0
Riparian Planting	0.5	3.0	0.0	3.0	

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM GIS files
b/ Offsite Mitigation Actions Data Source: BLM GIS files
Notes: Road Decommissioning acres based on an estimate of a 20' wide treatment area
LWD In-stream acres based on an estimate of a 50' wide treatment area

Figure 4-7a. Comparison of PCGP Impacts and Offsite Mitigation Actions in the Spencer Creek Watershed

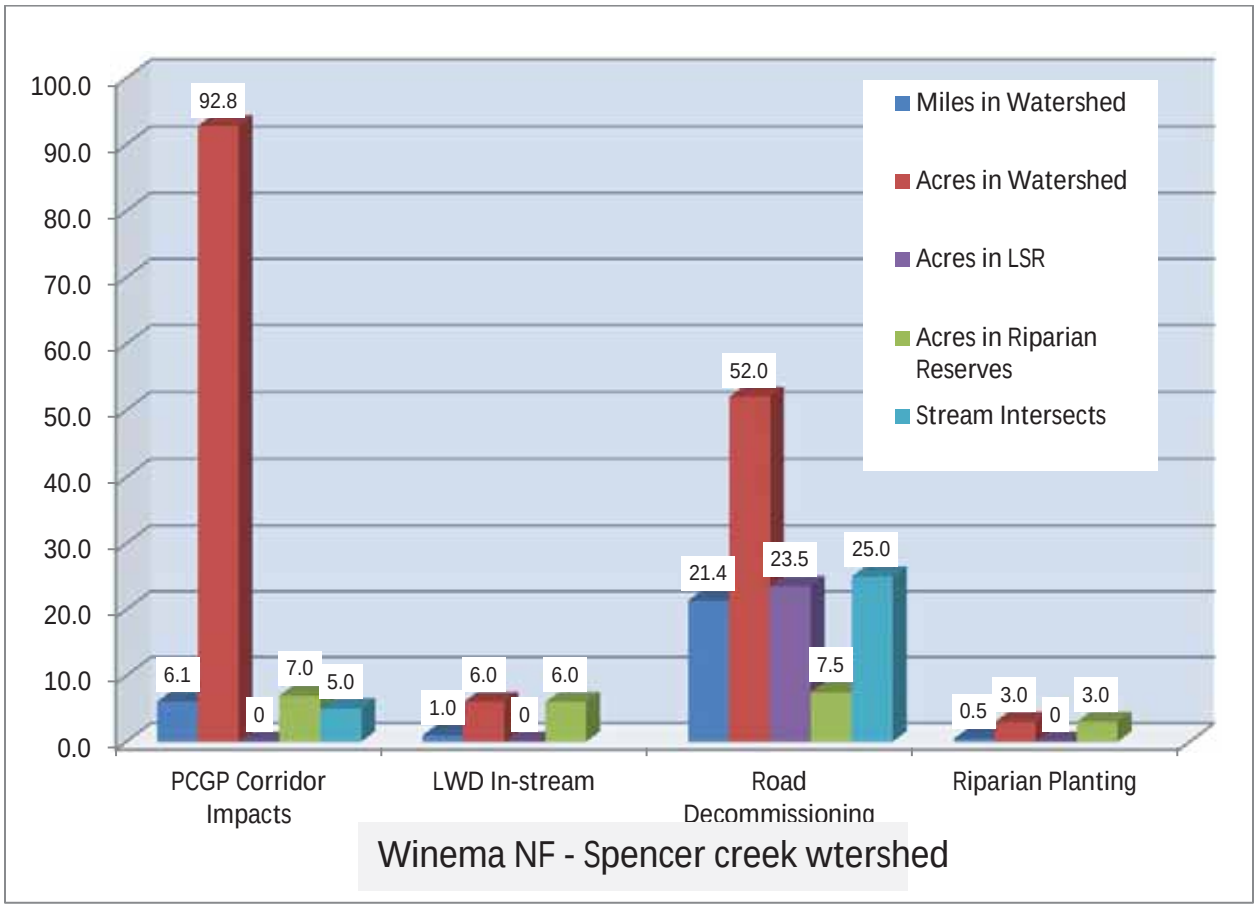
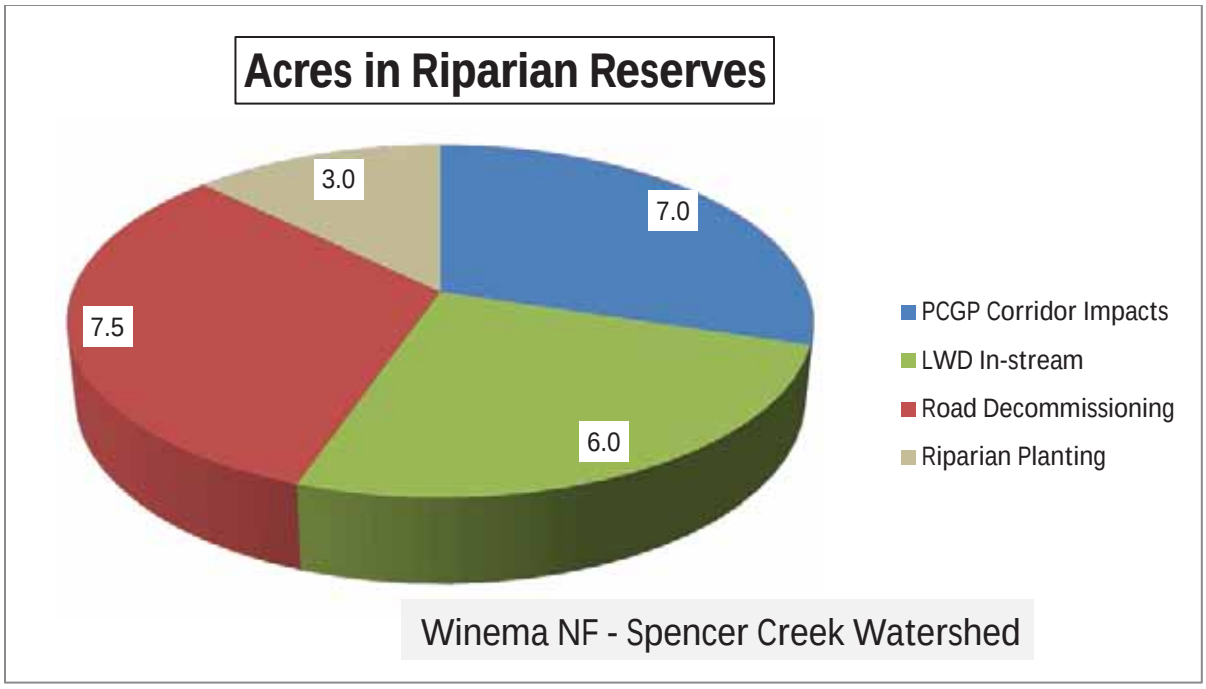


Figure 4-7b. Comparison of PCGP Impacts and Offsite Mitigation Actions in Riparian Reserves in the Spencer Creek Watershed



This page intentionally left blank.

5.0 SUMMARY OF TOTAL MITIGATION IN FIFTH-FIELD WATERSHEDS WHERE BOTH THE BLM AND FOREST SERVICE PROPOSE MITIGATION ACTIONS

There are several fifth-field watersheds crossed by the proposed Project that contain both BLM and Forest Service administered lands. The proposed mitigation actions by administrative unit are described in Sections 3 and 4 above including the rationale for each action. This section summarizes the total mitigation actions in fifth-field watersheds where both the BLM and Forest Service have proposed off-site mitigation actions. The Project impacts include the corridor, the TEWAs, and the UCSA. A more detailed description of each action by administrative unit is included in Sections 3 and 4 above. The fifth-field watersheds where both the BLM and Forest Service have proposed off-site mitigation actions include the Days Creek, Trail Creek, Little Butte Creek and Spencer Creek watersheds.

TABLE 5-1a

Mitigation Actions Proposed in the Days Creek South Umpqua Watershed on the BLM Roseburg District and the Umpqua NF

Admin Unit	Mitigation Group	Project Type	Project Name	Quantity	Unit
Roseburg BLM	Aquatic and Riparian Habitat	Fish Passage	Beal Creek Culvert Replacement	2	sites
Roseburg BLM	Aquatic and Riparian Habitat	LWD In-stream	Days Creek In-stream LWD	0.4	miles
Roseburg BLM	Aquatic and Riparian Habitat	LWD In-stream	West Fork Canyon	0.8	miles
Roseburg BLM	Fire suppression	Suppression Capacity	Dry Hydrants	6	sites
Roseburg BLM	Road Sediment Reduction	Road storm-proofing	31-4-3.2 Road Storm-proofing	1	project
Roseburg BLM	Road Sediment Reduction	Road Drainage and Surface Enhancement	South Umpqua Road Drainage and Surface Enhancement	10	miles
Roseburg BLM and Umpqua NF	Stand Density Fuel Break	Fuels Reduction	Days Creek South Umpqua Hazardous Fuel Reduction with approximately 232 acres in LSR	1382	acres
Umpqua NF	Road sediment reduction	Road Closure	Days Creek South Umpqua Road Closure	0.5	Miles
Umpqua NF	Stand Density Fuel Break	Pre-commercial Thinning	Days Creek South Umpqua LSR Pre-commercial Thinning	52.8	Acres
Umpqua NF	Stand Density Fuel Break	Under-burn	Days Creek South Umpqua LSR Under-burn	125	Acres
Umpqua NF	Stand Density Fuel Break	Under-burn	Days Creek South Umpqua Matrix Under-burn	102	Acres

TABLE 5-1b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Days Creek South Umpqua Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian reserves
PCGP Corridor Impacts	8.1	260.7	88.9	8.9
Stand Density Fuel Break		1536.6	661.5	222.0
Aquatic and Riparian Habitat	1.2	7.3	0.0	7.3
Road Sediment Reduction	10.5	25.5	15.8	3.2

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM/USFS GIS files
b/ Offsite Mitigation Actions Data Source: BLM and Forest Service GIS files
Note: Aquatic and Riparian Habitat acres based on an estimate of a 50' wide treatment area
Road Sediment Reduction acres based on an estimate of a 20' wide treatment area

Figure 5-1a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Days Creek South Umpqua Watershed

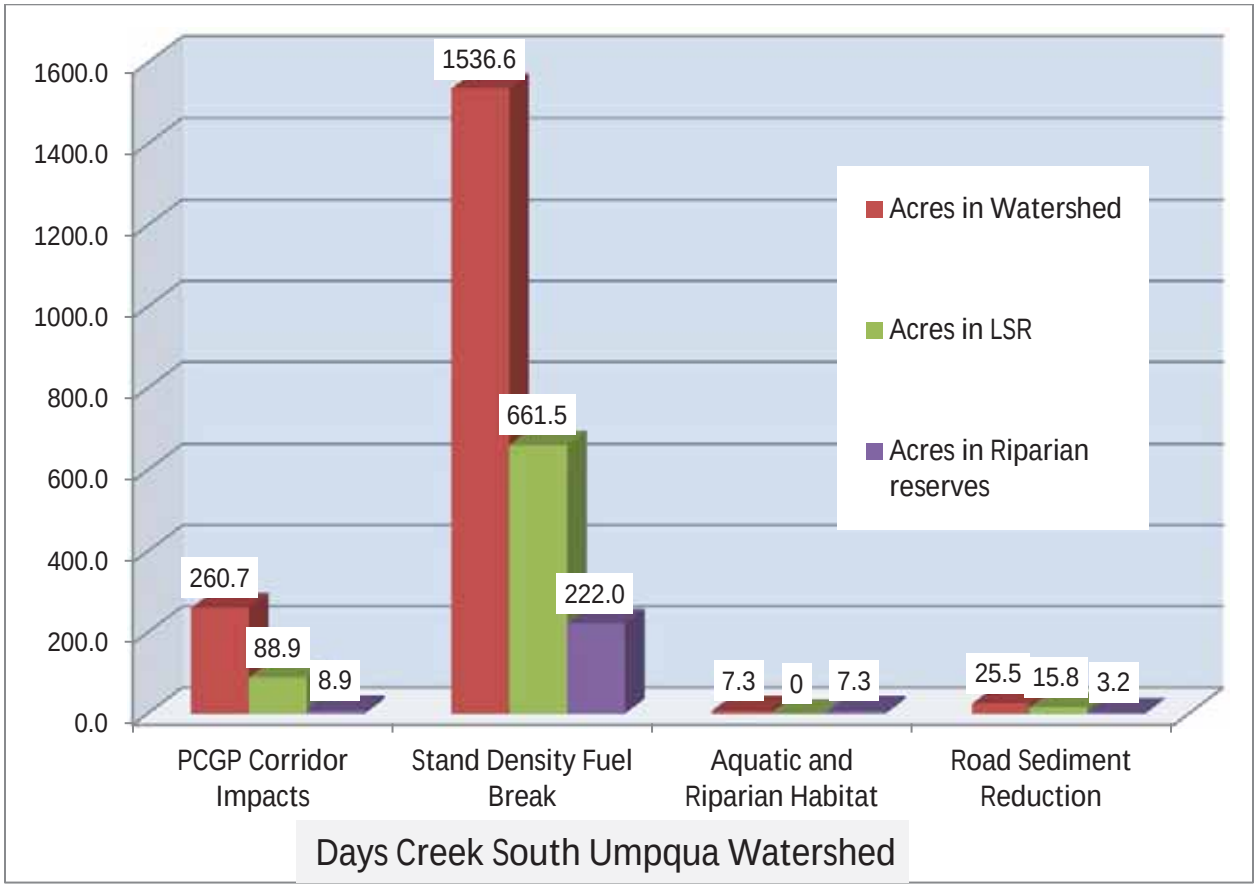


Figure 5-1b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in LSR in the Days Creek South Umpqua Watershed

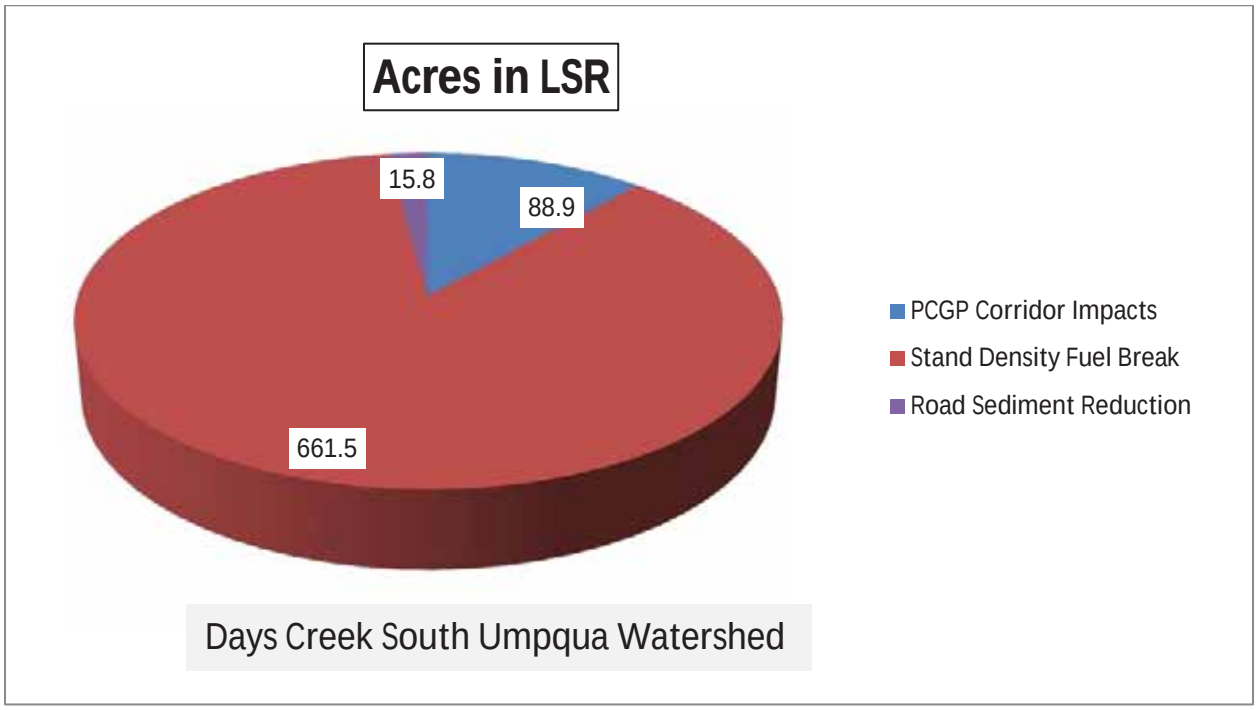


Figure 5-1c. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Days Creek South Umpqua Watershed

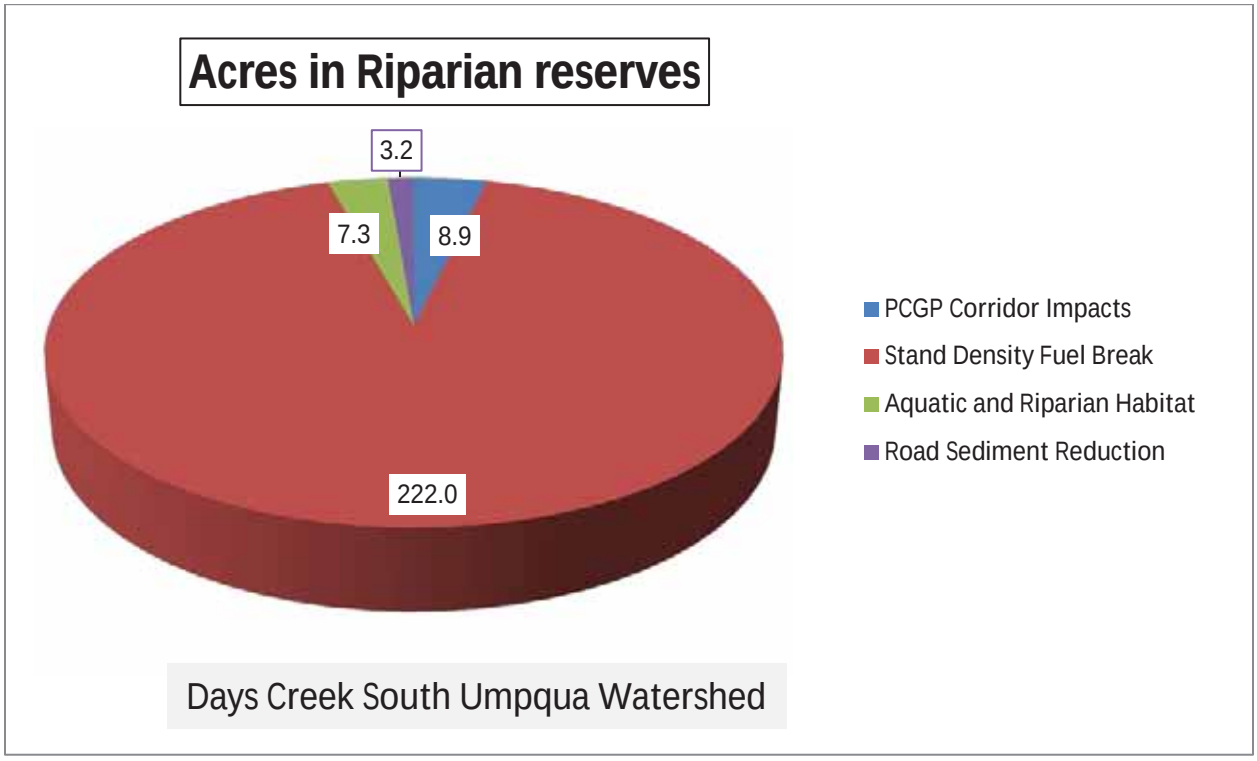


TABLE 5-2a

Mitigation Actions Proposed in the Trail Creek Watershed on the BLM Medford District and the Umpqua NF

Admin Unit	Mitigation Group	Project Type	Project Name	Quantity	Unit
Medford BLM	Aquatic and Riparian Habitat	LWD In-stream	Trail Creek LWD	2.6	miles
Medford BLM	Fire suppression	Suppression Capacity	Trail Creek Pump Chance	8	sites
Medford BLM and Umpqua NF	Road Sediment Reduction	Road storm- proofing	Trail Creek Road Storm-proofing	4.8	miles
Medford BLM and Umpqua NF	Road Sediment Reduction	Road Decommissioning	Trail Creek Road Decommissioning	3.8	miles
Medford BLM	Road Sediment Reduction	Road Surfacing	Trail Creek Road Resurface	16.3	miles
Medford BLM and Umpqua NF	Stand Density Fuel Break	Fuels Reduction	Trail Creek Fuel Hazard Reduction	1101.2	acres
Medford BLM	Stand Density Fuel Break	fuels Reduction	Trail Creek Fuels Hazard Maintenance	687	acres
Umpqua NF	Stand Density Fuel Break	Under-burn	Trail Creek Matrix Under-burn	280	Acres
Umpqua NF	Terrestrial Habitat Improvement	Snag Creation	Trail Creek Matrix Snag Creation	108.6	Acres

TABLE 5-2b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Trail Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian reserves
PCGP Corridor Impacts	6.0	124.4	0.0	5.1
Stand Density Fuel Break		1381.2	0.0	226.0
Aquatic and Riparian Habitat	2.6	15.8	0.0	15.8
Terrestrial Habitat Improvement		108.6	0.0	0.0
Road Sediment Reduction	24.9	60.4	0.0	10.7

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM/USFS GIS files
b/ Offsite Mitigation Actions Data Source: BLM and Forest Service GIS files
Note: Aquatic and Riparian Habitat acres based on an estimate of a 50' wide treatment area
Road Sediment Reduction acres based on an estimate of a 20' wide treatment area

Figure 5-2a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Trail Creek Watershed

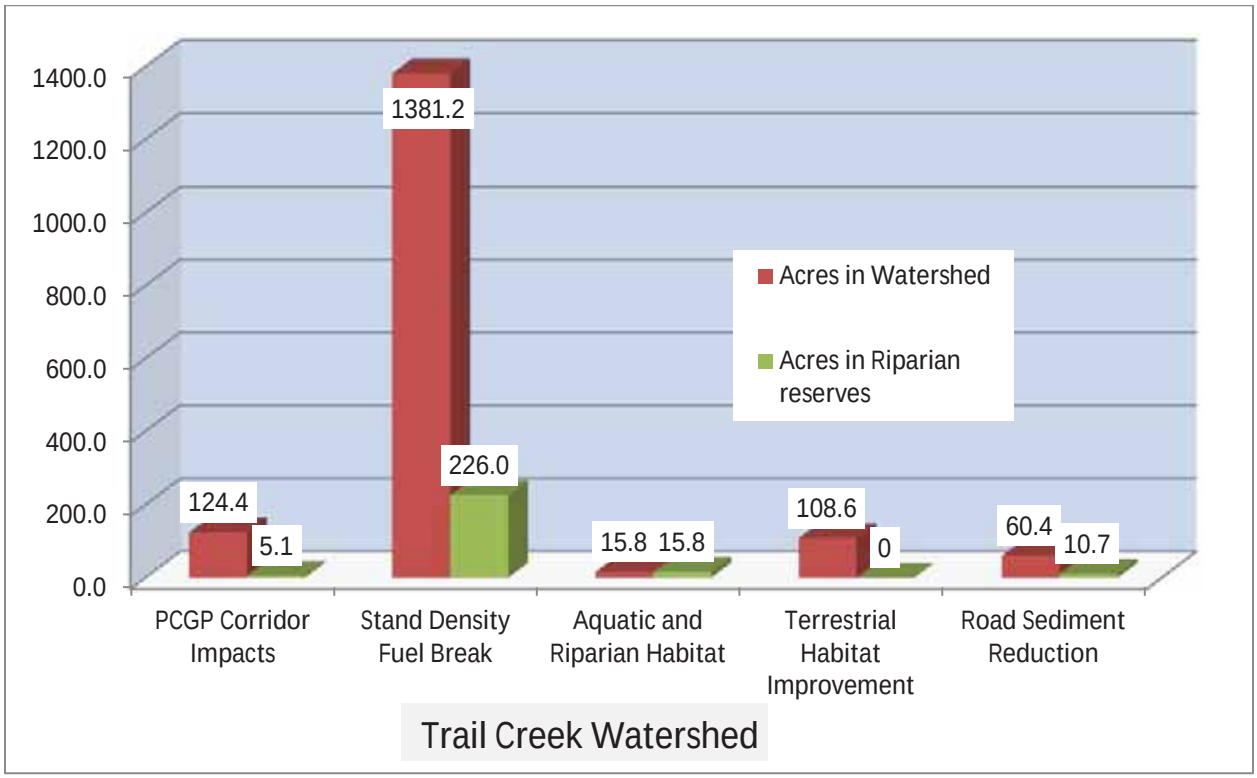


Figure 5-2b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Trail Creek Watershed

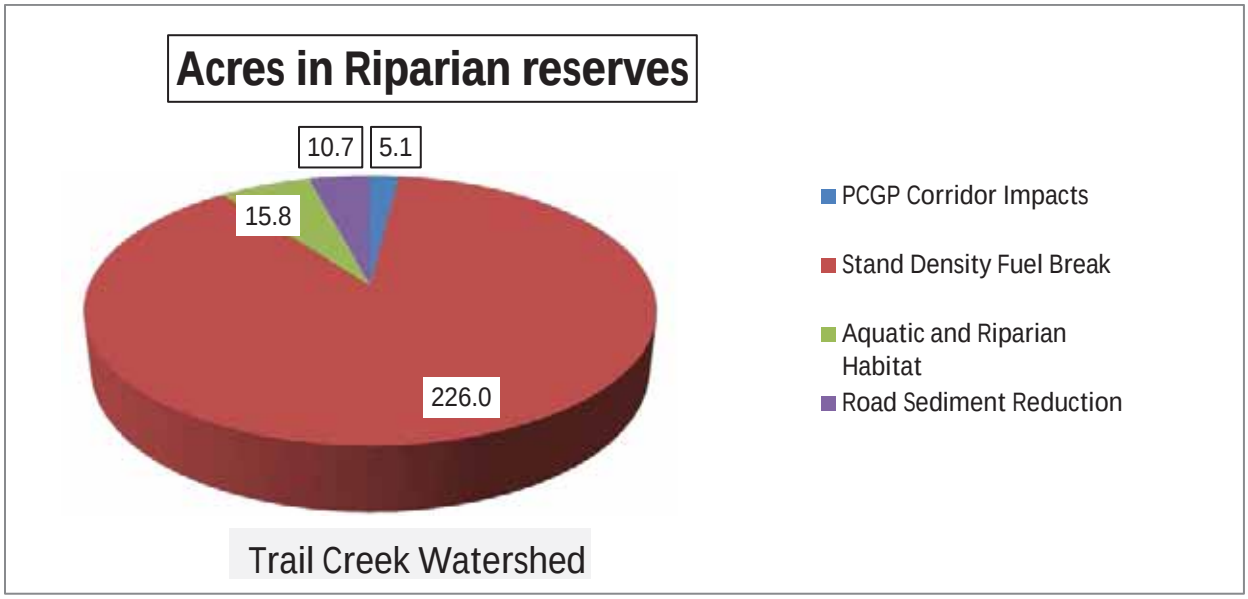


TABLE 5-3a

Mitigation Actions Proposed in the Little Butte Creek Watershed on the BLM Medford District and the Rogue River NF

Admin Unit	Mitigation Group	Project Type	Project Name	Quantity	Unit
Medford BLM	Aquatic and Riparian Habitat	Fish Passage	Little Butte Creek Fish Screen	1	site
Medford BLM and Rogue River NF	Aquatic and Riparian Habitat	LWD In-stream	Lost Creek and Little Butte Creek In-stream LWD	10.1	miles
Medford BLM	Fire suppression	Suppression Capacity	Little Butte Creek Pump Chance	8	sites
Medford BLM	Road Sediment Reduction	Road Drainage and Surface Enhancement	Little Butte Creek Road Improvement	3.5	miles
Medford BLM and Rogue River NF	Road Sediment Reduction	Road Decommissioning	Little Butte Creek Road Decommissioning	66.2	miles
Medford BLM	Road Sediment Reduction	Road Surfacing	Little Butte Creek Road Resurfacing Ashland Resource Area and Butte Falls Resource Area	18.3	miles
Rogue River NF	Aquatic and Riparian Habitat	Stream Crossing Repair	Little Butte Creek Stream Crossing Decommissioning	32	Sites
Rogue River NF	Stand Density Fuel Break	Pre-commercial Thinning	Little Butte Cr LSR Pre-commercial Thin	617.8	Acres
Rogue River NF	Terrestrial Habitat Improvement	Habitat Planting	Little Butte Creek Mardon Skipper Butterfly	20	Acres
Rogue River NF	Terrestrial Habitat Improvement	LWD Upland Placement	Little Butte Creek LSR LWD Placement	306	Acres
Rogue River NF	Terrestrial Habitat Improvement	Snag Creation	Little Butte Creek LSR Snag Creation	622	Acres
Rogue River NF	Reallocation of Matrix Lands to LSR	Reallocation of Matrix to LSR	LSR 227 Addition	12	Acres

TABLE 5-3b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Little Butte Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian reserves
PCGP Corridor Impacts	19.7	387.4	279.5	17.1
Stand Density Fuel Break		617.8	617.8	59.0
Aquatic and Riparian Habitat	10.1	61.2	9.1	61.2
Terrestrial Habitat Improvement		948.0	928.0	96.8
Road Sediment Reduction	88.0	213.3	129.0	24.9

a/ Data Source: 2013 PCGP License Application and BLM/USFS GIS files
b/ Data Source: BLM and Forest Service GIS files
Aquatic and Riparian Habitat acres based on an estimate of a 50' wide treatment area
Road Sediment Reduction acres based on an estimate of a 20' wide treatment area

Figure 5-3a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Little Butte Creek Watershed

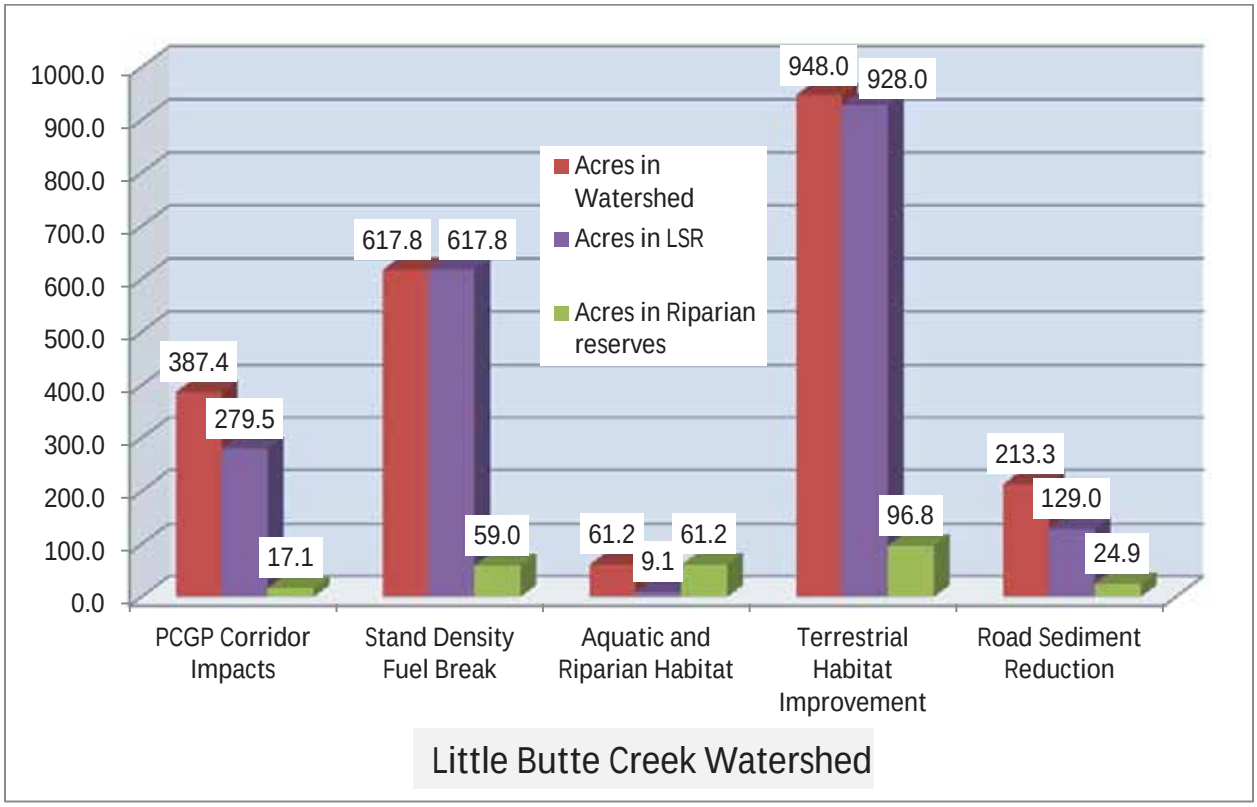


Figure 5-3b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in LSR in the Little Butte Creek Watershed

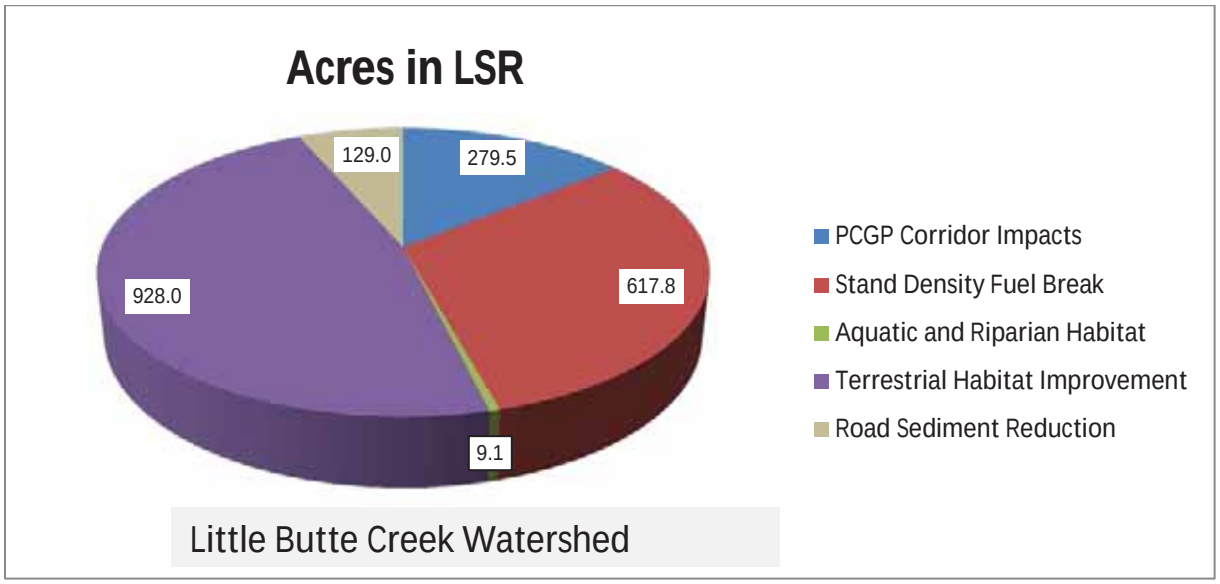


Figure 5-3c. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Little Butte Creek Watershed

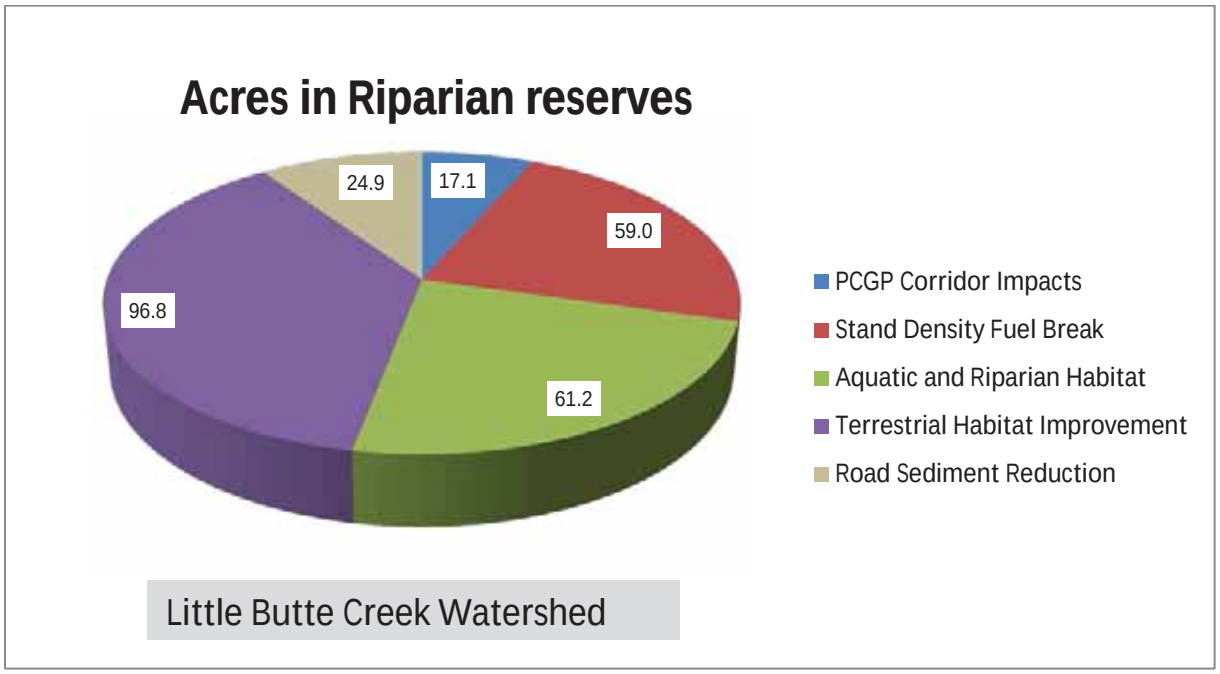


TABLE 5-4a

Mitigation Actions Proposed in the Spencer Creek Watershed on the BLM Lakeview District and the Winema NF

Admin Unit	Mitigation Group	Project Type	Project Name	Quantity	Unit
Lakeview BLM	Stand Density Fuel Break	Riparian Vegetation	Upper Spencer Creek And Miners Creek LSR/Riparian treatment	6.0	miles
Lakeview BLM	Stand Density Fuel Break	Riparian Vegetation	Tributary Creek Riparian Thinning	70	acres
Lakeview BLM	Road Sediment Reduction	Road Drainage - Culvert Replacement	Keno Access Road Repair and Culvert Replacement	1	site
Lakeview BLM	Road Sediment Reduction	Road Drainage	Spencer Creek Drainage Improvements and Sediment Trap Removal	15	sites
Lakeview BLM	Road Sediment Reduction	Road Closure	Spencer Creek Repair Existing Road Closure	12	sites
Lakeview BLM	Stand Density Fuel Break	Stand Density Habitat	Upper Spencer Creek LSR Density Mgt.	270	acres
Winema NF	Aquatic and Riparian Habitat	Riparian Planting	Spencer Creek Riparian Planting	0.5	Mile
Winema NF	Aquatic and Riparian Habitat	Fencing	Spencer Creek Fencing	6.4	Miles
Winema NF	Aquatic and Riparian Habitat	LWD In-stream	Spencer Creek In-stream LWD	1.0	Mile
Winema NF	Aquatic and Riparian Habitat	Stream Crossing Repair	Spencer Creek Ford Hardening and Interpretive Sign	1	Site
Winema NF	Aquatic and Riparian Habitat	Stream Crossing Repair	Spencer Creek Stream Crossing Decommissioning	25	Sites
Winema NF	Road sediment reduction	Road Decommissioning	Spencer Creek Road Decommissioning	21.4	Miles
Winema NF	Visuals	Stand Density Reduction	Clover Creek Visual Mgt.	113.5	Acres

TABLE 5-4b

Comparison of PCGP Impacts and Offsite Mitigation Actions a/ b/

Spencer Creek Watershed	Miles in Watershed	Acres in Watershed	Acres in LSR	Acres in Riparian reserves
PCGP Corridor Impacts	7.1	107.7	0.0	9.1
Stand Density Fuel Break		412.7	112.9	150.8
Aquatic and Riparian Habitat	1.5	9.1	0.0	9.1
Road Sediment Reduction	21.4	53.7	23.5	9.2

a/ PCGP Impacts Data Source: 2013 PCGP License Application and BLM/USFS GIS files
b/ Offsite Mitigation Actions Data Source: BLM and Forest Service GIS files
Note: Aquatic and Riparian Habitat acres based on an estimate of a 50' wide treatment area
Road Sediment Reduction acres based on an estimate of a 20' wide treatment area

Figure 5-4a. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in the Spencer Creek Watershed

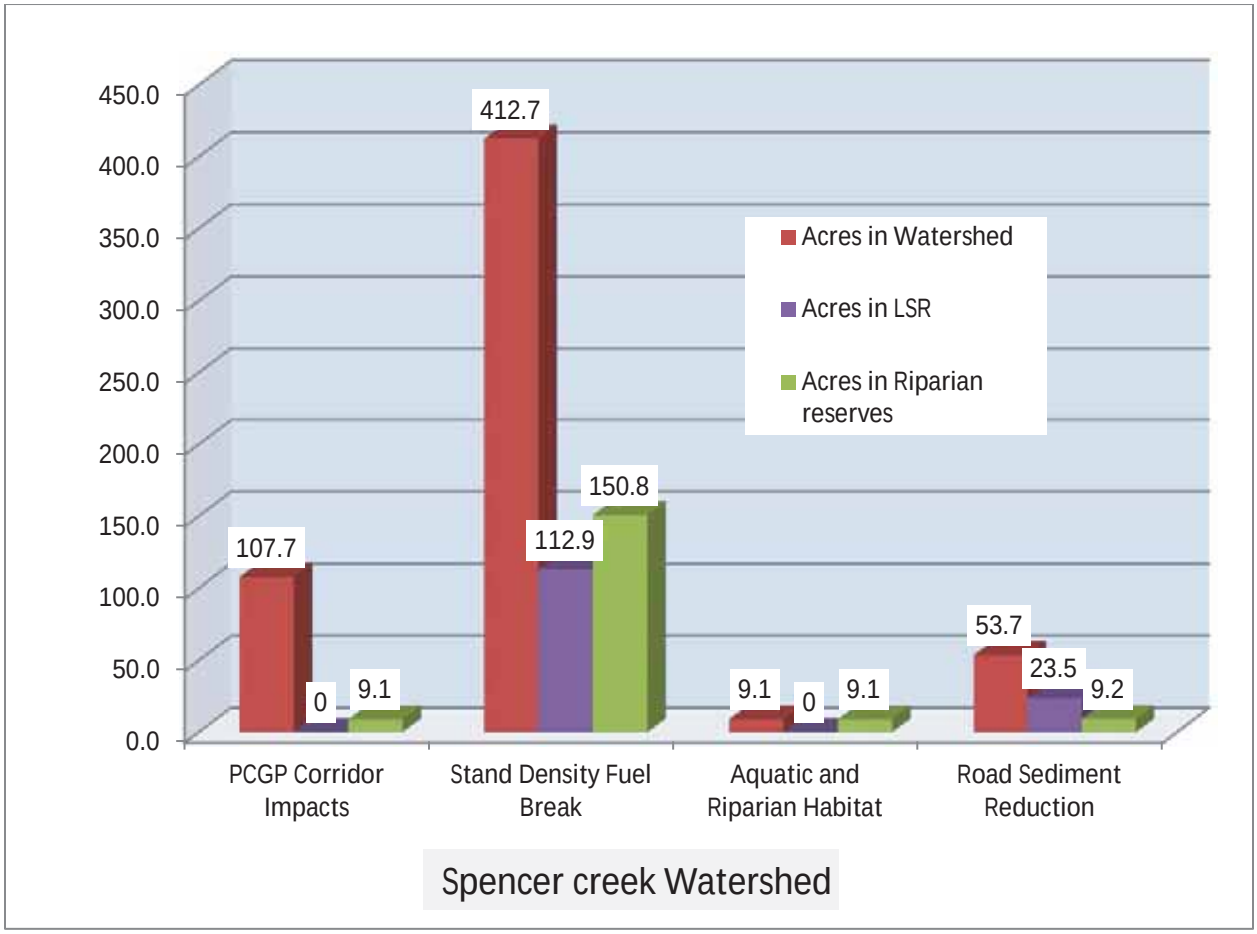
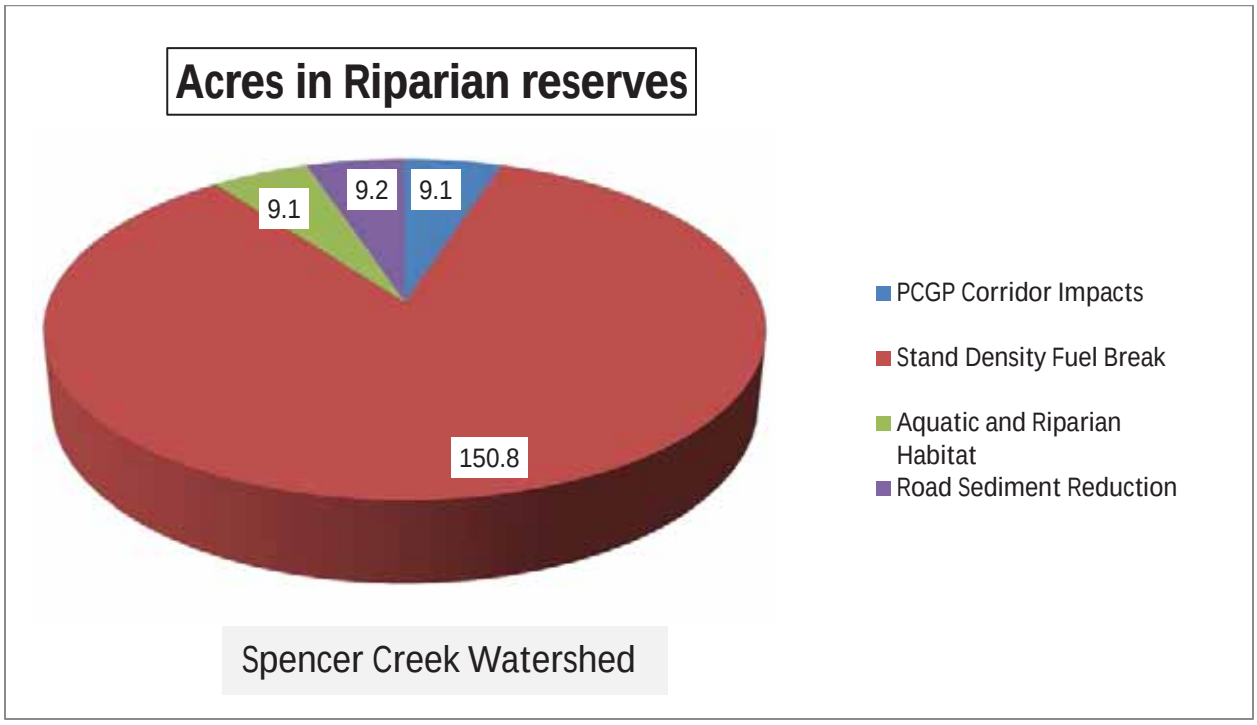


Figure 5-4b. Comparison of PCGP Impacts and Offsite Mitigation Actions by Mitigation Group in Riparian Reserves in the Spencer Creek Watershed



6.0 MAPS OF MITIGATION ACTIONS FOR EACH ADMINISTRATIVE UNIT OF THE BLM AND FOREST SERVICE

Figure 6-1. Map of Mitigation Actions on the BLM Coos Bay District

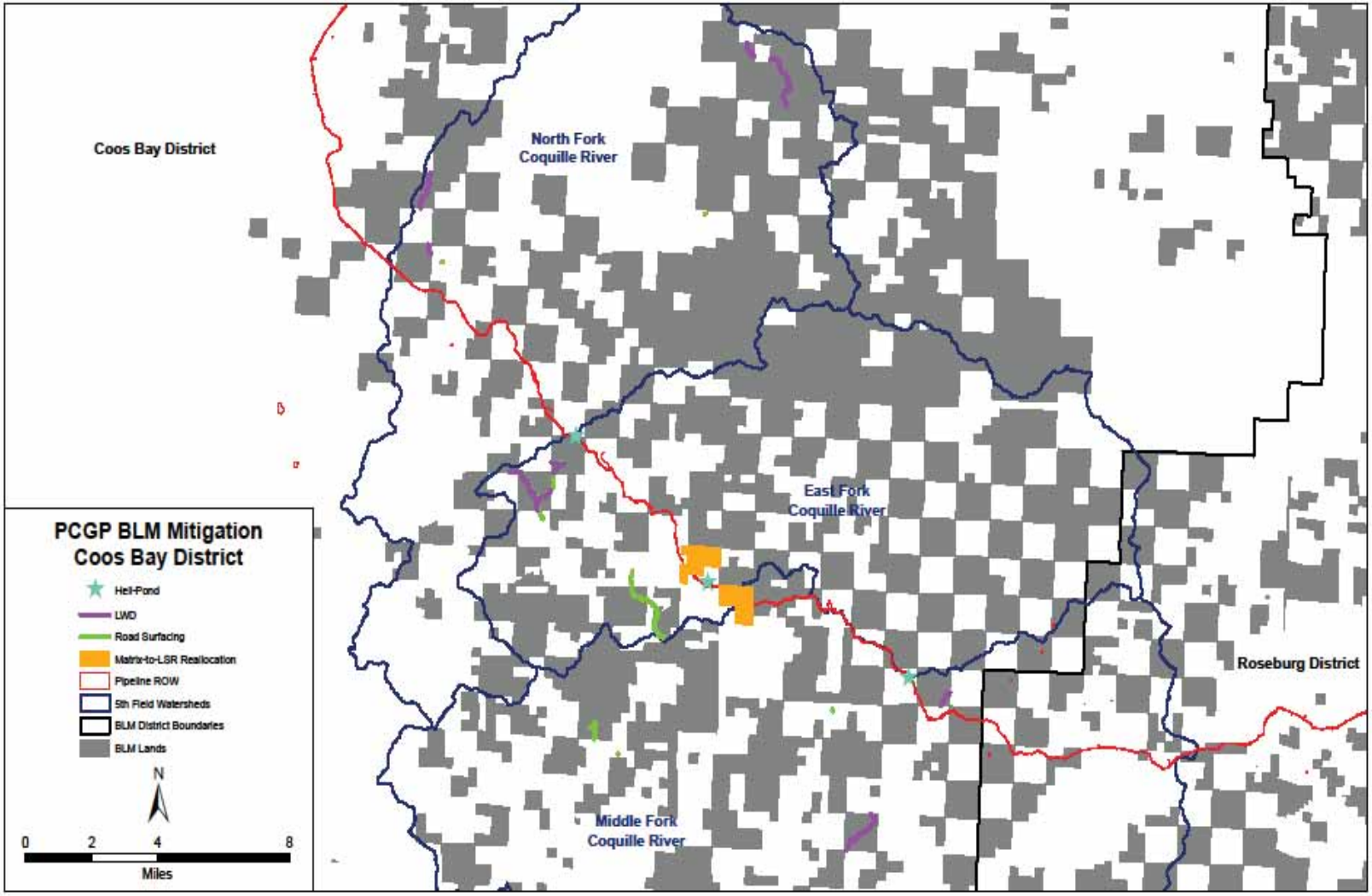


Figure 6-2. Map of Mitigation Actions on the BLM Roseburg District

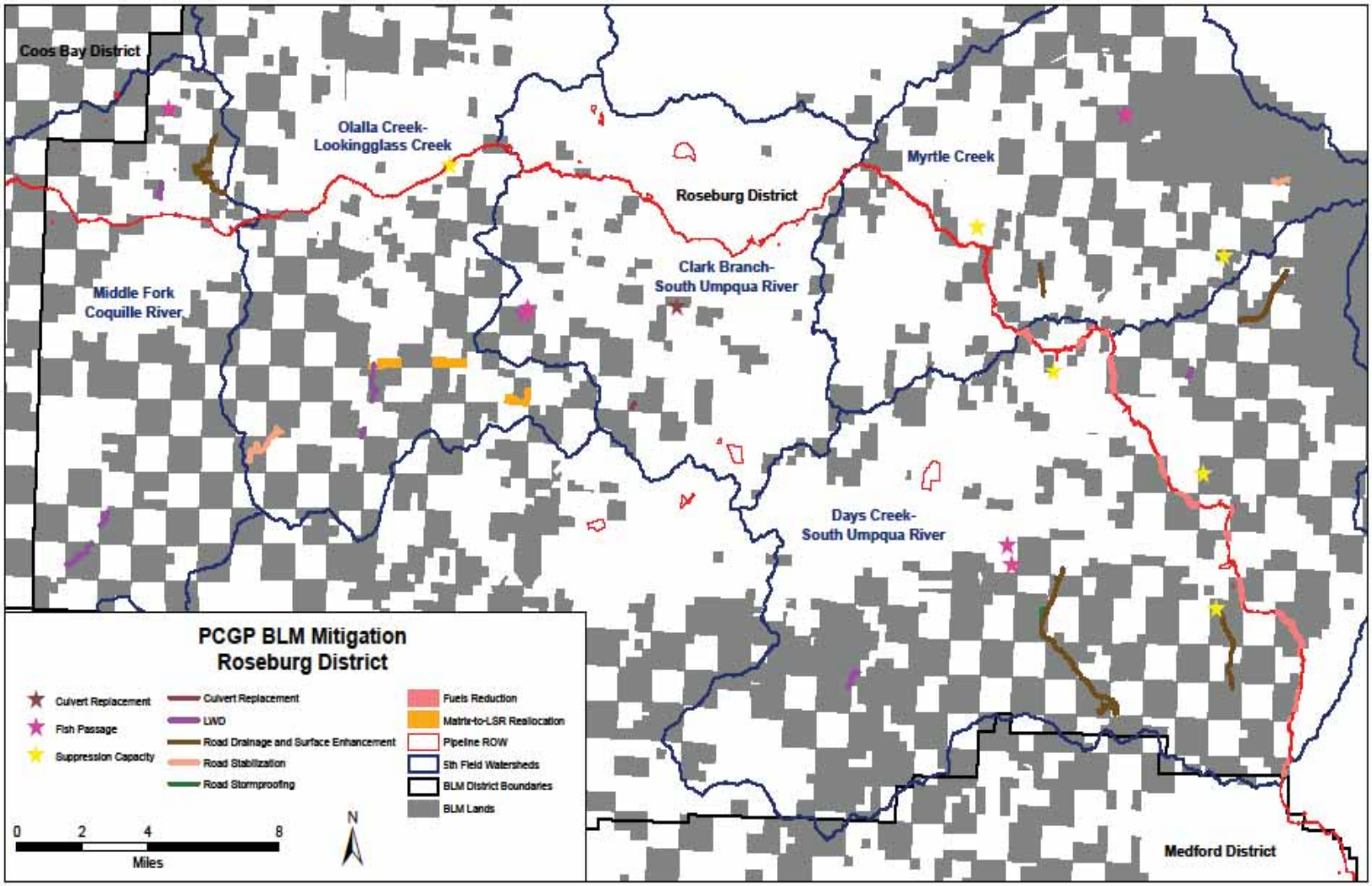


Figure 6-3. Map of Mitigation Actions on the BLM Medford District

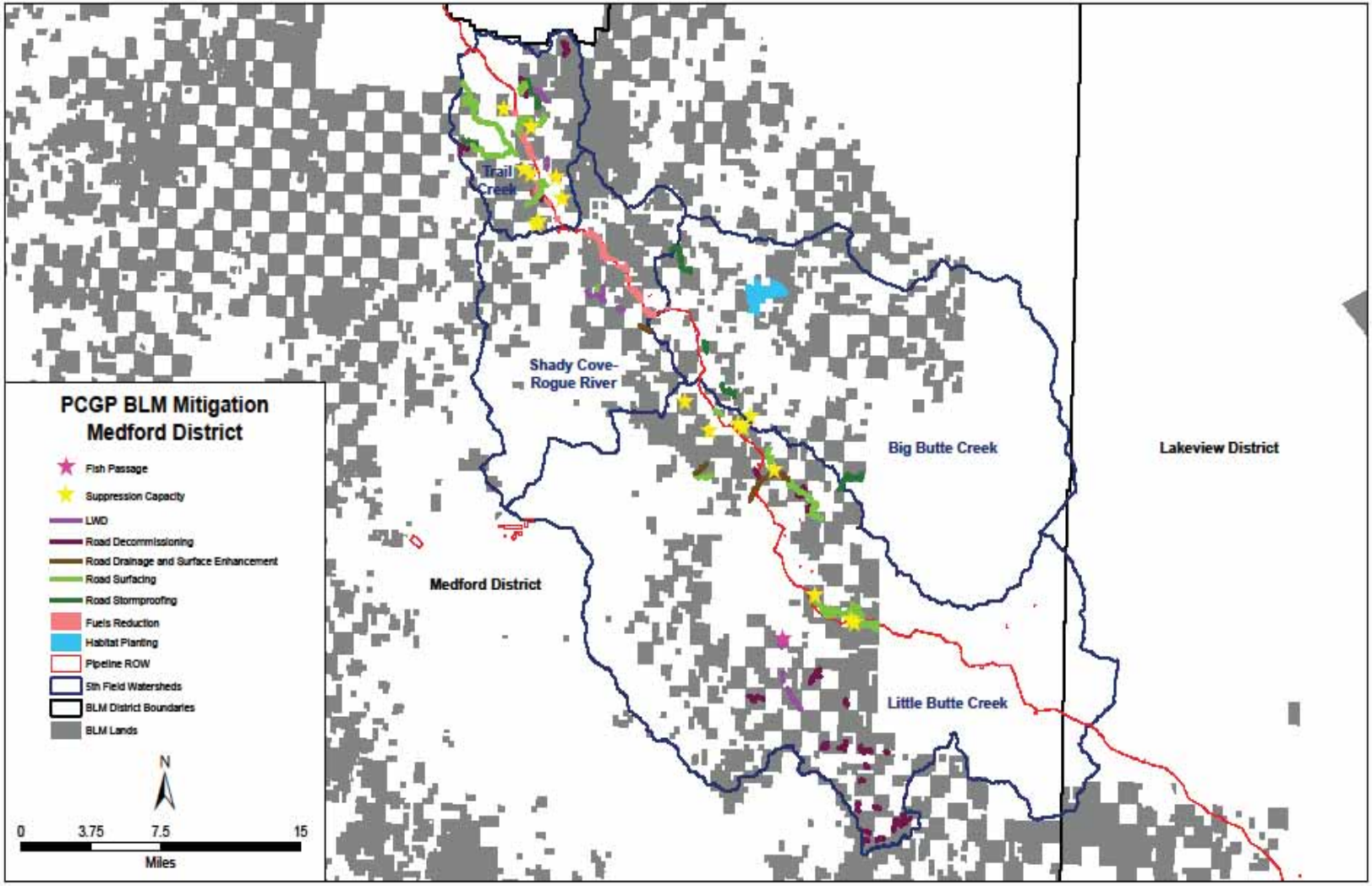


Figure 6-4. Map of Mitigation Actions on the BLM Lakeview District

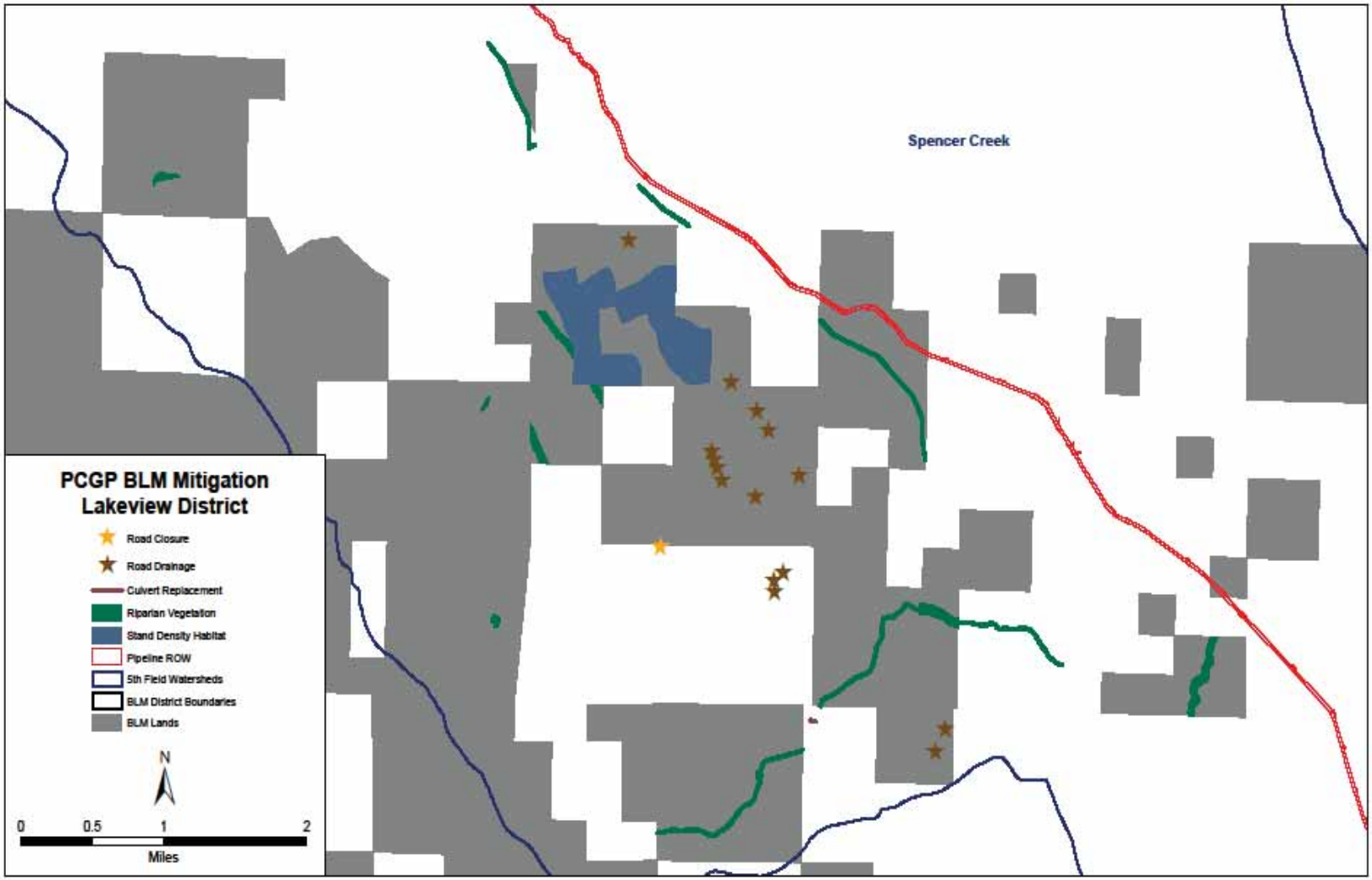


Figure 6-5. Map of Mitigation Actions on the Umpqua National Forest

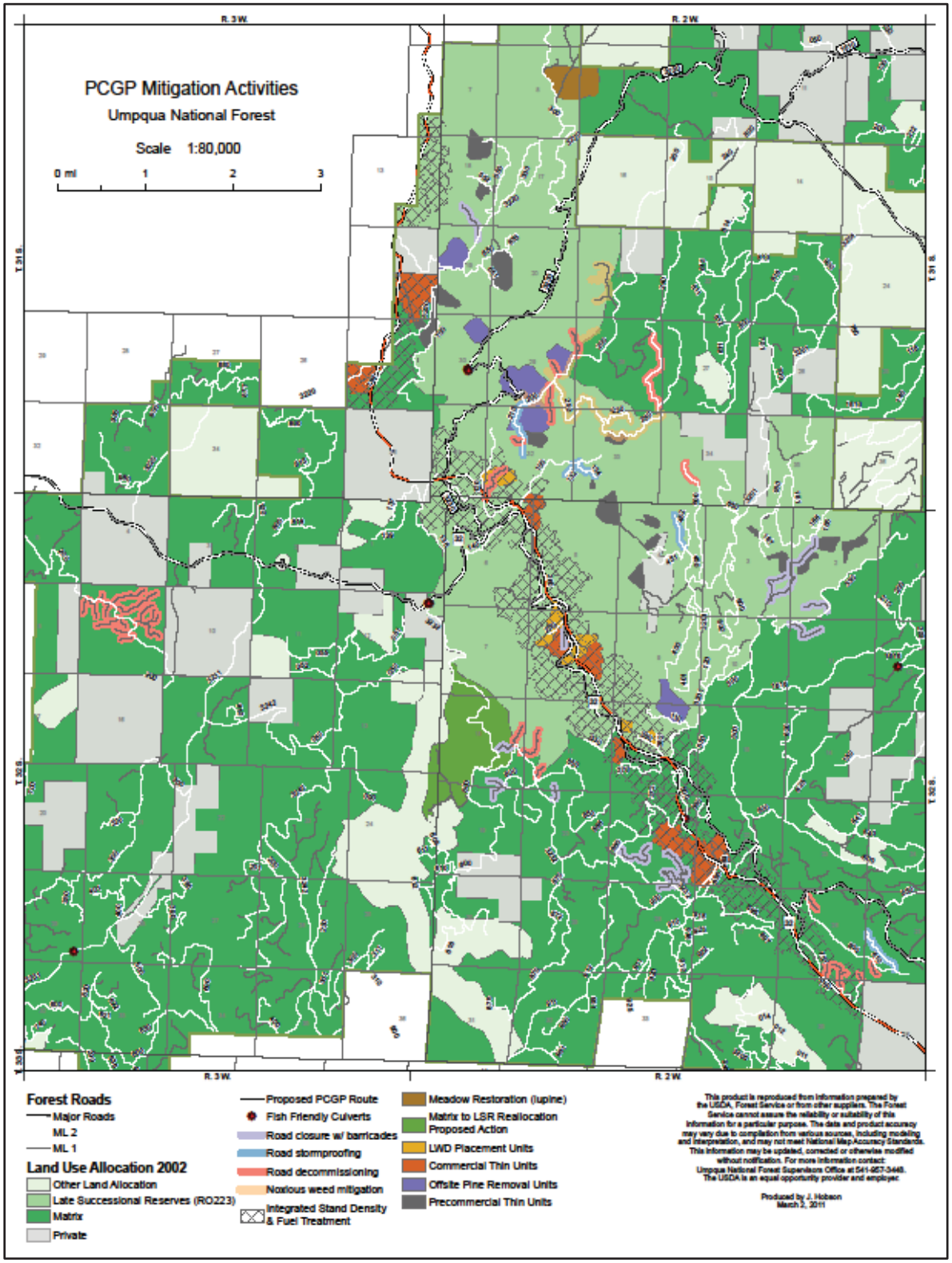


Figure 6-6. Map of Snag Creation Mitigation Actions on the Umpqua National Forest

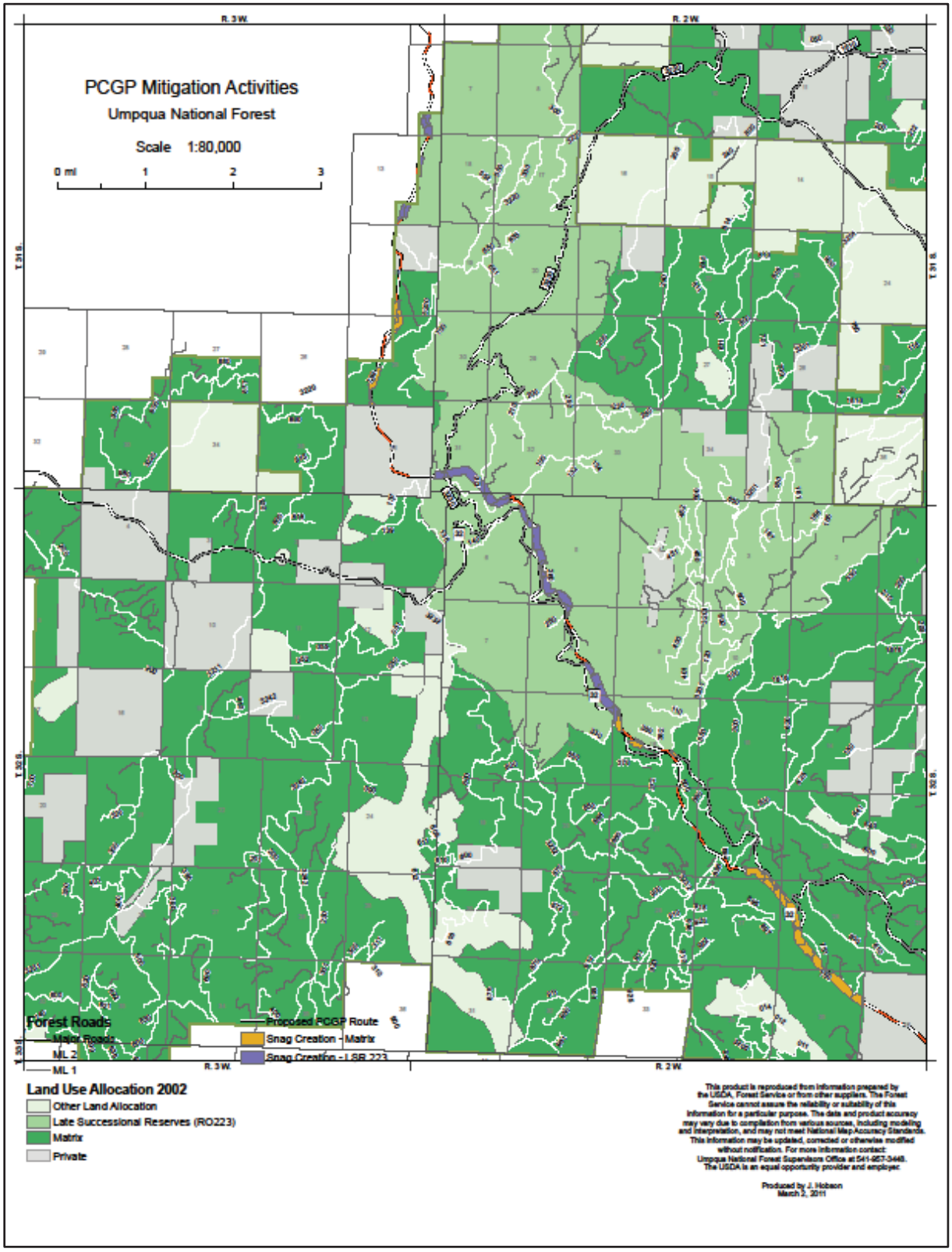


Figure 6-7. Map of Mitigation Actions on the Rogue River National Forest

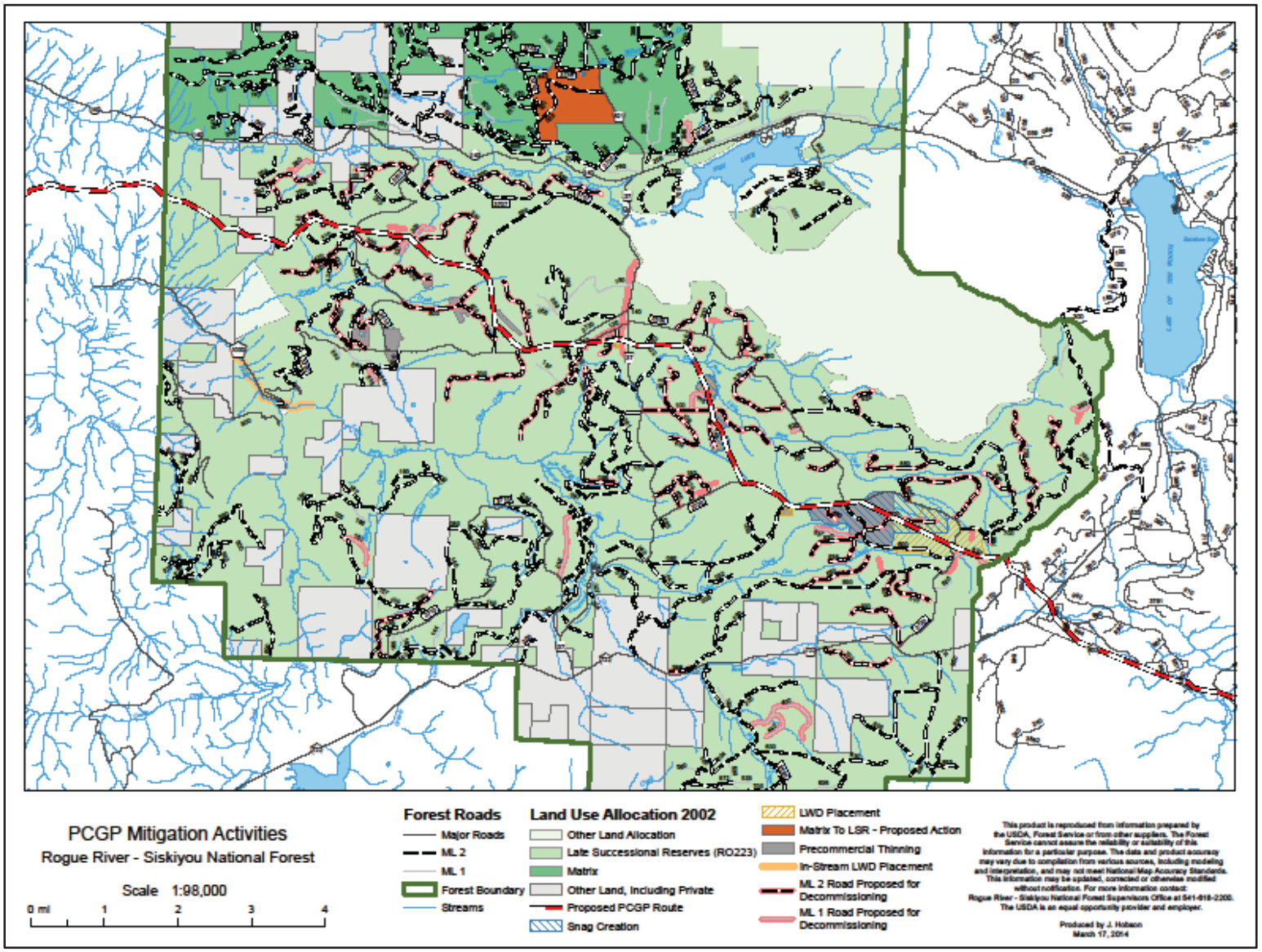


Figure 6-8. Map of Mitigation Actions on the Winema National Forest

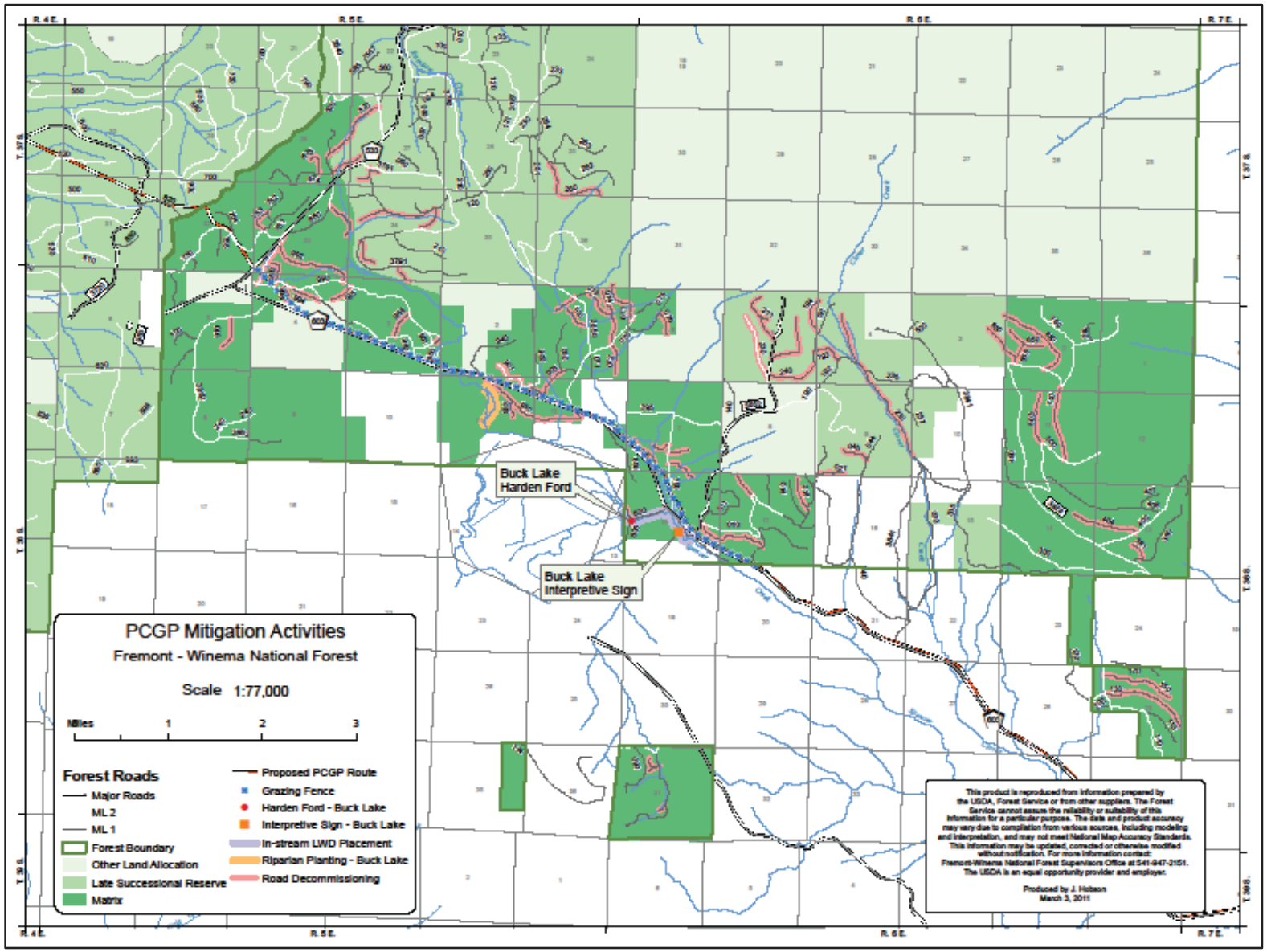
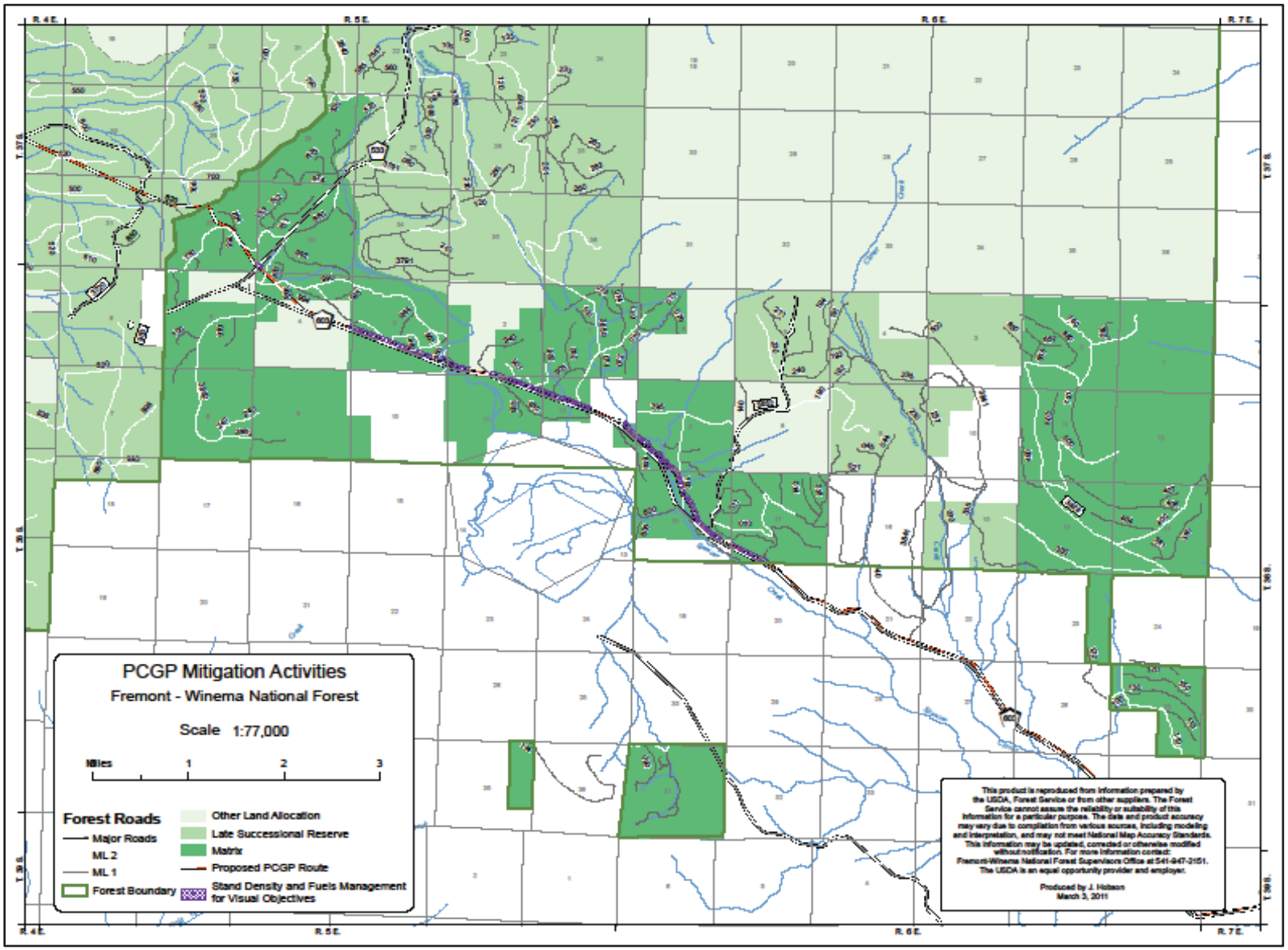


Figure 6-9. Map of Visual Mitigation Actions on the Winema National Forest



7.0 REFERENCES

Baker, W. (2011). Edge effect recovery on decommissioned roads.

Chen, J., J. Franklin, et al. (1993). "Contrasting microclimates among clearcut, edge, and interior of old-growth Douglas-fir forest." *Agricultural and forest meteorology* 63: 219-237.

Harper, K. A., E. Macdonald, et al. (2005). "Edge Influence on Forest Structure and Composition in Fragmented Landscapes." *Conservation Biology* 19(3): 768-782.

Mattson, D. M. (2009). Scenery Management Analysis and Mitigation Recommendations.

Switalski, T. A., J. A. Bissonette, et al. (2004). "Benefits and impacts of road removal." *Frontiers in Ecology and the Environment* 2(1): 21-28.

Trombulak, S. C. and C. A. Frissell (2000). "Review of Ecological Effects of roads on terrestrial and aquatic communities." *Conservation Biology* 14(1): 18-30.

USDA FS (2011). "GIS Analysis, Road Decommissioning."

USDA FS; RRNF (2010). GIS Analysis, Fragmentation Assessment, LSR 227, USDA Forest Service, Roseburg, OR.

USDA FS; USDI BLM (1994c). Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, USDA Forest Service, USDI Bureau of Land Management, Portland, OR.

USDI BLM (2012). Shady Cove - Rogue River PCGP Project - Specific Watershed Analysis

USDI BLM Roseburg District (2009). Roseburg District Aquatic Restoration Environmental Assessment, #OR-103-08-09.

USDI BLM Medford District (2014). Aquatic Habitat Enhancement, EA# DOI-BLM-OR-M000-2013-0004-EA

8.0 ATTACHMENTS

Attachment 1

BLM Mitigation Summary v.2

BLM Mitigation Summary

Introduction and Background

This document provides a summary of proposed BLM mitigation projects associated with the Pacific Connector Gas Pipeline. These projects were developed by BLM staff and approved by BLM Line Officers in a meeting on March 21, 2012. This analysis was developed by North State Resources and reviewed by the BLM. Its intended purpose is to provide context and information for completion of an Agreement in Principle between the Pacific Connector LLC and the BLM for off-site mitigations associated with the Pacific Connector Gas Pipeline Project. The policy framework for off-site mitigations by proponents of projects is provided by the BLM Offsite Mitigation Policy found in Appendix A.

Proposed mitigation projects are intended to be responsive to Resource Management Plan (RMP) objectives that include:

- Compliance with the Aquatic Conservation Strategy of the Northwest Forest Plan
- Habitat for T&E species including northern spotted owls, marbled murrelets and coho salmon
- Mitigation of impacts on Late Successional Reserves
- Specific resource issues as they occur by watershed

Offsite mitigation is a supplemental mitigation to address important issues or land management plan objectives that cannot be acceptably mitigated on-site. This document is organized by watershed, with a brief description of watershed issues and proposed mitigations. Watershed issues and conditions were extracted from agency assessments and local knowledge of the area.

Table 1-1 and associated chart show the miles by watershed by land management agency for both BLM and FS lands. NFS lands are included because the BLM and Forest Service jointly manage several watersheds.

Mitigation Groups

Aquatic Restoration

Aquatic restorations are aimed accomplishing objectives of the Aquatic Conservation Strategy (ACS) and offsetting project impacts at the watershed scale. Proposed projects are located in the 5th field watersheds where the PCGP occurs but because of the checkerboard nature of BLM ownerships, feasible projects may not be located in the same subwatersheds as the project.

LWD Instream

Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010) This is responsive to Aquatic Conservation Strategy objectives 2, 3, 4 and 5.

Road Surfacing and Drainage Repair

Road surfacing reduces sediment by capping existing fine textured sediments in the running surface of a gravel road with coarser rock or by paving. Paving all but eliminates traffic-generated sediments. Drainage repair reestablishes out-sloping, cross-drains and in some cases ditchlines to ditch-relief culverts. These actions have the effect of getting water off the road before it can enter streamcourses. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (USDA FS and USDI BLM 1994b p. B-11, C-7)

Road Decommissioning

Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). Proposed road decommissioning will increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the PCGP occur. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (USDA FS and USDI BLM 1994b p. B-11, C-7)

Fish Passage Culvert Replacement

Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS Objectives 1, 2, 3 and 9.(USDA FS and USDI BLM 2012)

Reallocation of Matrix Lands to Late Successional Reserves / Acquisition of Matrix Lands

The primary mitigation for the effects of the PCGP corridor on the Late Successional Reserve land allocation is to replace those acres of LSR in the corridor with additional acres of late-successional and old-growth habitat that are currently outside of the LSR to ensure that there are as many effective acres managed for LSR after the project as there were before the project. This is accomplished by the reallocation of land from the matrix land allocation to the LSR land allocation through a plan amendment. Reallocation of matrix lands to LSR also contributes to ACS objectives and may benefit Survey and Manage species over time by providing additional habitat that is managed to create LSOG stand conditions over time. Since the land reallocated to LSR comes out of the O&C matrix timber base, there is a need to replace those lands with other timber-producing lands to meet the BLM policy of no net loss of O&C lands. It is expected these lands would be acquired by the applicant and provided to the BLM to be managed as part of the O&C timber base.

Terrestrial Restoration

Terrestrial restoration projects are generally directed at mitigating direct and indirect effects of the Pacific Connector on late-successional and old-growth habitats and on reducing the risk of stand replacing fire.

Fire Protection

High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity however the corridor also provides a fuel break. Quick response time is imperative for successful control in wildfire situations during initial attack. Pump chance developments and helicopter dipping ponds provide readily available water sources to support fire suppression efforts.

Fuels Reduction

Late Successional Reserve Assessments in SW Oregon have noted shifts from forests dominated by fire-resistant LSOG stands to fire-prone early and mid-seral forests (USDA FS, USDI BLM et al. 1998; USDS FS and USDI BLM 1999). Use of fuels reduction and stand density management are appropriate tools to reduce the risk of high intensity stand replacement fires in these forests (USDA FS and USDI BLM 1994b). Management activities that reduce the risk of natural disturbance adjacent to Known Owl Activity Centers is also appropriate (USDA FS and USDI BLM 1994b p. C-11). Extensive fuels reductions projects are planned on the Umpqua National Forest. Integrating project proposals with existing projects or planned PCGP fuel reduction mitigations on the Umpqua National Forest could result in a more effective pattern of fuels reduction. Stand density reductions in riparian zones have the dual benefit of reducing the risk of stand-replacing fire, while also accelerating the development of late successional stand conditions by accelerating growth of remaining trees.

Specialized Habitats

Fritillaria

The Pacific Connector may impact habitat of *Fritillaria gentneri.* Outplanting bulbs is consistent with the Recovery Plan for this species and would offset any possible losses from impacts to habitat.

Assumptions for Comparisons

1. Comparisons in bar graphs are absolute values and do not represent calibrated indices or relative values. They are intended to illustrate the absolute values of direct effects for the purposes of comparison unless otherwise noted. Relative values are nearly impossible to model for multiple variables because of differences in landscapes, weather patterns, historic conditions and the stochastic character of natural events. Some terrestrial project types like fuel break acres don't lend themselves to graphic comparison and are not included in bar graphs. Bar graphs, unless noted, do not show indirect effects as those vary significantly by resource. Indirect effects may far exceed the direct impact of the project.
2. The BLM corporate Riparian Reserve Layer was used to generate road improvement and stream intersects. Acres were calculated based on an assumed 30 foot road right of way within the Riparian Reserve.
3. Acres in LWD projects were based on an assumed 75 foot average width for area influenced by LWD placement in the coast range. In smaller streams in the Cascades, the width influenced is assumed to be 50 feet. In upland volcanics east of the Cascade Crest, this is assumed to be 30 feet. This is intended to reflect a degree of floodplain connectivity in the estimates of affected acres. The influenced length is assumed to be the miles of LWD placed.
4. Acres of Right of Way include construction clearing, Temporary Extra Work Areas (TEWA) and Uncleared Storage Areas (UCSA).

Figure 1--1: Pacific Connector Route

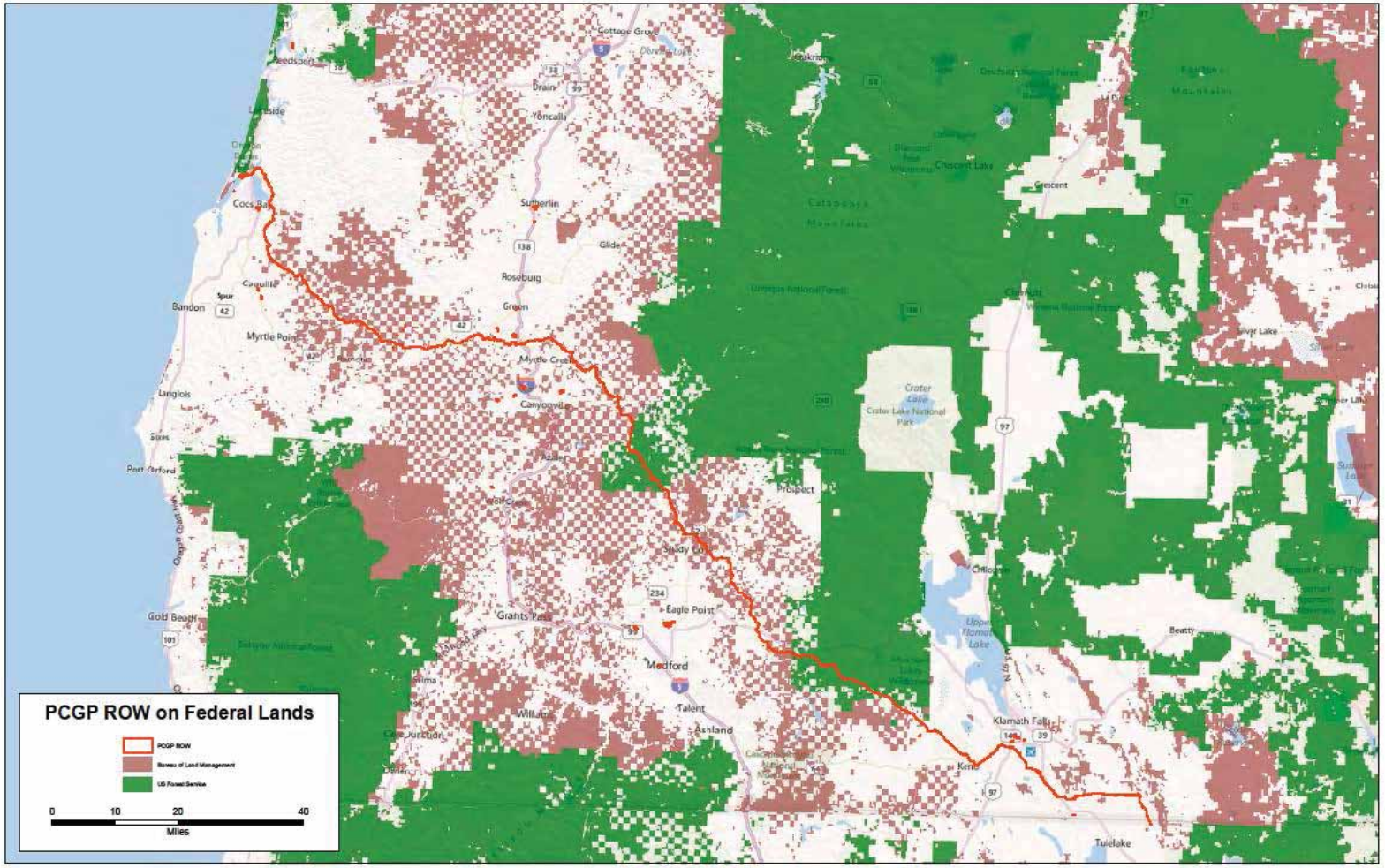


Table 1-1: Miles of PCGP by Watershed and Administrative Unit

Aquatic / Province	River Basin	Watershed	Hydrologic Unit Code	KWS	Total Miles All Owners	CB Miles	RD Miles	MD Miles	LV Miles	BLM Miles	UNF Miles	RRNF Miles	WNF Miles	FS Miles	Total Fed
	South Umpqua	Elk Creek-South Umpqua	1710030204	Yes	3.10	0.00	0.24	0.00	0.00	0.24	2.40	0.00	0.00	2.40	2.64
	South Umpqua	South Umpqua	1710030205	Yes	19.40	0.00	6.23	0.00	0.00	6.23	0.59	0.00	0.00	0.59	6.82
	South Umpqua	Upper Cow Creek	1710030206	No	5.60	0.00	0.00	0.00	0.00	0.00	4.78	0.00	0.00	4.78	4.78
	South Umpqua	MS Umpqua	1710030210	No	13.20	0.00	0.73	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.73
	South Umpqua	Myrtle Creek	1710030211	No	8.40	0.00	3.41	0.00	0.00	3.41	0.00	0.00	0.00	0.00	3.41
	Coquille	Olalla-Lookinglass	1710030212	No	8.70	0.00	1.08	0.00	0.00	1.08	0.00	0.00	0.00	0.00	1.08
	Coos	Coos Bay Frontal	1710030403	No	21.40	0.29	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.29
	Coquille	MF Coquille	1710030501	No	15.50	4.84	2.49	0.00	0.00	7.33	0.00	0.00	0.00	0.00	7.33
	Coquille	EF Coquille	1710030503	No	9.80	2.72	0.00	0.00	0.00	2.72	0.00	0.00	0.00	0.00	2.72
	Coquille	NF Coquille	1710030504	No	8.30	2.84	0.00	0.00	0.00	2.84	0.00	0.00	0.00	0.00	2.84
	Coos	Lower Coquille River	1710030505	No	2.00	0.06	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.06
	Upper Rogue	Big Butte Creek	1710030704	No	5.30	0.00	0.00	0.67	0.00	0.67	0.00	0.00	0.00	0.00	0.67

Table 1-1: Miles of PCGP by Watershed and Administrative Unit

Aquatic / Province	River Basin	Watershed	Hydrologic Unit Code	KWS	Total Miles All Owners	CB Miles	RD Miles	MD Miles	LV Miles	BLM Miles	UNF Miles	RRNF Miles	WNF Miles	FS Miles	Total Fed
	Upper Rogue	Trail Creek	1710030706	No	10.60	0.00	0.00	3.88	0.00	3.88	2.09	0.00	0.00	2.09	5.97
	Upper Rogue	Shady Cove RR	1710030707	No	7.50	0.00	0.00	4.42	0.00	4.42	0.00	0.00	0.00	0.00	4.42
	Upper Rogue	Little Butte Creek	1710030708	Yes	32.90	0.00	0.00	5.99	0.00	5.99	0.00	13.66	0.00	13.66	19.65
	Lost River	Lower Lost River	1801020409	No	25.10	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.00	0.00	0.26
	Upper Klamath	Lake Ewauna	1801020412	No	16.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Upper Klamath	Spencer Creek	1801020601	Yes	15.10	0.00	0.00	0.00	1.04	1.04	0.00	0.00	6.05	6.05	7.09
	Upper Klamath	Boyle Res.	1801020602	No	5.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total					**233.60**	**10.75**	**14.18**	**14.96**	**1.30**	**41.19**	**9.86**	**13.66**	**6.05**	**29.57**	**70.76**

Source: NSR GIS

Figure 1-2: Miles of Right of Way by Watershed and Administrative Unit

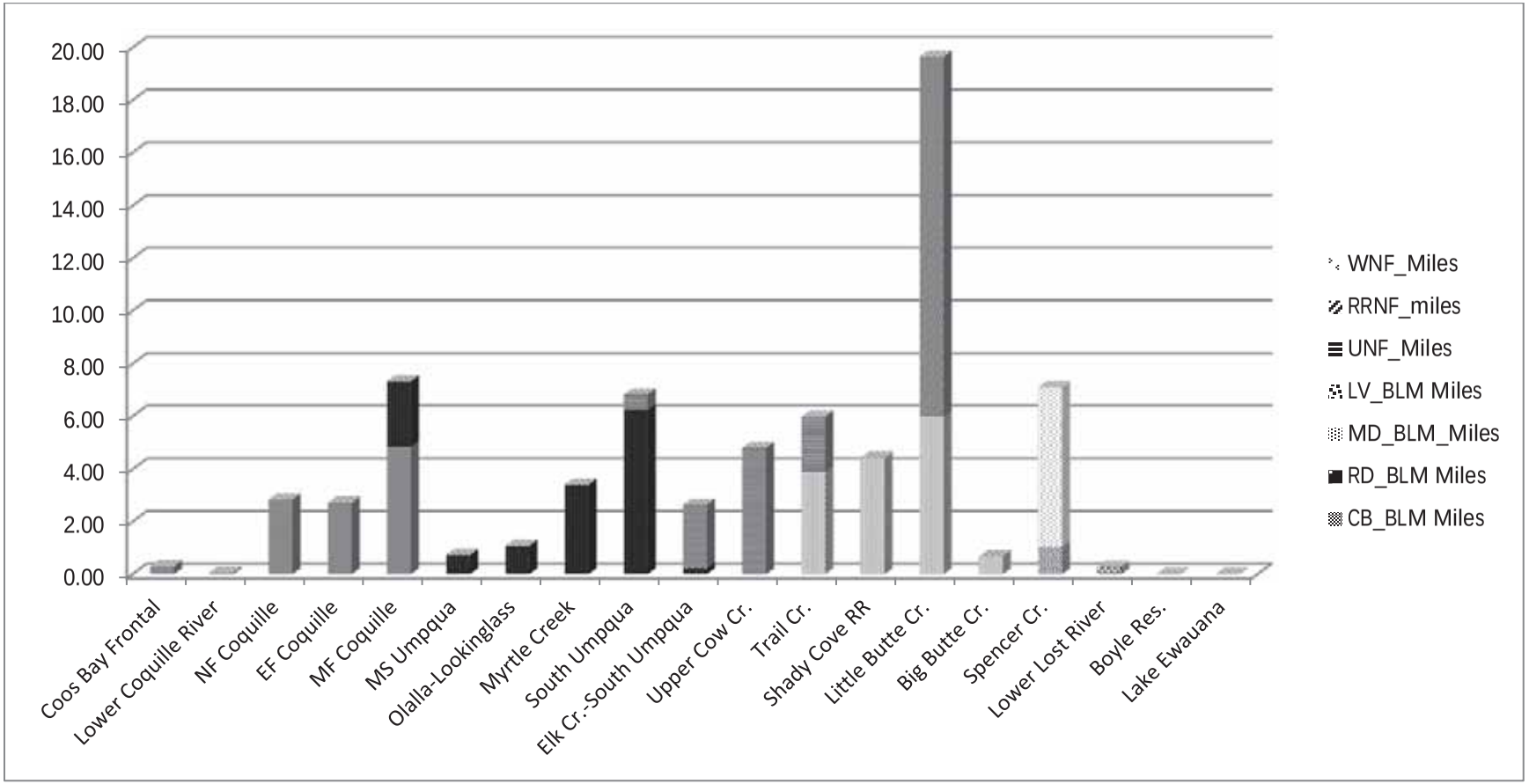
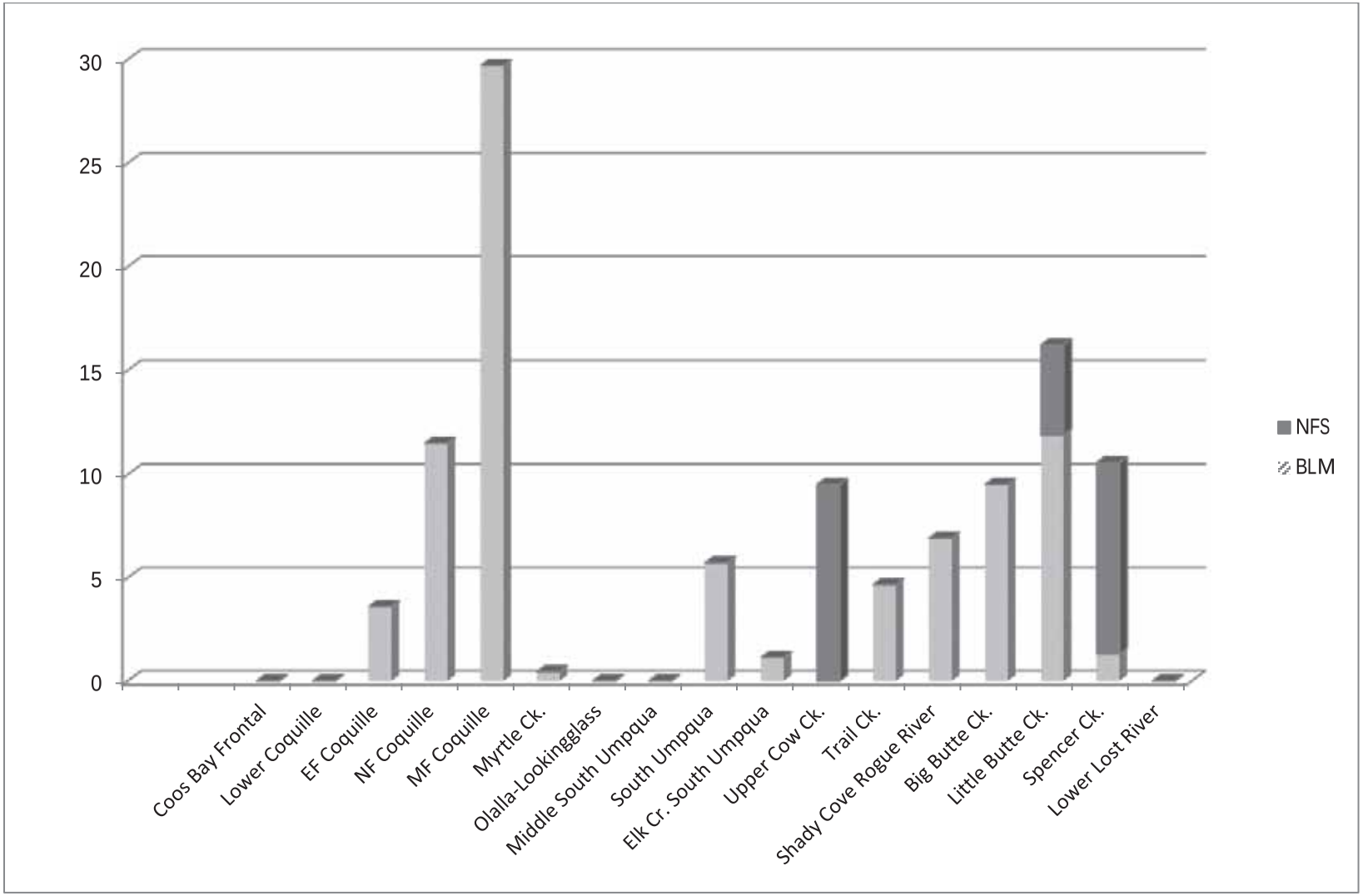


Table 0-2: Acres of Riparian Reserve Within the PCGP Right-of-Way by Watershed and Agency

	Coos Bay Frontal	Lower Coquille	EF Coquille	NF Coquille	MF Coquille	Myrtle Creek	Olalla-Lookingglass	Middle South Umpqua	South Umpqua	Elk Creek South Umpqua	Upper Cow Creek	Trail Creek	Shady Cove Rogue River	Big Butte Creek	Little Butte Creek	Spencer Creek	Lower Lost River	Total
BLM	0	0	3.59	11.5	29.7	0.44	0	0	5.71	1.13	0	4.66	6.91	9.51	11.9	1.29	0	86.34
FS	0	0	0	0	0	0	0	0		0	9.51	0	0	0	4.32	9.28	0	23.11
Total	0	0	3.59	11.5	29.7	0.44	0	0	5.71	1.13	9.51	4.66	6.91	9.51	16.22	10.57	0	109.45

Source: NSR GIS with FERC WWBC Resource Report—(Rerun to show Corridor plus TEWA and UC)

Figure 1-3: Riparian Reserve Acres within Right of Way by Ownership



BLM Fifth Field Watersheds Crossed by the PCGP

Coos Bay Frontal

R/W Miles in Watershed	0.29
R/W Acres in Watershed	4.68
Stream Channels Crossed	0
Riparian Reserve Acres in R/W[1]	0
Late Successional Reserve Acres	0

The PCPG project crosses the Catching Slough subwatershed in the Coos Bay Frontal watershed. No offsite mitigations are anticipated in the Coos Bay Frontal watershed because of the limited extent of the PCGP corridor.

Lower Coquille River

R/W Miles in Watershed	0.06
R/W Acres in Watershed	1.59
Stream Channels Crossed	0
Riparian Reserve Acres in R/W	0
LSR Acres in R/W	0

The PCGP project crosses the Cunningham Creek subwatershed in the Lower Coquille watershed. No offsite mitigations are anticipated in the Coos Bay Frontal watershed because of the limited extent of the PCGP corridor.

North Fork Coquille

R/W Miles in Watershed	2.84			
R/W Acres in Watershed	39.97			
Stream Channels Crossed	Perennial	Intermittent	Wetland	total
	1	5	2	8
Riparian Reserve Acres in R/W	11.5			
Designated LSR Acres in R/W	0			
Unmapped MAMU LSR Acres in R/W	0			

The PCGP crosses portions of the Middle Creek and Hudson Creek subwatersheds in the North Fork Coquille watershed.

Aquatic Conditions and Issues

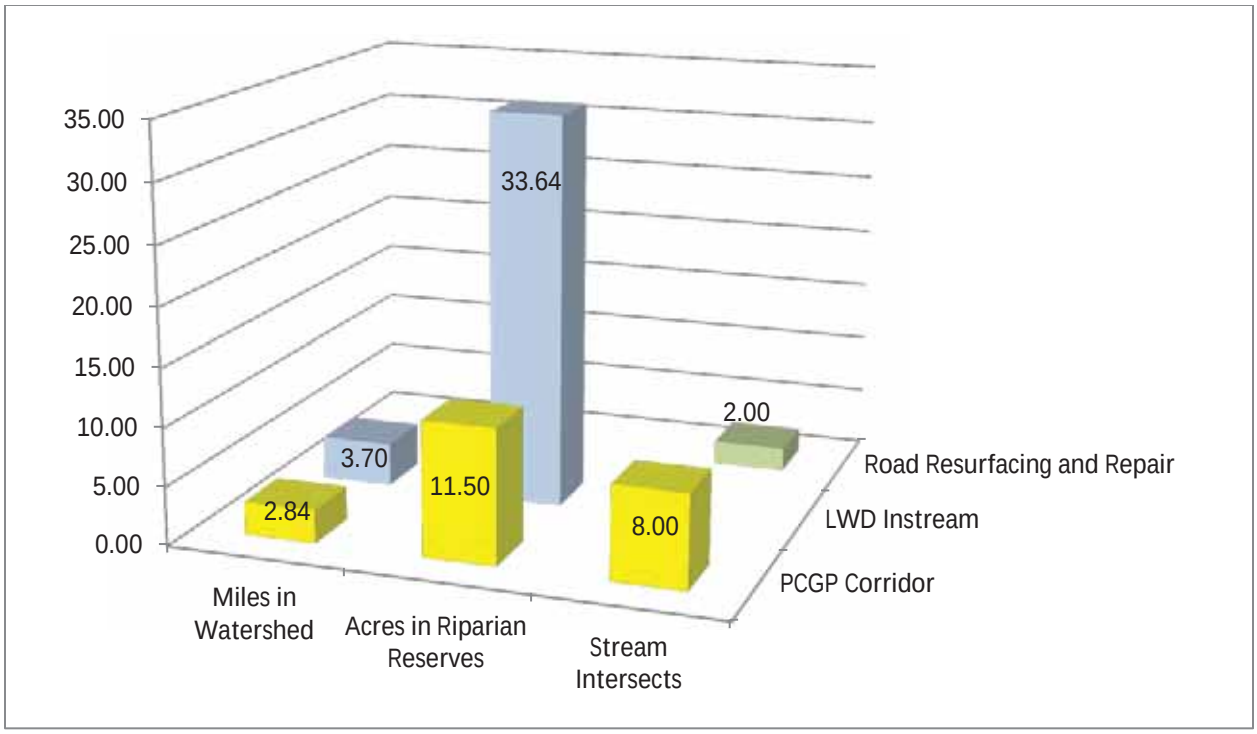
- NF Coquille is 303 (d) listed for temperatures and sediment.
- NF Coquille is “At Risk” or “Not Properly Functioning for multiple watershed indicators including temperature, spawning gravel, summer and winter rearing habitat, large wood, channel modification, .
- NF Coquille is within the range of anadromy for coho salmon.
- High road densities and road-related sediment have negatively impacted aquatic habitats.
- Disturbed soils are susceptible to significant surface erosion during heavy rainfall events
- Rapid runoff may occur because of shallow soils and limited water storage capacity.
- Loss of pool habitat for over wintering juvenile salmonids is determined to be a major limiting factor.
- Upland fine sediment sources are limiting aquatic habitat condition.

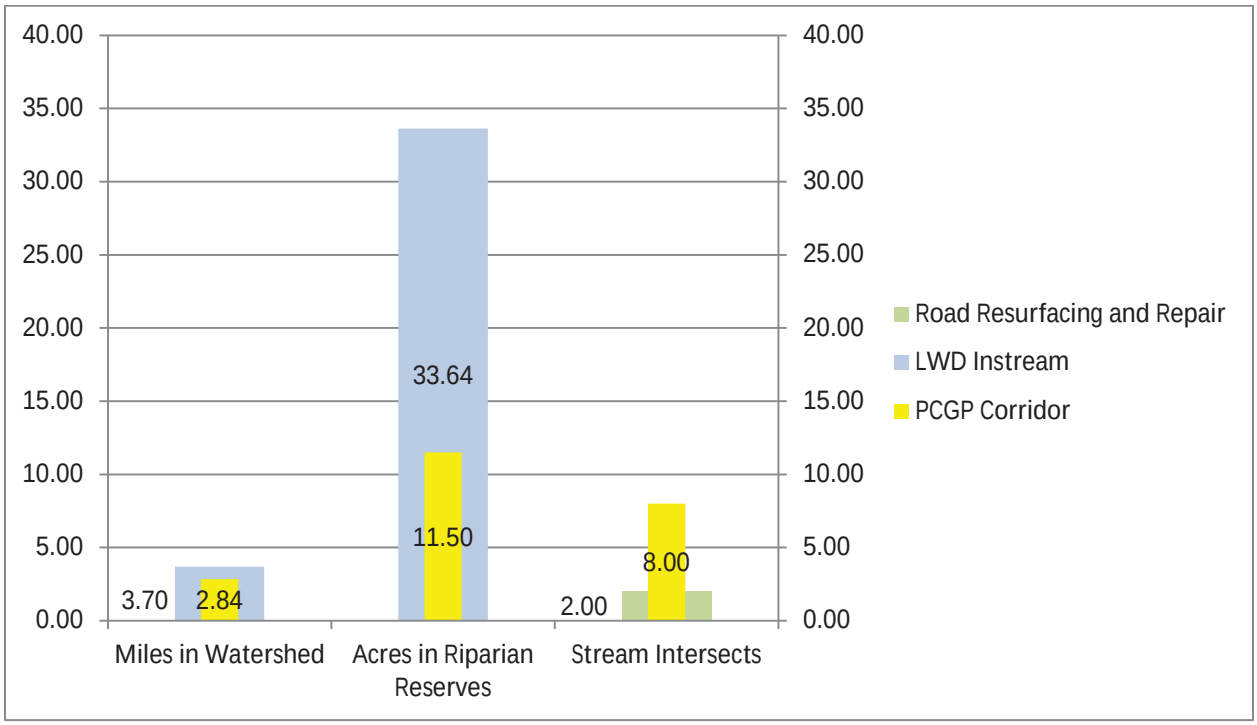
Terrestrial Conditions and Issues

- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Early and mid-seral plant communities have increased and late-successional-old-growth stands have decreased relative to the historic conditions.

Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
LWD instream	Aquatic Habitat	Steinnon Creek In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	1.5	miles	$128,157
LWD instream	Aquatic Habitat	Upper North Fork Coquille In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	2.2	miles	$270,958
Road Surfacing	Road Sediment Reduction	Bridge Approach paving - Woodward & Alder Creek Roads	Road-related sediment has negatively impacted the NF Coquille. While BMPs will be implemented, construction of the PCPG will likely cause sediment to enter stream channels and may affect aquatic habitat. Surfacing the bridge approach would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat.	2	ea.	$43,623


35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
33.64
3.70
11.50
2.84
8.00
2.00
Road Resurfacing and Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects


40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
33.64
11.50
3.70
2.84
2.00
8.00
Road Resurfacing and Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

East Fork Coquille

R/W Miles in Watershed	2.72
R/W Acres in Watershed	45.87
Stream Channels Crossed	2 Intermittent
Riparian Reserve Acres in R/W	3.59
Designated LSR Acres in R/W	6.25
Unmapped MAMU Acres in R/W	12.91 (See LSR-Matrix discussion)

The PCGP project crosses portions of the Elk Creek, Brewster Canyon and Yankee Run subwatersheds on BLM lands in the East Fork Coquille watershed.

Aquatic Conditions and Issues:

- Mainstem is 303(d) listed for temperatures but summer temperatures in the upper watershed above Camas Creek meet the temperature standards.
- EF Coquille is “At Risk” or “Not Properly Functioning for multiple watershed indicators.
- EF Coquille is within the range of anadromy for coho salmon.
- High road densities and road-related sediment have negatively impacted aquatic habitats. There is an over-abundance of fine sediments in Weekly, **Yankee Run**, Dead Horse and Knepper Creeks. Weekly**, Elk, Yankee Run** and lower Steel Creeks are deficient in large wood.
- Disturbed soils are susceptible to surface erosion during rainfall events
- Rapid runoff may occur because of shallow soils and limited water storage capacity
- Loss of pool habitat for over wintering juvenile salmonids is a major limiting factor.

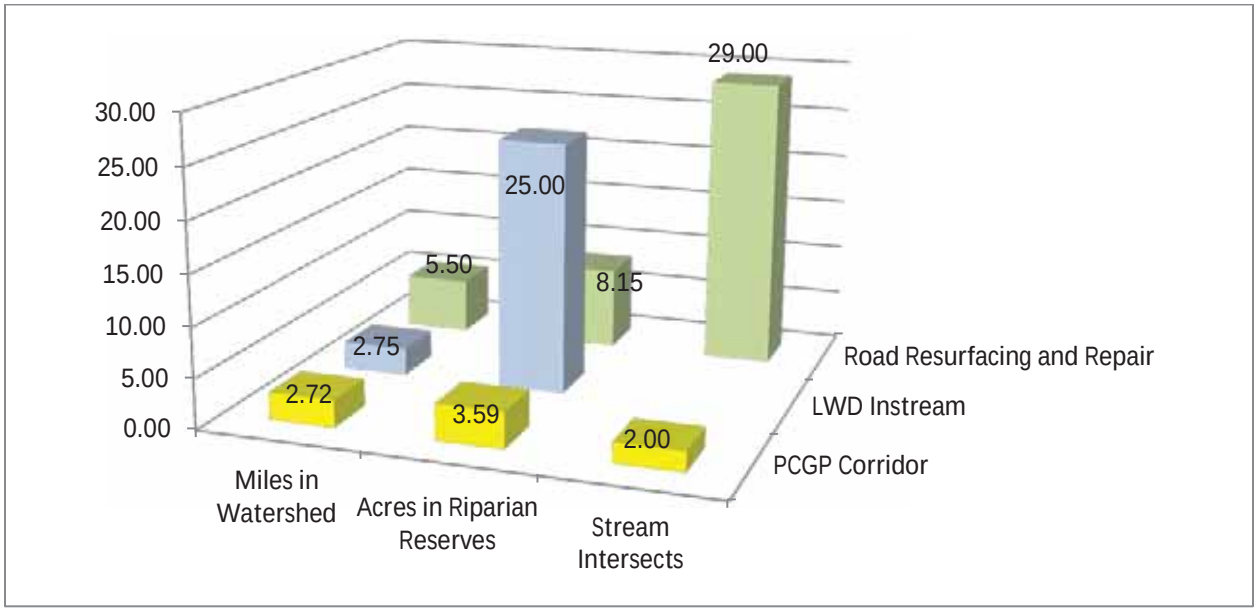
Terrestrial Conditions and Issues

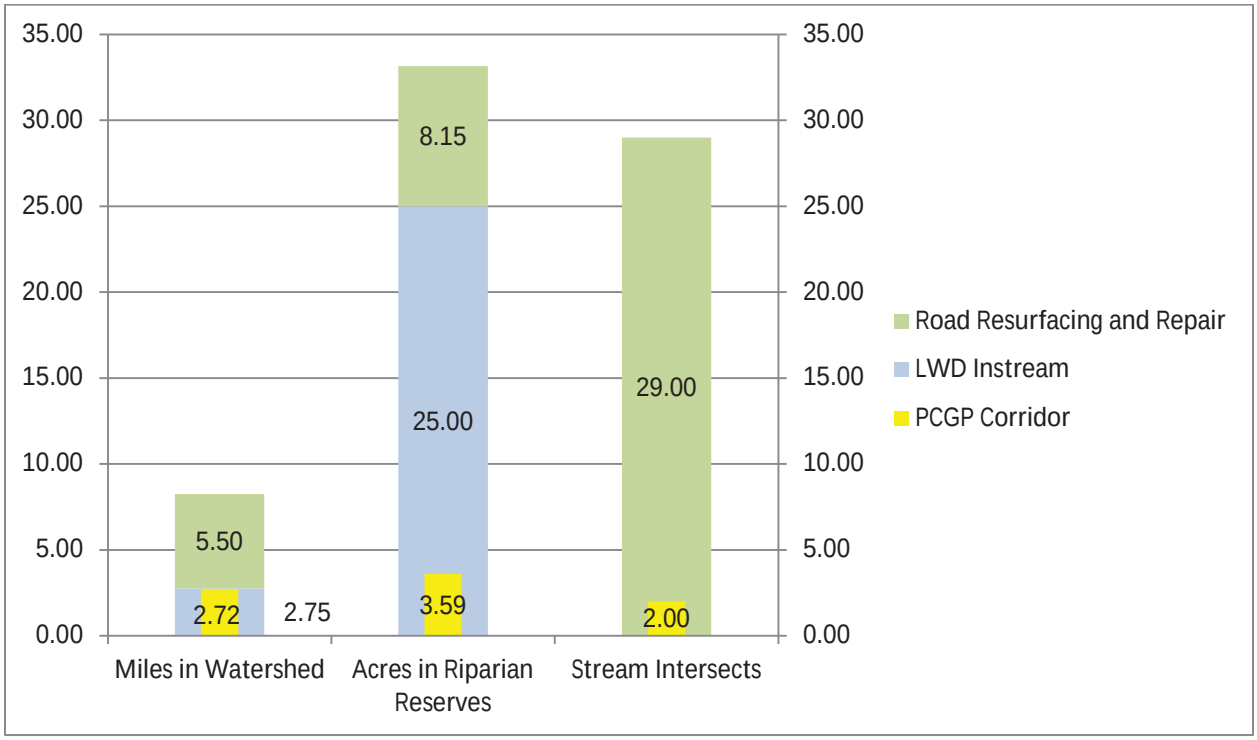
- Fragmentation from past logging has substantially impacted terrestrial habitats
- The EF Coquille provides substantial MAMU habitat.
- Fire and windthrow have greatest potential impacts on marbled murrelet habitats.

Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Qty.	Unit	CostWithOH
Road Surfacing	Road Sediment Reduction	Road Surfacing – South Fork Elk Creek	Road-related sediment has negatively affected the EF Coquille. The effects of the PCGP are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to the South Fork Elk Creek would reduce if not eliminate sediment input to adjacent Chinook, coho, steelhead, and cutthroat habitat.	2.6	miles	$1,038,170
Road Surfacing	Road Sediment Reduction	Road Surfacing – Yankee Run Mainline	Road-related sediment has negatively impacted the EF Coquille. The effects of the PCGP are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to Yankee Run Creek would reduce if not eliminate road-related sediment input to coho, steelhead, and cutthroat habitat.	2	miles	$785,332
Road Surfacing	Road Sediment Reduction	Road Surfacing – Yankee Run Spurs	Road-related sediment has negatively impacted the EF Coquille. The effects of the PCGP are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to Yankee Run Creek would reduce if not eliminate road – related sediment input to coho, steelhead, and cutthroat habitat.	0.9	miles	$410,999
LWD instream	Aquatic Habitat	Yankee Run In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	2.75	miles	$261,296

Fire Suppression	Fire suppression	Heli-Pond construction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity; however, the corridor also provides a fuel break. Within the East/Middle Fork watersheds, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heliponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur.	2	ea.	$259,380
Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation& Land Acquisition	This action contributes to the “neutral to beneficial” standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the PCGP. The action also compensates for the removal of occupied marbled murrelet habitat and suitable RNF spotted owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of Matrix lands adjacent to occupied murrelet sites by reallocating the entire parcel to LSR.	120	acres	$0


30.00
25.00
20.00
15.00
10.00
5.00
0.00
29.00
25.00
5.50
8.15
2.75
2.72
3.59
2.00
Road Resurfacing and Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects


35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
8.15
25.00
29.00
5.50
2.72
2.75
3.59
2.00
Road Resurfacing and Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

Middle Fork Coquille

R/W Miles in Watershed	7.34		
R/W Acres in Watershed	142.47		
Stream Channels Crossed	Perennial	Intermittent	total
	2	7	9
Riparian Reserve Acres in R/W	29.72		
Designated LSR Acres in R/W	50.88		
Unmapped MAMU LSR Acres in R/W	22.73 (See LSR-Matrix discussion)		

The PCGP project crosses portions of the Headwaters MF Coquille, Upper Rock Creek, Sandy Creek, Camas Creek, and Big Creek subwatersheds on BLM lands in the Middle Fork Coquille watershed.

Aquatic Conditions and Issues

- MF Coquille is “At Risk” or “Not Properly Functioning for multiple watershed indicators including temperature, spawning gravel, summer and winter rearing habitat, large wood, channel modification, .
- MF Coquille is within the range of anadromy for coho salmon.
- High road densities and road-related sediment have negatively impacted aquatic habitats.
- In general, the basin has a deficit of in-stream structure and channel complexity.
- Disturbed soils are susceptible to significant surface erosion during heavy rainfall events
- Rapid runoff may occur because of shallow soils and limited water storage capacity.
- Loss of pool habitat for over wintering juvenile salmonids is determined to be a major limiting factor.
- Upland fine sediment sources are limiting aquatic habitat condition.
- Replacing fish passage barriers with “fish friendly” passages, placement of LWD in appropriate stream reaches and reducing road sediment are key restoration recommendations.

Terrestrial Conditions and Issues

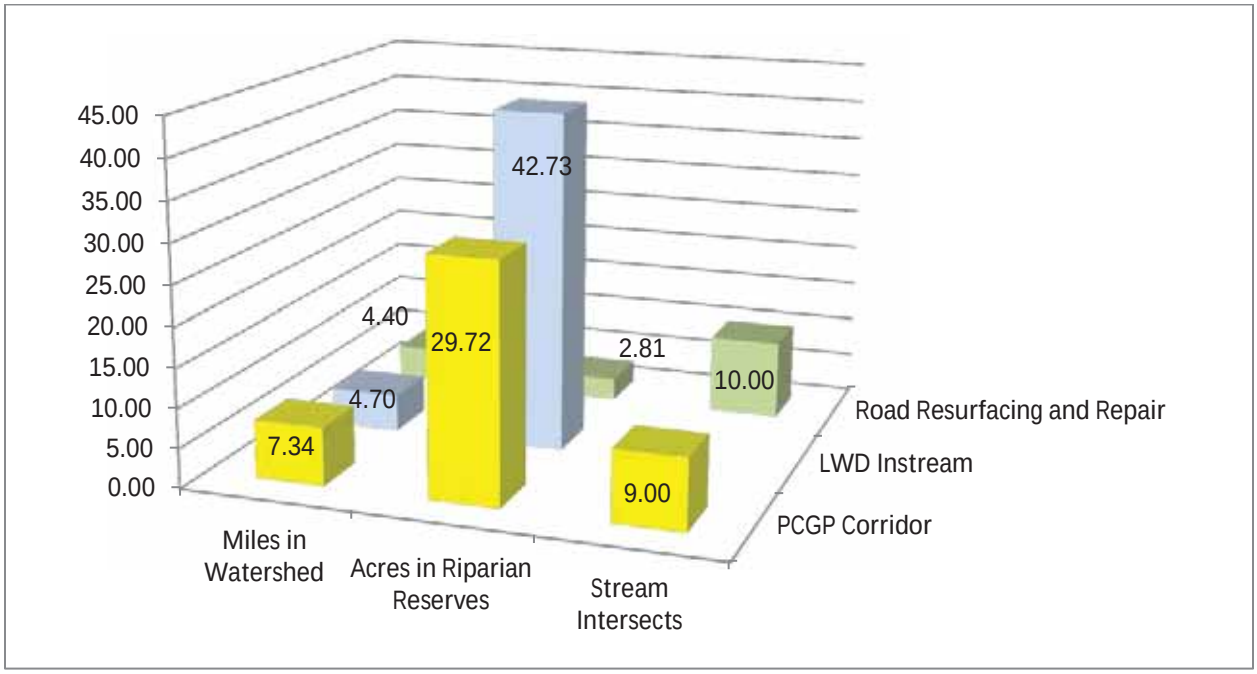
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Early and mid-seral plant communities have increased and late-successional-old-growth stands have decreased relative to the historic conditions.

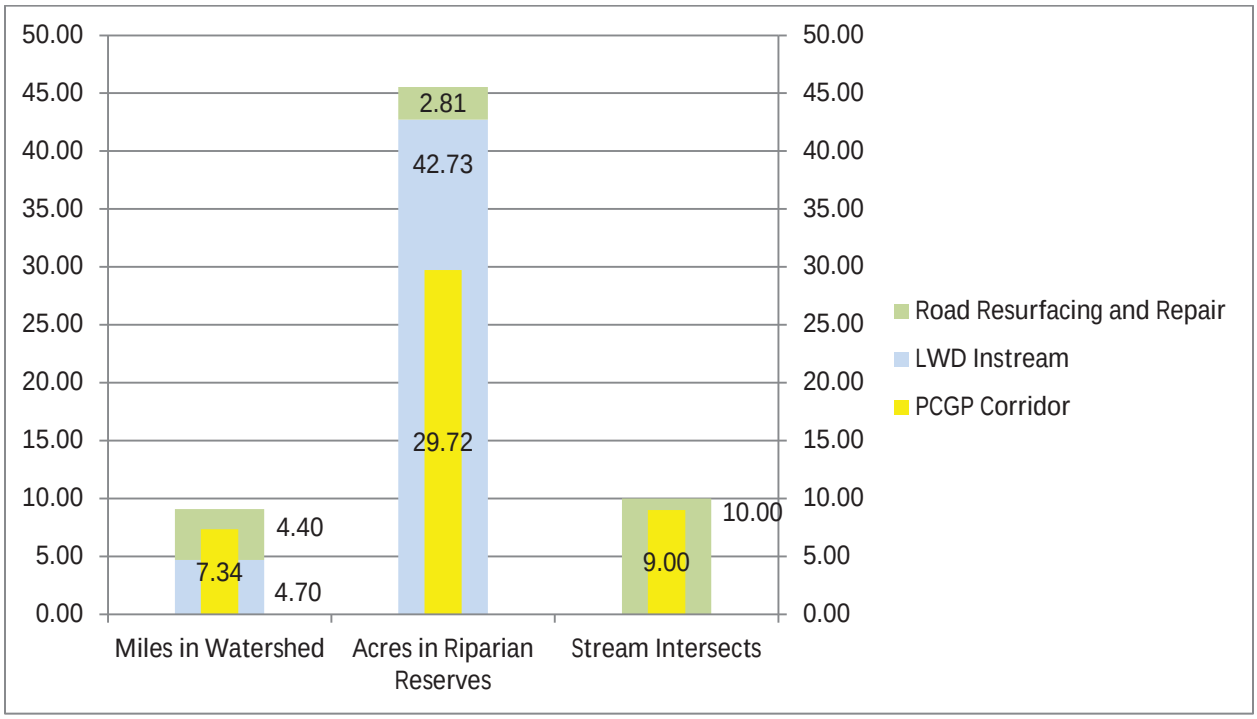
Proposed Off Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Fire Suppression	Fire suppression	Heli-Pond construction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity; however the corridor also provides a fuel break. Within the East/Middle Fork watersheds, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heliponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur.	1	ea.	$129,690
Fish Passage	Fish Passage	Loveseat Creek culvert removal	Man-made barriers to fish passage have negatively affected access to habitat in the MF Coquille. The stream crossing is a fish barrier to resident fish. Removing the culvert and associated road fill will extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. Sediment introductions to the stream network would also cease.	1	project	$23,580
Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation& Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the PCGP. The action also compensates for the removal of occupied marbled murrelet habitat and suitable RNF spotted owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of Matrix lands adjacent to occupied murrelet sites by reallocating the entire parcel to LSR.	330	acres	$0

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
LWD instream	Aquatic Habitat	Twelvemile Creek Large Wood and Boulder Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2	miles	$172,134
LWD instream	Aquatic Habitat	Upper Rock Creek In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.1	miles	$222,843
LWD instream	Aquatic Habitat	Middle Fork Coquille LWD Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat.	0.6	miles	$64,845

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Road Drainage and Surface Enhancement	Road Sediment Reduction	Camas Mountain Road Drainage and Surface Enhancement	Road-related sediment and stream network extension from ditchlines have negatively impacted the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Roads do not meet current BMPs and are a source of chronic sediment delivery to fish bearing streams. The 9.1 and 9.2 roads currently show signs of water rutting and stream network extension. Stormproofing and blocking the road will reduce the potential for sediment-laden water to be carried off the road surface and into the ditch where it could be transmitted to the stream network.	3.5	miles	$337,194
Road Surfacing	Road Sediment Reduction	Road Surfacing -Fall Creek System	Road-related sediment has negatively impacted the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Surfacing the BLM road which is parallel to Fall Creek would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat.	0.9	miles	$347,574
Road Surfacing	Road Sediment Reduction	Bridge Approach paving -Sandy & Jones Creek Roads	Road-related sediment has negatively impacted the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Surfacing the bridge approach would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat from this location.	2	ea	$43,623


45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
42.73
4.40
29.72
2.81
10.00
4.70
7.34
9.00
Road Resurfacing and Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects


50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2.81
42.73
29.72
4.40
7.34
4.70
10.00
9.00
Road Resurfacing and Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

Olalla Lookingglass

R/W Miles in Watershed	1.08
R/W Acres in Watershed	21.75
Stream Channels Crossed	0
Riparian Reserves Acres ion R/W	0
Designated LSR Acres in R/W	4.24
KOAC Acres in R/W	2.51

The PCPG crosses portions of the Tenmile Creek, Berry Creek and Olalla Creek on BLM lands in the Olalla-Lookingglass watershed.

Aquatic Conditions and Issues

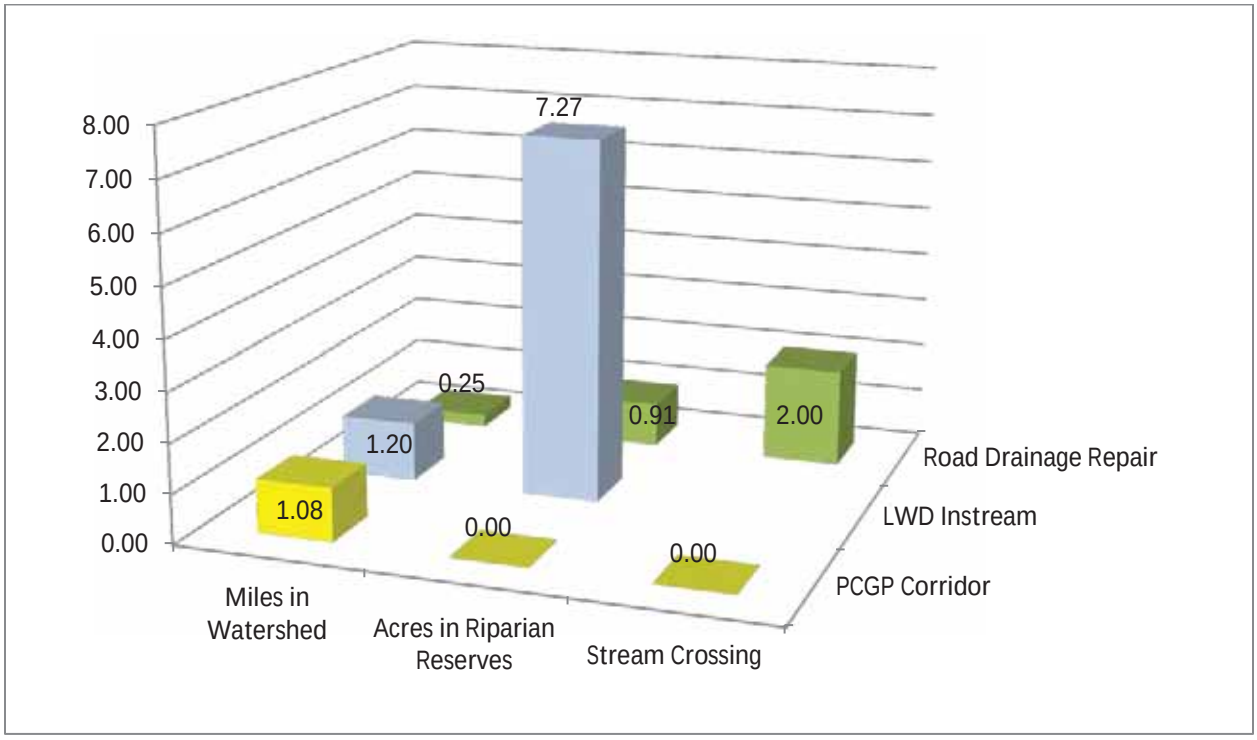
- High road densities, large numbers of stream crossings and cumulative effects of timber harvest have increased sediment and likely peak flows.
- Water quality issues include high temperatures, low flows, low dissolved oxygen and sediment issues
- Olalla Lookingglass watershed is within the range of anadromy for coho salmon.
- Road improvements that reduce road-related sediment would contribute to improving aquatic conditions in the watershed.

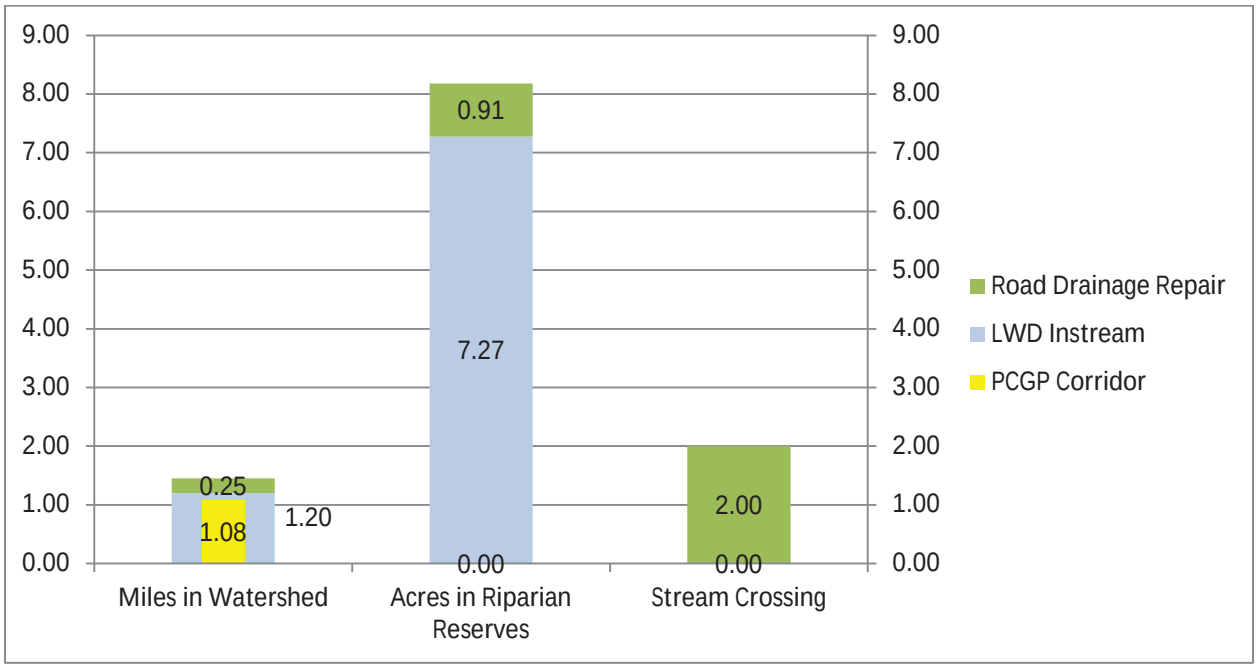
Terrestrial Conditions and Issues

- There are 37 spotted owl sites within the WAU. Thirty-two spotted owl sites are on BLM Administered Land. Seven spotted owl sites on BLM administered lands are protected with 100 acre activity centers (core areas).
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Early and mid-seral plant communities have increased and late-successional-old-growth stands have decreased relative to the historic conditions.

Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation and Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres of acres and habitat from the construction and operation of the PCGP. In addition to impacts to Mapped LSR, this action compensates for impacts to 3 unmapped LSRs (NSO habitat). The 409 acres of re-allocation would be a factor of 5.0 x to the 81 acres of habitat affected by the construction.	409	acres	$0
LWD instream	Aquatic Habitat	Olalla Creek Large Wood and Boulder Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	1.2	miles	$126,389
Road Stabilization	Road Sediment Reduction	Olalla Tie Road Renovation	Sediment from roads is a primary concern in Olalla-Lookinglass Creek Roads do not meet current BMPs and are a source of chronic sediment delivery to fish bearing streams. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Additionally, there are several landslides crossing the road which need to be stabilized. Stabilizing these conditions would reduce the delivery of road-related sediments to channels.	1	project	$294,750


8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
7.27
0.25
0.91
2.00
1.20
1.08
0.00
0.00
Road Drainage Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Crossing


9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.91
7.27
0.25
1.08
1.20
0.00
2.00
0.00
Road Drainage Repair
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Crossing

Middle South Umpqua

R/W Miles in Watershed	0.79
R/W Acres in Watershed	15.79
Stream Channels Crossed	0
Riparian Reserve Acres in R/W	0
Late Successional Reserve Acres	0

The PCGP project crosses portions of the Rice Creek subwatershed in the Middle South Umpqua watershed.

Aquatic Conditions and Issues

- Middle South Umpqua watershed is “At Risk” or “Not Properly Functioning for multiple watershed indicators including temperature, spawning gravel, summer and winter rearing habitat, large wood, and channel modification.
- Middle South Umpqua watershed is within the range of anadromy for coho salmon.
- High road densities and road-related sediment have negatively impacted aquatic habitats.
- In general, the watershed has a deficit of in-stream structure and channel complexity.
- Replacing fish passage barriers with “fish friendly” passages and reducing road sediment are key restoration recommendations.

Terrestrial Conditions and Issues

- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Early and mid-seral plant communities have increased and late-successional-old-growth stands have decreased relative to the historic conditions.

Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Fish Passage	Fish Passage	Rice Creek culvert replacements	Man-made barriers to fish passage have negatively affected access to habitat in the MS Umpqua. Replacing fish barrier culverts with crossings that pass adult and juvenile salmonids at a range of flows will extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter the stream network. Replacing fish barrier culverts with crossings that pass adult and juvenile salmonids at a range of flows will extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter the stream network.	2	sites	$265,275
Road Drainage	Road Sediment Reduction	East Fork Willis Creek tributary culvert replacement	Sediment is one of the primary water quality problems in the MS Umpqua. Watershed analyses clearly indicate that the sediment turbidity habitat indicator is at risk or more likely not functioning properly. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Culvert is plugged, old, undersized, shot-gunned, and eroding road fill. Culvert has poor alignment with the stream at the outlet. Replacing the culvert with a properly sized one will reduce the risk of road fill failure.	1	project	$56,592
Road Drainage	Road Sediment Reduction	Judd Creek culvert removal	Sediment is one of the primary water quality problems in the MS Umpqua. Watershed analyses clearly indicate that the sediment turbidity habitat indicator is at risk or more likely not functioning properly. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. This culvert is undersized and has a large amount of road fill associated with it. Pulling the culvert and fill material and stormproofing the road would prevent a plugged culvert. A plugged culvert could cause the road fill to fail which could deliver sediment downstream to fish bearing reaches. The road is blocked by a landslide just beyond so access would not be lost. Access to the stream crossing is gradually being lost due to soil slumping and vegetation growth.	1	project	$68,382

Myrtle Creek

R/W Miles in Watershed	3.41
R/W Acres in Watershed	114.44
Stream Channels Crossed	0
Riparian Reserve Acres in R/W	0.44
Designated LSR Acres in R/W	0
KOAC Acres in R/W	4.77

The PCGP crosses portions of the Lower South Myrtle and Lower North Myrtle subwatersheds on BLM lands in the Myrtle Creek watershed.

Aquatic Conditions and Issues

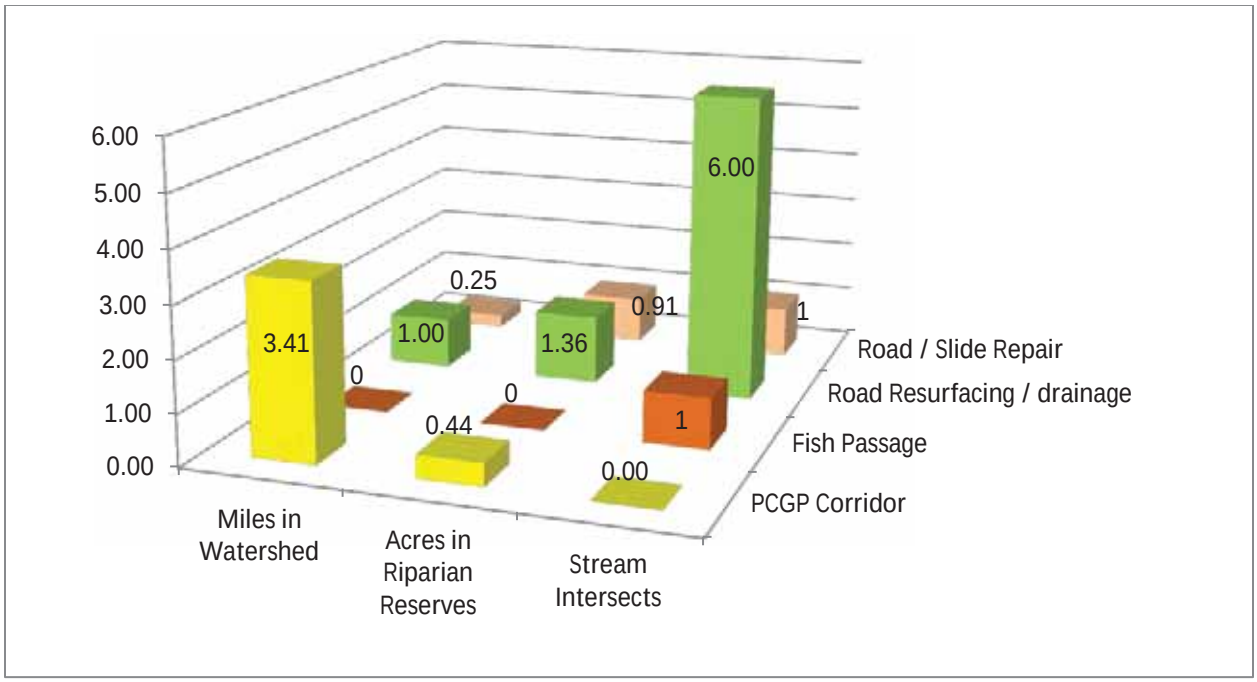
- North Myrtle Creek is on the water quality limited list for habitat modification. South Myrtle Creek and Riser Creek are on the water quality limited list for temperature. South Myrtle Creek (from the mouth to Weaver Creek) is on the water quality limited list for flow modification.
- Sediment in the streams, poor width to depth ratios, and the lack of large woody debris and pools are some of the limiting factors reported in the stream surveys conducted by ODFW.
- High road densities and road-related sediment have negatively impacted aquatic habitats. Road densities on BLM-administered land range from zero to 6.82 miles per square mile. The average road density on BLM-administered land in the WAU is 3.85 miles per square mile.

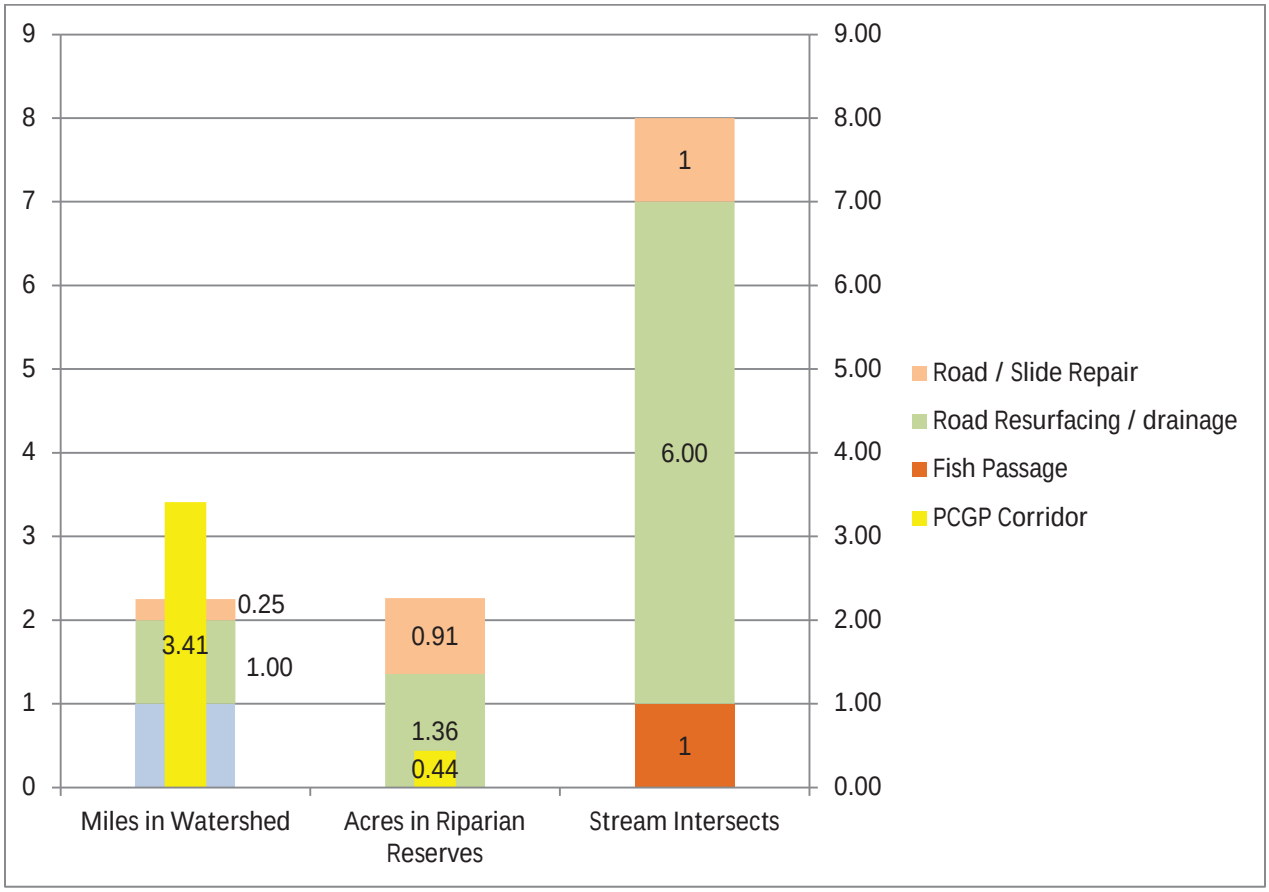
Terrestrial Conditions and Issues

- The Watershed Analysis documented 23 known spotted owl centers in the Myrtle Creek WAU.
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Early and mid-seral plant communities have increased and late-successional-old-growth stands have decreased relative to the historic conditions.

Proposed Offsite Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Fish Passage	Fish Passage	Slide Creek culvert replacement	Man-made barriers to fish passage have negatively affected access to habitat in Myrtle Creek Culvert is perched, undersized, and a fish barrier for anadromous and resident fish. Replacing a fish barrier culvert with one that will pass adult and juvenile salmonids at a range of flows will extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, undersized culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter into the stream network.	1	project	$142,659
Road Stabilization	Road Sediment Reduction	South Myrtle Hill Slide Repair	Sediment in streams is a limiting factor in Myrtle Creek. There are approximately 3.4 miles of corridor in Myrtle Creek. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Stabilizing the failure will prevent future sediment delivery and catastrophic slope failure.	1	project	$271,170
Road Drainage and Surface Enhancement	Road Sediment Reduction	Ben Branch Road Drainage and Surface Enhancement	Sediment in streams is a limiting factor in Myrtle Creek. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Roads do not meet current BMPs and are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair would reduce sediment delivery to fish bearing streams.	1	miles	$86,657


6.00
5.00
4.00
3.00
2.00
1.00
0.00
3.41
0
1.00
0.25
0.44
0
1.36
0.91
0.00
1
6.00
1
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects
Road / Slide Repair
Road Resurfacing / drainage
Fish Passage
PCGP Corridor


9
8
7
6
5
4
3
2
1
0
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
3.41
0.25
1.00
0.91
1.36
0.44
1
6.00
1
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects
Road / Slide Repair
Road Resurfacing / drainage
Fish Passage
PCGP Corridor

South Umpqua (Tier One Key Watershed)

R/W Miles in Watershed	6.25		
R/W Acres in Watershed	183.51		
Stream Channels Crossed	Intermittent	Wetland	total
	1	2	3
Riparian Reserve Acres in R/W	5.71		
Designated LSR Acres in R/W	59.96		
KOAC Acres in R/W	9.85		

The PCPG project crosses parts of the Days Creek., St. John Creek, Stouts Creek, and Corn Creek subwatersheds on BLM lands in the South Umpqua Watershed.

Aquatic Conditions and Issues

- Beals Creek, **Days Creek**, and Shively Creek were on the water quality limited list for habitat modification. Fate Creek, **Stouts Creek, and the East Fork of Stouts Creek** were on the water quality limited list for temperature. The South Umpqua River through portions of the WAU was on the water quality limited list due to toxics, flow modification, aquatic weeds or algae, bacteria, biological criteria, dissolved oxygen, sediment, pH, and temperature.
- High road densities and road-related sediment have negatively impacted aquatic habitats. Road densities on BLM-administered land range from 0.93 to 5.58 miles per square mile. The average road density on BLM-administered land in the WAU is 3.60 miles per square mile.
- Three stream reaches surveyed in the Aquatic Habitat Inventory were rated as being in good condition, 57 stream reaches were rated as being in fair condition, and 22 stream reaches were rated as being in poor condition.
- Restoration recommendations include reducing road – related sediment sources, adding LWD to stream courses, and providing fish passage.

Terrestrial Conditions and Issues

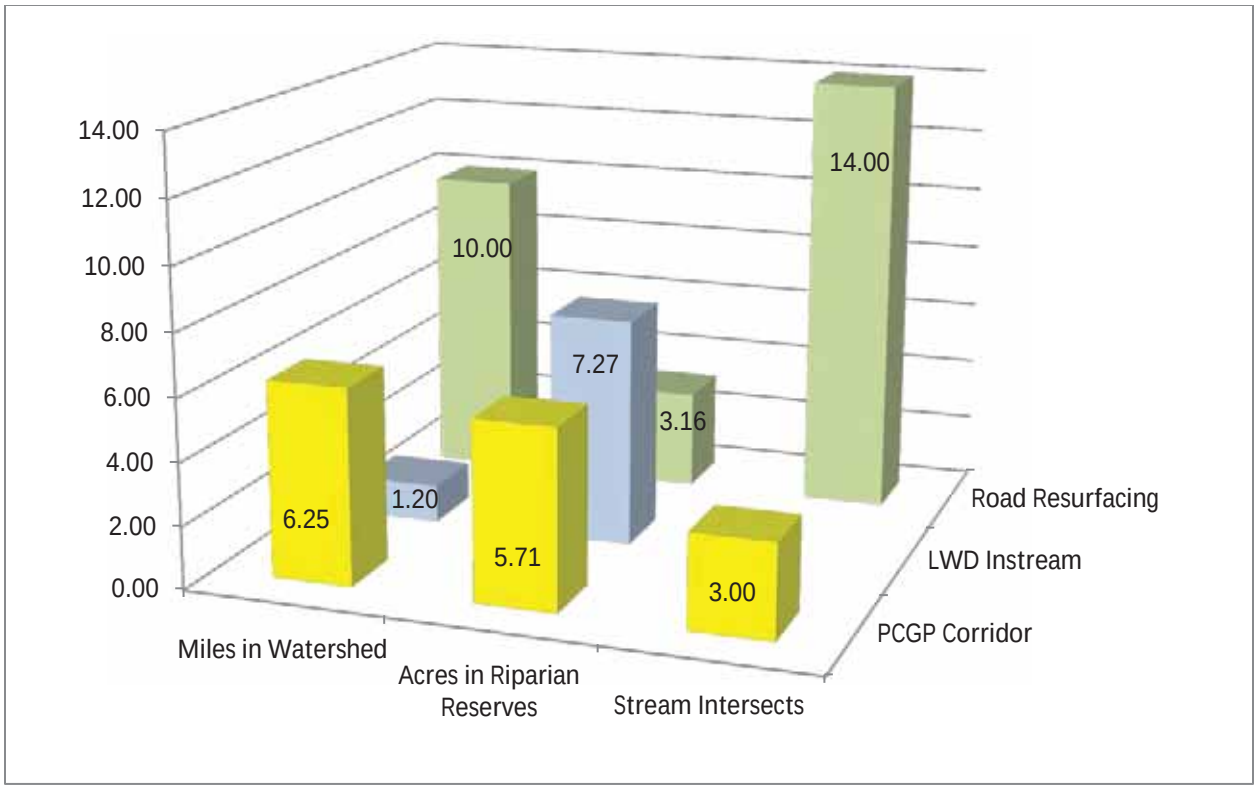
- The South Umpqua WA noted there are 79 known spotted owl centers in the South Umpqua WAU representing nest locations for 50 northern spotted owl pairs.
- WA Restoration recommendations include stand density management to accelerate development of LSOG habitats. LSRA recommendations include fuels reductions to reduce the risk of stand-replacement fire.

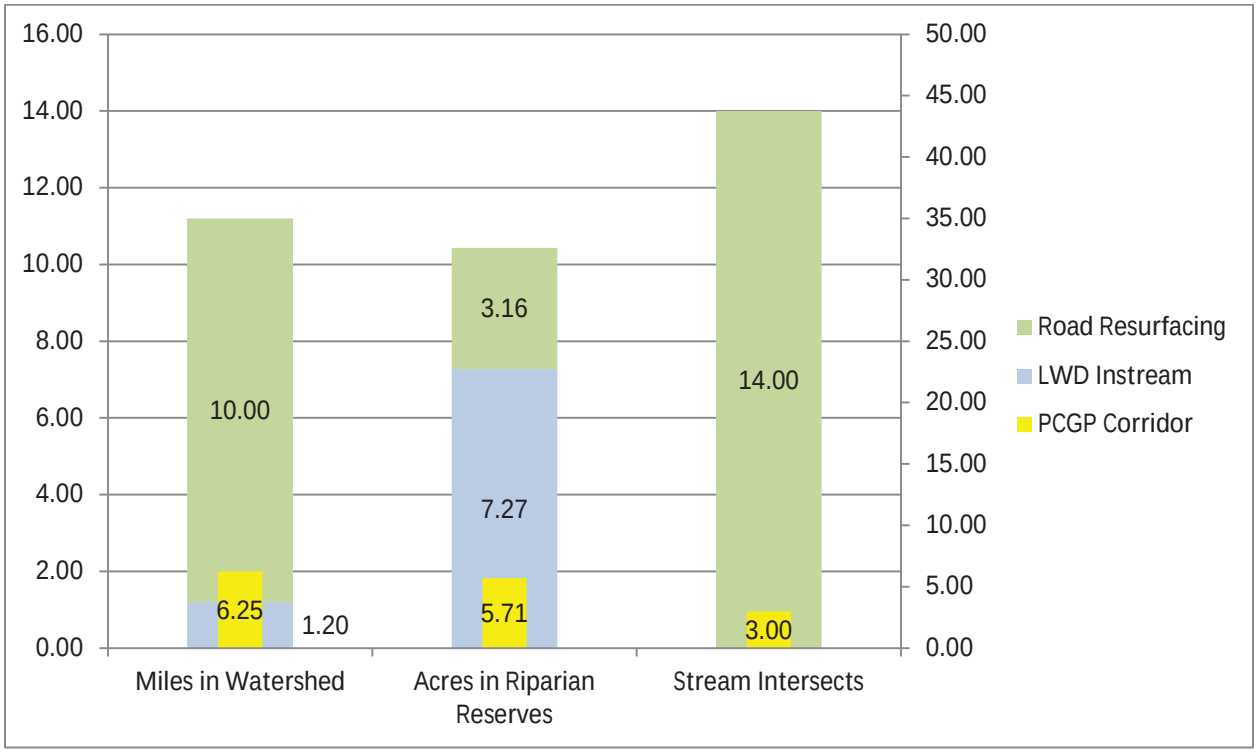
Proposed Offsite Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Fire Suppression	Fire suppression	Dry Hydrants	By installing dry hydrants, the water source is disturbed one time but there are several advantages. Fire vehicles will not need to be really close to the water to fill, decreasing risk of contamination, and they can fill out of some water sources that would otherwise need to be modified for use. Areas that have had restoration work for fish populations could still be safely accessed for fire suppression. Over all, better water sources will improve suppression success and therefore help protect natural resources.	6	sites	$19,571
Fish Passage	Fish Passage	Beal Creek culvert replacement	Man-made barriers to fish passage have negatively affected access to habitat in the South Umpqua. Both culverts are undersized and obstruct anadromous and resident fish passage. Replacing the culverts with ones properly sized for the stream will allow for proper fish passage along with reducing the risk for culverts plugging and causing road fill failures.	2	sites	$236,979
Fuels Reduction	Stand Density Fuel Break	Hazardous Fuel Reduction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity; however, the corridor also provides a fuel break. Fuels reduction adjacent to the corridor will increase the effectiveness of the corridor as a fuel break. Fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Days Creek to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	1000	acres	$1,196,685

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
LWD instream	Aquatic Habitat	West Fork Canyon Creek Large Wood and Boulder Placement	The South Umpqua River is a Tier 1 Key Watershed. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 6.23 miles of corridor and 3 stream crossings in the South Umpqua. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	0.8	miles	$85,831
LWD instream	Aquatic Habitat	Days Creek Large Wood and Boulder Placement	The South Umpqua River is a Tier 1 Key Watershed. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 6.23 miles of corridor and 3 stream crossings in the South Umpqua. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	0.4	miles	$43,623
Road Drainage and Surface Enhancement	Road Sediment Reduction	South Umpqua Road Drainage and Surface Enhancement	The South Umpqua River is a Tier 1 Key Watershed. There are approximately 6.23 miles of corridor and 3 stream crossings in the South Umpqua. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Sediment is likely the most limiting factor to aquatic function in the S. Umpqua Basin. Roads do not meet current BMPs and are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair would reduce sediment delivery to fish bearing streams.	10	miles	$781,677

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Road storm-proofing	Road Sediment Reduction	31-4-3.2 Road storm proofing	The South Umpqua River is a Tier 1 Key Watershed. Sediment is likely the most limiting factor to aquatic function in the South Umpqua Basin. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. If culverts fail, substantial sediment could be transported to Shively Creek. Removing culverts will prevent crossing failures that deposit fine road sediments in stream channels. Project should occur before road becomes too overgrown for heavy equipment access.	1	project	$8,843


14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
6.25
1.20
10.00
5.71
7.27
3.16
3.00
14.00
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects
Road Resurfacing
LWD Instream
PCGP Corridor


16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
10.00
6.25
1.20
3.16
7.27
5.71
14.00
3.00
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects
Road Resurfacing
LWD Instream
PCGP Corridor

Elk Creek South Umpqua (Tier One Key Watershed)

R/W Miles in Watershed	0.24
R/W Acres in Watershed	4.78
Stream Channels Crossed	2 wetlands
Riparian Reserve Acres in R/W	1.13
Designated LSR Acres in R/W	4.78

The PCGP project crosses portions of the Lower Elk Creek subwatershed on BLM lands in the Elk Creek-South Umpqua watershed. No off-site mitigations are proposed in the Elk-Creek South Umpqua watershed because of the limited extent of the PCGP corridor in the watershed.

Trail Creek

R/W Miles in Watershed	3.88		
R/W Acres in Watershed	76.72		
Stream Channels Crossed	Perennial	Intermittent	total
	1	1	2
Riparian Reserve Acres in R/W	4.66		
Late Successional Reserve Acres	0		

The PCPG project crosses parts of the West Fork, Trail Creek and Upper Trail Creek subwatersheds on BLM lands in the Trail Creek watershed.

Aquatic Conditions and Issues

- Road-related sediment has degraded aquatic habitats in Trail Creek. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.
- Stream restoration projects within the current extent of fish-bearing streams could be implemented where they meet the following criteria: 1) one or more improvable habitat components (e.g., temperature**, large woody debris,** or substrate) are currently limiting to aquatic habitat quality; 2) predisposing factors (e.g., hydrologic responsiveness, sedimentation, flows and geomorphology) will allow for aquatic habitat improvement; and 3) habitat improvements can practically be realized and persist over time. Generally, the ability of fish-bearing streams in the Trail Creek watershed to meet these criteria decreases with elevation. Efforts should be focused in the East and West Forks of Trail Creek rather than the mainstem.

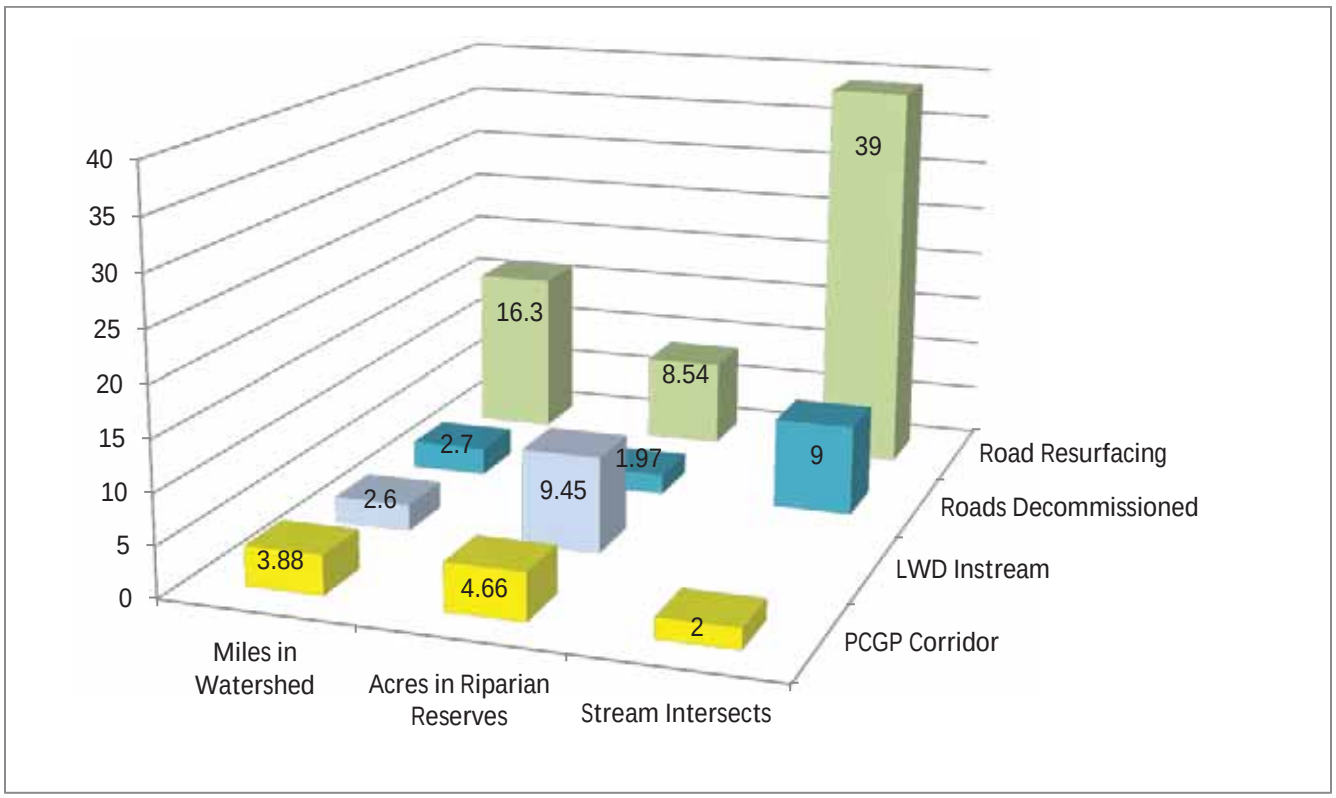
Terrestrial Conditions and Issues

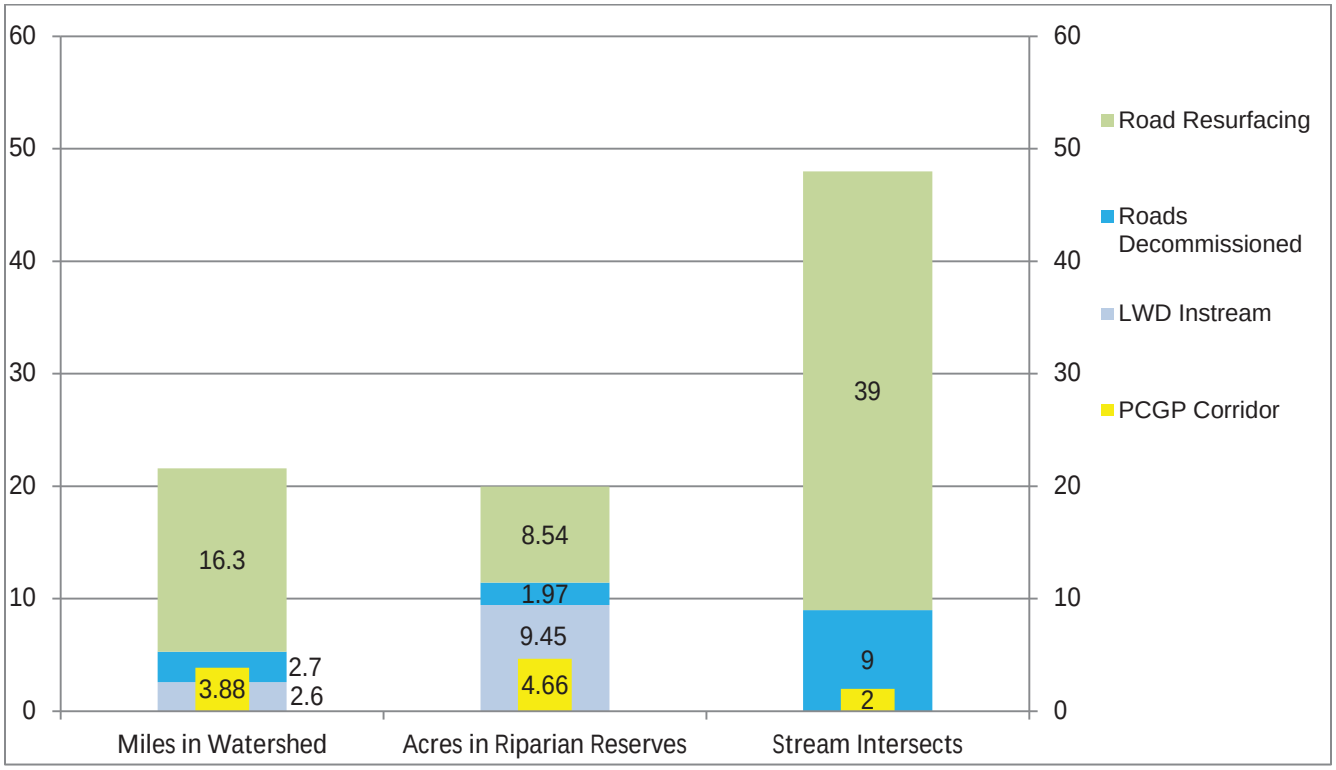
- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Trail Creek watershed.
- LSOG habitats are limited in this watershed.
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

Proposed Offsite Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit
Fire Suppression	Fire suppression	Trail Creek Pump Chance	Construction of the pipeline and associated activities will increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	8	sites
Fuels Reduction	Stand Density Fuel Break	Trail Creek Fuel Hazard Reduction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity; however, the corridor also provides a fuel break. Fuels reduction adjacent to the corridor will increase the effectiveness of the corridor as a fuel break. Fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	687	acres
fuels Reduction	Stand Density Fuel Break	Trail Creek Fuels Hazard Maintenance	This provides a mechanism for maintenance of fuel breaks over time for the life of the project.	687	acres
LWD instream	Aquatic Habitat	Trail Creek LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.6	miles
Road Decommissioning	Road Sediment Reduction	Trail Creek Road Decommissioning	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity and by reducing road density.	2.7	miles

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit
Road storm-proofing	Road Sediment Reduction	Trail Creek Road Stormproofing	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP are similar to a road, including possible impacts to flow and sediment regimes. Stormproofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	4.3	miles
Road Surfacing	Road Sediment Reduction	Trail Creek Road Resurface	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	16.3	miles


40
35
30
25
20
15
10
5
0
39
16.3
8.54
2.7
1.97
9
9.45
2.6
3.88
4.66
2
Road Resurfacing
Roads Decommissioned
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects


60
50
40
30
20
10
0
Road Resurfacing
Roads Decommissioned
LWD Instream
PCGP Corridor
16.3
2.7
3.88
2.6
8.54
1.97
9.45
4.66
39
9
2
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

Shady Cove - Rogue River

R/W Miles in Watershed	4.42		
R/W Acres in Watershed	80.27		
Stream Channels Crossed	Perennial	Intermittent	total
	0	4	4
Riparian Reserve Acres in R/W	6.91		
Late Successional Reserve Acres	0		

The PCGP project crosses portions of the Indian Creek and Brush Creek subwatersheds on BLM lands in the Shady Cove – Rogue River Watershed.

Aquatic Conditions and Issues

- Road-related sediment has degraded aquatic habitats in Shady Cove – Rogue River watershed. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.
- The Brush Creek-Rogue River and Indian Creek-Rogue River have the highest acreage of highly erodible soils in the Watershed. Further, approximately 76 percent of the entire Brush Creek-Rogue River subwatershed is composed of highly erodible soils (USDI BLM 2012).
- Northern California/Southern Oregon Coho salmon are present in the Indian Creek subwatershed.
- Stream temperature has not been identified as a limiting factor for water quality.
- Indian Creek is 303 (d) listed for DO impairment.
- Steelhead are present in the Brush Creek and Indian Creek subwatersheds.
- Peak flows have likely increased as a result of roads and timber harvest.

Terrestrial Conditions and Issues

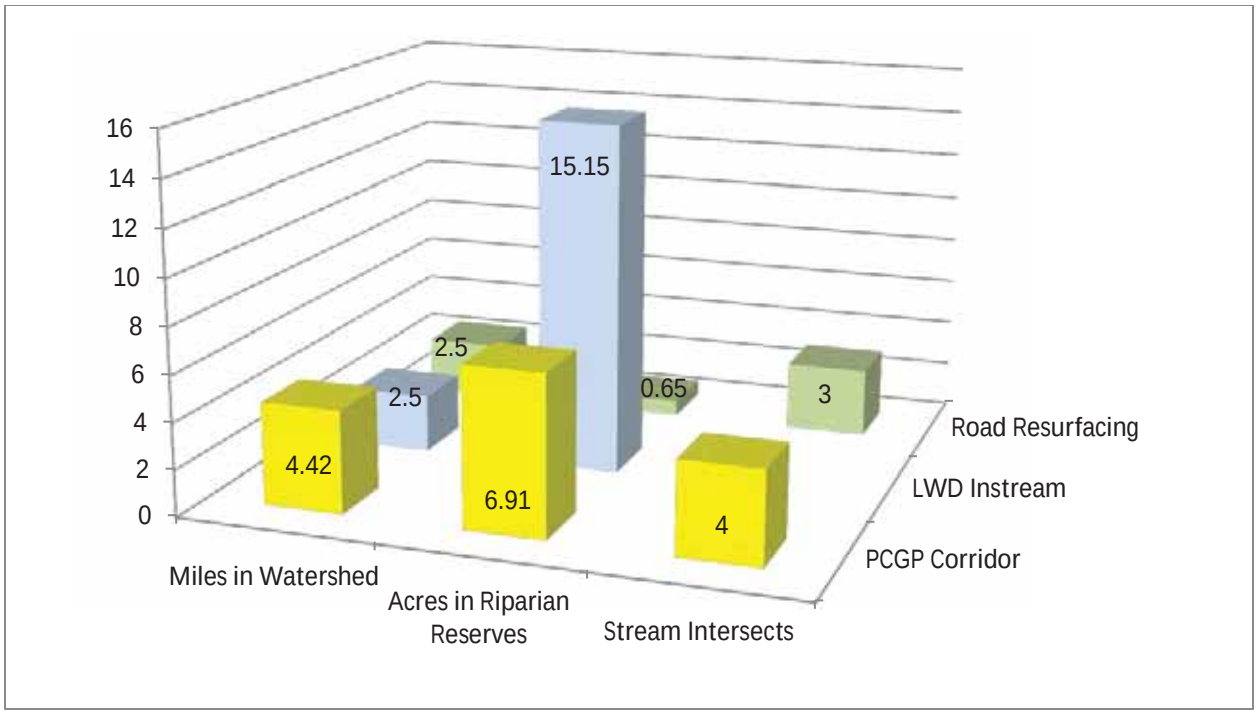
- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Shady Cove-Rogue River watershed.
- LSOG habitats are limited in this watershed.
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

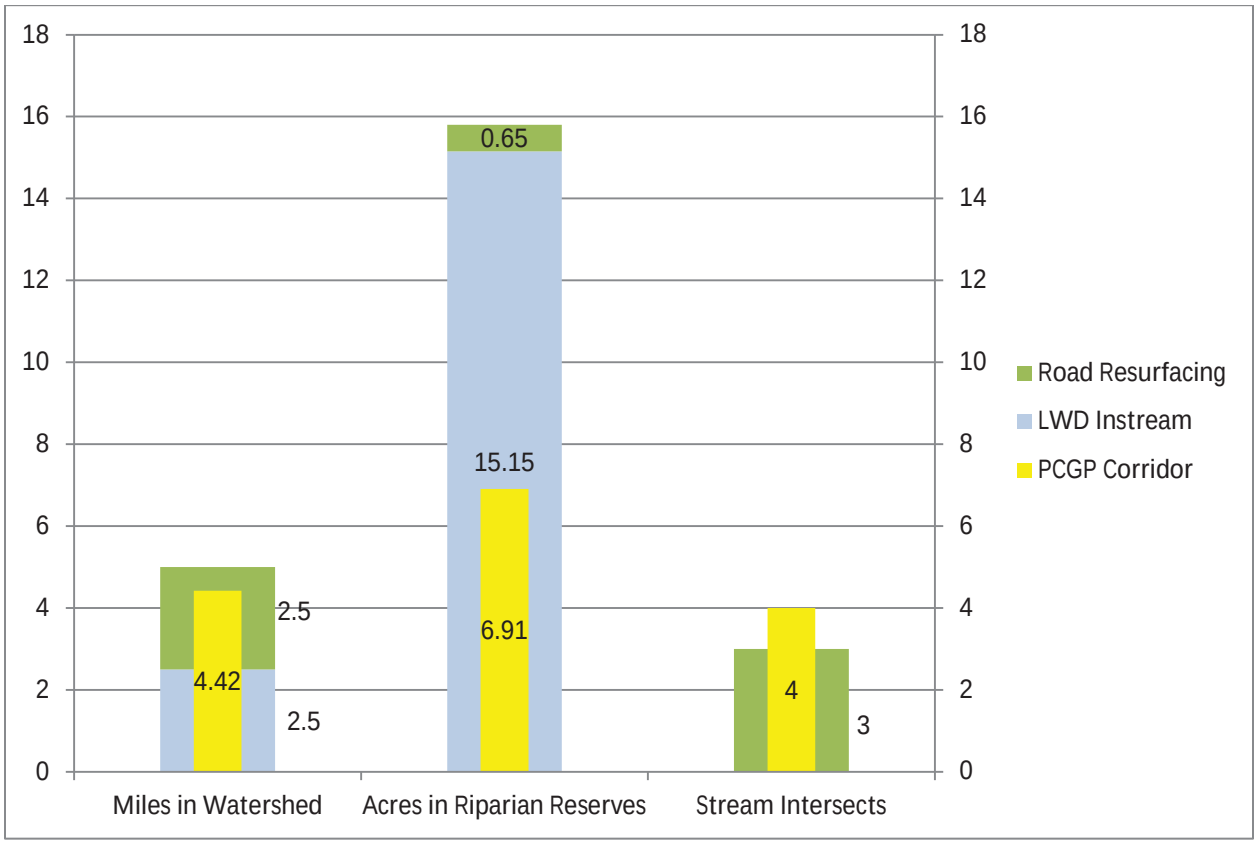
Proposed Off-Site Mitigations

The Rogue Basin Coordinating Council (2006) assessment identified barriers, water temperature, and water quantity as the most significant aquatic limiting factors (Priority One) in the Upper Rogue WCA. Channel modification, large wood, pool-to-riffle ratio, sediment, stream habitat complexity (Priority Two), and gravel substrate (Priority Three) were also identified as limiting aquatic habitat quality in the Upper Rogue WCA. Similarly, fire risk, roads, and seral stage deficiencies were the most significant terrestrial limiting factors (Priority One), while riparian shade and wood sources (Priority Two) needed for large woody debris recruitment were limiting terrestrial components for salmonid habitats in the WCA (USDI BLM 2012).

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Fuels Reduction	Stand Density Fuel Break	Shady Cove Fuel Hazard Reduction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity; however, the corridor also provides a fuel break. Fuels reduction adjacent to the corridor will increase the effectiveness of the corridor as a fuel break. Fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	866	acres	$1,115,452
Fuels Reduction	Stand Density Fuel Break	Shady Cove Fuel Hazard Maintenance	This provides a mechanism for maintenance of fuel breaks over time for the life of the project.	866	acres	$377,775
LWD instream	Aquatic Habitat	Shady Cove LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.5	miles	$170,218

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Road Drainage and Surface Enhancement	Road Sediment Reduction	Shady Cove Road Improvement	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Upper Rogue. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	1	mile	$9,727
Road Surfacing	Road Sediment Reduction	Shady Cove Road Resurface	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in the Upper Rogue. The effects of the PCGP are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	1.5	miles	$38,907


16
14
12
10
8
6
4
2
0
15.15
2.5
2.5
0.65
3
4.42
6.91
4
Road Resurfacing
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects


18
16
14
12
10
8
6
4
2
0
0.65
15.15
6.91
2.5
4.42
2.5
4
3
Road Resurfacing
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

Big Butte Creek

R/W Miles in Watershed	0.67		
R/W Acres in Watershed	9.59		
Stream Channels Crossed	Perennial	Intermittent	total
	1	1	2
Riparian Reserve Acres in R/W	7.39		
Late Successional Reserve Acres	0		

The PCGP project crosses portions of the McNeil Creek subwatershed on BLM lands in the Big Butte Creek watershed.

Aquatic Conditions and Issues

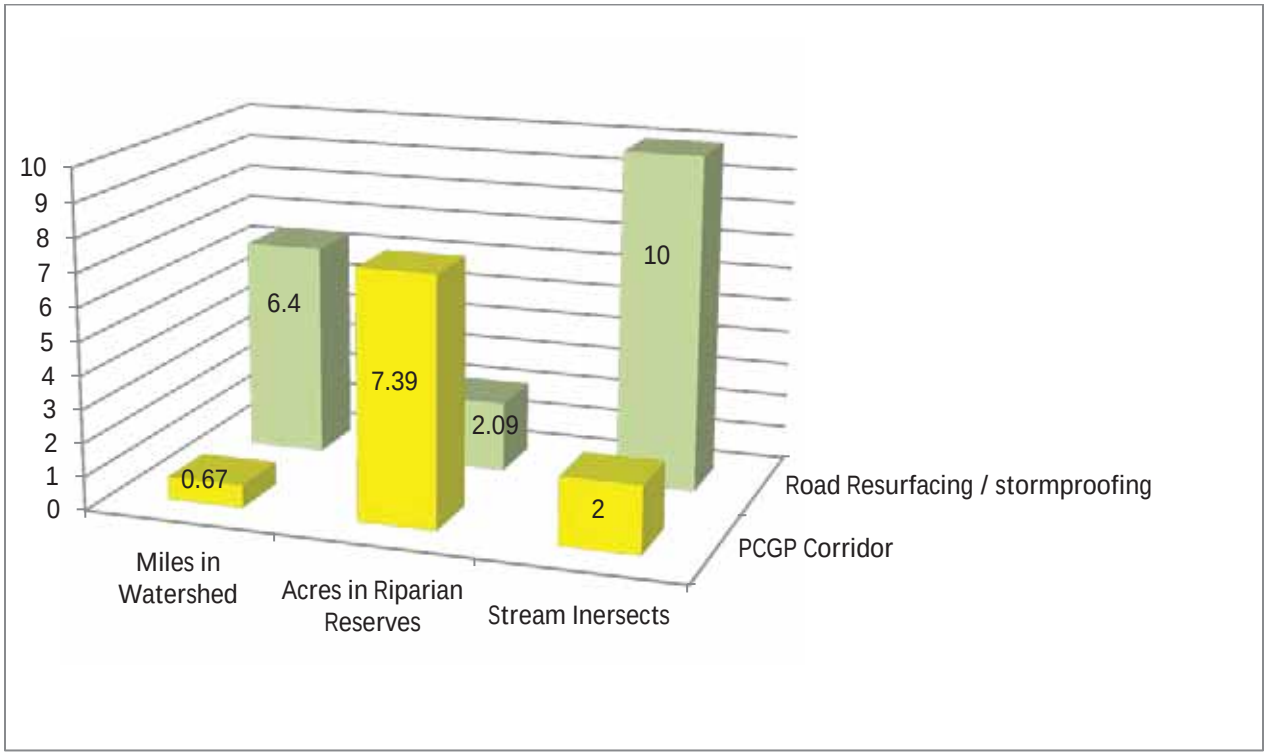
- Road-related sediment has degraded aquatic habitats in Big Butte Creek. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.
- Northern California/Southern Oregon Coho salmon (*Oncorhynchus kisutch*), a species listed as threatened under the Endangered Species Act (May 1997) are present in Big Butte, North and South Forks Big Butte, McNeil, Neil, Jackass, and Dog Creeks for a total of 37.2 miles.
- Summer and winter steelhead (*O. mykiss*) use a total of 53.9 miles of habitat in Big Butte, North and South Forks Big Butte, Crowfoot, McNeil, Neil, Camp, and the lower reaches of Jackass, Eighty Acre, Dog, Clark, Box, and Vine Creeks./
- LWD is deficient in many stream reaches.
- Peak flows have likely increased as a result of roads and timber harvest.

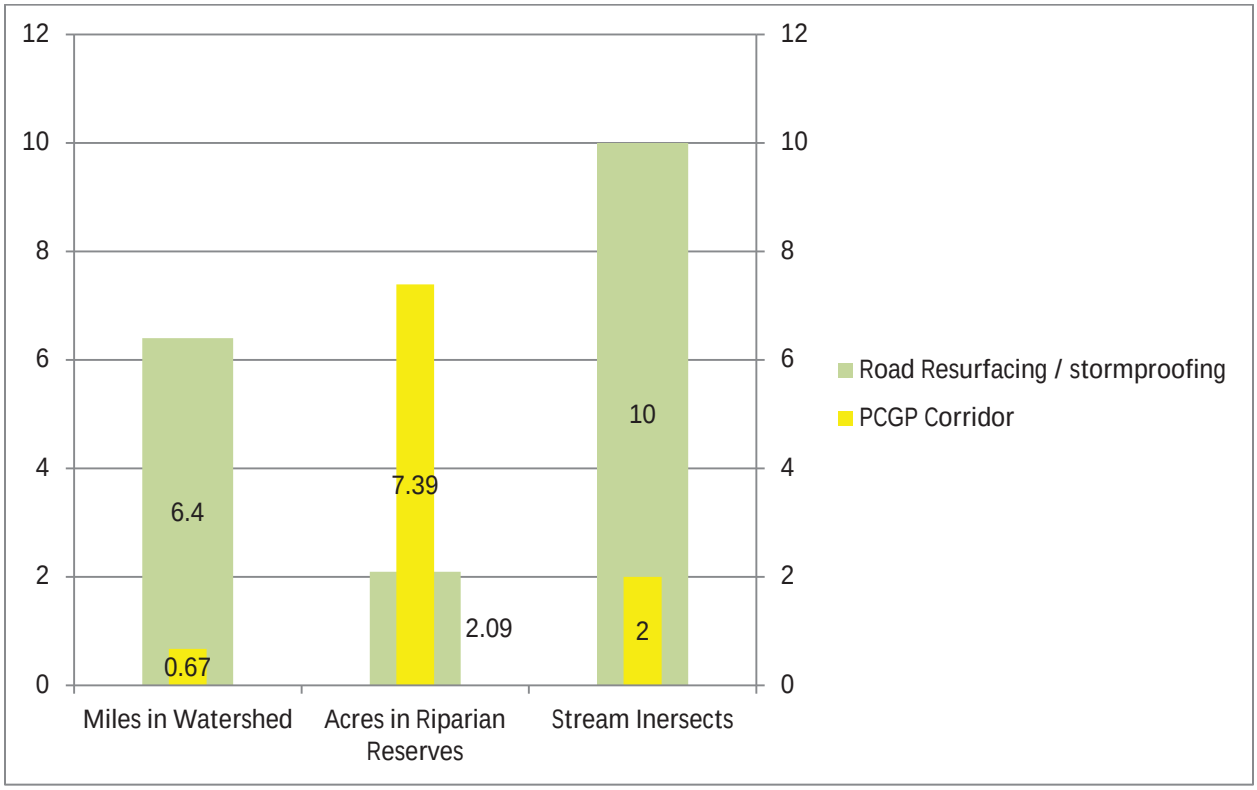
Terrestrial Conditions and Issues

- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Big Butte Creek watershed.
- LSOG habitats are limited in this watershed.
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Habitat Improvement	Terrestrial Habitat Imp.	Big Butte Creek Fritillaria Habitat	The PCGP may impact habitat of Fritillaria gentneri. Outplanting to suitable habitat locations is recommended in the recovery plan.	600	acres	$15,563
Fire Suppression	Fire suppression	Big Butte Creek Pump Chance	Construction of the pipeline and associated activities will increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	1	sites	$7,781
Road Surfacing	Road Sediment Reduction	Big Butte Creek Road stormproofing	Sediment was identified by the Upper Rogue Watershed Council as a factor that limited aquatic habitat in Big Butte Creek. The effects of the PCGP are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	6.4	miles	$249,005


10
9
8
7
6
5
4
3
2
1
0
6.4
7.39
2.09
10
0.67
2
Miles in Watershed
Acres in Riparian Reserves
Stream Inersects
Road Resurfacing / stormproofing
PCGP Corridor


12
10
8
6
4
2
0
6.4
0.67
7.39
2.09
10
2
Miles in Watershed
Acres in Riparian Reserves
Stream Inersects
Road Resurfacing / stormproofing
PCGP Corridor

Little Butte Creek (Tier One Key Watershed)

R/W Miles in Watershed	5.99		
R/W Acres in Watershed	113.78		
Stream Channels or Wetlands Crossed	Intermittent	Wetland	total
	1	1	2
Riparian Reserve Acres in R/W	7.99		
Late Successional Reserve Acres	0		

The PCGP crosses portions of the Lick Creek, Salt Creek, Lower North Fork and Lower South Fork Little Butte Creek subwatersheds on BLM Lands in the Little Butte Creek watershed.

Aquatic Conditions and Issues

- Road-related sediment has degraded aquatic habitats in Little Butte Creek. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.
- Northern California/Southern Oregon Coho salmon (*Oncorhynchus kisutch*), a species listed as threatened under the Endangered Species Act (May 1997) are present in Little Butte Creek.
- Chinook salmon, steelhead, cutthroat trout and Pacific lamprey are also found in Little Butte Creek
- High temperatures, habitat modification and sediment are key aquatic issues.

Terrestrial Conditions and Issues

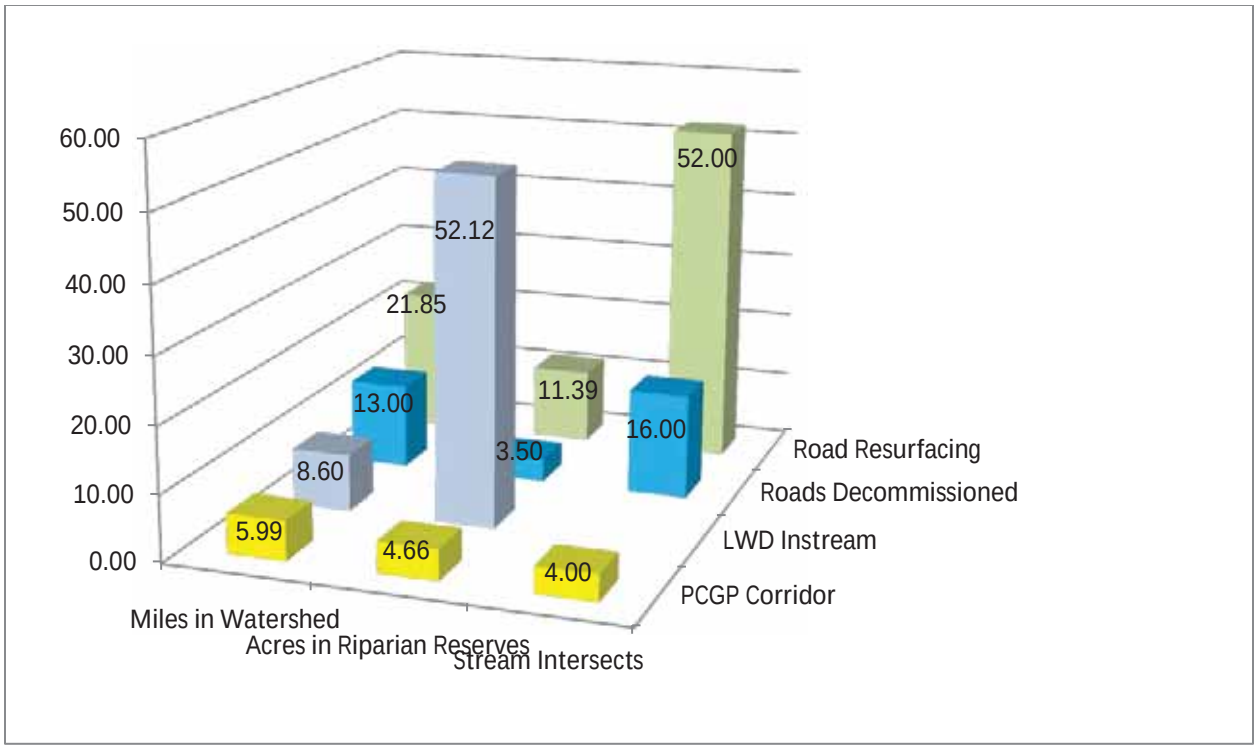
- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Little Butte Creek watershed.
- Fragmentation from past logging has substantially impacted terrestrial habitats.
- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

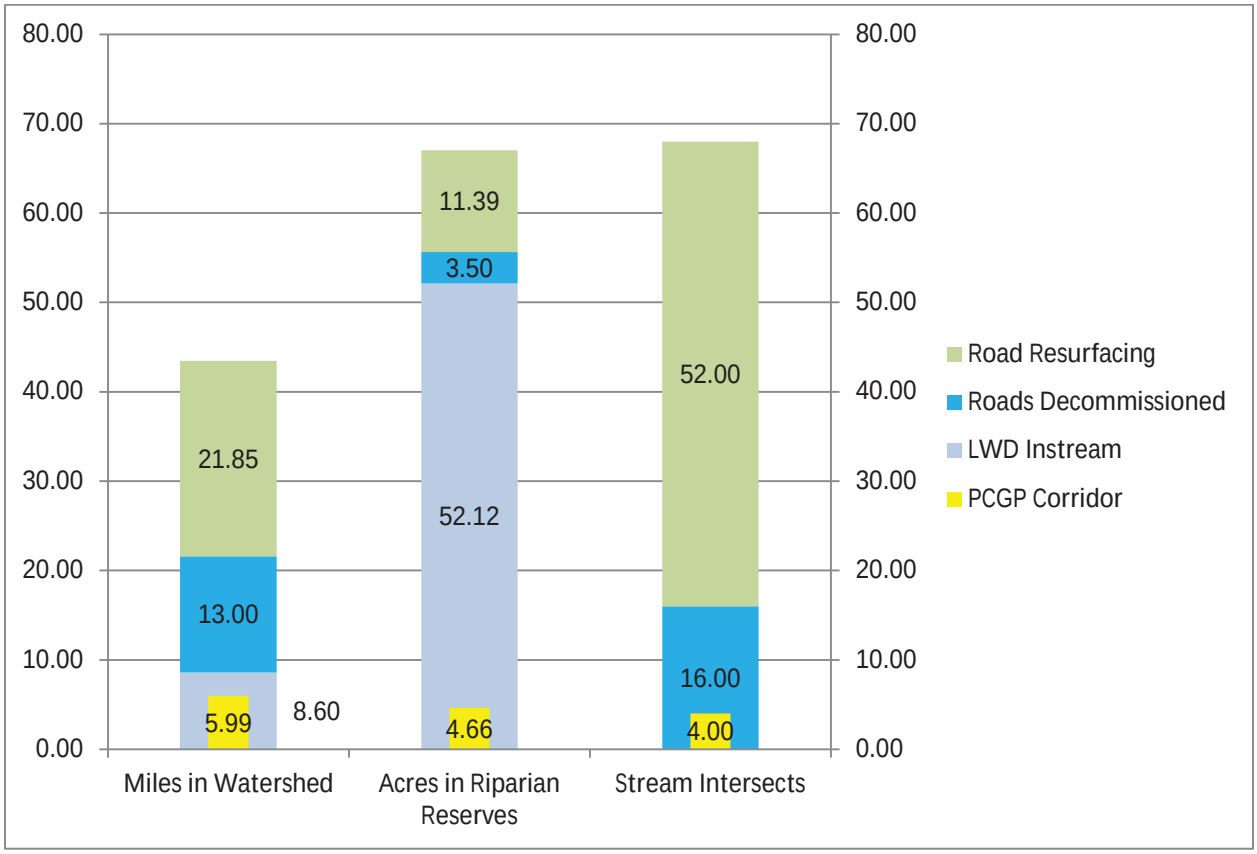
Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Fire Suppression	Fire suppression	Little Butte Creek Pump Chance	Construction of the pipeline and associated activities will increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	8	sites	$62,251
Fish Passage	Fish Passage	Little Butte Creek Fish Screen	Irrigation diversions have negatively impacted fisheries in Little Butte Creek by causing entrapment. There is a private irrigation ditch with an unscreened diversion and associated push up dam on BLM land in the lower 1.5 miles of Lost Creek. The unscreened ditch is currently accessible to juvenile and adult fish, creating a stranding hazard with limited return access to the main channel. The push up dam is constructed at the beginning of the irrigation season and removed at the end of the season. This stream is considered coho critical habitat and building a push up dam in the creek each season disturbs gravels, generates sediment and creates an unnecessary disturbance during steelhead spawning season. Creating a permanent diversion structure, possibly in the form of a boulder weir, would divert water without yearly maintenance and would provide for both upstream and downstream fish passage.	1	site	$162,113
LWD instream	Aquatic Habitat	Little Butte Creek LWD	Little Butte Creek is a Tier One, Key Watershed. Lost Creek provides habitat for Coho Salmon. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	8.6	miles	$626,108

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Road Decommissioning	Road Sediment Reduction	Little Butte Creek Road Decommissioning Butte Falls RA	Little Butte Creek is a Tier One, Key Watershed. Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. There are approximately 6 miles of the PCGP corridor and 7 stream crossings on BLM lands in LBC. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity by reducing road density.	2.4	miles	$61,001
Road Decommissioning	Road Sediment Reduction	Little Butte Creek Road Decommissioning Ashland RA	Little Butte Creek is a Tier One, Key Watershed. Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. There are approximately 6 miles of the PCGP corridor and 7 stream crossings on BLM lands in LBC. The effects of the PCGP are similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity by reducing road density.	10.6	miles	$343,679
Road Drainage and Surface Enhancement	Road Sediment Reduction	Little Butte Creek Road Improvement	Little Butte Creek is a Tier 1 Key Watershed. Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. The PCGP has approximately 6 miles of corridor and 7 stream crossings on BLM lands in the LBC 5th field watershed. The effects of the PCGP are similar to a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	3.5	miles	$283,667
Road Surfacing	Road Sediment Reduction	Little Butte Creek Road Resurfacing	Little Butte Creek is a Tier One, Key Watershed. The PCGP has approximately 6 miles of corridor and 7 stream crossings on BLM lands in the LBC 5th field watershed. The effects of the PCGP are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	9.35	miles	$563,503

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Road Surfacing	Road Sediment Reduction	Little Butte Creek Road Resurface	Little Butte Creek is a Tier One, Key Watershed. The PCGP has approximately 6 miles of corridor and 7 stream crossings on BLM lands in the LBC 5th field watershed. The effects of the PCGP are similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	9	miles	$350,163


60.00
50.00
40.00
30.00
20.00
10.00
0.00
52.00
52.12
21.85
11.39
13.00
16.00
3.50
8.60
5.99
4.66
4.00
Road Resurfacing
Roads Decommissioned
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects


80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
11.39
3.50
52.00
21.85
52.12
13.00
16.00
5.99
8.60
4.66
4.00
Road Resurfacing
Roads Decommissioned
LWD Instream
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

Spencer Creek (Tier One Key Watershed)

R/W Miles in Watershed	1.04
R/W Acres in Watershed	13.69
Stream Channels Crossed	1 Intermittent.
Riparian Reserve Acres in R/W	1.29
Late Successional Reserve Acres	0

The PCGP project crosses portions of the Uppers Spencer Creek and Clover Creek subwatersheds on BLM lands in the Spencer Creek watershed.

Aquatic Conditions and Issues

- Road-related sediment has degraded aquatic habitats in Spencer Creek. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.
- High temperatures, habitat modification and sediment are key aquatic issues.

Terrestrial Conditions and Issues

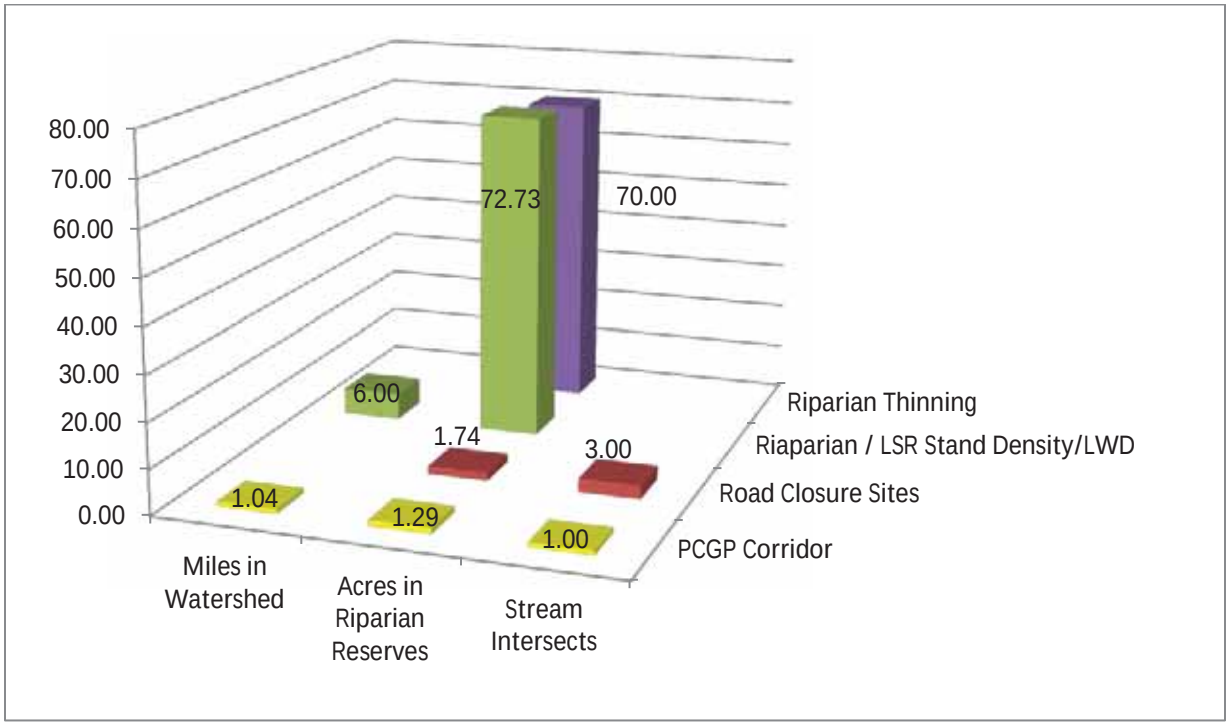
- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Spencer Creek watershed.
- Fragmentation from past logging and high road densities have impacted terrestrial habitats.
- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

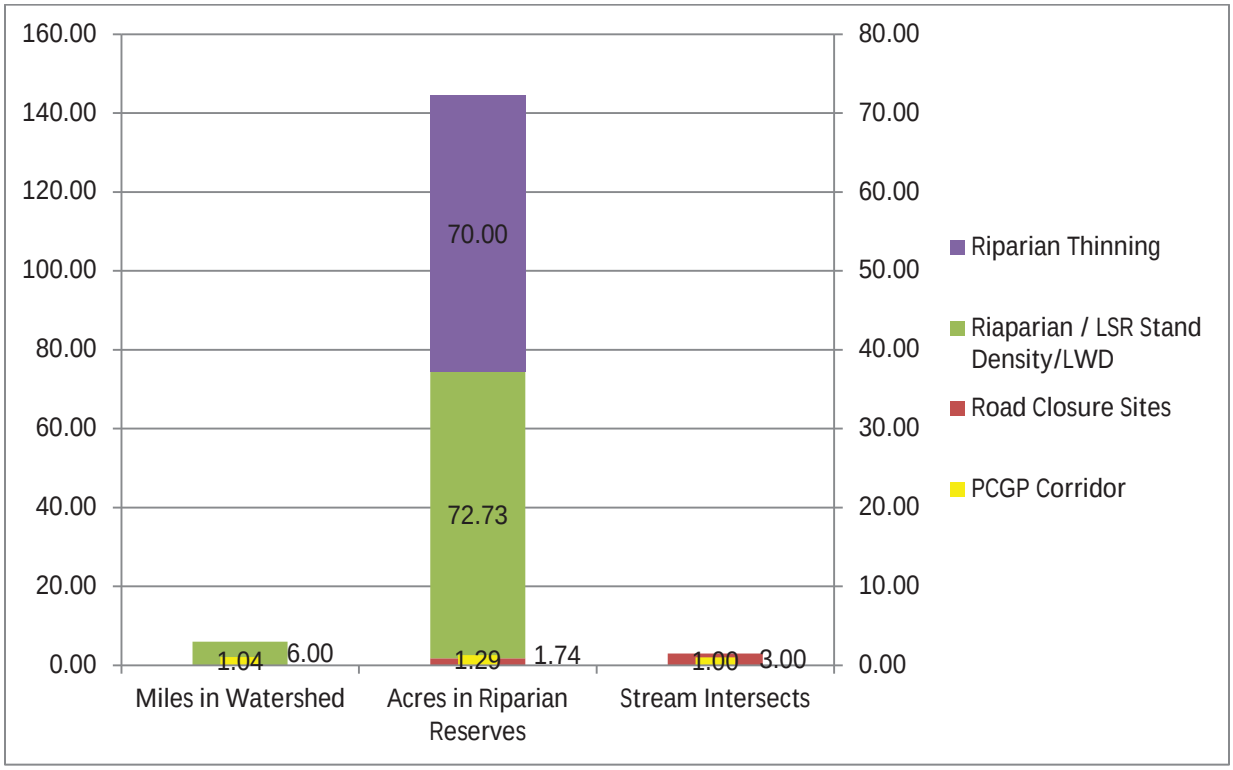
Proposed Off-Site Mitigations

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Riparian Vegetation	Riparian Stand Density	Tributary Creek Riparian Thinning	Spencer Creek is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. Thinning would restore forest health and diversity in riparian reserves and stands near streams that are currently overstocked. Thinning would be done in a way that emulates the natural “patchiness” of disturbance events.	70	acres	$44,802

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Riparian Vegetation	Riparian Stand Density	Upper Spencer Creek LSR/Riparian treatment	Spencer Creek is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. This project would thin, pile and burn dense white fir understory vegetation and fall occasional trees into the stream channel for LWD. This would enhance forest health and diversity with the LSR/Riparian Reserve by restoring stand density to more natural and sustainable levels. This contributes to forest health and sustainability of riparian reserves by increasing resistance to insect and disease losses and reducing the risk of stand replacing fire. LWD in stream channels contributes to meeting water quality and TMDL targets and provides habitat for sensitive fish and invertebrate species.	3	miles	$51,876
Riparian Vegetation	Riparian Stand Density	Miners Creek LSR, Riparian Treatment	Spencer Creek is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. This project would thin, pile and burn dense white fir understory vegetation and fall occasional trees into the stream channel for LWD. This would enhance forest health and diversity with the LSR/Riparian Reserve by restoring stand density to more natural and sustainable levels. This contributes to forest health and sustainability of riparian reserves by increasing resistance to insect and disease losses and reducing the risk of stand replacing fire. LWD in stream channels contributes to meeting water quality and TMDL targets and provides habitat for sensitive fish and invertebrate species.	3	miles	$51,876
Road Closure	Road Sediment Reduction	Spencer Creek Repair Existing Road Closure	Roads negatively impact wildlife. Implementation of the PCGP project would have road-like impacts on wildlife and require use of a large number of permanent and temporary roads and other access routes. Road closures (barricades) were established in the watershed to reduce road density to meet Resource Management Plan objectives for both the aquatic conservation strategy and reduce impacts to wildlife. This project repairs the existing closure structures to ensure that road closures remain effective. Spencer Creek is a Tier One, Key Watershed. Maintaining road closures also reduces sediment by keeping closed roads revegetated.	12	sites	$10,012

ProjType	MitGroup	Project Name	ProjectRationale	Quantity	Unit	CostWithOH
Road Drainage	Road Sediment Reduction	Spencer Creek Drainage Improvements and Sediment Trap Removal	Spencer Creek is a Tier One, Key Watershed. Although BMP's and other project measures would be implemented, the PCGP would have road-like watershed impacts if constructed, including mobilization of sediment and possible alteration of hydrologic regimes. The project also uses a number of roads for access and construction. Drainage improvements and removing non-functioning cross drains and sediment traps at selected locations would benefit aquatic habitat/connectivity by restoring drainage and reducing sediment transport.	15	sites	$5,895
Road Drainage	Road Sediment Reduction	Keno Access Road Repair and Culvert Replacement	Spencer Creek is a Tier One, Key Watershed. Although BMP's and other project measures would be implemented, the PCGP would have road-like watershed impacts if constructed, including mobilization of sediment and possible alteration of hydrologic regimes. The existing stream crossing (culvert) is undersized in both length and diameter, therefore it ability to meet ACS objectives is minimized. The culvert underlying the existing road bed periodically causes erosion of the road prism and adjacent upland and riparian areas. Replacement of the culvert will allow stabilization of the road shoulder and reduce sediment input to Miner's creek and its contribution of sediment to Spencer creek. If this work is not completed, the condition will eventually lead to increased sedimentation. Replacement of this drainage structure will decrease road-related erosion, increase the hydrologic capacity of the crossing and enhance aquatic connectivity for fish and other aquatic organisms.	1	site	$42,444
Stand Density Habitat	Terrestrial Habitat Imp.	Upper Spencer Creek LSR Density Mgt.	Implementation of the PCGP project would require removal of late-successional habitat, including critical habitat for northern spotted owls. Stand density management reduces the risk of stand replacing fire and accelerates the development of late-successional stand conditions which may benefit northern spotted owls.	270	acres	$31,835


80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
72.73
70.00
6.00
1.74
3.00
1.04
1.29
1.00
Riparian Thinning
Riaparian / LSR Stand Density/LWD
Road Closure Sites
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

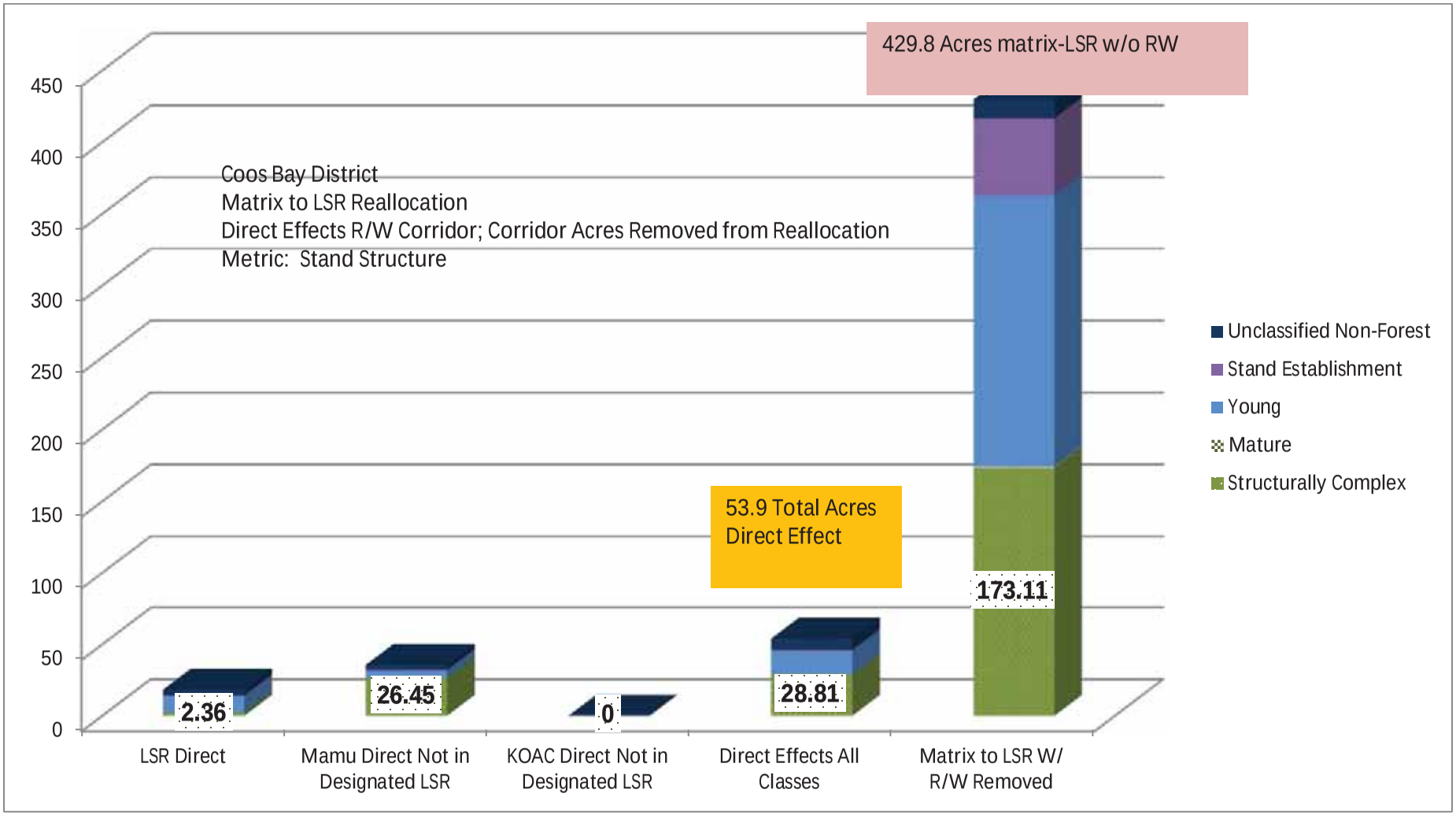

160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
70.00
72.73
1.04
6.00
1.29
1.74
1.00
3.00
Riparian Thinning
Riaparian / LSR Stand Density/LWD
Road Closure Sites
PCGP Corridor
Miles in Watershed
Acres in Riparian Reserves
Stream Intersects

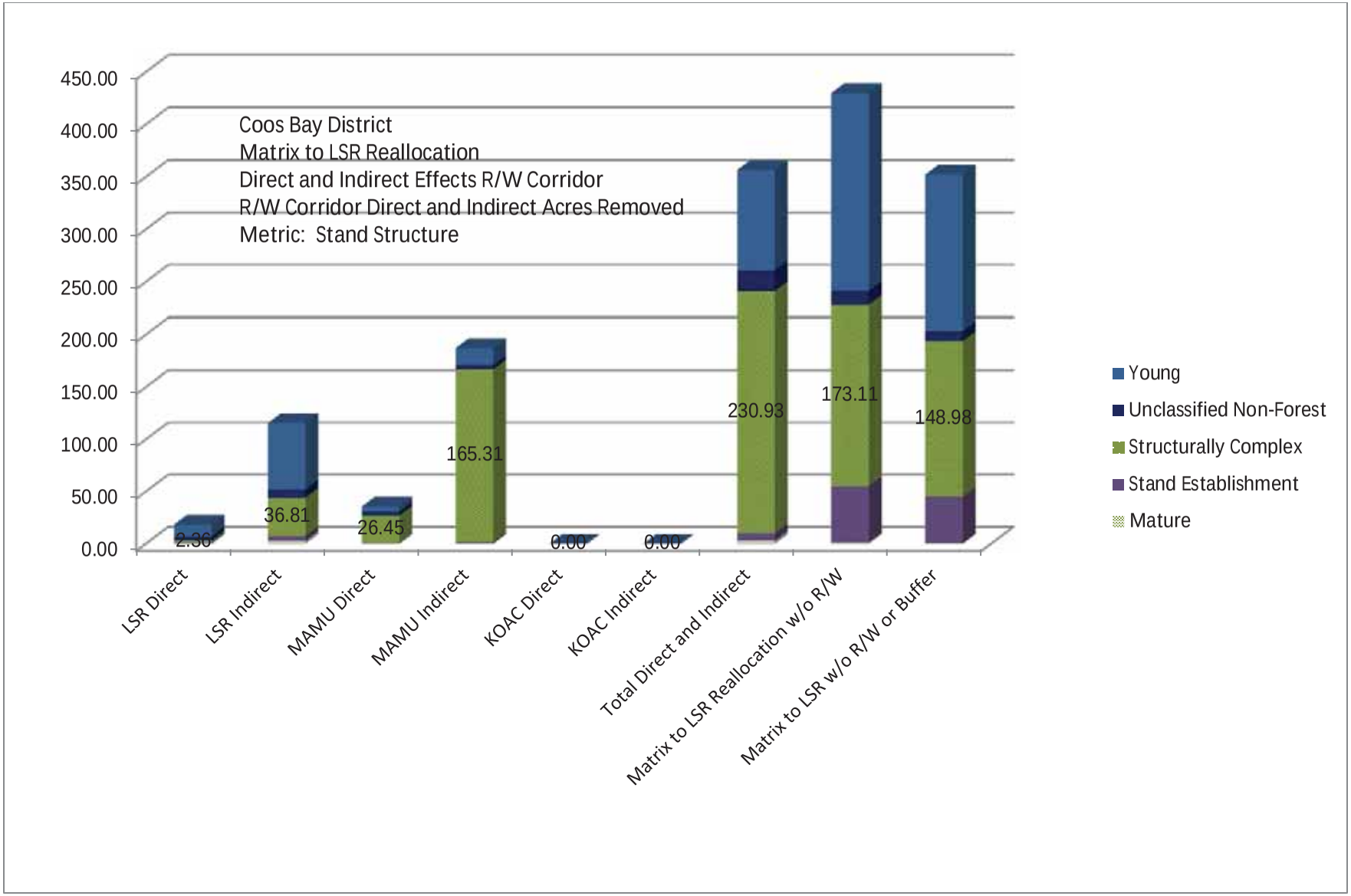
Lower Lost River

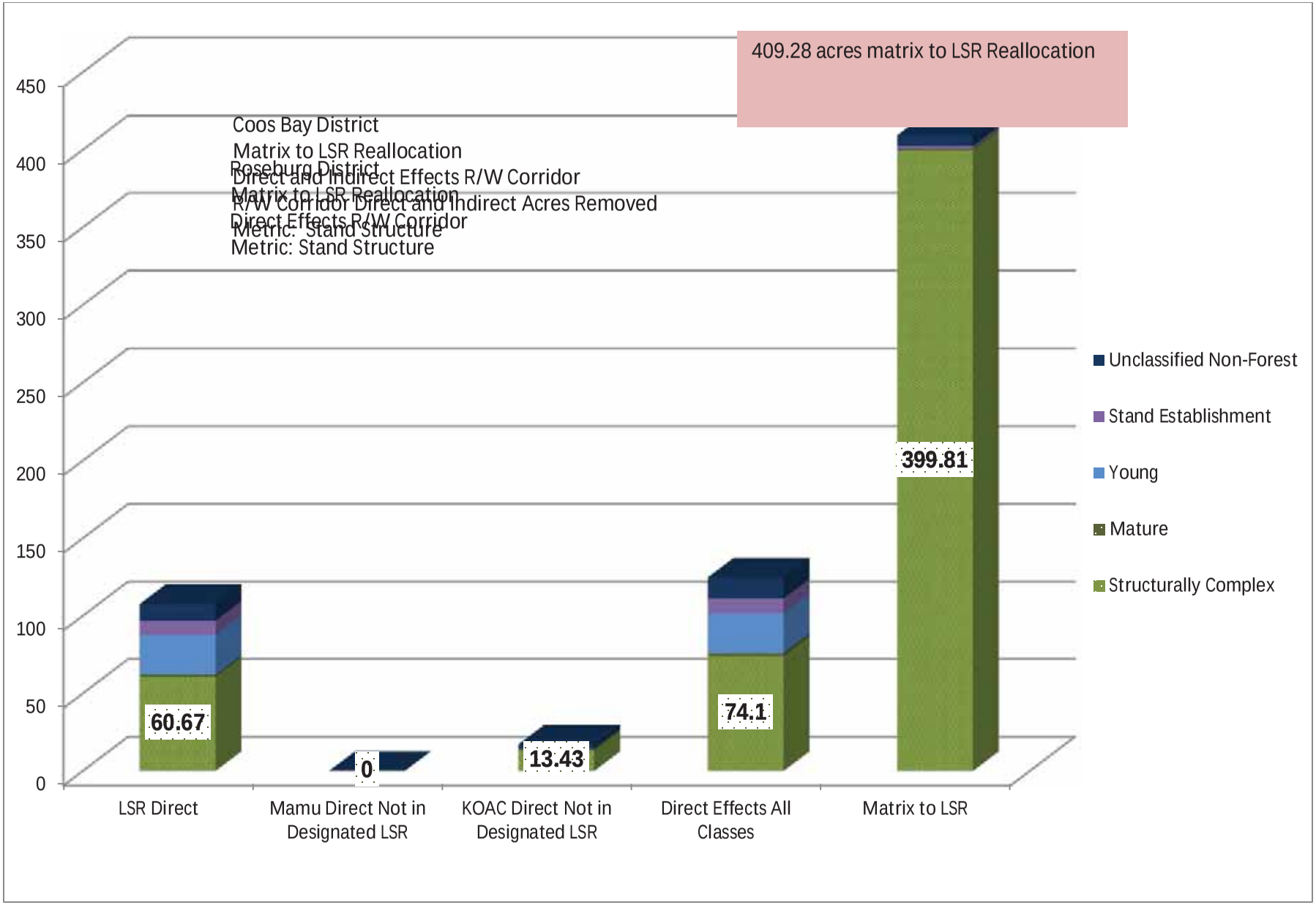
R/W Miles in Watershed	0.26
R/W Acres in Watershed	3.54
Stream Channels Crossed	0
Riparian Reserve Acres in R/W	0
Late Successional Reserve Acres	0

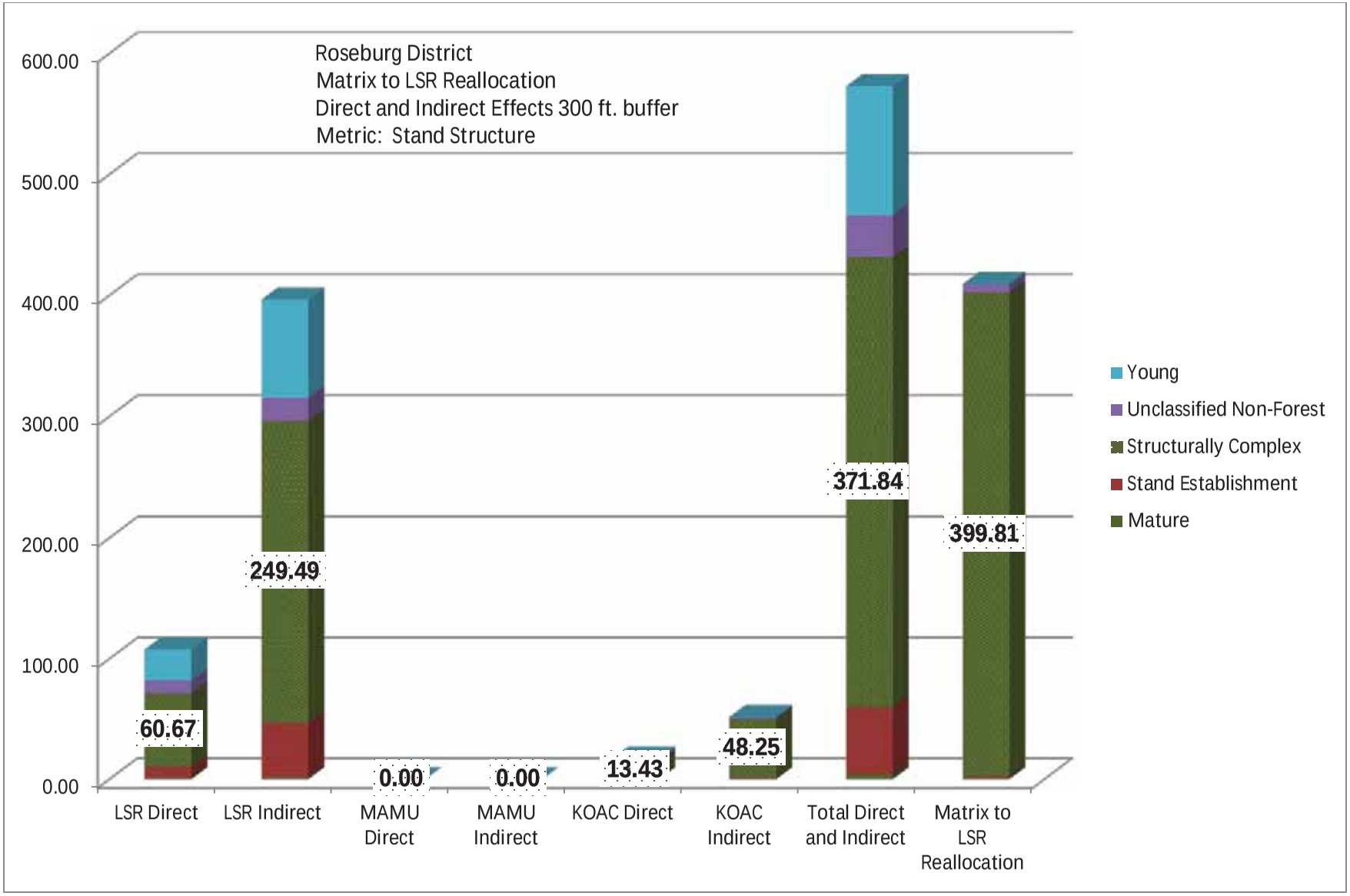
The PCGP crosses portions of the Anderson-Rose Diversion Dam subwatershed on BLM lands in the Lower Lost River watershed. No off-site mitigations are proposed in the Elk-Creek South Umpqua watershed because of the limited extent of the PCGP corridor in the watershed.

Reallocation of Matrix Lands to Late Successional Reserve




Coos Bay District
Matrix to LSR Reallocation
Direct and Indirect Effects R/W Corridor
R/W Corridor Direct and Indirect Acres Removed
Metric: Stand Structure
450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
2.36
36.81
26.45
165.31
0.00
0.00
230.93
173.11
148.98
LSR Direct
LSR Indirect
MAMU Direct
MAMU Indirect
KOAC Direct
KOAC Indirect
Total Direct and Indirect
Matrix to LSR Reallocation w/o R/W
Matrix to LSR w/o R/W or Buffer
Young
Unclassified Non-Forest
Structurally Complex
Stand Establishment
Mature


409.28 acres matrix to LSR Reallocation
Coos Bay District
Matrix to LSR Reallocation
Roseburg District
Direct and Indirect Effects R/W Corridor
Matrix to LSR Reallocation
R/W Corridor Direct and Indirect Acres Removed
Direct Effects R/W Corridor
Metric: Stand Structure
Metric: Stand Structure
450
400
350
300
250
200
150
100
50
0
60.67
0
13.43
74.1
399.81
LSR Direct
Mamu Direct Not in Designated LSR
KOAC Direct Not in Designated LSR
Direct Effects All Classes
Matrix to LSR
Unclassified Non-Forest
Stand Establishment
Young
Mature
Structurally Complex


Roseburg District
Matrix to LSR Reallocation
Direct and Indirect Effects 300 ft. buffer
Metric: Stand Structure
600.00
500.00
400.00
300.00
200.00
100.00
0.00
60.67
249.49
0.00
0.00
13.43
48.25
371.84
399.81
LSR Direct
LSR Indirect
MAMU Direct
MAMU Indirect
KOAC Direct
KOAC Indirect
Total Direct and Indirect
Matrix to LSR Reallocation
Young
Unclassified Non-Forest
Structurally Complex
Stand Establishment
Mature

Appendix A – BLM Offsite Mitigation Policy

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT
National

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
www.blm.gov

September 30, 2008

In Reply Refer To:
1740/1790 (310/230) P

EMS TRANSMISSION 10/03/2008
Instruction Memorandum No. 2008-204
Expires: 09/30/2009

To: All State Directors

From: Director

Subject: Offsite Mitigation

Program Areas: All Resource Programs

Purpose: This Instruction Memorandum (IM) outlines policy for the use of offsite mitigation for authorizations issued by the Bureau of Land Management (BLM). This IM replaces IM WO-2005-069 *Interim Offsite Compensatory Mitigation for Oil, Gas, Geothermal and Energy Rights-of-Way Authorizations* (February 1, 2005).

Policy/Action: Offsite mitigation consists of compensating for resource impacts by replacing or providing substitute resources or habitat at a different location than the project area. Offsite mitigation is supplemental to onsite mitigation and is used to enhance the BLM's ability to fulfill its mission of providing multiple uses on the public lands, while ensuring its resource management objectives are met. In making decisions that are within its discretion (taking into account statutes, regulations, and contractual/property rights of the requester), the BLM has an obligation to approve only land use authorizations that are consistent with its mission and objectives. This may mean that the BLM may be unable to permit certain land use authorizations without appropriate mitigation measures. Onsite mitigation alone may not always be possible or sufficient, though often resources are present offsite that can offer suitable compensation for remaining onsite impacts. Consequently, offsite mitigation may be an effective management tool to ensure appropriate land use authorizations.

In order to ensure a sufficient relationship between offsite mitigation and the BLM's mission to manage the public lands, offsite mitigation may be used only when the BLM can demonstrate that the proposed mitigation is reasonably necessary to accomplish an authorized BLM purpose.

When proposed offsite mitigation is geographically distant from the project area, and particularly when it occurs on non-Federal land, the connection to resources for which the BLM is responsible should be clear.

Offsite mitigation may be offered voluntarily by a project proponent, incorporated into the project proposal, and approved by the BLM as a condition of the permit authorization. In certain other cases, the BLM may find it necessary to advise the applicant that the project proposal cannot be approved without additional onsite modification or additional mitigation, including offsite mitigation. There may be a need for offsite mitigation when:

1. Impacts of the proposal cannot be mitigated to an acceptable level onsite; and
2. It is expected that the proposed land use authorization as submitted would not be in compliance with law or regulations or consistent with land use plan decisions or other important resource objectives.

Early in the authorization/approval process, the BLM and the applicant should discuss mitigation

References

Keppeler, E. T., P. H. Cafferata, et al. (2007). State forest road 600 : a riparian road decommissioning case study in Jackson Demonstration State Forest. Sacramento, CA, State of California, the Resources Agency, California Dept. of Forestry & Fire Protection.

Madej, M. (2000). "Erosion and sediment delivery following removal of forest roads." U.S. Geological Survey Western Ecological Research Center.

Tippery, S., K. K. Jones, et al. (2010). Effectiveness Monitoring Report for the Western Oregon Stream Restoration Program, 1999-2008. O. D. o. F. a. Wildlife. Salem, OR.

USDA FS and USDI BLM (1994b). Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, U. S. Forest Service and U. S. Bureau of Land Management, Portland, Oregon.

USDA FS and USDI BLM (2012). Northwest Foreset Plan - The first 15 years (1994-2008): watershed condition status and trends**:** 155.

USDA FS, USDI BLM, et al. (1998). South Cascades Late Successional Reserve Assessment.

USDI BLM (2012). Shady Cove - Rogue River PCGP Project - Specific Watershed Analysis

USDS FS and USDI BLM (1999). South Umpqua / Galesville LSR Assessemnt (LSR RO 223).

Attachment 2

FS Supplemental Mitigation Report 3_1_11v12

3-2-11 mdh

Reply To: 2670
Subject: Mitigation Plan, Pacific Connector Gas Pipeline
To: Randy Miller
Forest Service interdisciplinary teams developed PCGP mitigation plans for each national forest on the PCGP corridor based on the respective Forest Plan, the recommendations of the 2008 and draft (2010) northern spotted owl recovery plans, applicable Late Successional Reserve Assessments (LSRA) and 5th field Watershed Analyses (WA) for watersheds where impacts of the pipeline project occur. Team members used common sense, professional judgment and knowledge of the affected landscapes to develop these measures.

Central themes emerged on each landscape that drove the design of mitigation measures.

- On the Winema National Forest in Spencer Creek, a Tier 1 Key Watershed, current conditions include high road densities, sediment in streams and high stream temperatures (USDA FS WNF 1995 Executive Summary). Desired conditions include reduced road densities and achievement of Aquatic Conservation Strategy (ACS) objectives (USDA-FS_WNF_LRMP 1990; USDA FS; USDI BLM 1994b). The primary objective of proposed mitigations is to improve aquatic conditions in Spencer Creek by decommissioning roads and restoring aquatic habitats. Riparian plantings and in-stream log placement are also planned to further reduce sediment and stream temperature.
- On the Rogue River National Forest in Little Butte Creek, a Tier 1 Key Watershed that also includes part of Late Successional Reserve 227, current conditions include high road densities, high stand densities, sediment delivery to stream systems from roads and high stream temperatures (USDA FS; USDI BLM 1997; USDA FS; USDI BLM; USDI FWS 1998). Desired conditions include reduced stand densities, development of late-successional stand characteristics in LSR 227 and achievement of ACS objectives (USDA-FS: RRNF LRMP 1990; USDA FS; USDI BLM 1994b). Mitigations in Little Butte Creek are intended to reduce road densities by decommissioning roads, accelerate the development of interior stand conditions by accelerating stand development and restoring LS stand characteristics and restore aquatic systems.
- On the Umpqua National Forest, current conditions include high stand densities and the threat of stand replacing fire in LSR 223, fragmented habitats, sediment delivery to stream systems from roads, blockages of fish passage by roads and the presence of non-native invasive species (UNF 1995; UNF 1995b; USDA FS; USDI BLM; USDI FWS 1998; BLM 1999). Desired conditions include reduced risk of stand-replacement fire in LS habitats, reduction of fragmentation, restoration of native species and achievement of ACS objectives , ,(USDA-FS: UNF LRMP 1990; USDA FS; USDI BLM 1994b; UNF 1995; UNF 1995b; USDA FS; USDI BLM; USDI FWS 1998). Mitigation measures are intended to reduce the risk of catastrophic fire by integrated stand density reduction and fuels management projects that build off of the PCGP corridor, provide fish passage at key stream crossings, restore native plant species by eliminating non-native invasives and reduce road-related sediment delivery to streams.

The original mitigation plans was filed with FERC as part of the PCGP's application for this project and considered in the FERC FEIS. FERC made implementation of the mitigation plan a condition of the certificate of public convenience and necessity issued December 17, 2009. Additionally, Pacific Connector has signed, and filed with FERC, an Agreement in Principle to guarantee funding of these projects. A central provision of the mitigation plan is that it is to remain adaptable to new information and changed conditions.

Draft Working Paper

3-2-11 mdh

Since the mitigation plan was filed with FERC, the Forest Service has added additional mitigations on the Winema National Forest and corrected inconsistencies in road closures and coarse woody debris placement on the Rogue River and Winema National Forests. These are minor changes within the scope of the original plan and Agreement in Principle. The amended mitigation plan for the PCGP is shown in Table 1 which has been previously provided. A supplemental analysis of changes in the mitigation plan on each national forest is attached. GIS shape files are available for each mitigation proposal for additional analysis if needed. .

Forest Plans of the Umpqua, Rogue River and Winema National Forests were amended by the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl, otherwise known the Northwest Forest Plan (NWFP). Standards and Guidelines for new developments in Late Successional Reserves (USDA FS; USDI BLM 1994b p. C-17) make provisions for pipeline corridors but require that projects "minimize or mitigate" impacts so that the new development is neutral to beneficial with respect to LSR habitats. With respect to riparian and aquatic habitats, Standards and Guidelines for Lands, LH-4 for activities other than surface water developments (USDA FS; USDI BLM 1994b p. C-37) direct agencies, to "issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy (ACS) objectives". In determining consistency with the ACS and other forest plan compliance issues, decision-makers may consider the effects of other present and *reasonably foreseeable* future actions on watershed conditions[1]. The Forest Service considers these mitigations to be reasonably foreseeable because they were filed by the applicant with FERC, are a condition of the FERC certificate, have a committed source of funding and are consistent with their respective Land and Resource Management Plans and other agency mid-level planning documents. The attached analysis supplements the FERC FEIS for the purposes of Forest Service decision making, and focuses on supporting evaluations of Forest Plan consistency by the Forest Service.

Please contact Rob Cox (541-767-5042), lead biologist for the PCGP project on the Rogue River, Umpqua and Winema National Forests or Wes Yamamoto (541-825-3150), project lead for the national forests if you have questions.

Attachment: Supplemental Mitigation Report

Draft Working Paper

[1] 1950 memo dated 5/22/2007

Table 1: FS Amended Mitigation Plan

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amount	Treat-ments in 50 year Period	Resource Benefit	Rationale
Roads	**Key Watersheds**: Reduce existing system and nonsystem road mileage. There will be no net increase in the amount of roads in Key Watersheds. (ROD C-7) **Soil Productivity**: maintain and enhance soil productivity and soil stability. (UNF IV-67; RR 4-1)) **Wildlife:** To provide for present and future habitat needs of wildlife species Contribute to the recovery of all threatened or endangered species (UNF IV-39, RR 4-2) **Water Quality**: maintain or enhance water quantity, quality, and timing of streamflow (UNF IV-59, RR 4-1) **Fisheries:** protect, maintain and, where appropriate, enhance the productivity of fish habitat (UNF IV-33, RR 4-2).	Decommission/ obliterate roads, barricade road entrance w/permanent landscape structures (berms, boulders, etc.), remove culverts, restore drainage, recontour roadbed to original slope, large wood placement, and seed/plant.	Umpqua National Forest, LSR 222, 223	7.6 Miles	1	LSR, Northern Spotted Owl, Pacific fisher, other late-successional habitat dependent species, riparian habitat, aquatics, SONC Coho, Steelhead, soil productivity	Some natural-surface roads have poor drainage that can lead to erosion and increased sediment in nearby streams. Road maintenance or obliteration is needed to improve drainage and to reduce chronic sediment input to the stream systems. The objective of road decommissioning for this project is to accelerate the revegetation of the decommissioned road with trees. This mitigation also offsets the impacts of soil compaction and displacement within the construction right-of-way by reducing compaction in the decommissioned roadbeds. This will increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from surface erosion. A 30-50 foot wide route along the pipeline route will be maintained in early successional habitat. In addition a construction zone of 100 foot width or wider will be cut through mature forest, setting back development of mature forest habitat by one or more centuries. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Planting selected roads in conjunction with precommercial thinning treatments (see other mitigations) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in riparian reduces sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9. Little Butte Creek and Spencer Creek are Key Watersheds and road reduction is a major objective (NWFP ROD C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement within the construction R/W.
			Little Butte Creek Key Watershed, Rogue River-Siskiyou LSR 227 (road closures proposed intersect 32 streams and include 1 fish bearing stream, 1 perennial non-fish bearing stream and 30 intermittent streams. Proposal decommissions 6.7 miles of roads in riparian reserves and will allow restoration of riparian vegetation on approximately 14.3 acres of riparian vegetation.)	53.2 Miles (Reduced from 54.5 miles)	1		
			Spencer Creek Key Watershed, Winema National Forest (Proposed road closures intersect 25 intermittent streams. Proposal decommissions 5.3 miles of roads in riparian reserves and will allow restoration of approximately 12.8 acres of riparian vegetation)	21.4 miles (new mitigation)	1		
		Close roads with barricades and remove culverts; revegetate, outslope road prism but do not obliterate.	Umpqua NF	5.4 Miles	1	Wildlife sensitive to disturbance, improves aquatic and terrestrial connectivity.	Close roads and remove culverts and treat weeds Mowing and maintenance of pipeline corridor, temporary road construction, and road use are direct disturbance impacts to wildlife. Road closure will mitigate some of those impacts, improve interior stand connectivity and benefit aquatic habitats over time.
		Road stormproofing	Umpqua NF	2.17 miles	1		Replacing culverts with hardened low water crossing (drain dips), fill removal, outsloping and erosion control on disturbed areas

Draft Working Paper

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amount	Treatments in 50 year Period	Resource Benefit	Rationale
Stand Density and Fuels Management	**Late Successional Reserves:** Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem. (ROD, C-11) **Matrix Lands**: Most timber harvest and other silvicultural activities would be conducted in that portion of the matrix with suitable forest lands, according to standards and guidelines. (ROD, C-39) Efficient production of wood fiber to satisfy National needs and benefit local economies (UNF IV-42, RR 4-2) **ACS Objectives** 1,2, 5, 8.	Integrated Stand Density and Fuels Treatments: Commercial Thin, Precommercial Thin, Fuels Treatments adjacent to Pipeline corridor Removal of offsite pine in old plantations.	Umpqua LSR 223	2081 Acres Vegetation Rx with 1128 acres of underburns (Includes 350 acres of offsite pine removal)	1 Vegetation treatment, 3 underburns	Late successional and old growth dependent species and forest ecosystems. Timber production on Matrix Lands.	Both mature stands and developing stands will be removed during pipeline construction. Impacts to mature and developing stands will exceed the life of this project by many decades. Density management will increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands will accelerate development of LSOG. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG is essentially a permanent loss that cannot be replaced. Young stands will take 70 years to develop into LSOG so this is not a 1-1 replacement. LSR Assessments have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with late-successional habitat. The values to associated species, many other ecosystem goods and services components such as micro organisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable habitat late-seral forest. The proposed ridge line pipeline route intersects and area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation will assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, Forest, adjacent private landowners and public.
			Umpqua NF Matrix	1341 Acres Vegetation Rx with 1000 Acres of underburns (increased from 907 Acres)			
		Precommercial thin young harvest plantations in a single entry to create a pattern and spacing that will accelerate development of mature forest characteristics. These stands are in LSR but are not adjacent to the pipeline and are in addition to acres above.	Rogue River-Siskiyou NF LSR 227.	600 Acres	1 (staggered over a period of 3 years)	LSR, Northern Spotted Owl, Pacific fisher, other late-successional habitat dependent species	There will be direct impacts to existing interior, developing interior habitat. The project will result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Maintenance of pipeline corridor will provide a continued vector for predators, early-seral species and non-native species. Also the project will result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands will be removed during pipeline construction. Density management of forested stands will assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics will shorten the impacts of those biological services loss due to pipeline construction. Thinning of young stands is a recognized treatment within LRSs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD C-12). ROD Pages B-11 ACS Objectives , C-11 and C-17.
			Umpqua NF LSR 223	425 Acres (in addition to Fuel Break Project Above)			

Draft Working Paper

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amount	Treat ments in 50 year Period	Resource Benefit	Rationale
Upland Terrestrial	**Late Successional Reserves**: managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. (ROD C-11) **Long Term Soil Productivity**: Maintain or improve soil site productivity in all resource management activities Rehabilitate degraded land to a productive state. (RR 4-1, UNF IV-67) **Wildlife:** To provide for present and future habitat needs of wildlife species Contribute to the recovery of all threatened or endangered species (UNF IV-39, RR 4-2) **Biological Diversity:** Maintain viable representation of native plant and animal species, and biological communities. (UNF IV-36, RR 4-2)	Within LSR manage snags densities at 16/acre > 10.0 in, of which 8/acre > 20 in dbh. within the Matrix manage snag densities at 4/acre >20 in dbh. to mitigate loss of current and future sang habitat from removal large trees and snags within the construction clearing zone and the removal of adjacent hazard trees for the life of this project. Managing for this level of snag habitat provide for a greater assurance of associated species abundances within the LSR and Matrix (DecAID). ROD C-C11 and C-40	Umpqua NF LSR 223	175 Acres	1	LSR, Northern Spotted Owl, Pacific fisher, other late-successional habitat dependent species. Matrix benefits all snag dependent species.	Mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades after. Corridor construction will result in loss of snag habitat on approximately 775 acres of corridor construction (includes safety zone buffer). Data relies on the Cow Creek Watershed Analysis which suggests the watershed is far below historic levels of snag habitat due of past management actions. This project will add to those cumulative impacts. As snags are a critical component of LSR spotted owl habitat, replacement is needed. Snag requirements are specifically outlined in the Forests' LRMPs and NWFP. Forests require analysis and mitigation under most management activities. Replacement would be immediate though there would be a 10 year delay as snag decay develops. Snag management is required in the RRNF LRMP (4-20), with levels set under the various management directions. Snag Management is discussed in the NWFP for LSRs on C-14 and 15 of the ROD (items 4 and 7). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSR Assessment (Chap. 3).
			Rogue River-Siskiyou NF LSR 227	600 Acres	1		
			Umpqua NF Matrix	175 Acres	1		
		Manage Logs (Coarse woody material) within the pipeline corridor and in adjacent stands that have a deficiency in down wood due to past management.	Umpqua NF LSR 223	100-200 Acres (Reduced from 350 Acres)	1	LSR, Northern Spotted Owl, Pacific fisher, other late-successional habitat dependent species	Mitigate for the loss of recruitment of large down wood to adjacent stands and within the construction clearing zone. The project will forgo the development of large down wood for the life of the project and for decades after. Downed wood is a critical component of Mature Forest ecosystems. Large wood replacement will partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID). ROD C-11. Acres that can be treated are necessarily limited by material available from the corridor.
			Rogue River-Siskiyou NF LSR 227	200-400 Acres (Reduced from 600 Acres)	1		
		Treatment of noxious weeds, planting of native species, treatment of encroaching conifers and burning,	Umpqua NF Unique and Mosaic Habitats and Roadside Nox Weeds	120 Acres meadow restoration, 6.7 miles of roadside weeds.	1	Native plant and wildlife communities.	Mitigate impacts to Unique habitats impacted by the project, There will be loss of forest habitat buffering the unique habitats and disruption to soil horizons enhancing the opportunities for non native plant species.
		Planting at specific sites to grasses that benefit Mardon Skippers and Elderberry to benefit Short-horned Grasshopper.	Rogue River-Siskiyou NF LSR 227	20 Acres	1	Mardon Skipper Butterflies and short horned grasshoppers	The Dead Indian Plateau region is one of three known sites for Mardon Skipper butterflies in the world. It is also adjacent to a known site for Short-horned Grasshoppers. Both species are on the Forest's Sensitive Species list. The pipeline requirement of a permanent open corridor provides a unique opportunity to develop habitat for these skippers and grasshoppers. Planting the corridor with plants preferred by these Sensitive Species has the potential to increase the habitat and local range for these two species. Rehabilitation of disturbed sites is required under various BMP guidelines. Use of specific plant species has no additional problems. Results would be immediate in stabilizing the local habitat and location would be in the pipeline.

Draft Working Paper

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amount	Treatments in 50 year Period	Resource Benefit	Rationale
Wetlands Aquatic	**Riparian Areas**: Maintain or enhance the Characteristics of riparian areas, wildlife habitat, and fish habitat near or within riparian ecosystems (WIN 4-6). Riparian area management is designed to protect soil, water, wetland, floodplain, wildlife, and fish and resource values associated with riparian vegetative communities; maintain or improve water quality, wildlife habitat and fish habitat near or within riparian ecosystems (WIN 4-136, 139; RR 4-2; UNF IV-59) **Fisheries:** protect, maintain and, where appropriate, enhance the productivity of fish habitat to provide for populations of resident and anadromous fish (UNF IV-43; RR 4-2). High standards of water quality in terms of temperature, turbidity, and bank stability for fisheries (WIN 4-6, 4-139). **Aquatic ecosystems**: restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands... maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. (NWFP ROD B-9) **ACS objectives** 1, 2, 3, 4, 5, 8	Repair Stream Crossing	Winema NF, Spencer Creek	1 project	1	Fisheries and aquatic habitats	Mitigation-Indirect: The proposed pipeline will cross Spencer Creek upstream of Buck Lake. This ford is at the uppermost reach of the perennial portion of Spencer Creek which is occupied by redband trout. Spencer Creek has been identified by NMFS through the FERC re-licensing process for the Klamath River hydro facilities, as habitat for Federally listed Southern Oregon/Northern California Coast Coho salmon. Additionally, once fish passage is provided through the Klamath River hydro facilities, steelhead will re-colonize Spencer Creek. The pipeline crosses SONC Coho habitats at other locations in other watersheds along the proposed pipeline route, possibly impairing habitat quality or reducing available habitat. Improving habitat quality at Spencer Creek provides the opportunity to be pro-active in providing quality habitat for SONC Coho, mitigating for any detrimental effects to other SONC Coho habitats, while improving habitat for redband trout and other aquatic species. Spencer Creek appears on the Oregon DEQ 303(d) list as water quality impaired from increased sedimentation. Improvements at this location will immediately benefit all downstream aquatic habitats and the species associated with those habitats.
			Rogue River NF, Little Butte Creek	32 Stream crossings (see notes in road decommissioning)	1		Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which will help offset the impact of shade removal at pipeline R/W crossings.
		Stream Simulator Culverts Placement; Remove existing culverts and replace with stream simulator culverts	Umpqua National Forest	5 crossings	1	Fisheries, aquatic biota and connectivity	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which will help offset the impact of shade removal at pipeline R/W crossings.
		In-Stream Large Woody Debris Placement	Winema NF, Spencer Creek (new project)	1 mile	1	Fisheries and aquatic habitats	Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time. The BLM completed placement last year on 3 miles of Spencer Creek below this reach. Addition of this segment would complete the stream rehabilitation on the reach of Spencer Creek where the project occurs. Logs from the PCGP Right of Way will be used for the project. An estimated 75 pieces are needed. A helicopter will be used to place the logs.
			Rogue River NF, SF Little Butte Creek (new project)	1 mile	1		
		Riparian Planting	Winema NF, Spencer Creek (new project)	0.5 miles	1	Riparian vegetation and habitats	Spencer Creek just upstream of Buck Lake. This is a meadow site that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings will contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation will increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats.

Draft Working Draft

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amount	Treatments in 50 year Period	Resource Benefit	Rationale
Grazing	**Riparian Areas:** Maintain or enhance the Characteristics of riparian areas, wildlife habitat, and fish habitat near or within riparian ecosystems. (WIN 4-6). Water bodies, stream courses, and wetlands, their riparian vegetation, and the immediately adjacent upland areas will be managed to stabilize stream channels: prevent soil erosion: and maintain or improve water quality, fish habitat, recreation opportunities, and riparian/ wetland habitat for dependent fish and wildlife species and dependent aquatic species. (WIN 4-16) Riparian area management is designed to protect soil, water, wetland, floodplain, wildlife, and fish resource values associated with riparian vegetative communities (WIN 4-136); maintain or improve riparian areas associated with Class I, II and III streams and with lakes (WIN 4-139) **ACS Objectives: 3, 4, 5, 8, 9**	Fence construction and cattle guards	Fremont-Winema NF, Clover Creek Road. Buck-Indian Allotment	6.4 Miles	1	Wetland and aquatic habitats. Visual resources, public safety.	This fence would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the Right of Way corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met. It will also serve to separate anticipated increased cattle grazing of the ROW from the highway; greatly reducing a safety hazard for vehicles traveling the Clover Creek road. This fence would require 7-9 cattle guard crossings for Forest Roads intersecting the fence

Draft Working Paper

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amount	Treatments in 50 year Period	Resource Benefit	Rationale
Visuals	**Winema NF:** Provide attractive. visually pleasing settings, emphasizing appearance of areas seen from major travel .routes,-use areas, and bodies of water (LRMP 4-13) **Foreground Retention:** The primary emphasis for this intensity is to retain the natural-appearing condition of the foreground areas. The retention visual quality objective means that activities may only repeat whatever form, line, color, and texture are frequently found in the characteristic landscape. Changes in their qualities--such as size, amount, intensity, direction, and pattern-may not be evident (WIN MA 3A, LRMP 4-103, RR MA 6A, LRMP 4-72). **Foreground Partial Retention:** The goal is to provide attractive scenery that is slightly altered from a natural condition as viewed in the foreground . Activities may repeat or introduce form, line, color, or texture common or uncommon to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, and pattern must remain visually subordinate to the visual strength of the characteristic landscape (MA 3B; LRMP 4-107, RR MA 6B, LRMP 4-86).	Stand density and fuels treatments for visual purposes on 50-500 foot wide area (Avg. 300) feet wide for length of corridor along Clover Creek Road (estimated 110 Acres).	Winema National Forest, Clover Creek Road	Estimated 110 acres-50-500 foot wide zone along the timbered edge of the PCGP corridor on the Clover Creek Rd.	1	Soften the visual effect of the hard edge created along the timbered boundary of the PCGP along the Clover Creek Road.	The PCGP will create a hard line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway. Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with landscape. Thinning of commercial sized material will be accomplished with a commercial timber sale. The mitigation is intended to supplement funding for the non-commercial part of that work for visual purposes that could not otherwise be accomplished.
		Note that extensive mitigations are proposed within the PCGP Corridor for visual purposes at the PCGP crossing of the Big Elk Road and the Pacific Crest Trail on the Rogue River NF, and at the Dead Indian Memorial Highway crossing and along the Clover Creek Road on the Winema NF. These mitigations occur within the PCGP corridor and part of the Aesthetic Management Plan for the project, so they are not included as part of the Mitigation Plan or funding for activities that occur outside of the PCGP Corridor.					

Draft Working Paper

Winema National Forest

Forest Plan Objectives and Watershed Analysis Recommendations

This report adopts and supplements the existing FERC mitigation plan found in Appendix L of the FERC FEIS for the Winema National Forest to support Forest Service decision making. Land allocations affected by the PCPG are shown in Table 2, below.

Table 2: Land Allocations Affected by the PCGP, Winema NF

LSR	Matrix	Riparian Reserves
0	6.09	0.08 Miles
Source: FERC FEIS Table 4.7.4.2-1, page 4.7-72		

Spencer Creek is a Tier 1 Key Watershed in the NWFP. Reduction of road density is a Standard and Guideline (S&G) for Key Watersheds (USDA FS; USDI BLM 1994b p. C-7) Watershed restoration recommendations are found in the Spencer Creek Watershed Analysis (WA) (1995). The Spencer Creek WA noted that road density in the watershed is negatively affecting wildlife habitat (USDA FS WNF 1995 p. 4.3). The Spencer Creek WA also noted that road density, stream temperature, fine sediment and low flows negatively impacted aquatic habitats in Spencer Creek(USDA FS WNF 1995 Executive Summary). After the FERC FEIS was released, the Winema National Forest completed their forest travel management planning process. This served as a catalyst to reexamine mitigation proposals associated with the PCGP in the Spencer Creek drainage. The following changes in the mitigation plan for the PCGP were developed after reviewing the FERC FEIS, Travel Management recommendations and the recommendations of the Spencer Creek WA.

Proposed Mitigation Actions

Table 3 displays the relationship between the PCGP impacts and proposed mitigations.

Table 3: Relationship between PCGP Environmental Consequences and Proposed Mitigations

PCGP Environmental Consequences[1]	Off-Site Mitigation (not in the PCGP Corridor)
Wildlife habitat impacts: fragmentation and edge effects created by corridor (Direct and indirect effects)	Decommission roads to reduce road density. Reestablish native vegetation to reestablish wildlife habitat.
Watershed impacts: Loss of LWD and riparian vegetation at stream crossings, potential sediment transport into aquatic systems, residual soil displacement and compaction. (Direct and indirect effects)	Replant riparian vegetation, Instream LWD and boulder project, Fencing to keep cattle out of corridor and adjacent streams, Harden ford at Buck Lake, Decommission roads to reduce soil compaction and erosion in watershed
Visual impact: corridor edge along major travel routes (Direct effect)	Soften edge by manipulating stand density and creating small openings typical of landscape.
1: Source: FERC FEIS Chpt. 4, Environmental Consequences on Federal Lands, various sections	

Draft Working Paper

The following changes in the mitigation plan for the PCGP are intended to address objectives of the Winema NF LRMP as amended and the Spencer Creek WA. Maps of the project areas are attached (See Figure 1 and 2).

Riparian Plantings:
This is a meadow site along a .77 kilometer reach of Spencer Creek just upstream of Buck Lake (T38S R5E sec 11) that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings will contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation will increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats. This is responsive to Aquatic Conservation Strategy objectives 3, 4, 5, 8 and 9.

In-Stream Large Woody Debris Placement:
Over the last century, a 1mile reach of Spencer Creek (T38S R6E sec 18) with high aquatic habitat potential has become simplified, and therefore, has a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). The BLM completed placement last year on 3 miles of Spencer Creek below this reach. Addition of this segment would complete the stream rehabilitation on the reach of Spencer Creek where the project occurs. Logs from the PCGP Right of Way will be used for the project. An estimated 75 pieces are needed. A helicopter will be used to place the logs. This is responsive to Aquatic Conservation Strategy objectives 2, 3, 4 and 5.

Interpretive sign placed at the dispersed campsite below Buck Lake:
Continued recreational dam building occurs at this location resulting in negative impacts to stream morphology and riparian habitat impacting fish and the only known Upper Klamath Basin population of Giant Pacific Salamander. There is a need to educate the public as to the detrimental effects of this dam building action and this would best be served by installation of an informational sign to reach those parties utilizing the site.

Stand Density Reduction:
The PCGP along the Clover Creek Road will create a hard visual "edge" against the timbered side of the corridor. This mitigation project would soften the edge effect by thinning the stand edge at widths varying from 50-500 feet and creating small openings consistent with the surrounding landscape. Approximately 110 acres will be thinned along the timbered edge of the corridor to reduce the visual impact of the project.

Road Obliterations in the Spencer Creek Watershed:
Reduction in road density is a central recommendation of the Spencer Creek WA. The objective of road decommissioning for this project is to reduce road density and accelerate the revegetation of the decommissioned roads with trees to reduce negative impacts of roads on wildlife habitat and aquatic environments. Some natural-surface roads have poor drainage that can lead to erosion and increased

Draft Working Paper

sediment in nearby streams (Trombulak and Frissell 2000). Road obliteration can improve drainage and to reduce chronic sediment input to the stream systems (Madej 2000; Switalski, Bissonette et al. 2004; Tippery, Jones et al. 2010). This mitigation also offsets the impacts of soil compaction and displacement within the construction right-of-way by reducing compaction in the decommissioned roadbeds. Table 4 below compares miles of roads decommissioned with impacts of the PCGP corridor on riparian reserves, acres in degraded soil condition and number of stream crossings. Likely benefits of road decommissioning include increased infiltration of precipitation, reduced surface runoff, and reduced sediment production from surface erosion (Switalski, Bissonette et al. 2004). Where roads are decommissioned within riparian areas, riparian vegetation may be reestablished. Approximately 5.2 miles or 12.6 acres of proposed decommissioning occur within riparian reserves.

Approximately 29.3 miles of roads are currently open that can be decommissioned. Table 5 below shows the reduction in road density associated with implementation of the proposed mitigation plan. Road densities decrease at all scales with this mitigation. The greatest reductions in road density occur within ¼ mile of the PCGP corridor, showing that mitigations are associated with the impact of the project. Although an extensive erosion control plan and best management practices are incorporated in the PCGP, it is likely that 20-30% (15-25 acres) of the 78 acres cleared in the R/W and Temporary Extra Work Areas (TEWAs) on the Winema NF will remain in a degraded soil condition upon completion of the project because of displacement and residual compaction, thus necessitating some form of mitigation (FERC 2009 p. 4.2-29). These effects are similar to those created by a road so decommissioning roads is a logical mitigation for these impacts. Impacts of roads on watershed values are well documented (Trombulak and Frissell 2000; Switalski, Bissonette et al. 2004). Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). The proposed road decommissioning will increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the PCGP occur.

Assuming a 20 foot average road width, 29.3 miles of proposed road decommissioning will revegetate approximately 71 acres (29.3*5280*20/43560=52 Acres) that are currently native road surfaces in the Spencer Creek Watershed. A comparison of project watershed impacts and corresponding mitigations is shown in Table 4 below. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (USDA FS; USDI BLM 1994b p. B-11, C-7).

Draft Working Paper

Table 4: Comparison of PCGP Effects and Proposed Road Decommissioning: Spencer Creek Tier 1 Key Watershed

Winema NF	Miles in Watershed	Miles in Riparian Reserves	Acres in Degraded Soil Condition / Acres Restored	Stream Crossing
PCGP Corridor	6.09[1]	0.08[1]	15-25 degraded[2]	1 Class II[3] 5 Class IV
Roads Decommissioned[4]	29.3	5.20	71 Restored	25 Class IV

Sources:
1. FERC FEIS Table 4.7.4.2-1, page 4.7-72
2. FERC 2009, p 4.2-29
3. FERC 2009, Table G-4, page G-29
4. USFS GIS Analysis, (See Appendix)

Comparison of PCGP Effects and Proposed Road Decommissioning: Spencer Creek Tier 1 Key Watershed

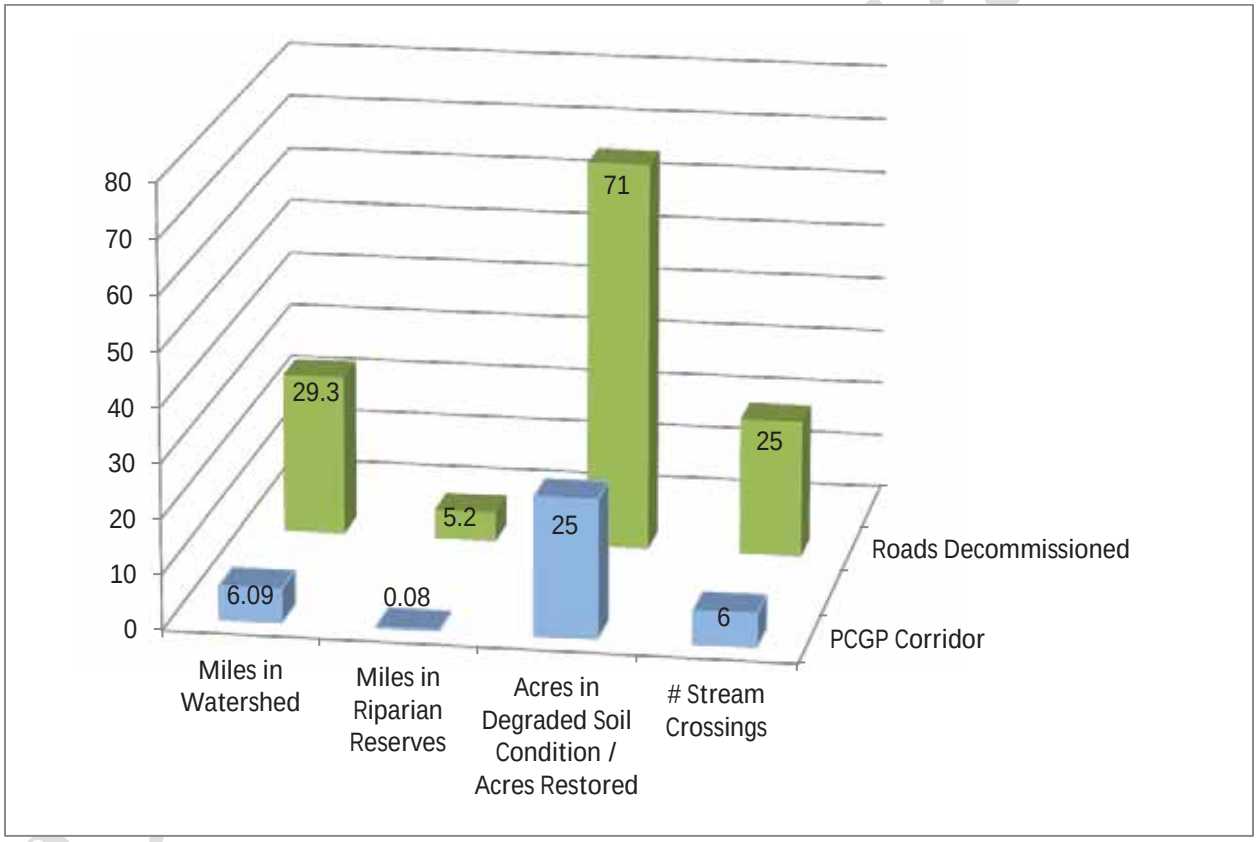
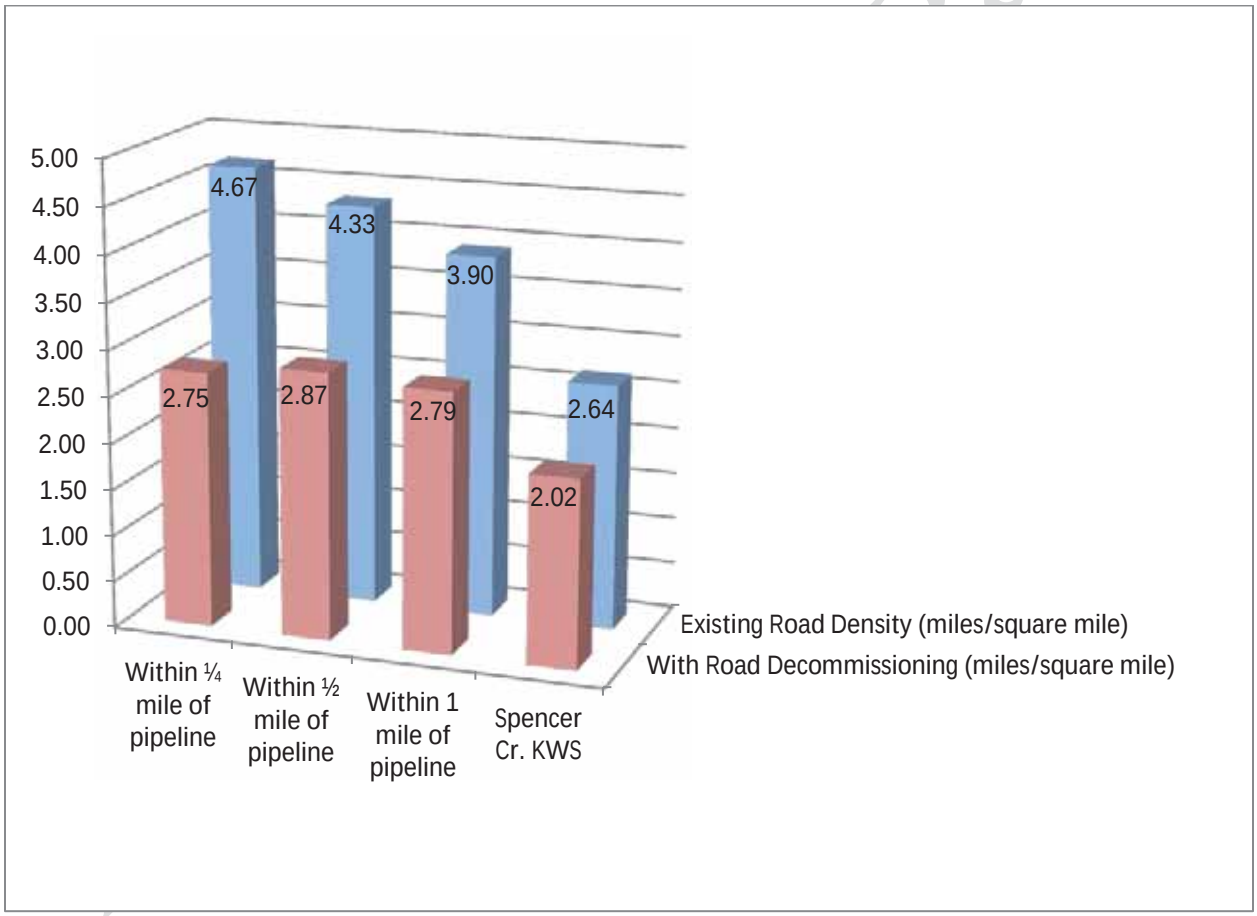


Table 5: Change in Road Density with Implementation of Mitigation Plan: WNF Spencer Creek Tier 1 Key Watershed

Winema NF	Current Condition (miles/square mile)	With Road Decommissioning (miles/square mile)	Change in Road Density with Decommissioning (miles/square mile)
All Roads, Spencer Cr. KWS (NFS only)	2.64	2.02	-0.62
Within 1 Mile of Corridor	3.9	2.79	-1.11
Within 1/2 mile of Corridor	4.33	2.87	-1.46
Within 1/4 mile of Corridor	4.67	2.75	-1.92
Source: FS GIS Analysis, Road Density Analysis,(See Appendix)			

Change in Road Density with Implementation of Mitigation Plan: WNF Spencer Creek Tier 1 Key Watershed



The following mitigations are a part of the FERC FEIS record, and are included here for reference.

Fencing

Construct allotment fencing along the south side of the ROW through Forest Service administered lands (approx. 6.4 miles). This fence would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the Right of Way corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met. It will also serve to separate anticipated increased cattle grazing of the ROW from the highway; greatly reducing a safety hazard for vehicles traveling the Clover Creek road. This fence would require 7-9 cattle guard crossings for Forest Roads intersecting the fence. This is responsive to ACS Objectives 3, 4, 5 and 8.

Harden the ford at the crossing below Buck Lake:

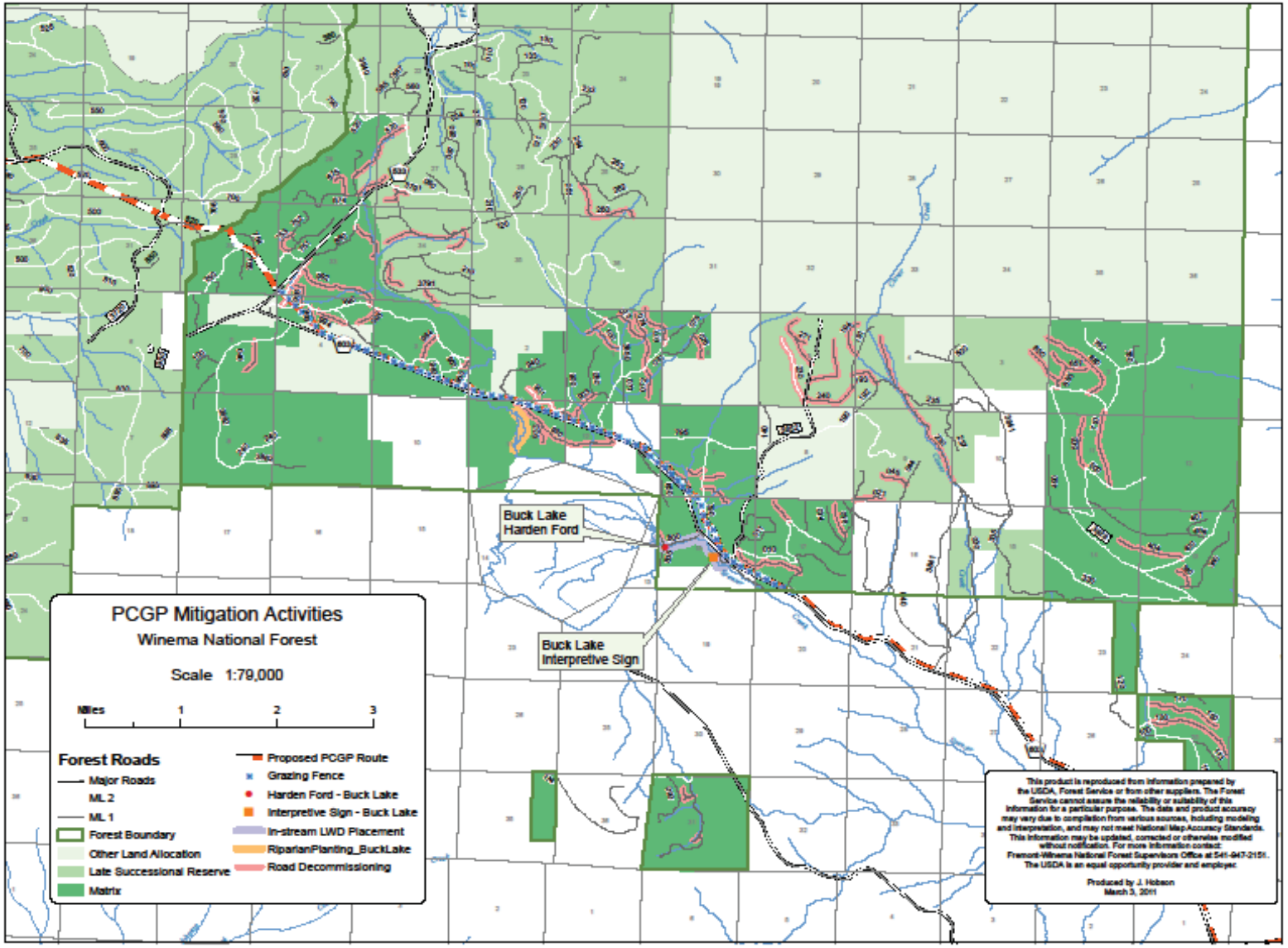
Stream crossing improvements would improve aquatic habitat/connectivity and reduce sedimentation. The road accessing this location has been closed on the BLM and USFS. The private landowner and cattle cross the ford to access pasture from private land. The raw, unstable banks at this crossing allow fine sediments to enter the stream. This ford needs to be hardened and the banks re-vegetated and protected from grazing. The USFS side from the upper Spencer Creek dispersed campground needs more boulders or method of blocking 4-wheelers. Over time, these measures will reduce sediment contributions to Spencer Creek from these sites. This is responsive to ACS Objectives 2, 3 and 5.

Stand density and fuels reduction to achieve visual objectives:

The PCGP will create a hard line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway (USDA-FS: RRNF LRMP 1990 p. 4-103). Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with landscape (Mattson 2009). Thinning of commercial sized material will be accomplished with a commercial timber sale. The mitigation is intended to supplement funding for the non-commercial part of that work for visual purposes that could not otherwise be accomplished or would not otherwise be required. An estimated 110 acres in a variable width strip 50-500 feet wide along the east side of the corridor would be treated in this manner.

Draft Working Paper

Figure 1: PCGP Mitigation Plan, Winema NF



Rogue River National Forest

Forest Plan Objectives, Late Successional Reserve Assessment Recommendations and Watershed Analysis Recommendations

This report adopts and supplements the existing FERC mitigation plan found in Appendix L of the FERC FEIS for the Rogue River National Forest for the purposes of Forest Service decision making. The PCGP Corridor on the Rogue River National Forest lies entirely within LSR 227 and crosses two Riparian Reserves (See Table 6).

Table 6: Land Allocations Affected by the PCGP, Rogue River NF

LSR	Matrix	Riparian Reserves
13.58 miles	0.0	0.25 Miles
Source: FERC FEIS Table 4.7.4.2-1, page 4.7-72		

The LRMP objective for the LSR land allocation is to protect and enhance conditions of late-successional and old-growth forest ecosystems which serve as habitat for late-successional and old-growth related species including the northern spotted owl (USDA FS; USDI BLM 1994b p. C-9). Late Successional Reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (USDA FS; USDI BLM 1994b p. C-11). New developments in LSRs such as pipelines are permitted by the Forest Plan where impacts can be minimized and mitigated (USDA FS; USDI BLM 1994b p. C-17). This report, in combination with the analysis in Appendix L of the FERC FEIS provides information for agency decision makers to determine whether project effects have been mitigated within the LSR land allocation.

Two mid-level analyses provide additional management recommendations for the Little Butte Creek watershed and the LSR land allocation. The Little Butte Creek Watershed Analysis provides information for aquatic and watershed restoration (USDA FS; USDI BLM 1997). The South Cascades Late Successional Reserve Assessment provides recommendations for management of vegetation to achieve the objectives of the LSR land allocation (USDA FS; USDI BLM; USDI FWS 1998).

Proposed Mitigation Actions

Portions of the Little Butte Creek watershed have high road densities that have negatively affected watershed condition and wildlife habitat (USDA FS; USDI BLM 1997). Key issues identified in the WA for aquatic habitats include temperature, habitat modification and sedimentation. Restoration recommendations to address these conditions include road decommissioning, riparian planting and thinning and instream projects that contribute to habitat complexity (USDA FS; USDI BLM 1997 Executive Summary, p. 10) Reduction in road density was identified as a method to improve watershed conditions (USDA FS; USDI BLM 1997 p. 182, 191, 205, Appendix F, K). High priority areas identified in the WA and proximity to the effects of the PCGP corridor were used to develop road decommissioning proposals.

Draft Working Paper

The South Cascades Late Successional Reserve Assessment (1998) estimated that LSR 227 was approximately 16% late-successional or old-growth (LSOG) habitat at the time of the assessment, but had the capacity to be 75% late seral (USDA FS; USDI BLM; USDI FWS 1998 p. 51, p. 113). In order to achieve that objective, the assessment recommended a number of stand -level activities to accelerate the development of late-successional stand conditions including young stand thinning, creation of snags and recruitment of large woody debris (USDA FS; USDI BLM; USDI FWS 1998 p. 189-194).

Table 7 displays the relationship between PCGP effects and proposed mitigations.

Table 7: Relationship between project effects and mitigations

PCGP Environmental Consequences[1]	Off-Site Mitigation, not in the PCGP Corridor
Impact to the LSR land allocation	Reallocate matrix lands to LSR
Wildlife habitat impacts: Loss of LSOG and snag habitat in corridor, fragmentation and edge effects created by corridor (Direct and indirect effects)	Accelerate development of LSOG habitats by thinning young stands, creating snags, and placing LWD in adjacent stands. Accelerate development of interior stand habitat to reduce edge and fragmentation by decommissioning roads, revegetating decommissioned roads, precommercial thinning young stands
Watershed impacts: Loss of LWD and riparian vegetation at stream crossings, potential sediment transport into aquatic systems, residual soil displacement and compaction. (Direct and indirect effects)	Instream LWD and boulder project, Decommission roads to reduce soil compaction and erosion in watershed
1: Source: FERC FEIS Chpt. 4, Environmental Consequences on Federal Lands, various sections	

The following changes in the mitigation plan for the RRNF are intended to be responsive to these issues. Maps of the project areas are attached. See Figure 3:

Road Decommissioning:
The purpose of road decommissioning as mitigation for the PCGP is to offset potential watershed effects from construction and to reduce impacts on wildlife habitat from edge effects and fragmentation associated with the PCGP corridor. After the FERC FEIS was filed, the RRNF completed a Forest-wide transportation planning project to identify roads that are necessary for the Forest's designated transportation system. As a result of that decision and other access considerations, minor changes in the roads proposed for decommissioning were needed. The total number of miles proposed for decommissioning decreased by 1.3 miles from 54.5 miles to 53.2 miles. The number of stream crossings on roads proposed to be decommissioned increased slightly from 29 to 32 (See Table 9, below). Miles of roads proposed to be decommissioned in Riparian Reserves increased from 5.7 to 6.7 miles (USDA FS 2011). Current road density in LSR 227 is 3.3 miles per square mile. With the proposed road decommissioning, that would be reduced to 2.5 miles per square mile, a 24% reduction in road density measured in miles of road per square mile of LSR. Reduction in road density within ¼, ½ and 1 mile of the pipeline corridor are shown in the Table 9 (USDA FS 2011) . Roads proposed for decommissioning are shown in Figure 4, below.

Draft Working Paper

Road Decommissioning Effects on Watershed Values**:** Although an extensive erosion control plan and best management practices are incorporated in the PCGP, it is likely that 20-30% (60-90 acres) of the 203 acres cleared in the R/W and TEWAs on the Rogue River NF will remain in a degraded soil condition upon completion of the project because of displacement and residual compaction, thus necessitating some form of mitigation (FERC 2009 p. 4.2-29). These effects are similar to those caused by a road, making road decommissioning an appropriate mitigation. Impacts of roads on watershed values are well documented (Trombulak and Frissell 2000; Switalski, Bissonette et al. 2004). Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). The proposed road decommissioning will increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the PCGP occur. Assuming a 20 foot average road width, 53.2 miles of proposed road decommissioning will revegetate approximately 130 acres (53.2*5280*20/43560=130 Acres) that are currently native road surfaces in the Little Butte Creek Watershed. A comparison of project watershed impacts and corresponding mitigations is shown in Table 7 below.

Riparian Restoration**:** The PCGP crosses 1 intermittent and 1 perennial stream on the Rogue River National Forest affecting approximately 0.25 miles and 3 acres of riparian vegetation (FERC 2009 Table G-4, Table 4.7.4.2-1, page 4.7-72). Decommissioning roads in Riparian Reserves and at stream intersections has the effect of restoring connectivity within aquatic ecosystems and allowing riparian vegetation to become reestablished in riparian areas now occupied by road beds (Switalski, Bissonette et al. 2004). Approximately 6.72 miles with of proposed road decommissioning will occur in Riparian Reserves. A total of 32 stream crossings as shown in Table 10 below will be restored by proposed road decommissioning. As vegetation becomes reestablished at these crossings, it is expected that road-related sediment transport to aquatic ecosystems will be reduced (Madej 2000; Keppeler, Cafferata et al. 2007). This also supports ACS objectives 2, 3, 4, and 5, in the Little Butte Creek Key Watershed by reducing compaction and by revegetating approximately 14.3 acres of decommissioned roadbeds within Riparian Reserves.[2]

Table 8: Stream Crossings in Decommissioned Roads by Subwatershed and Stream Class, Little Butte Creek

6th Field Subwatershed	Class II	Class III	Class IV
Beaver Dam Subwatershed		1	7
Middle South Fork Subwatershed			6
Upper North Fork Subwatershed			8
Upper South Fork Subwatershed	1		9
Total	1	1	30
Source: USFS GIS, (See Appendix)			

[2] Assumes a 20 foot average road width.

Draft Working Paper

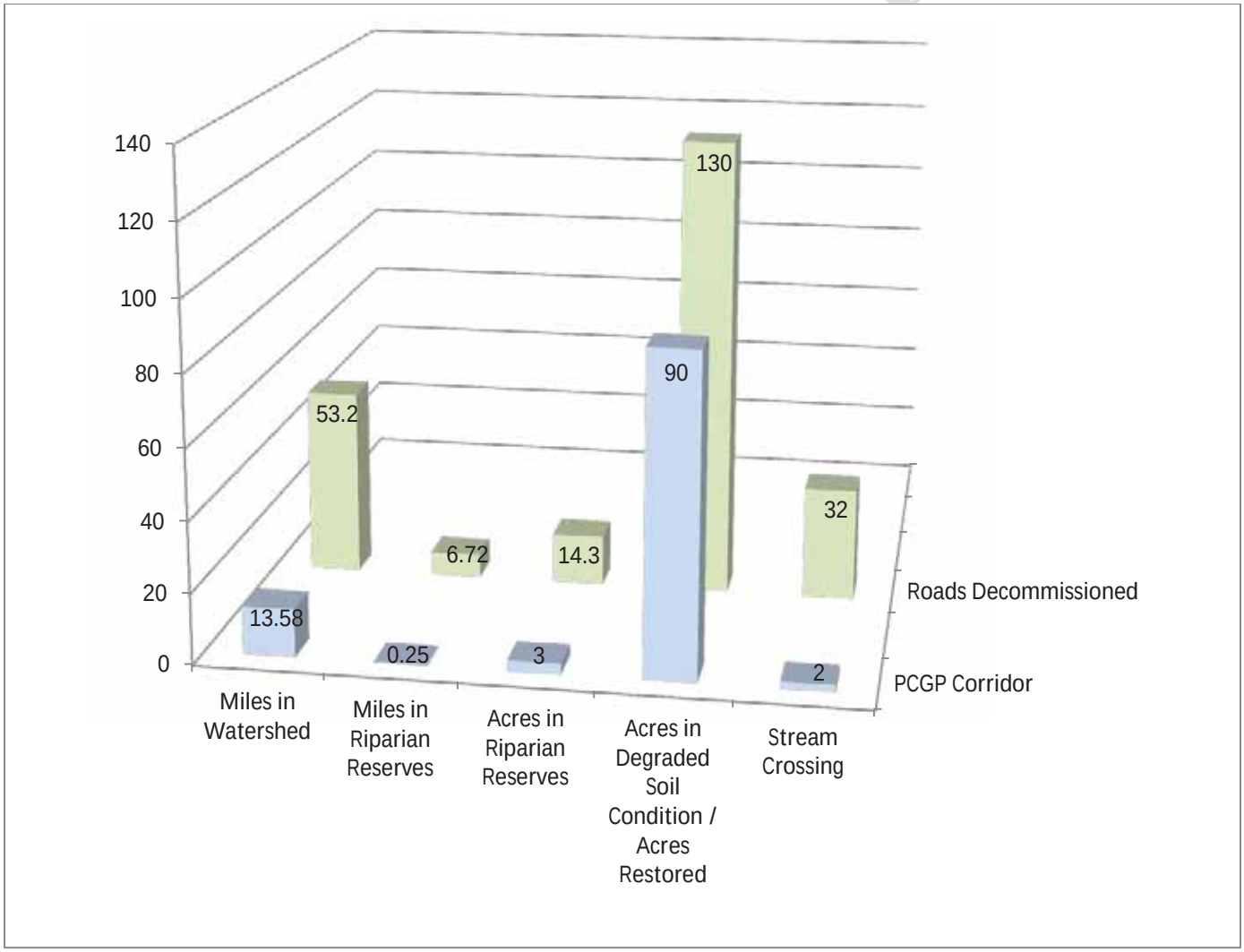
Table 9: Comparison of PCGP Effects and Proposed Road Decommissioning: Little Butte Creek Tier 1 Key Watershed

Rogue River NF	Miles in Watershed	Miles in Riparian Reserves	Acres in Riparian Reserves	Acres in Degraded Soil Condition / Acres Restored	Stream Crossing
PCGP Corridor	13.58[1]	0.25[1]	3[1]	60-90 degraded[2]	1 Class II[3] 1 Class IV
Proposed Decommissioned Roads[4]	53.2	6.72	14.3	130 Restored	1 Class II, 1 Class III 29 Class IV

Sources:
1. FERC FEIS Table 4.7.4.2-1, page 4.7-72
2. FERC FEIS, p 4.2-29
3. FERC FEIS, Table G-4, page G-29
4. USFS GIS Analysis, (See Appendix)

Paper

Comparison of PCGP Effects and Proposed Road Decommissioning: Little Butte Creek Tier 1 Key Watershed



Road Decommissioning Effects on Wildlife Habitats: Although the PCGP has been routed to avoid key wildlife habitats as much as possible, the project will create edge effects that may impact interior stand microclimates and cause habitat fragmentation with LSR 227 that cannot be avoided (FERC 2009 p. 4.4-41).

Edge: Edge is the effect of an opening on microclimate in adjacent stand (Hunter Jr. 1990; Chen, Franklin et al. 1993). Edge effect introduced by roads is highly variable and depends on aspect, road width, vegetation crossed and other variables. Edge effects are greatest when there is a high contrast in structure and composition between a newly created opening and the adjacent landscape (Harper, Macdonald et al. 2005 p. 768). Thus, edge effects are greatest when they impact interior stand habitats of older trees and least when the new opening is similar to the surrounding landscape such as adjacent to an existing road or in a recent clearcut

Decommissioning roads with appropriate restoration measures would presumably reverse edge and habitat fragmentation caused by existing roads and create habitat for a variety of animals (Switalski, Bissonette et al. 2004). The effect of edge reduction by road decommissioning is highly variable for the same reasons described for the edge effects created by constructing a road. Agency field experience has shown that road decommissioning reduces edge effect over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with density management proposed for adjacent plantations would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years as planted trees became pole sized (5-9 inches DBH and 20-40 feet tall). Published data on rate and pattern of edge reduction associated with decommissioning roads is not available (Baker 2011) but a comparison of the predicted beneficial effect of road decommissioning to edge effects associated with the PCGP corridor is useful, even if based on assumptions.[3] Using an assumed edge reduction of over time of 50 feet on each side of the road, decommissioning roads would reduce existing road-related edge effects on an estimated 640 acres (53.2*5280*100/43560)

Liner edge provides another measurement of edge effect. Approximately 13.58 miles of the PCGP corridor are located within LSR 227, creating 27.16 miles of new edge within LSR 227. Proposed road decommissioning will revegetate 53.2 miles of roads, removing approximately 106.4 miles of existing edge.

Fragmentation: Fragmentation can be described in several different contexts. Fragmentation in the context of impacts on the LSR land allocation is the process of reducing the size and connectivity of stands that compose a forest (USDA FS; USDI BLM 1994c Glossary, p. 7). The conversion of large tracts of old-growth forest to small, isolated forest patches with large edge areas can create changes in microclimate, vegetation species, and predator-prey dynamics (FERC 2010 p. 4-204). An assessment of fragmentation was conducted by FERC, but that assessment was not specific to LSR 227 with respect to patch size (FERC 2010 p. 4-198).

To provide an indication of the effects of the PCPG corridor and proposed road decommissioning on fragmentation, the Forest Service conducted a stand-level analysis considering stands that fell within 100

[3] This approach is consistent with CEQ Regulations for NEPA, 40 CFR 1508.22

Draft Working Paper

meters of the proposed pipeline corridor. All stands that overlapped the 100 meter buffer were included in the analysis out to the stand edges beyond the buffer. The only changes examined in this analysis were natural growth and development of trees and the off-site mitigation activities. Natural events, such as wildfire and storms, were not modeled because of their stochastic nature and the relatively limited size of the analysis area. Within the modeled stands, it was assumed there would be no forest management harvest activities during the 60 years modeled beyond activities already planned. Future management activities would need to be consistent with the existing forest plan at the time the project is implemented.

Construction of the pipeline will result in the fragmentation of mature forest in LSR 227, and will increase the fragmentation index (ratio of edge: acres) in modeled stands (those within 100 meters of the pipeline) by about 1%.[4] After 60 years, normal stand growth will reduce this ratio by about 3%. With implementation of proposed road decommissioning the ratio of edge: acres will decrease about 34%. A decrease in the ratio of edge to opening means that patch sizes of forested areas has increased. LSR 227 currently has 1,445 patches of mature forest greater than 1 acre in size that lie within 100 meters of the edge of the PCGP corridor Pipeline construction increases fragmentation slightly by passing through and dividing eight of these patches, with a net increase of 5 patches. The current average patch size throughout the LSR is approximately 7 acres, and this is not projected to change within the next 60 years. With the proposed road decommissioning and road closures, the size of patches within 100 meters of the pipeline will increase to an average of 14.5 acres within 60 years. This is consistent with a reduction in the edge to opening ratio discussed above.

In terms of interior patches (mature forest areas that are at least one acre in size and at least 300 feet from a hard edge) there are currently 779 interior patches in LSR 227. Eight of these (about 1% of the interior patches) would be fragmented by the pipeline corridor. In 60 years, interior patches are projected to increase to 856 interior patches – a 9% increase from the current condition. With the proposed road decommissioning, the number of interior patches will increase by about 16% to 927, and the average size of the patches will increase from about 6.5 acres to 13.9 acres – about a 50% increase in size. (USDA FS; RRNF 2010)

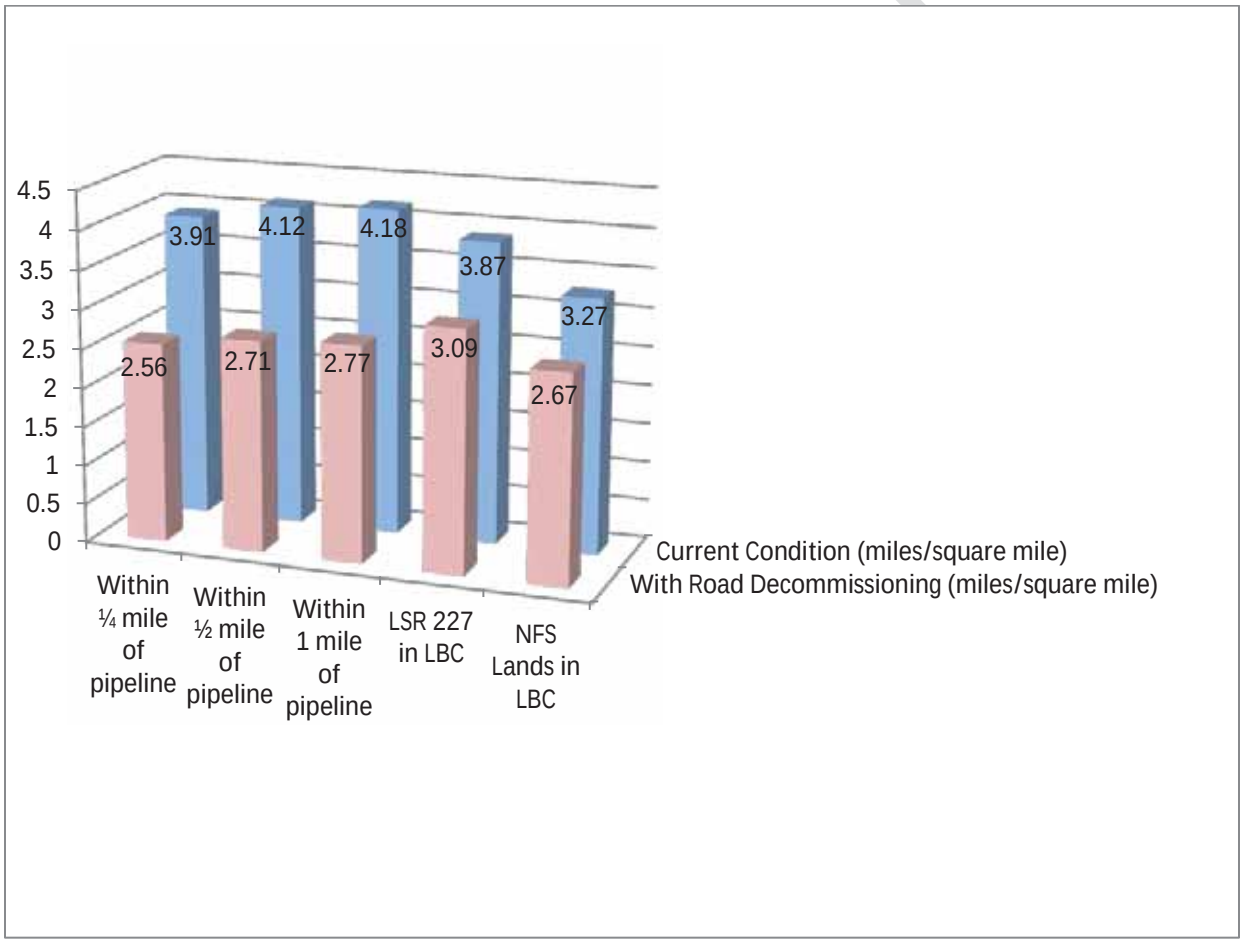
Draft Working Paper

[4] Changes in edge: area ratios are more meaningful as relative numbers rather than absolute values, so percentages are used to express changes in values.

Table 10: Change in Road Density with Implementation of Mitigation Plan: RRNF, LSR 227 in Little Butte Creek Tier 1 Key Watershed

Rogue River NF	Current Condition (miles/square mile)	With Road Decommissioning (miles/square mile)	Change in Road Density with Decommissioning (miles/square mile)
NFS Lands in LBC KWS	3.27	2.67	-0.6
LSR 227 in LBC KWS	3.87	3.09	-0.78
Within 1 mile of pipeline	4.18	2.77	-1.41
Within ½ mile of pipeline	4.12	2.71	-1.41
Within ¼ mile of pipeline	3.91	2.56	-1.35
Source: USFS GIS Analysis, (See Appendix)			

Change in Road Density with Implementation of Mitigation Plan: RRNF, LSR 227 in Little Butte Creek Tier 1 Key Watershed



Paper

Summary comparison of project effects or current condition and effect of proposed road decommissioning mitigation

	Road Density, LSR 227, miles / square mile[1]			Linear Miles of Edge				
PCGP Effect / Current Condition	3.87 (Current Condition)			27.16 miles created edge				
With Proposed Road Decom-missioning	3.09			106.4 miles edge removed				

Source:
1. **USFS GIS, Decommissioning Analysis (See Appendix)**
2. **FERC FEIS Table 4.7.4.2-1, page 4.7-72**
3. **FERC FEIS, Table G-4, page**

Table XX below provides a summary comparison Direct and indirect edge effects compared to effects of proposed mitigations are compared in Table XX below

RRNF, LSR 227	LSOG Acres	Total Acres, all age classes	Miles of Edge Created	Miles	
Direct Effects	67[1]	203[1]	13.58		
Indirect Effects-	874[2]				

Sources:
1. Table 2.1-1a, CMP, page L3-15, CMP
2. TABLE 4.3.5.3-13, page 4-206, FERC BA, 2010

Draft Working Paper

Large Woody Debris (LWD

The purpose of placing LWD in old harvest units is to meet forest plan objectives for LSR. The primary management objective of LSR is to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl (USDA FS; USDI BLM 1994b p. C-11). The South Cascades LSRA described a desired condition that includes LWD

ADD RECOVERY PLAN ACTIONS

WHEN WRITING ABOUT UMPQUA, HIGHLIGHT THAT ROAD DECOM NOT THAT BIG AN OBJECTIVE BECAUSE PART OF THE LAND IS MATRIX, AND NOT KEY WATERSHED.

LWD projects are necessarily limited by the number of pieces available from the corridor. The original proposal was based on preliminary estimates of available LWD from the corridor and did not account for pieces needed for corridor rehabilitation. As a result, the original proposal overestimated the acres that could be treated. Because of uncertainty in the number of pieces available projected treatment area is revised from 600 acres to an estimated range of 200-400 acres. Also, an instream project has been added which further reduced the number of pieces available for terrestrial LWD projects. Proposed LWD terrestrial units are shown in Figure 4, below.

In-stream Large Woody Debris, South Fork, Little Butte Creek:

This is a new mitigation project. Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). The proposed instream LWD project is shown in Figure 4, below.

Developed an Alternative Matrix to LSR Reallocation:

In response to scoping comments, an alternative matrix to LSR land allocation change has been developed that better matches the quality of habitat impacted by the PCGP. See Figure 3 below.

The purpose of this mitigation is to ensure that the Forest Plan objectives for Late Successional Reserve land allocation are achieved by adding acres from the matrix land allocation to LSR 227 to replace LSR acres impacted in the PCGP corridor. The Proposed Action would reallocate approximately 595 acres from matrix to LSR as shown in Figure 3 below. Scoping comments on the Proposed Action suggested that the matrix lands proposed for reallocation were of a lower quality habitat than that in the PCGP corridor and thus, may not adequately offset impacts to the LSR land allocation. In response to the scoping comments, the Forest Service developed an alternative proposal shown in Figure 3 that would reallocate approximately 512 acres from matrix to LSR. This alternative was developed to better represent types of habitat impacted in LSR 227 by the PCGP corridor. The Proposed Action and Alternative 1 are shown together in Figure 3 and compared in Tables 6, 7 and 8, below.

Compared to the Proposed Action, Alternative 1:

- Provides more contiguous habitat with fewer openings and less non-suitable habitat than the Proposed Action (See Figure 3 below).

Draft Working Paper

- Provides 50 more acres of NSO suitable habitat than the Proposed Action as shown in Table 7, below.
- Provides 63 more acres of LSOG than the Proposed Action as shown in Table 6 Additionally, as shown in Table 6, the old growth component of the LSOG age class has substantially more acres in Alternative 1 than in the Proposed Action.

Based on Tables 6, 7 and 8, Alternative 1 clearly provides larger amounts of higher quality habitat than the Proposed Action to replace habitat lost in the PCGP corridor.

When acres reallocated from matrix to LSR are compared to the acres removed in the LSR by the PCGP, the Proposed Action reallocates approximately 2.5 times more acres from matrix to LSR than are cleared by the PCPP; Alternative 1 reallocates approximately 3 times more acres to LSR than are cleared. When impacts to NSO habitat in LSR are considered, the Proposed Action reallocates approximately 4 times more suitable NSO habitat to LSR than is removed by the PCPG; Alternative 1 reallocates approximately 4.7 times more suitable NSO habitat to LSR than is removed by the PCGP corridor. When impacts to LSOG in LSR are considered, the Proposed Action reallocates approximately 4 times as many acres to LSR as are removed by the PCGP; Alternative 1 reallocates approximately 5 times as many acres of LSOG to LSR as are removed by the PCGP(see Table 8, below).

Draft Working Paper

Figure 2: Proposed Action and Alternative Matrix to LSR Land Reallocation, Rogue River NF

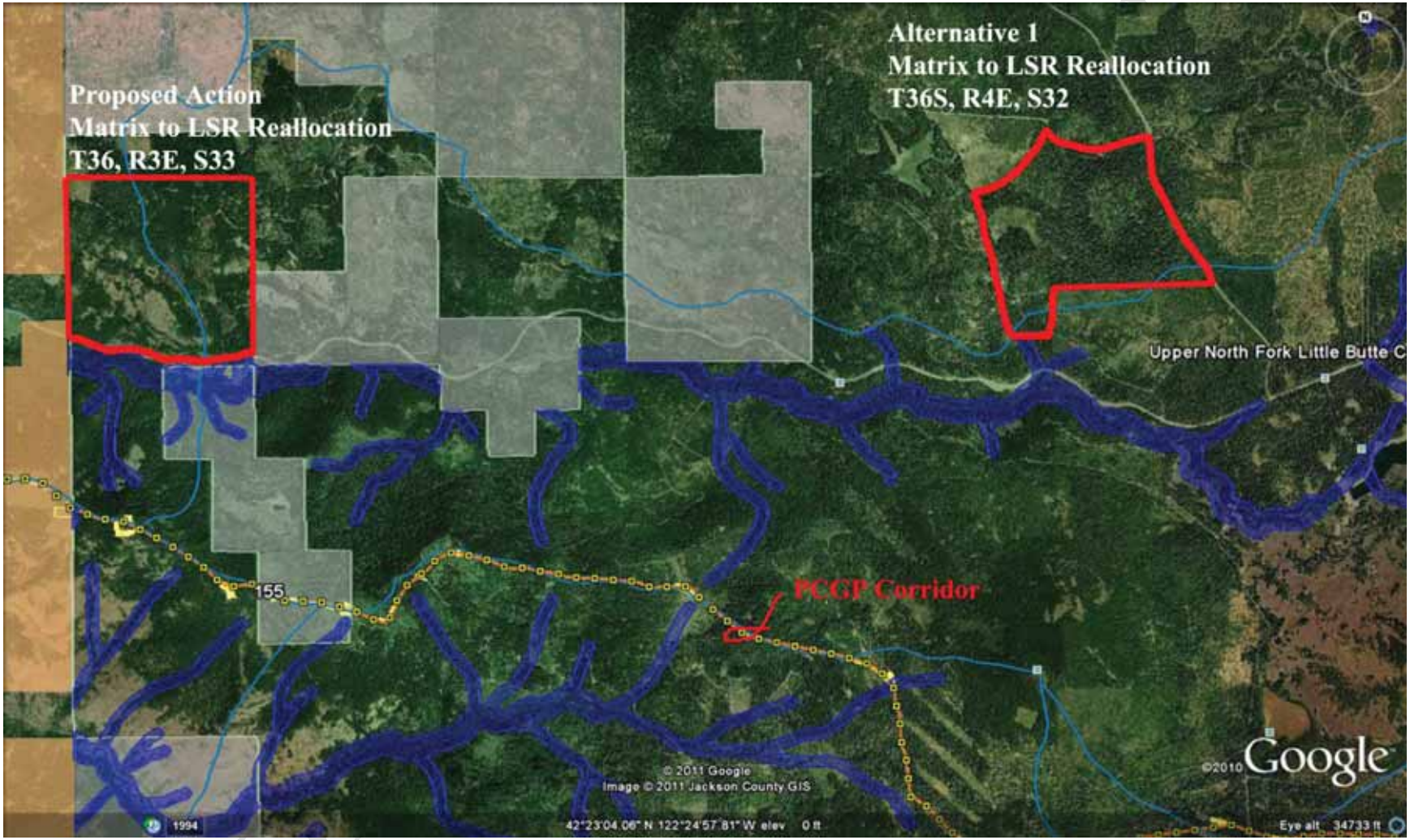
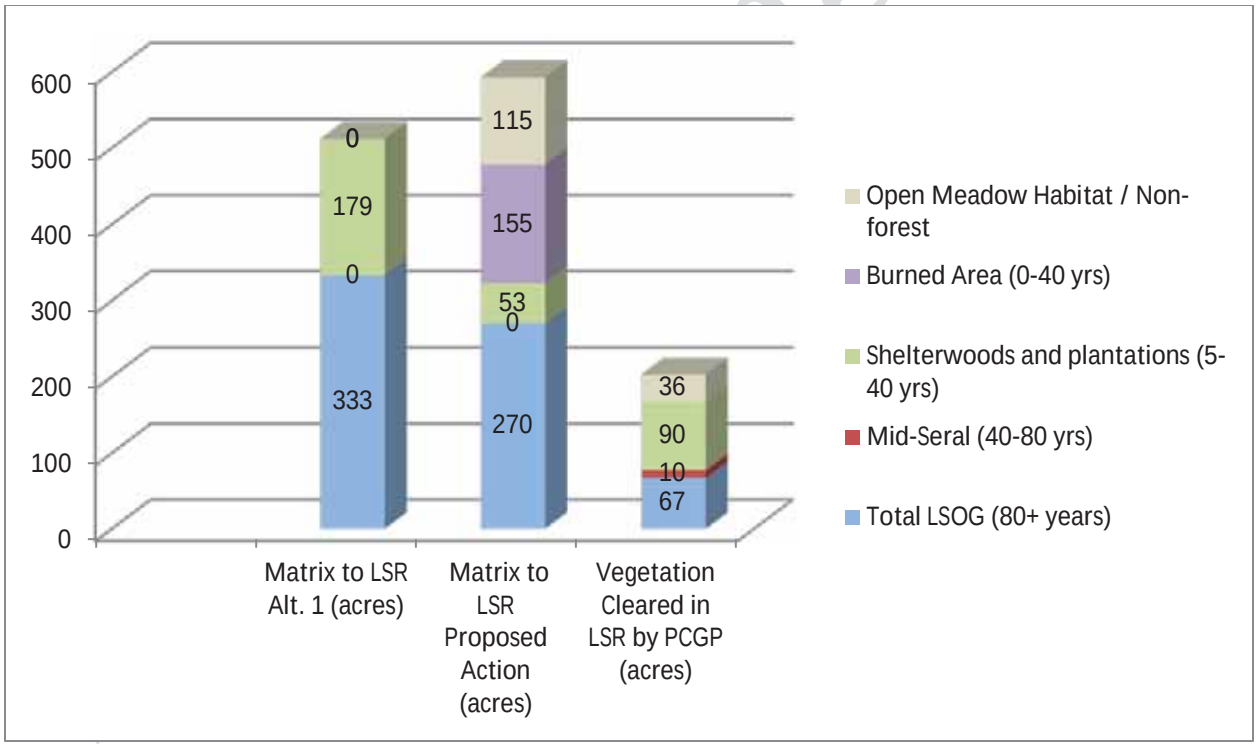


Table 11: Age Class Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 227

Rogue River NF	Total Late Successional and Old Growth (80+yrs)	Mid-Seral (40-80 yrs)	Regenerating Shelterwood and plantations (5-40 yrs)	Regenerating Forested Burned Area (0-40 yrs)	Open Meadow Habitat or non-forest	Total All Age Classes
Reallocation of Matrix to LSR Proposed Action (acres)[1]	270	0	53	155	115	593
Reallocation of Matrix to LSR Alternative 1 (Acres)[1]	333	0	179	0	0	512
Acres of Vegetation Cleared in LSR by PCGP Corridor (acres)[2]	67	10	90	0	36	203

Sources:
1. Cox, 2010. Age Class and NSO Habitat Acre Summary, Matrix to LSR Conversion (See Appendix)
2. FERC FEIS Appendix L, Table 2.1-1a

Age Class Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 227



g Paper

Table 12: NSO Habitat Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 227

				NSO Habitat Type
Rogue River NF	**Suitable**	**Dispersal Only**	**Non-Suitable/ Capable but not currently suitable[3]**	**Total Acres**
Alternative 1 Reallocation of Matrix to LSR (Acres) [1]	**320**	**13**	**179**	**512**
Proposed Action Reallocation of Matrix to LSR (Acres) [1]	**270**	**0**	**323**	**593**
Habitat Cleared in PCGP Corridor and TEWAs[2] (LSR Acres)	**68**	**62**	**73**	**203**

Sources:

1. **Cox, 2010. Age Class and NSO Habitat Acre Summary, Matrix to LSR Conversion (See Appendix)**
2. **FERC Biological Assessment, Table 4.3.5.3-14, page 4-204. LSR 227, West Cascades Physiographic Provinces**
3. **In this comparison, the Forest Service lumped capable but not currently suitable and non-suitable habitat for simplicity of comparison with matrix to LSR reallocation. See Cox, 2010, in the appendix for a breakdown of acres.**

NSO Habitat Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 227

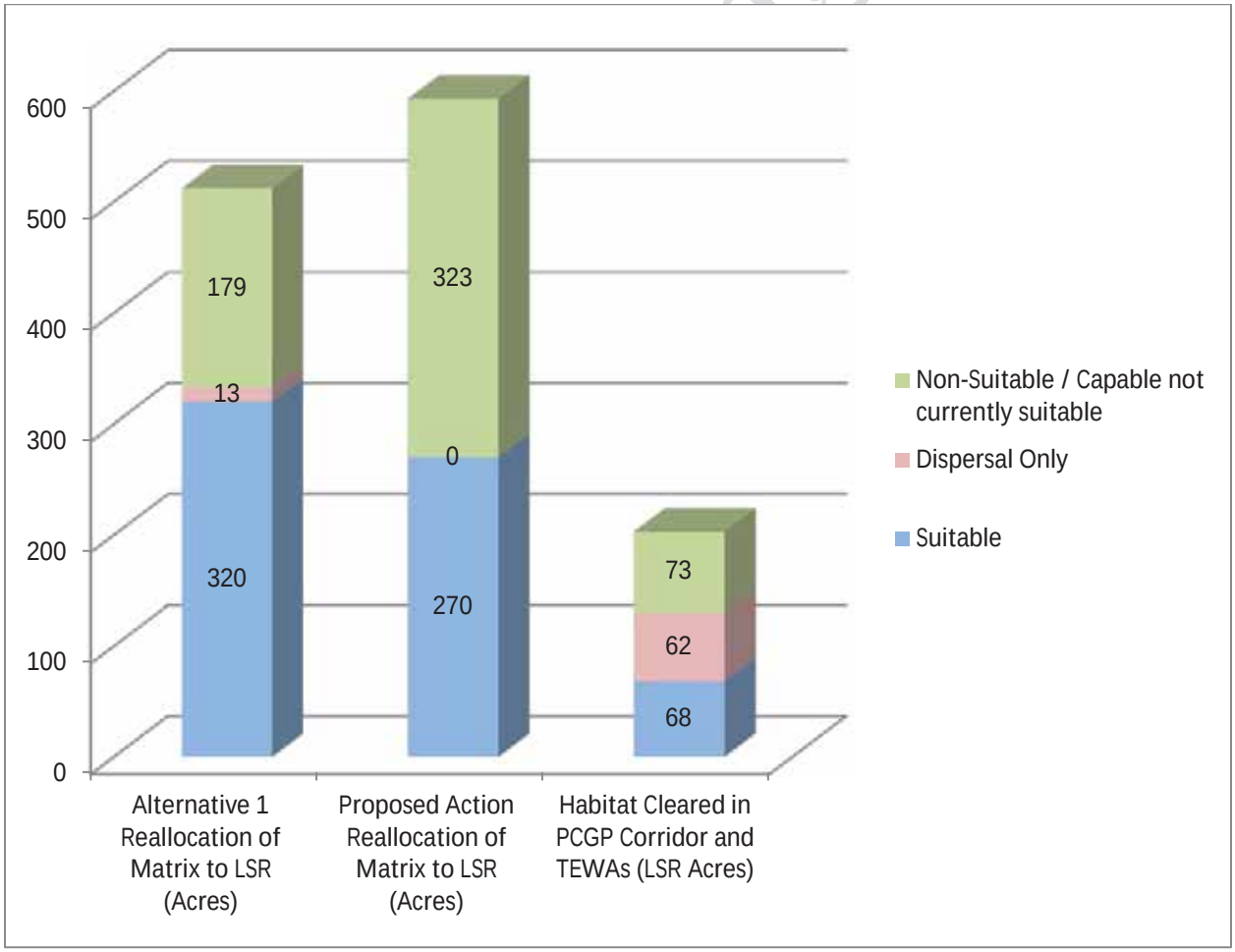
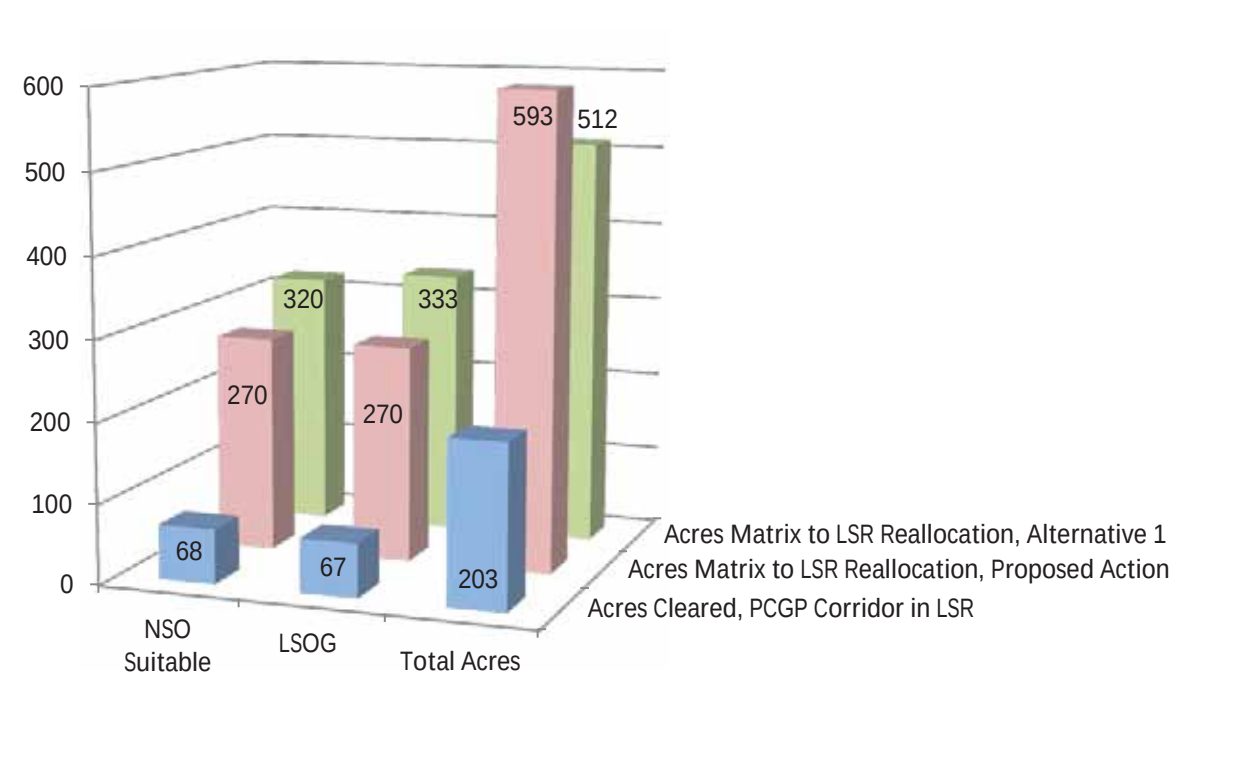


Table 13: Summary, NSO Suitable Habitat and LSOG: Comparison of Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 227

Rogue River NF	NSO Suitable Acres	LSOG Acres (80 Years+)	Total Acres
Acres Cleared, PCGP Corridor in LSR	68[1]	67[2]	203[2]
Matrix to LSR Reallocation, Proposed Action[3]	270 (Ratio acres reallocated to LSR NSO Suitable acres cleared: 4.0:1)	270 (Ratio acres reallocated to LSR LSOG acres cleared: 4.0:1)	593 (Ratio acres reallocated to total LSR acres cleared 2.9:1)
Matrix to LSR Reallocation, Alternative 1[3]	320 (Ratio acres reallocated to LSR NSO Suitable acres cleared: 4.7:1)	333 (Ratio acres reallocated to LSR LSOG acres cleared: 5.0:1)	512 (Ratio acres reallocated to total LSR acres cleared 2.5:1)

Sources:
1. FERC Biological Assessment, Table 4.3.5.3-14, page 4-204. LSR 227, West Cascades Physiographic Provinces
2. FERC FEIS Appendix L, Table 2.1-1a
3. Cox, 2010. Age Class and NSO Habitat Acre Summary, Matrix to LSR Conversion (See Appendix)

Summary, NSO Suitable Habitat and LSOG: Comparison of Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 227



Road Decommissioning (53.2 miles)

See Figure XX below for a map of proposed decommissioning projects.
Upland Terrestrial Restoration

Stand density (600 Acres): Precommercial thinning is proposed for overstocked plantations to accelerate the development of late-successional and old-growth forest characteristics in LSR 227. Managing stand density will increase growth rates, decrease susceptibility to stand replacing fire and diversify stand structure in otherwise relatively homogenous stands. This accelerated development will also reduce fragmentation and reduce edge effects and will help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused disturbances. All 600 acres are within 0.5 miles of the pipeline right-of-way. Placing the off-site mitigation activities close to the actual pipeline corridor increases their effectiveness by impacting lands within, or near, the home ranges of individual animals and species impacted by the pipeline habitat changes. As the mitigations address ecological processes like edge effect, placing the mitigation within or near the edge impacts increases the effectiveness of the mitigation by restoring ecosystem structures and processes on some of the acres also impacted by the pipeline. Thinning young stands will, over time reduce existing edge effects. There is no precise way to estimate this edge effect reduction with available date since stands are at many different age classes, perimeters and and canopy closures. The estimated perimeter of the units proposed for thinning is approximately 3.0 miles. Assuming some edge reduction within 100 of the edge of these units, density management would reduce edge effects over time by an estimated 36 acres(3*5280*100/43560).

Fuels treatments for the slash generated by stand density management are decided on a case-by-case basis and rely on slash loading information as well as proximity to roads and other factors. Slash treatments may be as simple as lop and scatter to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling and burning or removal of slash from the site.
Snag Creation (600 acres): Snag creation is proposed as a mitigation to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags will be lost from the pipeline corridor to facilitate pipeline construction or to mitigate safety hazards for construction workers.

Approximately 1200 snags will be created by blasting tops from live trees (preferably trees with existing decay that makes them more suitable for cavity-nesting birds and/or as denning sites) or by inoculating living trees with heart rot decay fungi. Sites selected for snag creation will be within ½ mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the pipeline corridor. Sites will be in mid-successional stands or around the edges of early successional stands that are currently deficient in snags as defined by Plant Association Group for Cascade White Fir forests. Stand data for these plant associations (which is an indication of undisturbed forest snag levels) shows that these stands have an average of about four snags/acre in the 11-20 inch diameter range and an additional four snags/acre greater than 20 inches in diameter.

If the tree diameters in the stands prevent snag creation in the >20” diameter size class, additional snags in the smaller size class (11-20” diameter) will be created to make up for the deficit. For sites bordering

Draft Working Paper

early successional stands, snags will be created within 100 yards of the stand boundary at the same trees/acre levels described above.

Large Woody Debris Placement in Plantations: Large wood placement in plantations is proposed to accelerate the development of late-successional and old-growth characteristics by restoring this habitat component to plantations where large woody debris (LWD) is lacking. Any wood used in this mitigation will come from the PCGP corridor. No additional trees outside the corridor will be harvested to provide large woody debris, so this mitigation is necessarily limited by the amount of LWD that can be provided from the corridor. LWD used in this mitigation will be staged at appropriate locations and placed with a helicopter. The standard for this mitigation is provided by the RRNF Plan and is noted for both soils productivity and wildlife habitat in numerous citations:

"At a minimum, a "moderate" amount of LWD will be left after project completion. The moderate range is 10-20 pieces of Class I and II logs and all Class III, IV and V logs…

The first priority in restoration with respect to LWD is to ensure that that the PCGP corridor itself meets Forest Plan standards after construction is completed. After LWD standards within the corridor have been met, any additional LWD would be available for placement in adjacent units identified below.

Large wood will be placed in plantations that are also receiving stand density management treatment. The large wood will be from trees cut from the pipeline corridor. Sites selected for down woody material placement will be within ½ mile of the pipeline right-of-way. As with the other off-site mitigations, placement of the mitigation activities close to the pipeline corridor can benefit species that are impacted by the vegetation changes within the corridor and will make these mitigations more effective. Sites will be in early successional stands that are currently deficient in downed wood (as defined by Plant Association Group for Cascade White Fir forests).

The large wood placement piece count / acre is expected to vary to account for some of the range in variability found across the landscape. For 11-20" diameter logs treatments will average about 10 pieces on each treated acre but densities will vary from 8 to 33 logs/acre. For 20"+ diameter logs an average of 5 pieces will be placed on each treated acre, but densities will vary from 3-12 logs/acre. Logs will be approximately 40' in length, and the specified diameter (11-20" and 20+") refers to the stem diameter at the midpoint of the 40' log.

Table XX below describes the proposed placement of CWD material. Unit numbers correspond to the attached map for CWD placement. Because piece counts of available wood are uncertain and highly variable a precise prediction of treatable acres cannot be made. With the limitations of available information, approximately 200 - 400 acres could be treated. Target numbers in Table XX below are upper bounds. Any increase in LWD in areas where LWD is deficient will be beneficial. If additional pieces of LWD and funds are available, additional units shown in Figure XX below may be treated.

Table 14: LWD Placement Objectives

Draft Working Paper

Unit Name	Prescription Level	Potential Acres	Existing 11-20" diameter logs/ac	Target 11-20" logs/ac 40'	Existing 20"+ diameter logs/ac	Target 20+" logs/ac 40'
CWD 13	1.5	10	0.0	24.9	0	9.0
CWD 15a	1.0	340.0	8.7	16.6	5.1	6.0
CWD 15b	2.0	48	8.7	33.2	5.1	12.0
Totals		398				

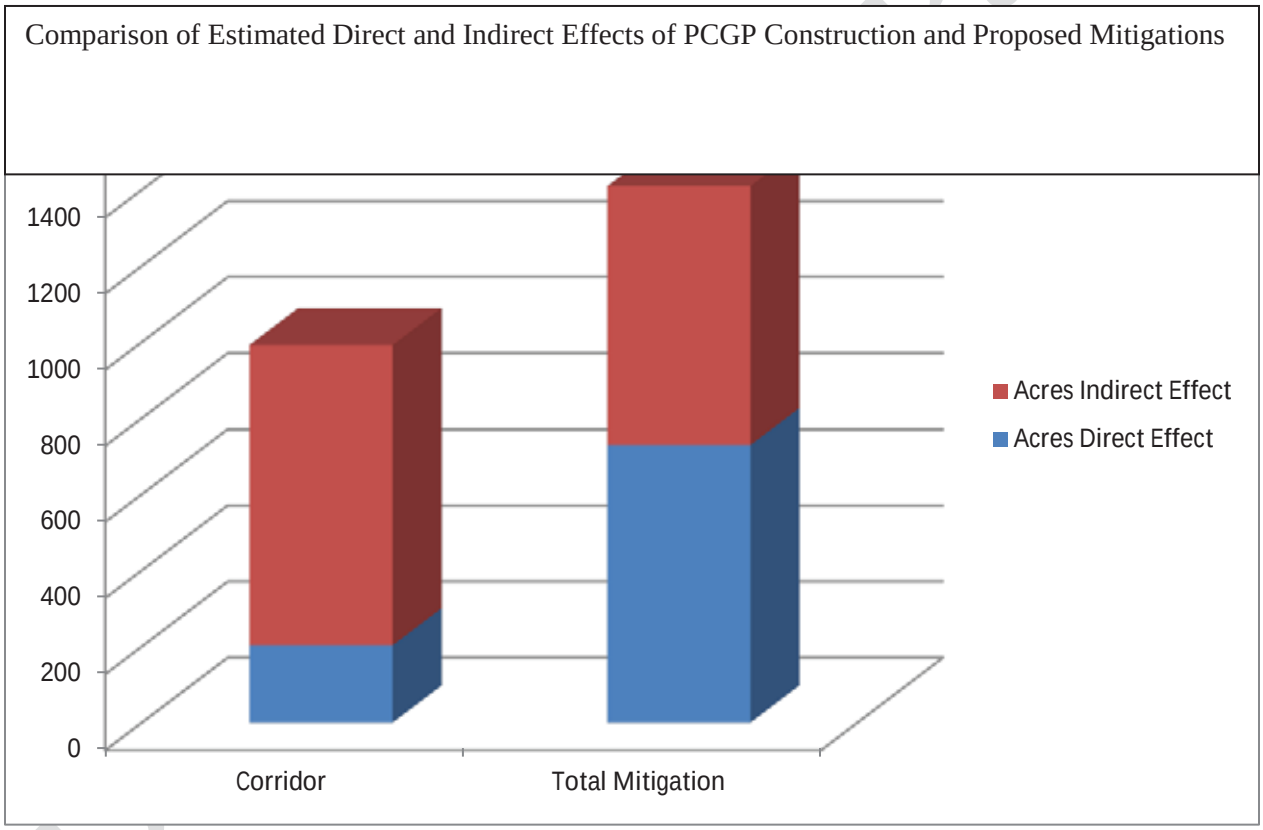
Comparison of total direct and indirect effects of project and mitigations on edge effects:
Acres of direct and indirect effects of the PCGP and the acres of direct and indirect effects of various mitigations as related to edge effect are shown in Table XX below. For the purposes of this comparison, indirect effects of the corridor are modeled by age class of vegetation and an associated estimate of edge effects. There is no precise method for predicting indirect effects so assumptions used for presenting this information follow.

- Indirect effects for LSOG (67 acres in corridor) are estimated to extend 600 feet on each side of the corridor. LSOG (80 years +) trees range from 100 to 180 feet depending on age. An average of 150 feet, or 4 tree heights is used for each side of the corridor.
- Indirect effects for mid-seral vegetation (10 acres in corridor) are estimated to extend 200 feet each side of the corridor. Mid seral trees are 80-100 feet tall, so this is approximately 2 tree heights each side of the corridor.
- Estimates of indirect effects in early seral or non-forested (126 acres) areas are estimated to extend 50 feet each side of the corridor.
- Indirect effects of road decommissioning are estimated to extend 50 feet each side of the decommissioned road in all vegetation classes.
- The indirect effect of stand density management is estimated to extend 100 feet from the perimeter of the unit in all vegetation classes.
- Indirect effects of other mitigations are not considered to reduce edge in this comparison.
- Using these assumptions, combined direct and indirect effects of the project and proposed mitigations are shown in Table XX below.

Draft Working Paper

Table 15: Comparison of Estimated Direct and Indirect Effects of PCGP Construction and Proposed Mitigations

Rogue River NF	Acres Direct Effect	Acres Indirect Effect	Total
Corridor	203	789	992
Road Decommissioning	129	645	774
Stand Density Mgt. and other Terrestrial Mitigations.	600	36	636
Total Mitigation	729	681	1410
Sources: FERC FEIS Table 2.1-1a, USFS Estimates of Direct and Indirect Effects. (See Appendix)			



Rogue River NF	Acres Direct Effect[1]	Acres Indirect Effect[1]	Total
Corridor	219	874	992
Road Decommissioning[2]	129	645	774
Stand Density Mgt and other terrestrial mitigations[2]	600	36	636
Total Mitigation Acres	729	681	1410

Sources:
1. FERC FEIS Table 4.6.1.2-14
2. USFS Estimates of Direct and Indirect Effects. (See Appendix)

Comparison of Direct and Indirect Effects of PCPG Construction and Proposed Mitigations

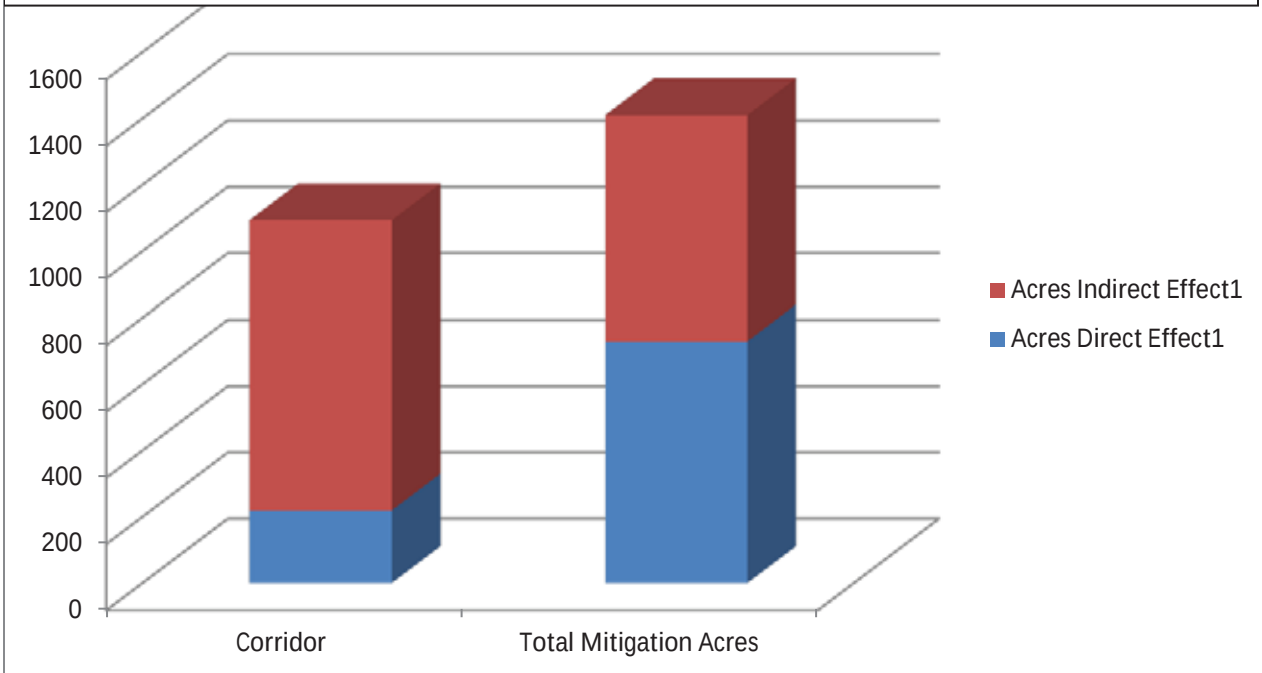
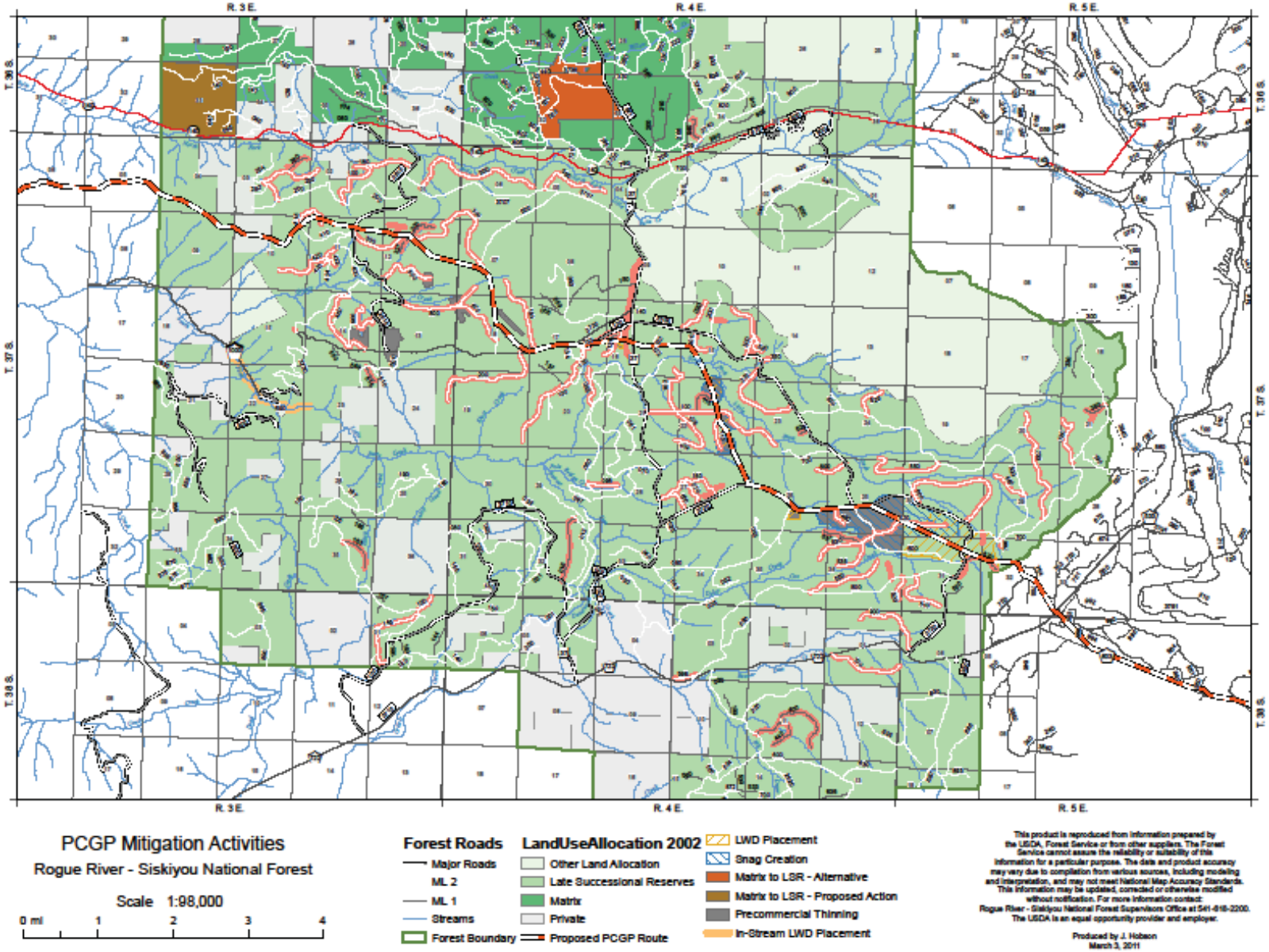


Figure 3: Proposed Mitigation Activities, Rogue River NF



Umpqua National Forest

Introduction: This report adopts and supplements the existing FERC mitigation plan for the Umpqua National Forest found in Appendix L of the FERC FEIS for the purposes of Forest Service decision making. . Land allocations crossed by the PCGP are shown below.

Table 16: Land Allocations Affected by PCGP, Umpqua National Forest

LSR	Matrix	Riparian Reserves	Total
5.89 Miles	5.33 Mile	0.55 Miles	11.77 Miles
Source: FERC FEIS Table 4.7.4.2-1, page 4.7-72			

Modifications to the Mitigation Plan Filed with FERC

Since the FERC FEIS was filed, the Forest Service has revised estimates of large woody debris (LWD) to be placed in units. LWD projects are necessarily limited by the number of pieces available from the corridor. The original proposal overestimated the pieces available and did not account for pieces needed for corridor rehabilitation resulting in more acres proposed than could be treated. Treatable acres decreased from 350 acres in LSR 223 to 100-200 acres based on more accurate estimates of available pieces and pieces needed for LWD rehabilitation within the corridor. No other changes have occurred to the Mitigation Plan filed in the FERC FEIS, however supplemental analysis information is provided in this report for the purposes of Forest Service decision making.

Large Woody Debris Placement in Plantations (100-200 acres)

The first priority in restoration with respect to LWD is to ensure that that the PCGP corridor itself meets Forest Plan standards after construction is completed. After LWD standards within the corridor have been met, any additional LWD would be available for placement in adjacent units indentified below. LWD placement in plantations is proposed to accelerate the development of late-successional and old-growth characteristics by restoring this habitat component to plantations where LWD is lacking. Log placement will occur on an estimated 100-200 acres within LSR 223. Units where LWD may be placed are shown in Figure XX below (Map needs to be clarified for reduced area). Large wood will be placed in plantations that are also receiving stand density management treatment. The large wood will be from trees cut from the pipeline corridor. No additional trees outside the corridor will be harvested to provide large woody debris, so this mitigation is necessarily limited by the amount of LWD that can be provided from the corridor. LWD used in this mitigation will be staged at appropriate locations and placed with a helicopter. Sites selected for down woody material placement will be within ½ mile of the pipeline right-of-way. As with the other off-site mitigations, placement of the mitigation activities close to the pipeline corridor can benefit species that are impacted by the vegetation changes within the corridor and will make these mitigations more effective. Sites will be in early and mid seral stands that are currently deficient in downed wood (as defined by DecAID, Southwest Oregon Mixed Conifer-Hardwood Forest, Larger Trees). The large wood placement piece count / acre is expected to vary to account for some of the range

Draft Working Paper

in variability found across the landscape. The DecAid model outputs recommend managing for approximately 7% cover. Down wood levels for LSRs will be managed for piece sizes between 8 to 60 inches in diameter in all diameter classes to provide habitat for all species. Larger logs maintain moisture longer and are less likely to be fully consumed by fire.

Supplemental Mitigation Analysis

The remainder of this report supplements the FERC FEIS mitigation analysis for the purposes of Forest Service Decision making.

Reallocation of Matrix Lands to LSR

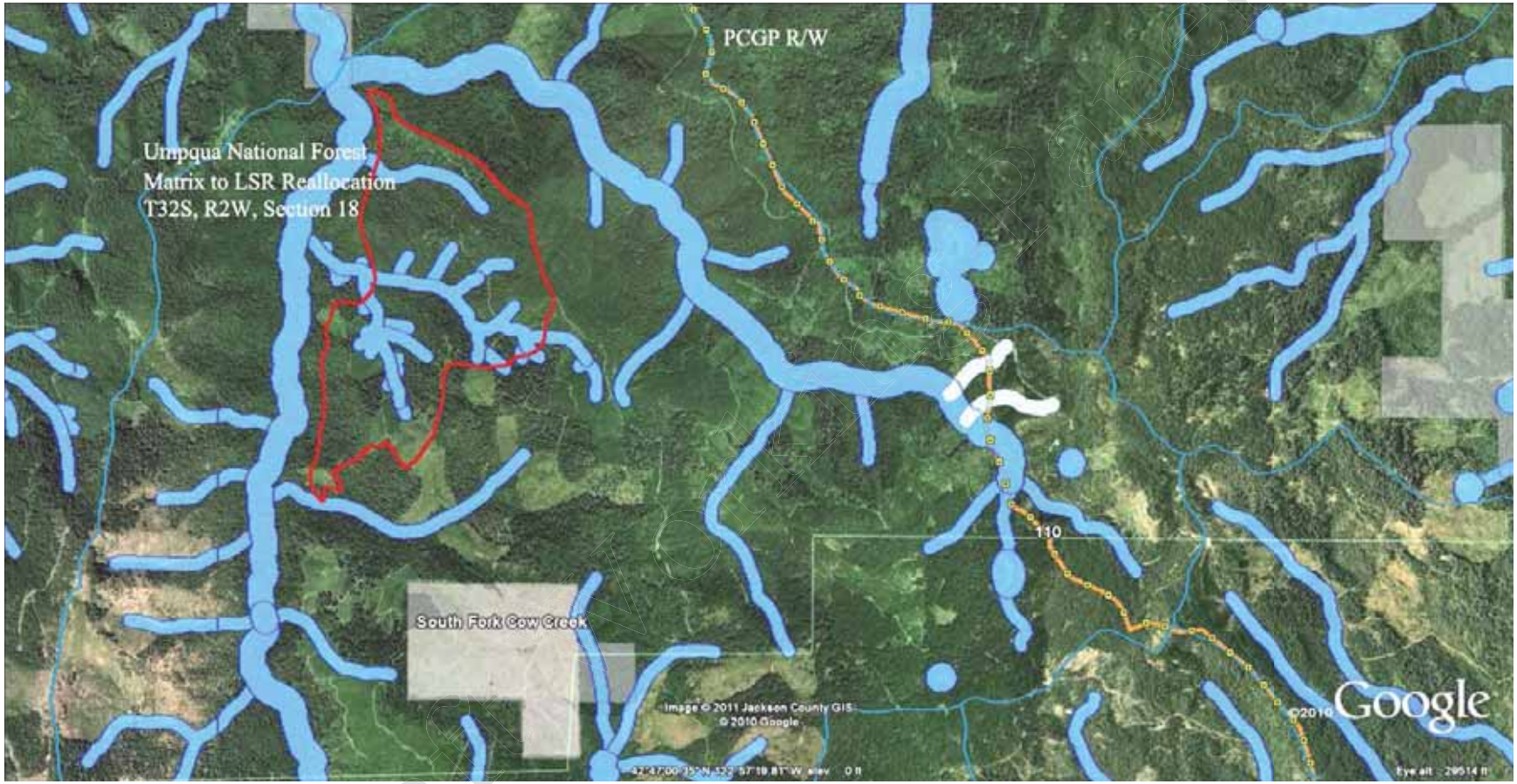
The primary management objective of the Late Successional Reserve land allocation is to protect and enhance conditions of late-successional and old-growth forest ecosystems which serve as habitat for late-successional and old-growth related species including the northern spotted owl (NWFP ROD p. C-9). Late Successional Reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (NWFP ROD p. C-11). Mitigation activities were developed to meet the Standards and Guidelines for Multiple-Use Activities (Developments) (ROD p. C-17) which states "New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects … may be approved when adverse effects can be minimized and mitigated.

The primary mitigation for the effects of the PCGP corridor on the Late Successional Reserve land allocation is to replace those acres of LSR in the corridor with additional acres of late-successional and old-growth habitat that are currently outside of the LSR. This is accomplished by the reallocation of land from the matrix land allocation to the LSR land allocation.

Figure XX shows the proposed matrix to LSR reallocation on the Umpqua National Forest. Table yy and Figure ZZ show the acres by vegetation age class in the proposed matrix to LSR land allocation compared to acres impacted by the PCGP corridor.

Draft Working Paper

Figure 4: Proposed Matrix to LSR Reallocation, Umpqua NF



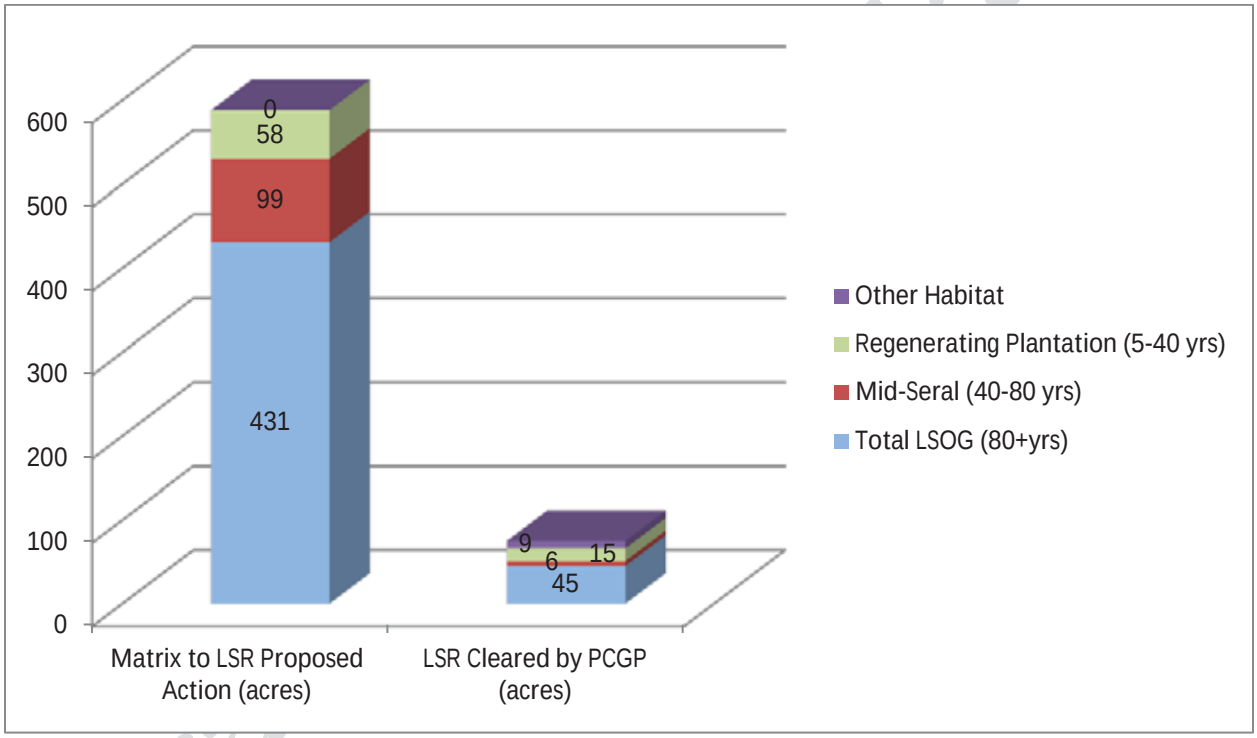
Draft Working Paper

Table 17: Age Class Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 223

Umpqua NF	Total Late Successional and Old Growth (80+ yrs)	Mid-Seral (40-80 yrs)	Regenerating Plantation (5-40 yrs)	Other Habitat	Total All Age Classes
Reallocation of Matrix to LSR Proposed Action (acres)[1]	431	99	58	0	588
LSR Cleared in PCGP Corridor and TEWAs (acres)[2]	45	6	15	9	75

Sources:
1. Cox, 2010. Age Class and NSO Habitat Acre Summary, Matrix to LSR Conversion (see Appendix)
2. FERC FEIS Appendix L, Table 2.1-1a

Age Class Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 223



Draft Paper

Table 18: NSO Habitat Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 223

			NSO Habitat Type	
Umpqua NF	**Suitable**	**Dispersal Only**	**Non-Suitable/ Capable but not currently suitable[3]**	**Total Acres**
Proposed Action (Acres) [1]	**431**	**99**	**58**	**588**
Habitat Cleared in PCGP Corridor and TEWAs (Acres) [2]	**47**	**17**	**10**	**74**

Sources:

1. Cox, 2010. Age Class and NSO Habitat Acre Summary, Matrix to LSR Conversion
2. FERC Biological Assessment, Table 4.3.5.3-14, page 4-204.
3. In this comparison, the Forest Service lumped capable but not currently suitable and non-suitable habitat for simplicity of comparison with matrix to LSR reallocation. See Cox, 2010, in the appendix for a breakdown of acres.

NSO Habitat Comparison: Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 223

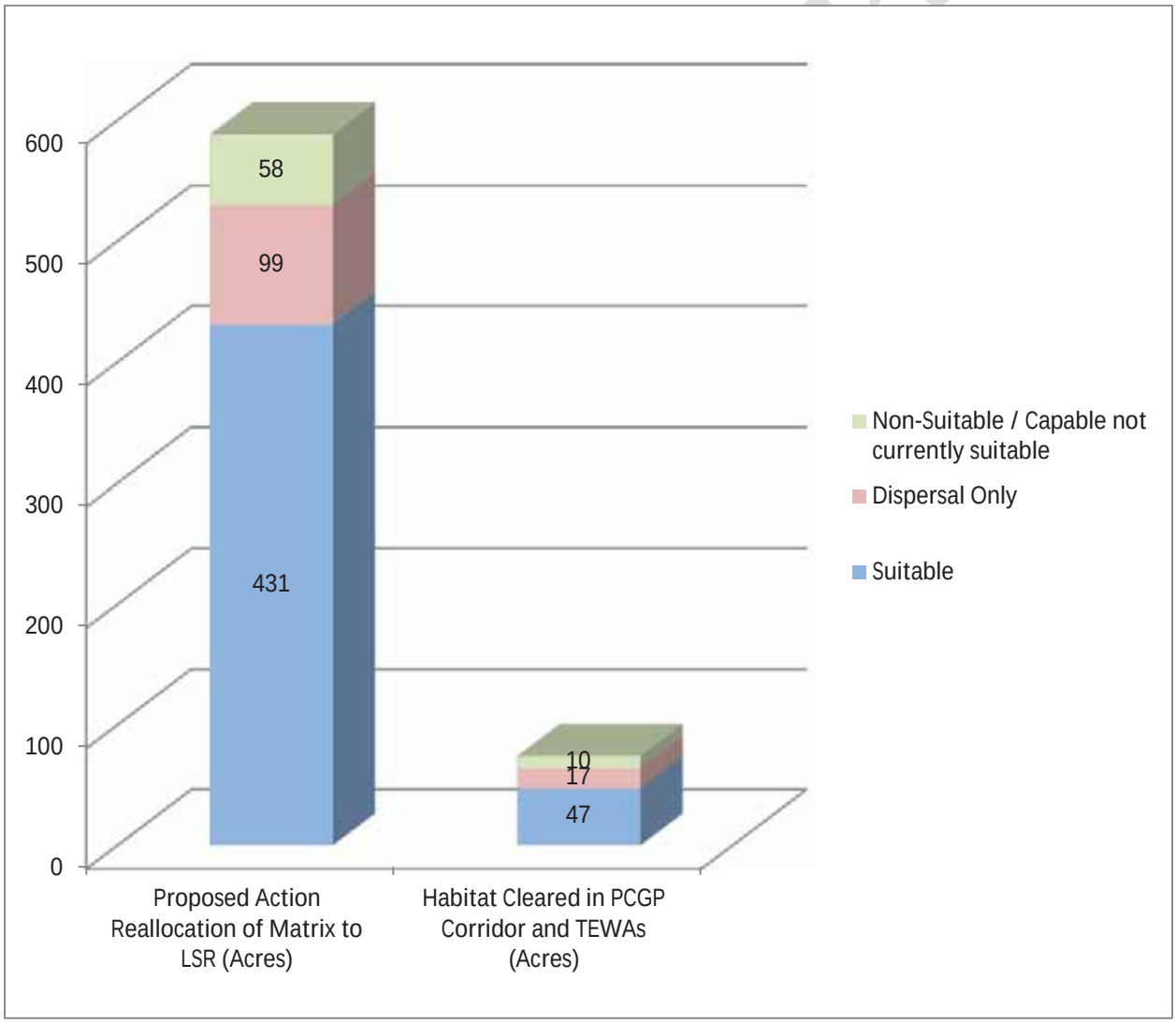


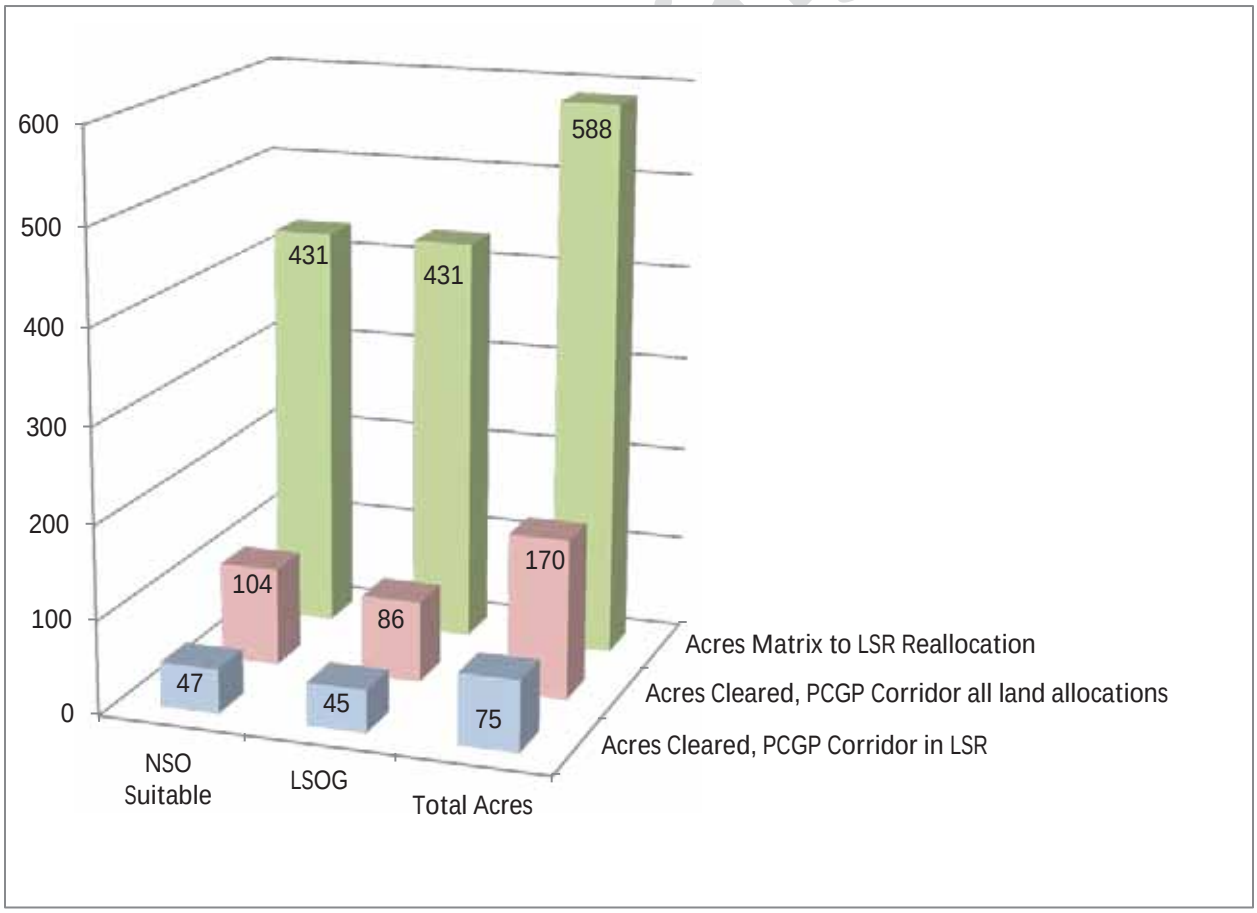
Table 19: Summary, NSO Suitable Habitat and LSOG: Comparison of Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 223

Umpqua NF	NSO Suitable Acres	LSOG Acres (80 years +)	Total Acres
Acres Cleared, PCGP Corridor in LSR	47[2]	45[1]	75[1]
Acres Cleared, PCGP Corridor and TEWAs, all land allocations	104[4]	86[4]	170[5]
Acres Matrix to LSR Reallocation, Proposed Action[3]	431 (Ratio acres reallocated to LSR NSO Suitable acres cleared: 9.2:1)	431 (Ratio acres reallocated to LSR LSOG acres cleared, 9.6:1)	588 Ratio acres reallocated to total LSR acres cleared: 7.84:1)

Sources:

1. FERC FEIS Table 2.1-1A, Appendix L,
2. FERC Biological Assessment, Table 4.3.5.3-14, page 4-208. LSR 227, West Cascades Physiographic Provinces
3. Cox, 2010. Age Class and NSO Habitat Acre Summary, Matrix to LSR Conversion (See Appendix)
4. FERC Biological Assessment, CMP Table 3.1-1a, page CMP-39
5. FERC FEIS, Table 4.4.4.4-2, page 4.4, Construction R/W and TEWAs

Summary, NSO Suitable Habitat and LSOG: Comparison of Matrix to LSR Reallocation vs. Acres Cleared by the PCGP in LSR 223



Offsite Mitigations

Direct and indirect effects of the PCGP corridor are described in the FERC FEIS and BA. Estimated acres affected by direct and indirect effects are shown in Table XX below. For the purposes of this discussion, indirect effects of the corridor are modeled by age class of vegetation and an associated estimate of edge effects. Indirect effects for LSOG (67 acres) are estimated to extend 600 feet on each side of the corridor. Indirect effects for mid-seral vegetation (10 acres) are estimated to extend 200 feet each side of the corridor. In order to offset the direct and indirect effects associated with the corridor on matrix, LSR and Riparian Reserve land allocations, offsite mitigations have also been developed by the Forest Service. These mitigations accomplish address by the direct and indirect effects of the PCGP corridor by:

- Accelerating development of larger trees by precommercial thinning young stands.
- Replacing constituent elements of habitat by placing LWD in units and creating snags.
- Reducing the risk of stand-replacing fire by stand density management, commercial thinning and fuels reduction treatments.
- Reducing habitat fragmentation by decommissioning roads and accelerating the development of interior stand conditions by stand density management
- Reducing the effects of roads on aquatic habitats by stormproofing selected roads
- Providing fish passage where passage is currently blocked by culverts.

The additional off-site mitigations will also increase the effectiveness of the late-successional old-growth habitat added to LSR 223 by improving the quantity, quality and distribution of high-quality late successional habitat as discussed in this report. The off-site mitigations associated with LSR are consistent with the Late Successional Reserve Assessment for LSR 223 and have been presented to the Late Successional Reserve Working Group that provides oversight for vegetation management in LSRs.

Road Decommissioning and Stormproofing

Road decommissioning (7.6 miles) will assist in mitigating the detrimental soil conditions from displacement and compaction that may be present on the pipeline right-of-way after the completion of pipeline construction by restoring soil conditions within off-site decommissioned roadbeds. This will increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from surface erosion within the watershed. Roads proposed for decommissioning are do not significantly reduce road density because they are located in different watersheds.

Riparian Restoration. 10.7 miles of road decommissioning will occur in Riparian Reserves. This will support riparian restoration in the South Umpqua Key Watershed by reducing compaction and by revegetating approximately 25.9 acres of decommissioned roadbeds within Riparian Reserves. Additionally there will be five-stream simulation culvert replacing existing barrel shaped culverts, posing aquatic barriers, thus enhancing aquatic connectivity for approximately 11.3 miles within the South Umpqua River system

Stand Density Management: Stand density management is proposed in early and mid seral Douglas-fir or ponderosa pine plantations that were planted to maximize timber volume and quality. The purpose of the mitigation is to increase growth, health, and vigor of the leave trees remaining in the stands; restore stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime by enhancing and accelerating those physical and biological services for associated

Draft Working Paper

flora and fauna. Additionally, provide biomass for local energy, if marketable; and meet Forest Plan objectives for both the Matrix and Late-Successional Reserve 223 land allocations.
Table XX below displays the acres of density management activities occurring in each land allocation

Table 20: Integrated Stand Density Prescriptions by Land Allocation, Umpqua NF

Treatment Type	LSR 223 Acres	Matrix Acres	Riparian Reserve Acres
PCT	**377**	**40**	**42**
Off-Site Pine Restoration	**398**		**15**
Commercial Thinning	**138**	**406**	**35**
Total	**913**	**446**	**92**
(Source: USFS GIS, Hobson 2010)			

Fuel Break (LSR 223 2,284.6 acres Matrix 1,873 acres)
The purpose of the mitigation is to increase growth, health, and vigor of the leave trees remaining in the stands; restore stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime and to control the spread and intensity of wildfire within forested stands prone to fire activity (USDA 2003 Umpqua). Fuels treatments are decided on a case-by-case basis and rely on fuel loading information as well as proximity to roads and other factors. Slash treatments may be as simple as lop and scatter to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling, burning or removal of fuel from the site for biomass energy.
These mitigations actions will improve the quantity, quality and distribution of late-successional habitat within LSR 223 (2,284 acres) and Matrix (1,873 acres) land allocations by ??????.

Upland Terrestrial (1,200 acres)

Snag Creation (175 acres LSR 223 and 175 acres Matrix)

Snag creation is proposed as a mitigation to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags will be lost from the pipeline corridor to facilitate pipeline construction, mitigate safety hazards for construction workers and from the removal of live trees that would have contributed to future snag habitat.

Approximately 6,300 snags (4,200 within LSR223 and 2,100 within Matrix) will be created by blasting tops from live trees (preferably trees with existing decay that makes them more suitable for cavity-nesting birds and/or as denning sites) or by inoculating living trees with heart rot decay fungi. Sites selected for snag creation will be within ½ mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the pipeline corridor. Sites will be in mid and late seral stands.
The current direction is to manage coarse wood levels on a landscape perspective, use land allocation as a consideration on where levels of coarse may occur overtime. DecAID (a tool for managing snags, partially dead trees, and down wood for biodiversity in forests of Washington and Oregon) is a summary of the best available data on dead wood in Pacific Northwest ecosystems.

Draft Working Paper

http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf It too, provides guidance for managing levels of coarse woody debris. To use DecAID, planning areas should be sufficiently large to encompass the range of variation in wildlife habitat types and structural conditions and as a rule-of-thumb; suggest that planning areas be at least 20 square miles in size (12,800 acres). Generally, 6th-field watershed (Cow Creek watershed) is appropriate scale to use for DecAID. A reasonable objective is to manage for a range of conditions within the area, balancing areas with high densities of dead wood with moderate and low-density areas (Marcot et al. 2005). The reference conditions, as described in the Cow Creek Watershed analysis, estimated the watershed structural condition. As indicated in the Cow Creek WA there are two seral stage that fall below historical structural conditions: establishment and late seral. Both these seral stages have the highest levels of large coarse wood while the other seral stage represents the lower levels of coarse wood. With approximately 70% of the watershed experiencing intensive timber harvest management retaining on an average less than 2 sang per acre, (Table 16, Cow Creek WA) this indicate a need for high levels of snags within the watershed.

Wildlife and inventory data summarized in the DecAID Advisor can be applied to management and planning decisions at a range of spatial scales and geographic extents. The calculated tolerance levels (80%, 50%, 30 %) for wildlife data can be applied to stand-level management. However, it is not advise that a particular tolerance level be applied to all stands across a landscape. Rather, decisions about how to distribute different levels of dead wood across a landscape can be guided by the distribution information from unharvested plots. Without gathering additional data on current coarse wood levels and assuming that private lands will be manage at the lowest tolerance level of coarse wood. for wildlife and forest species. The current density of snag levels within the Cow Creek WA range from 0 to 7 snags per acre (Table 16, Cow Creek WA). Looking at the percent (70%) of the area that have low or no snag density it seem that we should be managing at higher density where possible at this time. Considering the land allocations the location of the size of the project we should be managing for high and moderate sang densities on this project. The project should manage at the 80% tolerance level in LSR and 50% tolerance level for Matrix land allocation. However, most of the proposed pipeline is located along ridge tops that is prone to fire disturbance within moderate severity fire regime (USDA 2003 Umpqua). Considering fuels it is appropriate to manage at lower density of small snags and down wood in both tolerance levels.

Within LSR manage snags densities at 16/acre > 10.0 in, of which 8/acre are > 20 in dbh.

In Matrix manage snag densities at 8/acre > 10.0 in, of which 4/acre are > 20 in dbh.

Within the Matrix allocation, manage for down wood at about 3.6% cover

Weeds 6.73 miles
Soils disturbed during pipeline construction and proposed mitigation activities have the potential to disperse and generate potential seedbeds for noxious weeds. The proposed treatment along 6.73 miles roads with LSR 223 will assist in mitigating potential adverse habitat impacts.

Meadow Restoration 123 acres

Draft Working Paper

Mitigate impacts to Unique habitats impacted by the project, There will be loss of forest habitat buffering the unique habitats and disruption to soil horizons within those habitats. These actions will result in adverse impact to native flora, fauna, and enhancing the opportunities for evasion of non-native plant species. These impacts cannot be fully mitigated on site, therefore restoration activities such as: burning, removal of encroaching conifers and noxious control will be applied to a 123 acre unique habitat located in both Matrix (43 acres) and LSR 223 (80 acres)

Draft Working Paper

Data Synopsis

Changes in road density[5] resulting from implementation of road decommissioning mitigations

Spencer Creek Tier 1 Key Watershed, Winema National Forest
Little Butte Creek Tier 1 Key Watershed, Rogue River National Forest

Data Abstract: Data is derived from a GIS analysis by the FS using shape files from the updated mitigation plan dated 3/09/11 and FS transportation layer data. Tables 1 and 2 show changes in road density in Spencer Creek and Little Butte Creek Tier 1 Key Watersheds (KWS) that would result from implementation of the proposed road decommissioning that is part of the mitigation plan for the PCGP. Road densities are calculated for NFS roads on NFS lands. Spencer Cr. KWS all roads density is for all land allocations in the Spencer Cr. watershed. Little Butte Cr. KWS all roads density is shown for both the LSR portion of Little Butte Cr. KWS and as a summary for all land allocations in Little Butte Creek. Distances of ¼, ½ and 1 mile from the PCGP corridor are included to show relative comparisons of the effect of proposed road decommissioning in proximity to the effect of the PCGP corridor.

Comparison of effects of road decommissioning[6] and impacts of the PCGP corridor

Spencer Creek Tier 1 Key Watershed
Little Butte Creek Tier 1 Key Watershed

Data Abstract: Data is derived from the FERC FEIS and Biological Assessment and Forest Service GIS data in shape files dated 3/09/11 as noted in the tables. Data comparisons are as follows:

- **Miles in Watershed** compares the miles of the PCGP corridor in the watershed to the miles of roads that are proposed to be decommissioned. This information is important because decommissioning roads help offset the unavoidable watershed effects of the PCGP corridor. This provides a relative comparison of impact of the project to benefits of proposed road decommissioning.
- **Miles in Riparian Reserves** compares the miles of the PCGP corridor that occur in Riparian Reserves to miles of roads proposed to be decommissioned in Riparian Reserves. This information is important because it allows a comparison of riparian vegetation and habitat that will be impacted by the PCGP to the riparian vegetation and habitat where restoration can occur as part of road decommissioning.

[5] NFS lands only
[6] NFS lands only

Draft Working Paper

- **Acres in Degraded Soil Condition** compares estimated acres that will be displaced or compacted within the PCGP corridor to the estimated acres of existing roads where degraded soil conditions will be restored by decommissioning existing roads. This information is important because degraded soil conditions can adversely affect watershed functions such as sediment routing and infiltration. This provides a relative comparison of the estimated adversely impacted soil conditions to the potential restoration accomplished in proposed road decommissioning.
- **Stream Crossings** compares the number of stream crossed by the PCGP to the number of stream crossings in decommissioned roads. This is important because most watershed – road interactions occur at or near stream crossings. This provides a relative comparison of the potential watershed effects associated with stream crossings in the PCPG corridor and the potential watershed benefits associated with decommissioning roads where they intersect streams.

Spencer Creek and Little Butte Creek are both Tier 1 Key Watersheds in the NWFP.

Reallocation of matrix lands to LSR

Rogue River NF 227

- **Comparison of age classes of PCGP corridor to proposed matrix to LSR Reallocation**
- **Comparison of NSO habitat cleared in PCGP corridor to proposed matrix to LSR Reallocation**
- **Summary comparison PCGP corridor acres cleared to LSOG and NSO Suitable habitat**

Umpqua NF LSR 223

- **Comparison of age classes of PCGP corridor to proposed matrix to LSR Reallocation**
- **Comparison of NSO habitat cleared in PCGP corridor to proposed matrix to LSR Reallocation**
- **Summary comparison PCGP corridor acres cleared to LSOG and NSO Suitable habitat**

Data Abstract: Information concerning age classes and NSO habitat types in the PCGP corridor was derived from the FERC FEIS or Biological Assessment as noted. Information concerning age class and NSO habitat on matrix lands proposed for reallocation from matrix to LSR was derived from field verification of aerial photo and GIS analysis by the Forest Service. PCGP acres represent the area in the right of way corridor and the temporary extra work areas cleared as part of construction. On the Rogue River NF, an alternative matrix to LSR comparison was developed in response to public scoping comments so tables show both the proposed action and an alternative.

Presented in Order of Appearance

Cox, 2010
FERC FEIS, Table 2.1-1a
FERC FEIS Table 4.3.5.3-14
FS GIS Analysis of Mitigation Acres

Draft Working Paper

Draft Working Paper

Matrix to LSR Habitat (Source: USFS GIS, Cox 2010)

RRS- Age Class - Sec 32 - New Alternative (512 Acres total)

Age Class	Acres
Old Growth (175 + years)	320
Late successional (80 to 175 years)	13
Shelter Wood Regenerating (5 to 40 years)	157
Regenerating (5 to 40 years)	22

Northern Spotted Owl Habitat - Sec 32 - New alternative

Habitat Type	Acres
Suitable	320
Dispersal	13
Non-suitable	179
Capable Northern Spotted Owl Habitat	512

RRS- Age Class - Sec 33 - Proposed Action (593 Acres)

Age Class	Acres
Old Growth (175 + years)	21
Late successional (80 to 175 years)	249
Shelter Wood Regenerating (5 to 40 years)	45
Regenerating (5 to 40 years) Plantation	8
Regenerating (5 to 40 years) Forested burned area	155
Open meadow habitat	115

RRNF Northern Spotted Owl Habitat - Sec 33 - Proposed Action

Habitat Type	Acres
Suitable	270
Dispersal	0
Non-suitable	323
Capable Northern Spotted Owl Habitat	478

Umpqua- Age Class – Proposed Action (588 Acres)

Age Class	Acres
Old Growth (175 + years)	134
Late successional (80 to 175 years)	297
Med seral (40 to 80 years)	99
Regenerating (5 to 40 years)	58

Northern Spotted Owl Habitat – Proposed Action

Habitat Type	Acres
Suitable	431
Dispersal	99
Non-suitable	58
Capable Northern Spotted Owl Habitat	588

Draft Working Paper

Table 2.1-1a.
Total Terrestrial Habitat (acres) Affected/Removed[1] by Construction of the Proposed Action within Late Successional Reserves

LSR ID (Total Acres)[2]	Federal Jurisdiction	Forested Habitat [3]					Other Habitat [3]				Total LSR Impact (acres)
		Late Successional – Old Growth Forest	Mid-Seral Forest	Regenerating Forest	Clearcut Forest	Total	Forested Wetland	Unaltered Habitat	Altered Habitat	Total	
RO 261 (70,611 acres)	Coos Bay BLM	0.89	4.98	9.88	0	15.75	0	0	1.42	1.42	**17.17**
	Roseburg BLM	4.59	4.36	8.44	0.06	17.45	0	0	1.64	1.64	**19.09**
	RO 261 Total	**5.48**	**9.34**	**18.32**	**0.06**	**33.20**	**0**	**0**	**3.06**	**3.06**	**36.26**
RO 223 (66,173 acres)	Roseburg BLM	28.96	0.38	11.49	0	40.83	0.29	0.08	2.13	2.50	**43.33**
	Umpqua N.F.	44.89	5.74	15.07	0	65.70	0	0	8.94	8.94	**74.64**
	RO 223 Total	**73.85**	**6.12**	**26.56**	**0**	**106.53**	**0.29**	**0.08**	**11.07**	**11.44**	**117.97**
RO 227 (101,600 acres)	Rogue River – Siskiyou N.F.	67.40	10.36	79.74	9.87	167.37	0	14.27	21.52	35.79	**203.16**
	RO 227 Total	**67.4**	**10.36**	**79.74**	**9.87**	**167.37**	**0**	**14.27**	**21.52**	**35.79**	**203.16**
All LSR Units (238,384 acres)	Coos Bay BLM	0.89	4.98	9.88	0	15.75	0	0	1.42	1.42	**17.17**
	Roseburg BLM	33.55	4.74	19.93	0.06	58.28	0.29	0.08	3.77	4.14	**62.42**
	Umpqua N.F.	44.89	5.74	15.07	0	65.70	0	0	8.94	8.94	**74.64**
	Rogue River – Siskiyou N.F	67.40	10.36	79.74	9.87	167.37	0	14.27	21.52	35.79	**203.16**
	Overall Total	**146.73**	**25.82**	**124.62**	**9.93**	**307.10**	**0.29**	**14.35**	**35.65**	**50.29**	**357.39**

[1] Project components considered in calculation of habitat "Removed": PCGP construction right-of-way, temporary extra work areas, aboveground facilities, and permanent and temporary access roads (PAR, TAR).
[2] Overall Total Acres within each LSR were obtained from the following Late Successional Reserve Assessments: BLM and Forest Service, 1998 (RO 261); BLM and Forest Service, 1999 (RO 223); and FWS et al., 1998 (RO 227).
[3] Habitat Types within Late Successional Reserves generally categorized as: Late Successional (Mature) or Old Growth Forest (coniferous, deciduous, mixed ≥80 years old); Mid-Seral Forests (coniferous, deciduous, mixed ≥40 but ≤80 years old); Regenerating Forest (coniferous, deciduous, mixed ≥5 but ≤40 years old); Clearcut Forests; Wetland Forested, Unaltered Nonforested Habitat (grasslands, sagebrush, shrublands), and Altered Habitats (urban, industrial, residential, roads, utility corridors, quarries).

TABLE 4.3.5.3-14

Summary of Suitable, Dispersal, Capable, and Non-Suitable Habitat by Physiographic Province Impacted within NWFP Late-Successional Reserves (LSR) (Table Q5 in Appendix Q)

Land Owner	NWFP LSR (overlap with CHU)	Suitable Habitat a/		Dispersal Habitat b/		*Dispersal Only Habitat c/*		Capable Habitat d/		Non-Suitable Habitat e/		Total Acres h/	
		Removed f/	Modified g/	Removed f/	Modified g/	*Removed f/*	*Modified g/*	Removed f/	Modified g/	Removed f/	Modified g/	Removed f/	Modified g/
Coast Range Physiographic Province													
Coos Bay BLM	RO 261	0.89	0.00	12.42	0.90	*13.31*	*0.90*	2.44	0.17	1.42	0.02	17.17	1.08
Roseburg BLM	RO 261	4.08	8.35	7.68	6.77	*11.76*	*15.12*	2.82	1.85	1.86	0.53	16.44	17.50
Klamath Mountains Physiographic Province													
Roseburg BLM	RO 261	0.54	0.78	4.85	0.14	*5.39*	*17.05*	2.17	0.03	0.59	0.00	8.15	0.95
Roseburg BLM	RO 223	29.47	12.99	11.09	3.14	*40.56*	*16.13*	1.11	0.29	2.31	0.09	43.97	16.51
Umpqua N.F.	RO 223 (OR-14)	46.82	18.28	17.65	0.84	*64.47*	*19.12*	0.70	0.39	9.02	0.00	74.19	19.51
Umpqua N.F.	RO 223	0.58	2.33	0.00	0.00	*0.58*	*2.33*	0.0	0.00	0.00	0.00	0.58	2.33
West Cascades Physiographic Province													
Rogue River – Siskiyou N.F.	RO 227 (OR-17)	68.29	35.04	62.63	24.99	*130.92*	*60.03*	36.75	9.06	35.99	3.20	203.66	72.29
East Cascades Physiographic Province													
Rogue River – Siskiyou N.F.	RO 227 (OR-17)	2.18	0.90	0.98	0.28	*3.16*	*1.18*	0.00	0.00	0.00	0.00	3.16	1.18
Overall Total													
Overall Total		**152.85**	**78.67**	**117.30**	**37.06**	***270.15***	***131.86***	**45.99**	**11.79**	**51.19**	**3.84**	**367.32**	**131.35**

a/ Suitable Habitat: Forest stands used by NSO for nesting, roosting, and foraging (conifer dominated, 80+ years, multi-storied, sufficient snags and LWD, canopy closure > 60%). This was determined using the BioMapper model described in Section 4.2.5.2 (Habitat subsection) that included mid-seral, late successional, and old-growth coniferous forest PLUS coniferous forest habitat determined to be 80 years within the project area but not included in the model (all late successional and old-growth within the range of the spotted owl).

b/ Dispersal Only Habitat (only includes dispersal habitat not located in suitable habitat): support owl movement across landscape but lack structural characteristics to support nesting (conifer and mixed mature conifer-hardwood, canopy cover ≥ 40%, average dbh ≥ 11 inches). This was determined using the GNN model described in Section 4.2.5.2, Habitat subsection where all forested habitat (coniferous, mixed coniferous/deciduous, and deciduous) occurs within the project area but did not include recent clearcut areas.

c/ Total Dispersal Habitat (includes dispersal habitat that coincides with suitable habitat): support owl movement across landscape but lack structural characteristics to support nesting (conifer and mixed mature conifer-hardwood, canopy cover ≥ 40%, average dbh ≥ 11 inches). The acres within this column are not included in the Total Acres since they are included in Suitable and Dispersal Only.

d/ Capable Habitat: not currently spotted owl habitat (see # 3 and #4) but have the potential to become habitat in the future and includes recent clearcuts, as well as other regenerating and mid-seral forested habitat (plus all seral stages of deciduous forest) not included within the suitable habitat or dispersal habitat models.

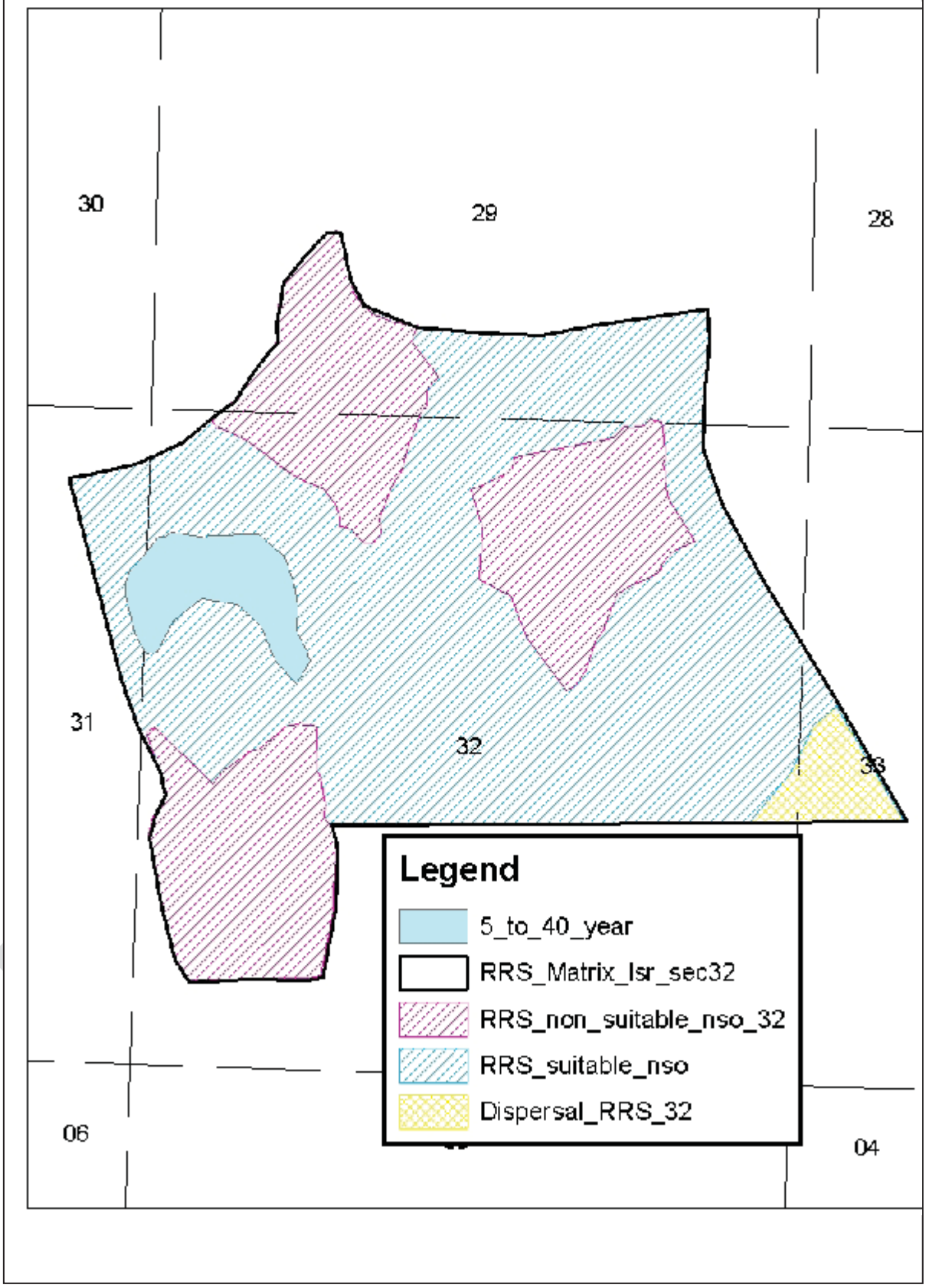
e/ Noncapable Habitat: areas such as lakes, rivers, rock outcroppings, roads

f/ Project components considered in calculation of habitat "Removed": Pacific Connector pipeline construction right-of-way, temporary extra work areas, aboveground facilities, permanent and temporary access roads (PAR, TAR), pipe storage yards.

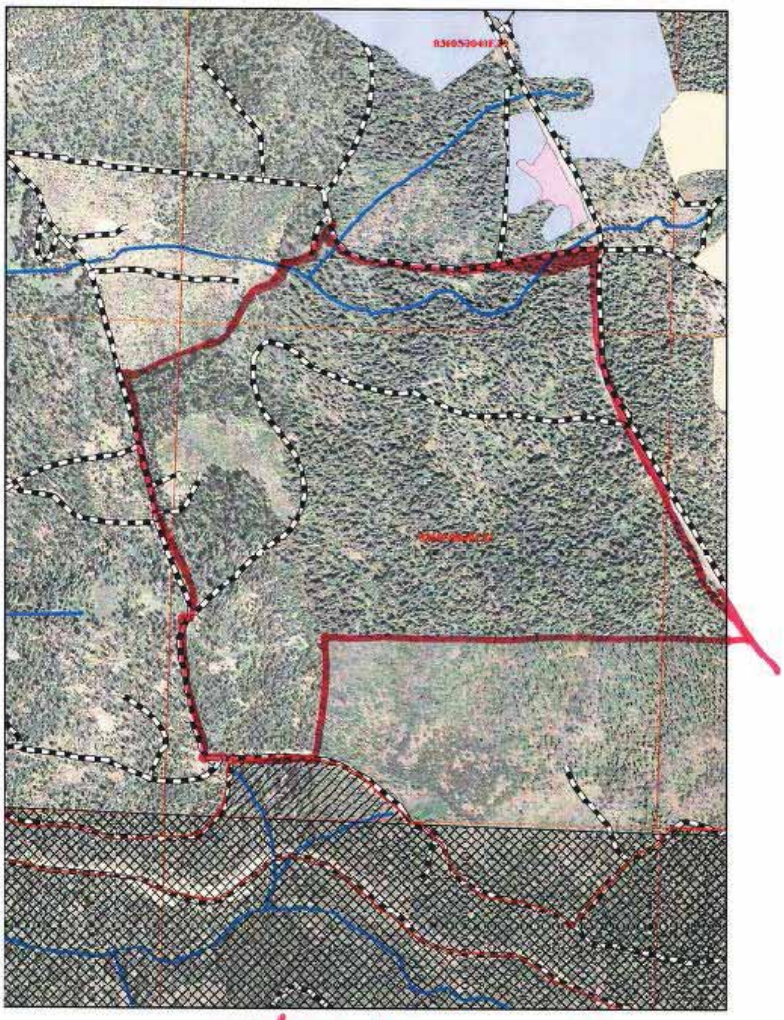
g/ Project components considered in calculation of habitat "Modified": Pacific Connector pipeline uncleared storage areas (UCSAs) described in Section 3.3.3.2 of the Project Description and will not be cleared of trees during construction. These areas will be used to store forest slash, stumps and dead and downed log materials that will be removed and scattered across the right-of-way after construction during restoration and are considered as temporary insignificant habitat modifications.

h/ Total Acres includes only the removed and modified columns within Suitable NRF, Dispersal Only, Capable, and Non-Capable Habitat.

NSO Habitat, Alternative 1

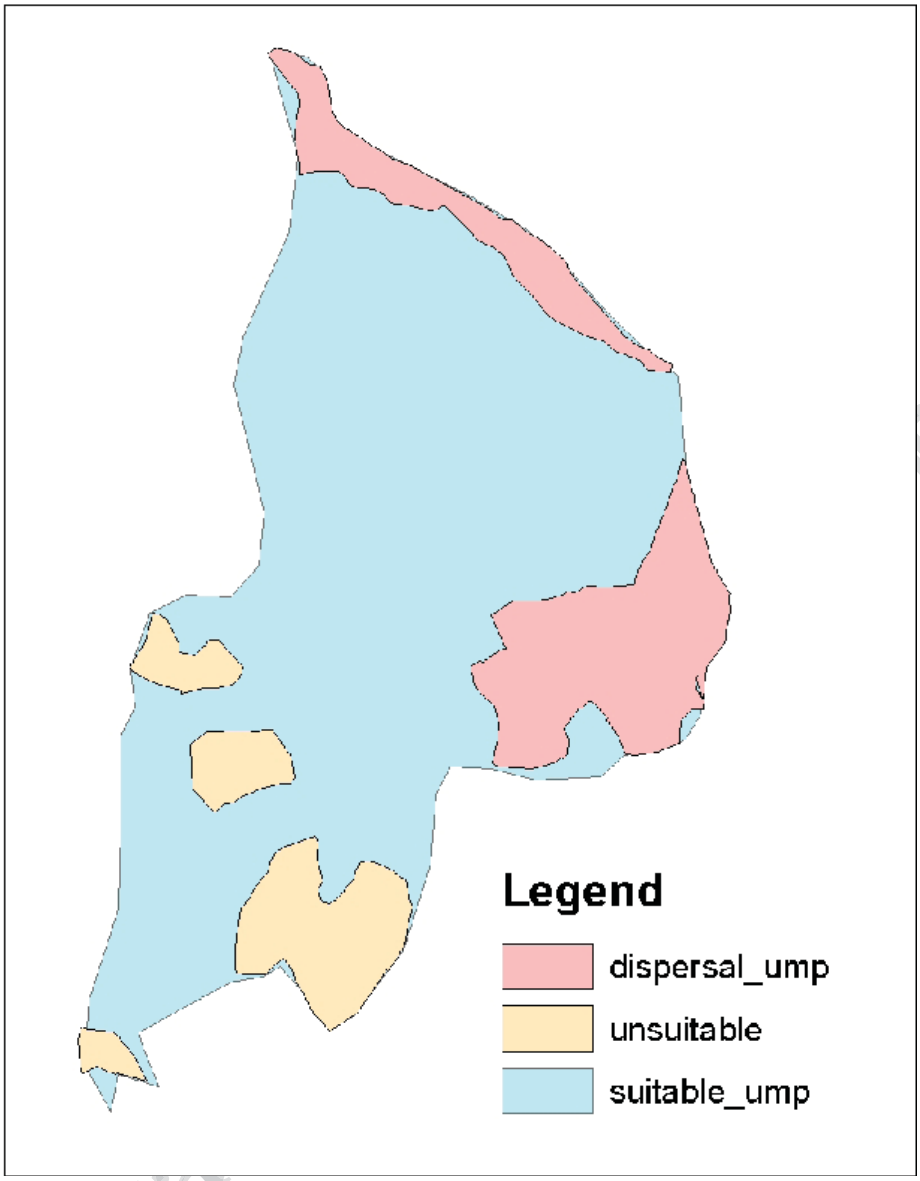


Rogue River Alternative 1 Boundary



01/12/4

Umpqua National Forest Proposed Action, NSO Habitat



Draft

USFS GIS Analysis, Road Decommissioning

RRS NF – Little Butte Creek Road Decom analysis 030911 final				
Riparian Reserves				
Watershed	Miles	GIS Acres		
Little Butte Creek	6.73	14.3155		
Stream Crossings	Class	Frequency		
	II	1		
	III	1		
	IV	30		
PCGP Buffers	Total Acres	Total miles NFS Roads	Road Density -- all roads	Road Density -- less proposed Decommissioned roads
Rogue River NF LBC 5th field watershed 030911 Final				
1/4 mile buffer	4,335.20			
All roads		26.50	3.91	
Road_Decom_052810.xlsx (Calibrated)		9.16		
37207XX-A (0.06812)				
37207XX-B (0.088)				
Roads less decommissioned		17.34		2.56
1/2 mile buffer	8,695.90			
All roads		56.00	4.12	
Road_Decom_052810.xlsx (Calibrated)		19.24		
37207XX-A (0.1546)				
37207XX-B (0.1546)				
Roads less decommissioned		36.76		2.71
1 mile buffer	16,709.20			
All roads		109.10	4.18	
Road_Decom_052810.xlsx (Calibrated)		36.86		
37207XX-A (0.1545)				
37207XX-B (0.1545)				
Roads less decommissioned		72.24		2.77
All NFS Roads, LSR 227 in LBC	44,028.21	266.05	3.87	
Mile decommissioned LSR 227 in LBC		53.50		3.09
All NFS Roads, NFS Lands LBC	57,234.02	292.19	3.27	
Miles decommissioned LBC		53.50		2.67

Winema NF, Spencer Creek WS- Road Decom analysis 030911 Final			
Stream Crossings			
Stream Class	**Frequency**		
Intermittent	25		
Riparian Reserves			
Miles	GIS Acres		
5.276	12.7868		
Spencer Creek WS Road Density, 030911 update			
PCGP Buffers	Total Acres	Total NFSR Miles	Road Density
1/4 mile buffer	1854.20		
NFSR roads		13.53	4.67
Decom Roads		5.56	
Roads less decom		7.97	2.75
1/2 mile buffer	3448.21		
NFSR roads		23.34	4.33
Decom Roads		7.86	
Roads less decom		15.48	2.87
1 mile buffer	6317.58		
NFSR roads		38.52	3.90
Decom Roads		10.95	
Roads less decom		27.57	2.79
All NFS Lands, Spencer Cr. KWS	22284.1	91.85	2.64
Decom Roads		21.45	
Roads less Decom		70.40	2.02

Draft

Draft Working Paper

Umpqua Mitigation Acres (Source: USFS GIS Data)						
Fuel Break						
HU_10_NAME	Acres	LSR	Matrix	Rip. Res.	Admin. Withdrawn	Other
Days Creek-South Umpqua River	449.02	254.17	194.81			0.00
Elk Creek	1183.04	953.91	229.14	101.74		0.00
Trail Creek	566.86		566.86	46.82		0.00
Upper Cow Creek	1922.68	1076.60	846.08	235.53		
Matrix - LSR						
HU_10_NAME	Acres					
Upper Cow Creek	585.04	2.33	580.31	130.24	2.40	
Commercial Thin						
HU_10_NAME	Acres					
Days Creek-South Umpqua River	170.95		170.94			0.00
Elk Creek	94.84	93.28	1.56	2.20		
Trail Creek	0.45		0.45			
Upper Cow Creek	277.72	47.81	229.92	32.39		
Log Placement						
HU_10_NAME	Acres					
Days Creek-South Umpqua River	4.66		4.66			
Elk Creek	289.74	263.27	26.47	17.05		
Trail Creek	13.92		13.92			
Upper Cow Creek	235.73	101.21	134.52	5.65		
Meadow Restore						
HU_10_NAME	Acres	LSR	Matrix	Rip. Res.	Admin. Withdrawn	Other
Days Creek-South Umpqua River	22.72	22.72				
Elk Creek	100.58	57.36	43.22	4.97		
LSR PCT						
HU_10_NAME	Acres					
Days Creek-South Umpqua River	53.86	53.48	0.38			
Elk Creek	363.04	323.57	37.44	42.27		2.03

Draft Working Paper

Offsite Pine						
HU_10_NAME	Acres					
Days Creek-South Umpqua River	59.40	58.14				1.26
Elk Creek	338.43	338.36	0.07	15.48		
Roads						
Weeds						
HU_10_NAME	Miles					
Elk Creek	6.73	6.22	0.51			
Stormproofing						
HU_10_NAME	Miles					
Elk Creek	1.59	1.59				
Trail Creek	0.58		0.58			

Draft Working Paper

Road Decommissioning						
HU_10_NAME	Miles					
Days Creek-South Umpqua River	0.45	0.45				
Dumont Creek-South Umpqua River	3.16	3.16		0.28		
Elk Creek	4.65	3.47	1.09	0.32		0.10
Evans Creek	0.02		0.02			
Trail Creek	1.75		1.75	0.11		
Upper Cow Creek	4.44	0.77	3.68	0.17		

*****Note the total mileage for the layer representing road decommissioning was adjusted - the old total mileage was 14.72 miles and the new total mileage is 14.47 miles.

Draft Working Paper

RRS NF – Little Butte Stream Crossings on Decommissioned Roads 030911 Final				
Riparian Reserves				
Watershed	**Miles**	**GIS Acres**		
Little Butte Creek	6.7252	14.3155		

Little Butte Creek Watershed Stream Crossing – Decommissioned Road Intersects 030911 Final	Stream Crossings
Beaver Dam Creek Subwatershed Class 4	7
Beaver Dam Creek Subwatershed Class 3	1
Middle South Fork Little Butte Creek Subwatershed Class 4	6
Upper North Fork Little Butte Creek Subwatershed Class 4	8
Upper South Fork Little Butte Creek Subwatershed Class 4	9
Upper South Fork Little Butte Creek Subwatershed Class 2	1
Total	32

RRS NF – Little Butte Creek Road Density Analysis 030911 final	Total Acres	Total miles	Road Density -- all roads	Road Density -- less proposed Decommissioned roads
Rogue River NF LBC 5th field watershed 030911 Final				
1/4 mile buffer	4335.2			
All roads		26.50	3.91	
Road_Decom_052810.xlsx (Calibrated)		9.16		
37207XX-A (0.06812)				
37207XX-B (0.088)				
Roads less decommissioned		17.34		2.56
1/2 mile buffer	8695.9			
All roads		56.00	4.12	
Road_Decom_052810.xlsx (Calibrated)		19.24		
37207XX-A (0.1546)				
37207XX-B (0.1546)				
Roads less decommissioned		36.76		2.71
1 mile buffer	16709.2			
All roads		109.10	4.18	
Road_Decom_052810.xlsx (Calibrated)		36.86		
37207XX-A (0.1545)				
37207XX-B (0.1545)				
Roads less decommissioned		72.24		2.77

Winema NF, Spencer Creek WS- Stream Crossings on Decommissioned Roads 030911 Final		
Stream Crossings		
Stream Class	**Frequency**	
Intermittent	25	
Riparian Reserves		
Miles	GIS Acres	
5.276	12.7868	

Spencer Creek WS Road Density Analysis 030911 Final			
PCGP Buffers	Total Acres	Total Miles	Road Density
1/4 mile buffer	4814.05		
All roads		30.31	4.03
Decom Roads		5.60	
Roads less decom		24.71	3.28
1/2 mile buffer	9616.36		
All roads		42.41	2.82
Decom Roads		7.90	
Roads less decom		34.51	2.30
1 mile buffer	19230.40		
All roads		62.87	2.09
Decom Roads		11.00	
Roads less decom		51.86	1.73

Draft Working Paper

FRAGMENTATION ANALYSIS REPORT
PACIFIC GAS PIPELINE

Rogue-River – Siskiyou National Forest
Draft 2/24/10

BACKGROUND

The proposed Pacific Gas Pipeline crosses the Rogue River – Siskiyou National Forest through LSR 227 on the Dead Indian Plateau. This land base is currently managed as part of the High Cascades Ranger District.

The original Pipeline EIS was approved by FERC in the winter of 2009-2010, with initial construction planned for 2010. Prior to construction the Rogue River – Siskiyou National Forest needs to amend several aspects of its Forest Plan to allow this type of activity to occur within the LSR. One of the larger issues of allowing pipeline construction is loss of spotted owl habitat within a Late Successional Reserve (LSR) and the fragmentation and degradation of the remaining habitat by creating a linear opening across the LSR. One of the proposed mitigations for this habitat loss/degradation is the closing and replanting of old roads. Over a long period of time these revegetated roads will grow into forest, eliminating edge and reducing habitat degradation through edge effects.

This analysis is designed to measure changes in fragmentation (both positive and negative) from development of the pipeline, planting of the pipeline work corridor, and planting of closed roads. Therefore, the area of analysis is the entire LSR, since the roads are scattered over much of the LSR land base. Because the long term changes modeled at 60 years from treatment include stand development across the forested landscape, there is no way to separate out the impacts specific to the proposed management activities. For this reason a separate model run was done looking at only those stands adjacent to the pipeline and the proposed road closures. The analysis does not include the lands proposed for conversion from Matrix to LSR along the north edge of the LSR.

The LSR Assessment and Northwest Forest Plan do not directly address fragmentation. Fragmentation is implicit in the discussions of dispersal and spotted owl habitat quality. Fragmentation is an integral part of habitat quality for spotted owls, affecting prey base, as well as stand structure for both nesting and foraging (Carey et al. 1992). It also affects the ability of young birds to disperse and access suitable breeding habitat sites. Fragmentation is directly discussed in Thomas et al. 1990, which formed the scientific basis for the Northwest Forest Plan.

ASSUMPTIONS

- Because this is LSR there will be no further regeneration cutting or road building. Any forest habitat treatments will be precommercial or commercial thinning that will not result in downgrading of spotted owl habitat.
- This analysis only looks at fragmentation of Mature Forest habitat since that is the management objective for LSR.
- Pure pine stands are not suitable Northern Spotted owl Habitat (Carey 1985).
- Roads and water diversion canals cause hard edge effect and fragmentation of mature forest habitats.
- Hard edge ceases to exist when a neighboring stand reaches 60 feet in height. Generally 60 year conifer stands in the affected region have achieved canopy height approaching that of the general forest.
- Edge effects extend 300 feet into a stand from a hard edge. This assumption is simply for modeling purposes. In fact edge effects vary based on orientation of the edge, the ecological factor being measured; variation is stand size on both sides of the edge; and other factors. Chen et al. (1995) found climatic edge effects ranged from 30 to >240 meters into a mature forest stand. Chen et al. (1992) also found vegetation responses to edge ranged from 16 to 137 meters into the stand. Increasing or decreasing the assumed edge distance will still demonstrate the impacts of the management activities, with the degree of change increasing or decreasing. 300 feet was selected as an average for environmental factors.

DEFINITIONS

Draft Working Paper

CORE AREA – That portion of a patch that is not impacted by hard edge effect, based on model assumptions. The minimum acreage for an individual patch is 1 acre.

EDGE EFFECT – Forest edge effect results primarily from differences in wind and light intensity and quality reaching a forest patch that alter microclimate and disturbance rates (Harper et al. 2005). Edge effects also include changes in humidity, seed dispersal, colonization, predator access and other ecological functions that differ between neighboring habitats.

- Hard edge occurs when two neighboring stands differ greatly in height, allowing wind, light and other environmental factors to penetrate into the taller (older) stand.
- Soft edge occurs when stands are similar in age or height but differ greatly in composition, allowing for seed dispersal, species movement and other ecological functions unique to one stand to penetrate partially into the other stand.
- This analysis will only look at Hard Edge.

FRAGMENTATION – The process of reducing size and connectivity of stands that compose a forest. Fragmentation of spotted owl habitat occurs when portions of the suitable habitat become isolated from neighboring suitable habitat through the creation of open landscapes (clearing, fire, etc) or development of unsuitable habitat types (pine stand development). Fragmentation also occurs within a stand when habitat is lost through development of large openings or when unsuitable openings or habitats encroach into the stand along the edges.

LANDSCAPE – For purposes of this analysis the landscape is the LSR 227 as it contains a number of spotted owl home ranges and is the management area being impacted by the pipeline.

LATE SUCCESSIONAL FOREST – Forest seral stages which include Mature and Old Growth classes (USDA FS & USDI BLM. 1994).

MATURE FOREST – Fir and mixed conifer forest with an average DBH of 21” and canopy closure >60%. The definition used will depend on the data available in the timber stand layer.

NORTHERN SPOTTED OWL HABITAT – The forest vegetation with the age class, species of trees, structure, sufficient area, and adequate food source to meet some or all of the life needs of the northern spotted owl.

OLD GROWTH FOREST – A forest stand usually at least 180-220 years old with moderate to high canopy closure; a multi species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulation of wood, including large logs on the ground.

PATCH – A single contiguous block of forests that provided for one or more of the survival needs of the northern spotted owl (nesting, roosting and/or foraging). Areas within the patch may provide for single or multiple needs while other portions of the patch meet different needs. Minimum acreage for a patch is 1 acre.

PIPELINE CORRIDOR – The 30 foot width of the maintained pipeline corridor and the additional cleared width of the corridor from the construction activity needs. This is estimated at 100 feet total width within the segment being analyzed, due to the flat nature of the landscape. The construction strip will be reforested, resulting in the narrower 30 foot width of corridor after approximately 40 years.

EDGE EFFECT – The alteration of habitat characteristics within a stand from a neighboring stand. For example, creation of an open area adjacent to mature forest allows wind and light to penetrate into the mature stand, altering the plant species mix along the edge. Edge effect varies in distance depending on orientation of the respective stands (is the opening on the south or north face of the mature stand), impact being measured (light, wind, seed dispersal…), stand condition (dense forest, thinned…) and other factors. For analysis purposes a set distance of 300 feet into the stand is used as an average.

STEPS IN THE ANALYSIS

Measures to be Compared –

Draft Working Paper

Patch

- Number of isolated patches of mature forest
- Total acres of Mature forest
- Average patch size of Mature Forest
- Average distance between patches

Core

- Number of isolated patches of Mature forest cores greater than 1 acre
- Total acres of Mature forest core in patches greater than 1 acre
- Average patch size of Mature Forest cores greater than 1 acre

Edge

- Total edge length around Mature forest patches
- Average edge length around Mature forest patches
- An index of fragmentation that is Avg. Edge/Avg. patch acres

ANALYSIS AREA - The LSR is the basic landscape being analyzed. This landscape will be buffered out to the nearest hard edge break for all stands along the boundary of the LSR for determining edge effects.

CURRENT FRAGMENTATION
Current fragmentation within this LSR comes from natural landscape patterns (lava beds and meadows primarily), past timber harvest, replanting to pine to prevent frost problems, road and canal construction, the damming of Fish Lake, and management on private land inholdings.

POST PIPELINE FRAGMENTATION
Fragmentation within the LSR will increase due to the development of the pipeline corridor as it passes through conifer forested stands of a variety of ages.

60 YEAR FRAGMENTATION
Fragmentation is predicted to be reduced after 60 years due to revegetation of closed roads through mitigation, revegetation of the construction strip along the pipeline, and maturation of historic clearcuts and shelterwoods across the LSR. Treatment of the Big Elk pine stands will be designed to convert to mixed conifer. These stands will therefore convert from Dispersal habitat only to Dispersal or potentially Foraging habitat.

Additional stands will grow into Mature Forest.

The steps taken in the GIS analysis are described in Appendix A.

RESULTS

The results of the GIS run are shown below for the three analysis periods. An additional run was done at 60 years for just those stands adjacent to the pipeline corridor and the roads proposed for closure to show the specific impacts of those actions.

Draft Working Paper

LSR 227 Fragmentation Analysis

	Current Conditions	Following Pipeline Construction	60 years out following road closures	60 years out following road closures, Stands adj. to pipeline and mitigation road closures
Patch Metrics				
Number of Isolated patches of mature forest:	1445	1450	1501	298
Total acres of Mature forest:	12,373.53	12,350.60	12,773.1	4555.001
Total acres of Mature forest (patches)	9,994.69	9,976.04	10,218.6	4191.96
Average patch size of Mature forest:	6.92	6.88	6.81	14.07
Average distance between patches:				
Core Metrics				
Number of isolated patches of Mature forest cores greater than 1 acre	779	771	901	155
Total acres of Mature forest core in patches greater than 1 acre	5076.27	5013.82	5990.87	2839.52
Average patch size (acres) of Mature Forest cores greater than 1 acre	6.52	6.5	6.65	18.32
Edge Metrics				
Total edge length (ft) around Mature forest patches	596,667.54	605,267.45	533,811.61	157549.103
Average edge length (ft) around Mature forest patches	202.95	203.86	205.63	263.46

Draft Working Paper

An index of fragmentation that is Avg. Edge/ Avg. patch acres	29.32803468	29.63081395	30.19530103	18.7249467

Draft Working Paper

The LSR currently includes 1,445 patches of mature forest greater than 1 acre in size. Construction of the pipeline results in slightly greater fragmentation by passing through and dividing some patches so that there is a net increase of 5 patches. After 60 years the number of patches across the landscape increases to 1,501, as numerous stands age and develop the characteristics of a mature forest. At the full landscape scale the development of these small, new patches result in the average patch size actually decreasing over 60 years from 6.92 to 6.1 acres. The patch sizes immediately adjacent to the pipeline and decommissioned roads increase to an average of 14 acres. As this is more than twice the average patch size and the opposite trend in average change across the LSR, the benefit of road closures on fragmentation are clearly shown.

Generically speaking, as patches increase in size the amount of edge around the patch increases at a much slower rate. For this reason the formula of Edge/Acres is a good measure of fragmentation. This index shows a decrease in Fragmentation from 33.67 currently to 31.12 in 60 years. This is a 9% reduction in fragmentation across the landscape. For the stands immediately adjacent to the pipeline and decommissioned roads this fragmentation index falls to 18.7, a 36% reduction over the LSR average.

Because of edge effects, an isolated 1 acre patch of Mature Forest has little real value as spotted owl habitat. For this reason we also looked at interior patches– 1 acre or larger blocks of Mature Forest that were 300 feet or more from a hard edge. Currently the forest has 779 of these interior patches. Eight of these interior patches would be fragmented by the pipeline corridor. Route realignments such as Big Elk avoided XX interior patches. With the maturation of harvested stands, the planted portion of the pipeline and planted segments of decommissioned roads, the number of cores increases to 901. This represents more than a 14% increase in the number of core areas across the landscape and a greater than 16% increase in total acres of Mature Forest within these patches. The average patch size of the cores also increases slightly. The average patch size of these cores increases only slightly to 6.65 acres from 6.5 acres. Core areas adjacent to the management activities increase in size to 18 acres. As the pipeline will remain as an edge creating feature after 60 years, this near tripling of acres in the adjacent cores is entirely attributable to the road decommissioning efforts.

CONCLUSIONS

Decommissioning of roads results in greatly reduced fragmentation in the stands immediately adjacent to the roads and a 9% decrease in fragmentation across the landscape, in conjunction with the aging of all stands across that landscape. In the 60 year interval modeled, none of the decommissioned roads will convert to mature forest; they simply grow tall enough to eliminate light and wind related edges along the boundaries of existing mature forest stands. The doubling in size of patches adjacent to management activities indicates that the timber growth in these road beds eliminate the barrier effect for forest dependant small animals and shade dependant plant species, allowing dispersal across these current gaps. Overall stand fragmentation is greatly reduced in the areas immediately adjacent to these roads and measurably reduced across the entire LSR.

Draft Working Paper

LITERATURE CITATIONS

Bingham, Bruce B. and John D., Sawyer Jr. Distinctive Features and Definitions of Young, mature and Old Growth Douglas Fir/Hardwood Forests. In USDA FS 1991. Wildlife in Vegetation of Unmanaged Douglas Fir Forests. K.B. Aubry and M.H. Brooks Ed. Pp 363-377.

Carey, Andrew B. 1985. A summary of the scientific basis for spotted owl management. *in* R.J. Guiterrez and A.B. Carey, tech eds. Ecology and management of the Spotted owl in the Pacific Northwest. USDA – Forest Service Gen. Tech. Rep. PNW-185. 119 pp.

Carey, Andrew B., Scott P. Horton, and Brian L. Biswell. 1992. Northern Spotted owls: influence of prey base and landscape character. Ecological Monographs. Vol. 62, No. 2, pp 223-250.

Chen, J., J. F. Franklin, and T.A. Spies. 1992. Vegetation responses to edge environments in old-growth Douglas fir forests. Ecological Applications. Vol 2, No. 4. pp 387-396.

Chen, J., J. F. Franklin, and T.A. Spies. 1995. Growing season microclimatic gradients from clearcut edges into old-growth Douglas fir forests. Ecological Applications. Vol 5, No. 1. pp 74-86.

Harper, K.A., S.E. MacDonald, P.J. Burton, J. Chen, K.D. Brosofske, S.C. Saunders, E.I. Euskirchen, D. Roberts, M.S. Jaiteh, and P. Esseen. 2005. Edge influence on forest structure and composition in fragmented landscapes. Conservation Biology Vol. 19, No. 3. pp 768-782.

Thomas, J.W., E. D. Forsman, J. B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990 A conservation strategy for the Northern Spotted owl – Report of the Interagency Scientific Committee to address the conservation of the Northern Spotted owl. USDA FS, USDI BLM, USDI FWS, and USDI NPS. 427 pp.

USDA FS. 1990. Final Environmental Impact Statement; Land and Resource Management Plan; Rogue River National Forest.

USDA FS. 2003. 2003 Upper Bear Assessment. Rogue River- Siskiyou National Forest.

USDA FS & USDI BLM. 1994. Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional and Old Growth Related Species Within the Range of the Northern Spotted owl. Appendix A

Draft Working Paper

Appendix A
Fragmentation Analysis Workflow

Jeremy Hobson

Patches

To identify patches of mature forest, I used the following selection criteria on the GNN layer:
CANCOV ≥ 60, QMDA_DOM ≥ 53.34 (21")
I overlaid the Mature Forest layer with fragmentation features and erased the intersecting area from the mature forest layer, resulting in the creation of the patches layer.

Current conditions

To calculate patch metrics, I selected the grid representing mature forest (as described above) and erased features with fragmentation effects, including:
Roads (all roads, 30' buffer)
Canals (60' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)
Timber stands less than 40 years of age (identified from activities database; used activities polygons and selected all those polygons with cutting activities since 1973)

Conditions following pipeline construction

To calculate patch metrics, I selected the grid representing mature forest (as described above) and erased features with fragmentation effects, including:
Roads (all roads, 30' buffer)
Canals (60' buffer)
Pipeline corridor (100' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)
Timber stands less than 40 years of age (identified from activities database; used activities polygons and selected all those polygons with cutting activities since 1973)

Conditions 60 years out after road closures

To calculate patch metrics, I selected the grid representing mature forest (as described above) and erased features with fragmentation effects, including:
Roads (all roads, less decommissioned roads, 30' buffer)
Canals (60' buffer)
Pipeline corridor (30' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)

Core

The calculation of Core metrics was accomplished by overlapping the fragmentation features with the mature forest selection, and erasing mature forest where overlapping occurred. Fragmentation feature edges were buffered 300.

Draft Working Paper

Current Conditions

To represent core areas, the mature forest layer will need to be buffered into 300' by the fragmentation edges, including:
Roads (all roads, 30' buffer)
Canals (60' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)
Timber stands less than 40 years of age (identified from activities database; used activities polygons and selected all those polygons with cutting activities since 1973)

Conditions following pipeline construction

To represent core areas, the mature forest layer will need to be buffered into 300' by the fragmentation edges, including:
Roads (all roads, 30' buffer)
Canals (60' buffer)
Pipeline (100' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)
Timber stands less than 40 years of age (identified from activities database)

Conditions 60 years out after road closures

To represent core areas, the mature forest layer will need to be buffered into 300' by the fragmentation edges, including:
Roads (all roads with decommissioned roads removed, 30' buffer)
Canals (60' buffer)
Pipeline (30' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)

Edge

To calculate edge metrics, I intersected fragmentation features (as listed below) with the mature forest layer; only those overlapping regions were identified as imposing an edge effect and were included in the metrics. The mature forest layer was selected on to identify all patches (areas > = 1 acre) and all edges intersecting these features were identified and included in the metrics – therefore, edges associated with mature forest areas less than 1 acre were not included in the metrics.

Current Conditions

Edge will occur where mature forest patches intersect the following features:
Roads (all roads, 30' buffer)
Canals (60' buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)
Edges of timber stands, less than 40 years of age (identified from activities database)

Conditions following pipeline construction

Edge will occur where mature forest patches intersect the following features:
Roads (all roads, 30' buffer)

Draft Working Paper

Pipeline corridor (100’ buffer)
Canals (60’ buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)
Edges of timber stands, less than 40 years of age (identified from activities database)

Conditions 60 years out after road closures

Edge will occur where mature forest patches intersect the following features:
Pipeline corridor (30’ buffer)
Roads (All roads with decommissioned roads removed, 30’ buffer)
Canals (60’ buffer)
Waterbodies
Wetlands
Non-forested vegetation polygon layer
Non-forested habitat derived from the veg_gnn layer (CANCOV = 0)

Draft Working Paper

Bibliography:

Baker, W. (2011). Edge effect recovery on decommissioned roads. M. Hupp.

BLM, U. F. U. (1999). South Umpqua / Galesville LSR Assessemnt (LSR RO 223).

Chen, J., J. Franklin, et al. (1993). "Contrasting microclimates among clearcut, edge, and interior of old-growth Douglas-fir forest." Agricultural and forest meteorology **63**: 219-237.

FERC (2009). FEIS, Jordon Cove Energy and Pacific Connector Gas Pipeline Project -00223F O. o. E. Projects. Washington, DC 20426.

FERC (2010). Biological Assessment, Jordon Cove Energy and Pacific Connector Gas Pipeline Project -00223F Federal Energy Regulatory Commission, Washington, DC.

Harper, K. A., E. Macdonald, et al. (2005). "Edge Influence on Forest Structure and Composition in Fragemented Landscapes." Conservation Biology **19**(3): 768-782.

Hunter Jr., M. L., Ed. (1990). Wildlife, Forests and Forestry, Prentice Hall.

Keppeler, E. T., P. H. Cafferata, et al. (2007). State forest road 600 : a riparian road decommissioning case study in Jackson Demonstration State Forest. Sacramento, CA, State of California, the Resources Agency, California Dept. of Forestry & Fire Protection.

Madej, M. (2000). "Erosion and sediment delivery following removal of forest roads." U.S. Geological Survey Western Ecological Research Center.

Mattson, D. M. (2009). Scenery Managment Analysis and Mitigation Recommendations.

Switalski, T. A., J. A. Bissonette, et al. (2004). "Benefits and impacts of road removal." Frontiers in Ecology and the Environment **2**(1): 21-28.

Tippery, s., K. K. Jones, et al. (2010). Effectiveness Monitoring Report for the Western Oregon Stream Restoration Program, 1999-2008. O. D. o. F. a. Wildlife. Salem, OR.

Trombulak, S. C. and C. A. Frissell (2000). "Review of Ecological Effects of roads on terrestrial and aquatic communities." Conservation Biology **14**(1): 18-30.

UNF, U. F. (1995). "Cow Creek Watershed Analysis."

UNF, U. F. (1995b). "Elk Creek Watershed Analysis."

USDA-FS: RRNF LRMP (1990). Rogue River National Forest Land and Resource Management Plan.

USDA-FS: UNF LRMP (1990). Umpqua National Forest Land and Resource Management Plan.

USDA-FS_WNF_LRMP (1990). Winema National Forest Land and Resource Management Plan.

USDA FS (2011). "GIS Analysis, Road Decommissioning."

USDA FS WNF (1995). Spencer Creek Pilot Watershed Analysis.

USDA FS; RRNF (2010). GIS Analysis, Fragementation Assessment, LSR 227, USDA Forest Service, Roseburg, OR.

USDA FS; USDI BLM (1994b). Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, U. S. Forest Service and U. S. Bureau of Land Management, Portland, Oregon.

USDA FS; USDI BLM (1994c). Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, USDA Forest Service, USDI Bureau of Land Management, Portland, OR.

USDA FS; USDI BLM (1997). Little Butte Creek Watershed Analysis.

USDA FS; USDI BLM; USDI FWS (1998). South Cascades Late Successional Reserve Assessment.

Draft Working Paper

APPENDIX G

Soils Association Descriptions

APPENDIX G
Soil Association Descriptions

SITKA SPRUCE BELT (MLRA-4A) – MPs 1.47R TO 19.22

The Sitka Spruce Belt is a relatively long and narrow zone running north-south along the coast. In the project area, it includes the greater Coos Bay area and the hills and valleys just to the east and south. Most of this part of the Major Land Resource Area (MLRA) has an elevation of 50 to 300 feet. The coastal area around the mouth of floodplains along the major rivers near the coast is flat, but inland areas are very hilly. The area is highly dissected by numerous perennial rivers and creeks which commonly flow into estuaries. The average annual precipitation is 50 to 90 inches. Precipitation is evenly distributed throughout fall, winter, and spring, but summers are cool and dry. Snowfall accumulation is rare. This area lies within the coastal fog belt zone, and heavy fogs are common in summer. The average annual temperature is 45 to 55 degrees Fahrenheit (°F). The freeze-free period ranges from 220 to 365 days in most of this area. Most of MLRA 4A near the project area consists of privately owned residential land, small farms and ranches, or forests. Timber production is the major industry (NRCS 2006). The two major soils associations crossed by the project in this MLRA are described below.

Nehalem-Duneland-Bullards (s6398)

The Nehalem-Duneland-Bullards soil association is crossed by 1.2 percent of the pipeline route length. The dominant soil mapping units which are crossed by the Project in soils association s6398 are: Coquille silt loam (map unit 12, 1.75 miles); Templeton silt loam, 30 to 50 percent slopes (map unit 54E, 0.42 mile); and Templeton silt loam, 0 to 30 percent slopes (map unit 54D, 0.30 mile). Five other soil mapping units are crossed by the Pacific Connector pipeline with individual crossing lengths ranging from 0.02 to 0.13 mile.

Coquille soils are susceptible to soil compaction, have a year-round high water table (0 to greater than 6 feet deep), are a hydric soil and prime farmland (farmland of statewide importance). Templeton soils have a paralithic contact with siltstone between 40 and 60 inches deep and are susceptible to soil compaction. Templeton silt loam has steep slopes (30 to 50 percent) which makes it susceptible to water erosion and gives it a potential for reclamation sensitivity. The mean annual precipitation in this soil association is 70 to 90 inches.

Tolovana-Templeton-Salander-Reedsport-Fendall (s6399)

The Tolovana-Templeton-Salander-Reedsport-Fendall soil association is crossed by 7.1 percent of the pipeline route length. The dominant soil mapping units which are crossed by the Project in soils association s6399 are: Geisel silt loam, 12 to 30 percent slopes (map unit 26D, 2.56 miles); Preacher-Bohannon loams, 30 to 60 percent slopes (map unit 46E, 2.05 miles); Templeton silt loam, 30 to 50 percent slopes (map unit 54E, 0.77 miles); and Templeton silt loam, 0 to 30 percent slopes (map unit 54D, 0.86 mile). Fifteen other soil mapping units are crossed by the Project with individual crossing lengths ranging from 0.04 to 0.56 mile. All of the soil map units crossed in this soils association are susceptible to soil compaction. Geisel soils have a paralithic contact with siltstone at 40 to 60 inches which rates them as having reclamation sensitivity. The Geisel soil map unit is designated as a farmland of statewide importance. Preacher-Bohannon loams are susceptible to water erosion due to the steep slopes and are

designated as having a reclamation sensitivity rating. Templeton soils have a paralithic contact with siltstone between 40 and 60 inches deep and a reclamation sensitivity potential. Templeton silt loam has steep slopes (30 to 50 percent) which makes it susceptible to water erosion and gives it a potential for reclamation sensitivity. The mean annual precipitation in this soil association is 65 to 80 inches.

NORTHERN PACIFIC COAST RANGE, FOOTHILLS, AND VALLEYS (MLRA-1) – MPs 19.22 TO 47.16

The North Pacific Coast Range, Foothills and Valleys MLRA encompasses the Coast Range of Oregon in the project area, which is centered about on the Coos and Douglas County line. Most of the MLRA consists of hills and low mountains with gentle to steep slopes. Elevations near the project area range from 300 to almost 3,000 feet. The valleys are mostly narrow and of small extent. The MLRA receives an average annual precipitation of 60 to 100 inches, which is evenly distributed throughout fall, winter, and spring. Summers are usually dry and warm, but hot days are rare. Winters are cool and snow and freezing temperatures are common only at higher elevations. In most of this area, snow falls only a few days each year. The average annual temperature is 40 to 55°F. The average freeze-free period in this area ranges between 150 to 280 days and decreases with elevation. Most of the area is densely forested, and timber production is the major industry. Recreation and wildlife habitat also are important land uses (NRCS 2006). The major soil resource concerns are water erosion due to steep slopes, erodible soils and high rainfall. The erosion hazard is considerable if plant cover is removed. Surface compaction and sedimentation of streams are also soil resource concerns. Mass movement in the form of landslides and slips is a serious problem and a major source of sediment in the rivers. The three soils associations crossed by the project area are described below.

Peavine-Olyic-Melby-Honeygrove-Blachly (s6396)

The Peavine-Olvic-Melby-Honeygrove-Blachly soil association is crossed by 4.5 percent of the pipeline route length. The dominant soil mapping units which are crossed by the Project in soils association s6396 are: Honeygrove silty clay loam, 30 to 50 percent slopes (map unit 30E, 3.17 miles); Honeygrove silty clay loam, 3 to 30 percent slopes (map unit 30D, 2.62 miles); Preacher-Blachly association, 12 to 30 percent slopes (map unit 44D, 1.45 miles); and Preacher-Blachly association, 30 to 60 percent slopes (map unit 44E, 1.33 miles). All of the soil map units crossed in this soils association are susceptible to soil compaction. Honeygrove and Blachly soils have greater than 40 percent clay in the control section which classifies them as having a reclamation sensitivity rating. Map units 30 E and 44E have slopes greater than 30 percent which increases water erosion potential and rates them as having reclamation sensitivity. Landforms are typified by uneven, step-like benches caused by sliding and slumping. The mean annual precipitation ranges from about 75 to 100 inches.

Nekoma-Meda-Kirkendall-Eilertsen (s6402)

The Nekoma-Meda-Kirkendall-Eilertsen soil association is crossed by 0.9 percent of the pipeline route length. The dominant soil mapping units which are crossed by the proposed Project in soils association s6402 are: Chismore silt loam, 3 to 7 percent slopes (map unit 10B, 0.79 mile); and Pyburn silty clay, 0 to 8 percent slopes (map unit 47B, 0.28 mile). Soils in both map units are prime farmland (farmland of statewide importance). Pyburn soils have greater than 40

percent clay in the control section which causes these soils have a reclamation sensitivity rating. Pyburn soils are hydric soils. Chismore soils have a high water table from November through March that ranges in depth from 1.5 to greater than 6.0 feet. Pyburn soils have a high water table from October through May that ranges from the surface to greater than 6.0 feet. The average annual precipitation of this association is about 75 inches.

Bohannon-Preacher (s6395)

The Bohannon-Preacher association (s6395) is crossed by the Pacific Connector pipeline in both Coos (14.38 miles) and Douglas (1.49 miles) Counties (7.0 percent of the pipeline route length). The mean annual precipitation is 80 to 95 inches. The dominant soil mapping units which are crossed by the proposed Project in soils association s6395 are: Preacher-Bohannon loams, 3 to 30 percent slopes (map unit 46D, 2.72 miles); Preacher-Blachly-Digger association, 30 to 60 percent slopes (map unit 45E, 2.43 miles); Preacher-Blachly association, 12 to 30 percent slopes (map unit 44D, 1.57 miles); Remote-Digger-Preacher complex, 30 to 50 percent slopes (map unit 50E, 1.56 miles). Ten other soil map units are crossed in this association with individual lengths ranging from 0.05 to 1.10 miles with similar soils and varying slope ranges. All of the dominant soil map units in this association are susceptible to soil compaction. Preacher-Blachly-Digger (45E) and Remote-Digger-Preacher (50E) have steep slopes that increase the potential for water erosion. Remote-Digger-Preacher (50E) is characterized by large stones. Preacher-Bohannon (46D), Preacher-Blachly-Digger (45E), and Remote-Digger-Preacher soil map units have a paralithic contact with sandstone within 20 to 60 inches, and have a potential for reclamation sensitivity.

The dominant soil mapping unit from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) which is crossed by the proposed Pacific Connector pipeline in soils association OR068 is Digger-Bohannon complex, 3 to 30 percent slopes (map unit 57E, 0.95 mile). Soils in this map unit are limited by large stones and are susceptible to compaction. The revegetation potential is low.

Siskiyou-Trinity Area (MLRA-5) – MPs 47.16 to 168.0

Siskiyou-Trinity Area is the largest MLRA crossed by the Project and it encompasses the three national forests (Umpqua, Rogue River-Siskiyou and portions of the Fremont-Winema), spanning portions of the Klamath Mountain and Cascade west physiographic provinces (crossing 1.8 percent of the pipeline route length). The Siskiyou-Trinity Area receives an average annual precipitation of 40 to 60 inches, with the high precipitation ranges occurring in the mountains. Precipitation is low in summer but is evenly distributed throughout the rest of the year. Summers are warm with an average temperature of 67°F. Winters are cool with snow and freezing temperatures common at higher elevations. The average seasonal snowfall ranges from 10 to 70 inches, varying dramatically depending on the year. During most winters, one or two storms bring strong and sometimes damaging winds. In some years, the accompanying heavy rains cause serious flooding (NRCS 2006).

The Pacific Connector pipeline will cross through the northern section of MLRA-5, crossing on the west the Klamath Mountains section of the Pacific Border Province of the Pacific Mountain System between Highway 42 near Camas Valley (MP 47.16) and Highway 62 near Trail Oregon (MP 122.6). This section consists of an uplifted and eroded peneplain on very hard rocks.

Numerous higher peaks are in scattered areas throughout this mountainous region. The Middle Cascade Mountains Section of the Cascade-Sierra Mountains Province of the Pacific Mountain System is also crossed within this MLRA-5 between about Highway 62 near Trail Oregon (MP 122.6) and Dead Indian Memorial Highway (MP 164.48). This section is an area of steep mountainous terrain with generally accordant summits interspersed with higher volcanic cones (NRCS 2006).

Elevation in the project area ranges from about 600 feet at the Umpqua River crossing north of Myrtle Creek to 5,300 feet at the crest of the Cascades. The freeze-free period averages 240 days and ranges from 110 to 365 days. Shorter freeze-free periods occur at the higher elevations. Most of this area is in coniferous forests that are important for wood products, wildlife habitat and recreation. Irrigated pasture, hay crops and livestock are grown in the valleys where water is available. Because of steep slopes, erodible soils and high rainfall, the major soil resource concern is erosion. The erosion hazard is considerable if plant cover is removed. Mass movement in the form of landslides and slips is a serious problem and a major source of sediment in the rivers (NRCS 2006).

The 13 soil associations crossed by the project within MLRA-5 are described below.

Windygap-Larmine-Bellpine-Bateman-Atring (s6410)

The Windygap-Larmine-Bellpine-Bateman-Atring soil association is crossed by 1.8 percent of the pipeline route length. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the Pacific Connector pipeline in soils association s6410 are: Windygap clay loam, 12 to 30 percent slopes (map unit 263E, 0.83 mile); Windygap clay loam, 2 to 12 percent slopes (map unit 263C, 0.71 mile); and McNabb-Windygap complex, 3 to 30 percent slopes (map unit 152E, 0.66 mile). All three of these soil map units are characterized by large stones, greater than 40 percent clay in the control section, and are susceptible to soil compaction, which rates them as having reclamation sensitivity potential. However, these soils are also designated as prime farmlands. Twelve other soil map units are crossed by the PCGP Project within this association with individual lengths ranging from 0.03 to 0.48 mile. The mean annual precipitation of this association is about 45 to 50 inches. Slopes are 2 to 75 percent.

Wapato-Waldo-McAlpin-Cove-Bashaw (s6408)

The Wapato-Waldo-McAlpin-Cove-Bashaw soil association is crossed by 2.0 percent of the pipeline route length. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the Pacific Connector pipeline in soils association s6408 are: Windygap clay loam, 2 to 12 percent slopes (map unit 263C, 0.54 mile); Windygap clay loam, 12 to 30 percent slopes (map unit 263E, 0.54 mile); and Windygap silt loam, 12 to 30 percent slopes (map unit 262E, 0.52 mile). Sixteen other soil map units are crossed within this association ranging in individual length from 0.03 to 0.32 mile. These soils are characterized by a paralithic contact with weathered siltstone within 40 to 60 inches, greater than 40 percent clay in the control section, and are susceptible to compaction.

These characteristics rate these soils as having reclamation sensitivity potential. However, each of these dominant soil map units is listed as prime farmland. The mean annual precipitation is about 45 to 50 inches.

Otwin-Oatman (s6397)

The Otwin-Oatman soil association is crossed by 1.4 percent of the pipeline route length in this MLRA (it is also crossed in another MLRA). The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the proposed Pacific Connector pipeline in soils association s6397 are: Conser silty clay loam, 0 to 3 percent slopes (map unit 44A, 0.61 mile); Veneta loam, 0 to 12 percent slopes (map unit 255C, 0.56 mile); Josephine-Speaker complex, 30 to 60 percent slopes (map unit 117F, 0.38 mile); and Windygap-Bellpine complex, 30 to 60 percent north slopes (map unit 265F, 0.34 mile). Twelve other soil map units are crossed within this association with individual lengths ranging from 0.04 to 0.25 mile.

The Conser, Veneta, and Windygap-Bellpine map units have greater than 40 percent clay in the control section, are susceptible to soil compaction, and have reclamation sensitivity potential. Conser soils are hydric and have a water table within 6 feet of the surface from November through May. The Veneta soil has a water table within 4 to 6 feet of the surface from November through May. Conser and Veneta soils are listed as prime farmland. The Josephine-Speaker complex and Windygap-Bellpine complex are characterized by steep slopes which increase the water erosion potential, have a paralithic contact with weathered sandstone or metasedimentary rock within 20 to 60 inches, are susceptible to soil compaction, and have a reclamation sensitivity rating. The mean annual precipitation is about 40 inches.

Vermisa-Vannoy-Josephine-Beekman (s6360)

The Vermisa-Vannoy-Josephine-Beekman soil association is crossed by 13.1 percent of the pipeline route length. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the proposed Pacific Connector pipeline in soils association s6360 in MLRA 2 are: Speaker-Beekman-Josephine complex, 60 to 90 percent north slopes (map unit 228G, 1.26 miles); Josephine-Speaker complex, 30 to 60 percent north slopes (map unit 116F, 1.68 miles); Speaker-Nonpareil complex, 30 to 60 percent slopes (map unit 230F, 1.08 miles); Debenger-Brader complex, 12 to 30 percent slopes (map unit 51E, 0.80 mile); Oakland-Nonpareil-Sutherlin complex, 30 to 60 percent slopes (map unit 174F, 0.78 mile); and Speaker loam, 30 to 60 percent south slopes (map unit 227F, 0.72 mile). Twenty seven other soil map units are crossed by this association with individual lengths ranging from 0.01 to 0.62 mile. All of the dominant soil map units are susceptible to soil compaction and have a reclamation sensitivity rating.

The Speaker-Beekman-Josephine, Josephine-Speaker, Speaker-Nonpareil, Oakland-Nonpareil-Sutherlin, and Speaker loam map units have steep slopes and water erosion potential. Beekman soils have a lithic contact with sedimentary rock at 20 to 40 inches. Brader and Nonpareil and soils have a paralithic contact with weathered sandstone at 10 to 20 inches. Debenger, Oakland, and Speaker soils have a paralithic contact with weathered sandstone at 20 to 40 inches. Josephine soils have a paralithic contact with weathered metasedimentary rock at 40 to 60 inches. Sutherlin soils are very deep and have a water table at 1.5 to 3.0 feet from November

through April. The Debenger-Brader complex map unit is listed as prime farmland (farmland of statewide importance).

Ruch-Medford (s6385)

The Ruch-Medford soil association is crossed by 36.0 percent of the pipeline route length in this MLRA. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the proposed Pacific Connector pipeline in soils association s6385 are: Sutherline silt loam, 3 to 12 percent slopes (map unit 235C, 0.39 mile); Coburg silty clay loam, 0 to 5 percent slopes (map unit 42B, 0.27 mile); and Fordice very cobbly loam, 0 to 12 percent slopes (map unit 82C, 0.19 mile). Six other soil map units are crossed within this association with individual lengths ranging from 0.04 to 0.09 mile. Sutherlin and Coburg soils have greater than 40 percent clay in the control section, are susceptible to soil compaction, and are listed as prime farmland. However, because of the high clay content and the soils susceptibility to compaction these soils have a reclamation sensitivity rating. Sutherlin soils have a water table at 1.5 to 3.0 feet from November through April. Coburg soils have a water table at 1.5 to greater than 6 feet from November through May. Fordice soils have large stones, giving this soil a reclamation sensitivity rating. The mean annual precipitation of the association ranges between 25 and 40 inches.

Lettia-Kanid-Atring-Acker (s6382)

The Lettia-Kanid-Atring-Acker soil association is crossed by 3.4 percent of the pipeline route length. This STATSGO soil association occurs in both the Douglas County Soil Survey Area and in the Umpqua National Forest Soil Resource Inventory. The average annual precipitation is about 45 inches. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the Pacific Connector pipeline in soils association s6382 are: Acker-Norling complex, 30 to 60 percent north slopes (map unit 5F, 0.94 mile); Dumont gravelly loam, 12 to 30 percent slopes (map unit 69E, 0.78 mile); Sharpshooter loam, 30 to 60 percent north slopes (map unit 220F, 0.47 mile); Sweetbriar silty clay loam, 3 to 30 percent slopes (map unit 239E, 0.44 mile); and Buckeye loam, 2 to 20 percent slopes (map unit 30D, 0.43 mile). Thirteen other soil map units are crossed in this association with individual lengths ranging from 0.01 to 0.38 mile.

All of the dominant soil map units are susceptible to soil compaction. Acker-Norling map unit is characterized by steep slopes that increase the water erosion potential, large stones, a paralithic contact with metavolcanic rock at 20 to 60 inches, and reclamation sensitivity potential. Dumont soils have greater than 40 percent clay in the control section, a reclamation sensitivity characteristic. Sharpshooter soils have steep slopes that increase the water erosion potential, a paralithic contact with schist at 40 to 60 inches; and a reclamation sensitivity rating. Sweetbriar soils have greater than 40 percent clay in the control section and reclamation sensitivity potential. Buckeye soils have a lithic contact with greenstone at 20 to 40 inches, greater than 40 percent clay in the control section, providing a reclamation sensitivity rating. Dumont, Sweetbriar, and Buckeye soils are prime farmland (farmland of statewide importance).

The dominant soil mapping units from the Soil Resource Inventory of Umpqua National Forest, Oregon (Forest Service 1976) crossed by the proposed Pacific Connector pipeline in soils association s6382 are: map unit 712 (0.23 mile); map unit 62 (0.47 mile); and map unit 25 (0.42

mile). Six other soil map units are crossed in this association with individual lengths ranging from 0.01 to 0.23 mile. Map unit 47 is characterized by steep slopes, large stones, a lithic contact with tuffs and breccia at 3 to 8 feet, susceptibility to compaction, and a reclamation sensitivity rating. Map unit 62 is characterized by steep slopes, wind and water erosion potential, a lithic contact with granite at 3 to 6 feet, susceptible to soil compaction, and is rated as having reclamation sensitivity. Map unit 25 is characterized by landslides on steep slopes, hydric soils and water tables associated with sag ponds, and landslides with reclamation sensitivity.

Rock outcrop-Pearsoll-Dubakella-Cornutt (s6377)

The Rock outcrop-Pearsoll-Dubakella-Cornutt soil association is crossed by 0.5 percent of the pipeline route length. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the proposed Pacific Connector pipeline in soils association s6377 are: Hilltish very gravelly sandy loam, 60 to 90 percent north slopes (map unit 95G, 0.57 mile); and Hilltish very gravelly sandy loam, 60 to 90 percent south slopes (map unit 96G, 0.29 mile). Four other soil map units are crossed within this association with individual lengths ranging from 0.01 to 0.14 mile. Hilltish soils are characterized by steep slopes that increase the potential for water erosion, large stones, a lithic contact with conglomerate at 20 to 40 inches, susceptibility to soil compaction, and a reclamation sensitivity rating. The mean annual precipitation of the association is about 30 inches.

Tethrick-Tallowbox-Siskyou-Shefflein (s6383)

This STATSGO soil association occurs in both the Douglas County Soil Survey Area and in the Umpqua National Forest Soil Resource Inventory; and is crossed by 3.6 percent of the pipeline route length. The annual precipitation is 32 to 45 inches. The dominant soil mapping units from the Soil Survey of Douglas County are: Lettia-Beal-Zing complex, 30 to 60 percent south slopes (map unit 138F, 1.57 miles); Sharpshooter loam, 30 to 60 percent south slopes (map unit 221F, 0.47 mile); Lettia-Beal-Zing complex, 30 to 60 percent north slopes (map unit 137F, 0.39 mile); and Acker-Norling complex, 30 to 60 percent south slopes (map unit 6F, 0.36 mile). Six other soil map units are crossed within this association with individual lengths ranging from 0.06 to 0.26 mile. All of the dominant soil map units have steep slopes that lead to severe water erosion potential, susceptibility to soil compaction and reclamation sensitivity potential. Lettia soils have a paralithic contact with granodiorite at 40 to 60 inches. Sharpshooter soils have a paralithic contact with weathered schist at 40 to 60 inches. Norling soils have a paralithic contact with metavolcanic rock at 20 to 40 inches.

Beal and Zing soils have a water table from 2 to greater than 6 feet from November through May. The dominant soil mapping units from the Soil Resource Inventory of Umpqua National Forest, Oregon (USFS 1976) crossed by the proposed Project in soils association s6383 are: map unit 812 (2.16 miles); and map unit 621 (1.32 mile). Three other soil map units are crossed within this association with individual lengths ranging from 0.17 to 0.20 mile. Both of the dominant soil map units have steep slopes, are susceptible to wind and water erosion, have large stones, and have reclamation sensitivity potential. Map unit 812 has a lithic contact with serpentine at 3 to 6 feet. Map unit 621 has a lithic contact with granite at 3 to 8 feet.

Thistleburn-Telemon-Scaredman-Mellowmoon-Lempira-Illahee (s6390)

The dominant soil mapping units from the Soil Resource Inventory of Umpqua National Forest, Oregon (Forest Service 1976) crossed by the Pacific Connector pipeline in soils association s6390 are: map unit 723 (1.98 miles); map unit 712 (1.07 miles); and map unit 421 (0.78 mile) (crossed by 2.2 percent of the pipeline route length). Four other soil map units are crossed within this association with individual lengths ranging from 0.15 to 0.46 mile. Each of the dominant map units have steep slopes, large stones, and are susceptible to soil compaction. Map unit 723 has a lithic contact with schist at 3 to 6 feet. Map unit 712 has a lithic contact with schist at 3 to 8 feet. Map unit 621 has a lithic contact with tuffs at 3 to 8 feet. The mean annual precipitation is 60 to 70 inches.

Straight-Geppert-Freezener-Dumont (s6381)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Umpqua National Forest Soil Resource Inventory (crossed by 2.6 percent of the pipeline route length). The mean annual precipitation ranges from 43 to 50 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the Pacific Connector pipeline in soils association s6381 are: McNull loam, 12 to 35 percent north slopes (map unit 114E, 0.68 mile); Straight extremely gravelly loam, 12 to 35 percent north slopes (map unit 182E, 0.62 mile); Freezner gravelly loam, 12 to 35 percent slopes (map unit 64E, 0.56 mile); and McNull loam, 35 to 60 percent north slopes (map unit 114G, 0.53 mile). Twelve other soil map units are crossed within this association with individual lengths ranging from 0.02 to 0.48 mile. Each of the dominant soil map units has steep slopes, is susceptible to soil compaction, and has a reclamation sensitivity rating. McNull and Straight soils have a lithic contact with andesite at 20 to 40 inches. McNull soils in map unit 114G are susceptible to water erosion. The Straight soil is hydric. The Freezner soil is prime farmland (farmland of statewide importance).

The dominant soil mapping unit from the Soil Resource Inventory of Umpqua National Forest, Oregon (Forest Service 1976) crossed by the proposed Project in soils association s6381 is map unit 222 (1.14 miles). Map units 421 (0.27 mile) and 42 (0.01 mile) are also crossed within this association. Map unit 222 has steep slopes, a lithic contact with tuffs and breccia at 3 to 8 feet and a reclamation sensitivity rating.

McNull-Medco-McMullin (s6380 and s6386)

The McNull-Medco-McMullin soil association is crossed by 15.5 percent of the pipeline route length. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the Pacific Connector pipeline in soils association s6380 and s6386 are: Medco-McMullin complex, 12 to 50 percent slopes (map unit 125F, 4.04 miles); McMullin-Rock Outcrop, 3 to 35 percent slopes (map unit 113E, 3.95 miles); McMullin-McNull gravelly loams, 35 to 60 percent slopes (map unit 111G, 2.65 miles); Mcmullin-Medco Complex, 15-50 percent slopes (map unit 112F, 2.05 miles); McNull loam, 12 to 35 percent north slopes (map unit 114E, 2.24 miles); and McNull-Medco complex, 12 to 50 percent slopes (map unit 118E, 2.37 miles). Thirty-four other map units are crossed within this association with individual lengths ranging from 0.06 to 1.88 miles. Each of the dominant soil map units has steep slopes, is susceptible to soil compaction, and has reclamation sensitivity potential. McNull, Medco, and Carney soils have greater than 40 percent clay in the control section. McNull and Medco soils

have large stones. Carney soils have a paralithic contact with weathered sandstone at 20 to 40 inches. McMullin soils have a lithic contact at 12 to 20 inches. McNull soils have a lithic contact with fractured andesite at 12 to 20 inches. McNull soils have a paralithic contact with fractured andesite at 20 to 40 inches. Medco soils have a paralithic contact with weathered tuff at 20 to 40 inches. Medco soils have a water table at 0.5 to 1.6 feet from December through March. Carney soils have a water table at 3 to 3.5 feet from December through April. Carney soils are prime farmland (farmland of statewide importance). This association has a mean annual precipitation of about 30 to 35 inches.

Tatouche-Pinehurst-Farva-Bybee Farva-Tatouche-Bybee (s6384)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Rogue River-Siskiyou National Forest (crossed by 5.9 percent of the pipeline route length). The mean annual precipitation ranges from 40 to 43 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the Pacific Connector pipeline in soils association s6384 are Farva very cobbly loam, 3 to 12 percent slopes (map unit 56C, 0.73 mile); Tatouche gravelly loam 12 to 35 percent slopes (map unit 191 E, 0.52 mile); Farva very cobbly loam, 35 to 65 percent slopes (map unit 57G, 0.65 mile); Farva very cobbly loam, 12 to 35 percent slopes (map unit 57E, 0.43 mile); and Freezner gravelly loam, 12 to 35 percent slopes (map unit 64E, 0.43 mile). Four other map units are crossed within this association with individual lengths ranging from 0.05 to 0.33 mile. Farva soils have large stones, a paralithic contact with partially weathered andesite at 20 to 40 inches, and have reclamation sensitivity potential. Farva soils in map units 57E and 57G have steep slopes. Farva soils in map unit 57G have potential for water erosion due to the steep slopes. Freezner soils have steep slopes, are susceptible to compaction, and thus are rated as having reclamation sensitivity, but are considered farmlands of statewide importance.

The following STATSGO description for soil association s6384 is provided for areas crossed by the PCGP Project within the Rogue River-Siskiyou National Forest between MPs 158.30 and 168.0 (9.7 miles). In this area the Rogue River National Forest Soil Resource Inventory was used to characterize soil properties (Forest Service 1977). The Farva series consists of moderately deep, well drained soils formed in colluvium weathered from andesite, tuffs, basalts and breccias found on mountains at 3,600 to 6,100 feet. The Tatouche series consists of deep, well-drained soils that formed in clayey colluvium weathered from tuff, breccia, and andesite. Tatouche soils are on mountain slopes. The Bybee series consists of deep, somewhat poorly drained soils that formed in clayey colluvium weathered from andesite, volcanic tuffs and breccias. Bybee soils are found on mountains. The mean annual precipitation is about 40 to 43 inches, on slopes of 3 to 70 percent.

Klamath and Shasta Valleys and Basins (MLRA-21) – MPs 168.0 to 228.13

The proposed pipeline passes through the Klamath and Shasta Valleys and Basins MLRA on the east side of the Cascade Mountains in the Klamath Basin. Most of this section of the project area is approximately 4,000 feet in elevation. As described by NRCS (2006), this area is in a transition zone between the Basin and Range Province to the southeast and the Cascades and Klamath Basins to the west. The area receives an average annual precipitation of 20 to 30 inches, with dry summers. Average temperature for summer is in the mid 60 degrees F range. The winter is in the mid-50°F range. Snowfall accounts for 30 percent of the moisture in the

valleys. Average freeze-free period is 70 to 140 days, decreasing with elevation. Most of the land crossed in the Klamath Basin is in agricultural production including irrigated potatoes, grain, seed crops, hay or pastures. Rangelands are grazed and trees are harvested for lumber in forested areas. The major soil resource concerns are wind erosion, water erosion, maintenance of productivity of the soils, conservation of soil moisture and the quality of irrigation water. The hazard of water erosion is slight in most of the basin areas but can be high in the steeper areas if the surface is bare. In some areas where soils are coarsely textured the hazard of wind erosion can be high, especially when the surface is disturbed during the period of highest wind velocities typically in spring or early summer (NRCS 2006). The eight soil associations crossed in this MLRA are summarized below.

Oatman-Otwin (s6387)

The Oatman-Otwin soil association is crossed by 2.9 percent of the pipeline route length in this MLRA (it is also crossed in another MLRA). This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Fremont-Winema National Forest in Klamath County. The mean annual precipitation for this association ranges between 35 and 40 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the proposed Pacific Connector pipeline in soils association s6387 is: Oatman cobbly loam, depressional, 0 to 12 percent slopes (map unit 137C, 2.96 miles); Two other soil map units are crossed in this association with individual lengths of 0.12 and 0.05 mile. Oatman soil has large stones, is susceptible to soil compaction, and has a reclamation sensitivity potential.

The following STATSGO description for soil association s6387 is provided for areas crossed by the Pacific Connector pipeline within the Fremont-Winema National Forest between MPs 168.00 and 171.6 (3.6 miles). In this area the Winema National Forest Soil Resource Inventory was used to characterize soil properties (Forest Service 1979).

The Oatman series consists of very deep, well-drained soils on plateaus and hillslopes. These soils formed in colluvium and residuum derived dominantly from andesite and volcanic ash (SCS 1993). The Otwin series consists of moderately deep, well-drained soils that formed in colluvium and residuum weathered from andesite and volcanic ash. Otwin soils are found on plateaus. The Hoxie series consists of deep, poorly drained soils that formed in lacustrine material with an influence of volcanic ash in the surface. Hoxie soils are in flat basins. The Hoxie soils are in Buck Lake and were avoided by incorporating the Clover Creek Road Alternative into the preferred alignment (see Resource Report 10). The mean annual precipitation for this association ranges between 35 and 40 inches. Slopes are 0 to 65 percent.

Woodcock-Pokegema-Royst (s6388)

The Woodcock-Pokegema-Royst soil association is crossed by 2.4 percent of the pipeline route length. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the Pacific Connector pipeline in soils association s6388 is Pokegema-Woodcock, 1 to 12 percent slopes (map unit 147C, 2.52 miles). Three other soil map units (two of the units are steep units of Pokegema and Woodcock soils) are crossed in this association with individual lengths ranging from 0.11 to 0.29 mile. Pokegema soils have a paralithic contact with partially weathered andesite at 40 to 60 inches. This soil map unit is susceptible to soil

compaction and has a reclamation sensitivity rating. The mean annual precipitation for this association ranges from about 20 to 30 inches.

Sheld-Pinehurst-Greystoke-Bly (s656)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Klamath County Soil Survey Area (crossed by 4.2 percent of the pipeline route length). This mapping unit has a mean annual precipitation range between 25 to 37 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the proposed PCGP Project in soils association s656 are: Bly-Royst complex, 1 to 12 percent slopes (map unit 13C, 3.09 miles); Pinejurst-Greystoke complex, 1 to 12 percent slopes (map unit 145C, 3.47 miles); and Greystoke-Pinehurst complex, 12 to 35 percent slopes (map unit 80E, 1.35 mile). Five other soil map units are crossed in this association with individual lengths ranging from 0.04 to 0.67 mile. Each of the dominant soil map units has large stones, is susceptible to soil compaction, and is rated as having reclamation sensitivity potential. The Royst soil has a lithic contact with andesite at 20 to 40 inches. The Greystoke soil has a paralithic contact with weathered andesite at 40 to 60 inches.

The Greystoke-Pinehurst map unit (80E) has steep slopes. The Bly-Royst complex is listed as prime farmland (farmland of statewide importance). The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon Southern Part (SCS 1985) crossed by the proposed PCGP Project in soils association s656 is Greystoke-Pinehurst complex, 12 to 35 percent slopes (map unit 98E, 0.56 mile).

Two other soil map units are crossed in this association with individual lengths of 0.05 and 0.33 mile. The Greystoke-Pinehurst map unit has steep slopes, potential for water erosion, large stones, susceptibility to soil compaction, and potential for reclamation sensitivity.

Lorella-Deven-Bieber-Adinot (s542)

The Lorella-Deven-Bieber-Adinot soil association is crossed by 0.9 percent of the pipeline route length. The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon, Southern Part (SCS 1985) crossed by the Project in soils association s542 are: Fordney loamy fine sand, 2 to 20 percent slopes (map unit 19C, 0.39 mile); and Woodcock association, south (map unit 82E, 0.36 mile). Seven other soil map units are crossed in this association with individual lengths ranging from 0.02 to 0.25 mile. Each of the dominant soils is susceptible to compaction. Fordney soils are considered as prime farmland, if irrigated. Lorella soils have steep slopes that increase water erosion potential, have large stones, a lithic contact with volcanic tuff at 10 to 20 inches, and are classed as having reclamation sensitivity. Woodcock soils have steep slopes, large stones, and are listed as farmland of statewide importance. Average annual precipitation is 18 to 23 inches.

Tulebasin-Malin-Lather-Capjac (s1150)

The Tulebasin-Malin-Lather-Capiac soil association is crossed by 3.1 percent of the pipeline route length. The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon, Southern Part (SCS 1985) crossed by the proposed PCGP Project in soils association s1150 are: Laki-Henley loams (map unit 40, 1.76 miles); Malin clay loam (map unit 53, 0.95 miles); Zuman silt loam (map unit 91, 0.82 mile); Deter clay loam (map unit 17A, 0.71 mile); and Scherrard

clay loam (map unit 70, 0.52 mile). Ten other soil map units are crossed in this association with individual lengths ranging from 0.01 to 0.50 mile.

Each of the dominant soil map units is susceptible to soil compaction. Henley soils have a duripan (4 to 50 inches thick) at 10 to 20 inches. Scherrard soils have a duripan (4 to 24 inches thick) at 20 to 40 inches. The Laki-Henley, Malin, Zuman, and Scherrard map units have saline/sodic conditions and have reclamation sensitivity. The Laki-Henley, Malin, Zuman, and Scherrard soil map units have water tables from the surface to greater than 6 feet from January through December and are listed as prime farmland (farmland of statewide importance). Deter soils are listed as prime farmland if irrigated. Average annual precipitation is 10 to 14 inches.

Poe-Pit-Malin-Laki-Henley (s6357)

The Poe-Pit-Malin-Laki-Henley soil association is crossed by 1.2 percent of the pipeline route length. The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon, Southern Part (SCS 1985) crossed by the PCGP Project in soils association s6357 are: Henley-Laki loams (map unit 28, 1.11 miles); and Laki loams (map unit 38, 0.53 mile). Six other soil map units are crossed in this association with individual lengths ranging from 0.01 to 0.25 mile. Henley soils have a duripan (4 to 50 inches thick) at 10 to 20 inches. Soils in both map units are saline/sodic, are susceptible to soil compaction, and have reclamation sensitivity potential. Henley soils have a water table at 1 to greater than 6 feet from January through December. Laki soils have a water table at 3 to greater than 6 feet from March through August. Both map units are listed as prime farmland (farmland of statewide importance). The average annual precipitation is 10 to 14 inches.

Fordney-Calimus (s6356)

The Fordney-Calimus soil association is crossed by 8.8 percent of the pipeline route length. The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon Southern Part (SCS 1985) crossed by the PCGP Project in soils association s6356 are: Fordney loamy fine sand, 0 to 2 percent slopes (map unit 19A, 3.21 miles); Modoc fine sandy loam, 0 to 2 percent slopes (map unit 58A, 2.94 miles); Calimus loam, 5 to 15 percent slopes (map unit 7C, 1.52 miles); Fordney loamy fine sand, 2 to 20 percent slopes (map unit 19C, 1.89 miles); Calimus loam 0 to 2 percent slopes (map unit 7A, 1.08 miles); and Lorella very stony loam, 2 to 35 percent slopes (map unit 50E, 0.89 mile). Twenty-eight other soil map units are crossed in this association with individual lengths ranging from 0.02 to 1.08 miles. All of the dominant soil map units are susceptible to soil compaction. Modoc soils have a duripan at 20 to 40 inches. Lorella soils have a lithic contact with volcanic tuff at 10 to 20 inches. Fordney, Modoc, and Lorella soils are classed as having reclamation sensitivity because of their shallow restrictive layer or coarse textures. However, the Fordney, Modoc, and Calimus (0 to 2 percent) soils are listed as prime farmland if irrigated. Calimus, 5 to 15 percent slopes, is listed as prime farmland (farmland of statewide importance). The average annual precipitation is 10 to 14 inches.

Stukel-Salisbury-Lorella-Fiddler-Dehlinger-Capona (s6355)

The Stukel-Salisbury-Lorella-Fiddler-Dehlinger-Capona soil association is crossed by 2.2 percent of the pipeline route length. The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon Southern Part (SCS 1985) crossed by the proposed PCGP Project in

soils association s6355 are: Lorella very stony loam, 2 to 35 percent south slopes (map unit 50E, 3.45 miles); Calimus loam, 5 to 15 percent slopes (map unit 7C, 0.58 mile); and Lorella-Calimus association, steep north slopes (map unit 51E, 0.30 mile). Six other soil map units are crossed in this association with individual lengths ranging from 0.05 to 0.24 mile. Lorella soils have steep slopes, water erosion potential, large stones, a lithic contact with volcanic tuff at 10 to 20 inches, have greater than 40 percent clay in the control section, and are rated as having reclamation sensitivity. Calimus and Lorella soils are susceptible to compaction. Calimus soils are listed as farmland of statewide importance. The average annual precipitation is 10 to 14 inches.

REFERENCES

Forest Service (U.S. Department of Agriculture Forest Service). 1976. Soil Resource Inventory. Cottage Grove, Steamboat, Diamond Lake, Glide and Tiller Ranger Districts. Umpqua National Forest. Pacific Northwest Region. Prepared by Sherman Radtke and Rudolph V. Edwards.

Forest Service. 1977. Soil Resource Inventory. Rogue River National Forest. Pacific Northwest Region. Prepared by George Badura and Philip Jahn.

Forest Service. 1979. Soil Resource Inventory. Winema National Forest. Pacific Northwest Region. Prepared by Garwin Carlson.

NRCS (Natural Resources Conservation Service). 2004. Soil Survey of Douglas County Area, Oregon. U.S. Department of Agriculture.

NRCS. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

NRCS. 2006. SSURGO Version: 2.2 Template Database Version: 32, Oregon v. 9.

SCS (Soil Conservation Service). 1985. Soil Survey of Klamath County, Oregon. U.S. Department of Agriculture.

SCS. 1989. Soil Survey of Coos County, Oregon. U.S. Department of Agriculture.

SCS. 1993. Soil Survey of Jackson County Area, Oregon. U.S. Department of Agriculture.

APPENDIX H

Late Successional Reserves Crossed by the PCGP Project

Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project Draft EIS

Appendix H

Late Successional Reserves Crossed by PCGP Project

Pacific Connector Gas Pipeline

Coos Bay, Roseburg, and Medford Districts and Klamath Falls Resource Area, Lakeview District, BLM Oregon; Umpqua, Rogue River, and Winema National Forests

Prepared for:

USDI Bureau of Land Management

USDA Forest Service

Prepared by:

North State Resources

Administrative Draft

Table of Contents

1.0 INTRODUCTION 1
1.1 Report Format 2
1.1.1 Purpose 2
1.1.2 Approach 2
1.1.3 Agency Use 2
1.2 Late Successional Reserves 3
1.2.1 Background 3
1.2.2 LSR Objectives/Goals 4
1.2.3 LSR Elements 4
1.2.4 Mapped LSRs 5
1.2.5 Unmapped LSRs 5
1.2.6 LSR Standards and Guidelines 5
1.2.7 LSRAs 6

2.0 LATE SUCCESSIONAL RESERVES CROSSED BY THE PCGP PROJECT 7
2.1 Overview 7
2.1.1 Energy Transmission on Federal Lands 7
2.1.2 The Proposed PCGP Project on BLM and Forest Service Lands 8
2.1.3 The Need for Plan Amendments and Off-Site Mitigation in LSRs 14
2.2 RMP Amendments on BLM Lands 18
2.2.1 Coos Bay District 20
2.2.2 Roseburg District 53
2.2.3 Medford District 85
2.2.4 Klamath Falls Resource Area of the Lakeview District 86
2.3 LRMP Amendments on National Forest system lands 88
2.3.1 Umpqua National Forest 89
2.3.2 Rogue River National Forest 108
2.3.3 Winema National Forest 124
2.4 Aggregated LSR Amendments and Off-Site Mitigation 126
2.4.1 Comparison of Total PCGP Project Impacts and Proposed Plan Amendments 128
2.4.2 Comparison of Total PCGP Project Impacts and Off-site Mitigation Actions 130
2.4.3 Summary of PCGP Project Impacts on LSRs and Proposed Plan Amendments and Off-site Mitigation Actions at the Province Level 132
2.4.4 Summary of PCGP Project Impacts on Occupied MAMU Stands and Proposed Plan Amendments and Off-site Mitigation Actions at the Province Level 138

3.0 LIST OF REPORT PREPARERS AND CONTRIBUTORS 142

4.0 REFERENCES 143

TABLES

TABLE 2.1.2-1 **Direct Effects a/ of the Proposed PCGP Project on Mapped and Unmapped b/ LSRs (acres)** 12

TABLE 2.1.2-2 **Summary of Total LSR Acres Directly and Indirectly a/ Affected by the Proposed PCGP Project** 13

TABLE 2.1.3-1 **Comparison of Total LSR Acres Cleared a/ by the PCGP Project and the Acres of Matrix Reallocated to LSR** 17

TABLE 2.2.1.1-1 **Acres and Percentages of LSOG and Interior Forest Habitat in LSR 261** 24

TABLE 2.2.1.2-1 **Known Occupied MAMU Stands within the PCGP Project Area in the Coos Bay District** 26

TABLE 2.2.1.4-1 **Comparison of LSR Acres Cleared a/ by Proposed PCGP Project and Acres Reallocated from Matrix to LSR** 33

TABLE 2.2.1.4-2 **Comparison of Total PCGP Project LSR Effects a/ and Acres of Matrix Reallocated to LSR** 34

TABLE 2.2.1.4-3 **Comparison of Total PCGP Project Effects a/ on MAMU Stands and Matrix Reallocated to LSR (acres)** 49

TABLE 2.2.1.4-4 **Comparison of the Total PCGP Project Effects a/ on LSRs and Matrix Reallocated to LSR (acres)** 50

TABLE 2.2.2.3-1 **KOAC Sites within the PCGP Project Area in the Roseburg District** 58

TABLE 2.2.2.3-2 **Known Occupied MAMU Stands in the Roseburg District within the PCGP Project Area** 59

TABLE 2.2.2.5-1 **Comparison of LSR Acres Cleared a/ by PCGP Project and Acres of Matrix Reallocated to LSR** 68

TABLE 2.2.2.5-2 **Comparison of the Total LSR Acres Affected a/ by the PCGP Project and Matrix Reallocated to LSR** 69

TABLE 2.2.2.5-3 **Comparison of Total Acres of Occupied Marbled Stands Impacteda/ by the PCGP Project and acres of Matrix to LSR Reallocation** 71

TABLE 2.2.2.5-4 **Summary of Total KOAC Acres Affected a/ by PCGP Project in the Roseburg District** 76

TABLE 2.2.2.5-5 **Summary of Total LSR 223 Acres Affected a/ by the PCGP Project in the Roseburg District and Acres of Matrix Reallocated to LSR** 78

TABLE 2.2.2.5-6 **Comparison of Total LSR Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR** 79

TABLE 2.2.2.5-7 **Comparison of Total LSR 261 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR** 81

TABLE 2.3.1.4-1 **Comparison of LSR Acres Cleared a/ by the PCGP Project and Acres of Matrix Reallocated to LSR** 95

TABLE 2.3.1.4-2 **Comparison of LSR 223 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR**....96

TABLE 2.3.1.4-3 Stand-Density Management Activities in LSR 223 and Matrix....100

TABLE 2.3.1.4-4 **Comparison of Total PCGP Project Impacts a/ on LSR 223 and Estimated Edge Reduction Effect b/ of Proposed Off-site Mitigation Actions (Acres)**....103

TABLE 2.3.1.4-5 **Comparison of Total LSR 223 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR**....104

TABLE 2.3.2.4-1 **Comparison of LSR Acres Cleared a/ by PCGP Project and Acres of Matrix Reallocated to LSR**....115

TABLE 2.3.2.4-2 **Comparison of Total LSR Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR**....116

TABLE 2.3.2.4-3 **Reductions in Road Density within 1/4 and 1/2 and 1 mile of PCGP Corridor**....119

TABLE 2.3.2.4-4 **Comparison of Total PCGP Project Impacts a/ on LSR 227 and Estimated Edge Reduction Effect b/ of Proposed Off-site Mitigation Actions (acres)**....122

TABLE 2.4-1 **Summary of Proposed BLM RMP and Forest Service LRMP Amendments**....126

TABLE 2.4-2 **Summary of Total LSR Acres Directly and Indirectly Affected a/ by PCGP Project**....126

TABLE 2.4-3 **Summary of Proposed Off-site Mitigation Actions for LSR Impacts on BLM and Forest Service Lands**....128

TABLE 2.4.1-1 **Summary of the Total LSR Acres Affected Directly and Indirectlya/ by PCGP Project and Total Acres of Matrix Reallocated to LSR**....128

TABLE 2.4.1-2 **Comparison of Total LSR Acres by Habitat Type Affected a/ by the PCGP Project and Total Acres of Matrix Reallocated to LSR**....129

TABLE 2.4.2-1 **Comparison of Total PCGP Project Impacts a/ on LSRs 223 and 227 and Estimated Edge Reduction Effect a/ of Proposed Off-site Mitigation Actions on Forest Service Lands (Acres)**....131

TABLE 2.4.3-1 **Comparison of Total PCGP Project Effects a/ on LSOG Habitat in LSRs and LSOG Habitat in Matrix Reallocated to LSR by Province (Acres)**....136

TABLE 2.4.3-2 **Summary of Proposed Off-site Mitigation Actions for LSR Impacts on BLM and Forest Service Lands by Province**....137

TABLE 2.4.4-1 **Comparison of Total LSOG Habitat Acres in Occupied MAMU Stands Affected a/ by PCGP Project and Acres of LSOG Habitat in the Matrix Reallocated to LSR in the Oregon Coast Province**....140

FIGURES

Figure 2.1-1. Overview Map of the PCGP Project and LSRs on BLM and USFS Lands 10

Figure 2.1-2. Occupied MAMU Stands Crossed by the Proposed PCGP Project 11

Figure 2.1-3. Known Owl Activity Centers Crossed by the PCGP Project 12

Figure 2.1-4. Direct Effects of the Proposed PCGP Project on Mapped and Unmapped LSRs (acres) 13

Figure 2.1-5. Summary of Total LSR Acres Directly and Indirectly Affected by the PCGP Project.....14

Figure 2.1-6. Comparison of Total LSR Acres Cleared by the PCGP Project and Total Acres of Matrix Reallocated to LSR 18

Figure 2.2-1. Map of Proposed PCGP Project and LSRs in the Coos Bay District.....22

Figure 2.2-2. Map of South Coast–North Klamath LSRA.....23

Figure 2.2-3. Map of Occupied MAMU Stands in PCGP Project Area 27

Figure 2.2-4. Map of Matrix Reallocated to LSR in the Coos Bay District.....29

Figure 2.2-5. Map of Off-site LSR Mitigation Proposals in the Coos Bay District.....30

Figure 2.2-6. Map of Reallocation from Matrix to LSR and MAMU Stands.....32

Figure 2.2-7. Comparison of LSR Acres Cleared by PCGP Project and Acres Reallocated from Matrix to LSR.....33

Figure 2.2-8. Comparison of Total PCGP Project LSR Effects and Matrix Reallocated to LSR (acres).....34

Figure 2.2-9. Map of MAMU Occupied Stand C1080 38

Figure 2.2-10. Map of MAMU Occupied Stand C3098 39

Figure 2.2-11. Map of MAMU Occupied Stand C3075 and C3042 40

Figure 2.2-12. Map of MAMU Occupied Stand C3093 41

Figure 2.2-13. Map of MAMU Occupied Stand C3165 42

Figure 2.2-14. Map of MAMU Occupied Stand C3073 43

Figure 2.2-15. Map of MAMU Occupied Stand C3090 44

Figure 2.2-16. Map of MAMU Occupied Stand C3094 45

Figure 2.2-17. Map of MAMU Occupied Stand C3095 46

Figure 2.2-18. Map of MAMU Occupied Stand C3070 47

Figure 2.2-19. Map of MAMU Occupied Stand C3092 48

Figure 2.2-20. Comparison of Total PCGP Project Effects on MAMU Stands and Matrix Reallocated to LSR (acres).....50

Figure 2.2-21. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR.....51

Figure 2.2-22. Map of Proposed PCGP Project and LSRs in the Roseburg District 54
Figure 2.2-23. Map of KOAC Sites Crossed by PCGP Project in the Roseburg District.....58
Figure 2.2-24. Map of Occupied MAMU Stand R3035 59
Figure 2.2-25. Map of Occupied MAMU Stand R3036 60
Figure 2.2-26. Map of Proposed Matrix to LSR Reallocation in the Roseburg District.....62
Figure 2.2-27. Map of Proposed Off-site LSR Mitigation Actions in the Roseburg District 63
Figure 2.2-28. Map of LSR 261 Crossed by PCGP Project (east portion) 65
Figure 2.2-29. Map of LSR 261 Crossed by PCGP Project (west portion) 66
Figure 2.2-30. Map of Proposed Matrix to LSR Reallocation and LSOG Habitat in the Roseburg District.....67
Figure 2.2-32. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR.....69
Figure 2.2-33. Total Acres of Occupied MAMU Stands Affected by PCGP Project on the Roseburg District.....71
Figure 2.2-34. MAMU Zone Map 72
Figure 2.2-35. Map of KOAC P2199 and the PCGP Project.....74
Figure 2.2-36. Map of KOAC P0361 and P2294 and the PCGP Project.....75
Figure 2.2-37. Summary of Total KOAC Acres Affected by the PCGP Project in the Roseburg District.....76
Figure 2.2-38. Map of LSR 223 Crossed by the PCGP Project in the Roseburg District.....77
Figure 2.2-39. Summary of Total LSR 223 Acres Affected by the PCGP Project on the Roseburg District.....78
Figure 2.2-40. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR.....80
Figure 2.2-41. Comparison of Total LSR 261 Acres Impacted by the PCGP Project and Acres of Matrix to LSR Reallocation.....82
Figure 2.2-42. Map of the Proposed PCGP Project and LSRs on the Medford District.....86
Figure 2.2-43. Map of the Proposed PCGP Project and LSRs in the Klamath Falls Resource Area of the Lakeview District 87
Figure 2.3-1. Map of Proposed PCGP Project and LSRs in the Umpqua National Forest 90
Figure 2.3-2. Proposed Matrix to LSR Reallocation, Umpqua National Forest 93
Figure 2.3-3. Proposed Off-site Mitigation Actions in the Umpqua National Forest.....94
Figure 2.3-4. Comparison of Acres of LSR Cleared by the PCGP Project and Acres of Matrix to LSR Reallocation 96
Figure 2.3-5. Comparison of Total LSR 223 Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR 97
Figure 2.3-6. Comparison of Total PCGP Project Impacts on LSR 223 and Estimated Edge Reduction Effect of Proposed Off-site Mitigations (acres).....103

Figure 2.3-7. Comparison of Total LSR 223 Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR 105

Figure 2.3-8. Map of Proposed PCGP Project and LSR in the Rogue River National Forest 109

Figure 2.3-9. Map of Proposed Matrix Reallocated to LSR in the Rogue River National Forest 113

Figure 2.3-10. Proposed Off-site Mitigation Actions in the Rogue River National Forest 114

Figure 2.3-11. Comparison of LSR Acres Cleared by the PCGP Project and Acres of Matrix Reallocated to LSR 115

Figure 2.3-12. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR 116

Figure 2.3-13. Comparison of Total PCGP Project Impacts on LSR 227 and Estimated Edge Reduction Effect of Proposed Off-site Mitigation Actions (acres) 122

Figure 2.3-14. Map of Proposed PCGP in the Winema National Forest 125

Figure 2.4-1. Summary of Total LSR Acres Directly and Indirectly Affected the PCGP Project 127

Figure 2.4-2. Comparison of Total LSR Acres Affected by the PCGP Project and Total Acres of Matrix Reallocated to LSR 129

Figure 2.4-3. Comparison of Total LSR Acres Affected by PCGP Project and Total Acres of Matrix Reallocated to LSR 130

Figure 2.4-4. Comparison of Total PCGP Project Impacts on LSRs 223 and 227 and Estimated Edge Reduction Effect of Proposed Off-site Mitigations on Forest Service Lands (acres) 132

Figure 2.4-5. Physiographic Provinces of the Northwest Forest Plan 134

Figure 2.4-6. Map of Physiographic Provinces Crossed by PCGP Project 135

Figure 2.4-7. Comparison of Total PCGP Project Impacts on LSOG Habitat in LSRs and LSOG Habitat in Matrix Reallocated to LSR by Province (acres) 136

Figure 2.4-8. Map of Physiographic Provinces and MAMU Zones 139

Figure 2.4-9. Comparison of Total LSOG Habitat Acres in Occupied MAMU Stands Affected by PCGP Project and Acres of LSOG Habitat in the Matrix to LSR Reallocation in the Oregon Coast Province 140

1.0 INTRODUCTION

The 1994 Northwest Forest Plan (NWFP) Record of Decision (ROD) created a new land use allocation called the Late-Successional Reserve (LSR). LSRs were designed to maintain late-successional (mature or old-growth) forests in a well-distributed pattern across federal lands within the range of the NSO (Mouer et al. 2011). The NWFP contained standards and guidelines for LSRs. As defined in the NWFP ROD, these standards and guidelines constitute the "rules and limits governing actions, and the principles specifying the environmental conditions or levels to be achieved" in each LSR (USDA and USDI 1994, page F-4).

The proposed Pacific Connector Gas Pipeline (PCGP) project would cross four Bureau of Land Management (BLM) districts and three U.S. Forest Service (Forest Service) national forests. The Resource Management Plans (RMPs) for the BLM districts that would be crossed by the PCGP project—Coos Bay, Roseburg, Medford, and Klamath Falls Resource Area of the Lakeview District—were approved in 1995 after the ROD for the NWFP was signed and, therefore, explicitly incorporated the LSR designation and related standards and guidelines. The land and resource management plans (LRMPs) of the three national forests that would be crossed by the PCGP project—Rogue River, Umpqua, and Winema—were amended by the NWFP to include LSR designations and standards and guidelines.

In crossing these federal lands, the PCGP project would traverse portions of three large (mapped) LSRs, RO-223 (223), RO-227 (227), and RO-261 (261), located in the Coos Bay and Roseburg Districts of the BLM and the Umpqua and Rogue River National Forests. Specifically, a portion of LSR 261 is in the Coos Bay District, portions of LSRs 261 and 223 are in the Roseburg District, portions of LSR 223 are in the Umpqua National Forest, and portions of LSR 227 are in the Rogue River National Forest. The proposed project would also cross several smaller (unmapped) LSRs in the Coos Bay and Roseburg Districts of the BLM, based on presence of marbled murrelet (MAMU) habitat and/or known owl activity centers (KOACs) outside mapped LSRs. For development proposals like the PCGP project, the LSR standards and guidelines state that pipelines should be planned to have the least possible adverse impacts on LSRs (USDA and USDI 1994, page C-17). The standards and guidelines also state that these types of proposals will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated.

To meet this direction, the federal agencies (BLM and the Forest Service) have provided input to the project proponent regarding project design. First, in routing the proposed PCGP project, LSRs have been avoided where possible. Second, where impacts to LSRs are unavoidable, onsite mitigation actions have been developed to minimize the impacts. Third, in order to ensure that the objectives would continue to be achievable in these LSRs, land reallocations are being proposed as part of a substantial off-site mitigation package. These proposed land reallocations would take non-LSR (i.e., matrix) lands and designate them as LSRs. The reallocations will require amendments to the RMPs for the Coos Bay and Roseburg Districts of the BLM and the LRMPs for the Umpqua and Rogue River National Forests. These proposed mitigation actions and related plan amendments for LSRs are a primary focus of this report.

1.1 REPORT FORMAT

1.1.1 Purpose

The purpose of this technical report is to provide the information necessary to support findings by agency decision-makers regarding impacts of the proposed PCGP project to the LSRs that the pipeline would cross. The Federal Land Policy and Management Act (FLPMA) of 1976 and the National Forest Management Act (NFMA) of 1976 require projects or other management activities on BLM- and Forest Service-managed lands to be consistent with the relevant land management plans. This means that decision makers must determine whether BLM and Forest Service actions to amend the relevant land management plans to reallocate non-LSR lands to LSR lands and the BLM decision (with Forest Service concurrence) to issue a right-of-way grant for the project are consistent with the standard and guidelines for new developments in LSRs.

1.1.2 Approach

Section 1 of this report provides background on the NWFP and the development of the LSR designation as part of the overall strategy to maintain healthy forest ecosystems that will support populations of native species associated with late-successional and old-growth (LSOG) forests. Included are overviews of the LSR components and standards and guidelines, as well as a summary of the content and role of Late-Successional Reserve Assessments (LSRAs).

Section 2 provides an evaluation, organized by BLM and Forest Service unit, of PCGP project impacts and related mitigation actions in individual LSRs. Each LSR evaluation includes a summary of relevant information from the associated LSRA, updated, as appropriate, with any significant new information. This section also includes an evaluation of proposed off-site mitigation actions and related plan amendments for each affected LSR and their impacts, if any, on attainment of LSR objectives. Finally, Section 2 describes the effects of the proposed mitigation actions and plan amendments on projected outputs of the land management plans, and, for LRMPs, the significance of any changes to the delivery of goods or services.

Section 3 of this report lists the experience and association of the report preparers, and Section 4 provides the references cited in this report.

1.1.3 Agency Use

As cooperating agencies, the BLM and Forest Service will use information in this report to prepare the portions of the PCGP Project Environmental Impact Statement (EIS) that are relevant to proposed agency actions.

The BLM will use the information in this report in considering whether or not to approve LSR-related amendments to the relevant RMPs. The BLM will also use this information in considering whether or not to grant a right-of-way for the project.

The Forest Service will use the information in this report in making its decision to approve or not approve LSR-related amendments to the relevant LRMPs, in its finding of whether or not those amendments would constitute significant changes under the NFMA, and in its decision regarding concurrence in BLM's granting of a right-of-way for the project.

1.2 LATE SUCCESSIONAL RESERVES

1.2.1 Background

In the 1980s, public controversy intensified over timber harvesting of LSOG forests; declining populations of LSOG-related species such as the northern spotted owl (NSO) and marbled murrelet (MAMU), which are both listed as threatened under the Endangered Species Act (ESA); and the role of federal forests in regional and local economies. Litigation and court injunctions on harvesting of LSOG forests on federal land resulted in gridlock for federal timber sales and economic impacts to communities dependent on the timber resource. Congress, seeking a permanent solution to the gridlock, commissioned a group of scientists to develop and evaluate different strategies for protecting LSOG forests on federal lands within the range of the NSO. This scientific team mapped areas of significant LSOG forests and developed several strategies for protecting them (Scientific Panel on Late-Successional Forest Ecosystems 1991). The turmoil ultimately led to President Clinton's convening a Forest Conference in Portland, Oregon, on April 2, 1993, to address the human and environmental needs served by federally managed forests in Washington, Oregon, and northern California (Mouer et al. 2011). Following the conference, an interagency team of scientists, economists, sociologists, and others—the Forest Ecosystem Management Assessment Team or FEMAT—was assembled to develop proposals for the management of over 24 million acres of public land within the range of the NSO.

On July 1, 1993, President Clinton announced his forest plan for a sustainable economy and a sustainable environment (Clinton and Gore 1993). During the same month, FEMAT issued its report, "Forest Ecosystem Management: An Ecological, Economic and Social Assessment" (FEMAT 1993), which provided the framework for subsequent National Environmental Policy Act (NEPA) decision-making. Over the next year, NEPA analyses were completed, and an EIS was developed. The ROD associated with this EIS was signed in 1994, implementing new management direction for the public lands within the range of the NSO (USDA and USDI 1994). The ROD amended existing management plans for 19 national forests and seven BLM districts in California, Oregon, and Washington. The ROD and accompanying standards and guidelines are commonly referred to as the Northwest Forest Plan. The ROD for the Final EIS is available at http://www.reo.gov/library/reports/newroda.pdf, and the standards and guidelines are available at http://www.reo.gov/library/reports/newsandga.pdf.

The NWFP established the following objectives for the land use allocations and standards and guidelines (USDA and USDI 1994, page 3):

- Comply with the requirements of federal law.
- Be based on the best available science and be ecologically sound.
- Protect the long-term health of federal forests.
- Provide for a steady supply of timber and non-timber resources that can be sustained over the long term without degrading forest health or other environmental resources.

The NWFP standards and guidelines created new land use allocations that overlay existing management directions in the relevant land management plans (USDA and USDI 1994). These plans, as amended, are consistent with all management directions in the NWFP regarding the proposed PCGP project. The standards and guidelines in the current BLM and FS management plans apply where they are more restrictive or provide greater benefits to late-successional forest

related species than other provisions of the standards and guidelines in the NWFP (USDA and USDI 1994, page C-2).

The NWFP allocated a network of LSR reserves to conserve species of concern within the existing configuration of land ownership and the location of remaining LSOG forests within the range of the NSO. The reserve network is embedded in a matrix of "working" forests and was designed to maintain LSOG forests in a well-distributed pattern across these federal lands (Mouer et al. 2011).

The LSR network is composed primarily of areas of large (mapped) reserves, but also includes smaller areas of "unmapped" reserves that are composed of sites occupied by MAMUs or are known NSO activity centers. The LSR standards and guidelines are designed to guide management activities occurring within these LSRs to protect and enhance the conditions of the LSOG forest ecosystems contained therein (USDA and USDI 1994). The proposed PCGP project would cross three mapped LSRs (223, 227, and 261).

1.2.2 LSR Objectives/Goals

The overall objective of the LSR network is to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG-related species, including the listed NSO and marbled murrelet. The reserves are designed to help achieve the following goals (USDA and USDI 1994, page B-4):

- Promote a distribution, quantity, and quality of LSOG forest habitat sufficient to avoid foreclosure of future management options.
- Provide habitat for populations of species associated with LSOG forests.
- Help ensure that LSOG species diversity will be conserved.

The LSR land allocations and standards and guidelines have been specifically designed to help achieve the goals listed above.

1.2.3 LSR Elements

In 1994, the standards and guidelines for the NWFP described five elements that were used to designate LSRs.

> Late-Successional Reserves have been designated based on five elements: (1) areas mapped as part of an interacting reserve system; (2) LS/OG 1 and 2 areas within Marbled Murrelet Zone 1, and certain owl additions, mapped by the Scientific Panel on Late-Successional Forest Ecosystems (1991); (3) sites occupied by marbled murrelets; (4) known owl activity centers; and (5) Protection Buffers for specific endemic species identified by the Scientific Analysis Team (SAT) (1993). (USDA and USDI 1994b, page C-9)

Today, elements (1) and (2) are commonly referred to as "mapped" LSRs, and elements (3) and (4) are commonly referred to as "unmapped" LSRs. Although element (5), protection buffers, was originally part of the LSR network, it was later removed by the 2001 ROD for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA and USDI 2001b). The 2001 ROD retained the direction to manage known sites of protection buffer species but removed their designation as small, species-specific LSRs.

1.2.4 Mapped LSRs

Most LSR areas are mapped. The LSR network includes approximately 7.4 million acres or about 30 percent of the area covered by the NWFP. Several factors were considered in designating these reserves, including key watersheds and significant areas of old-growth forest that had previously been identified (USDA and USDI 1994b). These included LS/OG 1 and 2 areas (most ecologically significant, and ecologically significant late-successional and old-growth forests, respectively) identified by the Scientific Panel on Late-Successional Forest Ecosystems (Johnson et al. 1991). Maps of the LSR network are available at the following website: http://www.reo.gov/gis/data/gisdata/index.htm. Maps of the LSRs that would be crossed by the PCGP project are included in Section 2 of this report.

1.2.5 Unmapped LSRs

Unmapped LSRs include sites occupied by MAMUs and known NSO activity centers. For MAMUs, surveys are required for projects that occur within MAMU habitat to determine if there is occupation within the project area. If occupation is documented, all contiguous existing and recruitment habitat within a 0.5-mile radius is to be protected and managed by the standards and guidelines for LSRs. The standards and guidelines for LSRs also apply to known spotted owl activity centers (as of January 1, 1994) located in matrix or Adaptive Management Areas of the NWFP. Activity centers are defined as an area of concentrated activity of either a pair of spotted owls or a territorial single owl. Each KOAC has a 100-acre area identified around or near the activity center, where the standards and guidelines for LSRs apply (USDA and USDI 1994b). Areas of unmapped LSRs affected by the PCGP project are discussed in Section 2 of this report.

It should be noted that the term “unmapped” LSR is being used to distinguish the LSR areas represented by occupied MAMU stands and KOACs from the larger “designated” or “mapped” LSRs in the NWFP. However, with implementation of the NWFP these areas are mapped and are part of the LSR land allocation network. It should also recognized that other terms are used by the agencies to refer to these areas including the terms LSOG 3 and 4 areas as well as LSR 3 and 4 areas. The term “unmapped” LSR is used in this report because it was the term used in the NWFP and is a consistent way to identify and discuss these LSR areas.

1.2.6 LSR Standards and Guidelines

The standards and guidelines for LSRs are contained in Attachment C (pages C-9 through C-21) of the NWFP ROD. They are designed to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG species. They are written to apply to specific management actions such as silviculture, range management, mining, new developments, etc., and should be interpreted in that context.

The standards and guidelines that apply to new developments such as pipelines are addressed on page C-17 of the NWFP standards and guidelines.

> “Developments of new facilities that may adversely affect Late-Successional Reserves should not be permitted. New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated. These will be planned to have the least possible adverse impacts

> on Late-Successional Reserves. Developments will be located to avoid degradation of habitat and adverse effects on identified late-successional species."

The LSR standards and guidelines provide the framework upon which the proposed LSR mitigation actions and related plan amendments for the PCGP project are evaluated.

1.2.7 LSRAs

The LSR standards and guidelines specify that management assessments be prepared for each large LSR (or groups of smaller LSRs) before habitat-disturbing projects are allowed to occur in these areas. The standards and guidelines (page C-11 of the NWFP ROD, USDA and USDI 1994) directed that these LSRAs include:

> "(1) a history and inventory of overall vegetative conditions within the reserve, (2) a list of identified late-successional associated species within the reserve, (3) a history and description of current land uses within the reserve, (4) a fire management plan, (5) criteria for developing appropriate treatments, (6) identification of specific areas that could be treated under those criteria, (7) a proposed implementation schedule tiered to higher order (i.e., larger scale) plans, and (8) proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results."

The BLM and the Forest Service use LSRAs to better understand the existing conditions in the LSRs, develop criteria for appropriate treatments, and identify and prioritize actions that would further LSR objectives. The NWFP directed that LSRAs would be subject to review by the Regional Ecosystem Office (REO). The REO provides staff work, support, and recommendations to the Regional Interagency Executives concerning the implementation of the NWFP (USDA and USDI 1994, page E-16). The standards and guidelines for LSRs also require REO review of projects in LSRs, such as thinning of trees, prescribed fire, salvage of dead trees, and others (USDA and USDI 1994, page C-12 through C-19). Once an LSRA has been reviewed by the REO, projects that are determined to be in conformance with relevant project criteria in the LSRA are exempt from further REO review. It is also intended that LSRAs be treated as 'living' assessments that should be updated over time as new data become available, conditions change (e.g., due to fires), and projects are implemented and monitored.

The three LSRAs relevant to the LSRs that would be affected by the PCGP project include the South Coast – Northern Klamath LSRA for LSR 261 (May 1998), the South Cascades LSRA for LSR 227 (April 1998), and the South Umpqua River/Galesville LSRA for LSR 223 (July 1999). These assessments will be discussed in further detail in Section 2 of this report and are available at the following website: http://www.reo.gov/lsr/assessments/

2.0 LATE SUCCESSIONAL RESERVES CROSSED BY THE PCGP PROJECT

2.1 OVERVIEW

2.1.1 Energy Transmission on Federal Lands

By law, energy transmission can be a legitimate use of public land. The U.S. Congress has determined that public lands, including BLM and Forest Service lands, play a significant role in energy development and transmission. This intent has been expressed in legislation that dates back to the Mineral Leasing Act of 1920. Because federal lands are so extensive in the Pacific Northwest, it would be practically impossible to avoid them and still construct interstate power transmission lines or natural gas pipelines that connect to distribution hubs. If utility corridors could not cross public lands, the impacts on private lands from easements would increase, and overall costs resulting from longer, more indirect routes would also increase. These costs would be ultimately carried by the public.

While the BLM and Forest Service have a mission to manage public lands, the Federal Energy Regulatory Commission (FERC) determines where and when new energy sources and transmission facilities can be developed. FERC is also the federal agency responsible for authorization of natural gas pipelines and certain other types of energy projects. Construction and operation of public utilities like the PCGP project are regulated by FERC to ensure that public interests are protected. If FERC has accepted an application from a utility company to cross public land, Congress, through the 2005 Energy Policy Act (EPAct), has directed the responsible agencies to coordinate with FERC to process applicaitons required to construct the project. The 2005 EPAct reinforced Executive Order (EO) 13212 issued May 18, 2001, which directed federal agencies to take appropriate actions, consistent with applicable law, to expedite reviews of applications for energy-related projects and to take other action necessary to accelerate the completion of such projects while maintaining safety, public health and environmental protections. To facilitate EO 13212, the Secretaries of Agriculture, Interior, and Energy and other federal agencies have agreed, through a formal Memorandum of Understanding (Interagency MOU, 2002), to coordinate their efforts and to cooperate in the expeditious processing of applications for construction of natural gas pipelines.

The underlying need for action of the PCGP project is for FERC to respond to the June 6, 2013, application to authorize the Jordan Cove export terminal (and PCGP), and for the BLM to respond to a right-of-way grant application originally filed by Pacific Connector on April 17, 2006. The right-of-way grant would allow Pacific Connector to construct, operate, maintain and eventually decommission a natural gas pipeline that would cross lands and facilities administered by the BLM, BOR, and the Forest Service. In addition there is a need for the BLM and Forest Service to consider amending affected district and forest land management plans to make provision for the PCGP right-of-way.

FERC will analyze the environmental consequences of the construction and operation of the proposed PCGP project in its EIS. The BLM and Forest Service have identified the specific sections of their RMPs and LRMPs that would need to be amended to make provision for the proposed project. The BLM and Forest Service will independently evaluate the proposed RMP and LRMP amendments, considering the overall balance of the goals and objectives and goods and services in each RMP/LRMP using the NEPA process as required by the planning regulations of each agency. The BLM and Forest Service will use FERC's consolidated public

record for description and analysis of environmental consequences associated with construction and operation of the PCGP project. The proposed RMP/LRMP amendments will be included and evaluated as part of FERC EIS. With the exception of land allocation changes that would reallocate acres of Matrix to LSR, the amendments are project-specific, and would apply only to this proposed project. This report evaluates the proposed RMP/LRMP amendments that are related to LSRs.

2.1.2 The Proposed PCGP Project on BLM and Forest Service Lands

The proposed project would cross about 71 miles of land managed by the BLM or Forest Service. The pipeline would cross four BLM districts (Coos Bay, Roseburg, Medford, and the Klamath Falls Resource Area of the Lakeview District) for a total of approximately 40 miles. The proposed pipeline would also cross three national forests (Rogue River, Umpqua, and Winema) for a total of approximately 31 miles.

The mapped LSRs that would be crossed are depicted on figure 2.1-1. The proposed project would affect mapped LSRs on four of the seven BLM and Forest Service units: the Coos Bay and Roseburg Districts for the BLM, and the Rogue River and Umpqua National Forests for the Forest Service. Several unmapped LSR areas would also be affected in the Coos Bay and Roseburg Districts of the BLM. These unmapped LSRs are depicted in figures 2.1-2 and 2.1-3. Table 2.1.2-1 and figure 2.1-4 provide an overview of the number of acres that would be directly affected by the PCGP project within LSRs on each affected unit of the BLM and Forest Service. Direct effects would occur in the areas that would be cleared (i.e., forest vegetation would be cleared) for the pipeline right-of-way and the temporary extra work areas (TEWAs). Direct effects would also occur in acres that would be "modified" by the PCGP project. These acres include uncleared storage areas (UCSAs) that would not be cleared of trees during construction. These areas would be used to store forest slash, stumps, and dead and downed log materials that would be scattered across the right-of-way after construction, which would be considered temporary habitat modifications.

Indirect effects from construction of the pipeline are also expected within LSRs that have interior forest that the MAMU and NSO rely on for nesting habitat. The conversion of large tracts of LSOG forest to small, isolated forest patches with large edge areas can create changes in microclimate, vegetation species, and predator-prey dynamics. Such edge effects – magnitude of changes over distance from the edge to forest interior – will depend on the general orientation to the sun. Two main physical factors affecting and creating an edge microclimate are sun and wind (Forman 1995; Chen et al. 1995, Harper et al. 2005). Together, sun and wind: 1) desiccate leaves by increasing evapotranspiration; 2) influence which plant species survive and thrive along the edge, usually favoring shade intolerant species; and 3) impact the soil, insects, and other animals along the edge. Compared to the forest interior, areas near edges receive more direct solar radiation during the day, lose more long-wave radiation at night, have lower humidity, and receive less short-wave radiation. However, such effects are dependent on such local conditions as orientation of an edge: the magnitudes of change in humidity with distance from an edge are most extreme with south-facing edges, compared to east- and west-facing edges (Chen et al. 1995). These effects would vary along the pipeline route as a function of route orientation and the facing direction of each edge. Because the Pacific Connector pipeline generally trends from northwest to southeast, edge effects would be most pronounced on the southwest-facing edges and weakest along the northeast-facing edges. Fundamental changes in the microclimate

(moisture, temperature, solar radiation) of a stand have been recorded greater than 700 feet from the forest edge (Chen et al. 1995).

Using recommendations from the ESA Sub-Task Group and Habitat Quality Subtask Group[1], indirect effects are considered to extend for 100 meters from the created edge in LSOG forest. In making their recommendation the sub-task groups considered the study done by Karen A. Harper et al, which looked at edge influence on forest structure in fragmented landscapes (Harper et al 2005). The study reviewed the effects caused by forest edges on multiple response variables including: 1) forest processes of tree mortality/damage, recruitment, growth rate, canopy foliage, understory foliage, and seedling mortality, 2) forest structure by canopy trees, canopy cover, snags and logs, understory tree density, herbaceous cover, and shrub cover, and 3) stand composition by species, exotics, individual species and species diversity. The study found that the mean distance of edge influence on any single response variable did not exceed 300 feet (100 meters). Therefore, indirect effects for the project are estimated to extend for 100 meters beyond the cleared area on each side of the corridor in LSOG forest habitat. There is no corresponding research for edge effects in younger forest stands (less than 80 yrs. old). There is however research that indicates indirect effects extend out approximately two times the average tree height (Morrison et al 2002). Based on this an estimate of 30 meters is used in non-LSOG forest habitat. In non-forested areas, no indirect effects are estimated since no new edge would be created. Table 2.1.2-2 and figure 2.1-5 provide a summary of the total number of LSR acres that would be directly and indirectly affected on BLM and Forest Service lands by the PCGP project.

The construction, operation, and maintenance of the proposed PCGP project would affect LSRs on federal lands in several ways. It would remove and fragment LSOG forest habitat that some vertebrate and invertebrate species are dependent on. It would directly affect individuals of species listed as threatened under the ESA (NSO and MAMU) through removal of suitable nesting, roosting, and foraging habitat for the NSO and the removal of suitable or potential nesting habitat for the MAMU. The indirect effects discussed above would result in the loss of interior LSOG forest habitat and increased predation. These impacts and others from the proposed construction, operation, and maintenance of the PCGP project on LSRs are discussed in sections 4.3.2, 4.4.2, 4.5.2, 4.6.2, , and 4.7.3 of FERC Draft EIS and in FERC-prepared biological assessments (BAs). In addition to the direct and indirect effects of the project the FERC DEIS will also address the cumulative impacts in section 4.14. This analysis would include other actions proposed on federal lands as well as the off-site mitigation actions that are being recommended. The analysis in this report focuses on how the proposed amendments and mitigation actions would affect the LSR land allocation in terms of the distribution, quantity and quality of LSOG habitat, and how the reallocation of matrix lands to LSR may impact expected timber outputs in the land use plans.

[1] These sub-task groups were part of an Interagency Task Force, which included representatives of the FWS and NMFS, as well as USFS, BLM, ODLCD, ODE, ODSL, COE, ODFW, EPA, and ODEQ, to obtain specific input, guidance, and technical approach reviews. Agencies participating in the Interagency Task Force reviewed information provided by Jordan Cove Energy and Pacific Connector Gas Pipeline.

Figure 2.1-1. Overview Map of the PCGP Project and LSRs on BLM and USFS Lands

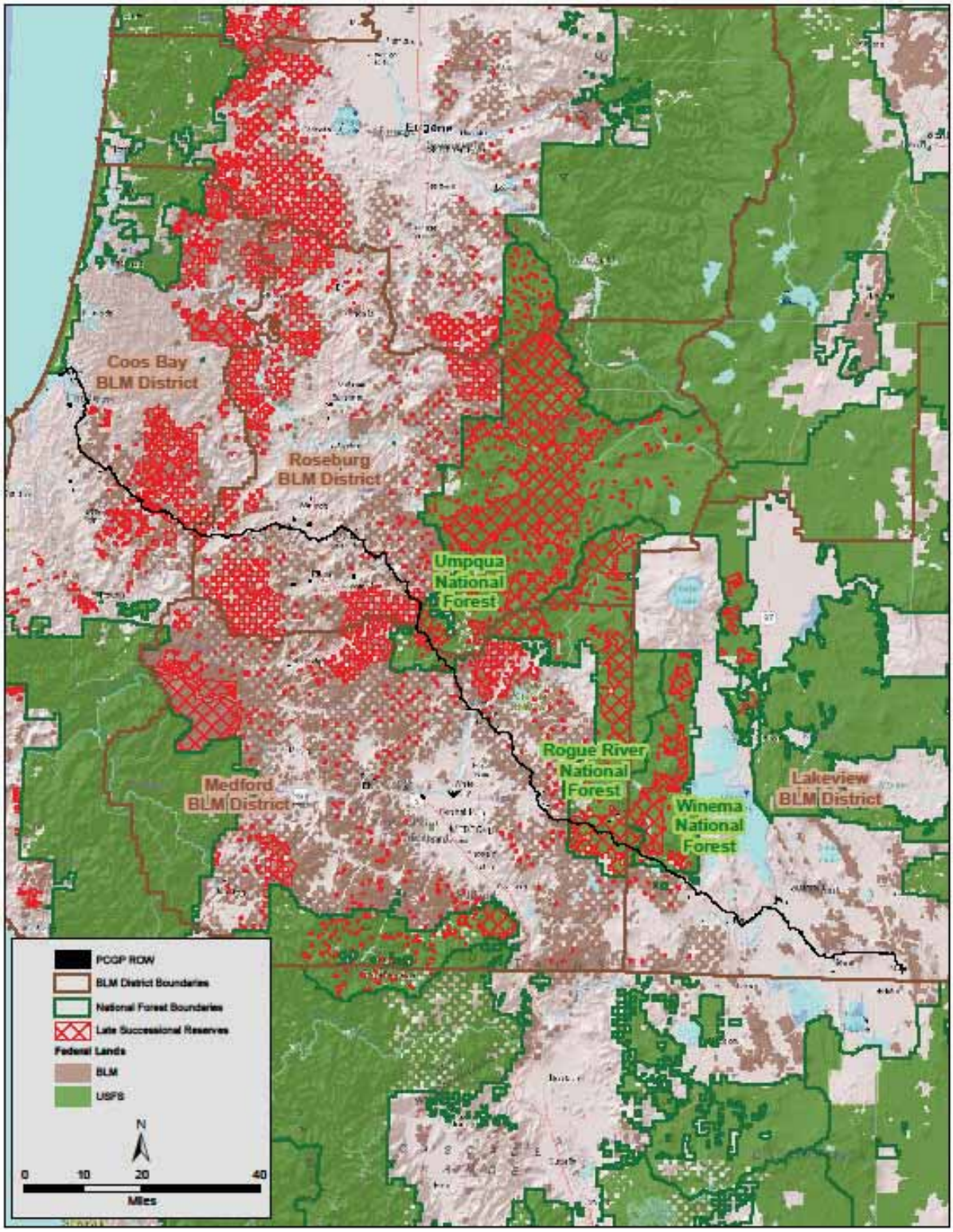


Figure 2.1-2. Occupied MAMU Stands Crossed by the Proposed PCGP Project

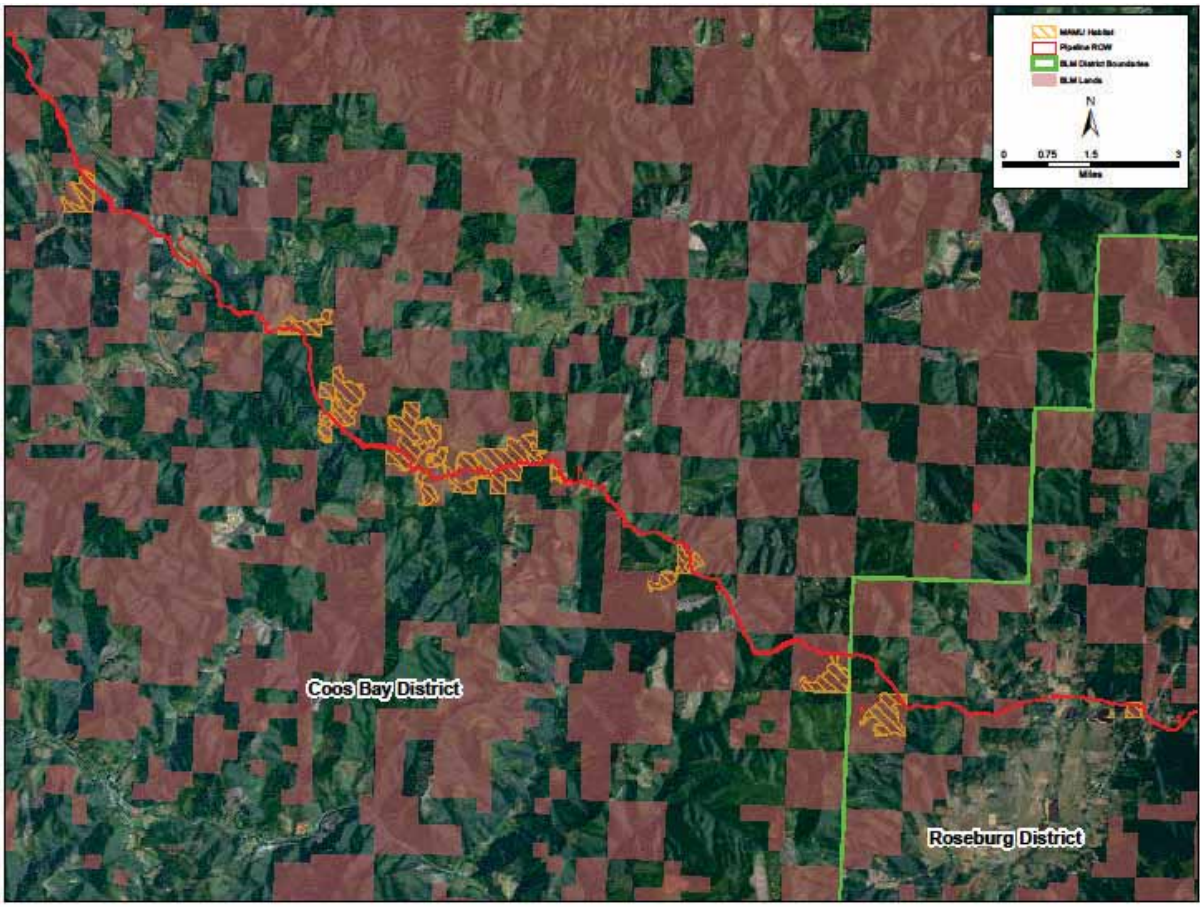


Figure 2.1-3. Known Owl Activity Centers Crossed by the PCGP Project

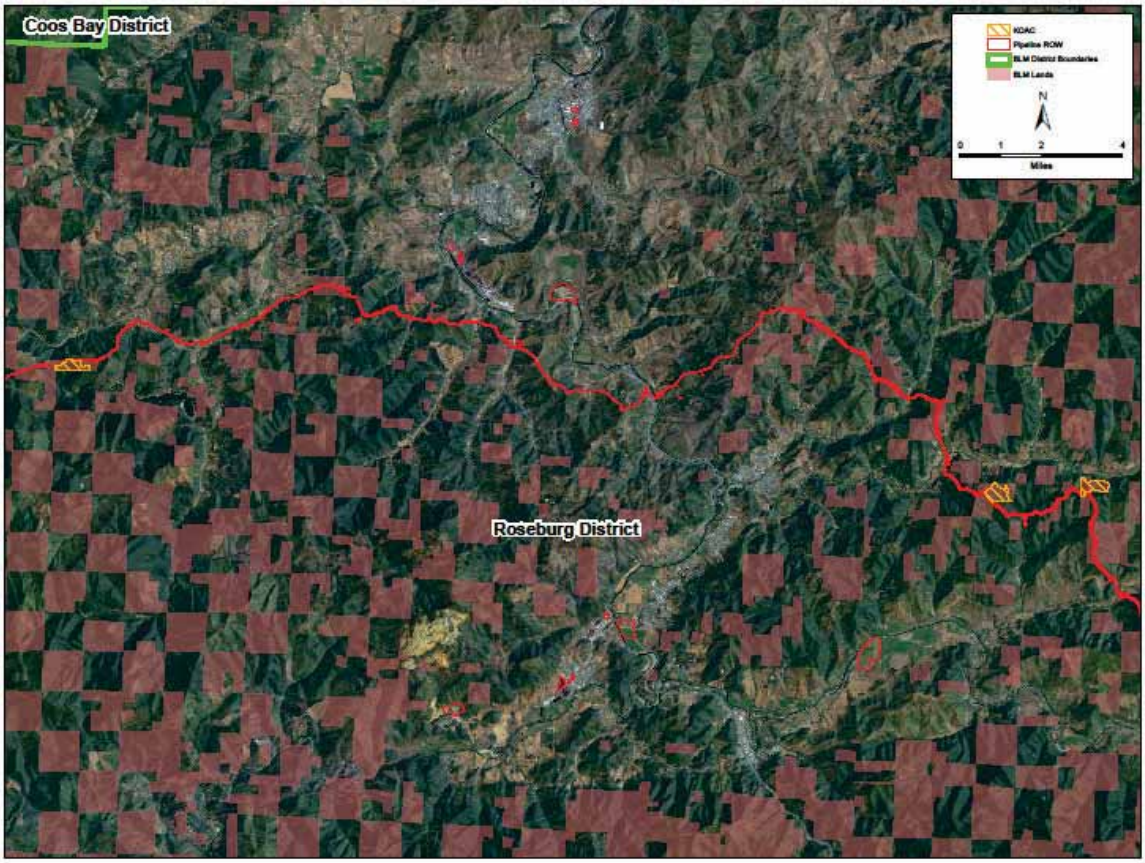


TABLE 2.1.2-1

Direct Effects a/ of the Proposed PCGP Project on Mapped and Unmapped b/ LSRs (acres)

District/Forest	Direct Effects on Mapped LSRs	Direct Effects on Unmapped LSRs	Total Direct Effects
Coos Bay District	34.8	39.9	74.7
Roseburg District	74.4	18.5	92.9
Umpqua National Forest	89.0	0.0	89.0
Rogue River National Forest	279.5	0.0	279.5
Total	477.6	58.4	536.1

a/ Direct effects include PCGP corridor clearing, TEWAs, and UCSAs
b/ Unmapped LSRs include MAMU stands and known owl activity centers
Data source: USFS, BLM GIS layers

Figure 2.1-4. Direct Effects of the Proposed PCGP Project on Mapped and Unmapped LSRs (acres)

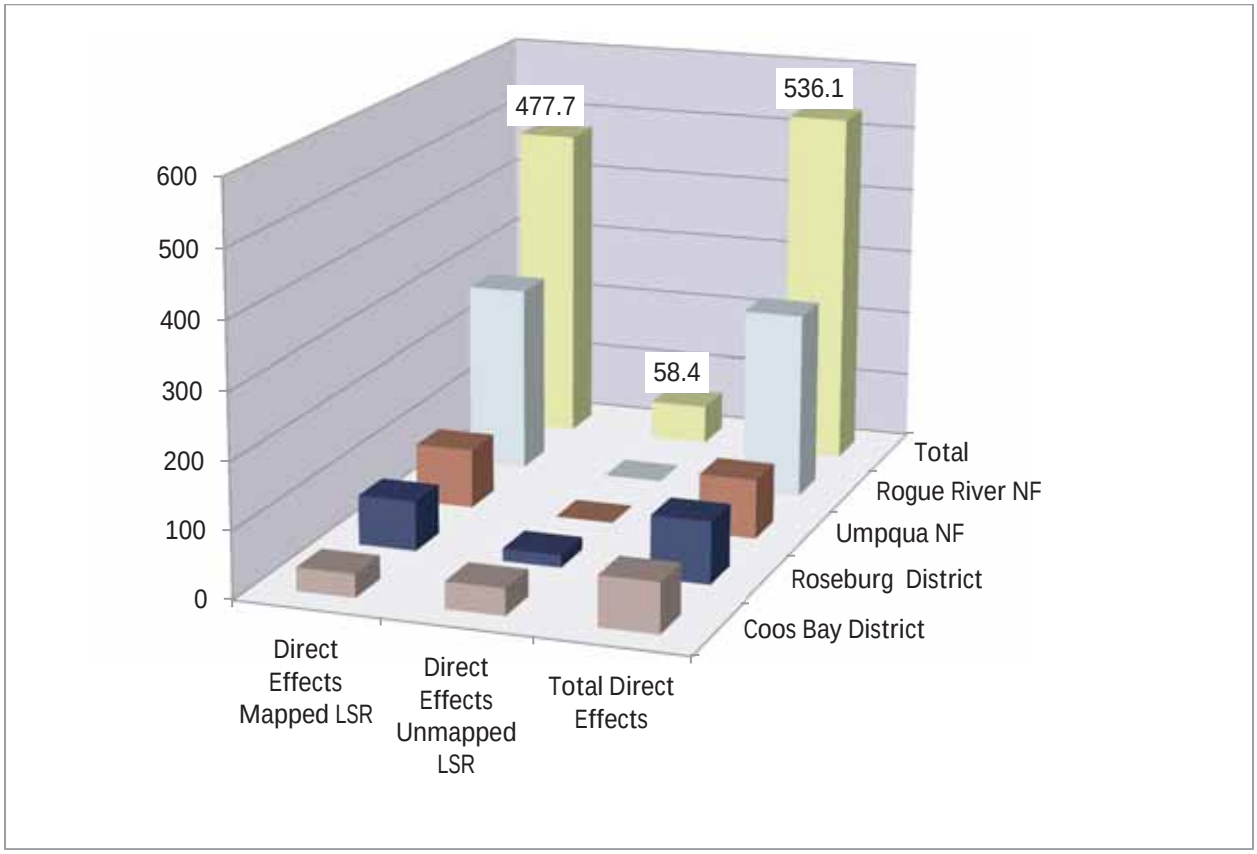


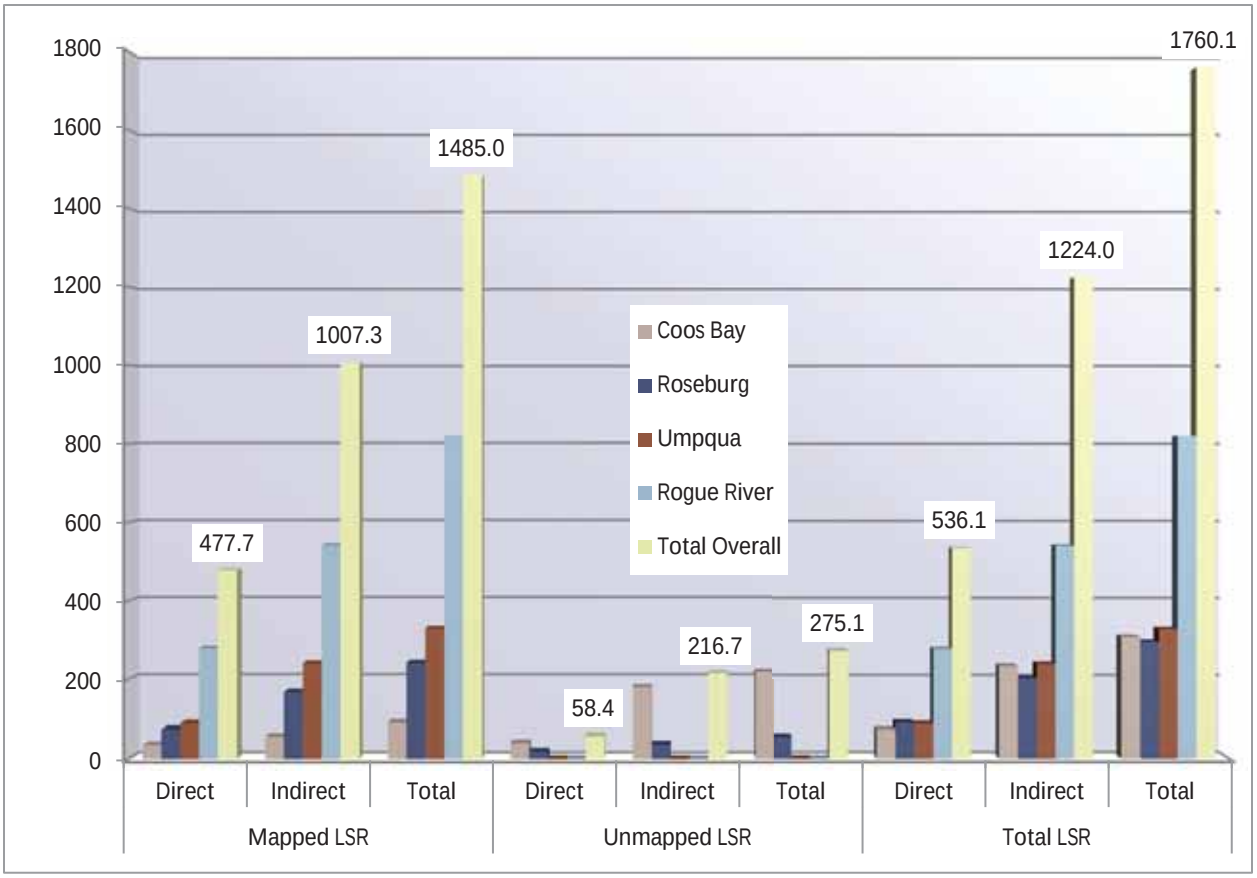
TABLE 2.1.2-2

Summary of Total LSR Acres Directly and Indirectly a/ Affected by the Proposed PCGP Project

District/National Forest	Mapped LSR			Unmapped LSR			Total LSR		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
BLM District									
Coos Bay	34.8	56.1	90.9	39.9	180.0	219.9	74.7	236.1	310.8
Roseburg	74.4	168.1	242.5	18.5	36.7	55.2	92.9	204.8	297.7
Total BLM	109.2	224.2	333.4	58.4	216.7	275.1	167.6	440.9	608.5
Forest Service National Forest									
Umpqua	89.0	241.1		0.0	0.0	0.0	89.0	241.1	330.1
Rogue River	294.8	542.0	821.5	0.0	0.0	0.0	279.5	542.0	821.5
Total Forest Service	368.5	783.1	1151.6	0.0	0.0	0.0	368.5	783.1	1151.6
Total Overall	477.7	1007.3	1485.0	58.4	216.7	275.1	536.1	1224.0	1760.1

Data source: BLM, USFS GIS data layers
a/ Total impacts include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).

Figure 2.1-5. Summary of Total LSR Acres Directly and Indirectly Affected by the PCGP Project



2.1.3 The Need for Plan Amendments and Off-Site Mitigation in LSRs

Under the Federal Land Policy and Management Act (FLPMA), and the National Forest Management Act (NFMA), the proposed PCGP project would have to conform to BLM and Forest Service land use plans. Those plans incorporate the NWFP standards and guidelines, which allow new developments in LSRs, provided several steps are taken. The standard and guideline for new developments in LSRs state;

> "Developments of new facilities that may adversely affect Late-Successional Reserves should not be permitted. New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated. These will be planned to have the least possible adverse impacts on Late-Successional Reserves. Developments will be located to avoid degradation of habitat and adverse effects on identified late-successional species." (USDA and USDI 1994, page C-17)

To be consistent with this standard and guideline, the first step is to avoid affecting LSRs altogether. When that is not feasible, the second step is to address the public need for the project. The third step is locating the project to minimize adverse impacts, and the fourth step is to mitigate or compensate for unavoidable adverse impacts. In order to be consistent with the standard above, steps three and four would need to result in impacts that are either neutral or beneficial to the creation and maintenance of late-successional habitat in LSRs (USDA and USDI Memorandum 2001).

2.1.3.1 Step One: Avoidance

Alternative routes that would avoid all LSRs were investigated by the applicant, BLM, Forest Service, and FERC. These alternatives would require lengthy rerouting both in terms of the overall length of the pipeline and in the amount of private land affected. These alternatives and the reasons why they were not carried further are discussed in section 3.4 of FERC Draft EIS. The steps taken to avoid LSRs and how they were incorporated into the proposed route where feasible are also discussed in section 10.6 of Resource Report 10.

In summary, because the proposed project is a linear, large-diameter, high-pressure natural gas pipeline that must be routed to ensure safety, stability, and integrity, it is unreasonable, impractical, and infeasible to entirely avoid all designated LSRs within the project area for the following reasons:

1) The overall extent of the designated LSR land allocation in the project area makes it impractical to completely avoid LSRs;

2) The length of the proposed project, which extends approximately 230 miles from Coos Bay to Malin, Oregon, crosses Coos, Douglas, Jackson, and Klamath counties, and traverses public lands managed by four BLM districts as well as three national forests makes it impractical to avoid all designated LSRs;

3) The checkerboard landownership pattern of BLM lands within the project area makes it unreasonable to avoid LSRs;

4) Large contiguous areas of federal lands (see figure 2.1-1) in the project area make it impractical and infeasible to entirely route around these lands to avoid LSRs; and

5) Where LSRs are encountered along the alignment, the routing requirements of the proposed pipeline to ensure a safe, stable, and constructible alignment to ensure long-term integrity make it infeasible/unreasonable to avoid LSRs by aligning the pipeline on steep side slopes or other potentially unstable areas.

2.1.3.2 Step Two: Public Need:

The Commission will consider the need and public benefit of this project when making its decision on whether or not to authorize it, as documented in the Project Order. The cooperating agencies will consider need and public benefit within the context of each agency's respective authorities. Each Cooperating Agency will document its decision in the applicable permit, approval, concurrence or determination.

2.1.3.3 Step Three: Minimize

During the project route selection and construction footprint design process, interdisciplinary teams from the BLM and Forest Service worked with FERC and the applicant to develop steps that would minimize impacts to LSRs where avoidance was not feasible. In August 2006, the Forest Service requested that the FERC study an alternative route over portions of the Rogue River and Fremont-Winema National Forests. This suggested route variation, mostly followed existing Forest Service roads. In late September 2006, Pacific Connector met with the Forest Service to discuss the variation, as well as to explain project construction requirements. As a result of consultations with the Forest Service, Pacific Connector modified its original May 2006 route to adopt segments of the USFS suggested variation, and incorporated the modified route into its proposed route as filed with the Commission on September 4, 2007. The following features have been incorporated into the proposed route and construction design:

- Performing routing and geotechnical evaluations to ensure the most stable pipeline alignment for long-term stability. These efforts would minimize the potential need to conduct future maintenance activities, which could require additional impacts to LSRs.
- Where feasible, the proposed alignment was co-located with existing roads and early seral, conifer plantations to reduce impacts to LSOG habitat and to minimize disturbance impacts.
- Areas of side slopes were avoided to minimize the need for additional TEWAs to accommodate the necessary cuts and fill to safely construct the pipeline.
- The number and size of the planned TEWAs in LSRs were minimized to those critical for safe pipeline construction.
- Additional TEWAs were located in previously disturbed areas (i.e., areas that were recently logged) or in young regenerating forest stands.
- Existing roads would be used to access the construction right-of-way during construction and the right-of-way would be used as the primary travel-way to move equipment and materials up and down the right-of-way to remove the need for additional roads within LSRs. The existing roads would also be used during operations and maintenance to avoid the need for new access routes.
- Pacific Connector would replant or allow trees to naturally regenerate to within 15 feet of the pipeline centerline within the permanent pipeline easement to minimize potential long-term effects of the pipeline easement.

Detailed descriptions of all the conservation measures proposed by the applicant are included in table 1 of Resource Report 3 in the FERC Draft EIS.

2.1.3.4 Step Four: Mitigate

In addition to avoidance and minimization, off-site mitigation would also be necessary to ensure that unavoidable adverse impacts are mitigated to meet the requirement that the overall impact would be either neutral or beneficial to the creation and maintenance of late-successional habitat

in LSRs. A Compensatory Mitigation Plan (CMP) on BLM and Forest Service lands has been recommended by the agencies for the PCGP project. A portion of the CMP was developed specifically to compensate for the unavoidable adverse impacts of the project on LSRs to achieve a neutral or beneficial condition within affected LSRs, and to maintain the long-term integrity of the BLM and Forest Service land use plans for LSRs. Under the CMP, unavoidable impacts to LSOG forest habitats within LSRs on BLM and Forest Service lands would be compensated for by a combination of reallocation of matrix lands to LSR and implementing off-site mitigation projects. The off-site mitigations for stand treatments and fuel breaks are intended to implement the recommendations contained in the LSRAs for LSR 223, 227 and 261. Stand treatments would enhance or accelerate the development of LSOG habitat elements to further offset the effects of the PCGP project on LSRs in the long term (long term is longer than the expected life of the project or greater than 50 yrs.). Fuel breaks would help reduce the risks of LSOG forest loss to catastrophic wildfires. The off-site mitigation actions would also increase the effectiveness of the LSOG forest habitat added to LSRs by improving the quantity, quality, and distribution of high-quality habitat. On BLM lands, the proposed mitigation actions also include having the applicant acquire approximately 860 acres of non-federal forest lands to replace the matrix lands that are being reallocated to LSR. The proposed CMP is described in Appendix J of the 2013 FERC Draft EIS.

The primary mitigation action for the effects of the proposed pipeline on LSRs would add acres to the LSRs. The BLM and Forest Service are proposing to accomplish this through reallocation of matrix lands to LSR. Reallocating these acres will require amendments to the Coos Bay and Roseburg District RMPs and the Umpqua and Rogue River National Forest LRMPs. The analysis in the following sections will look at the acres of habitat (by habitat type of LSOG, non-LSOG and non-forest) that would be cleared by the project with the amount of habitat that would be reallocated since this would the most direct comparison of acres affected in the LSR system. Table 2.1.3-1 and figure 2.1-6 display a summary comparison between the LSR acres that would be cleared by the construction of the PCGP project and the proposed reallocation of matrix lands to LSR. Amendments concerning LSRs associated with the PCGP project would be coordinated with the Regional Ecosystem Office as required by the Northwest Forest Plan.

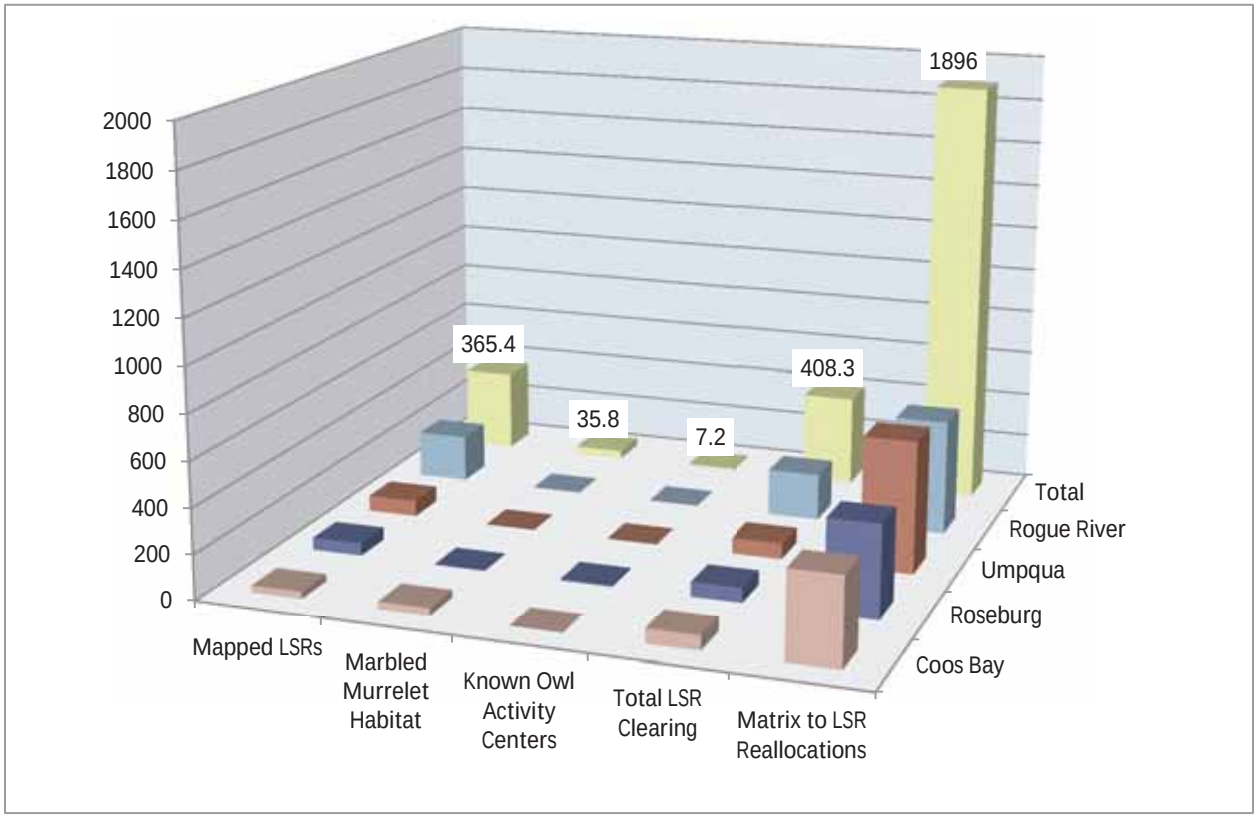
TABLE 2.1.3-1

Comparison of Total LSR Acres Cleared a/ by the PCGP Project and the Acres of Matrix Reallocated to LSR

District/National Forest	LSR Components b/ Affected by PCGP Right-of-Way Clearing				LSR Mitigation: Matrix to LSR Reallocations
	Mapped LSRs	MAMU Stands	Known Owl Activity Centers	Total LSR Clearing	
BLM District					
Coos Bay	31.5	32.9	0.0	64.4	387
Roseburg	54.9	2.9	7.2	65.0	409
Forest Service National Forest					
Umpqua	70.0	0.0	0.0	70.0	588
Rogue River	209.1	0.0	0.0	209.1	512
BLM and Forest Service Combined					
Total	365.4	35.8	7.2	408.3	1896

Data source: BLM, USFS GIS data layers
a/ Clearing includes acres in the PCGP corridor and the TEWAs
b/ MAMU stands and known owl activity centers outside of mapped LSRs

Figure 2.1-6. Comparison of Total LSR Acres Cleared by the PCGP Project and Total Acres of Matrix Reallocated to LSR



The following section evaluates the proposed amendments and mitigation actions in relation to LSRs on BLM lands.

2.2 RMP AMENDMENTS ON BLM LANDS

The proposed PCGP project would cross four BLM Districts (Coos Bay, Roseburg, Medford and the Lakeview Resource Area of the Klamath Falls District) for a total of approximately 40 miles. Figure 2.1-1 (above) provides an overview of the proposed project and the management units of the BLM. Table 2.1.2-1 (above) displays the total acres that would be directly affected for each BLM District.

The BLM in western Oregon developed six RMPs concurrently, including the RMPs for the Coos Bay, Roseburg, Medford, and Klamath Falls Districts. The six RMPs together cover all BLM-administered lands in western Oregon. The RMPs were developed under the requirements of the FLPMA through the use of an interdisciplinary planning process. Lands administered by the BLM are managed to maintain healthy, functioning ecosystems from which a sustainable production of natural resources can be provided.

Oregon and California Railroad Grant Lands (O&C Lands) and Coos Bay Wagon Road Lands (CBWR Lands) are a unique category of federal lands that would be crossed by the PCGP project. These lands are managed by BLM districts in western Oregon.

The O&C Lands were designated by Congress in 1866 to support the construction of a railroad in the State of Oregon. The O&C Lands were to be sold by the Oregon and California Railroad Company to aid in offsetting the cost of building the railroad between Portland and the California border. The railroad ended its sales of O&C Lands to private citizens in 1903 before all of the O&C Lands were sold. In 1916, Congress passed the O&C Revestment Act, which returned over 2.4 million acres of Oregon's O&C Lands to federal ownership and management.

The CBWR Lands were established by a land grant in 1869 to the Southern Oregon Company a decade after Oregon entered the United States. These lands were also subsequently reconveyed to the United States. The O&C Lands Act of 1937 requires the Secretary of the Interior to manage O&C and CBWR Lands for permanent forest production in conformity with the principle of sustained yield. Further, the Act requires that management of O&C Lands protect watersheds, regulate stream-flow, provide for recreational facilities, and contribute to the economic stability of local communities and industries. O&C Lands must also be managed in accordance with other environmental laws such as ESA and the Clean Water Act. Some provisions of these laws take precedence over the O&C Lands Act. For instance, ESA requires the Secretary of the Interior to ensure that management of O&C lands would not result in jeopardy to listed species or destruction or adverse modification of their critical habitat.

The Responsible Official for the proposed LSR-related amendments to the RMPs is the BLM Oregon/Washington State Director. The decision to be made is whether the RMPs would be amended if FERC approves the PCGP project. If FERC does not authorize the project, the amendments would not be implemented.

The implementing regulations for FLPMA (43 CFR 1600) describe the process for amending RMPs as follows:

> §1610.5-5 Amendment.
>
> A resource management plan may be changed through amendment. An amendment shall be initiated by the need to consider monitoring and evaluation findings, new data, new or revised policy, a change in circumstances or a proposed action that may result in a change in the scope of resource uses or a change in the terms, conditions and decisions of the approved plan. An amendment shall be made through an environmental assessment of the proposed change, or an environmental impact statement, if necessary, public involvement as prescribed in § 1610.2 of this title, interagency coordination and consistency determination as prescribed in § 1610.3 of this title and any other data or analysis that may be appropriate. In all cases, the effect of the amendment on the plan shall be evaluated. If the amendment is being considered in response to a specific proposal, the analysis required for the proposal and for the amendment may occur simultaneously.
>
> (a) If the environmental assessment does not disclose significant impact, a finding of no significant impact may be made by the Field Manager. The Field Manager shall then make a recommendation on the amendment to the State Director for approval, and upon approval, the Field Manager shall issue a public notice of the

> action taken on the amendment. If the amendment is approved, it may be implemented 30 days after such notice.
>
> (b) If a decision is made to prepare an environmental impact statement, the amending process shall follow the same procedure required for the preparation and approval of the plan, but consideration shall be limited to that portion of the plan being considered for amendment. If several plans are being amended simultaneously, a single environmental impact statement may be prepared to cover all amendments.

In addition, the BLM Land Use Planning Handbook (H-1601-1) provides the following guidance for amending RMPs.

> **B. Determining When it is Necessary to Amend Plans and How It Is Accomplished**
>
> Plan amendments (see 43 CFR 1610.5-5) change one or more of the terms, conditions, [or] decisions of an approved land use plan. These decisions may include those relating to desired outcomes; measures to achieve desired outcomes, including resource restrictions; or land tenure decisions. Plan amendments are most often prompted by the need to:
>
> 1. consider a proposal or action that does not conform to the plan;
> 2. implement new or revised policy that changes land use plan decisions, such as an approved conservation agreement between the BLM and the USFWS;
> 3. respond to new, intensified, or changed uses on public land; and
> 4. consider significant new information from resource assessments, monitoring, or scientific studies that change land use plan decisions.
>
> The BLM regulations in 43 CFR 1600 and the NEPA process detailed in the CEQ [Council on Environmental Quality] regulations in 40 CFR 1500 guide preparation of plan amendments. Plans needing amendment may be grouped geographically or by type of decision in the same amendment process. Similarly, one amendment process may amend the same or related decisions in more than one land use plan.

The planning criteria that will be used to evaluate the proposed amendments include the amount and quality of MAMU habitat that would be affected, the quantity and quality of habitat in KOACs that would be affected, and the functionality of LSRs in terms of the distribution, quantity and quality of LSOG habitat that would be affected by the construction and operation of the PCGP project. The remainder of this section of the report evaluates the proposed amendments and mitigation actions related to LSRs on each of the BLM Districts that the proposed pipeline would cross.

2.2.1 Coos Bay District

The Coos Bay District RMP as amended guides all resource management activities in the District. The RMP provides the vision and strategy for the land allocations and resource programs as well as the management actions/directions for each of the land allocations and

resource programs (USDI 1995a). The Coos Bay District RMP is available at http://www.blm.gov/or/districts/coosbay/plans/coosbayrmp.php. A map of the proposed PCGP project and LSRs in the Coos Bay District is displayed as figure 2.2-1.

In the Coos Bay District, the construction of the PCGP project would directly affect approximately 34.8 acres of LSR 261. The construction of the project would also directly affect approximately 40.9 acres of MAMU stands within both mapped and unmapped LSRs.

2.2.1.1 Existing Conditions of Mapped LSR 261

Summary from LSRA

The South Coast-North Klamath LSRA (USDA and USDI 1998b) covers 10 mapped LSRs: 251, 255 (not included in the Siskiyou National Forest), 257, 259, 260, 261, 263, 264, 265, and 267, and the unmapped LSRs on lands administered by the BLM in the Coos Bay, Roseburg, and Medford Districts, and the Forest Service Siuslaw National Forest in the Mapleton Ranger District (see figure 2.2-2). The assessment area ranges from about the Smith River drainage in the north to the California border in the south, west to the Pacific Ocean, and east approximately to Interstate 5. This grouping of LSRs into one assessment occurred due to their proximity to each other and their interdependence. Approximately 80 percent of the assessment area is within the Oregon Coast Range Province, 19.7 percent is within the Klamath Province, and 0.3 percent is within the Oregon Western Cascade Province.

Figure 2.2-1. Map of Proposed PCGP Project and LSRs in the Coos Bay District

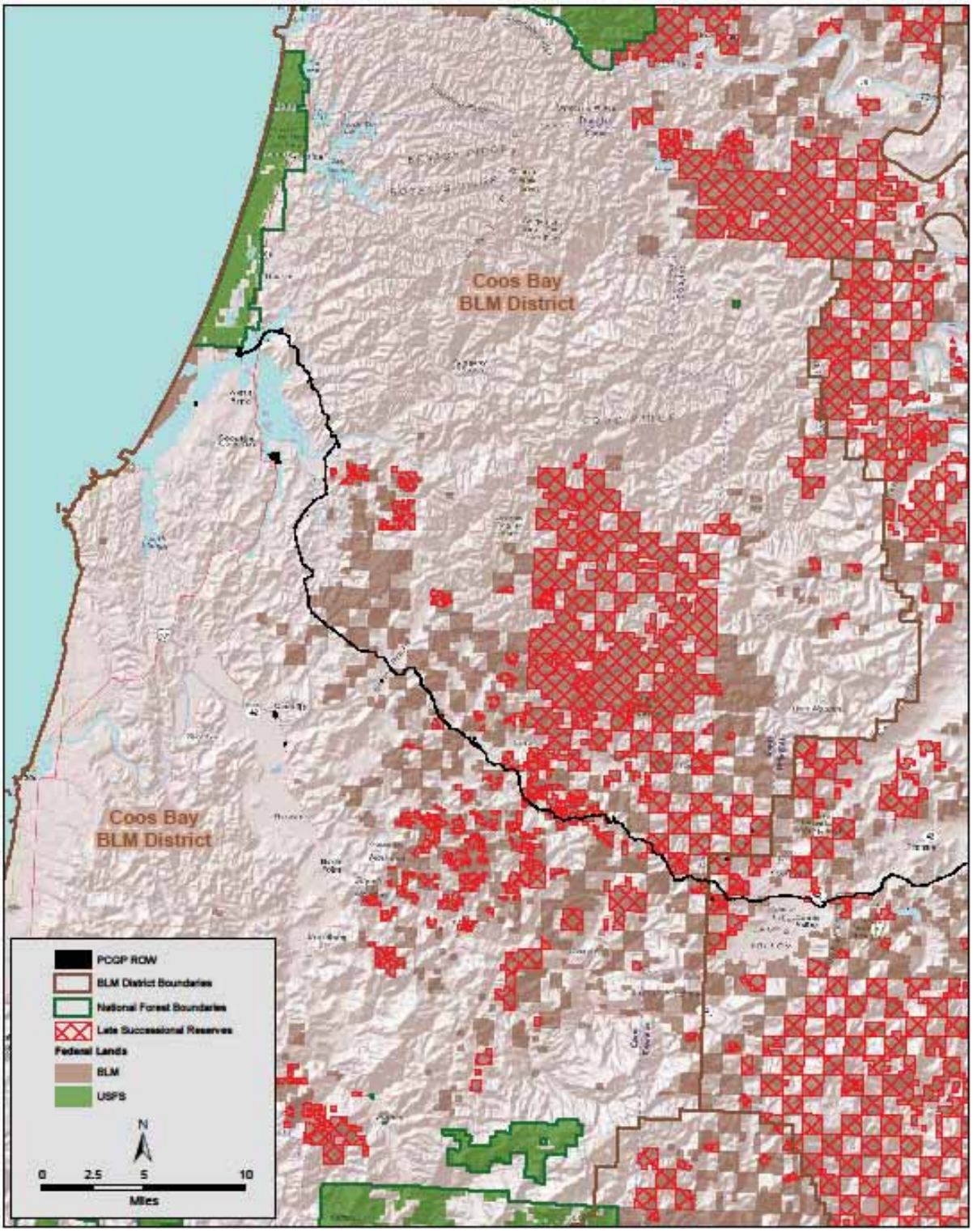
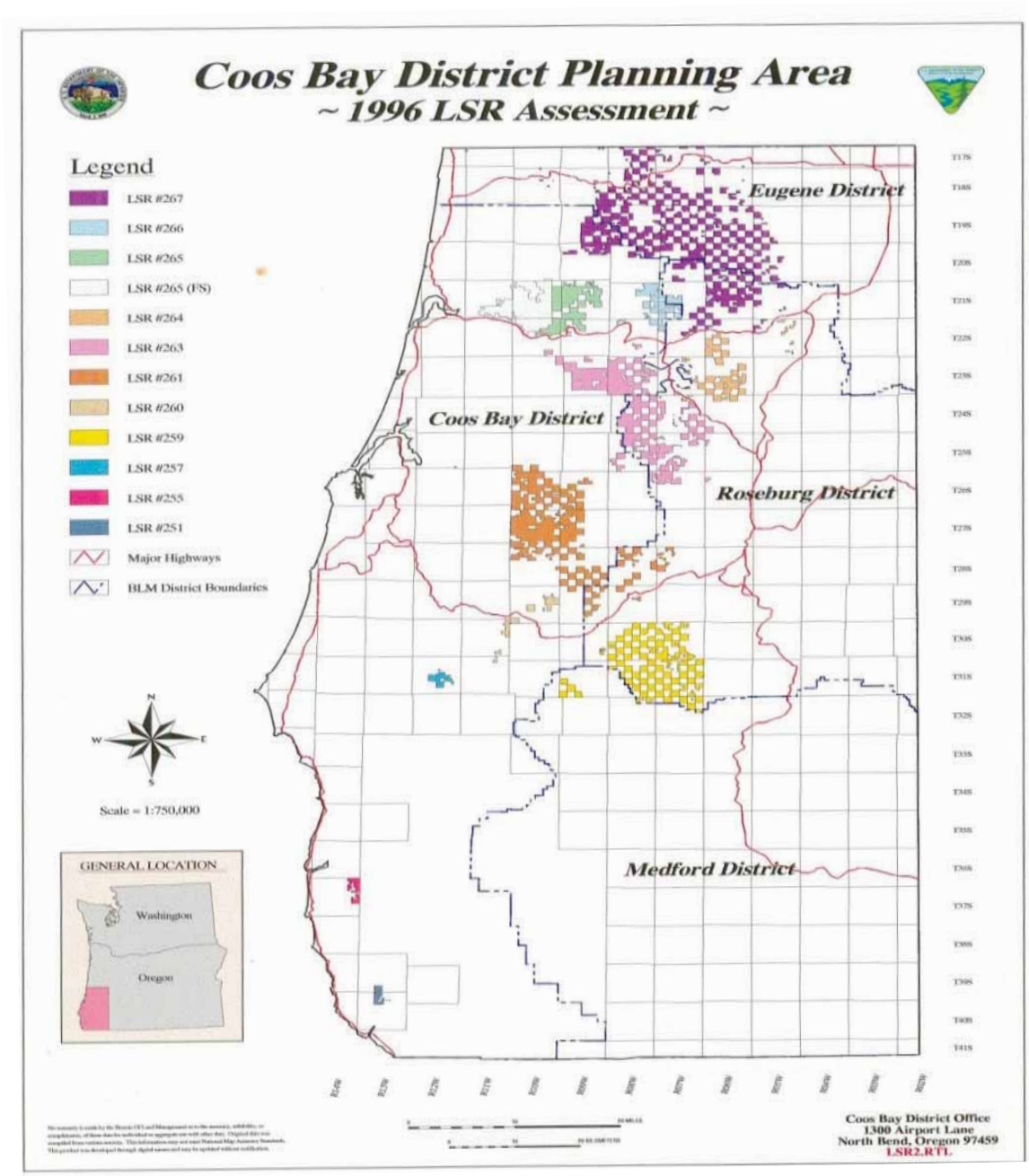


Figure 2.2-2. Map of South Coast–North Klamath LSRA



LSR 261 is approximately 70,611 acres and lies within the Oregon Coast Range Province. This LSR is located within two BLM districts totaling approximately 59,656 acres in the Coos Bay District and 10,955 acres in the Roseburg District.

One indicator of the current habitat condition of the LSRs is the amount and percentage that is late-successional forest. Overall, the percentages of late-successional forest habitat in the 10 LSRs ranged from 41 percent for LSR 266 to 72 percent for LSRs 260 and 265, with a mean of

57.4 percent for all the LSRs. The amount for LSR 261 is 50 percent. Although these percentages give an overall indication of how much late-successional forest habitat remains in the LSRs, an analysis of the number of acres of interior forest habitat may be a better indicator of the ability of these reserves to support and maintain populations of late-successional species. Interior forest habitat is defined as that part of late-successional habitat that is beyond [not subject to] the edge effect. Estimates of the number of acres of interior forest habitat in the LSRs were derived using a buffer approximating edge effects for the provinces in this LSRA. The buffer used for the Oregon Coast Range Province (including LSR 261) was 500 feet.

The acres of interior forest habitat are substantially lower than the corresponding numbers for late-successional forest habitat. Percentages of interior forest habitat range from 4 percent for LSR 251 to 32 percent for LSR 265. The amount for LSR 261 is 14 percent. Some differences among LSRs in the percentage of interior habitat are due simply to LSR size, since smaller LSRs have a higher ratio of perimeter (edge) to total area. Another key factor accounting for differences among the LSRs is the degree to which the reserves are fragmented due to public versus private ownership. The more fragmented the ownership pattern, the less interior habitat will be provided. Generally, these estimates indicate that many of the LSRs in the study area are presently in poor condition for maintaining populations of many late-successional forest species, especially those associated with interior forest habitat. The amount of LSOG and interior forest habitat for LSR 261 is shown in table 2.2.1.1-1.

TABLE 2.2.1.1-1

Acres and Percentages of LSOG and Interior Forest Habitat in LSR 261

LSR	Total Acres	LSOG Acres	Percent of Total LSR	Interior Forest Habitat Acres	Percent of Total LSR
261	70,611	35,583	50%	9,646	14%

Desired Future Conditions

Goals for the LSRs in the assessment area are to protect and enhance conditions of LSOG forest ecosystems and to create and maintain biological diversity associated with native species and ecosystems. Some of the important attributes that can be influenced by management actions include stand composition (species, density, and size), legacy wood (snags and coarse woody debris (CWD)), and disturbance processes (fire, wind, and disease).

The LSRs in the LSRA area were ranked for management actions using the following priorities: high, medium, and low. Although it is expected that most emphasis will be focused on the high-priority LSRs, the ranking system does not imply that there will not be management activities in the medium- and low-priority LSRs. LSR 261 was ranked in the high-priority category.

High Priority LSRs

Of the LSRs in the LSRA, 261, 263, and 259 have the highest priority for management actions because they are large and are key links in the LSR network. Also LSRs 261 and 263 provide greater opportunities to either increase or develop large (greater than 640 acres) contiguous stands of interior late-successional habitat. In addition, most of the acres of young, intensively cultured forest plantations that could benefit the most from treatments occur in the three LSRs.

Since LSRs 261 and 263 are the largest LSRs in the LSRA (70,611 and 60,599 acres), developing large contiguous stands of late-successional habitat would have greater value.

The quantity and quality of late-successional habitat is changed through disturbance events such as wildfire, windstorms, disease, insects, and soil movement. Large-scale disturbance events can change or eliminate late-successional habitat on hundreds to thousands of acres, while small-scale disturbance events cause habitat loss at the stand level. While the risk of habitat loss cannot be eliminated, risk management activities may reduce the probability that a major stand-replacing event or events that degrade habitat quality will occur. The primary purpose of risk reduction activities in these LSRs is to reduce the probability of large-scale loss of late-successional habitat. Another purpose of risk reduction activities is to reduce the probability of late-successional habitat loss in stands with important features such as nest stands for NSOs, stands containing other key species, or stands containing larger blocks of interior habitat or providing meaningful localized connectivity.

Wildfire presents the greatest risk of late-successional habitat loss within the LSRA area. The majority of risk-reducing activities would be aimed at managing fuels and sources of ignition. Fuels and ignition sources may be actively managed by reducing existing fuels; by reducing fuels created by stand management operations through prescribed burning; indirectly through treatments designed to maintain stand vigor; or pruning to reduce fuel ladders into the canopy. Access may be restricted during periods of high fire danger.

Recent Changes

There have been no notable changes in the transportation system or fire history in LSR 261 in the Coos Bay District since the LSRA was written in 1998. Numerous density management treatments designed to accelerate LSOG forest habitat conditions have occurred since 1999 on approximately 6,396 acres. These density management treatments included tree topping/snag creation to increase CWD levels throughout the 6,396 acres. An additional 566 acres of tree topping/snag creation was also accomplished. Vegetation management has also included hardwood conversions on approximately 215 acres, pre-commercial thinning on approximately 6,074 acres, and invasive plant treatments on approximately 211 acres. In addition to these past activities, approximately 3,018 acres are planned for density management and another 38 acres are planned for hardwood conversion.[2]

Using the most recent GIS data from the latest Northwest Forest Plan Monitoring Report on LSOG forest (Mouer et. al. 2011), the current estimate of LSOG forest in LSR 261 is 31,793 acres. This is less than the 35,583 acres estimated when the LSRA was written. However, because the two estimates were derived using different data bases a direct comparison cannot be made.

Agency Recommendations

The recommendations and priority for treatments in the LSRA have not changed. Although the extensive vegetation treatments are designed to accelerate the development of LSOG forest

[2] Information provided by Steven Fowler, District Planning and Environmental Coordinator, Coos Bay District BLM.

habitat conditions in the future, the need to develop contiguous LSOG habitat and prevent loss due to intensive fires remain high priorities.

2.2.1.2 Unmapped LSRs in the Coos Bay District Affected by the PCGP Project

Known Owl Activity Centers

The proposed PCGP project corridor would not clear or modify any of the KOACs in the Coos Bay District. Therefore, the proposed project would not alter any unmapped KOAC LSR areas in the Coos Bay District.

Occupied MAMU Stands

Existing known MAMU occupied sites were inventoried using BLM geographic information system (GIS) layer data in 2006, and three occupied sites were identified that were in the proposed PCGP project corridor. Additional MAMU surveys were conducted in 2007, 2008, 2012 and 2013 within the project area. Nine additional occupied sites were identified from these surveys for a total of 12 occupied MAMU stands within the project area on the Coos Bay District. BLM delineated the extent of the occupied stands identified during the surveys and incorporated the newly identified stands into the GIS layer. All but one of the occupied stands within the PCGP project area on the Coos Bay District occur outside of mapped LSRs in lands currently allocated as matrix in the NWFP. Stand C3070 lies entirely within mapped LSR 261. Approximately 34 acres of occupied MAMU stands would be cleared by the PCGP project on the Coos Bay District (see table 2.2.1.2-1). The map in figure 2.2-3 displays the known MAMU occupied stands in relation to the project.

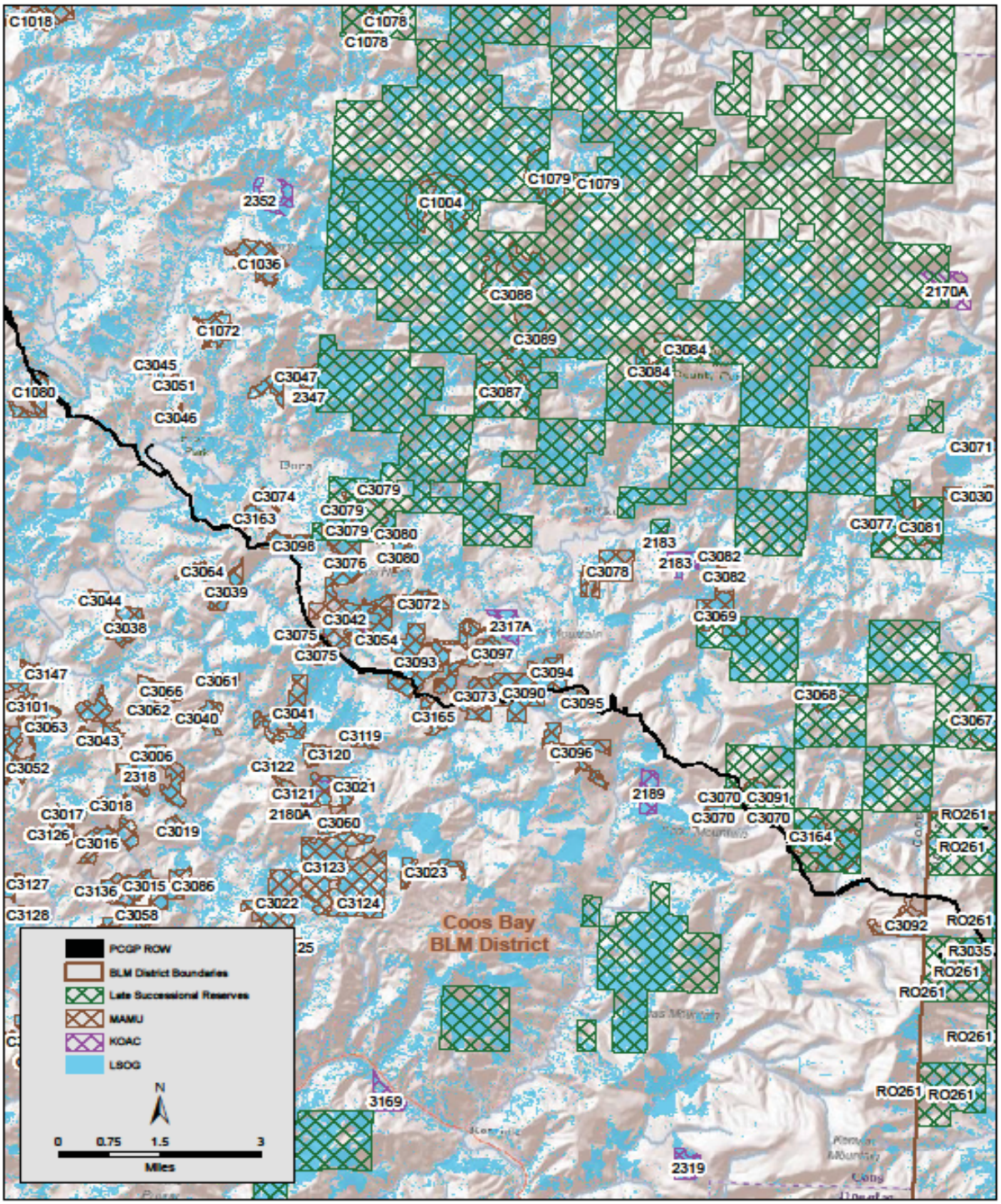
TABLE 2.2.1.2-1

Known Occupied MAMU Stands within the PCGP Project Area in the Coos Bay District

Occupied Stand	Location	Acres cleared by PCGPa/
C1080	MP 27.14-27.48	4.1
C3098	MP 32.04-32.48	5.0
C3075	MP 33.77-33.99	1.8
C3042	MP 33.84-33.90	0.9
C3093	MP 35.12-35.79	4.2
C3165	MP 35.89-36.11	0.6
C3073	MP 36.49-37.15	4.4
C3090	MP 37.15-38.09	9.6
C3094	MP 38.09-38.18	0.9
C3095	MP 38.83-38.90	0.8
C3070b/	MP 41.89-41.97	1.0
C3092	MP 45.40-45.47	0.9
Total		**33.9**

a/ Cleared acres include the PCGP project construction corridor and TEWAs
b/ Occupied Stand C3070 lies entirely within LSR 261
Data Source: BLM GIS data layers

Figure 2.2-3. Map of Occupied MAMU Stands in PCGP Project Area



2.2.1.3 Proposed RMP Amendments and Mitigation Actions Relevant to LSRs in the Coos Bay District

There are two RMP amendments and one set of mitigation measures proposed.

RMP Amendments

The BLM proposes to amend the Coos Bay District RMP as follows:

BLM-4, Reallocation of Matrix Lands to Late Successional Reserves

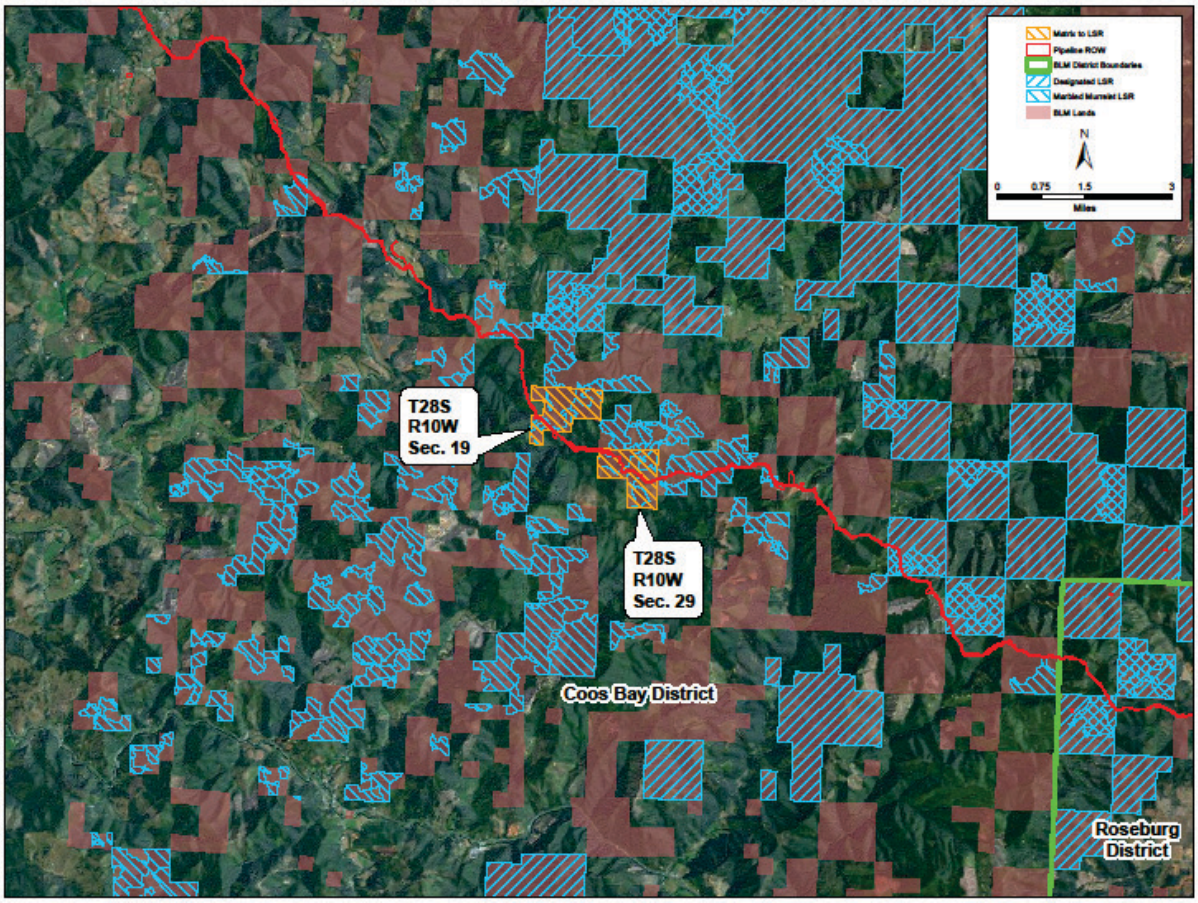
The Coos Bay District RMP would be amended to change the designation of approximately 387 acres from the matrix land allocation to the LSR land allocation in Sections 19 and 29, of T. 28 S., R. 10 W., W. M., Oregon.

This change in land allocation is proposed to provide partial mitigation for the potential adverse impact of the PCGP project on LSRs in the Coos Bay District. This amendment would change future management direction for the lands reallocated from matrix to LSR. A map of the proposed reallocation is displayed as figure 2.2-4.

BLM–1, Site-Specific Exemption from Requirement to Protect MAMU Habitat in the BLM Coos Bay District

The Coos Bay District RMP would be amended to waive the requirements to protect contiguous existing and recruitment habitat for MAMUs within parts of the PCGP right-of-way that is within 0.5 mile of occupied MAMU sites, as mapped by the BLM. This is a site-specific amendment applicable only to the PCGP right-of-way and would not change future management direction at any other location. The RMP for the Coos Bay District requires protection of occupied MAMU sites whether they are inside or outside of a mapped LSR. Most of the occupied sites in the Coos Bay District that would be affected by the PCGP project are outside of mapped LSRs.

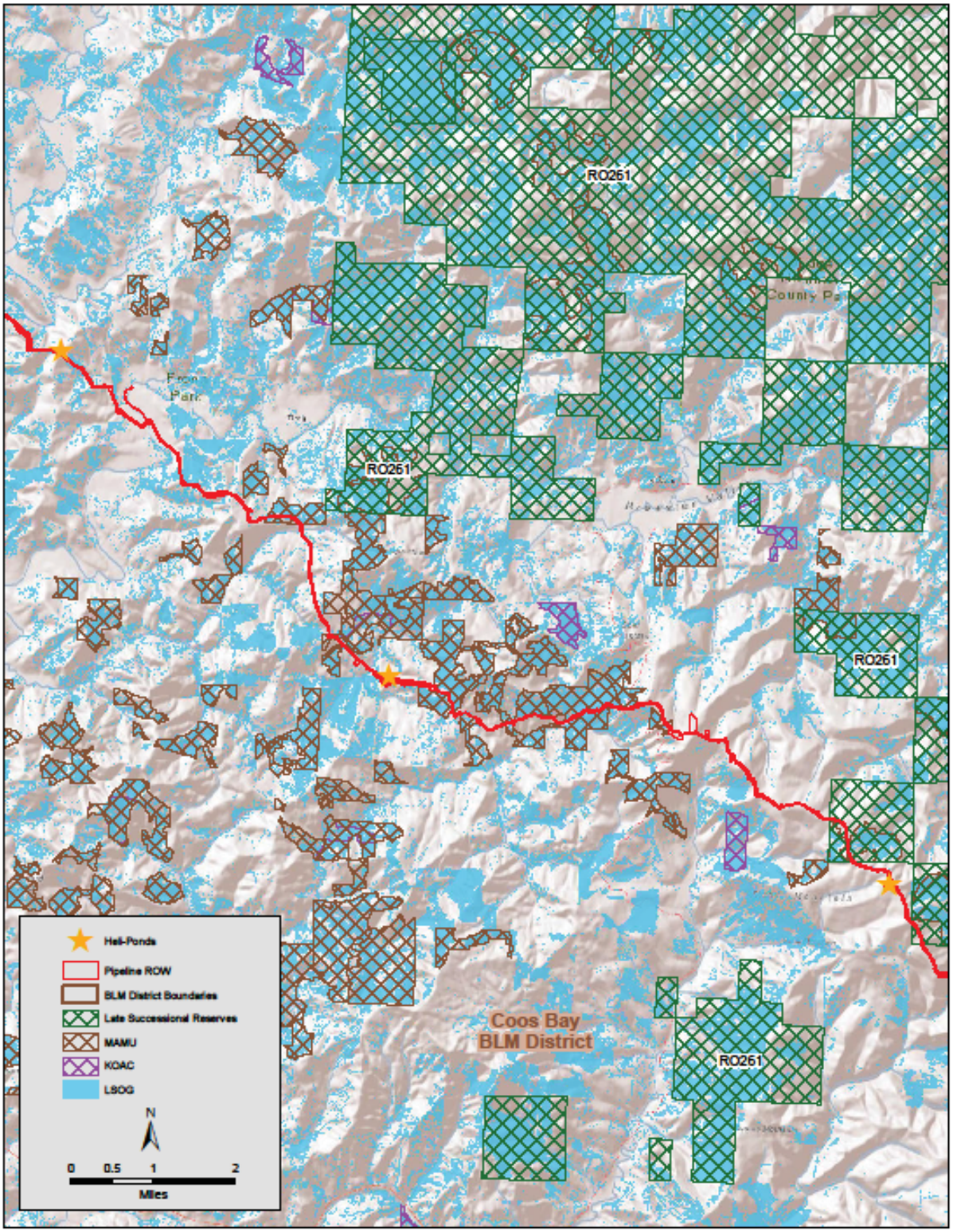
Figure 2.2-4. Map of Matrix Reallocated to LSR in the Coos Bay District



Mitigation Actions

A Mitigation Plan has been recommended by the BLM to ensure that the objectives of the RMP related to LSRs would be achieved (see figure 2.2-5). In addition to reallocating matrix to LSR, the mitigation actions include creating three heli-ponds at strategic locations in the East Fork and Middle Fork of the Coquille River. These heli-ponds would help protect LSRs in this area from high-intensity fires by reducing initial response times.

Figure 2.2-5. Map of Off-site LSR Mitigation Proposals in the Coos Bay District



2.2.1.4 Impacts Related to the Proposed Amendments and Mitigation Actions in the Coos Bay District

RMP Amendments

BLM-4, Reallocation of Matrix Lands to Late Successional Reserves

The primary management objective of the LSR land allocation is to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth–related species. Currently, based on the most recent BLM GIS data there are approximately 31,793 acres of LSOG forest which comprises approximately 45 percent of LSR 261. The PCGP project would remove approximately 31.5 acres of forest vegetation in LSR 261 in the Coos Bay District (see figure 2.2-4). This would include the removal of forest vegetation from both the pipeline corridor and the temporary extra work areas (TEWAs). Approximately 2.0 of the 31.5 acres would be LSOG forest habitat. The area proposed to be allocated to LSR 261 is approximately 998 acres. There are, however, approximately 611 acres of occupied MAMU stands within this proposed area. The occupied MAMU stands are protected under the Coos Bay RMP and managed by the standards and guidelines for LSRs as an area of unmapped LSR. Therefore, the net reallocation equals approximately 387 acres (998 minus 611), of which approximately 101 acres are LSOG forest. The 31.5 acres of clearing in LSR 261 described above includes the clearing that would occur within the reallocated Matrix acres (see figure 2.2-6 for a depiction of the acres proposed for reallocation and the area of occupied MAMU stands).

This change in land allocation is proposed to partially mitigate for the potential adverse impact of the proposed PCGP project on LSR 261 in the Coos Bay District. When acres reallocated from matrix to LSR are compared to the acres of LSR that would be cleared by construction, the proposed amendment reallocates approximately 12 times more acres to LSR than would be cleared by the PCGP project (see table 2.2.1.4-1 and figure 2.2-7).

In addition to the impacts from the removal of forest vegetation in LSR 261, there would be additional impacts from the acres modified by UCSAs and from the acres indirectly affected through the creation of new edges and fragmentation of older forest. A comparison of the total acres affected in LSR 261 and the acres of reallocation are displayed in table 2.2.1.4-2 and figure 2.2-8.

Figure 2.2-6. Map of Reallocation from Matrix to LSR and MAMU Stands

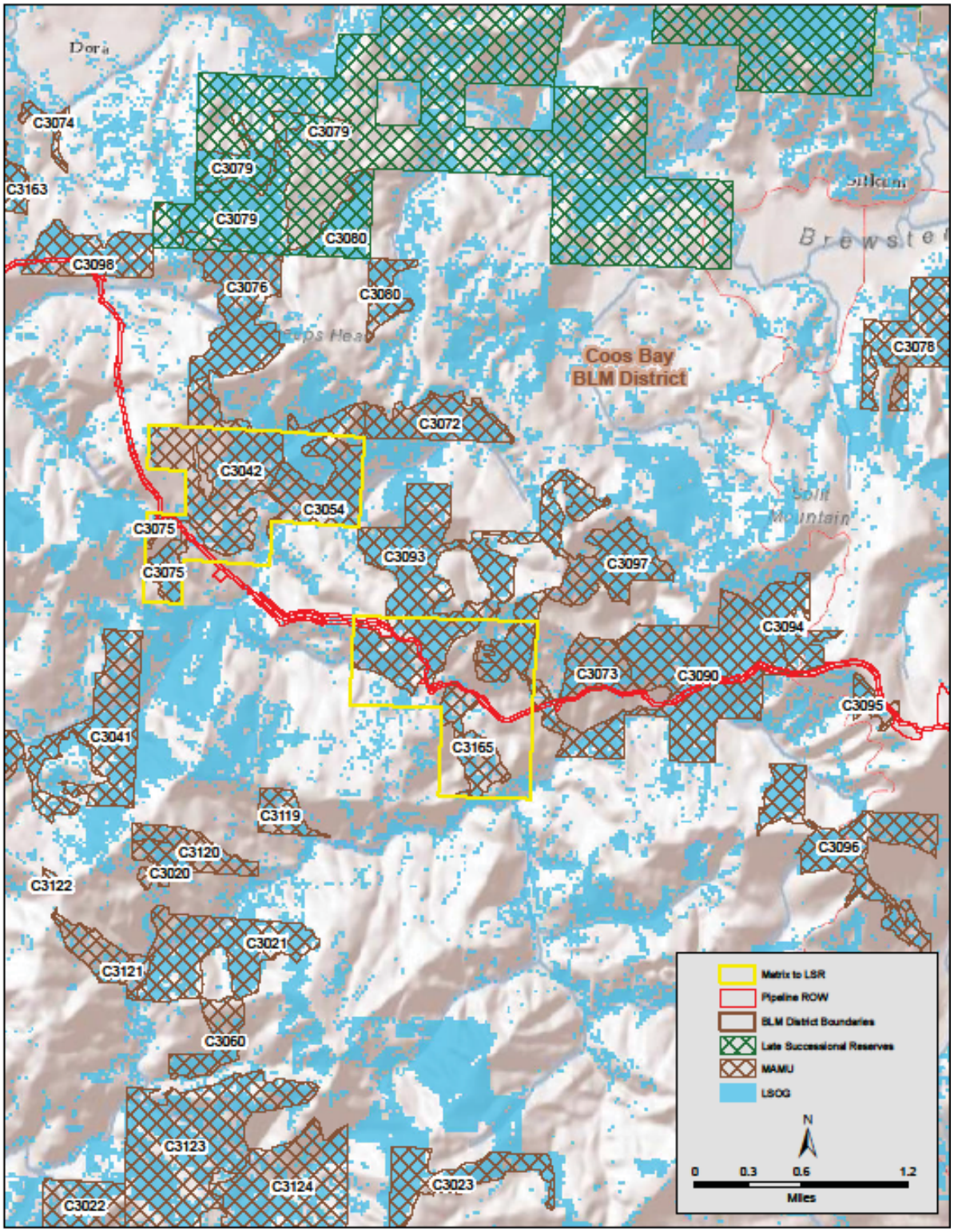


TABLE 2.2.1.4-1

Comparison of LSR Acres Cleared a/ by Proposed PCGP Project and Acres Reallocated from Matrix to LSR

Coos Bay District LSR 261	LSOG	Non-LSOG	Non-Forest	Total All Classes
Matrix to LSR Reallocation	101	284	2	387
LSR Cleared by PCGP Corridor	2.0	29.5	0	31.5

Data source: USFS, BLM GIS Layers
a/ Acres cleared includes the PCGP corridor and TEWAs

Figure 2.2-7. Comparison of LSR Acres Cleared by PCGP Project and Acres Reallocated from Matrix to LSR

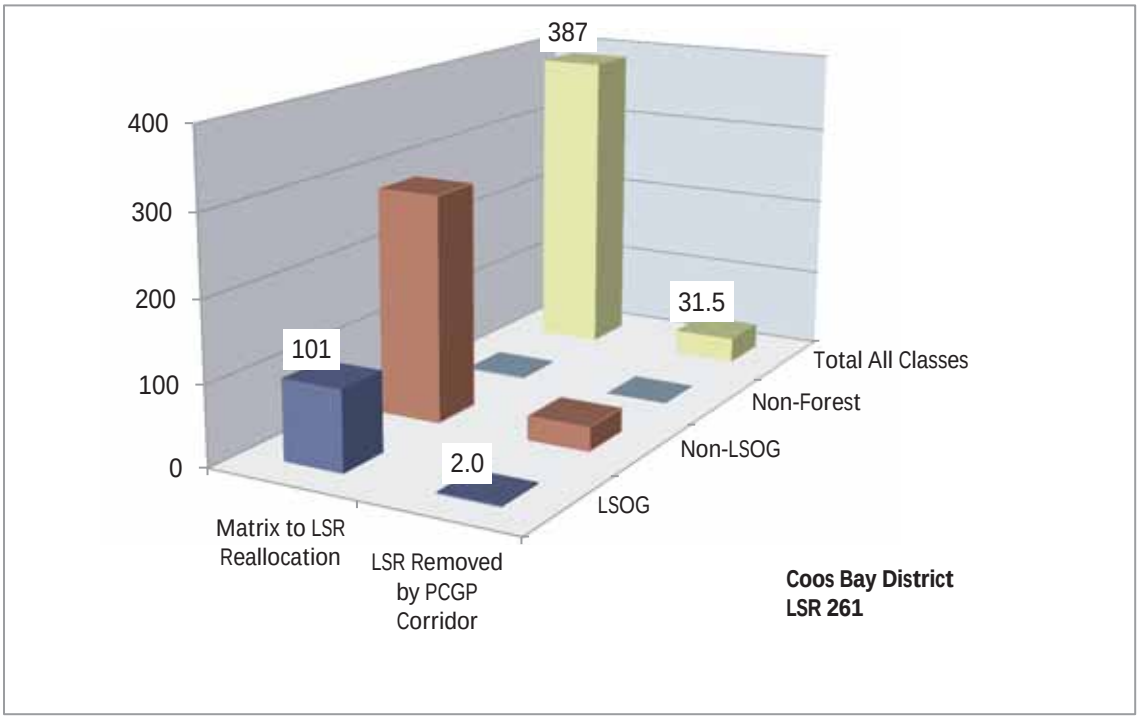


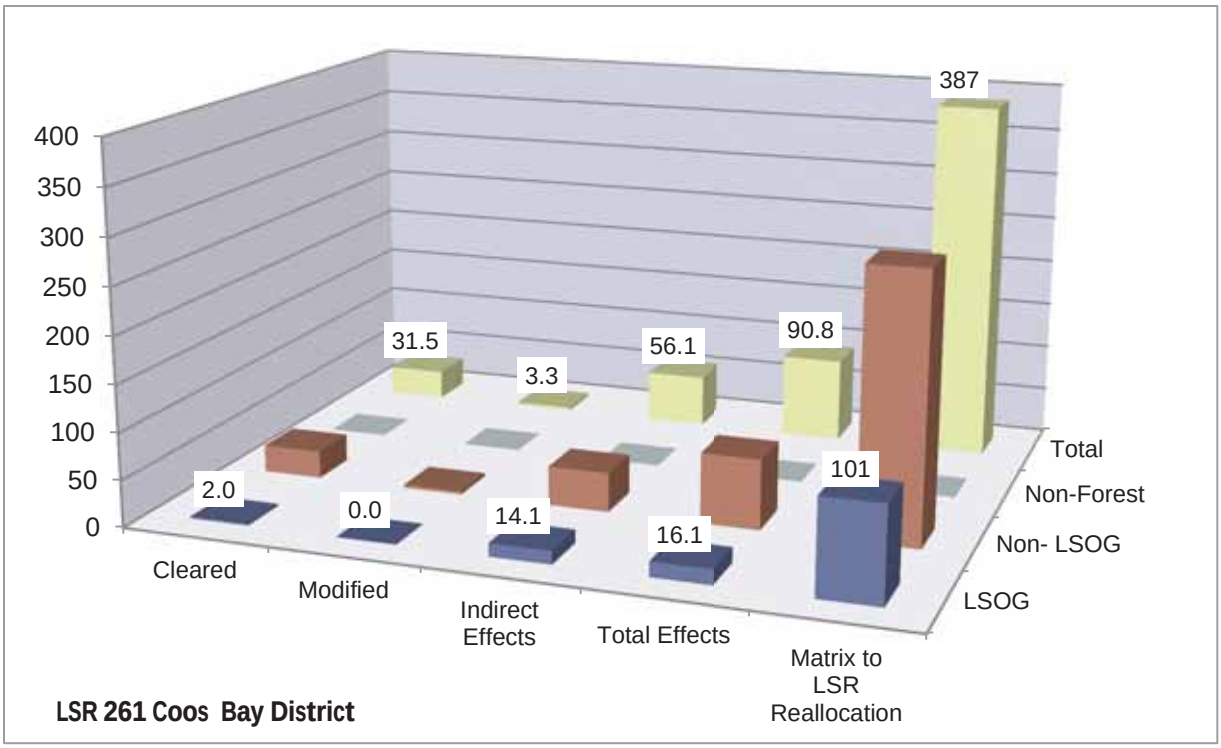
TABLE 2.2.1.4-2

Comparison of Total PCGP Project LSR Effects a/ and Acres of Matrix Reallocated to LSR

Coos Bay Dist. LSR 261	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	2.0	0.0	14.1	16.1	101
Non- LSOG	29.5	3.3	42.0	74.7	284
Non-Forest	0.0	0.0	0.0	0.0	2
Total	31.5	3.3	56.1	90.8	387

Data source: BLM, USFS GIS data layers
a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).

Figure 2.2-8. Comparison of Total PCGP Project LSR Effects and Matrix Reallocated to LSR (acres)



Impact on the Functionality of LSR 261 on the Coos Bay District

The functionality of LSR 261 relates directly to the goals and objectives for LSRs (see section 1.2.2) and can be measured by the quantity, quality and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 261 on the Coos Bay District would increase with the proposed RMP amendment. There are approximately

998 acres that would be redesignated as LSR 261, approximately 611 of those acres are currently unmapped LSR MAMU stands and the other 387 acres are matrix. The PCGP project would remove approximately 2 acres of LSOG habitat but the reallocation from Matrix lands would add 101 acres of LSOG habitat for a net increase of 99 acres of LSOG habitat in LSR. There is also approximately 364 acres of LSOG within the 611 acres of unmapped LSR that would be included within mapped LSR 261. The management direction for these 611 acres would not change. Overall this would increase the current level of LSOG habitat within mapped LSR 261 from 31,793 acres to 32,256 acres or by about one percent.

- Quality: The area of LSR 261 that would be affected by the PCGP project is highly fragmented due to both the land ownership pattern and past management activities. In routing the pipeline, existing developments such as roads were used where feasible and impacts to LSOG habitat was avoided or minimized. The area proposed for reallocation to LSR 261 contains some large blocks of LSOG habitat as well as occupied MAMU stands (see figure 2.2-6). This reallocation would consolidate habitat in an area that is highly fragmented. LSR 261, like most LSRs on BLM land, is comprised of checkerboard sections or even smaller parcels of land. The intent of the reallocations is to better connect these pieces by decreasing distances between individual LSR parcels and reduce the amount of 'edge' adjacent to existing occupied murrelet stands. Consolidating habitat is one of the main objectives in the LSRA for this area. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat the quality of the LSOG habitat within LSR 261 would be slightly improved.

- Distribution: The distribution of LSOG habitat within LSR 261 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR RMP amendment. To the extent there are minor changes they would be beneficial due to the location of the proposed reallocation. The reallocation would occur within a current gap between the northern and southeastern portions of LSR 261 and would provide some additional connectivity within LSR 261 in this area.

- The off-site mitigation action would provide added protection to the quantity, quality and distribution of LSOG habitat by improving the potential to decrease initial fire suppression response times and thereby increase the potential to control fires before they become high-intensity fires that threaten LSOG forests. Protecting LSOG forest from loss due to high-intensity fire is also one of the objectives in the LSRA for this area.

The RMP amendment and off-site mitigation actions for LSR 261 in the Coos Bay District have been designed with the goal that the overall impact would be either neutral or beneficial to the creation and maintenance of late-successional habitat.

RMP Amendment: BLM–1, Site-Specific Exemption from Requirement to Protect MAMU Habitat in the BLM Coos Bay District

Amount and quality of MAMU habitat affected by the construction and operation of the PCGP project.

Minimization Efforts: The following measures were taken in routing the proposed PCGP project to minimize adverse effects to habitat within each of the identified MAMU occupied stands.

- C1080: This stand was identified by surveys conducted in 2013 after the proposed route was filed with FERC. Presently there is only one small TEWA located within the stand (see figure 2.2-9).
- 3098: The MAMU surveys performed in 2008 identified this stand. Minor alignment adjustments reduced habitat removal within this stand. The adjustments shortened the route and minimized an acute alignment angle (PI), which allowed a TEWA to be eliminated (see figure 2.2-10).
- C3075: The proposed route would be partially within an existing road (BLM 28-10-25.0; Elk Mountain Loop) through this stand. The alignment was adjusted slightly to stay within the existing road as much as possible before shifting 90 degrees to continue along the ridgeline to ensure the safety and integrity of the pipeline and to minimize grading/disturbance requirements (see figure 2.2-11).
- C3042: The route was realigned to avoid multiple deep-seated landslides, which would minimize affects to this stand (see figure 2.2-11).
- C3093: The MAMU surveys performed in 2008 identified this stand. The proposed right-of-way would be generally located within an existing road (BLM 28-11-29.0; Elk Creek), which would minimize impacts to this stand. The sizes of the TEWAs in the northern and southern portion of the stand were reduced to further minimize impacts (see figure 2.2-12).
- C3165: This stand was identified from surveys performed in 2013 after the proposed route was filed with FERC. The proposed route is on the north edge of the stand and follows an existing road (BLM 28-11-29.0; Elk Creek). Only a small portion (about 0.6 acres) of this stand would be impacted (see figure 2.2-13).
- C3073: The proposed alignment within stand C3073 would follow an existing road (BLM 28-11-29.0; Elk Creek) except in the western part of the stand, where the alignment crosses a narrow strip of the stand within a Riparian Reserve before intersecting with and following the road. In-road construction would minimize impacts to this stand (see figure 2.2-14).
- C3090: The MAMU surveys performed in 2007 identified this stand. Stand C3090 is bisected by the pipeline right-of-way, which follows a ridgeline. Due to steep topography and the size of this stand, no additional routing avoidance was identified. There is one TEWA on this portion of the route that would be required because of a sharp

angle PI and because it is the only topographic break suitable for staging along this steep narrow ridgeline (see figure 2.2-15).

- C3094: The MAMU surveys performed in 2008 identified this stand. The proposed right-of-way follows a ridgeline and just clips the southern edge of this stand. Use of UCSAs areas instead of TEWAs would minimize removal of habitat within stand C3094 (see figure 2.2-16).
- C3095: The MAMU surveys performed in 2008 identified this stand. The proposed right-of-way would be located within an existing access road (BLM 28-10-9.4; Weaver-Sitkum Tie Road). In-road construction techniques and the use of uncleared storage areas would minimize habitat removal within this stand (see figure 2.2-17).
- C3070: This stand is within mapped LSR 261. Only a small portion (about one acre) of this stand would be cleared for the project (see figure 2.2-18).
- C3092: The MAMU surveys performed in 2007 identified this stand. Micro-adjustments moved the right-of-way further to the edge of the stand to minimize habitat removal. A small portion (less than one acre) of the northern most edge of this stand would be cleared (see figure 2.2-19).

Figure 2.2-9. Map of MAMU Occupied Stand C1080

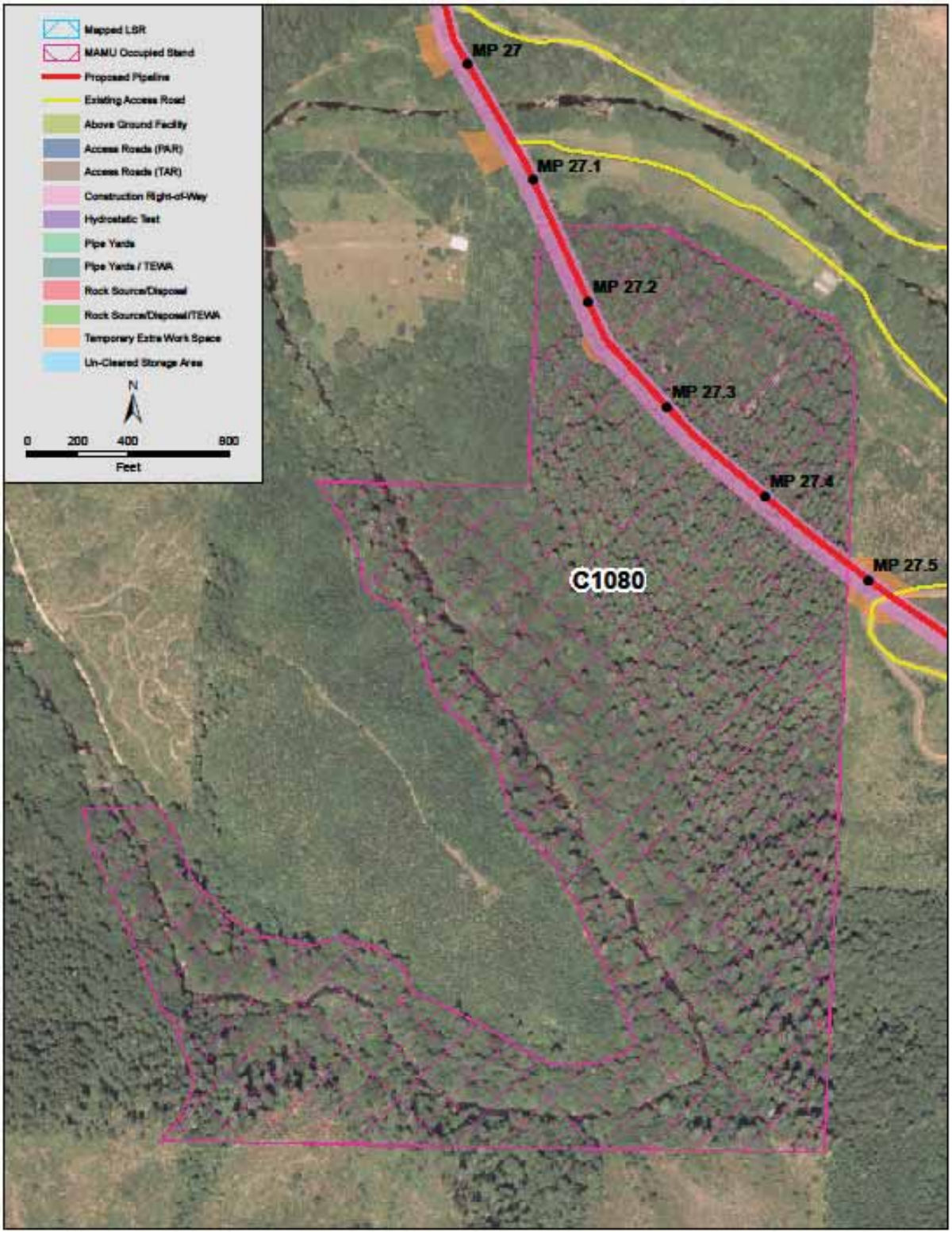


Figure 2.2-10. Map of MAMU Occupied Stand C3098

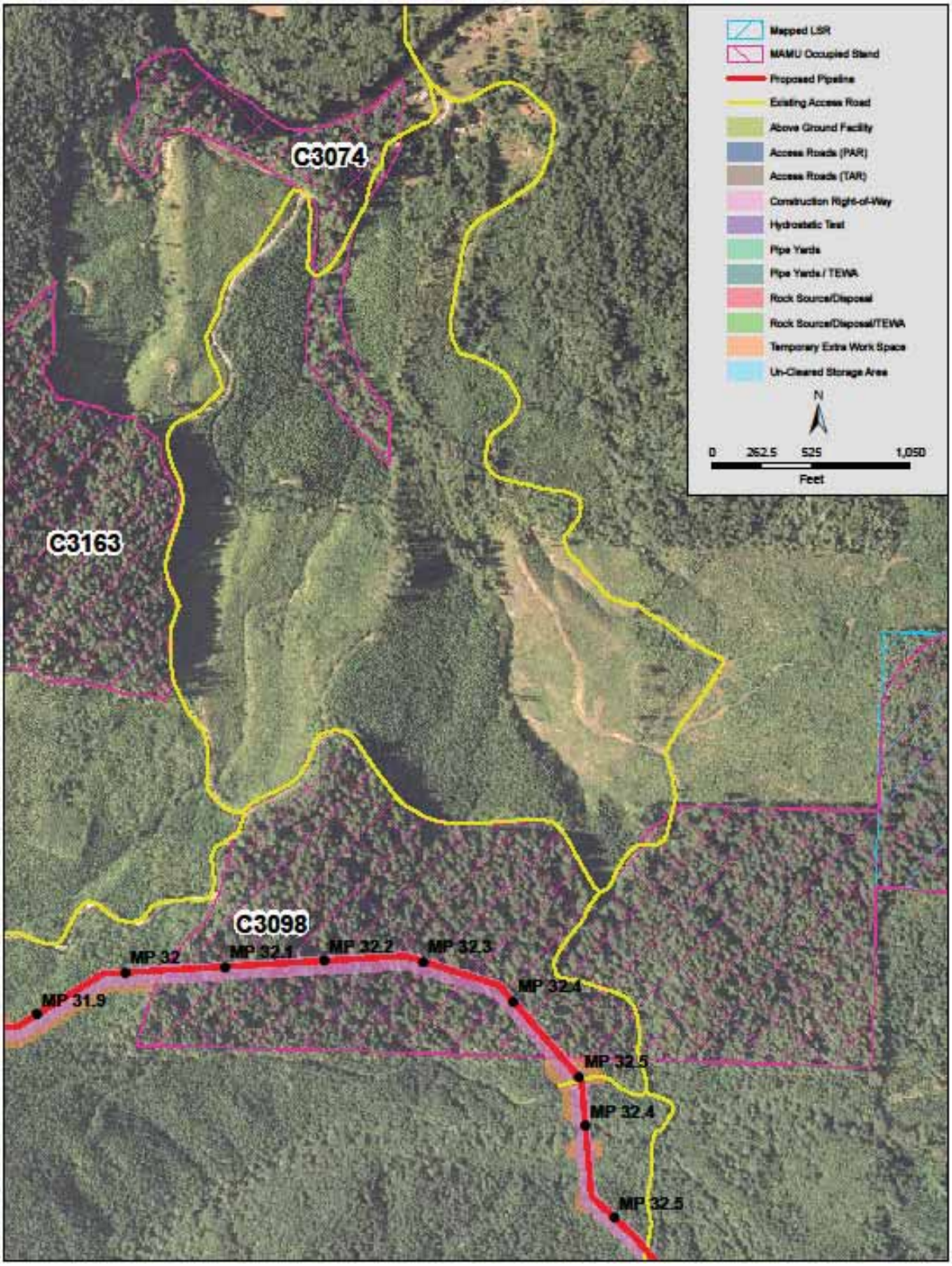


Figure 2.2-11. Map of MAMU Occupied Stand C3075 and C3042

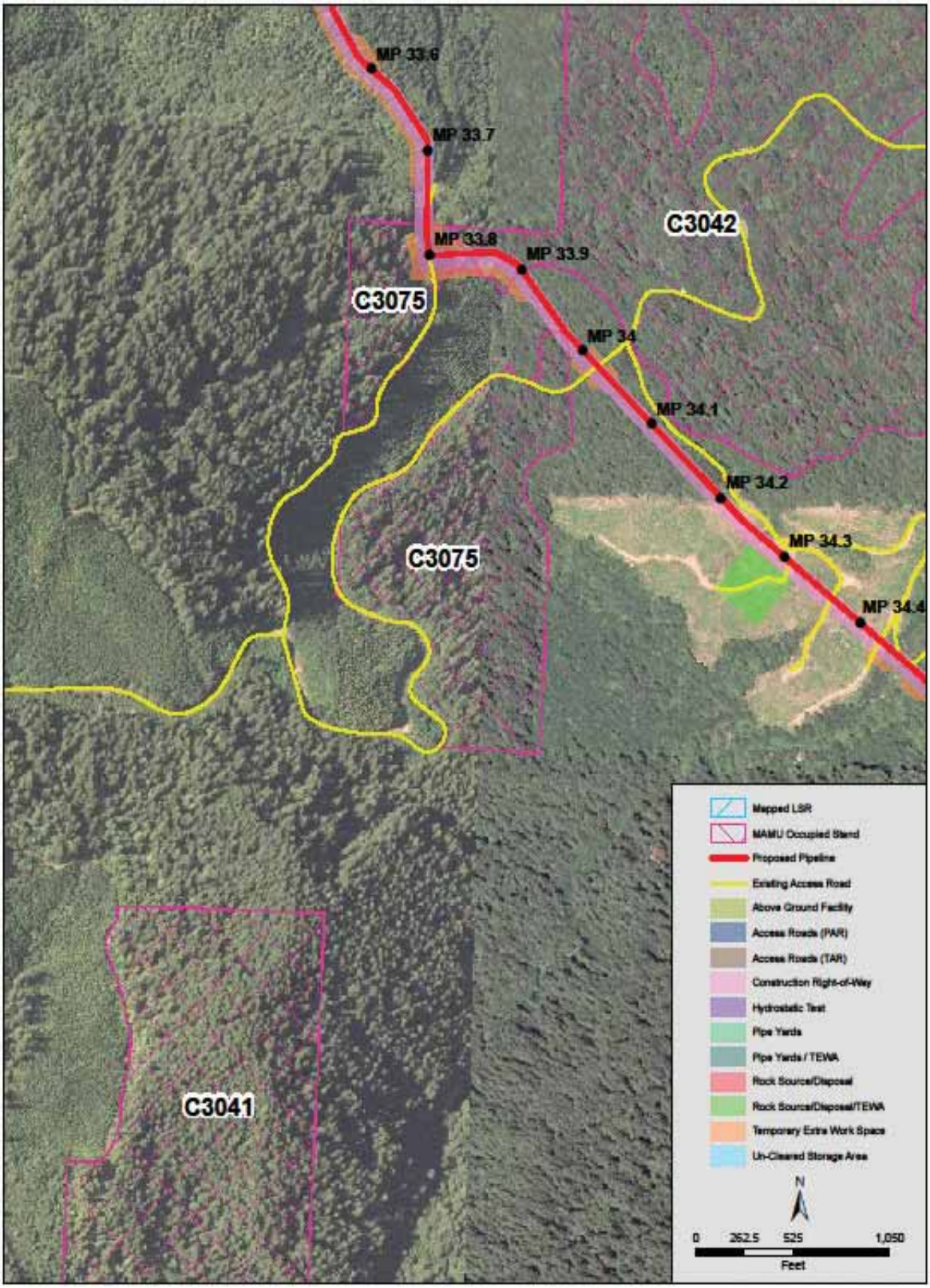


Figure 2.2-12. Map of MAMU Occupied Stand C3093

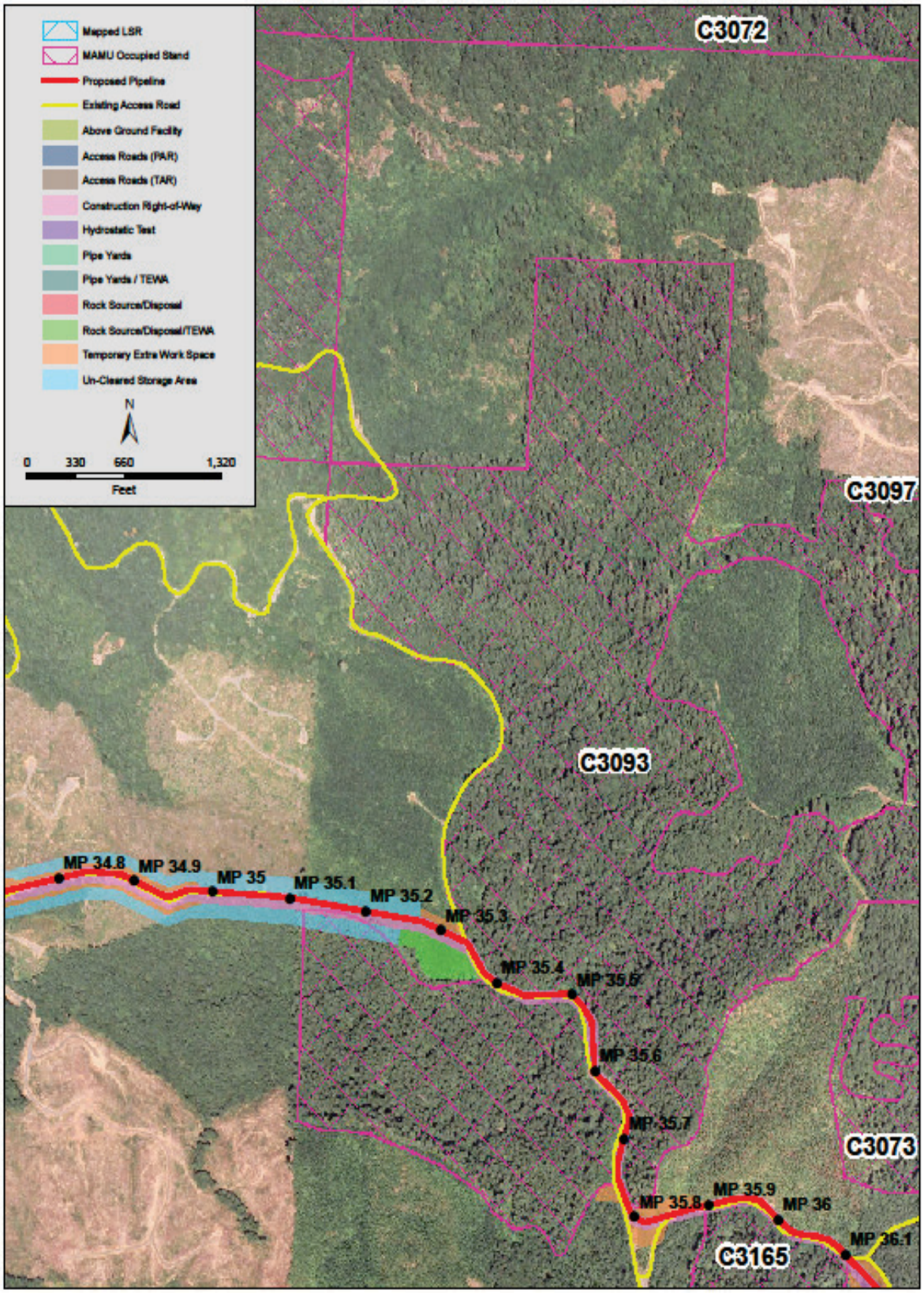


Figure 2.2-13. Map of MAMU Occupied Stand C3165

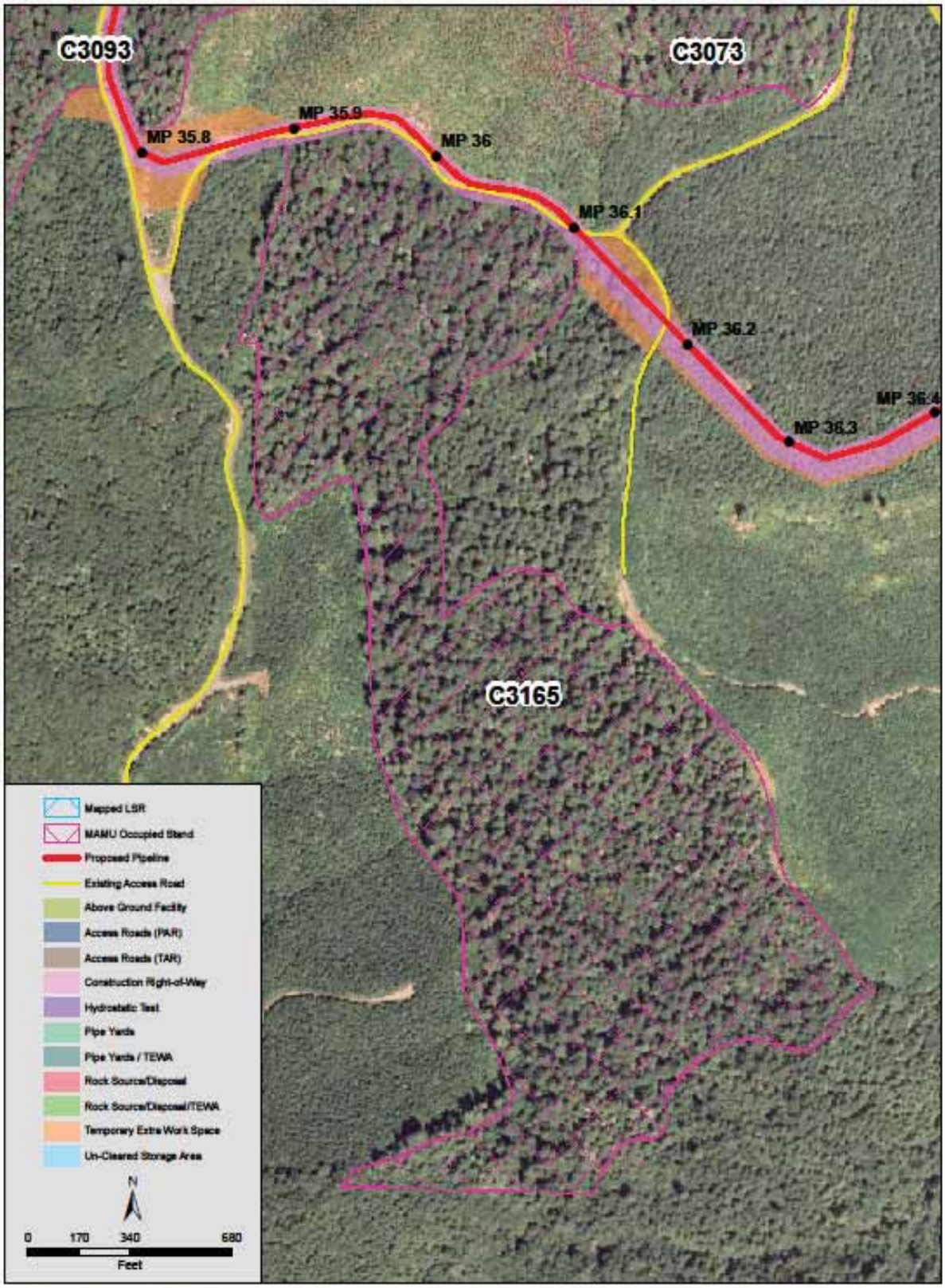


Figure 2.2-14. Map of MAMU Occupied Stand C3073

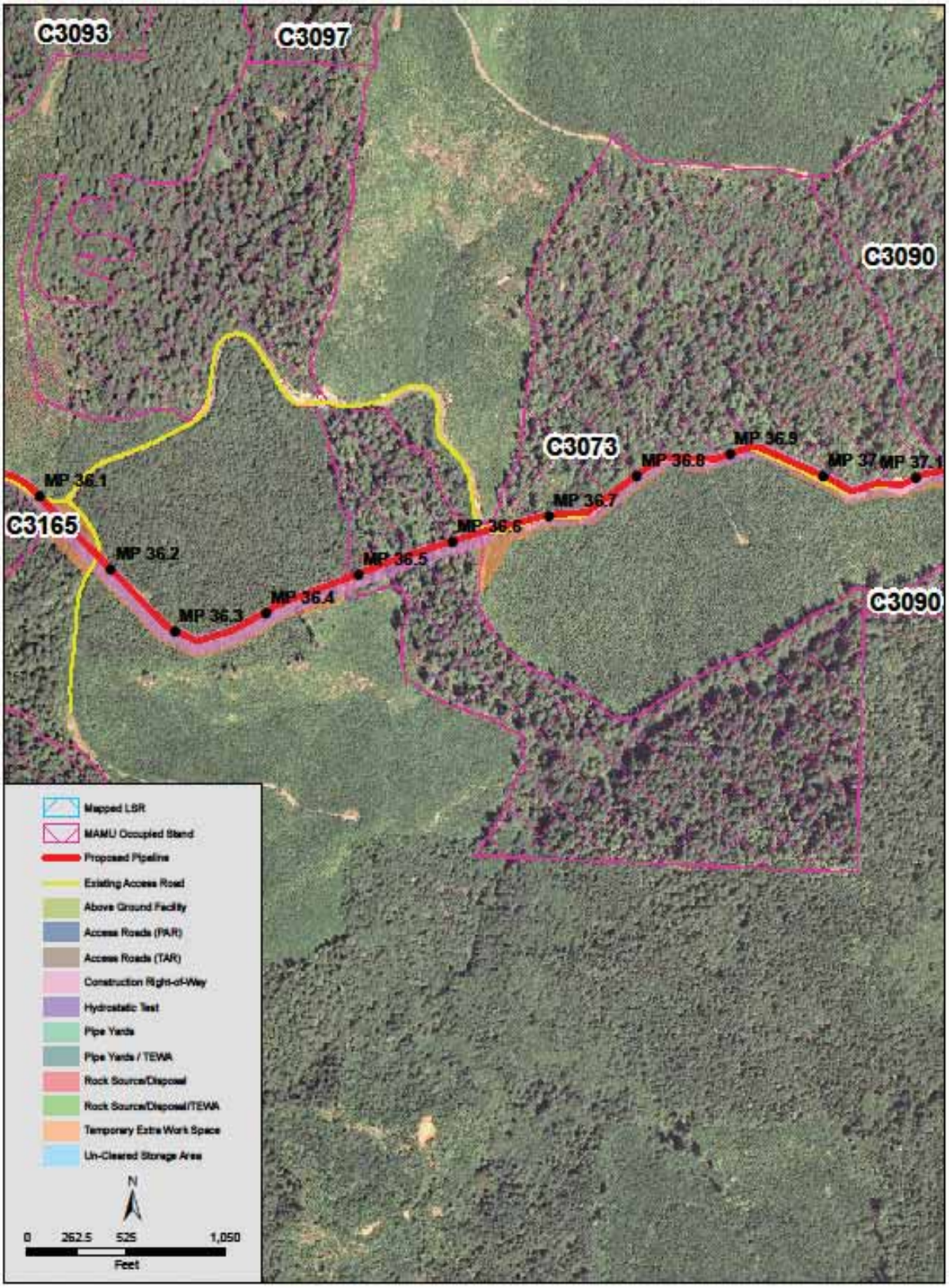


Figure 2.2-15. Map of MAMU Occupied Stand C3090

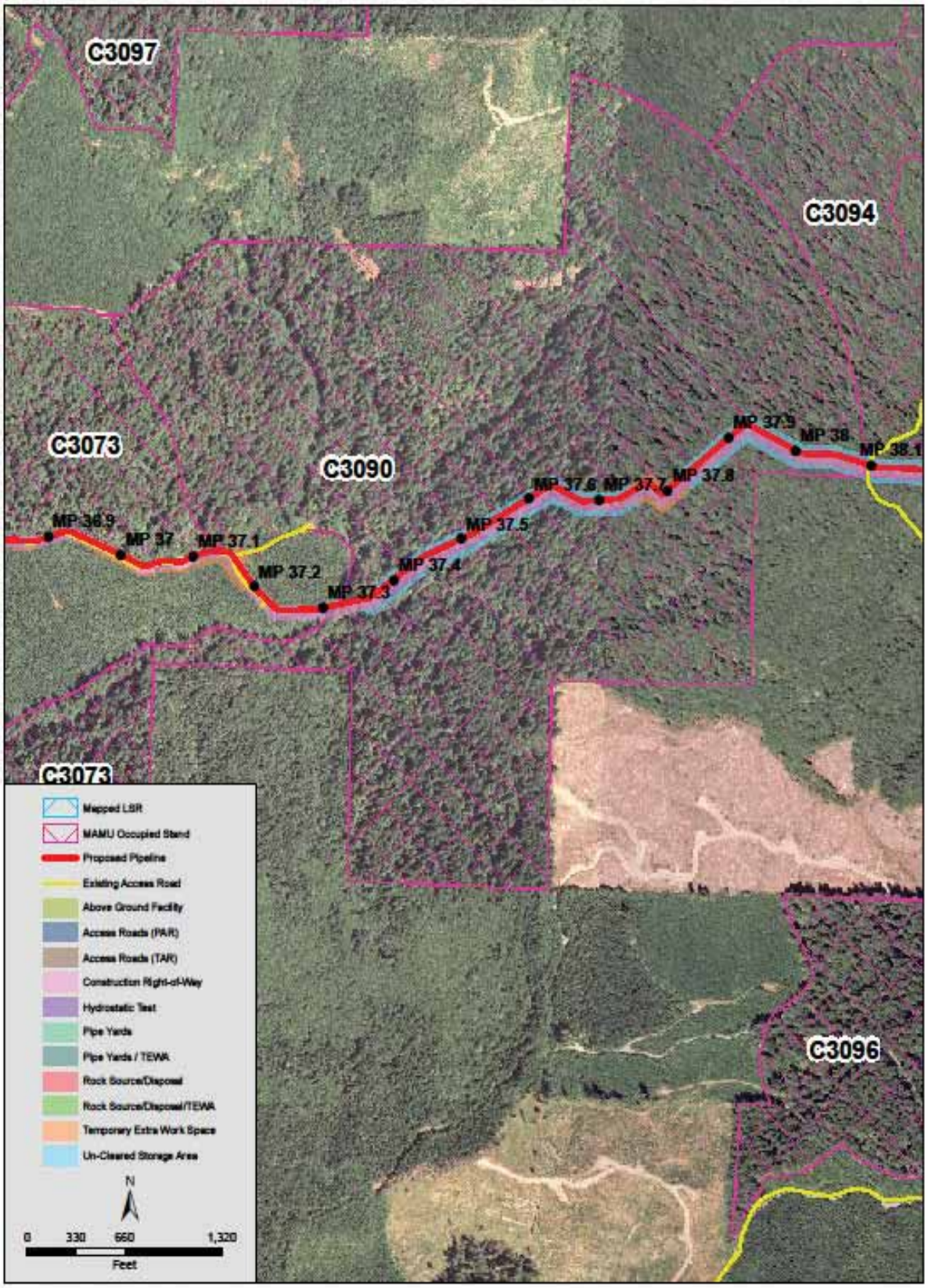


Figure 2.2-16. Map of MAMU Occupied Stand C3094

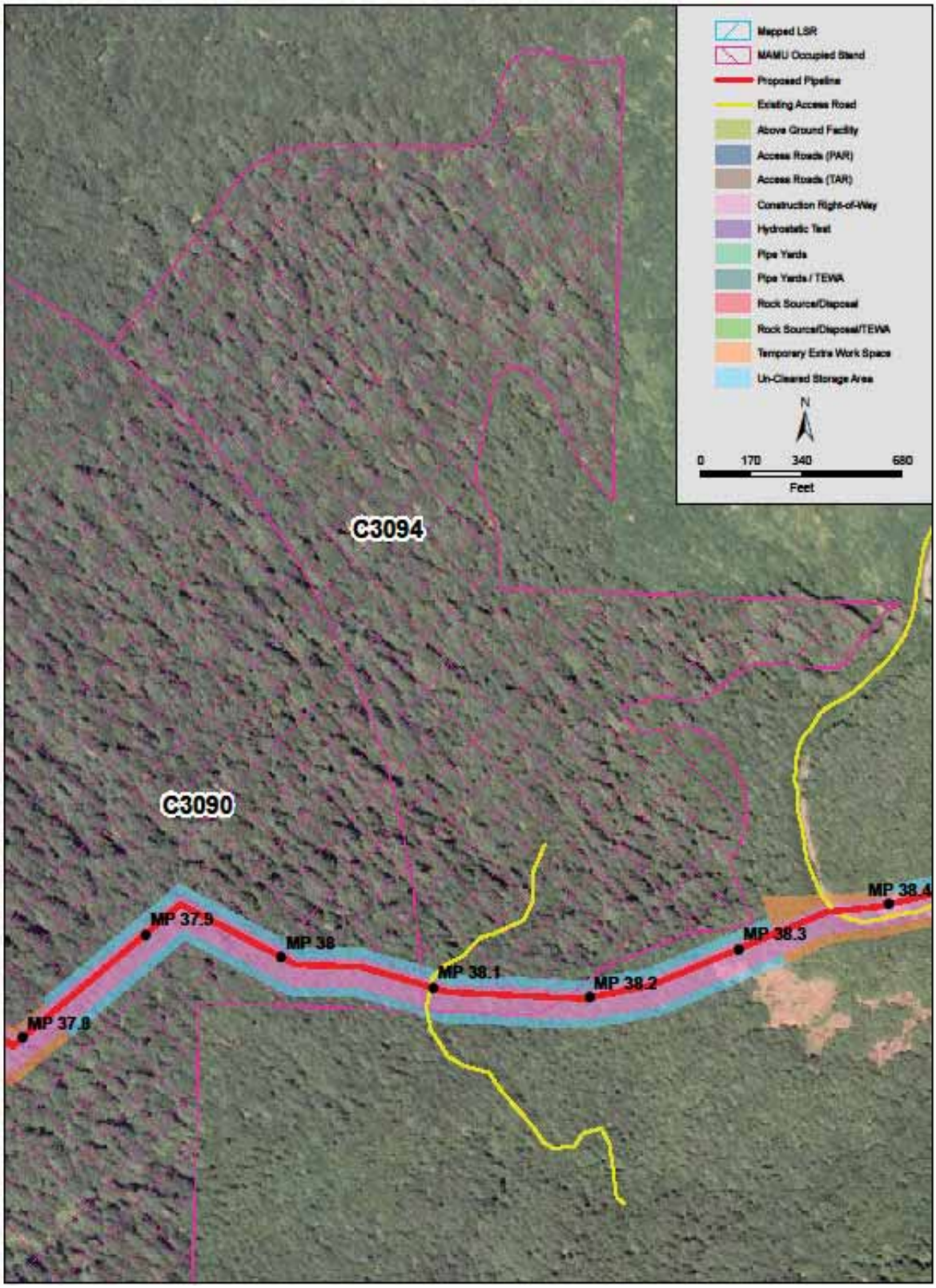


Figure 2.2-17. Map of MAMU Occupied Stand C3095

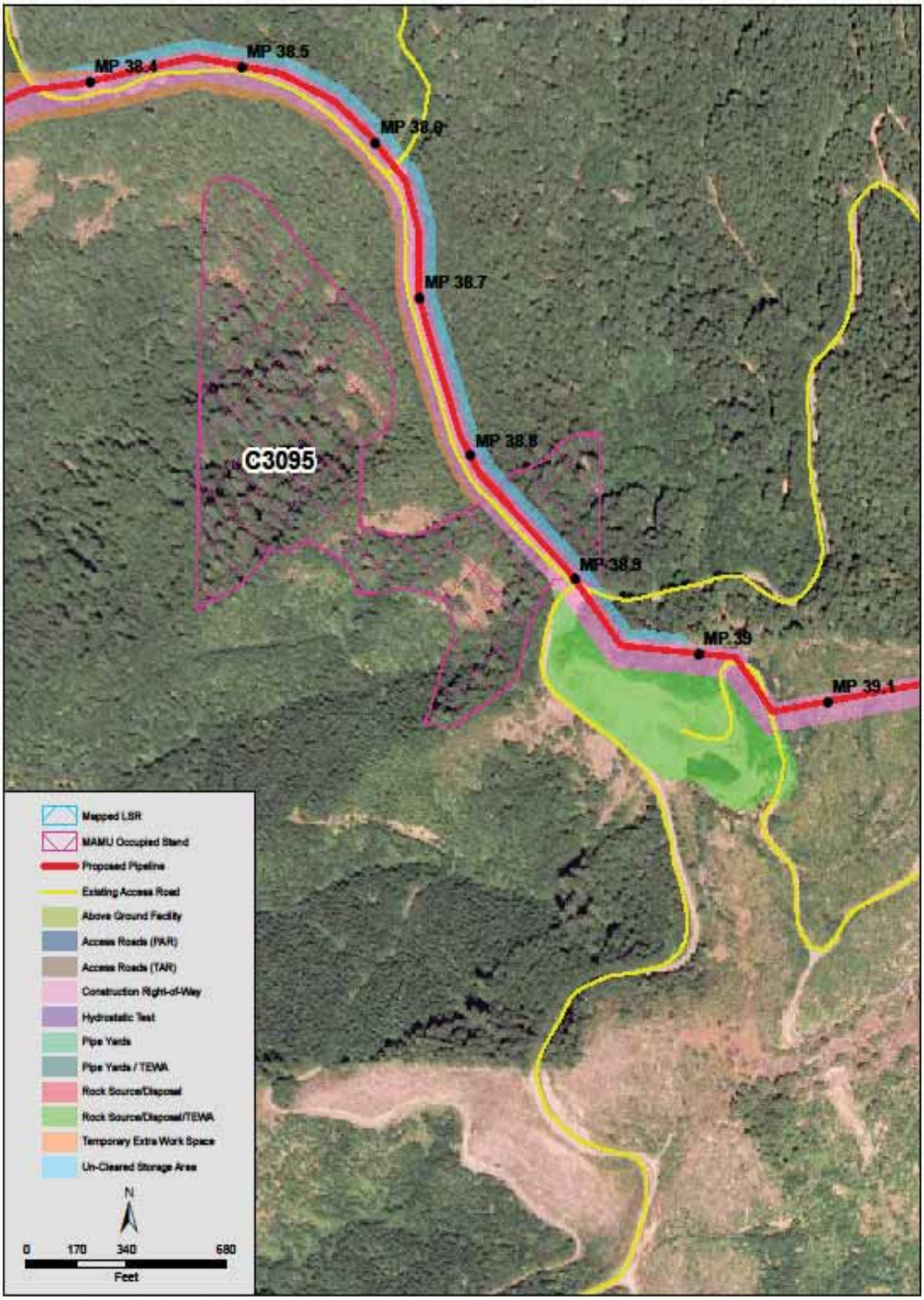


Figure 2.2-18. Map of MAMU Occupied Stand C3070

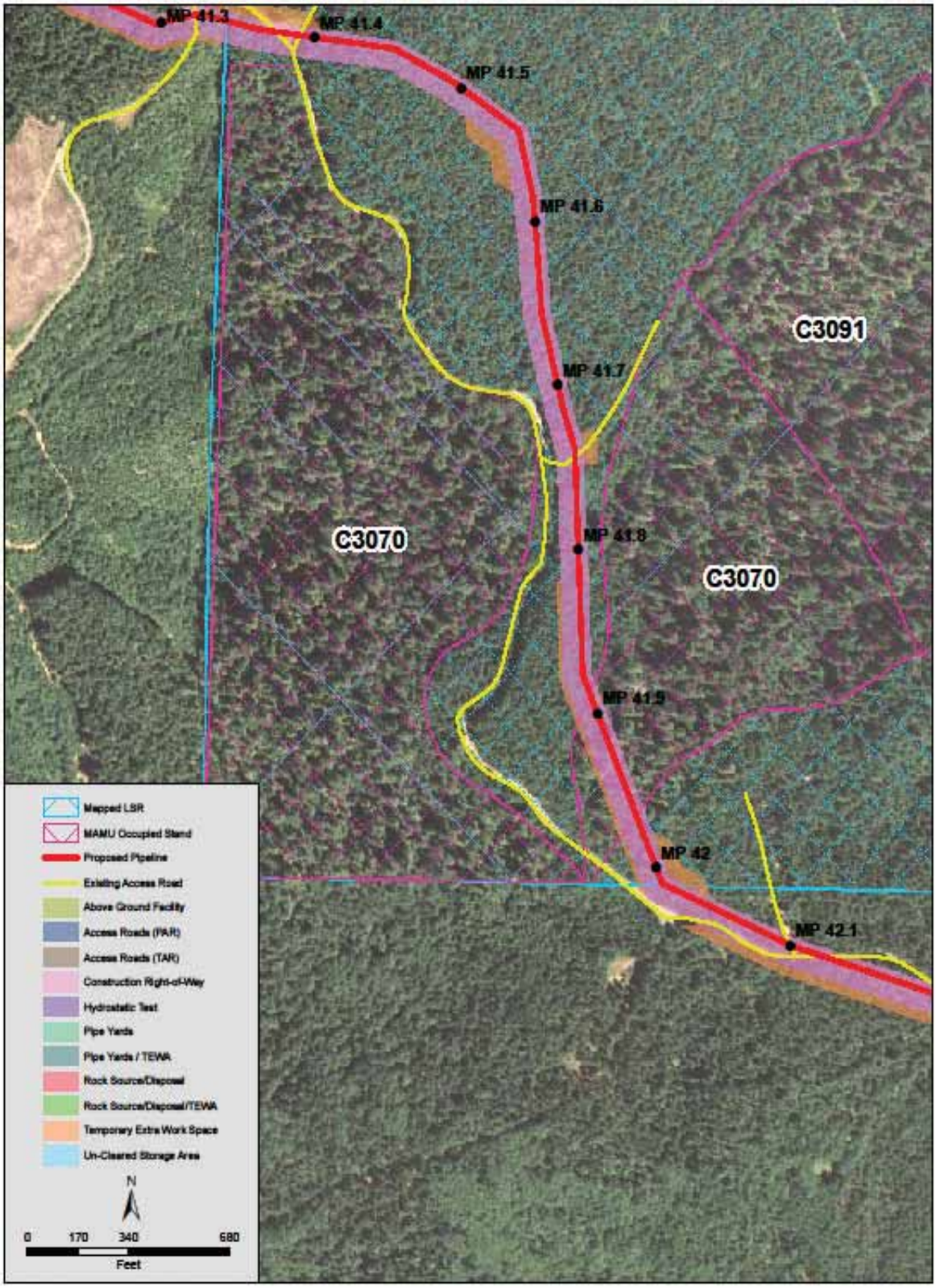
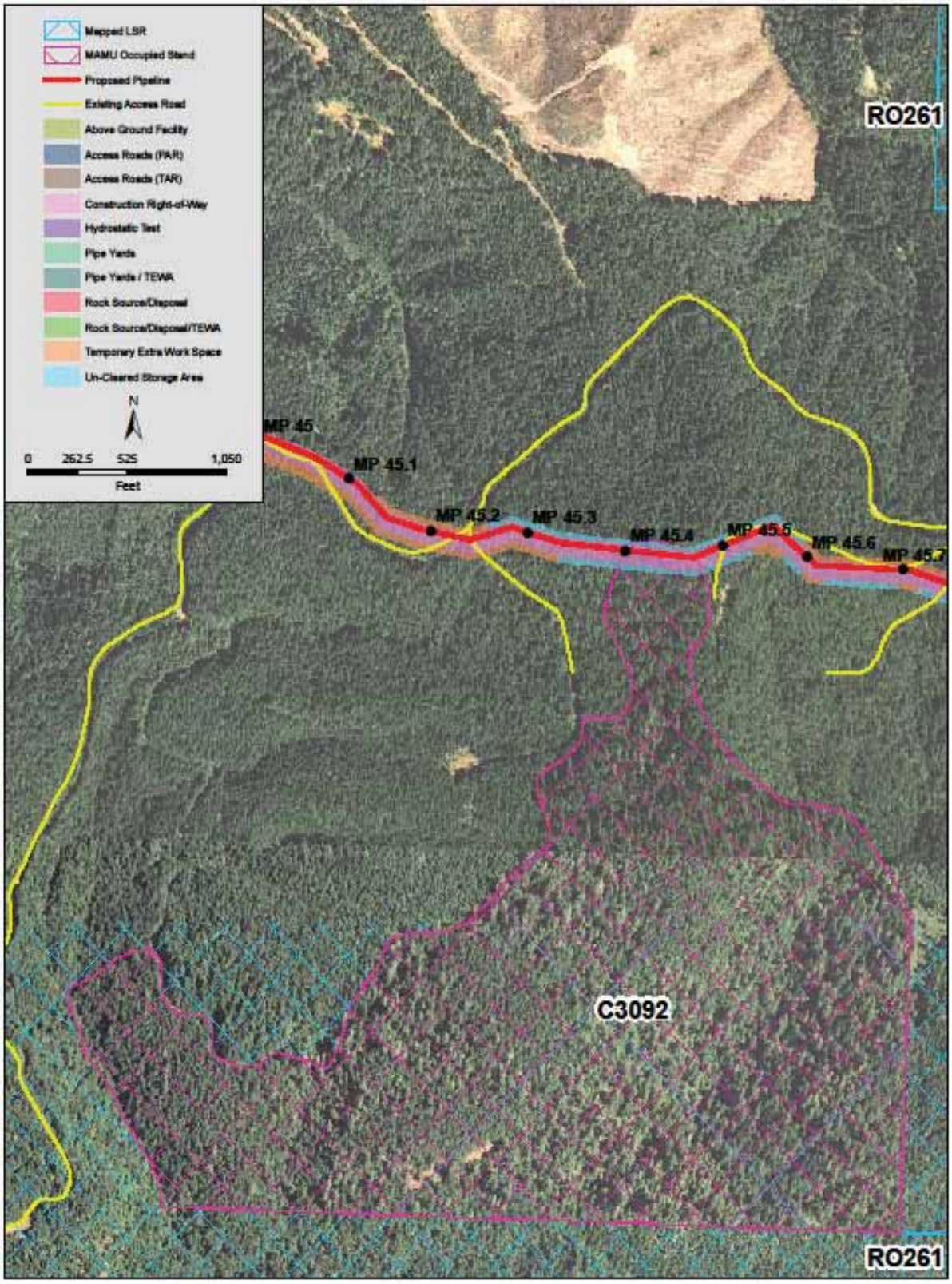


Figure 2.2-19. Map of MAMU Occupied Stand C3092



Currently, based on the latest BLM GIS data layers there are approximately 1,225 acres of LSOG forest habitat within the twelve occupied MAMU stands impacted by the PCGP project on the Coos Bay District. The PCGP project would require removing approximately 33.9 acres of forest vegetation in occupied MAMU stands from both the pipeline corridor and the TEWAs. Approximately 14.1 of these acres would be LSOG forest habitat. This would result in an approximate one percent reduction of the existing LSOG habitat within these twelve occupied MAMU stands.

The area proposed to be reallocated to LSR 261 is in the immediate vicinity of the occupied MAMU stands that would be affected (see figure 2.2-6 above). A large portion of this area (approximately 611 acres) contains occupied MAMU habitat (see discussion for RMP Amendment BLM-4 above). Although this habitat is currently protected by the management direction in the Coos Bay RMP, reallocating it to become part of a designated LSR would provide additional protections and benefits for MAMU habitat. The additional protection would result from the area being protected not just because of the existing habitat condition but as a land allocation dedicated to the management of late successional habitat. The additional benefits would result from the surrounding non-habitat areas being managed in the future to become LSOG forest, thereby consolidating larger contiguous blocks of habitat. A summary of the acres that would be affected both directly and indirectly from the construction of the PCGP project is displayed in table 2.2.1.4-3 and figure 2.2-20.

TABLE 2.2.1.4-3

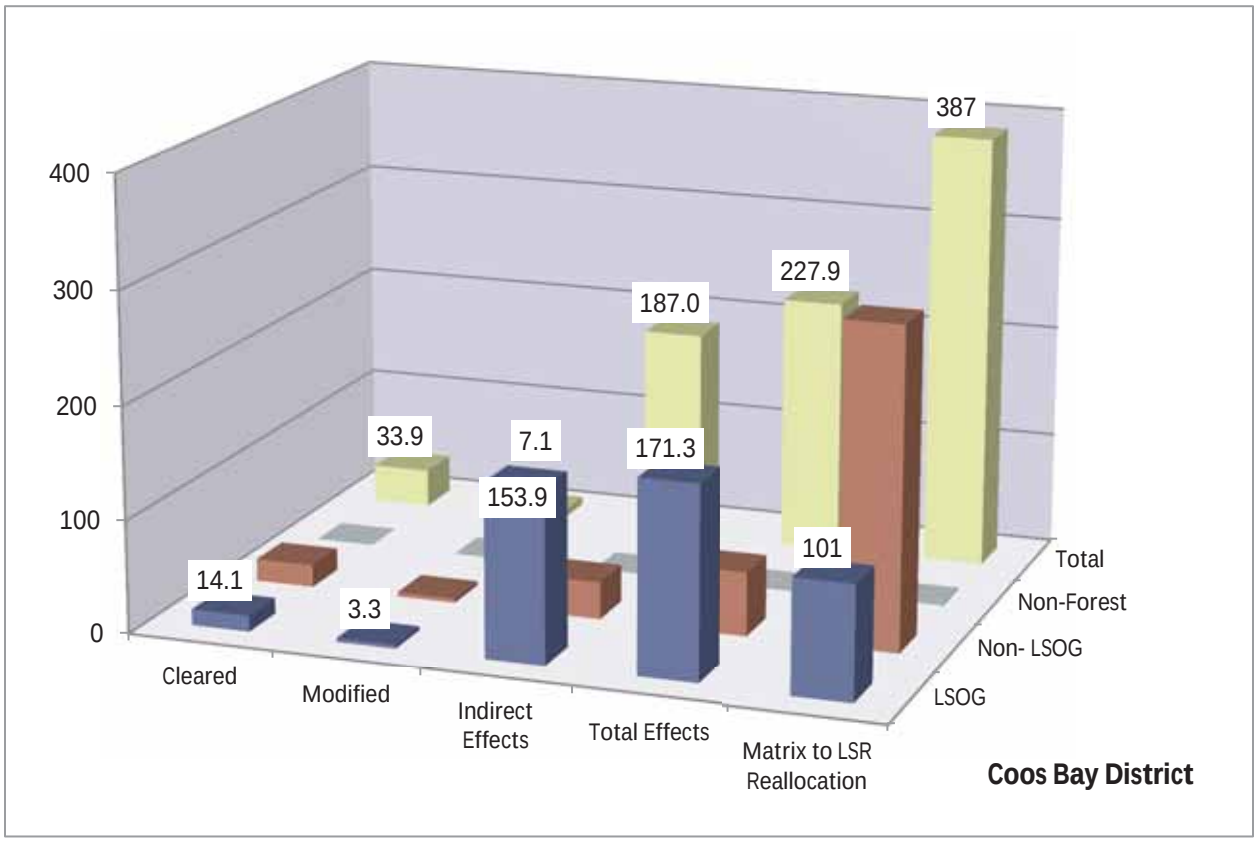
Comparison of Total PCGP Project Effects a/ on MAMU Stands and Matrix Reallocated to LSR (acres)

Coos Bay District	Direct Effects: Cleared	Direct Effects: Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
LSOG	14.1	3.3	153.9	171.3	101
Non- LSOG	19.8	3.8	33.1	56.6	284
Non-Forest	0.0	0.0	0.0	0.0	2
Total	33.9	7.1	187.0	227.9	387

Data source: BLM, USFS GIS Data Layers

a/ PCGP project total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).

Figure 2.2-20. Comparison of Total PCGP Project Effects on MAMU Stands and Matrix Reallocated to LSR (acres)



Aggregated Impact of the Proposed PCGP Project on Mapped and Unmapped LSRs in the Coos Bay District

Approximately 101 acres of the 387 acres of matrix lands being reallocated to LSR contain LSOG forest habitat. A comparison of the total LSR acres that would be affected by the proposed PCGP project in the Coos Bay District (in both mapped and unmapped LSRs) and the matrix acres reallocated to LSR is in table 2.2.1.4-4 and figure 2.2-21.

TABLE 2.2.1.4-4

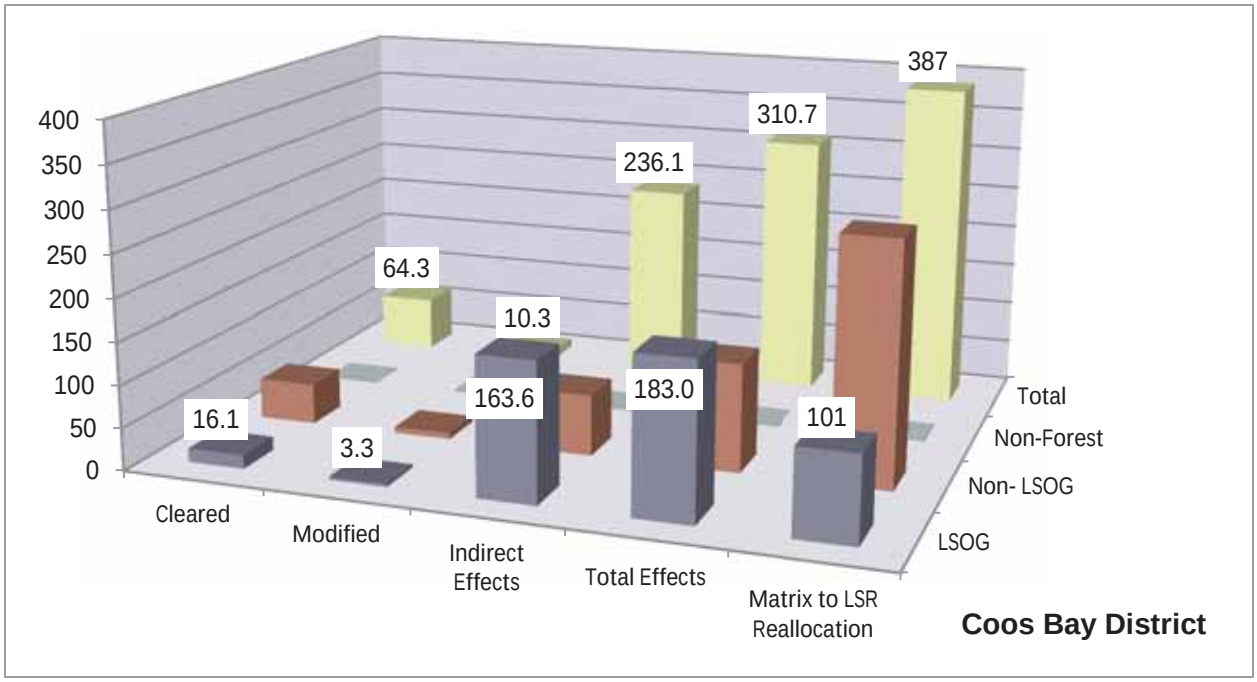
Comparison of the Total PCGP Project Effects a/ on LSRs and Matrix Reallocated to LSR (acres)

Coos Bay District	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	16.1	3.3	163.6	183.0	101
Non- LSOG	48.2	7.0	72.5	127.7	284
Non-Forest	0.0	0.0	0.0	0.0	2
Total	**64.3**	**10.3**	**236.1**	**310.7**	**387**

Data source: BLM, USFS GIS Data Layers

a/ PCGP project total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG) in both mapped and unmapped LSR.

Figure 2.2-21. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



A total of approximately 64.3 acres of LSR lands would be cleared by the construction of the PCGP project in the Coos Bay District. Approximately 16.1 of these acres would be LSOG forest habitat. The proposed amendment would reallocate more than six times the amount of LSOG forest that would be cleared for the construction of the project.

Mitigation Actions

In addition to the reallocation of matrix land to LSR, the Coos Bay District is also proposing to construct three heli-ponds. Two of them would be in the East Fork Coquille watershed and the other in the Middle Fork Coquille watershed (see figure 2.2-5 above). High-intensity fire has been identified as the single factor most affecting LSOG forest habitats on federal lands in the area of the NWFP (Mouer et al. 2011). Construction of the pipeline and associated activities would remove both mature and developing stands and would increase fire suppression complexity; however, the corridor would also provide a fuel break that could aid in suppression efforts. Within the East/Middle Fork watersheds, there is an 18-plus mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during the initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heli-ponds at these locations would reduce the 18 mile gap to approximately 6 miles and would enable a 2 to 3 mile radius for aerial application. Fire control is necessary to protect LSRs and endangered species habitat should a wildfire occur. These heli-ponds would reduce initial attack response times in both the mapped and unmapped LSRs that would be affected by the PCGP project and increase the potential to control fires before they become high-intensity fires that threaten LSOG forests.

Aggregated Amendments to LSR 261

There are no other proposed amendments related to LSR 261 in the Coos Bay District. There is, however, another amendment being proposed for LSR 261 in the Roseburg District of the BLM. The combined amendments to LSR 261 are evaluated and discussed in Section 2.2.2.5.

2.2.1.5 Evaluation of the Proposed Amendments and Mitigations Relevant to the Coos Bay District RMP Objectives

Two LRMP amendments and one mitigation measure are associated with LSRs in the Coos Bay District. Proposed amendment BLM-1 would waive the requirement to protect all MAMU habitat within occupied stands. A total of 33.9 acres would be cleared within twelve occupied MAMU stands. The proposed waiver is project specific, meaning that it would apply only to the PCGP project. Proposed amendment BLM-4 would reduce the matrix land allocation in the Coos Bay District by 387 acres from 55,300 acres to 54,913 acres, or by about 0.7 percent. This amendment would increase LSR 261 by 998 acres from 70,357 acres to 71,355, or by 1.4 percent. This proposed change would affect the 988 acres as shown in figure 2.2-6 for the life of the current RMP. The proposed mitigation would create three heli-ponds, one in the Middle Fork Coquille watershed and two in the East Fork Coquille watershed.

The objective for the LSR land allocation in the Coos Bay District RMP states, "Protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest-related species including the NSO and MAMU. Maintain a functional, interacting, late-successional and old-growth forest ecosystem" (USDI May 1995, page 18).

The objective in the Coos Bay District RMP for managing MAMU habitat states, "Protect, manage, and conserve federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and bureau special status species policies" (USDI May 1995, page 32).

The proposed amendments and mitigation would not alter the objectives of the Coos Bay District RMP for LSRs for the following reasons:

- The quantity, quality, and distribution of LSOG habitat within LSR 261 would be either maintained or improved with the proposed reallocation of matrix to LSR RMP amendment (see discussion in section 2.2.1.4 *Impact on the Functionality of LSR 261 on the Coos Bay District* above)

- The quantity and quality of LSOG habitat within and adjacent to occupied MAMU stands would be either maintained or improved with the proposed reallocation of matrix to LSR (see discussion in section 2.2.1.4 *Amount and quality of MAMU habitat affected by the construction and operation of the PCGP project* above).

- The construction of the heli-ponds would provide increased protection of the existing LSOG forest habitat in both the mapped and unmapped LSRs from loss due to intensive fire through reduced initial response times. These measures along with the reallocation of matrix lands to LSR have been designed so that the overall effect on LSRs would be neutral or beneficial, thereby maintaining the goals for LSRs in the Coos Bay District.

Both the reallocation of matrix lands to LSR and the proposed mitigation would be consistent with the goals of the LSR land allocation to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG-related species. They would also be consistent with the management recommendations in the LSRA for LSR 261 by consolidating blocks of LSOG forest habitat and providing increased protection of existing LSOG forest habitat from intensive fire.

An objective in the Coos Bay District RMP for matrix land is to produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability. Moving a net of 387 acres from matrix to LSR 261 would not prevent attainment of objectives for matrix in the Coos Bay District RMP because:

- Allowable Sale Quantity (ASQ) would be minimally affected between now and the time that the Coos Bay District RMP is revised. The CMP includes a provision that approximately 450 acres of non-federal forest lands would be acquired by the applicant to replace matrix lands lost to reallocation. As a practical matter, if a linear relationship between acres and outputs is assumed, the potential effect would be less than 1 percent of the District's ASQ since the amendments affect less than 1 percent of the general forest management land base. With the acquisition of 450 acres of forest land to be added to the matrix land base, the potential timber output would not be reduced. The amendments would not prevent future vegetation management activities such as commercial thinning in LSR 261, which would also contribute to the local forest products industry. Also, the off-site mitigation measures would provide increased protection for forested stands in the matrix in this area by reducing initial response times and increasing the potential to prevent loss of commercial timber from intensive fire.

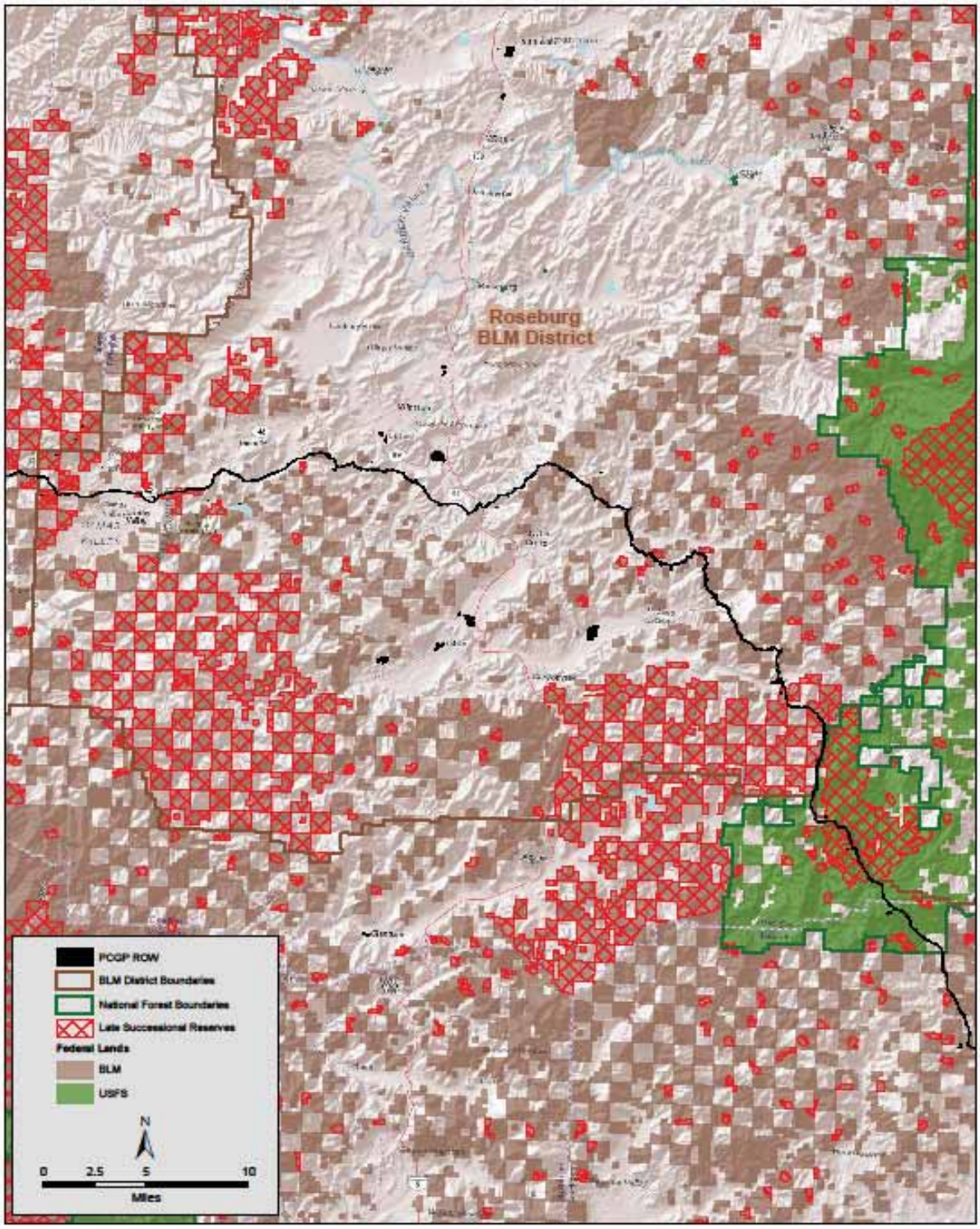
These changes would not have an important effect on the objectives identified in the RMP or affect land resources throughout a large portion of LSR land allocation in the Coos Bay District.

2.2.2 Roseburg District

The Roseburg District RMP as amended guides all resource management activities in the District. The RMP provides the vision and strategy for the land allocations and resource programs as well as the management actions/directions for each of the land use allocations and resource programs (USDI 1995b). The Roseburg District RMP is available at http://www.blm.gov/or/districts/roseburg/plans/roseburgrmp.php. A map of the proposed PCGP project and LSRs in the Roseburg District is displayed in figure 2.2-22.

In the Roseburg District, the construction of the PCGP project would directly affect approximately 12.1 acres of LSR 261 and 62.3 acres of LSR 223. The construction would also directly affect approximately 18.5 acres of unmapped LSRs within two MAMU stands and three KOACs.

Figure 2.2-22. Map of Proposed PCGP Project and LSRs in the Roseburg District



2.2.2.1 Existing Conditions of Mapped LSR 261

Summary from LSRA

This information is provided in section 2.2.1.1.

Recent Changes

There have been no notable changes in the transportation system or fire history in LSR 261 in the Roseburg District since the LSRA was written in 1998. Several density-management treatments designed to accelerate LSOG forest habitat conditions have occurred since 1999 on approximately 544 acres. Vegetation management has also included pre-commercial thinning on approximately 5,622 acres and some treatments for invasive plants.[3]

Agency Recommendations

Since there have been no significant changes in the conditions of this LSR in the Roseburg District, there would be no changes to the recommendations or priorities for management activities in the LSRA.

2.2.2.2 Existing Conditions of Mapped LSR 223 in the Roseburg District

Summary from LSRA

The South Umpqua River/Galesville Late-Successional Reserve Assessment (USDA and USDI 1999) addresses one LSR in the Roseburg and Medford Districts of the BLM and the Umpqua National Forest totaling about 66,900 acres. This LSR is a major habitat link between the Coast Range and Cascade Provinces. The LSR is addressed in the context of a 104,140-acre assessment area.

This LSR lies in a critical east-west connectivity area between two large valley systems. To the south is the Rogue River valley and to the north is the Umpqua valley. North and south of this LSR, there are essentially no neighboring LSRs. The LSR is located at the south end of the Umpqua valley in a landscape dominated by intermingled BLM and private lands. To the east and southeast of the LSR, there is a block of Forest Service lands. The lack of federal ownership across the I-5 corridor in most of western Oregon makes this area a vital link between major physiographic provinces.

Vegetative conditions, past and present, have been influenced by environmental and human factors. Late-successional stands are estimated to have historically covered from 40 to 75 percent of southwestern Oregon (USDA 1993). For this LSR, approximately 43 percent (28,767 acres) of the federal lands are in late-successional stands. The objective for management in this LSR is to attain and maintain 60 percent to 75 percent of the federal lands in late-successional stands.

Three general landscape criteria were identified for setting priorities for the location of future treatment areas. These included maintaining or enhancing connectivity across the landscape, establishing large blocks of late-successional habitat, and enhancing suitable spotted owl habitat conditions around centers of activity.

[3] Information provided by Paul Ausbeck, District Planner and Environmental Coordinator, Roseburg District BLM.

The risk of large-scale habitat loss from a wildfire occurring within this LSR is relatively high. The historic fire-return level for the LSR is on the order of 30 to 80 years. The primary objective of fire and fuels management in the LSR is to minimize the loss of late-successional habitat by reducing the risks of high-intensity, stand-replacing wildfires.

The objective of silvicultural systems proposed for this LSR would be to develop old-growth characteristics, including snags, downed logs, large trees, canopy gaps, multiple layers, and diverse species composition. Silviculture treatments, such as reforestation, release, density management, pruning, fertilization, and tree culturing to accelerate the development of desired characteristics, could occur within the LSR

Fire has been a significant if not the dominant factor in maintaining the compositional and structural diversity of the area, as well as fragmenting the late-successional forests. The intensity of fires has varied based on elevation, aspect, and vegetation zones. Forests of all vegetation zones have burned, though the return intervals have been different. The zones in the lower elevations probably had more frequent fires than the Douglas-fir and other conifer-dominated types at higher elevations. Not only were the fuel characteristics more conducive to frequent fires, but the lower elevations probably experienced more frequent human-caused fires as Native Americans burned the valleys and foothills for their own uses. Fire exclusion and the continued suppression of fires became effective around the 1940s. Fire exclusion has resulted in the development of stands that would not have occurred naturally. In some stands, shade-tolerant understories have seeded in that would have otherwise been kept out by frequent low-intensity fires. This is particularly so at the higher elevation zones where white fir has become a more common understory species.

Risk of large-scale habitat loss from a wildfire event occurring within this LSR is relatively high. Fuels and ignition sources are present. The NWFP recognizes that the Oregon Klamath Physiographic Province has an increased fire risk due to lower moisture conditions and rapid accumulation of fuels after insect outbreaks and drought. Fire suppression and exclusion have caused fuels to accumulate to a point that they are outside the range of “historic” variability. Many stands are currently overstocked with conifers, hardwoods, and shrubs.

Changes Since the LSR Was Written

Little fire activity has occurred in LSR 223 in the Roseburg District since the LSRA was written in 1999. The Bland Mountain II Fire burned approximately 36 acres of forest 50 years or older in 2004. There has also been little change in the transportation system, with approximately 2 miles of road being decommissioned and a current road system of about 151 miles on BLM-administered lands. Several density management treatments designed to accelerate LSOG forest habitat conditions have occurred since 1999 on approximately 345 acres. Vegetation management has also included approximately 63 acres of girdling of noncommercial-sized conifers, pre-commercial thinning on approximately 5,137 acres, and some treatments for invasive plants on approximately 159 acres.[4]

Using the most recent GIS data from the latest Northwest Forest Plan Monitoring Report on LSOG forest (Mouer et. al. 2011), the current estimate of LSOG forest in LSR 223 is 20,557

[4] Information provided by Paul Ausbeck, District Planner and Environmental Coordinator, Roseburg District BLM.

acres. This is less than the 28,767 acres estimated when the LSRA was written. However, because the two estimates were derived using different data bases a direct comparison cannot be made.

Agency Recommendations

Since there has been no significant change in the conditions of this LSR in the Roseburg District, there would be no changes in the recommendations or priorities for management activities in the LSRA.

2.2.2.3 Unmapped LSR in the Roseburg District

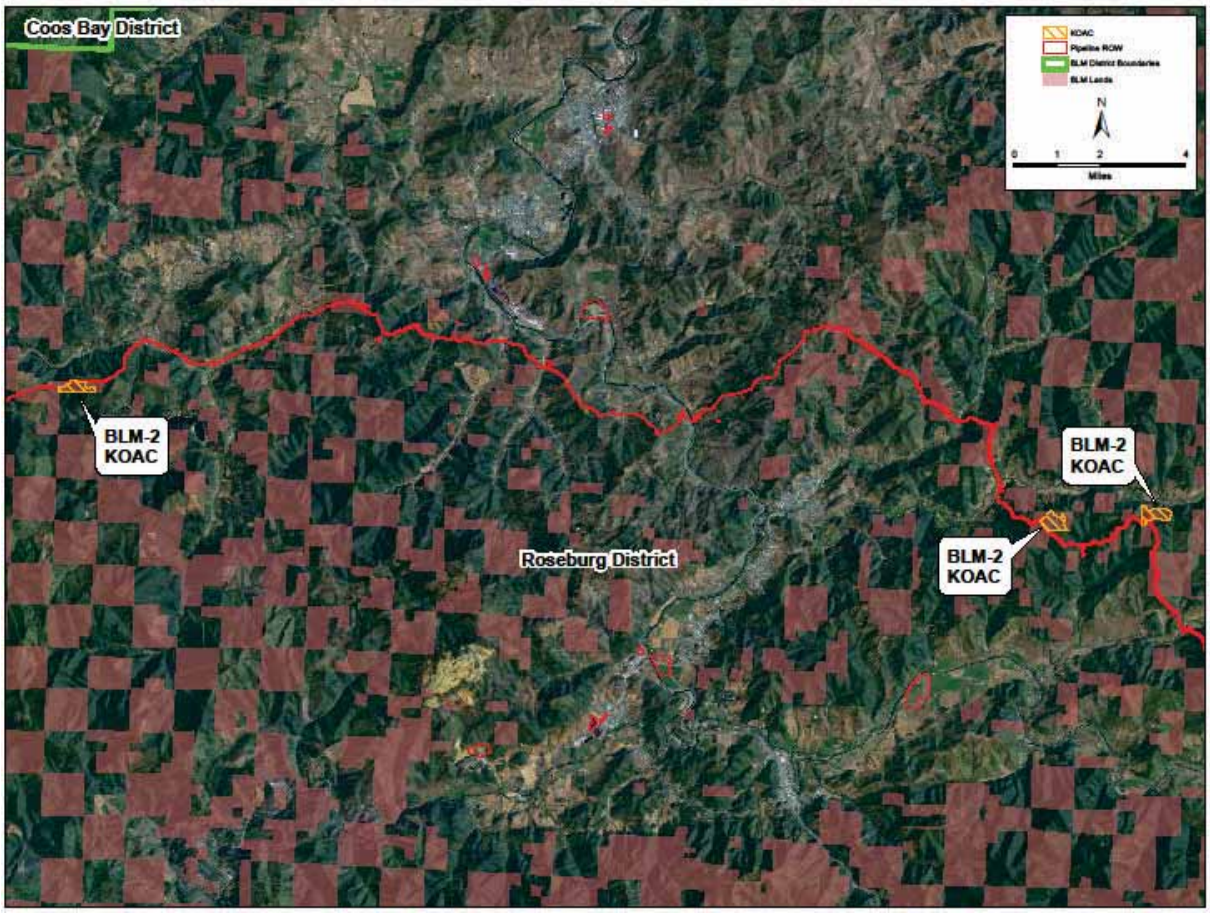
KOACs

A known spotted owl activity center as described by the NWFP is approximately 100 acres of the best NSO habitat adjacent to a nest site or activity center for all spotted owl sites known prior to January 1, 1994, on federal matrix and Adaptive Management Area lands (USDA and USDI 1994, page C-10). In 2006, BLM provided to Pacific Connector GIS data layers of known spotted owl activity centers within its jurisdictional boundaries. Three KOACs located on matrix lands (unmapped LSRs) within the Roseburg District occur within the PCGP project area (P2199, P0361, and P2294); see table 2.2.2.3-1 and figure 2.2-23.

TABLE 2.2.2.3-1 KOAC Sites within the PCGP Project Area in the Roseburg District		
Site Identification	**Approximate Mile Post Range**	**Acres Cleared by the PCGP[1]**
P2199	MP 53.36–53.76	1.7
P0361	MP 82.96–83.28	4.4
P2294	MP 85.95-86.16	2.1

1. Cleared acres include the PCGP project construction corridor and TEWAs.
Data source: BLM GIS layers

Figure 2.2-23. Map of KOAC Sites Crossed by PCGP Project in the Roseburg District



MAMU

Existing known MAMU occupied sites were inventoried using BLM geographic information system (GIS) layer data in 2006, and one occupied sites was in the proposed PCGP project corridor on the Roseburg District. Additional MAMU surveys were conducted in 2007-2008 and 2012-2013 within the project area, and one additional occupied site was identified on the Roseburg District. BLM delineated the extent of the stand identified during the surveys and incorporated the newly identified stand into the GIS layer. One of the two occupied stands within the PCGP project area on the Roseburg District occurs outside of mapped LSRs on lands

that are currently allocated as matrix and the other stand lies within in LSR 261. Approximately 5.4 acres of occupied MAMU stands would be cleared by the PCGP project (see table 2.2.2.3-2). The map in figures 2.2-24 and 2.2-25 displays the known MAMU occupied stands in relation to the project on the BLM Roseburg District.

TABLE 2.2.2.3-2

Known Occupied MAMU Stands in the Roseburg District within the PCGP Project Area

MAMU Occupied Stand	Milepost Location	Acres Cleared a/
R3035 b/	MP 46.91-47.10	2.5
R3036	MP 51.04-51.29	2.9
Total		5.4

a/ Acres cleared equals the clearing in the PCGP corridor and the TEWAs
b/ Occupied Stand R3035 lies entirely within LSR 261

Figure 2.2-24. Map of Occupied MAMU Stand R3035

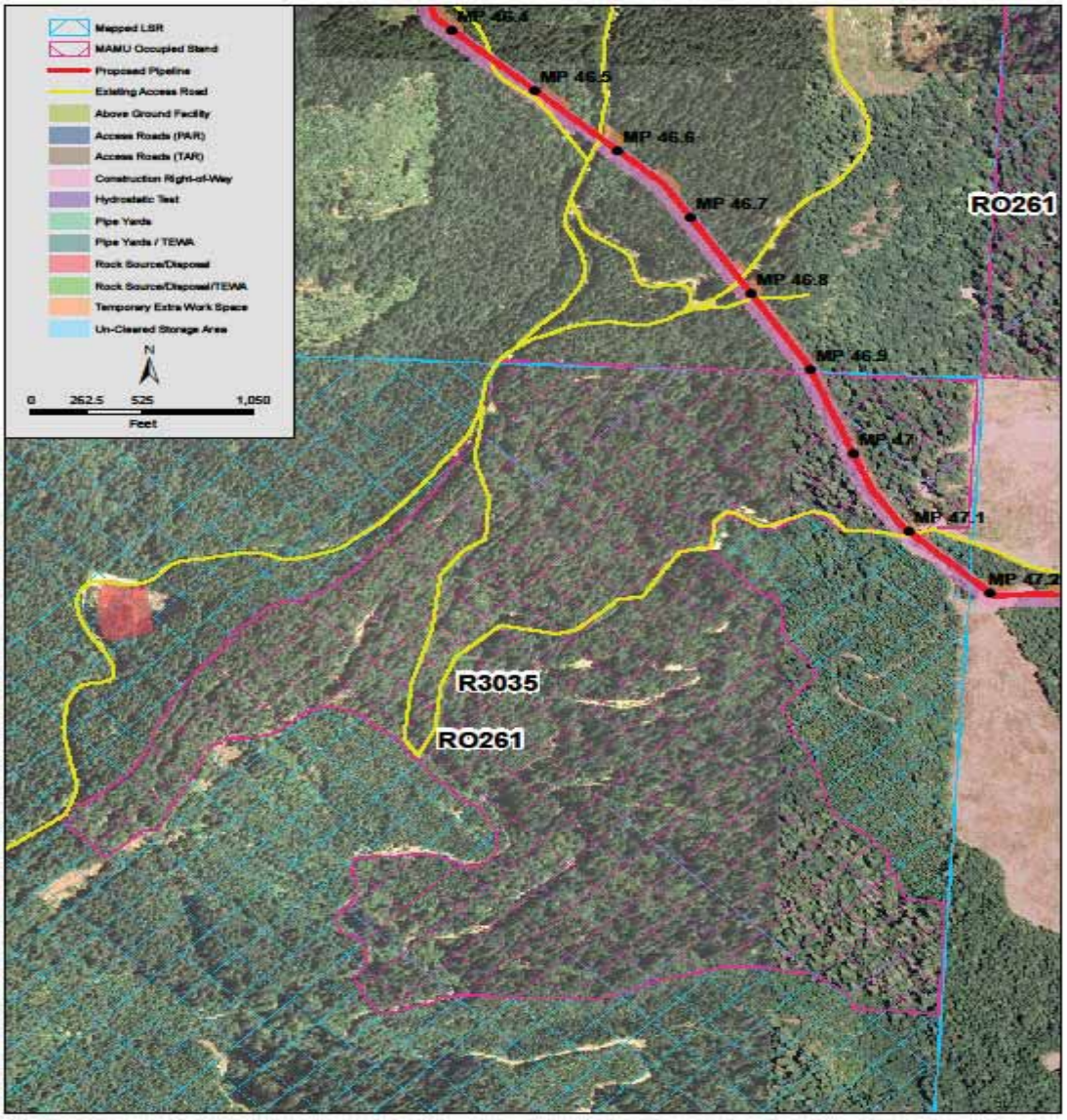
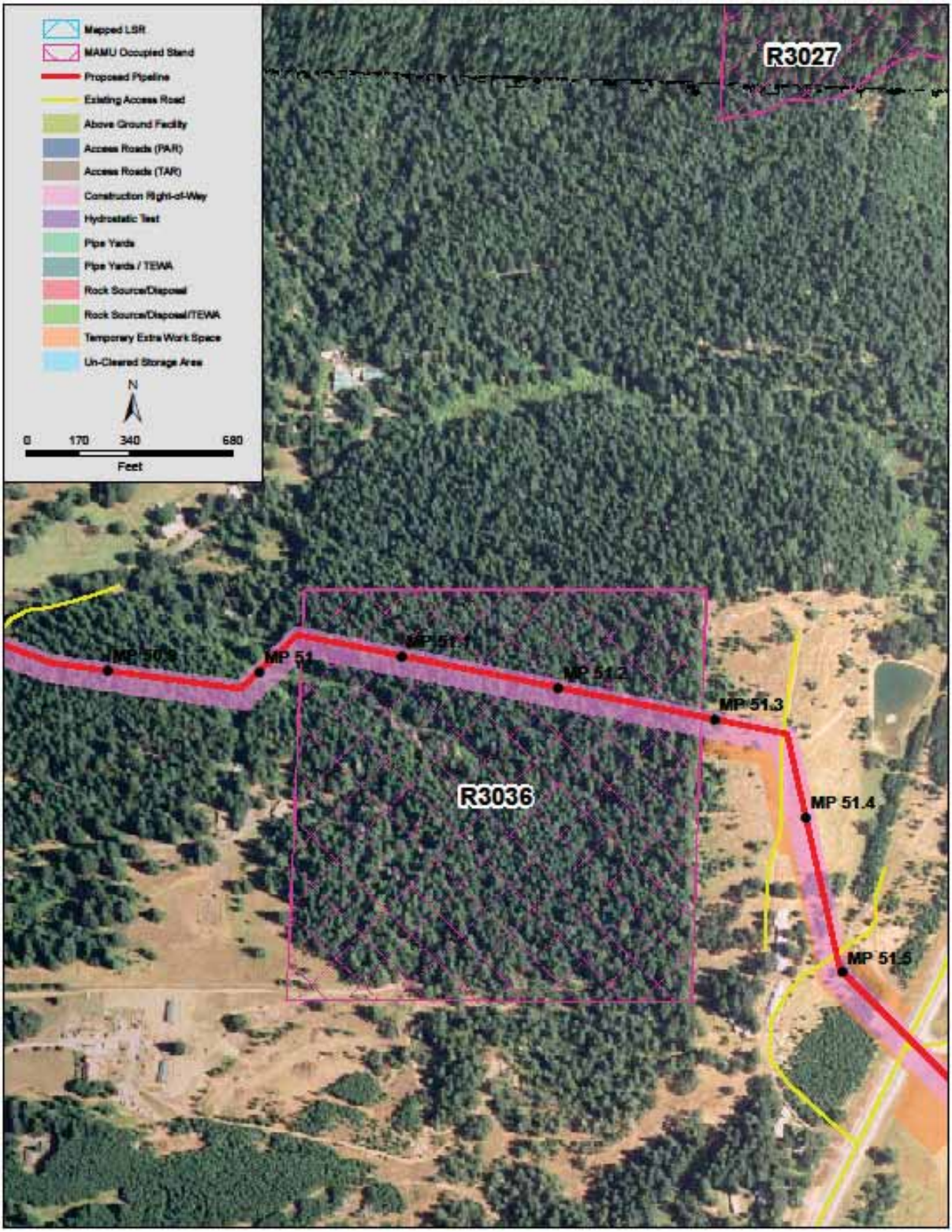


Figure 2.2-25. Map of Occupied MAMU Stand R3036



2.2.2.4 Proposed RMP Amendments and Mitigation Actions Relevant to LSRs in the Roseburg District

There are two RMP amendments and two sets of mitigation actions proposed.

RMP Amendments

BLM proposes to amend the Roseburg District RMP as follows:

BLM-3, Reallocation of Matrix Lands to Late Successional Reserves

The Roseburg District RMP would be amended to change the designation of approximately 409 acres from the matrix land allocation to the LSR land allocation in Sections 32 and 34, of T. 29 1/2 S., R. 7 W., and section 1 T. 30 S. R. 7 W., W. M., Oregon.

This change in land allocation is proposed to partially mitigate for the potential adverse impact of the proposed PCGP project on LSRs in the Roseburg District. This amendment would change future management direction for the lands reallocated from matrix to LSR. A map of the proposed reallocation is displayed in figure 2.2-26.

BLM–1, Site-Specific Exemption for Requirement to Protect MAMU Habitat in the BLM Roseburg District

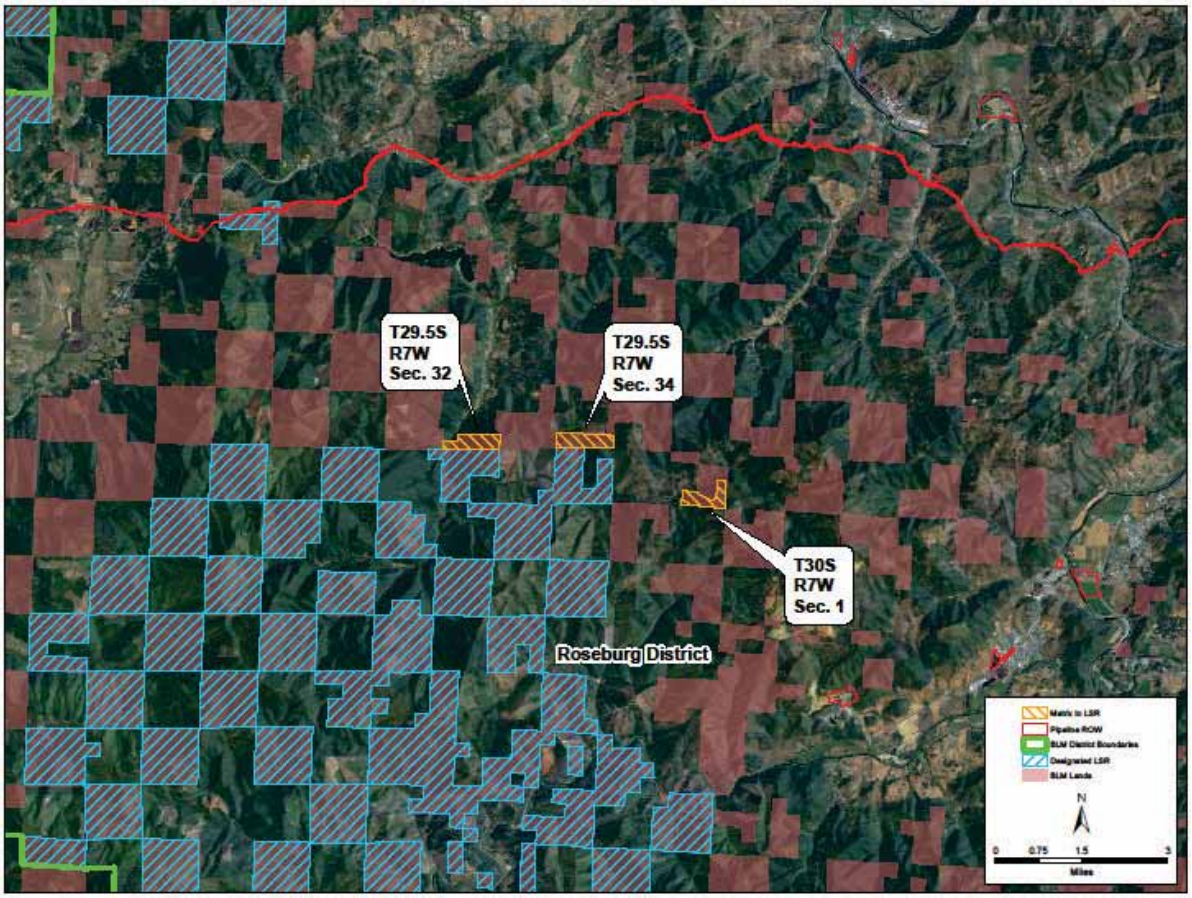
The Roseburg District RMP would be amended to waive the requirements to protect contiguous existing and recruitment habitat for MAMUs within the PCGP right-of-way that is within 0.5 mile of occupied MAMU sites, as mapped by the BLM. This is a site-specific amendment applicable only to the PCGP right-of-way and would not change future management direction at any other location.

The RMP for the Roseburg District requires protection of occupied MAMU sites whether they are inside or outside of a mapped LSR. The occupied sites in the Roseburg District that would be affected by the PCGP project are within mapped and unmapped LSR (see figures 2.2-24 and 2.2-25).

BLM-2, Site-Specific Exemption from Requirement to Retain Habitat in Known Owl Activity Centers in the BLM Roseburg District

The Roseburg District RMP would be amended to waive the requirements to retain habitat in KOACs at three locations (see figure 2.2-23). This is a site-specific amendment applicable only to the PCGP right-of-way and would not change future management direction at any other location. The RMP for the Roseburg District requires retaining habitat within KOACs. By definition, KOACs are within matrix lands and therefore will be addressed as unmapped LSRs.

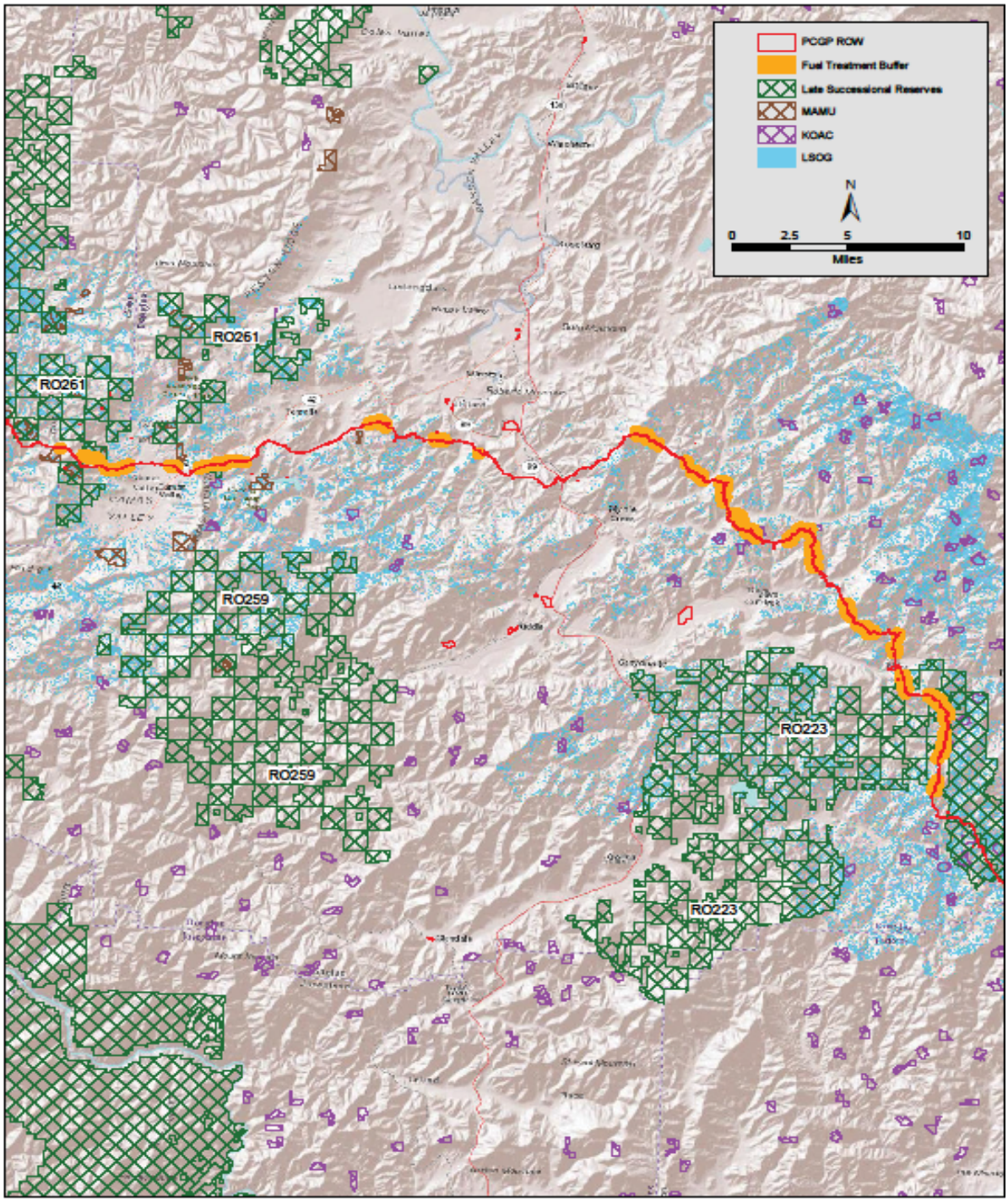
Figure 2.2-26. Map of Proposed Matrix to LSR Reallocation in the Roseburg District



Mitigation Actions

A Mitigation Plan was developed by the BLM and adopted by the PCGP project applicant to ensure that the objectives of the Roseburg District RMP related to LSRs would be achieved (see Figure 2.2-27). In addition to the reallocation of matrix lands to LSR, the mitigation actions include hazardous fuels reduction through creating a 1,000-acre fuel break adjacent to the proposed corridor in the South Umpqua River watershed and aiding fire suppression efforts through the creation of six dry hydrants in the South Umpqua River, Myrtle Creek, and Middle South Umpqua River watersheds. These off-site mitigation actions are designed to help protect LSOG forest habitat by reducing the risk of high-intensity fires.

Figure 2.2-27. Map of Proposed Off-site LSR Mitigation Actions in the Roseburg District



2.2.2.5 Impacts Related to Proposed Amendments and Mitigation Actions Relevant to LSRs in the Roseburg District

RMP Amendments

BLM-3, Reallocation of Matrix Lands to Late Successional Reserves

The primary management objective of the LSR land allocation is to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth related species. Currently, based on the latest BLM GIS data there are approximately 31,793 acres of LSOG forest habitat in LSR 261. If constructed, the portion of the PCGP project in the Roseburg District would remove approximately 11.1 acres of forest vegetation in LSR 261. This includes the removal of forest from both the pipeline corridor and the TEWAs. Approximately 1.2 of these acres are LSOG forest habitat (see figures 2.2-28 and 29). The area proposed to be reallocated to LSR is approximately 409 acres of matrix lands, of which approximately 286 acres are LSOG forest. The proposed reallocation is shown in figure 2.2-30 and displayed in table 2.2.2.5-1 and figure 2.2-31.

The acres that would be reallocated would become part of mapped LSR 259. This LSR is adjacent to LSR 261 and is also near the area of the proposed PCGP project (see figure 2.2-30). LSR 259 is also included in the South Coast-North Klamath LSRA and has the same priorities and recommendations as LSR 261 see section 2.2.1.1. Of the LSRs in the LSRA, 261, 263, and 259 have the highest priority for management actions because they are large and are key links in the LSR network. One of the key objectives for these LSRs is to increase the stand sizes of contiguous LSOG habitat. In addition, most of the acres of young, intensively cultured forest plantations that could benefit the most from treatments occur in the three LSRs. A key recommendation for these LSRs is risk management activities to reduce the probability that a major stand-replacing event or events that degrade habitat quality would occur. The primary purpose of risk reduction activities in these LSRs is to reduce the probability of large-scale loss of late-successional habitat. Another purpose of risk reduction activities is to reduce the probability of late-successional habitat loss in stands with important features such as nest stands for NSOs, stands containing other key species, or stands containing larger blocks of interior habitat or providing meaningful localized connectivity.

Also, the area around LSR 259 provides a better opportunity to consolidate LSOG habitat as evidenced by the high percentage of LSOG forest in the acres proposed for reallocation. The reallocation would increase the quantity of LSOG habitat in LSR 259 by 286 acres. It would also improve the quality of LSOG habitat due to the larger LSOG patch size and the consolidation of habitat in this area. Reallocation in this area would also improve the distribution of LSOG habitat between LSR 259 and LSR 261, which is important in this area due to the highly fragmented land ownership patterns (see figures 2.2-26 and 2.2-30). For these reasons, reallocating acres to LSR 259 is being considered for mitigation to the impacts in LSR 261.

Figure 2.2-28. Map of LSR 261 Crossed by PCGP Project (east portion)

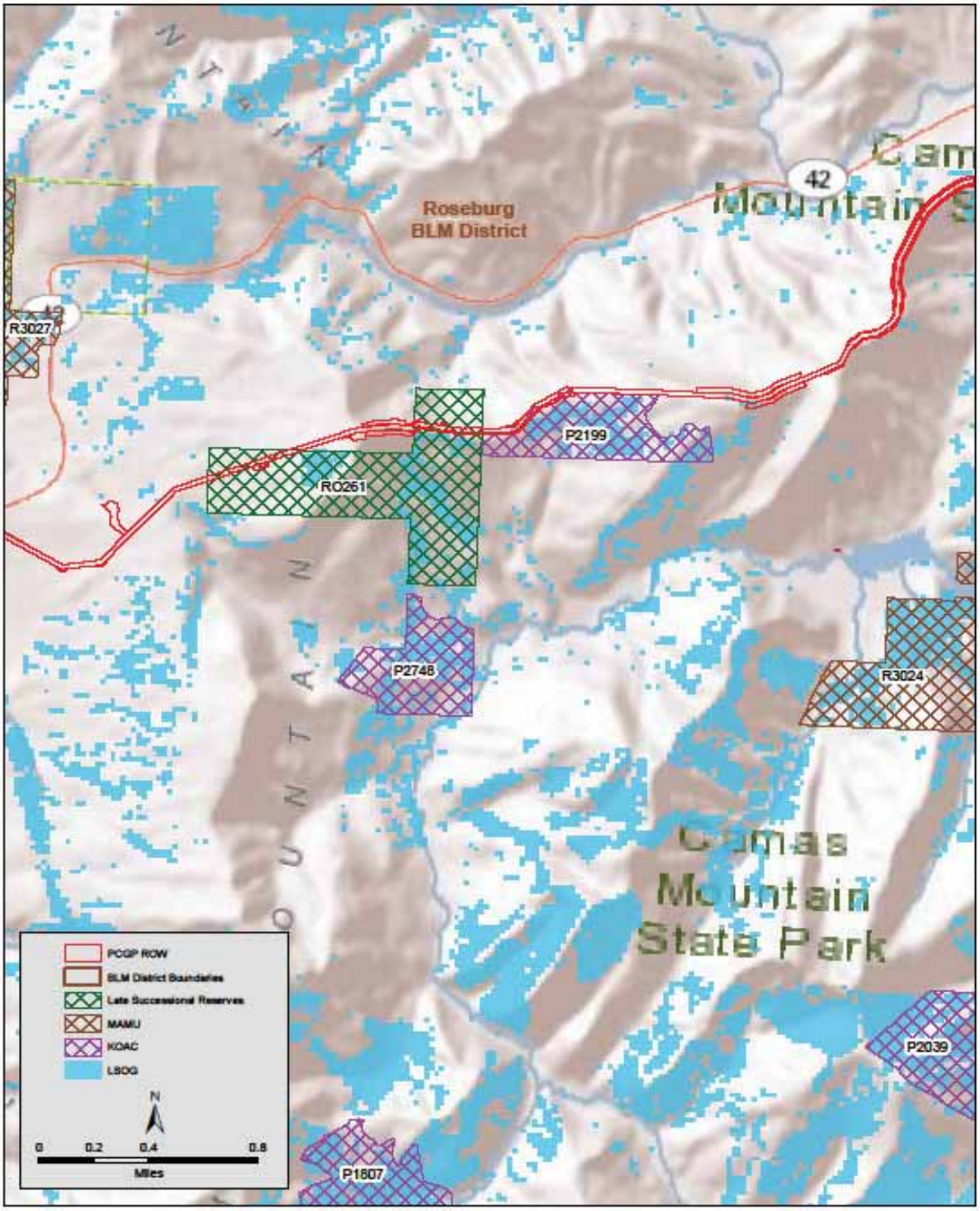


Figure 2.2-29. Map of LSR 261 Crossed by PCGP Project (west portion)

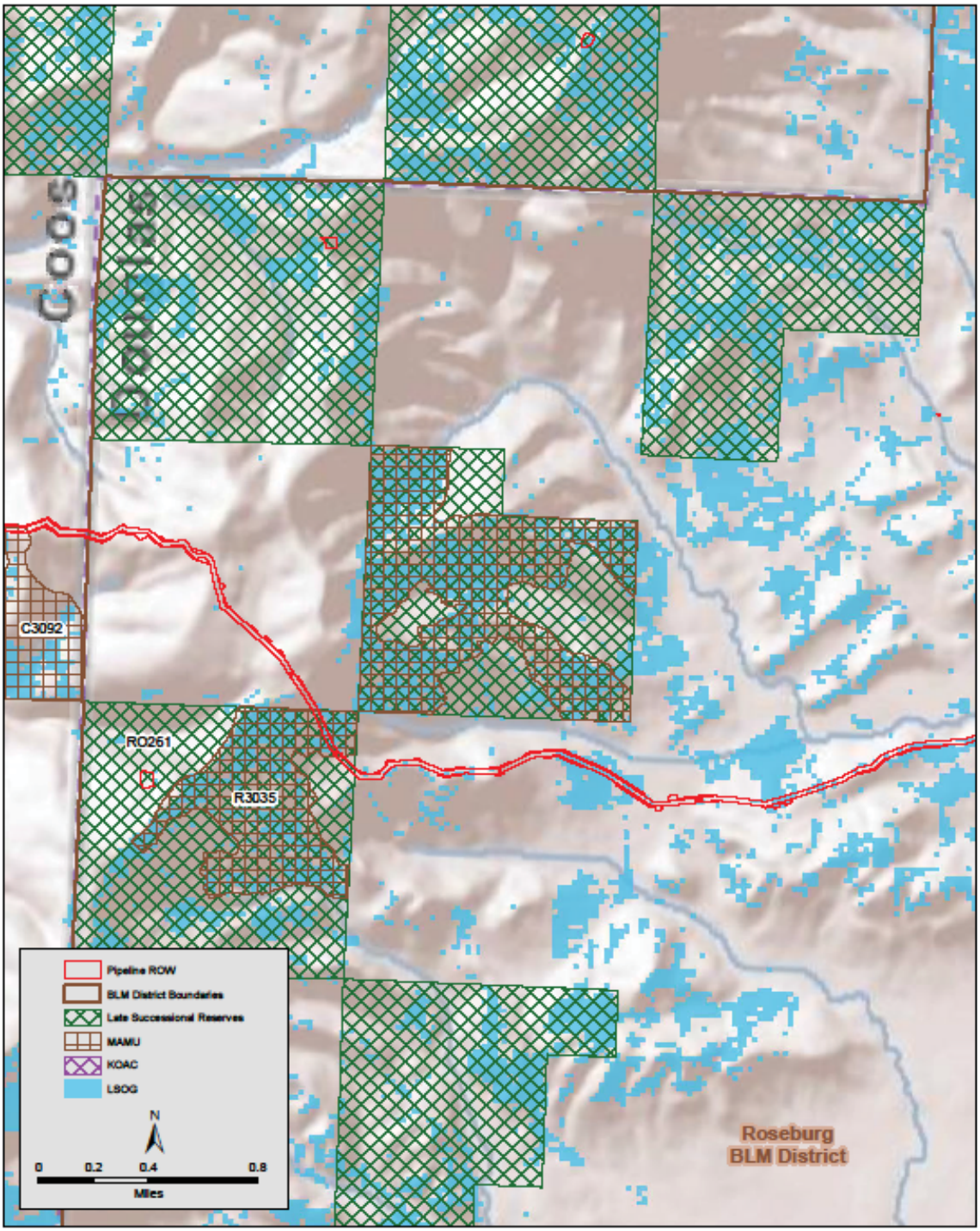


Figure 2.2-30. Map of Proposed Matrix to LSR Reallocation and LSOG Habitat in the Roseburg District

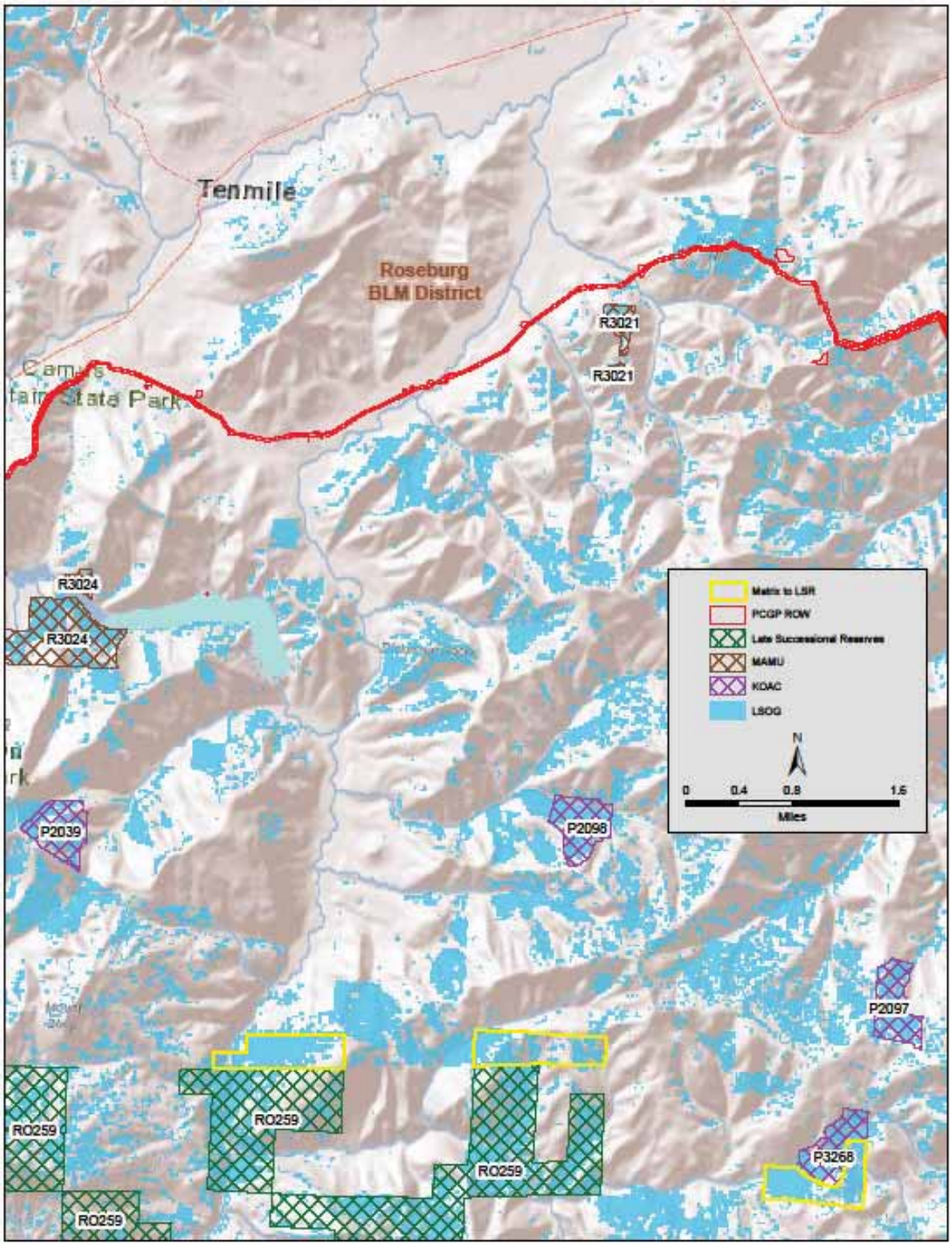


TABLE 2.2.2.5-1

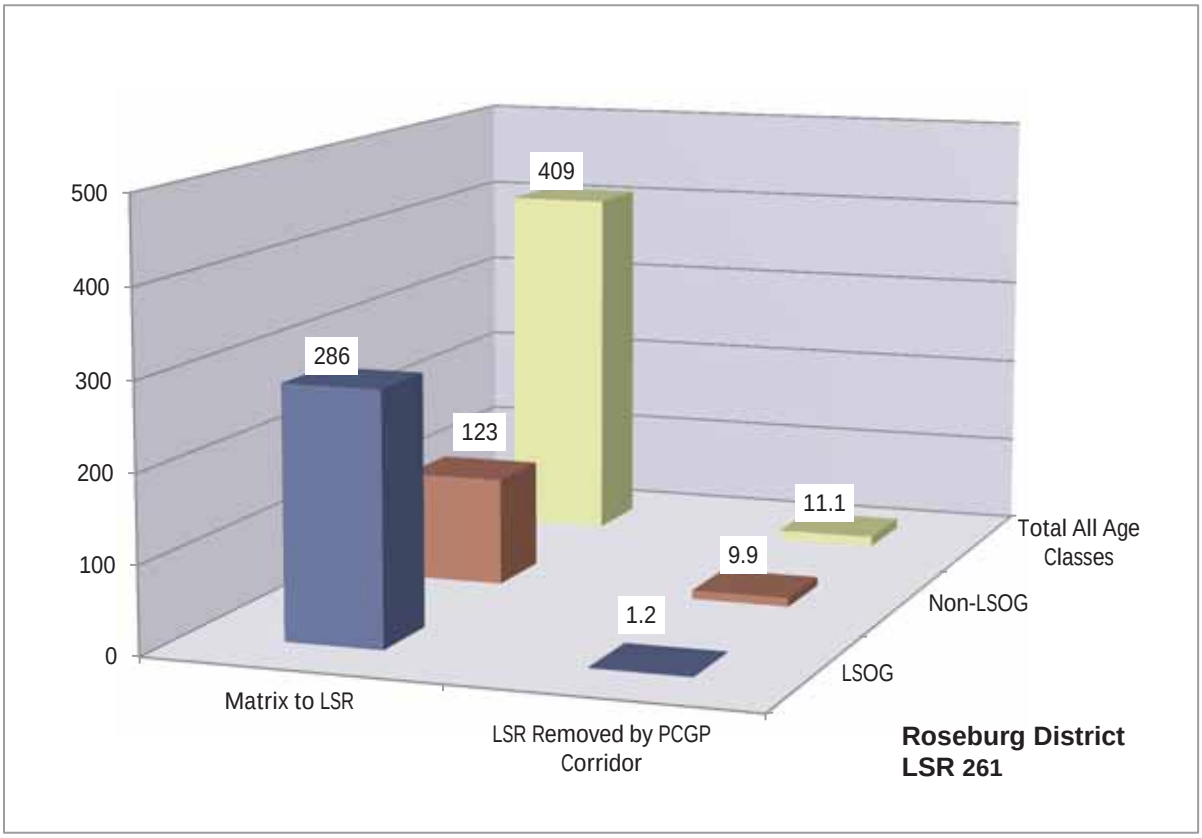
Comparison of LSR Acres Cleared a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Roseburg District LSR 261	LSOG	Non-LSOG	Non-forest	Total All Age Classes
Matrix to LSR	286	123	0	**409**
LSR cleared by PCGP Corridor	1.2	9.9	0	**11.1**

a/ Acres cleared includes the PCGP Corridor and TEWAs

Data source: USFS, BLM GIS Layers

Figure 2.2-31. Comparison of LSR Acres Cleared by the PCGP Project and the Acres of Matrix to LSR Reallocation



In addition to the impacts from the removal of forest vegetation in LSR 261, there would be additional impacts from the acres modified by UCSAs and the acres indirectly affected through the creation of new edges and fragmentation of older forest. A comparison of the total acres affected in LSR 261 and the acres of reallocation are displayed in table 2.2.2.5-2 and figure 2.2-32 below.

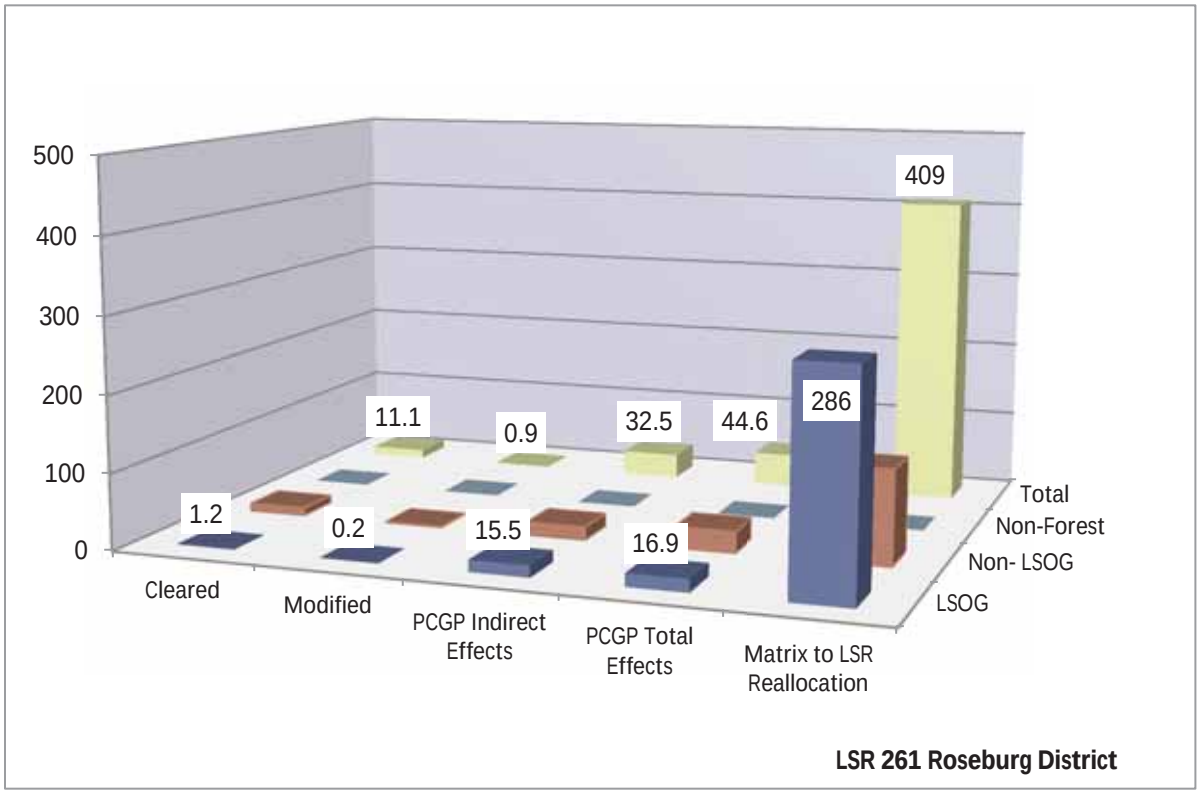
TABLE 2.2.2.5-2

Comparison of the Total LSR Acres Affected a/ by the PCGP Project and Matrix Reallocated to LSR

Roseburg Dist. LSR 261	Cleared	Modified	PCGP Indirect Effects	PCGP Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	1.2	0.2	15.5	16.9	286
Non- LSOG	9.9	0.7	17.0	27.7	123
Non-Forest	0.0	0.0	0.0	0.0	0
Total	**11.1**	**0.9**	**32.5**	**44.6**	**409**

a/ PCGP total impacts include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in Non-LSOG)
Data source: BLM, USFS GIS Data Layers

Figure 2.2-32. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



Impact on the Functionality of LSR 261 on the Roseburg District

The functionality of LSR 261 relates directly to the goals and objectives for LSRs (see section 1.2.2) and can be measured by the quantity, quality and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat in LSRs on the Roseburg District would increase slightly with the construction of the PCGP project and RMP amendment. The

PCGP project would remove approximately 1.2 acres of LSOG habitat, but would reallocate approximately 286 acres of LSOG habitat with the RMP amendment. This would represent a net increase of approximately 285 acres of LSOG habitat within LSR on the Roseburg District[5].

- Quality: The area of LSR 261 that would be affected by the PCGP project is highly fragmented due to both the land ownership pattern and past management activities. The area contains a high degree of edge with little or no interior forest habitat (see figures 2.2-28 and 2.2-29 above). In routing the pipeline, existing developments such as roads were used where feasible and impacts to LSOG habitat was avoided or minimized. The area proposed for reallocation contains some large blocks of LSOG habitat as well as an adjacent KOAC (see figure 2.2-30). This reallocation would consolidate habitat in an area that is highly fragmented. LSRs on BLM land are comprised of checkerboard sections or even smaller parcels of land. The intent of the reallocations is to better connect these pieces by decreasing distances between individual LSR parcels and reduce the amount of 'edge' adjacent to existing occupied murrelet stands. Consolidating habitat is one of the main objectives in the LSRA for this area. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat the quality of the LSR habitat would be slightly improved.

- Distribution: The distribution of LSOG habitat within LSR 261 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR RMP amendment. To the extent there are minor changes they would be beneficial due to the location of the proposed reallocation. The reallocation would occur between the southern edge of LSR 261 and the northern edge of LSR 259 and would provide some additional connectivity within LSR in this area.

- The off-site mitigation action would provide added protection to the quantity, quality and distribution of LSOG habitat by improving the potential to decrease initial fire suppression response times and thereby increase the potential to control fires before they become high-intensity fires that threaten LSOG forests. Protecting LSOG forest from loss due to high-intensity fire is also one of the objectives in the LSRA for this area.

The RMP amendments and off-site mitigation actions for LSR 261 in the Roseburg District have been designed with the goal that the overall impact would be either neutral or beneficial to the creation and maintenance of late-successional habitat.

BLM-1, Site-Specific Exemption from Requirement to Protect MAMU Habitat in the BLM Roseburg District

Amount and Quality of MAMU Habitat Affected by the Construction and Operation of the PCGP Project

The occupied MAMU stands that would be affected by the proposed PCGP project in the Roseburg District lie within mapped and unmapped LSR (see figure 2.2-24 and 2.2-25). The

[5] The acres would be reallocated to LSR 259 which is next to LSR 261, see discussion in section 2.2.2.5 BLM-3, Reallocation of Matrix Lands to Late Successional Reserves above for the reasons reallocation in LSR 259 is being considered as mitigation for LSR 261.

amount of MAMU habitat that would be affected both directly and indirectly is displayed in table 2.2.2.5-3 and figure 2.2-33

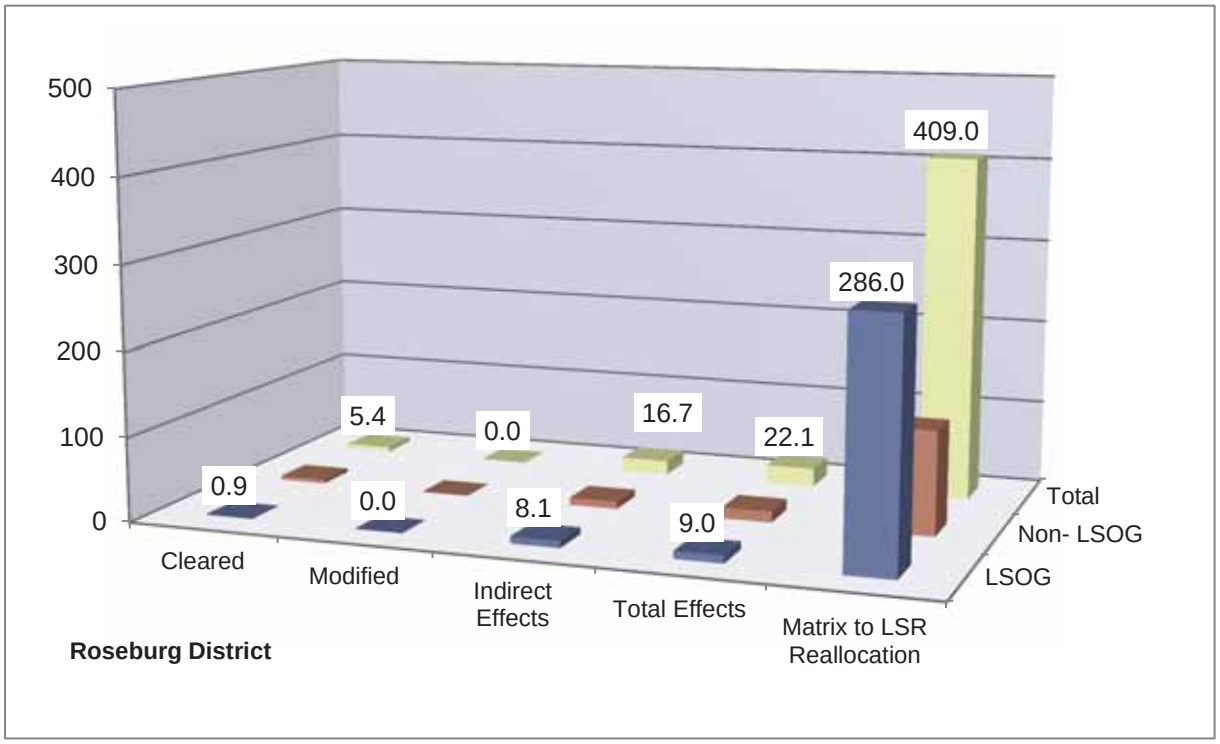
TABLE 2.2.2.5-3

Comparison of Total Acres of Occupied Marbled Stands Impacted[a] by the PCGP Project and acres of Matrix to LSR Reallocation

Roseburg District	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	0.9	0.0	8.1	9.0	286.0
Non- LSOG	4.5	0.0	8.6	13.1	123.0
Non-Forest	0.0	0.0	0.0	0.0	0.0
Total	**5.4**	**0.0**	**16.7**	**22.1**	**409.0**

a/ PCGP project total impacts include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in Non-LSOG).
Data Source: BLM, USFS GIS Data Layers

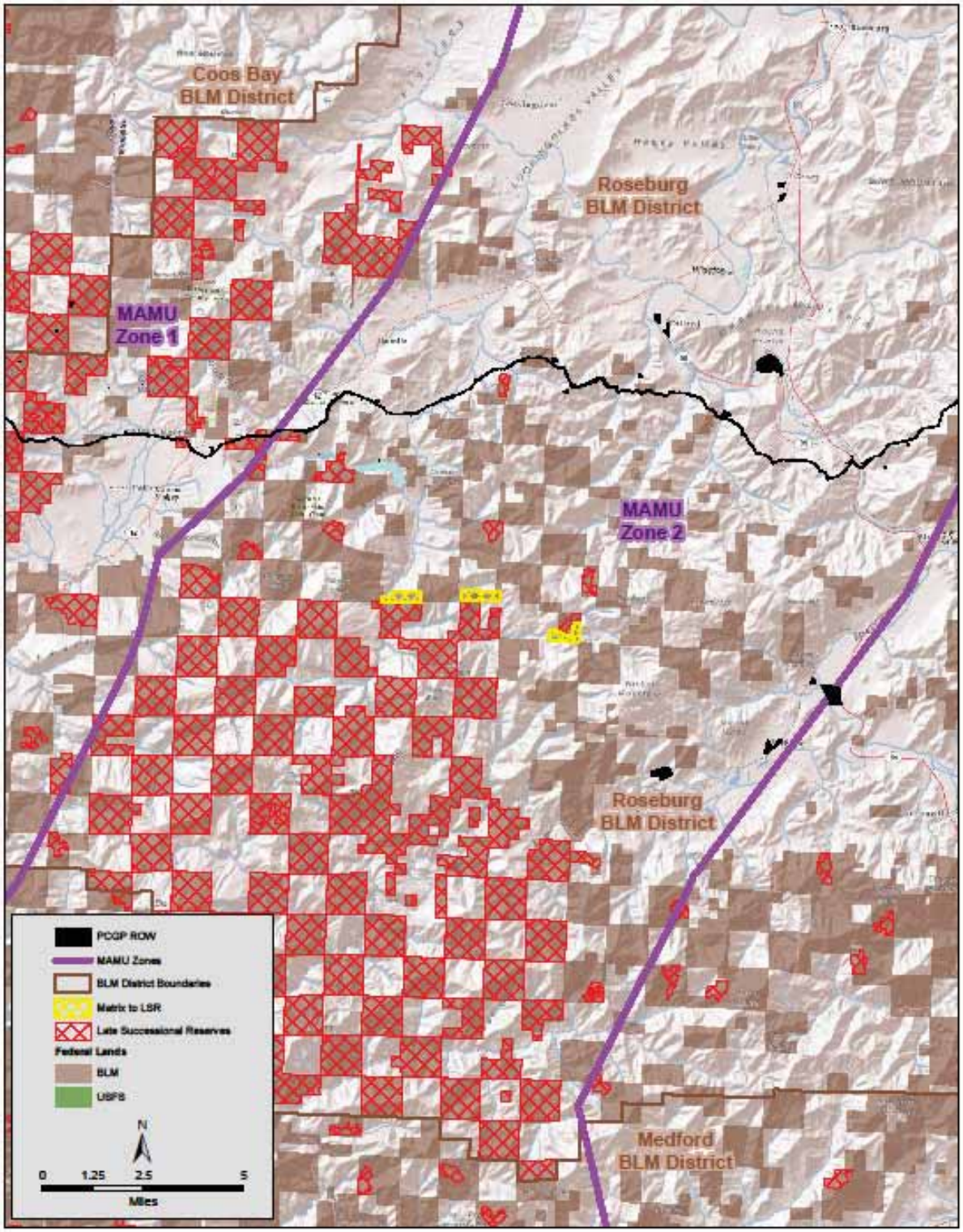
Figure 2.2-33. Total Acres of Occupied MAMU Stands Affected by PCGP Project on the Roseburg District



The proposed PCGP project would remove approximately 5.4 acres within occupied MAMU stands. The proposed matrix to LSR reallocation for LSRs in the Roseburg District is outside of MAMU Zone 1 but is within MAMU Zone 2 and contains suitable habitat for MAMUs (see figure 2.2-34). The affected MAMU stands on the Roseburg District are adjacent to the MAMU occupied stands affected by the project in the Coos Bay District. The proposed matrix to LSR reallocation in the Coos Bay District also contains MAMU nesting habitat and would

compensate for habitat loss in LSR, see section 2.4.4 for further discussion of the total impacts to MAMU stands on the Coos Bay and Roseburg Districts.

Figure 2.2-34. MAMU Zone Map



BLM 2, Site-Specific Exemption from Requirement to Retain Habitat in Known Owl Activity Centers in the BLM Roseburg District

Amount and Quality of KOACs Affected by the Construction and Operation of the PCGP Project

Minimization Efforts: The following measures were taken in routing the proposed PCGP project to minimize adverse effects to habitat within each of the identified KOACs. A map of each of the KOACs that would be affected by the proposed PCGP project is shown in figures 2.2-35 and 36.

- P2199. The right-of-way would generally be within an existing road (BLM 28-8-2.2) along the edge of the KOAC. TEWAs would be placed in existing clear-cut and regenerating coniferous forest stands. Recent activity of the spotted owl pair (MSNO 2199B) is more than 1.25 miles southeast of this site, near KOAC R3024 (see figure 2.2-35).

- P0361. The alignment of the pipeline would follow a narrow ridgeline along an existing road (BLM 29-4-35; Wood Creek Road) that forms the western boundary of this KOAC. The alignment along the ridgeline ensures the safety and integrity of the pipeline and would minimize disturbance by reducing grading requirements. An effort was made to place a required TEWA for a PI in early seral habitat. Recent activity of this spotted owl pair (MSNO 0361A) is more than 0.75 mile northwest of this KOAC (see figure 2.2-36).

- P2294. The pipeline alignment along the ridgeline would ensure pipeline safety and integrity and minimize disturbance by reducing grading requirements. Only a small lobe on the southern edge and on the upper ridgeline of the KOAC would be crossed by the alignment. The KOAC is located within the Klamath demographic study area and has been monitored for more than 20 years. The most recent activity at this site was last documented in 1994 (see figure 2.2-36).

Currently, based on the latest BLM GIS data layers there are approximately 197 acres of LSOG forest habitat within the three KOACs that would be impacted by the PCGP project on the Roseburg District. Even though measures were taken to minimize impacts, habitat would still be affected by the PCGP project. While removal of LSOG forest habitat would be kept to 2 acres, there would also be impacts from the UCSAs and the indirect effects of new edge and fragmentation of forest habitat. The total impacts from the proposed pipeline on KOACs are displayed below in table 2.2.2.5-4 and figure 2.2-37.

Figure 2.2-35. Map of KOAC P2199 and the PCGP Project

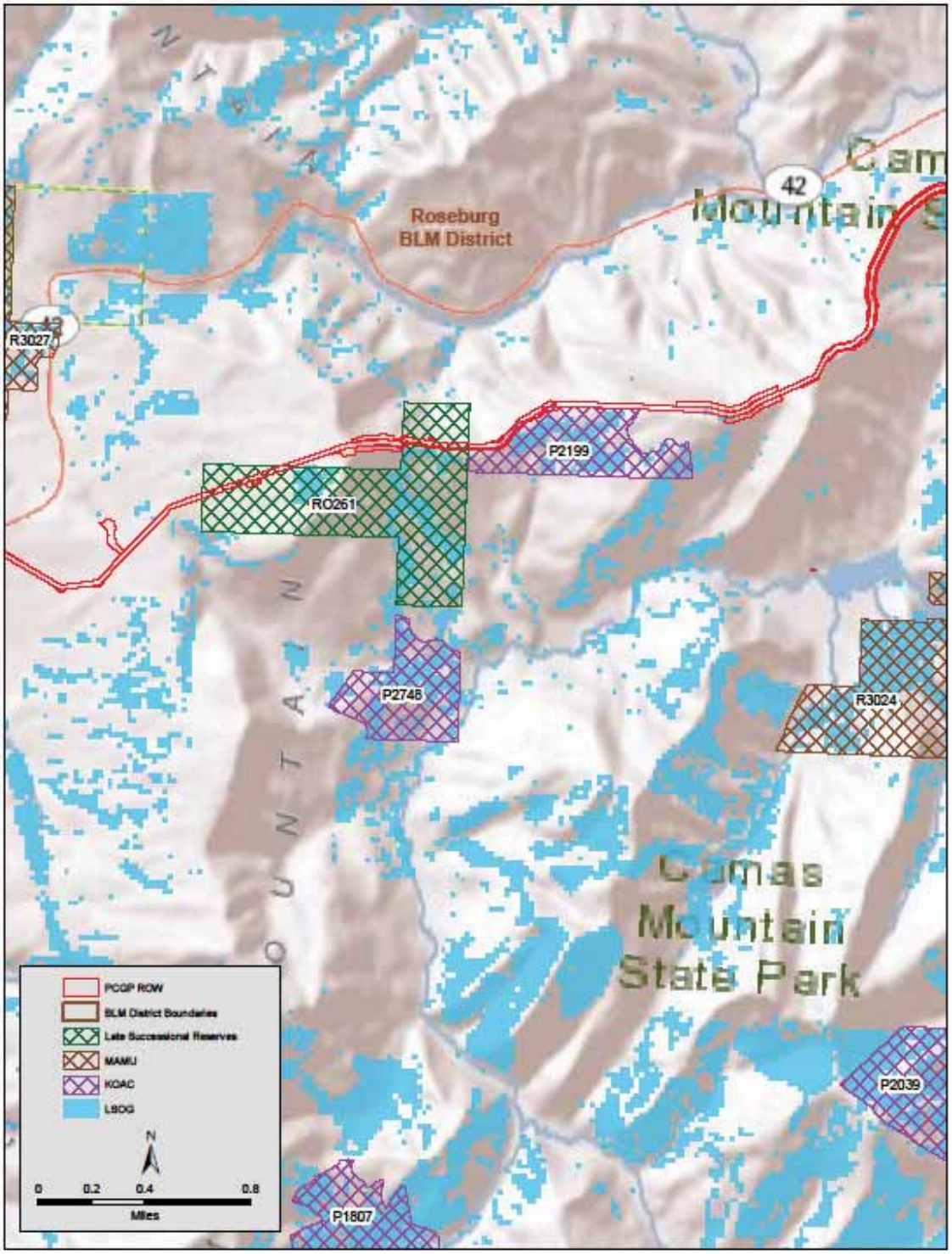


Figure 2.2-36. Map of KOAC P0361 and P2294 and the PCGP Project

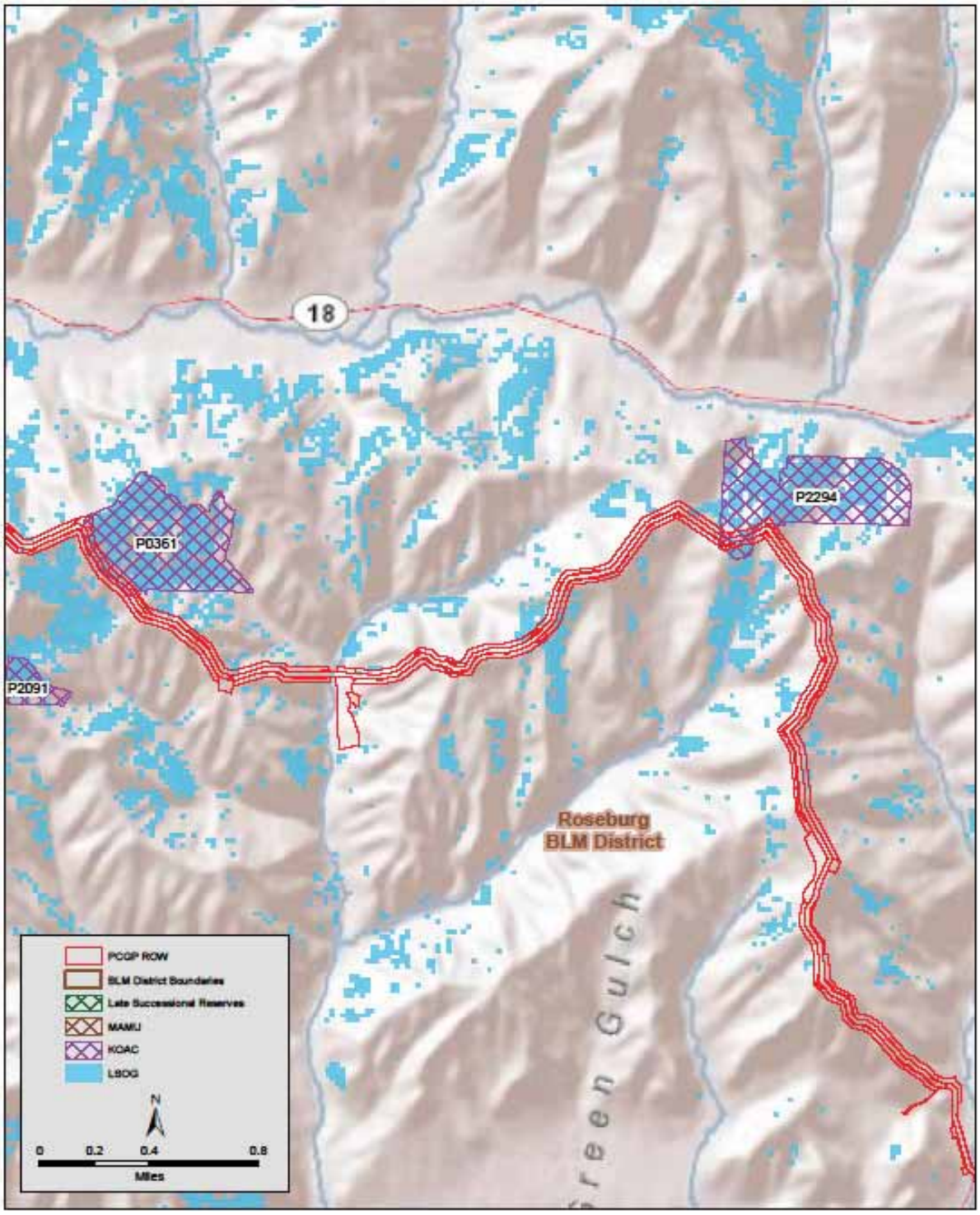


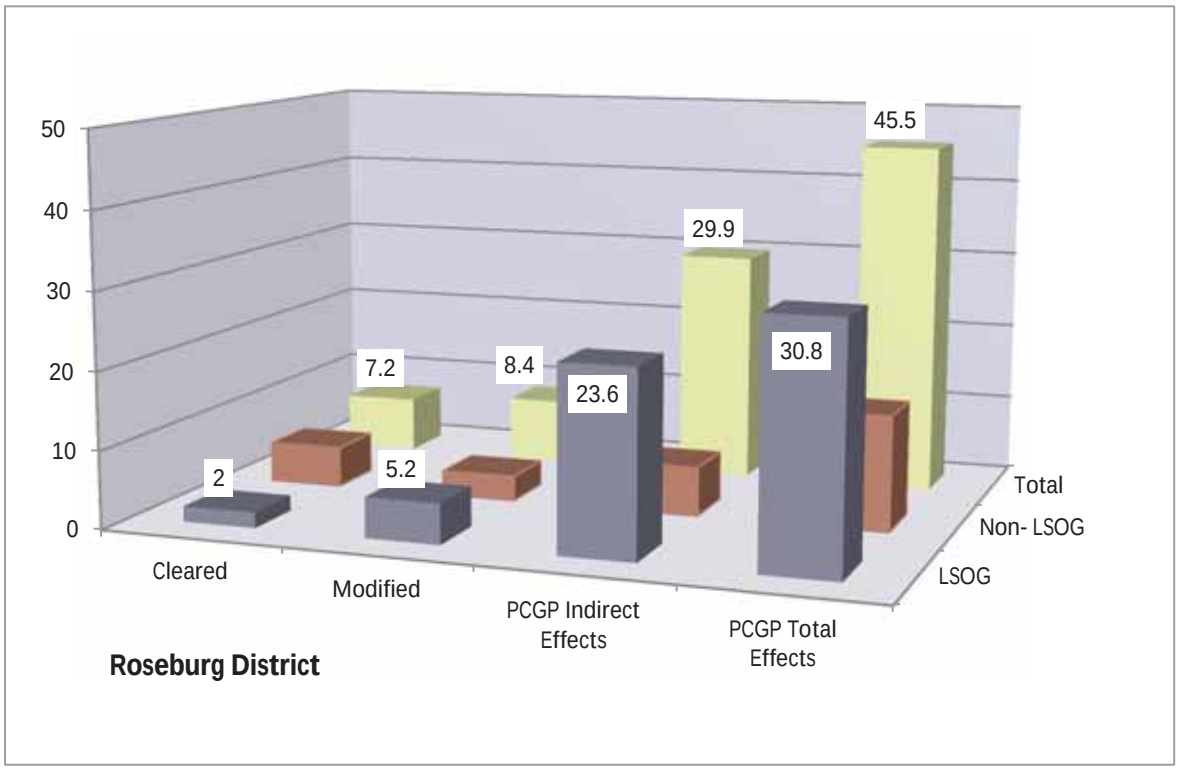
TABLE 2.2.2.5-4

Summary of Total KOAC Acres Affected a/ by PCGP Project in the Roseburg District

Roseburg Dist. KOACs	Cleared	Modified	PCGP Indirect Effects	PCGP Total Effects
	PCGP Direct Effects			
LSOG	2.0	5.2	23.6	30.8
Non- LSOG	5.2	3.2	6.3	14.7
Non-Forest	0	0	0	0
Total	**7.2**	**8.4**	**29.9**	**45.5**

a/ PCGP total impacts include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS Data Layers

Figure 2.2-37. Summary of Total KOAC Acres Affected by the PCGP Project in the Roseburg District



Aggregated Impact of the Proposed PCGP Project on Mapped and Unmapped LSRs in the Roseburg District

The construction of the PCGP project in the Roseburg District would also affect LSR 223 (see figure 2.2-38). Currently, based on the latest BLM and Forest Service GIS data there are approximately 20,557 acres of LSOG forest habitat which comprises approximately 31 percent of LSR 223. The proposed pipeline would remove approximately 43.7 acres of forest from LSR 223, of which approximately 12.4 acres would be LSOG forest. In addition to the acres cleared,

there would be effects from acres modified by UCSAs and indirect effects from the creation of new edge and the fragmentation of forest habitat. The total impacts to LSR 223 in the Roseburg District are displayed in table 2.2.2.5-5 and figure 2.2-39 below.

Figure 2.2-38. Map of LSR 223 Crossed by the PCGP Project in the Roseburg District

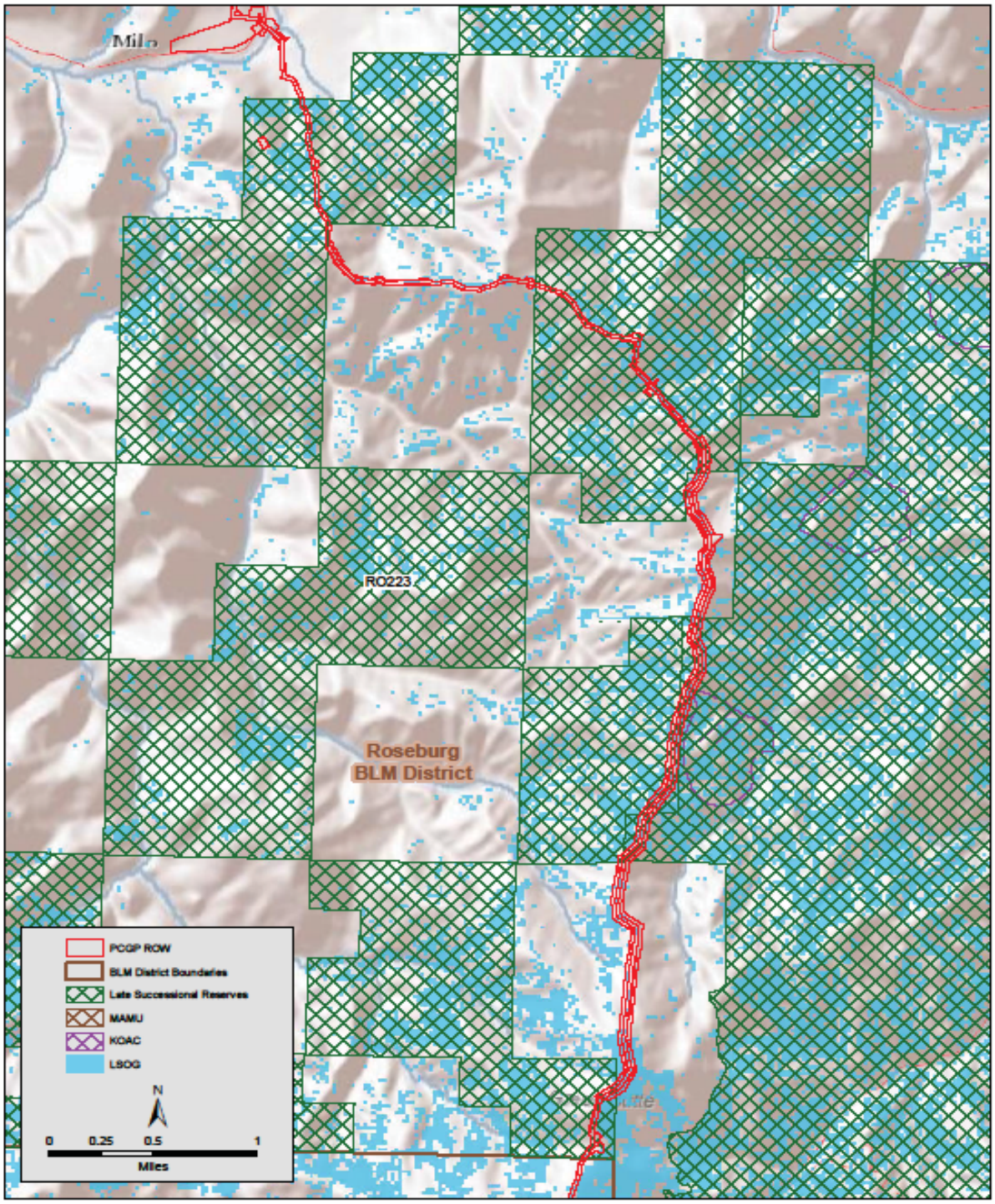


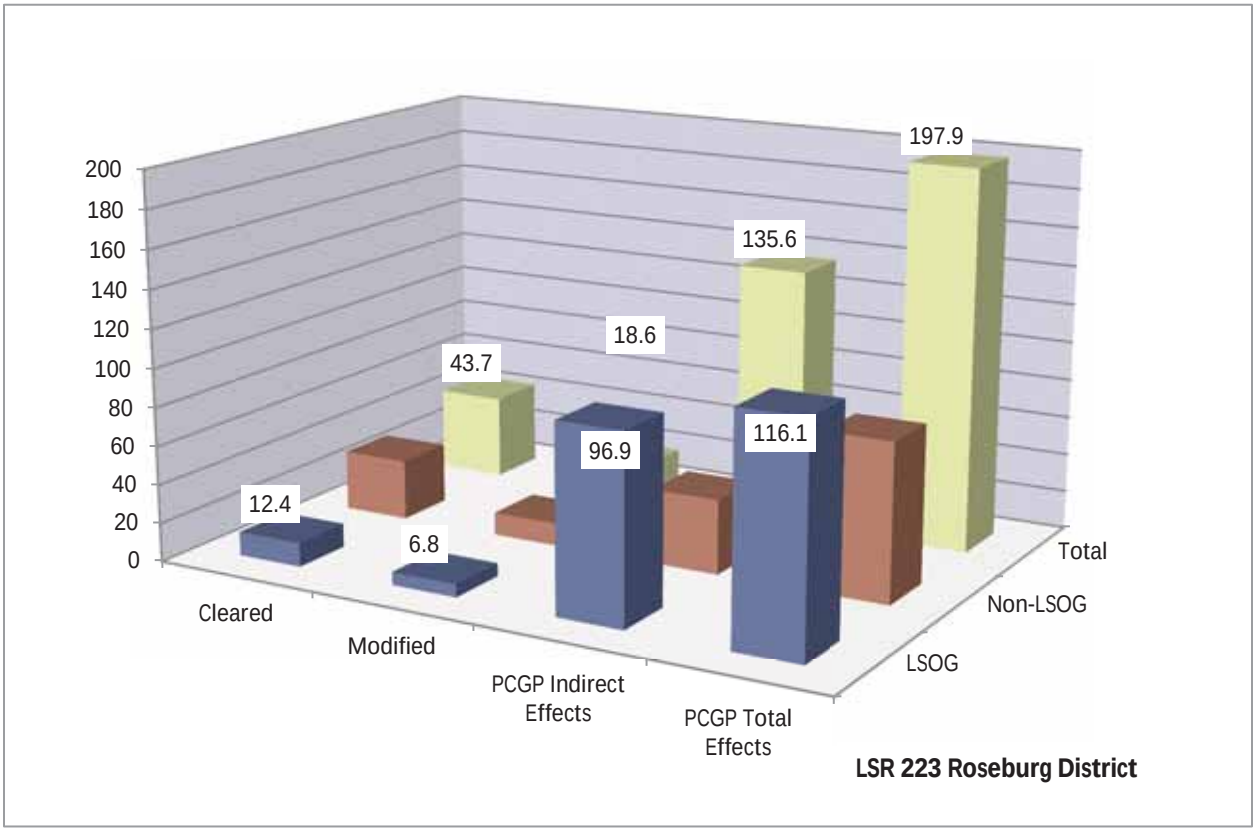
TABLE 2.2.2.5-5

Summary of Total LSR 223 Acres Affected a/ by the PCGP Project in the Roseburg District and Acres of Matrix Reallocated to LSR

Roseburg Dist. LSR 223	Cleared	Modified	PCGP Indirect Effects	PCGP Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	12.4	6.8	96.9	116.1	0.0
Non-LSOG	31.3	11.8	38.7	81.8	0.0
Non-Forest	0.0	0.0	0.0	0.0	0.0
Total	**43.7**	**18.6**	**135.6**	**197.9**	**0.0**

a/PCGP total impacts include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS Data Layers

Figure 2.2-39. Summary of Total LSR 223 Acres Affected by the PCGP Project on the Roseburg District



In addition to the impacts of the PCGP corridor on LSR 223 in the Roseburg District there are also potential off-site impacts to LSR 223 from road reconstruction that would be necessary to accommodate the trucks that would be hauling the sections of pipe. These trucks are longer than typical trucks that use forest roads and some road widening and curve realignment may be necessary to safely allow for this truck traffic. In LSR 223 on the Roseburg District it is estimated that approximately two acres of road widening would occur within LSR. Although

this road widening would occur to the extent possible within the existing clearing limits it is probable that some additional clearing of forest vegetation would be necessary to accommodate the road reconstruction. It is estimated that this would be a maximum of two acres and would occur along an existing road opening.

There are no proposed amendments to reallocate matrix lands to LSR 223 in the Roseburg District. This is due primarily to the lack of suitable LSOG forest habitat in the matrix near the LSR and the proposed pipeline. There is, however, a proposed amendment to reallocate matrix lands to LSR 223 in the Umpqua National Forest, which borders the east side of the Roseburg District. The proposed PCGP project would also affect LSR 223 in the Umpqua National Forest. The combined impacts of the project on LSR 223 in the Roseburg District and Umpqua National Forest, the matrix to LSR reallocation, and the proposed mitigation actions are evaluated in section 2.3.1.3.

Approximately 286 acres of the 409 acres of matrix lands that would be reallocated in the Roseburg District contain LSOG forest habitat. A comparison of the total LSR acres that would be affected by the proposed PCGP project in the Roseburg District in both mapped LSRs (261 and 223) and unmapped LSRs (KOACs and MAMU), with the matrix acres reallocated to LSR, is in table 2.2.2.5-6 and figure 2.2-40. A total of approximately 65 acres of LSR lands would be cleared by the construction of the PCGP project in the Roseburg District. Approximately 16 of these acres would be LSOG forest habitat. The proposed amendment would reallocate approximately 18 times the amount of LSOG forest that would be cleared with the construction of the PCGP project.

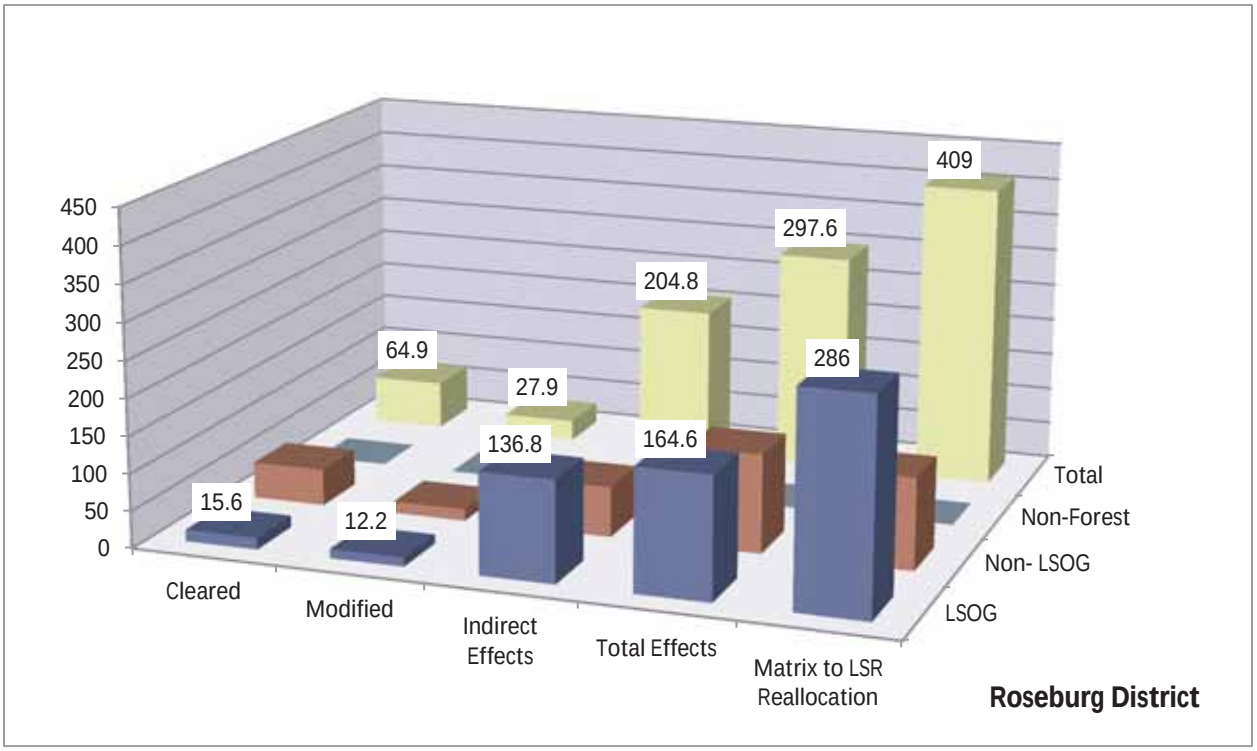
TABLE 2.2.2.5-6

Comparison of Total LSR Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Roseburg District	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	15.6	12.2	136.8	164.6	286
Non- LSOG	49.3	15.7	68.0	133.0	123
Non-Forest	0.0	0.0	0.0	0.0	0
Total	**64.9**	**27.9**	**204.8**	**297.6**	**409**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG) in both mapped and unmapped LSR Data source: BLM, USFS GIS data layers

Figure 2.2-40. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



Mitigation Actions

In addition to the reallocation of matrix lands to LSR, the off-site mitigation actions include hazardous fuels reduction through creating a 1,000-acre fuel break adjacent to the PCGP project corridor in the South Umpqua River watershed and aiding fire suppression efforts through the creation of six dry hydrants in the South Umpqua River, Myrtle Creek, and Middle South Umpqua River watersheds (see figure 2.2-27). These mitigation actions have been designed to complement the mitigation actions being considered in the Umpqua National Forest to benefit LSR 223 (see section 2.3.1.4).

<u>1,000-Acre Fuel Break</u>

High-intensity fire has been identified as the single factor most affecting late successional and old growth forest habitats on federal lands in the area of the NWFP (Mouer et al. 2011). Construction of the pipeline and associated activities would remove both mature and developing stands and increase fire suppression complexity. However the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Days Creek to Shady Cove fuel break and ties in with similar projects in the Umpqua National Forest.

Six Dry Hydrants

By installing dry hydrants, the water source is disturbed only once, and there are several other advantages. Fire vehicles will not need to be really close to the water to fill up, decreasing the risk of contamination, and they can fill from some water sources that would otherwise need to be modified for use. Areas that have had restoration work for fish populations could still be safely accessed for fire suppression. Over all, better water sources would improve suppression success and therefore help protect natural resources.

Aggregated Amendments to LSR 261

There are no other proposed amendments related to LSR 261 in the Roseburg District. There is, however, another amendment being proposed for LSR 261 in the Coos Bay District of the BLM. The amendment to LSR 261 in the Coos Bay District is discussed in section 2.2.1 above. The following discussion relates to the overall impacts of the PCGP project on LSR 261 and the overall acres being reallocated to LSR in the vicinity of LSR 261.

The total impacts to LSR 261 from the proposed PCGP project on both the Coos Bay and Roseburg Districts are displayed in table 2.2.2.5-7 and figure 2.2-41 below. The impacts include the direct impacts that would occur from construction (the acres cleared plus the acres modified by UCSAs) as well as the indirect impacts that would occur from the creation of new edge and the fragmentation of existing LSOG forest habitat. The indirect effects are measured as extending for 100 meters from the cleared edge on each side of the corridor in LSOG forest and 30 meters on each side of non-LSOG forest.

In considering the total impacts to LSOG forest habitat in LSR 261, there would be approximately 33 acres affected (including both direct and indirect impacts) compared to the approximately 387 acres of LSOG forest habitat being reallocated. The amendments would reallocate slightly more than 13 times the amount of LSOG forest habitat than would be affected. In considering the total impacts to forest habitat in LSR 261, there would be approximately 135 acres affected (including both direct and indirect impacts) compared to the 796 acres of matrix lands being reallocated. The amendments would reallocate almost 6 times more forest habitat than would be affected.

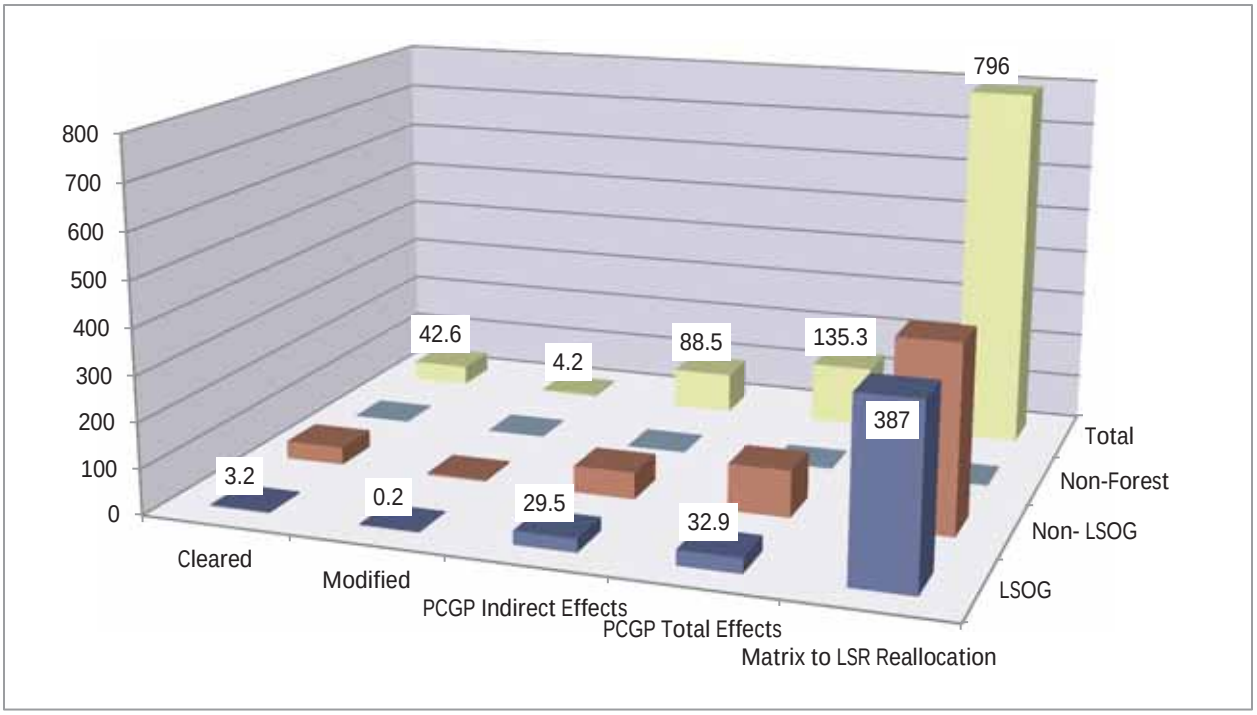
TABLE 2.2.2.5-7

Comparison of Total LSR 261 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

LSR 261	Cleared	Modified	PCGP Indirect Effects	PCGP Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	3.2	0.2	29.5	32.9	387
Non- LSOG	39.4	4.0	59.0	102.4	407
Non-Forest	0.0	0.0	0.0	0.0	2
Total	**42.6**	**4.2**	**88.5**	**135.3**	**796**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG) on Coos Bay and Roseburg Districts.
Data source: BLM, USFS GIS Data Layers

Figure 2.2-41. Comparison of Total LSR 261 Acres Impacted by the PCGP Project and Acres of Matrix to LSR Reallocation



Impact on the Functionality of LSR 261 on the Roseburg and Coos Bay Districts

The functionality of LSR 261 relates directly to the goals and objectives for LSRs (see section 1.2.2) and can be measured by the quantity, quality and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 261 on the Roseburg and Coos Bay Districts would increase with the proposed RMP amendments. The PCGP project would remove approximately 3.2 acres of LSOG habitat in LSR 261 but the reallocation would add 387 acres of LSOG habitat for a net increase of 385 acres[6]. This would increase the current level of LSOG habitat in LSR 261 from 31,793 acres to 32,178 acres or by approximately 1.2 percent.

- Quality: The area of LSR 261 that would be affected by the PCGP project on both the Roseburg and Coos Bay Districts is highly fragmented due to both the land ownership pattern and past management activities. In routing the pipeline, existing developments such as roads were used where feasible and impacts to LSOG habitat was avoided or minimized. The area proposed for reallocation to LSR 261 contains some large blocks of LSOG habitat as well as occupied MAMU stands and an adjacent KOAC (see figures

[6] 286 of these acres would be reallocated to LSR 259 which is next to LSR 261, see discussion in section 2.2.2.5 BLM-3, Reallocation of Matrix Lands to Late Successional Reserves above for the reasons reallocation in LSR 259 is being considered as mitigation for LSR 261.

2.2-6 and 2.2-30). This reallocation would consolidate habitat in an area that is highly fragmented. LSR 261, like most LSRs on BLM land, is comprised of checkerboard sections or even smaller parcels of land. The intent of the reallocations is to better connect these pieces by decreasing distances between individual LSR parcels and reduce the amount of 'edge' adjacent to existing occupied murrelet stands and KOACs. Consolidating habitat is one of the main objectives in the LSRA. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat the quality of the LSOG habitat within LSR 261 would be slightly improved.

- Distribution: The distribution of LSOG habitat within LSR 261 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR RMP amendments. To the extent there are minor changes they would be beneficial due to the location of the proposed reallocation. The reallocation would occur within a current gap between the northern and southeastern portions of LSR 261 and between LSR 261 and LSR 259 which would provide some additional connectivity within LSR in these areas.

- The off-site mitigation actions on the Roseburg and Coos Bay Districts would provide added protection to the quantity, quality and distribution of LSOG habitat by improving the potential to decrease initial fire suppression response times and thereby increase the potential to control fires before they become high-intensity fires that threaten LSOG forests. Protecting LSOG forest from loss due to high-intensity fire is also one of the objectives in the LSRA for this LSR.

The matrix to LSR reallocations and the off-site mitigation actions on both the Coos Bay and Roseburg Districts have been designed with the goal that, overall, the impact of the PCGP project on LSR 261 would be either neutral or beneficial to the creation and maintenance of late-successional habitat. With the increase in the acres of protected LSOG habitat and the formation of larger habitat blocks in areas where fragmentation was a major concern in the LSRA, the overall functionality of LSR 261 would be maintained or improved.

2.2.2.6 Evaluation of the Proposed Amendments and Mitigation Actions Relevant to the Roseburg District RMP Goals and Objectives

Three LRMP amendments and two off-site mitigation measures are associated with LSRs in the Roseburg District. The proposed amendment BLM-1 would waive the requirement to protect all MAMU habitat within occupied stands. Approximately 5.5 acres of occupied MAMU stands would be cleared within the Roseburg District. The proposed waiver is project-specific and would apply only to the PCGP project. Proposed amendment BLM-3 would reduce the matrix land allocation in the Roseburg District by 409 acres from 54,900 acres to 54,491 acres or by 0.74 percent. It would increase the total LSR land allocation in the Roseburg District by 409 acres from 186,423 acres to 186,832 acres, or by 0.33 percent. This proposed change would affect the 409 acres for the life of the current planning cycle (see figure 2.2-30). Proposed amendment BLM-2 would waive the requirement to retain KOAC habitat in the Roseburg District. A total of approximately 7.2 acres of habitat within three KOACs would be cleared with the construction of the PCGP project. The proposed mitigation actions would create a 1,000 acre fuel break and six dry hydrants.

The objective for the LSR land allocation in the Roseburg District RMP states, "Protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest-related species including the NSO and MAMU. Maintain a functional, interacting, late-successional and old-growth forest ecosystem" (USDI June 1995, page 29).

The objective in the Roseburg District RMP for managing MAMU habitat states, "Protect, manage, and conserve federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and bureau special status species policies" (USDI June 1995, page 41).

The proposed amendments and mitigation actions would not alter the objectives of the Roseburg District RMP for LSR for the following reasons:

- The quantity, quality, and distribution of LSOG habitat in LSRs on the Roseburg District would be either maintained or improved with the proposed reallocation of matrix to LSR RMP amendment (see discussion in section 2.2.2.5 BLM-3, Reallocation of Matrix Lands to Late Successional Reserves and *Impact on the Functionality of LSR 261 on the Roseburg District* above)

- The quantity and quality of LSOG habitat within KOACs on the Roseburg District would be minimally altered. Approximately 2 acres of LSOG habitat would be cleared with the PCGP project within an area that is already highly fragmented (see discussion in section 2.2.2.5 *Amount and quality of KOACs affected by the construction and operation of the PCGP project* above).

- The construction of the 1,000-acre fuel break and the construction of six dry hydrants would provide increased protection of the quantity, quality, and distribution of LSOG forest habitat in both mapped and unmapped LSRs on the Roseburg District from loss due to intensive fire through the ability to use fuel breaks in fire suppression strategies and reduced initial response times. These measures along with the reallocation of matrix lands to LSR have been designed so that the overall effect on LSRs would be neutral or beneficial, thereby maintaining the goals for LSRs in the Roseburg District.

Both the reallocation of matrix lands to LSR and the proposed mitigation actions would be consistent with the goals of the LSR land allocation to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG-related species. They would also be consistent with the management recommendations in the LSRAs for LSR 261, 259 and 223 by consolidating blocks of LSOG forest habitat and/or providing increased protection of existing LSOG forest habitat from intensive fire.

One of the objectives in the Roseburg District RMP for matrix land is to produce a sustainable supply of timber and other forest commodities. Moving 409 acres from the matrix to LSR would not prevent attainment of the objectives for matrix in the Roseburg District RMP because:

- Allowable Sale Quantity (ASQ) would not be affected between now and the time the Roseburg District RMP is revised. The CMP includes a provision that approximately 409 acres of non-federal forest lands would be acquired by the applicant to replace matrix lands lost to reallocation. As a practical matter, if a linear relationship between acres and

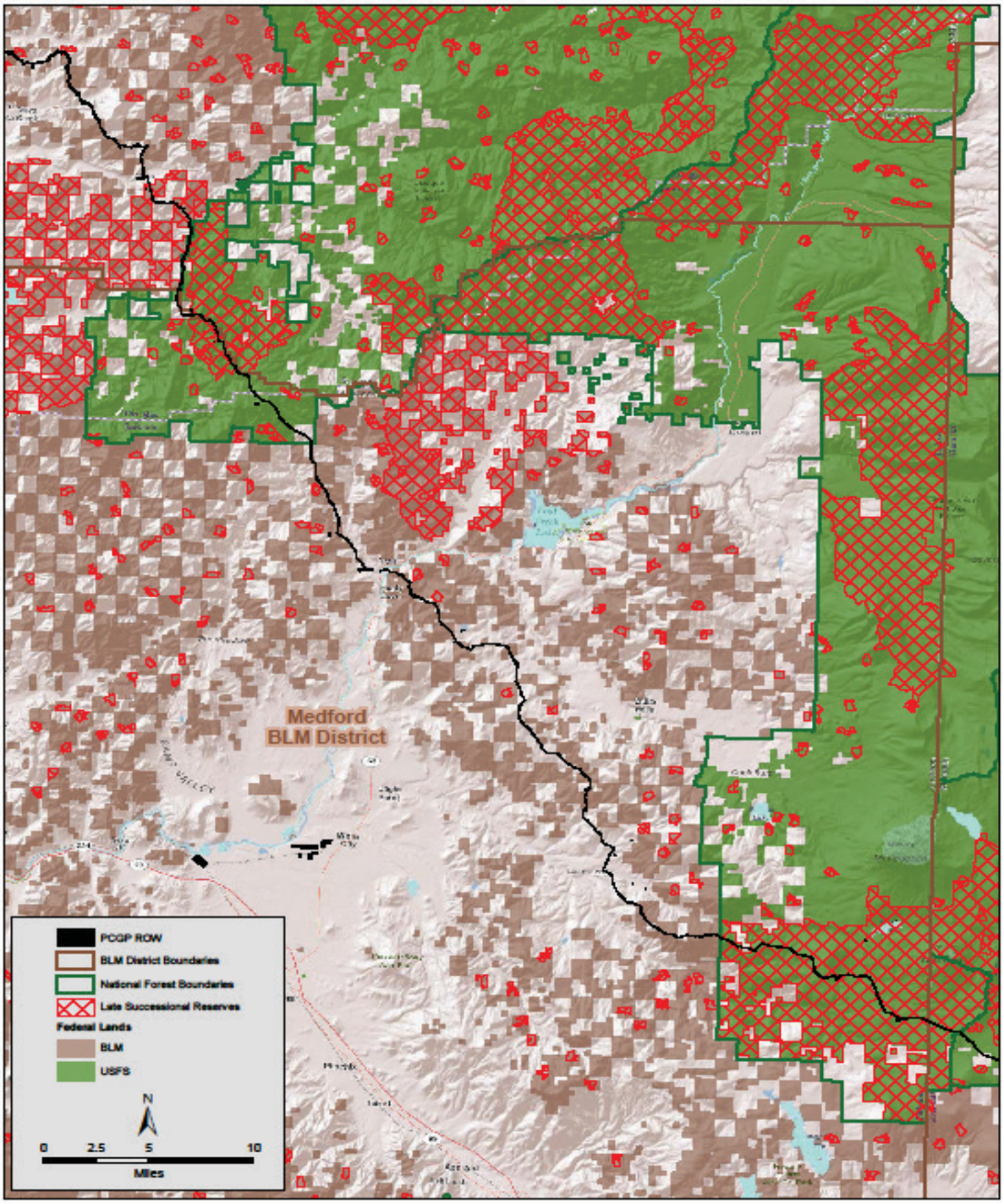
outputs is assumed, the potential effect would be less than 1 percent of the District's ASQ since these amendments affect less than 1 percent of the General Forest Management land base. With the acquisition of 409 acres of forest land to be added to the matrix land base, the timber output potential would not be altered. This amendment would not prevent future vegetation management activities such as commercial thinning in LSRs that would also contribute to the local forest products industry. The mitigation actions would also provide increased protection for forested stands in the matrix in this area by reducing initial response times and increasing the potential to prevent loss of commercial timber from intensive fire.

These changes would not have an important effect on the objectives in the Roseburg District RMP or affect land resources throughout a large portion of the LSR land allocation in the Roseburg District.

2.2.3 Medford District

There is no MAMU habitat in the Medford District where the proposed PCGP project would be located due to its distance from the ocean. The map in figure 2.2-42 demonstrates that all of the mapped LSR as well as all KOACs have been avoided with the proposed PCGP project corridor. Therefore, the proposed project would not alter any mapped or unmapped LSR in the Medford District.

Figure 2.2-42. Map of the Proposed PCGP Project and LSRs on the Medford District.

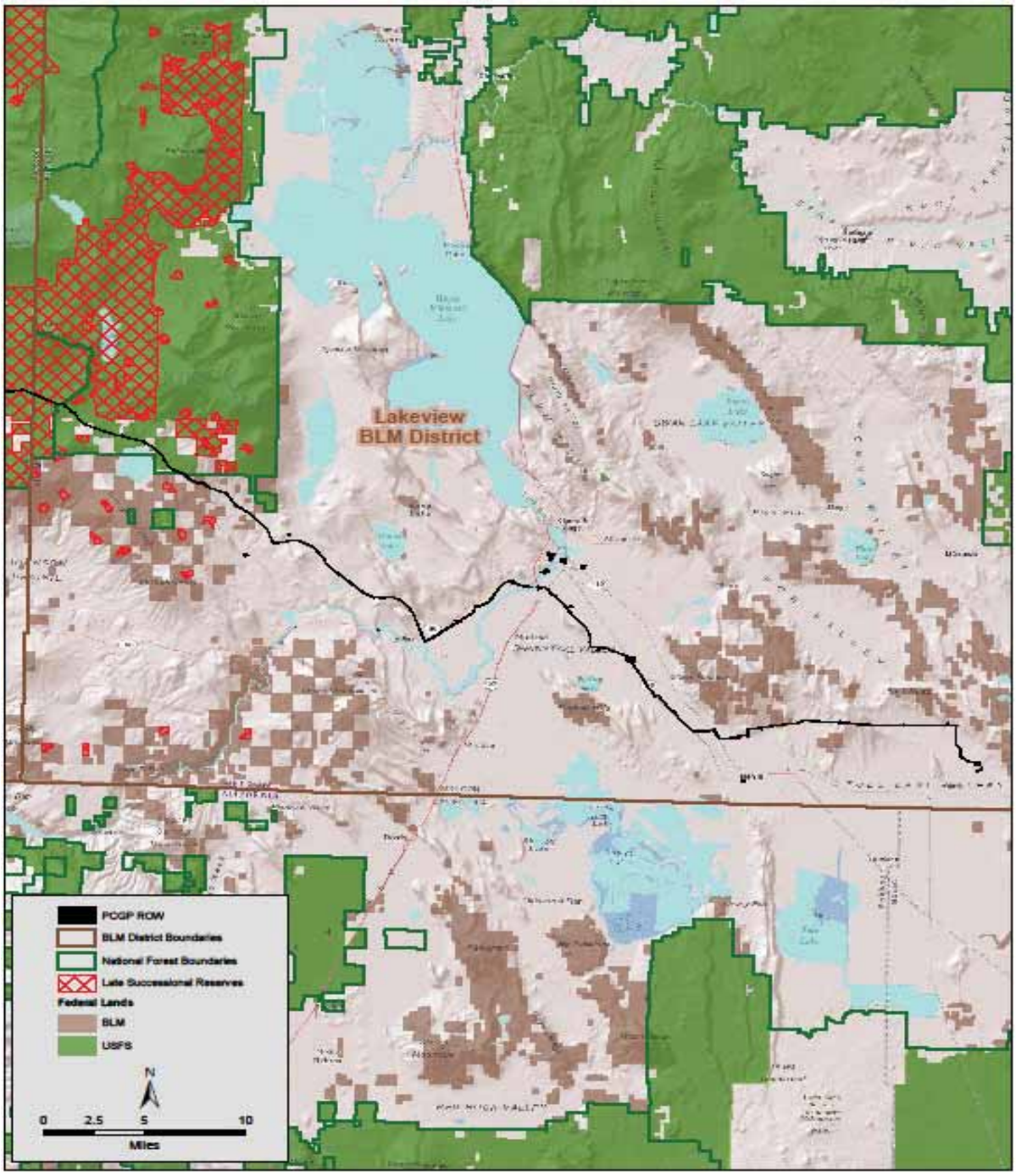


2.2.4 Klamath Falls Resource Area of the Lakeview District

There is no MAMU habitat in the Klamath Falls Resource Area of the Lakeview District due to its distance from the ocean. The map in figure 2.2-43 demonstrates that all of the mapped LSR as well as all KOACs have been avoided with the proposed PCGP project corridor. Therefore,

the proposed project would not alter any mapped or unmapped LSR in the Klamath Falls Resource Area of the Lakeview District.

Figure 2.2-43. Map of the Proposed PCGP Project and LSRs in the Klamath Falls Resource Area of the Lakeview District



2.3 LRMP AMENDMENTS ON NATIONAL FOREST SYSTEM LANDS

The proposed PCGP project would cross three national forests—Umpqua, Rogue River, and Winema—for a total of approximately 31 miles. Figure 2.1-1 provides an overview of the proposed project and the management units of the Forest Service. Table 2.1.2-1 displays the total acres of LSR that would be affected in each management unit of the Forest Service.

National forests are managed for many purposes. The concept of a broad mission for the public lands dates to the Organic Act of 1897, when Congress directed that federal timber reserves be managed for a supply of timber and protection of watersheds. Later, the Multiple Use Sustained Yield Act of 1960 again expressed Congressional intent to provide goods and services that people need while providing for long-term sustainability. The dual mission of providing resources people need and sustaining the environment of the national forests is the job of the Forest Service.

Generally, LRMPs do not provide project-level analysis or authorize individual projects. Every project or activity that occurs on a national forest is evaluated by the Forest Service for consistency with the LRMP of the national forest where the project is located. Forest Service personnel evaluated the proposed PCGP project and found that the linear nature of the proposed pipeline was not consistent with certain parts of the existing LRMPs for the Rogue River, Umpqua, and Winema National Forests.

In order to address these inconsistencies, the Forest Service is evaluating LRMP amendments to make provision for construction and operation of the PCGP project. With the exception of boundary changes that add acres to LSRs in the Umpqua and Rogue River National Forests, the amendments are project-specific and would apply only to this project. In considering these amendments, the Forest Service is guided by maintaining the overall balance of goods and services provided by each national forest.

The Forest Service is now under the 2012 planning rule (36 CFR 219, 2012). The 2012 planning rule allows a three year transition period for the procedures of the previous planning rule to be used to amend LRMPs (36 CFR 219.17(b)(2), 2012). The proposed amendments are using the procedures of the 1982 planning rule.[7] The 1982 planning rule and the 2000 planning rule as amended and clarified are available online at http://www.fs.fed.us/emc/nfma/2000_planning_rule.html.

The Responsible Official for the proposed LRMP amendments is the Forest Supervisor of the Umpqua National Forest (as designated by the Regional Forester). The decision to be made is whether the LRMPs would be amended if FERC approves the PCGP project. The Forest Supervisor will also determine if the proposed amendments are significant for the purposes of the planning process.[8] If FERC does not authorize the PCGP project, the LRMP amendments would not be implemented.

[7] 36 CFR 219, (1982)
[8] 36 CFR 219.10(f) (1982)

"Significance" as used in the discussion of LRMP amendments relates to the impact of an amendment on the delivery of goods and services from the Forest Plan that it amends.[9] The determination of whether a plan amendment is significant is guided by several factors.

Changes to a LRMP that are not significant can result from:

- Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.
- Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management.
- Minor changes in standards and guidelines.
- Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

The following examples indicate circumstances that may cause significant changes to a LRMP:

- Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000)
- Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

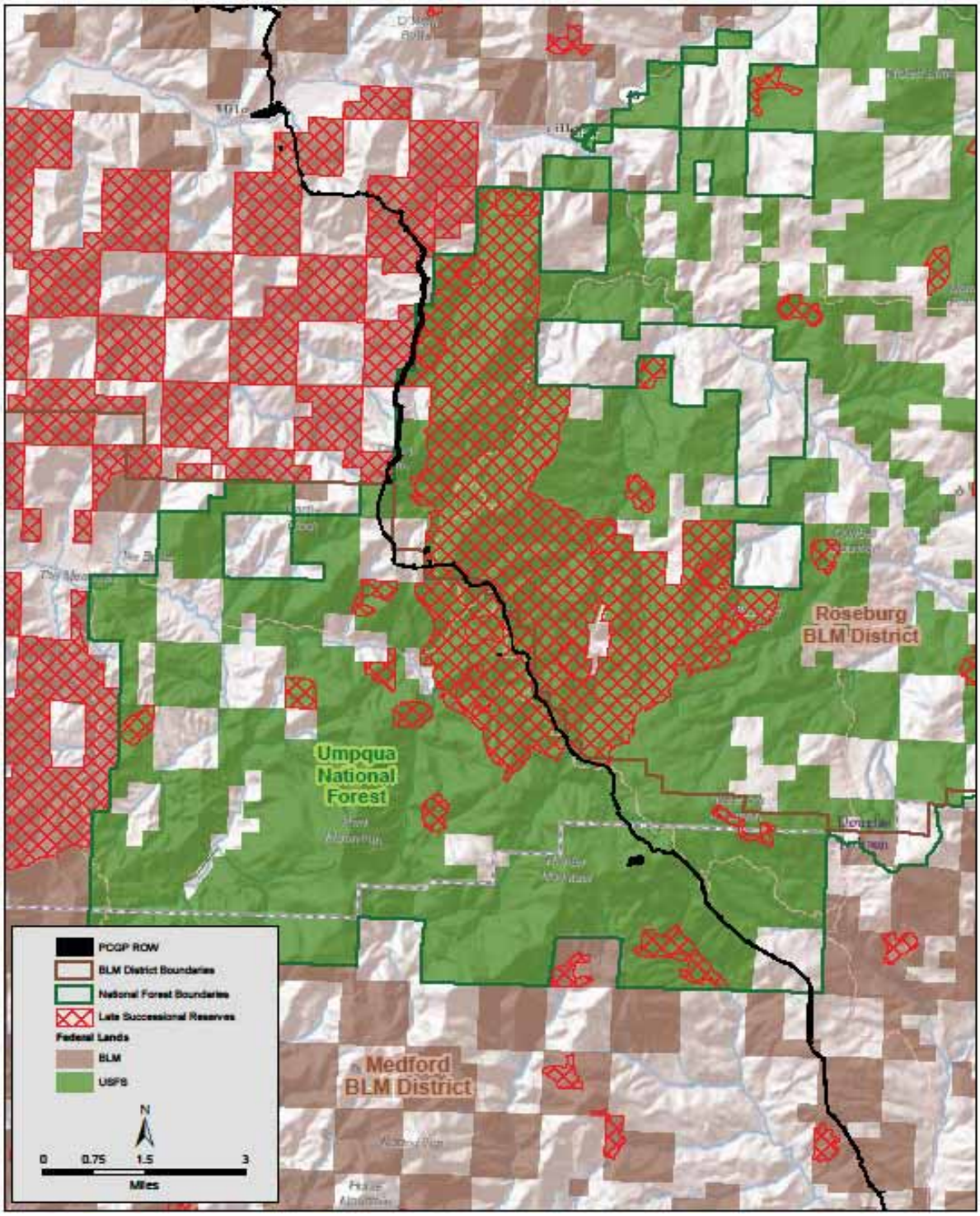
The planning criteria used to evaluate the significance of amendments includes the timing and duration of the proposed change, the location and size of the proposed change, and how the proposed change could alter multiple-use goals and objectives. The remainder of this section will address amendments on the Umpqua, Rogue River, and Winema National Forest related to LSRs.

2.3.1 Umpqua National Forest

The Umpqua National Forest LRMP as amended guides all resource management activities, establishes management standards and guidelines, and serves as the primary land management plan for the Umpqua National Forest. The amendments to the Umpqua National Forest LRMP include the NWFP and the inclusion of LSRs (see section 1.2.3 above). Goals and Objectives, Standards and Guidelines, and Management Prescriptions are found in Chapter Four: Forest Management Direction. Management direction in Chapter Four may be changed by amending the Forest Plan. The Umpqua NF LRMP is available at http://www.fs.usda.gov/detailfull/umpqua/landmanagement/?cid=fsbdev3_056190&width=full. In the Umpqua National Forest, the construction of the project would directly affect (acres cleared plus acres modified) approximately 89 acres of LSR 223. A map of the proposed PCGP project and LSRs in the Umpqua National Forest is displayed in figure 2.3-1.

[9] FSM 1926.51 The context of "significance" as it relates to Forest Plans is different than "significance" for environmental impacts as defined by the CEQ regulations at 40 CFR 1508.27. A project may have a "significant" impact on the human environment, but not "significantly" change a forest plan because the context of the effects is different in each determination.

Figure 2.3-1. Map of Proposed PCGP Project and LSRs in the Umpqua National Forest



2.3.1.1 Mapped LSR 223 in the Umpqua National Forest

Summary from LSRA

This information is provided in section 2.2.2.2.

Recent Changes since LSRA was Written

Little activity has occurred in LSR 223 in the Umpqua National Forest since the LSRA was written in 1999. Approximately four wildfires have occurred but each was less than 10 acres. There have been several fuel treatments (thinning and pile-burning) for a total of approximately 136 acres. There has also been some pre-commercial thinning of young stands of timber on approximately 93 acres[10].

Agency Recommendations

Since little has changed in the conditions of this LSR, there would be no changes in the recommendations or priorities for management activities in the LSRA[11].

2.3.1.2 Relationship of Unmapped LSR and the PCGP Project in the Umpqua National Forest

There is no MAMU habitat in the Umpqua National Forest due to its distance from the ocean. The map in figure 2.3-1 demonstrates the PCGP project would not affect KOACs in the Umpqua National Forest. Therefore the proposed PCGP project does not alter any unmapped LSR areas in the Umpqua National Forest.

2.3.1.3 Proposed LRMP Amendments and Mitigation Actions Relevant to LSR 223

LRMP Amendments

The Forest Service proposes to amend the Umpqua National Forest LRMP as follows:

<u>UNF-4, Reallocation of Matrix Lands to Late Successional Reserves</u>

The Umpqua National Forest LRMP would be amended to change the designation of approximately 588 acres from the matrix land allocation to the LSR land allocation in Sections 7, 18, and 19, T.32 S., R. 2 W., Oregon; and Sections 13 and 24, T. 32 S., R. 3 W., W. M., Oregon.

This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 223 in the Umpqua National Forest. This amendment would change future management direction for the lands reallocated from matrix to LSR. A map of the proposed reallocation is displayed in figure 2.3-2.

[10] Personal communications with Wes Yamamoto, Forest Service PCGP project coordinator
[11] Personal communications with Wes Yamamoto, Forest Service PCGP project coordinator

Mitigation Actions

A Mitigation Plan was developed by the Forest Service and adopted by the PCGP project applicant to ensure that the goals and objectives of the LRMP related to LSR would be achieved. Mitigation actions include:

- Creation of snags on 175 acres that are below desired snag densities for LSRs.
- Placing CWD on 350 acres in units that are currently below desired levels for CWD.
- Closing and decommissioning 7.6 miles of roads to reduce fragmentation and develop interior stand habitat over time.
- Thinning approximately 2,081 acres of overstocked stands, and under-burning approximately 1,128 acres in LSRs to reduce fire risk and accelerate development of LSR characteristics.
- Integrated stand density and fuel break treatments on 2285 acres in LSR 233 to restore stand density, species diversity, structural diversity, and control the spread and intensity of wildfire within forested stands prone to fire activity.

While the primary mitigation action for the effects of the proposed pipeline on LSR 223 would be to replace affected acres with additional acres of LSOG forest habitat that are currently outside of the LSR, the additional off-site mitigation actions proposed are consistent with the recommendations in the LSRA for LSR 223. These off-site mitigation actions would accelerate the development of LSOG forest habitat elements to further offset the effects of the PCGP project on LSR 223 in the long term. The additional off-site mitigation actions would also increase the effectiveness of the additional LSOG forest habitat added to LSR 223 by improving the quantity, quality, and distribution of high-quality habitat. The fuels treatment is part of the approximate 10 mile-long fuel break extending form Stouts Creek on the Roseburg District to Trail Creek on the Medford District that represents a landscape-scale action to reduce the risk of damage to LSR from catastrophic wildfire. Figure 2.3-3 displays where the proposed mitigation actions would occur.

Figure 2.3-2. Proposed Matrix to LSR Reallocation, Umpqua National Forest

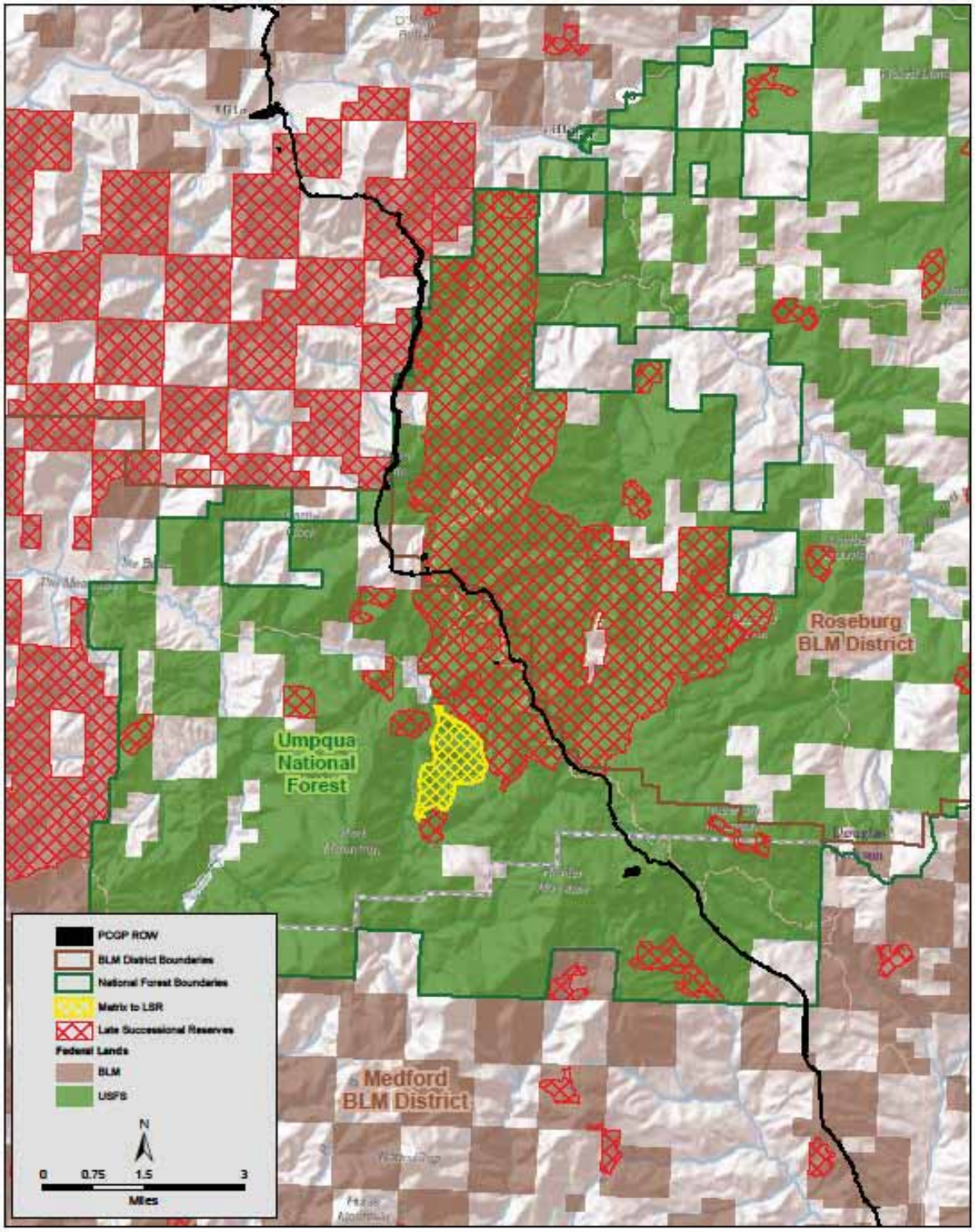
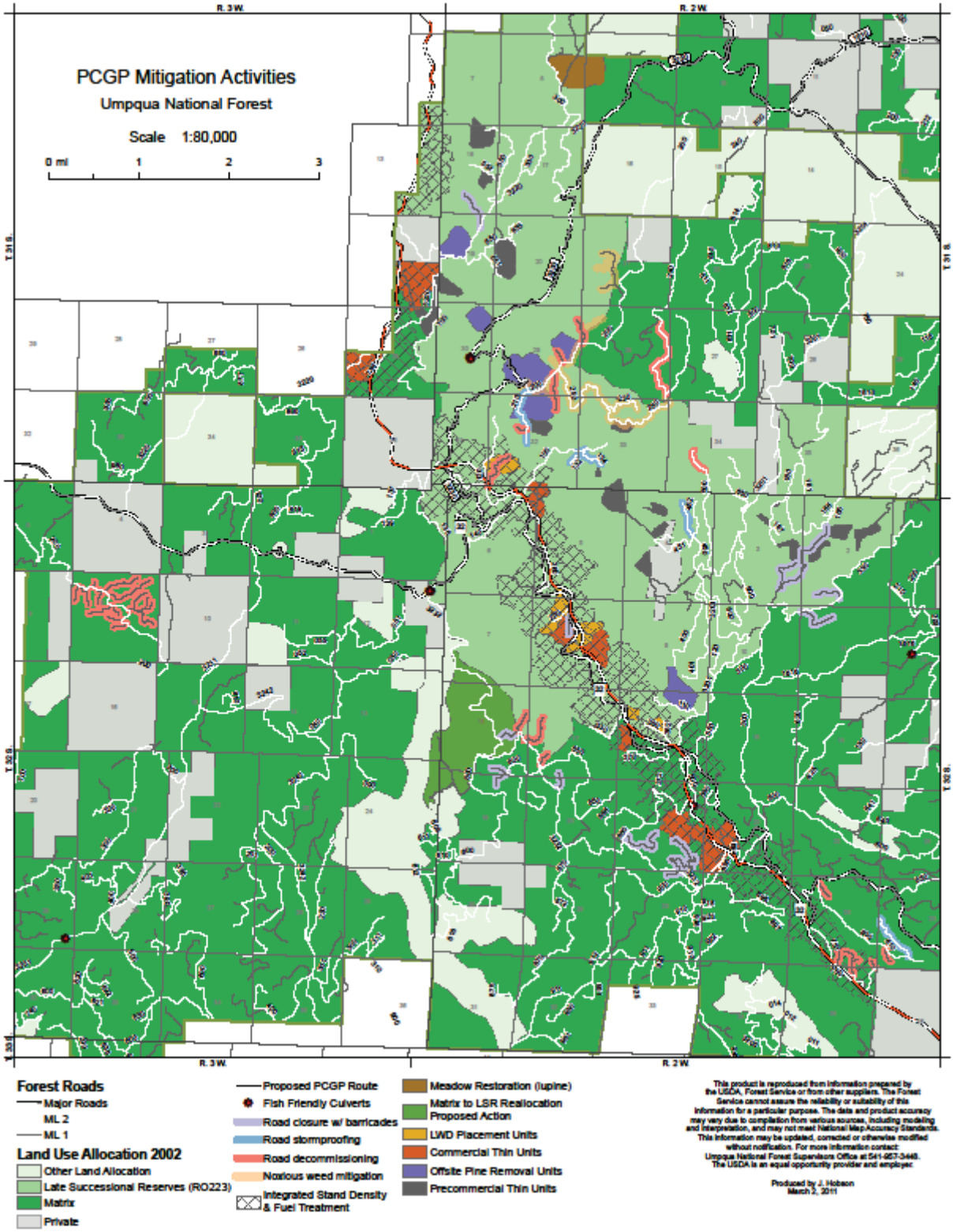


Figure 2.3-3. Proposed Off-site Mitigation Actions in the Umpqua National Forest



2.3.1.4 Impacts Related to the Proposed Amendments and Mitigation Actions Relevant to LSR 223

LRMP Amendment

One LRMP amendment is proposed for the Umpqua National Forest.

UNF-4, Reallocation of Matrix Lands to LSR

The primary management objective of the LSR land allocation is to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old growth–related species. Currently, based on latest BLM and Forest Service GIS data there are approximately 20,557 acres of LSOG forest habitat which comprises approximately 31 percent of LSR 223.

If constructed, the portion of the PCGP project in the Umpqua National Forest would be about 10.9 miles long, of which about 5.0 miles would traverse through LSR 223. The PCGP project would clear approximately 70 acres, of which approximately 25 acres are LSOG forest. The area proposed to be reallocated to LSR 223 is approximately 588 acres of matrix lands, of which approximately 431 acres are LSOG forest. This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 223 in the Umpqua National Forest. The proposed reallocation is shown in figure 2.3-2. When acres reallocated from matrix lands to LSR are compared to the acres of LSR that would be cleared by the PCGP project, the proposed amendment would reallocate over eight times more acres to LSR than would be cleared for the project corridor (see table 2.3.1.4-1 and figure 2.3-4, below).

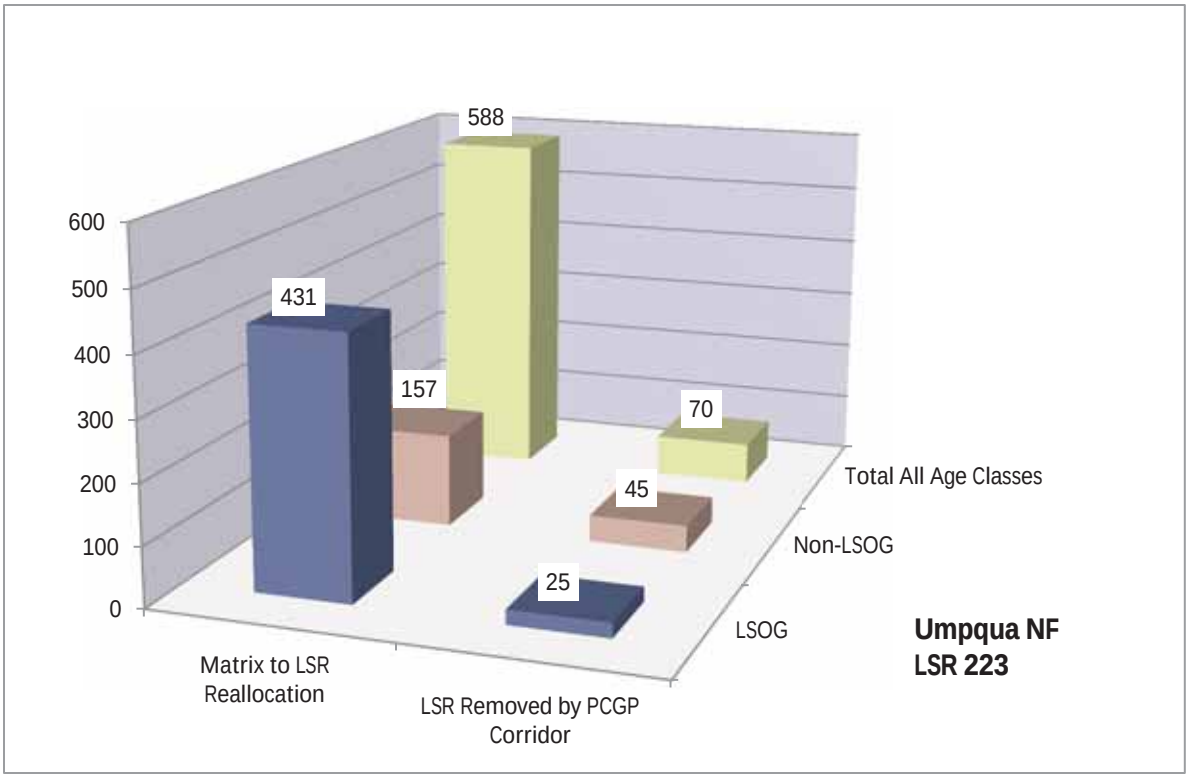
TABLE 2.3.1.4-1

Comparison of LSR Acres Cleared a/ by the PCGP Project and Acres of Matrix Reallocated to LSR

Umpqua National Forest LSR 223	LSOG	Non-LSOG	Non-Forest	Total All Age Classes
Matrix to LSR Reallocation	431	157	0	**588**
LSR Cleared by PCGP Corridor	25	45	0	**70**

a/ Acres cleared include corridor clearing and TEWAs.
Data source: BLM, USFS GIS data layers, Cox 2010

Figure 2.3-4. Comparison of Acres of LSR Cleared by the PCGP Project and Acres of Matrix to LSR Reallocation



In addition to the impacts from the removal of forest vegetation in LSR 223, there would be additional impacts from the acres modified by UCSAs and the acres indirectly affected through the creation of new edges and fragmentation of older forest. A comparison of the total acres affected in LSR 223 and the acres of reallocation are displayed in table 2.3.1.4-2 and figure 2.3-5 below.

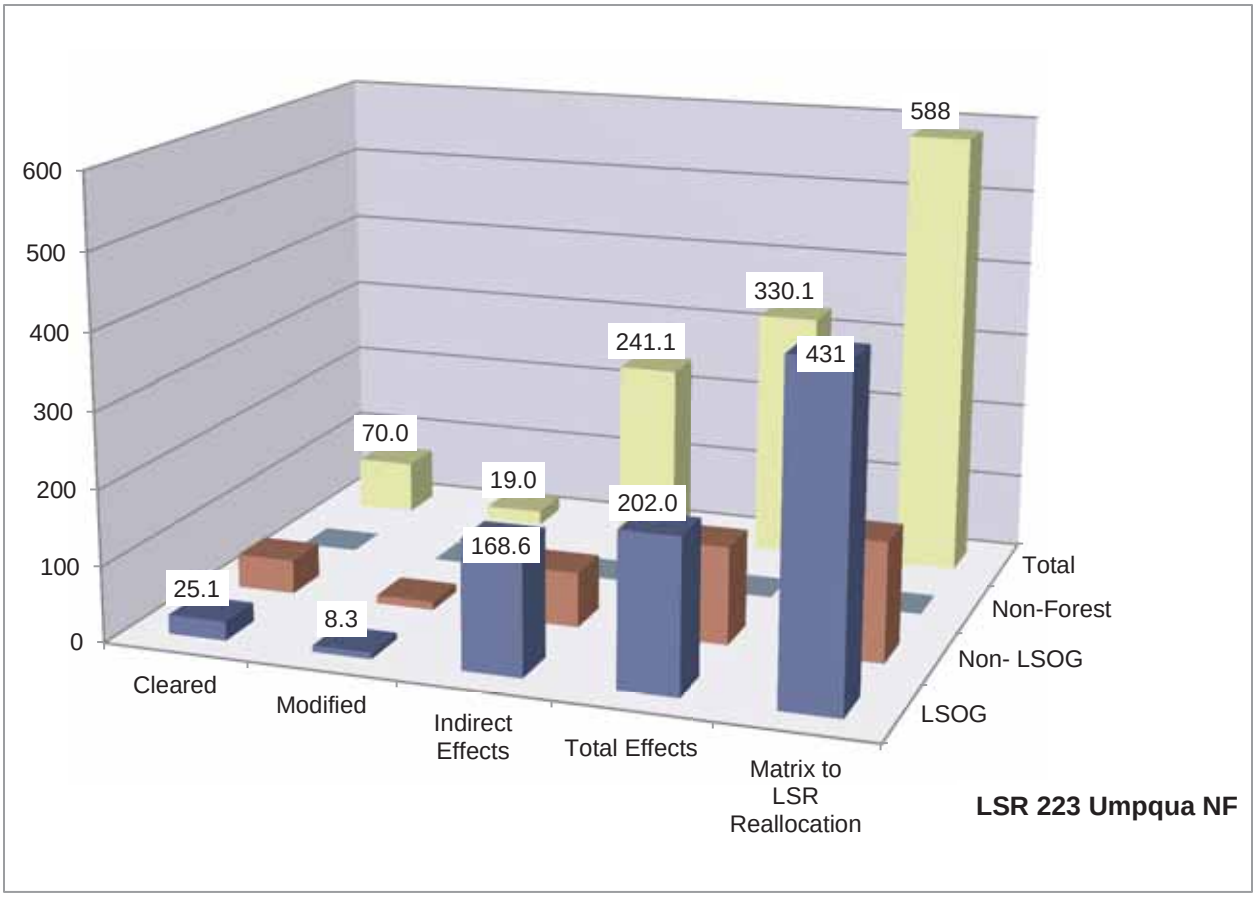
TABLE 2.3.1.4-2

Comparison of LSR 223 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Umpqua National Forest LSR 223	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	25.1	8.3	168.6	202.0	431
Non- LSOG	44.9	10.7	72.5	128.1	157
Non-Forest	0.0	0.0	0.0	0.0	0
Total	**70.0**	**19.0**	**241.1**	**330.1**	**588**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS Data Layers, Cox 2010

Figure 2.3-5. Comparison of Total LSR 223 Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



In addition to the impacts of the PCGP corridor on LSR 223 in the Umpqua National Forest there are also potential off-site impacts to LSR 223 from road reconstruction that would be necessary to accommodate the trucks that would be hauling the sections of pipe. These trucks are longer than typical trucks that use forest roads and some road widening and curve realignment may be necessary to safely allow for this truck traffic. In LSR 223 on the Umpqua National Forest it is estimated that approximately 2.5 acres of road widening would occur. Although this road widening would occur to the extent possible within the existing clearing limits it is probable that some additional clearing of forest vegetation would be necessary to accommodate the road reconstruction. It is estimated that this would be a maximum of 2.5 acres and would occur along an existing road opening.

Impact on the Functionality of LSR 223 on the Umpqua National Forest

The functionality of LSR 223 relates directly to the goals and objectives for LSRs (see section 1.2.2) and can be measured by the quantity, quality and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 223 on the Umpqua National Forest would increase with the proposed LRMP amendment. The PCGP project

would remove approximately 25 acres of LSOG habitat but the reallocation would add 431 acres of LSOG habitat for a net increase of 406 acres. This would increase the current level of LSOG habitat in LSR 223 from 20,557 acres to 20,963 acres or by approximately two percent.

- Quality: The area proposed for reallocation to LSR 223 contains some large blocks of LSOG habitat and would also be located immediately adjacent to two KOACs, providing further consolidation of LSOG habitat and increased protection of NSO habitat. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat the quality of the LSOG habitat within LSR 223 would be slightly improved.

- Distribution: The distribution of LSOG habitat within LSR 223 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR LRMP amendment. To the extent there are minor changes they would be beneficial due to the location of the proposed reallocation. The reallocation would occur on the southwest edge of the LSR providing for some additional connectivity with the nearest LSRs to the south and west.

- The off-site mitigation would improve the quantity, quality and distribution of LSOG habitat in LSR 223 by accelerating the development of constituent elements of late-successional habitat, reducing the risk of stand-replacement fire and reducing fragmentation through road decommissioning and stand-density management.

The mitigation actions for LSR 223 in the Umpqua National Forest have been designed with the goal that the overall impact would be either neutral or beneficial to the creation and maintenance of late-successional habitat. These actions combined would maintain or improve the functionality of LSR 223.

Mitigation Actions

To compensate for the direct and indirect effects associated with the PCGP project in the LSR land allocation, off-site mitigation actions have also been developed by the Forest Service (see figure 2.3-3). Direct and indirect effects of the PCGP project corridor are described in the FERC Draft EIS and BA. For the purposes of this discussion, indirect effects of the corridor are modeled by age class of vegetation and an associated estimate of edge effects. Indirect effects on LSOG forest are estimated to extend 100 meters on each side of the corridor. Indirect effects for non-LSOG forest are estimated to extend 30 meters on each side of the corridor. No indirect effects are estimated to non-forested areas. These proposed off-site mitigation actions include:

- Accelerating development of larger trees by pre-commercial thinning young stands.
- Replacing constituent elements of habitat by placing LWD in units, creating snags, controlling noxious weeds, and restoring meadows.
- Reducing the risk of stand-replacing fire by stand-density management, commercial thinning, and fuels reduction treatments.
- Reducing habitat fragmentation by decommissioning roads and accelerating the development of interior stand conditions by stand-density management

The additional off-site mitigation actions would increase the effectiveness of the LSOG forest habitat added to LSR 223 by improving the quantity, quality, and distribution of LSOG forest habitat. These off-site mitigation actions are consistent with the LSRA for LSR 223.

Road Decommissioning (7.6 miles)

Although the PCGP project has been routed to avoid LSOG habitat as much as possible, the project would create edge effects that would affect interior stand microclimates and cause habitat fragmentation within LSR 223 that cannot be avoided. Edge is the effect of an opening on microclimate in adjacent stands (Chen, Franklin et al. 1993). Edge effects introduced by roads (or corridors) are highly variable and depend on aspect, road width, vegetation crossed, and other variables. Edge effects are greatest when there is a high contrast in structure and composition between a newly created opening and the adjacent landscape (Harper, Macdonald et al. 2005). Thus, edge effects are greatest when they affect interior stand habitats of older forests and lowest when the new opening is similar to the surrounding landscape, such as adjacent to an existing road or in a recent clearcut.

Decommissioning roads with appropriate restoration measures would presumably reverse edge effects and habitat fragmentation caused by existing roads and create habitat for a variety of animals (Switalski, Bissonette et al. 2004). The effect of edge reduction by road decommissioning is highly variable for the same reasons described for the edge effects created by constructing a road. Agency field experience has shown that road decommissioning reduces the edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with the density management proposed for adjacent plantations would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years as planted trees became pole sized (5 to 9 inches diameter at breast height (dbh) and 20 to 40 feet tall).

Published data on rate and pattern of edge reduction associated with decommissioning roads is not available (Baker 2011), but a comparison of the predicted beneficial effect of road decommissioning to edge effects that would be associated with the PCGP project is useful, even if based on assumptions[12]. Using an assumed edge reduction over time of 50 feet on each side of the road, decommissioning 7.6 miles of road would reduce existing road-related edge effects on an estimated 92 acres (7.6*5280*100/43560)

Linear edge provides another measurement of the edge effect. Approximately 5.9 miles of the proposed PCGP project would be located within LSR 223, creating 11.8 miles of new edge within LSR 223. Proposed road decommissioning would revegetate 7.6 miles of roads, removing approximately 15.2 miles of existing edge over time.

Stand-Density Management

Stand-density management is proposed in early and mid seral Douglas-fir or ponderosa pine plantations that were planted. The purpose of this mitigation action is to restore stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime by enhancing and accelerating the physical and biological services for

[12] This approach is consistent with CEQ Regulations for NEPA, 40 CFR 1508.22

associated flora and fauna within LSR 223. Table 2.3.1.4-3 below displays the acres of density management activities occurring in LSR 223 and matrix.

TABLE 2.3.1.4-3

Stand-Density Management Activities in LSR 223 and Matrix

Treatment Type	LSR 223 Acres	Matrix Acres	Riparian Reserve Acres
Pre-commercial Thinning	377	40	42
Off-Site Pine Restoration	398		15
Commercial Thinning	138	406	35
Total	**913**	**446**	**92**

Source: USFS GIS, Hobson 2010

Pre-commercial thinning is proposed for overstocked plantations to accelerate the development of late-successional and old-growth forest characteristics in LSR 223. Managing stand density would increase growth rates, decrease susceptibility to stand-replacing fire, and diversify stand structure in otherwise relatively homogenous stands. This accelerated development would also reduce fragmentation and edge effects and would help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused disturbances. A majority of the pre-commercial thinning acres are within 1 mile of the pipeline right-of-way. Placing the off-site mitigation activities close to the actual pipeline corridor increases their effectiveness by affecting lands within, or near, the home ranges of individual species affected by the pipeline habitat changes. Because the mitigation actions address ecological processes like the edge effect, placing the mitigation action near the edge impacts would increase the effectiveness of the mitigation action by restoring ecosystem structures near the acres that would be affected by the pipeline. The stand-density management activities in matrix lands would improve timber productivity by increasing growth rates, which would partially offset some of the lost timber management potential in the matrix acres reallocated to LSR.

Integrated Stand Density and Fuel Break Treatments (2,285 acres LSR 223)

This prescription is intended accomplish two outcomes. First, it is intended to enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands; restoring stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime. Secondly, it is intended to reduce the probability of large-scale loss of LSOG from wildfires as part of a 10 mile long and 0.5-mile wide shaded fuel break extending form Stouts Creek on the Roseburg District to Trail Creek on the Medford District that represents a landscape-scale action to reduce the risk of damage to LSR from catastrophic wildfire. Fuels treatments are decided on a case-by-case basis and rely on fuel loading information as well as proximity to roads and other factors. Slash treatments may be as simple as lop and scatter to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling, burning, or removal of fuel from the site for biomass energy or other uses.

Stand-density management over time would reduce existing edge effects. There is no precise way to estimate the reduction in edge effects with available data since stands have many different age classes, perimeters, and canopy closures. The estimated perimeter of the units proposed for integrated stand-density management and fuels treatment adjacent to the pipeline in LSR 223 is approximately 10 miles. Assuming some edge effect reduction within 100 feet of the

perimeter of these units, density management would reduce edge effects over time by an estimated 121 acres (10*5280*100/43560).

Snag Creation (175 acres LSR 223)

Snag creation is proposed as a mitigation action to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags would be lost from the pipeline corridor to facilitate pipeline construction and mitigate safety hazards for construction workers and from the removal of live trees that would have contributed to future snag habitat.

Approximately 4,200 snags within LSR 223 would be created by blasting tops from live trees (preferably trees with existing decay that makes them more suitable for cavity-nesting birds and/or as denning sites) or by inoculating living trees with heart rot decay fungi or other methods. Sites selected for snag creation would be within ½ mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the pipeline corridor. Sites would be in mid and late seral stands.

The current direction is to manage CWD levels on a landscape perspective and use land allocation as a consideration for where levels of CWD may occur overtime. DecAID (a tool for managing snags, partially dead trees, and downed wood for biodiversity in forests in Washington and Oregon) is a summary of the best available data on dead wood in Pacific Northwest ecosystems (Marcot et al. 2002). To use DecAID, planning areas should be large enough to encompass the range of variation in wildlife habitat types and structural conditions; it is suggested that planning areas be at least 20 square miles in size (12,800 acres). A reasonable objective is to manage for a range of conditions within the area, balancing areas with high densities of dead wood with moderate- and low-density areas (Marcot et al. 2002).

Wildlife and inventory data summarized in the DecAID Advisor can be applied to management and planning decisions at a range of spatial scales and geographic extents. The calculated tolerance levels (80, 50, and 30 percent) for wildlife data can be applied to stand-level management. However, it is not advised that a particular tolerance level be applied to all stands across a landscape. The LSRA for LSR 223 indicates that snags are below historic conditions (USDA and USDI 1999). The objectives of the LSR land allocation and the location and size of the project make it appropriate to manage for high and moderate snag densities for this project. Snags should be managed at the 80 percent tolerance level in LSRs. However, most of the proposed pipeline would be located along ridge tops that are prone to fire disturbance. Considering fuels, it would be appropriate to manage at a lower density of small snags and downed wood in both tolerance levels. The LSRA for this area recommended a desired future condition of at least 4 snags per acre > 20 inches dbh and 15 feet tall (USDA and USDI 1999, table 8). The target within the LSR treatment areas would be to manage snags densities at 16 per acre > 10.0 inches dbh, of which 8 per acre are > 20 inches dbh.

Large Woody Debris Placement (350 acres LSR 223)

One of the components of CWD is large woody debris (LWD), which consists of trees or portions of trees lying on the forest floor. LWD placement is proposed to accelerate the

development of LSOG forest characteristics by restoring this habitat component to areas where LWD is lacking.

Large wood would be placed in or near areas that are also receiving stand-density management treatment. The large wood would be from trees cut from the pipeline corridor. Sites selected for LWD placement are within 1/2 mile of the proposed pipeline right-of-way. As with the other off-site mitigation actions, placement of the mitigation activities close to the pipeline corridor can benefit species that would be affected by the vegetation changes within the corridor and would make these mitigation actions more effective. Sites for placement of LWD would be in early successional stands that are currently deficient in downed wood. The LWD placement is expected to vary to account for some of the range in variability found across the landscape. For 11 to 20 inch diameter logs, densities would vary from 8 to 33 logs/acre. For 20 inch plus diameter logs, densities would vary from 3 to 12 logs per acre. Logs would be approximately 40 feet in length, and the specified diameter (11 to 20 inches, and 20 inches plus) refers to the stem diameter at the midpoint of the 40-foot log.

Noxious Weed Treatment (6.7 miles)

Soils disturbed during pipeline construction and proposed mitigation activities would have the potential to disperse and generate potential seedbeds for noxious weeds. The proposed noxious weed treatment along 6.7 miles roads within LSR 223 would assist in mitigating potential adverse habitat impacts.

Meadow Restoration (80 acres)

There would be a loss of forest habitat buffering unique habitats and disruption to soil horizons within those habitats from the construction of the PCGP project. These actions would result in adverse impacts to native flora and fauna and increase the opportunities for invasion by non-native plant species. These impacts cannot be fully mitigated on site; therefore, restoration activities such burning, removal of encroaching conifers, and noxious weed control would be applied to an 80-acre meadow located in LSR 223.

Comparison of Total Adverse Direct and Indirect Effects of the PCGP Project on Edge and Total Beneficial Direct and Indirect Effects of Mitigation Actions on Edge in LSR 223

The acres of direct and indirect effects of the PCGP project and the acres of direct and indirect effects of various mitigation actions as related to the edge effect are shown in table 2.3.1.4-4 and figure 2.3-6. For the purposes of this comparison, indirect effects of the corridor are modeled by the age class of vegetation and an associated estimate of edge effects. Since there is no precise method for predicting indirect effects, the following assumptions were used.

- Adverse indirect effects of the PCGP project on LSOG habitat are estimated to extend 100 meters from the cleared edge on each side of the corridor.
- Adverse indirect effects of the PCGP project for non-LSOG habitat are estimated to extend 30 meters from the cleared edge on each side of the corridor.
- No indirect effects are estimated for non-forested areas since there would be no new edge created.

- Direct effects of road decommissioning are estimated from the revegetation of an average road prism of 20 feet.
- The beneficial indirect effects of road decommissioning are estimated to extend 50 feet on each side of the decommissioned road in all vegetation classes.
- The beneficial indirect effect of integrated stand-density fuels management treatments is estimated to extend 100 feet from the perimeter of the unit in all vegetation classes.
- Indirect effects of other mitigation actions are not considered to reduce edge in this comparison.

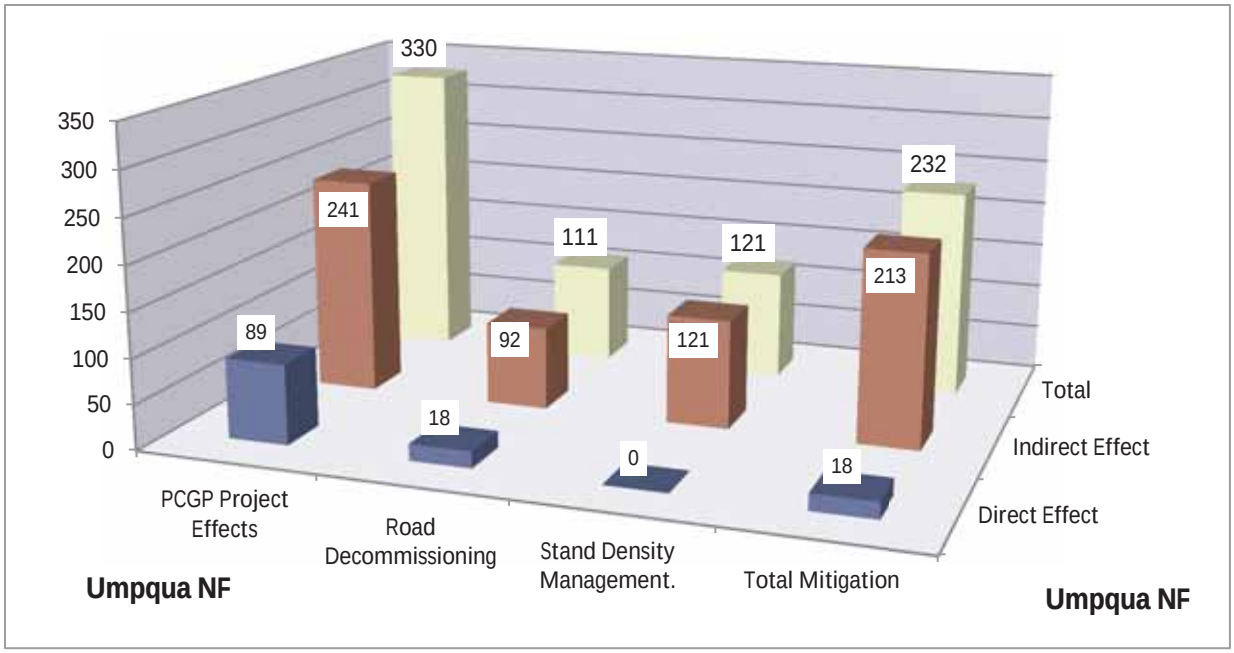
TABLE 2.3.1.4-4

Comparison of Total PCGP Project Impacts a/ on LSR 223 and Estimated Edge Reduction Effect b/ of Proposed Off-site Mitigation Actions (Acres)

Umpqua National Forest (LSR 223)	Direct Effect	Indirect Effect	Total
		Total PCGP Project Impacts on LSR 223	
PCGP Effects	89	241	330
		Proposed Off-site Mitigation	
Road Decommissioning	18	92	111
Stand-Density Management.	0	121	121
Total Mitigation	**18**	**213**	**232**

a/ PCGP project direct effects include corridor clearing, TEWAs, and UCSAs. Indirect effects include 100 meters on each side of corridor edge in LSOG and 30 meters on each side of corridor edge in non-LSOG
b/ Direct edge reduction effects include acres of decommissioned road revegetated (7.6*5280*20/43560) and indirect effects include 50 feet on each side of decommissioned road and 100 feet along perimeter of stand-density treatments.
Data source: BLM, USFS GIS data layers, Hobson 2010

Figure 2.3-6. Comparison of Total PCGP Project Impacts on LSR 223 and Estimated Edge Reduction Effect of Proposed Off-site Mitigations (acres)



The comparisons displayed are not one-to-one correlations, since the adverse impacts on edge would occur immediately with the construction of the pipeline and the reduction of edge effect from the off-site mitigation would occur over time. The comparison also does not take into consideration that the edge created by the construction of the pipeline would also reduce over time as the majority of the corridor (about 70 percent) would be re-forested. The comparison does display that some of the mitigation actions proposed would help reduce the amount of fragmentation in LSR 223 by reducing the amount of existing edge. Over time, this would allow for the formation of larger blocks of interior forest habitat.

Aggregated Impacts to LSR 223

There are no other proposed amendments related to LSR 223 in the Umpqua National Forest. There would be, however, additional impacts to LSR 223 from the proposed PCGP project in the Roseburg District of the BLM. The impacts to LSR 223 in the Roseburg District are discussed in section 2.2.2.5. The following discussion relates to the overall impacts of the proposed project on LSR 223 and the overall acres being reallocated to LSR 223.

The total impacts to LSR 223 from the proposed PCGP project on both the Umpqua National Forest and Roseburg Districts are displayed in table 2.3.1.4-5 and figure 2.3-7 below. The impacts include the direct impacts that would occur from the construction of the project (the acres cleared plus the acres modified by UCSAs) as well as the indirect impacts that would occur from the creation of new edge and the fragmentation of existing LSOG forest habitat. The indirect effects are measured as extending for 100 meters from the cleared edge on each side of the corridor in LSOG forest and 30 meters on each side of non-LSOG forest.

In considering the total impacts to LSOG forest habitat in LSR 223, there would be approximately 318 acres affected (including both direct and indirect impacts) compared to the approximately 431 acres of LSOG forest habitat being reallocated. The amendments would reallocate slightly more than 1.3 times the amount of LSOG forest habitat that would be affected. The off-site mitigation proposed in the Roseburg District would add another 1,000 acres of fuel treatment in addition to the 2,284 acres proposed in the Umpqua National Forest. This in addition to the six dry hydrants proposed in the Roseburg District that would provide for increased prevention of LSOG forest habitat loss due to intensive fire.

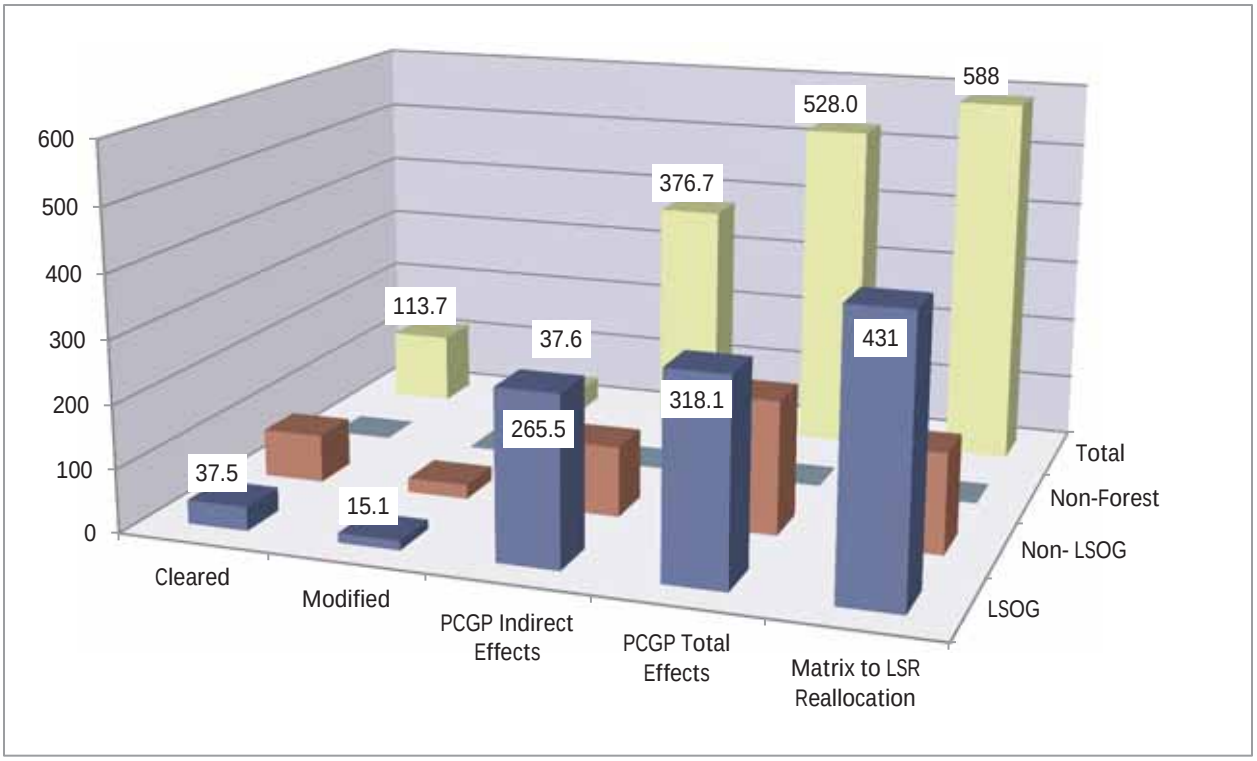
TABLE 2.3.1.4-5

Comparison of Total LSR 223 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

LSR 223	Cleared	Modified	PCGP Indirect Effects	PCGP Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	37.5	15.1	265.5	318.1	431
Non- LSOG	76.2	22.5	111.2	209.9	157
Non-Forest	0.0	0.0	0.0	0.0	0
Total	**113.7**	**37.6**	**376.7**	**528.0**	**588**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG) in the BLM Roseburg District and Umpqua National Forest.
Data source: BLM, USFS GIS Data Layers, Cox 2010

Figure 2.3-7. Comparison of Total LSR 223 Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



In considering the total impacts to forest habitat in LSR 223, there would be approximately 528 acres affected (including both direct and indirect impacts) compared to the 588 acres of matrix lands being reallocated. The amendment would reallocate slightly more than 1.1 times the amount of forest habitat that would be affected in LSR 223. However when comparing the amount of LSOG habitat that would be cleared with the PCGP project with the amount of LSOG habitat that would be reallocated there would be over 11 acres reallocated for each acre cleared in LSR 223.

Impact on the Functionality of LSR 223 on the Umpqua National Forest and BLM Roseburg District

The functionality of LSR 223 relates directly to the goals and objectives for LSRs (see section 1.2.2) and can be measured by the quantity, quality and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 223 on the Umpqua National Forest and Roseburg District would increase with the proposed LRMP amendment. The PCGP project would remove approximately 38 acres of LSOG habitat but the reallocation would add 431 acres of LSOG habitat for a net increase of 393 acres. This would increase the current level of LSOG habitat in LSR 223 from 20,557 acres to 20,950 acres or by approximately 1.9 percent.

- Quality: The area proposed for reallocation to LSR 223 contains some large blocks of LSOG habitat and would also be located immediately adjacent to two KOACs, providing further consolidation of LSOG habitat and increased protection of NSO habitat within LSR 223. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat the quality of the LSOG habitat in LSR 223 would be slightly improved.

- Distribution: The distribution of LSOG habitat within LSR 223 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR LRMP amendment. To the extent there are minor changes they would be beneficial due to the location of the proposed reallocation. The reallocation would occur on the southwest edge of the LSR providing for some additional connectivity with the nearest LSRs to the south and west.

- The off-site mitigation would improve the quantity, quality and distribution of LSOG habitat in LSR 223 by accelerating the development of constituent elements of late-successional habitat, reducing the risk of stand-replacement fire and reducing fragmentation through road decommissioning and stand-density management.

The matrix to LSR reallocation and the off-site mitigation actions on both the Roseburg District and the Umpqua National Forest have been designed with the goal that the overall impact of the PCGP project on LSR 223 would be either neutral or beneficial to the creation and maintenance of late-successional habitat. With the increase in the acres of protected LSOG habitat and the inclusion of large LSOG habitat blocks, the overall functionality of LSR 223 would be maintained or improved.

2.3.1.5 Evaluation of the Proposed Amendment and Mitigation Actions in Relation to the Goals and Objectives and Outputs of the Umpqua LRMP

One LRMP amendment and multiple off-site mitigation actions are associated with LSR 223 in the Umpqua National Forest. The proposed amendment would reduce the matrix lands in the Umpqua National Forest by 588 acres from 412,300 acres to 411,712 acres, or by 0.14 percent. It would increase the total LSR land allocation in the Umpqua National Forest by 588 acres from 375,160 acres to 375,748 acres, or by 0.16 percent. This amendment would increase the Umpqua NF portion of LSR 223 by 588 acres from 14,386 acres to 14,973, or by 3.9 percent. This proposed change would affect 588 acres as shown in figure 2.3-2 for the life of the current planning cycle.

This amendment would not alter the long term multiple use goals and objectives of the Umpqua LRMP as amended for LSRs for the following reasons:

- The quantity, quality, and distribution of LSOG habitat in LSR 223 would be either maintained or improved with the proposed reallocation of matrix to LSR LRMP amendment (see discussion in section 2.3.1.4 *Impact on the Functionality of LSR 223 on the Umpqua National Forest* above).

- An extensive off-site mitigation plan was developed by the Forest Service and adopted by the PCGP project applicant to ensure that the Goals and Objectives of the LRMP related to LSR habitat would still be achievable. The off-site mitigation actions were designed to compensate for the impacts of the proposed PCGP project. Mitigation actions include (1)

creation of snags on 175 acres that are below desired snag densities adjacent to the project corridor within the LSR, (2) placing LWD on 350 acres in units that are currently below desired levels for LWD within the LSR and close to the project corridor, (3) closing and decommissioning 7.6 miles of roads to reduce fragmentation and develop interior stand habitat over time within the LSR, and (4) thinning approximately 2,080 acres of overstocked stands to accelerate development of LSR characteristics, and (5) under-burning approximately 1,128 acres in the LSR to reduce fire risk.

All of these actions would be consistent with the goals of the LSR land allocation to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG-related species and with the recommendations in the LSRA for LSR 223.

The proposed amendment would not alter any existing standards and guidelines. Lands that are transferred from the matrix land allocation to LSR would be managed under the LSR standards and guidelines in the future. Moving 588 acres from the matrix to the LSR would not prevent attainment of the long-term balance of goods and services for the Umpqua National Forest because:

- Approximately 25 acres of LSOG forest would be cleared from the LSR by the construction of the PCGP project; 431 acres of LSOG forest would be added back to the LSR in the land allocation change. Additionally, several elements of the off-site mitigation plan would accelerate the development of late-successional stand characteristics on several hundred acres within the LSR where the potential loss of habitat occurs. Acres of LSOG habitat replaced in the LSR by the proposed amendment would exceed the acres of LSOG habitat cleared by construction of the project, thus increasing the acres that are managed for late-successional habitats. As a general principle, populations and individuals within a population of LSOG-dependent species respond favorably to increased protection of LSOG forest, so it can be inferred that LSOG-dependent species would benefit somewhat by this increase in LSOG habitat over time. This is consistent with the goals for LSR.

- The proposed amendment would not affect outputs from the LRMP because it would not stop any existing or planned project. If it would not stop or affect any management activity designed to benefit LSRs or meet other management objectives, then it is not likely that the amendment would affect the multiple use balance of the LRMP.

- An evaluation of the proposed change to matrix land was conducted by staff of the Umpqua NF (USDA Forest Service 2009a). The evaluation concluded that the small change in matrix would not warrant a change in the Forests' Probable Sale Quantity (PSQ). The evaluation noted the PSQ would not be affected between now and the time that the Umpqua National Forest LRMP is revised because the Forest has the capacity to maintain PSQ without the acres of matrix lands that are being reallocated to LSR. As a practical matter, if a linear relationship between acres and outputs is assumed, the potential effect would be approximately 0.1 percent of the Forest's PSQ, since this amendment would affect approximately 1/10th of 1 percent of the Forest matrix land base. This amendment would not prevent future vegetation management activities such as thinning that would benefit LSR and also contribute to the local forest products industry.

2.3.1.6 Evaluation of the effect of the proposed amendment on the entire land management plan or land resources throughout a large portion of the planning area:

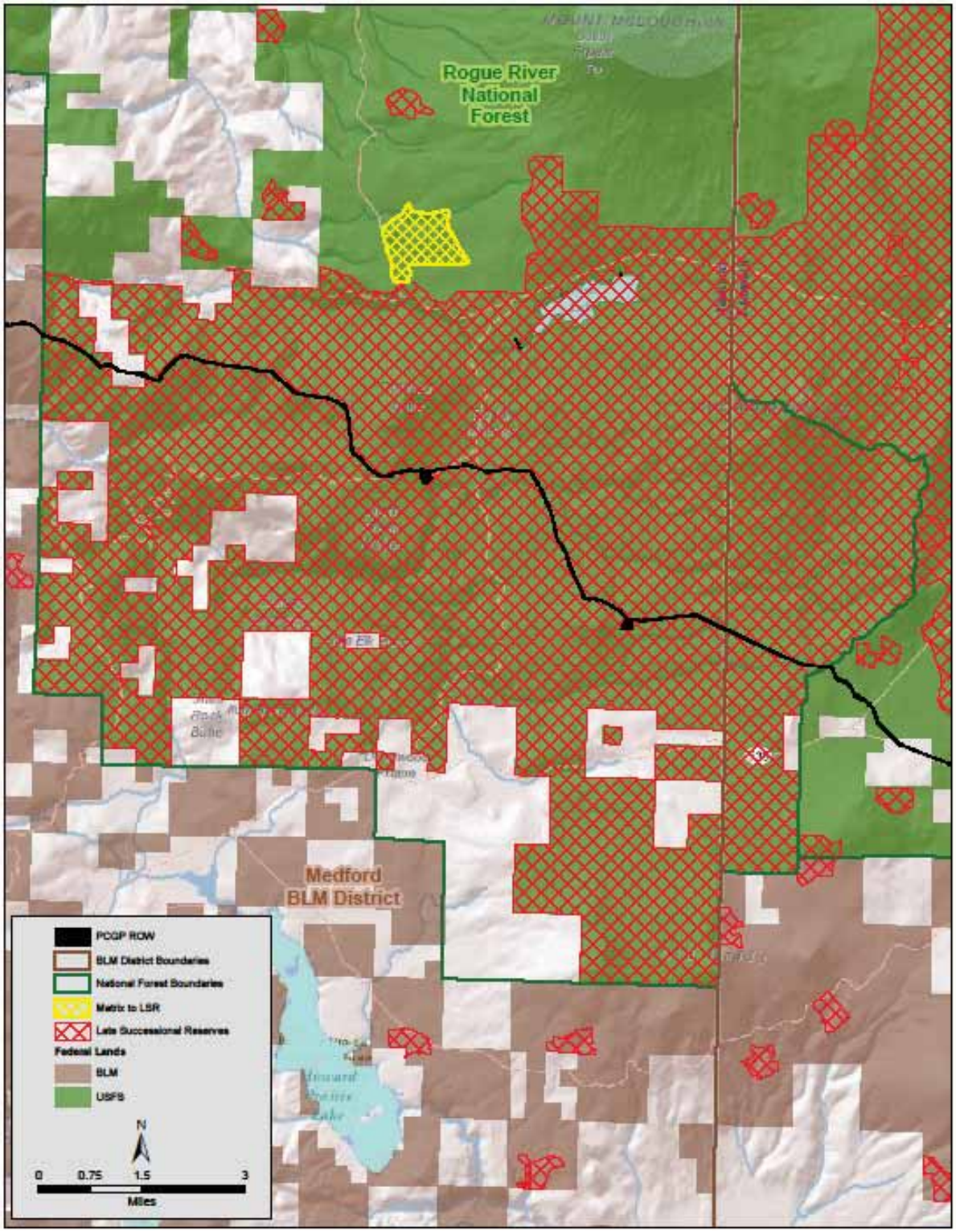
- Reducing the matrix land allocation of 412,300 acres by 588 acres or 0.1 percent would not be an important change because it would not alter the outputs of goods and services from the matrix lands during this planning period.
- The PCGP project would affect a very small portion of LSR 223 in the Umpqua National Forest. The clearing for the construction right-of-way where most impacts would occur is approximately 70 acres of the more than 375,000 acres of LSR in the Umpqua National Forest, or about 0.02 percent of the LSR land allocation in the Umpqua National Forest.

For these reasons, the proposed amendment would not have an important effect on the entire land management plan or affect land resources throughout a large portion of the planning area.

2.3.2 Rogue River National Forest

The Rogue River National Forest LRMP, as amended, serves as the single land management plan for the Rogue River National Forest (USDA Forest Service, Rogue River National Forest LRMP 1990). The amendments to the Rogue River National Forest LRMP include the NWFP and the inclusion of LSRs (see section 1.2.3 above). The Rogue River NF LRMP is available at http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5315100. The proposed PCGP project would cross approximately 13.7 miles of the Rogue River National Forest and, if constructed, would directly affect (corridor plus TEWAs and UCSAs) approximately 279.5 acres of LSR 227. A map of the proposed project and LSR 227 in the Rogue River National Forest is displayed in figure 2.3-8.

Figure 2.3-8. Map of Proposed PCGP Project and LSR in the Rogue River National Forest



2.3.2.1 Mapped LSR 227 in the Rogue River National Forest

Summary from LSRA

The South Cascades LSRA (USDA and USDI 1998a) area is located in a network of southwest Oregon LSRs. The LSRA includes lands administered by the following jurisdictions: the Rogue River, Winema, Umpqua, and Willamette National Forests and the Butte Falls, Mt. Scott, and South Valley Resource Areas of the Medford, Roseburg, and Eugene Districts of the BLM. The assessment area includes about 721,000 acres in the following LSRs: 222, 224, 225, 226, and 227.

The South Cascades LSRs are part of a regional network designed in association with other land allocations (riparian reserves, National Parks, Wildernesses, botanical areas, etc.) to provide functional late seral habitat, including long-term dispersal and migratory pathways. From a regional perspective, the south Cascades provide a link and are a north-south transition area between the Sierra Nevada of northern California and the northern Cascade Range of Oregon and Washington. The Siskiyou Mountains run generally east-west and provide connectivity between the coastal and inland south Cascade areas. The Columbia and Klamath Rivers, the only major rivers that significantly breach the Cascade and Coast ranges, allow mixing of inland and coastal species and genetic varieties. These links allow movement of species and genetic material north and south and east and west in response to changes in climate such as occurred during the ice ages and the xerothermic period. These links are still important in the evolutionary process and health of the Pacific Northwest flora and fauna.

The habitat within the South Cascades LSRs serves as source areas for spotted owls and other late-successional and old growth–dependent species. Since species depend on habitat, a variety of habitats present over time and space provides for a broad range of species, including rare and sensitive species and those associated with late-seral stages. Successional and disturbance processes have provided a varied seral-stage mix and a functional landscape pattern. However, the effects of fire, the most influential process, have been altered and will likely continue to be modified well into the future.

The eastern portion of LSR 227 contains many acres of relatively recent volcanic flows in which the soils are not developed well enough to support late seral forests. The amount of interior late seral habitat also decreases as one moves south and east through the LSR network (i.e., fragmentation is greater). LSR 227 contains approximately 101,600 acres, of which approximately 16,250 acres (16 percent) is in late seral, 39 percent is in mid seral, 32 percent is in early seral, and approximately 13 percent is in areas not capable of supporting late seral forests. Previous work on the Regional Ecological Assessment Program (REAP) suggests that the historical functional range is between 45 and 75 percent late seral conditions.

Changes Since LSRA Was Written

Two wildfires totaling approximately 294 acres—the Little Butte and the Fish Lake fires—have occurred in LSR 227 in the Rogue River National Forest since the LSRA was written in 1998. Existing roads total approximately 238 miles, with 70 miles of road being decommissioned. Vegetation management has included approximately 540 acres of pre-commercial thinning, 27

acres of meadow restoration, aspen restoration, invasive plant treatments, and a 207-acre commercial thinning timber sale (Big Bad Elk).[13]

Using the most recent GIS data from the latest Northwest Forest Plan Monitoring Report on LSOG forest (Mouer et. al. 2011), the current estimate of LSOG forest in LSR 227 is 30,404 acres. This is more than the 16,250 acres of late-seral forest estimated when the LSRA was written. However, because the two estimates were derived using definitions and different data bases a direct comparison cannot be made.

Agency Recommendations

Because little has changed in the conditions of the LSR, there would be no changes in the recommendations or priorities for management activities in the LSRA[14].

2.3.2.2 Relationship of Unmapped LSR and the PCGP Project in the Rogue River National Forest

There is no MAMU habitat in the Rogue River National Forest due to its distance from the ocean. The map in figure 2.3-8 demonstrates the lands that would be affected by the proposed project are all within mapped LSR 227. Therefore, the proposed project would not alter any unmapped LSR in the Rogue River National Forest.

2.3.2.3 Proposed LRMP Amendments and Mitigation Actions Relevant to LSR 227

LRMP Amendment

The Forest Service proposes to amend the Rogue River National Forest LRMP as follows:

<u>RRNF-7, Reallocation of Matrix Lands to Late Successional Reserves</u>

The Rogue River National Forest LRMP would be amended to change the designation of approximately 512 acres from the matrix land allocation to the LSR land allocation in Section 32, T.36 S., R. 4 E., W. M., Oregon.

This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 227 in the Rogue River National Forest. The amendment would change future management direction for the lands reallocated from matrix to LSR. A map of the proposed reallocation is displayed in figure 2.3-9.

Mitigation Actions

The lands in the Rogue River National Forest that would be affected by the proposed project are all within LSR 227. The primary objectives for the off-site mitigation actions are to accelerate the development of LSOG forest habitat in LSR 227 through snag creation, woody debris placement, and density management, and to reduce LSOG forest habitat fragmentation through road decommissioning.

[13] Personal communications with Wes Yamamoto, Forest Service PCGP project coordinator, and Jeff Von Kienast
[14] Personal communications with Wes Yamamoto, Forest Service PCGP project coordinator

The primary mitigation action for the effects of the proposed pipeline on LSR 227 would be to replace the acres in LSR 227 that would be affected by the pipeline with additional acres of LSOG forest habitat that are currently outside of the LSR. The additional off-site mitigation actions proposed are consistent with the recommendations in the LSRA for LSR 227. These off-site mitigation actions would accelerate the development of LSOG forest habitat elements to further offset the effects of the PCGP project on LSR 227 in the long run. The additional off-site mitigation actions would also increase the effectiveness of the additional LSOG forest habitat added to LSR 227 by improving the quantity, quality, and distribution of high-quality habitat. Figure 2.3-10 displays where the proposed off-site mitigation actions would occur.

Figure 2.3-9. Map of Proposed Matrix Reallocated to LSR in the Rogue River National Forest

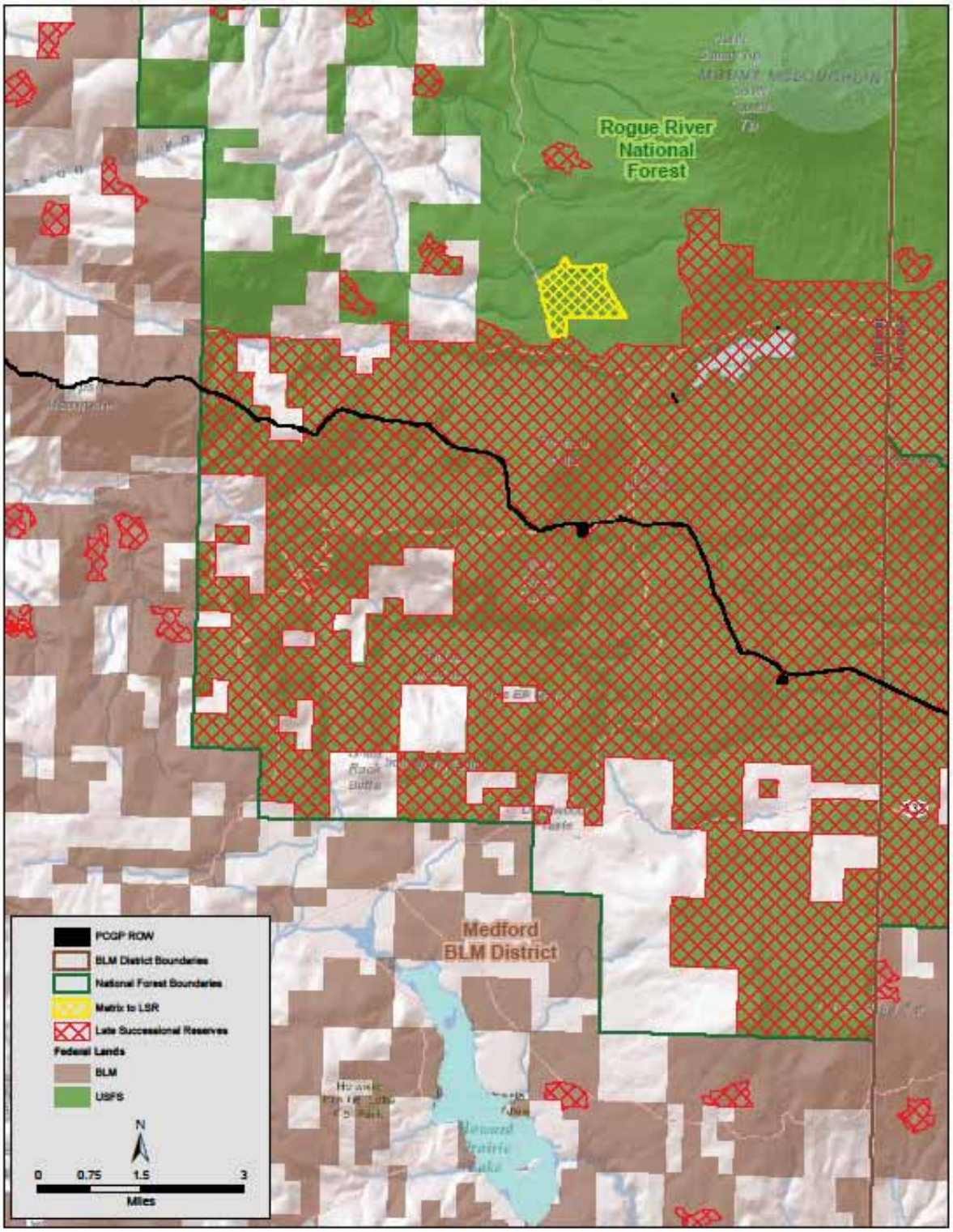
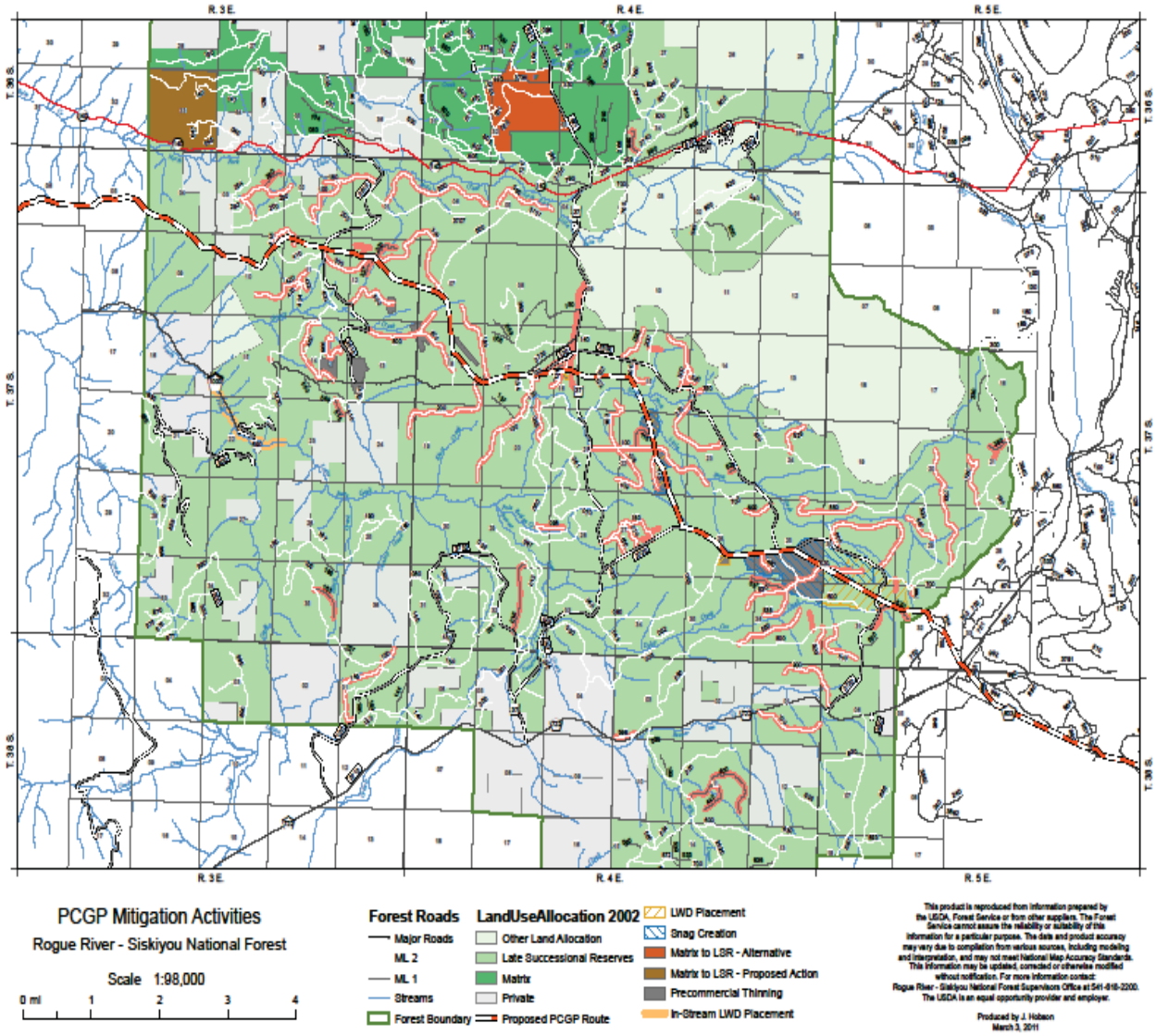


Figure 2.3-10. Proposed Off-site Mitigation Actions in the Rogue River National Forest



2.3.2.4 Impacts Related to Proposed Amendments and Mitigation Actions Relevant to LSR 227

LRMP Amendment

<u>RRNF 7, Reallocation of Matrix Lands to LSR 227</u>

In the Rogue River National Forest, the proposed project would lie entirely within LSR 227. Currently, based on the latest Forest Service GIS data there are approximately 30,404 acres of LSOG forest habitat which comprises approximately 30 percent of LSR 227. If constructed, the portion of the project on the Rogue River National Forest would be about 13.7 miles long and would clear approximately 209 acres of forest vegetation in LSR 227, of which approximately 56 acres are LSOG forest. The matrix area proposed for reallocation to LSR is approximately 512

acres, of which approximately 333 acres are LSOG forest (see figure 2.3-9). This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 227 in the Rogue River National Forest. When acres reallocated from matrix to LSR are compared to the acres of LSR that would be cleared by the PCGP project, the proposed amendment would reallocate about 2-1/2 more acres to LSR than would be cleared in the project corridor. When comparing acres of LSOG habitat, the proposed amendment would reallocate about 6 times more acres of LSOG habitat than would be cleared by the project (see table 2.3.2.4-1 and figure 2.3-11 below).

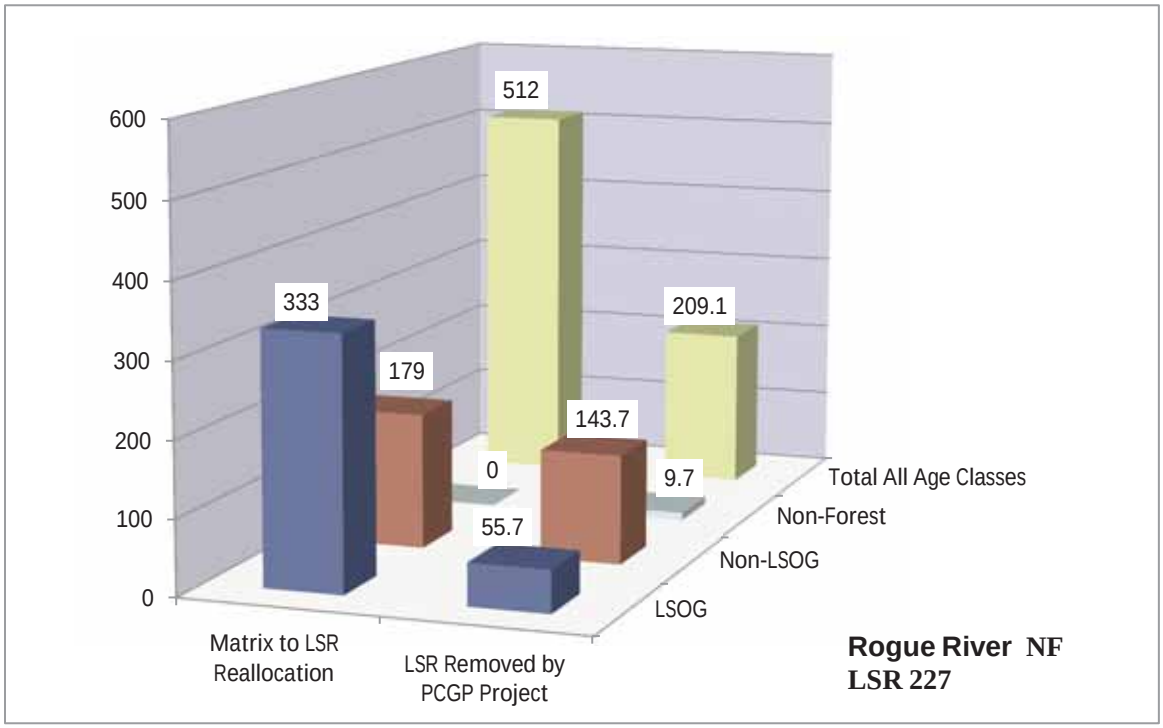
TABLE 2.3.2.4-1

Comparison of LSR Acres Cleared a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Rogue River National Forest LSR 227	LSOG	Non-LSOG	Non-Forest	Total All Age Classes
Matrix to LSR Reallocation	333	179	0	**512**
LSR Cleared by PCGP Project	55.7	143.7	9.7	**209.1**

a/ Acres cleared include corridor clearing and TEWAs.
Data source: BLM, USFS GIS data layers, Cox 2010

Figure 2.3-11. Comparison of LSR Acres Cleared by the PCGP Project and Acres of Matrix Reallocated to LSR



In addition to the impacts from the removal of forest vegetation in LSR 227, there would be additional impacts from the acres modified by UCSAs and the acres indirectly affected through the creation of new edges and fragmentation of older forest. A comparison of the total acres affected in LSR 227 and the acres that would be reallocated are displayed in table 2.3.2.4-2 and figure 2.3-12 below.

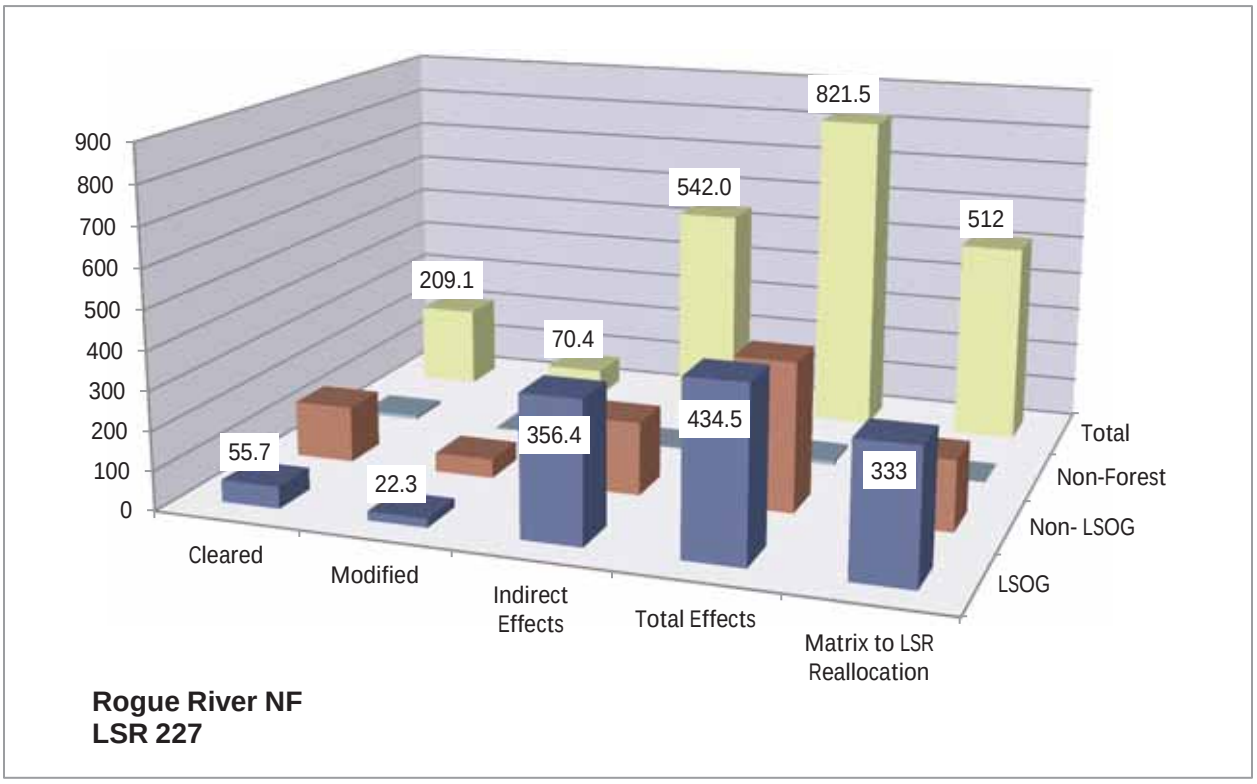
TABLE 2.3.2.4-2

Comparison of Total LSR Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Rogue River National Forest LSR 227	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	55.7	22.3	356.4	434.5	333
Non- LSOG	143.7	48.1	185,5	377.3	179
Non-Forest	9.7	0.0	0.0	9.7	0
Total	**209.1**	**70.4**	**542.0**	**821.5**	**512**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS Data Layers, Cox 2010

Figure 2.3-12. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



In addition to the impacts of the PCGP corridor there are also potential off-site impacts to LSR 227 from road reconstruction that would be necessary to accommodate the trucks that would be hauling the sections of pipe. These trucks are longer than typical trucks that use forest roads and some road widening and curve realignment may be necessary to safely allow for this truck traffic. It is estimated that approximately four acres of road widening would occur within LSR 227. Although this road widening would occur to the extent possible within the existing clearing limits it is probable that some additional clearing of forest vegetation would be necessary to accommodate the road reconstruction. It is estimated that this would be a maximum of four acres and would occur along an existing road opening.

Impact on the Functionality of LSR 227 on the Rogue River National Forest

The functionality of LSR 227 relates directly to the goals and objectives for LSRs (see section 1.2.2) and can be measured by the quantity, quality and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 227 on the Rogue River National Forest would increase with the proposed LRMP amendment. The PCGP project would remove approximately 56 acres of LSOG habitat but the reallocation would add 333 acres of LSOG habitat for a net increase of 277 acres. This would increase the current level of LSOG habitat in LSR 227 from 30,404 acres to 30,681 acres or by approximately 0.9 percent.

- Quality: The area proposed for reallocation to LSR 227 contains some large blocks of LSOG habitat. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat the quality of the LSOG habitat within LSR 227 would be slightly improved.

- Distribution: The distribution of LSOG habitat within LSR 227 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR LRMP amendment. To the extent there are minor changes they would be beneficial due to the location of the proposed reallocation. The reallocation would occur on the north end of the LSR providing for some additional connectivity with the nearest LSRs to the north.

- The off-site mitigation would improve the quantity, quality and distribution of LSOG habitat in LSR 227 by accelerating the development of constituent elements of late-successional habitat, reducing the risk of stand-replacing fire, and reducing fragmentation through road decommissioning and stand-density management.

The mitigation actions for LSR 227 in the Rogue River National Forest have been designed with the goal that the overall impact would be either neutral or beneficial to the creation and maintenance of late-successional habitat. These actions combined would maintain or improve the functionality of LSR 227.

Mitigation Actions

Road Decommissioning (53.2 miles)

Although the proposed PCGP project has been routed to avoid LSOG forest as much as possible, it would create edge effects that may affect interior stand microclimates and cause habitat fragmentation within LSR 227 that cannot be avoided. Edge is the effect of an opening on microclimate in adjacent stands (Chen, Franklin et al. 1993). Edge effects introduced by roads are highly variable and depend on aspect, road width, vegetation crossed, and other variables. Edge effects are greatest when there is a high contrast in structure and composition between a newly created opening and the adjacent landscape (Harper, Macdonald et al. 2005. p. 768). Thus, edge effects are greatest when they affect interior stand habitats of older trees and least when the new opening is similar to the surrounding landscape, such as when it is adjacent to an existing road or in a recent clearcut.

Decommissioning roads with appropriate restoration measures would presumably reverse edge effects and habitat fragmentation caused by existing roads and create habitat for a variety of animals (Switalski, Bissonette et al. 2004). By discouraging vehicular access, road decommissioning also eliminates disturbance (noise, presence, etc.) caused by human intrusion. This potentially benefits nesting behavior in particular for the NSO. The effect of edge reduction by road decommissioning is highly variable for the same reasons described for the edge effects created by constructing a road. Agency field experience has shown that road decommissioning reduces edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with the density management proposed for adjacent plantations would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years as planted trees became pole sized (5 to 9 inches dbh and 20 to 40 feet tall). Published data on the rate and pattern of edge reduction associated with decommissioning roads are not available (Baker 2011), but a comparison of the predicted beneficial effect of road decommissioning on edge effects associated with the PCGP project is useful, even if it is based on assumptions.[15] Using an assumed edge reduction over time of 50 feet on each side of the road, decommissioning roads would reduce existing road-related edge effects on an estimated 645 acres (53.2*5280*100/43560).

Linear edge provides another measurement of edge effect. Approximately 13.6 miles of the proposed PCGP project would be located within LSR 227, creating 27.2 miles of new edge within LSR 227. Proposed road decommissioning would revegetate 53.2 miles of roads, removing approximately 106.4 miles of existing edge over time. Fragmentation in the context of impacts on the LSR land allocation is the process of reducing the size and connectivity of stands that compose a forest. The conversion of large tracts of old-growth forest to small, isolated forest patches with large edge areas can create changes in microclimate, vegetation species, and predator-prey dynamics.

To provide an indication of the effects of the proposed PCPG corridor and proposed road decommissioning on fragmentation, the Forest Service conducted a stand-level analysis, considering stands that fall within 100 meters of the proposed pipeline corridor (USDA Forest Service, Rogue River National Forest 2010). All stands that overlapped the 100-meter buffer were included in the analysis out to the stand edges beyond the buffer. The only changes examined in this analysis were natural growth and development of trees and the off-site mitigation activities. Natural events, such as wildfire and storms, were not modeled because of their stochastic nature and the relatively limited size of the analysis area. Within the modeled stands, it was assumed that there would be no forest management harvest activities during the 60 years modeled beyond activities already planned. Future management activities would need to be consistent with the LRMP in effect at the time the project is implemented.

Construction of the pipeline would result in the fragmentation of LSOG forest in LSR 227 and would increase the fragmentation index (ratio of edge to acres) in modeled stands (those within 100 meters of the pipeline) by about 1 percent.[16] After 60 years, normal stand growth would reduce this ratio by about 3 percent. With implementation of proposed road decommissioning, the ratio of edge acres would decrease by about 34 percent. A decrease in the ratio of edge to

[15] This approach is consistent with CEQ Regulations for NEPA, 40 CFR 1508.22

[16] Changes in edge:area ratios are more meaningful as relative numbers rather than absolute values, so percentages are used to express changes in values.

opening means that patch sizes of forested areas have increased. LSR 227 currently has 1,445 patches of mature forest greater than 1 acre in size that lie within 100 meters of the edge of the proposed PCGP project corridor. Project construction would increase fragmentation by passing through and dividing some of these patches, with a net increase of five patches. The current average patch size throughout the LSR is about 7 acres, which is not projected to change within the next 60 years. With the proposed road decommissioning and road closures, the size of patches within 100 meters of the proposed pipeline would increase to an average of 14.5 acres within 60 years. This would be consistent with a reduction in the edge to opening ratio discussed above.

In terms of interior patches (LSOG areas that are at least one acre in size and at least 300 feet from a hard edge), there are currently 779 interior patches in LSR 227. Eight of these (about 1 percent of the interior patches) would be fragmented by the pipeline corridor. In 60 years, interior patches are projected to increase to 856 interior patches, a 9 percent increase from the current condition. With the proposed road decommissioning, the number of interior patches would increase by about 16 percent to 927, and the average size of the patches would increase from about 6.5 acres to 13.9 acres, an increase in size of over 100 percent.

There are approximately 233 miles of road in LSR 227. The proposed road decommissioning would create a 23 percent reduction in road mileage in this LSR. Current road density in LSR 227 is about 3.3 miles per square mile. With the proposed road decommissioning, it would be reduced to about 2.5 miles per square mile. Reductions in road density that would occur within ¼, ½, and 1 mile of the pipeline corridor are shown in the table 2.3.2.4-3 below.

TABLE 2.3.2.4-3

Reductions in Road Density within 1/4 and 1/2 and 1 mile of PCGP Corridor

Road Density	Existing Road Density (miles/square mile)	With Road Decommissioning (miles/square mile)
LSR 227	3.3	2.5
Within ¼ mile of pipeline	3.9	1.7
Within ½ mile of pipeline	4.1	1.7
Within 1 mile of pipeline	4.2	2.5

Stand-Density Management (600 Acres)

Pre-commercial thinning is proposed for overstocked plantations to accelerate the development of late-successional and old-growth forest characteristics in LSR 227. Managing stand density would increase growth rates, decrease susceptibility to stand-replacing fire, and diversify stand structure in otherwise relatively homogenous stands. This accelerated development would also reduce fragmentation and edge effects and would help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused disturbances. All 600 acres are within 0.5 mile of the pipeline right-of-way. Placing the off-site mitigation activities close to the actual pipeline corridor would increase their effectiveness by affecting lands within, or near, the home ranges of individual animals and species affected by the pipeline habitat changes. As the mitigation actions address ecological processes like edge effects, placing the mitigation within or near the edge impacts increases the effectiveness of the mitigation by restoring ecosystem structures and processes on some of the acres also affected by the pipeline. Thinning young stands would, over time, reduce existing edge effects. There is no precise way

to estimate the edge effect reduction with available data since stands have many different age classes, perimeters, and canopy closures. The estimated perimeter of the units proposed for thinning is approximately 3.0 miles. Assuming some edge reduction within 100 feet of the edge of these units, density management would reduce edge effects over time by an estimated 36 acres (3*5280*100/43560).

Fuels treatments for the slash generated by stand-density management are decided on a case-by-case basis and rely on slash loading information as well as proximity to roads and other factors. Slash treatments may be as simple as "lop and scatter" (cutting slash into smaller pieces and scattering) to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling and burning, jackpot or underburning, or removal of slash from the site for biomass energy or other uses.

Snag Creation (600 acres)

Snag creation is proposed as a mitigation action to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags would be lost from the pipeline corridor to facilitate pipeline construction or to mitigate safety hazards for construction workers.

Approximately 1,200 snags would be created by blasting tops from live trees (preferably trees with existing decay, which makes them more suitable for cavity-nesting birds and/or as denning sites),by inoculating living trees with heart rot decay fungi, or by other methods. Sites selected for snag creation would be within ½ mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the pipeline corridor. Sites would be in mid-successional stands or around the edges of early successional stands that are currently deficient in snags as defined by the LRSA (USDA and USDI 1998a). Stand data for the plant associations in this area (which is an indication of undisturbed forest snag levels) shows these stands have an average of about four snags per acre in the 11- to 20-inch-diameter range, and an additional four snags per acre greater than 20 inches in diameter.

If the tree diameters in the stands prevent snag creation in the > 20-inch-diameter size class, additional snags in the smaller size class (11- to 20-inch-diameter) would be created to make up for the deficit. For sites bordering early successional stands, snags would be created within 100 yards of the stand boundary at the same trees per acre levels described above.

Large Woody Debris (LWD) Placement in Plantations

Large wood placement in plantations is proposed to accelerate the development of LSOG forest characteristics by restoring this habitat component to plantations where LWD is lacking. Any wood used in this mitigation would come from the PCGP project corridor. No additional trees outside the corridor would be harvested to provide large woody debris, so this mitigation is necessarily limited by the amount of LWD that can be provided from the corridor. LWD used in this mitigation would be staged at appropriate locations and placed with a helicopter.

The first priority in restoration with respect to LWD would be to ensure that that the PCGP project itself meets LRMP standards after construction is completed. After LWD standards within the corridor have been met, any additional LWD would be available for placement in the adjacent units identified below.

Large wood would be placed in plantations that are also receiving stand-density management treatment. The large wood would be from trees cut from the pipeline corridor. Sites selected for downed woody material placement would be within ½ mile of the pipeline right-of-way. As with the other off-site mitigation actions, placement of the mitigation activities close to the pipeline corridor can benefit species that are affected by the vegetation changes within the corridor and would make these mitigation actions more effective. Sites would be in early successional stands that are currently deficient in downed wood.

The large wood placement piece count per acre is expected to vary to account for some of the range in variability found across the landscape. For 11- to 20-inch-diameter logs, treatments would average about 10 pieces on each treated acre but densities would vary from 8 to 33 logs per acre. For 20-inch plus-diameter logs, an average of 5 pieces would be placed on each treated acre, but densities would vary from 3 to 12 logs per acre. Logs would be approximately 40 feet in length, and the specified diameter (11- to 20-inch and 20-inch plus) refers to the stem diameter at the midpoint of a 40-foot log.

Comparison of Total Direct and Indirect Effects of the PCGP Project and the Beneficial Effects of Off-site Mitigation Actions on Edge

Acres of direct and indirect effects of the PCGP project and the acres of direct and indirect effects of various mitigation actions as related to a reduction in edge effects are shown in table 2.3.2.4-4. For the purposes of this comparison, indirect effects of the PCGP project are modeled by the age class of vegetation and an associated estimate of edge effects. Since there is no precise method for predicting indirect effects, the following assumptions were used.

- Indirect effects for LSOG habitat are estimated to extend 100 meters from the cleared edge on each side of the corridor.
- Indirect effects for non-LSOG habitat are estimated to extend 30 meters from the cleared edge on each side of the corridor.
- No indirect effects are estimated for non-forested areas since there would be no new edge created.
- Direct effects of road decommissioning are estimated from the revegetation of an average road prism of 20 feet.
- Indirect effects of road decommissioning are estimated to extend 50 feet on each side of the decommissioned road in all vegetation classes.
- The indirect effect of stand-density management is estimated to extend 100 feet from the perimeter of the unit in all vegetation classes.
- Indirect effects of other mitigation actions are not considered to reduce edge in this comparison.

Using these assumptions, combined direct and indirect effects of the project and proposed mitigation actions are shown in table 2.3.2.4-4 and figure 2.3-13 below.

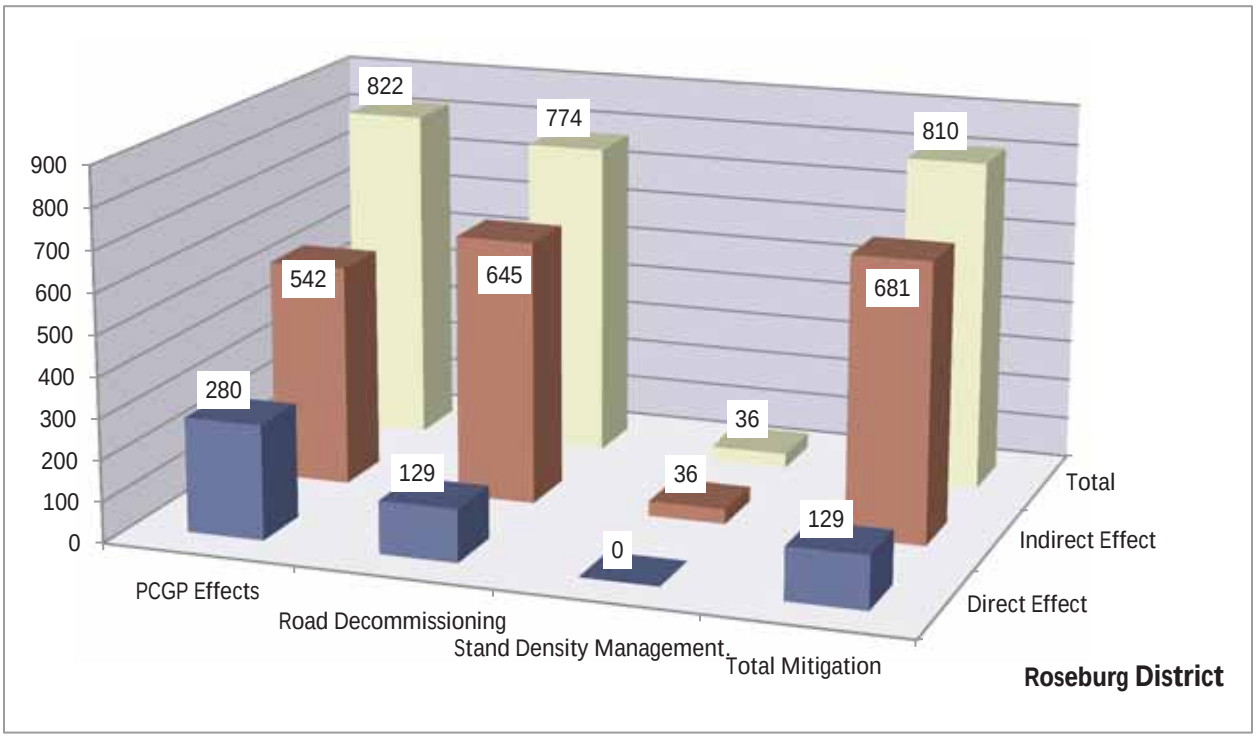
TABLE 2.3.2.4-4

Comparison of Total PCGP Project Impacts a/ on LSR 227 and Estimated Edge Reduction Effect b/ of Proposed Off-site Mitigation Actions (acres)

Rogue River National Forest (LSR 227)	Direct Effect	Indirect Effect	Total
		Total PCGP Project Impacts on LSR 227	
PCGP Effects	280	542	822
		Proposed Off-site Mitigation	
Road Decommissioning	129	645	774
Stand-Density Management.	0	36	36
Total Mitigation	129	681	810

a/ PCGP project direct effects include corridor clearing, TEWAs, and UCSAs. Indirect effects include 100 meters on each side of corridor edge in LSOG and 30 meters on each side of corridor edge in non-LSOG
b/ Direct edge reduction effects include acres of decommissioned road revegetated (53.2*5280*20/43560) and indirect effects include 50 feet on each side of decommissioned roads and 100 feet along the perimeter of stand-density treatments.
Data source: BLM, USFS GIS data layers, Hobson 2010

Figure 2.3-13. Comparison of Total PCGP Project Impacts on LSR 227 and Estimated Edge Reduction Effect of Proposed Off-site Mitigation Actions (acres)



2.3.2.5 Evaluation of the Proposed Amendment and Mitigation Actions in Relation to the Goals and Objectives of the LRMP for the Rogue River National Forest

The proposed amendment would reduce the matrix land allocation in the Rogue River National Forest by 512 acres, from 191,839 acres to 191,244 acres or by 0.27 percent. It would increase the total LSR land allocation in the Rogue River National Forest by 512 acres, from 187,745 acres to 188,257 acres or by 0.27 percent. This amendment would increase LSR 227 by 512 acres, from 54,300 acres to 54,812 acres or by 0.94 percent.

This proposed change would affect 512 acres for the life of the current planning cycle. Peripheral habitat connectivity with adjacent habitats would be improved on the perimeter of the addition.

This amendment would not alter the long term multiple use goals and objectives of the Rogue River National Forest LRMP as amended for LSRs for the following reasons:

- The quantity, quality, and distribution of LSOG habitat in LSR 227 would be either maintained or improved with the proposed reallocation of matrix to LSR LRMP amendment (see discussion in section 2.4.1.4 *Impact on the Functionality of LSR 227 on the Rogue River National Forest* above).

- An extensive off-site mitigation plan was developed by the Forest Service and adopted by the PCGP project applicant for the construction of the pipeline to ensure that the goals and objectives of the LRMP related to LSRs would still be achievable. The off-site mitigation actions have been specifically designed to offset the adverse impacts of the PCGP project. Mitigation actions include (1) closing and decommissioning 53 miles of roads, which would help consolidate interior stand habitat and reduce fragmentation to achieve long-term objectives for LSR 227; (2) 600 acres of pre-commercial thinning of young stands, which would reduce fragmentation and accelerate the development of LSOG forest habitat conditions; (3) placing LWD on approximately 600 acres in existing harvest units that are low in LWD to provide this constituent element of LSOG forest habitat; and (4) creating snags on approximately 600 acres that are currently below desired snag levels for LSRs.

All of these actions would be consistent with the goals of the LSR land allocation to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG-related species and with the recommendations in the LSRA for LSR 227.

This amendment would not change any existing standards and guidelines in the LRMP. If the LRMP is amended, these 512 acres would be administered as LSR in the future. Moving 512 acres from matrix to LSR would not alter attainment of the long-term balance of goods and services for the Rogue River National Forest for the following reasons:

- The proposed amendment would not affect LSR outputs because it would not stop any existing or planned project. If it would not stop or affect any management activity designed to benefit the LSR or meet other management direction, then it is not likely that the proposed amendment would affect the multiple use balance of the LRMP.

- An evaluation of the proposed change to matrix land was conducted by staff of the Rogue River NF (USDA Forest Service 2009). The evaluation concluded that the small change in matrix would not warrant a change in the Forests' Probable Sale Quantity (PSQ). The evaluation noted the Forests' PSQ would not be affected between now and the time that the Rogue River National Forest LRMP is revised because the forest has the capacity to maintain PSQ without the acres of matrix lands that are being reallocated to LSR. As a practical matter, if a linear relationship between acres and outputs is assumed, the potential effect would be approximately three tenths of one percent of the Forest's PSQ since this amendment would affect approximately three tenths of one percent of the

Forest matrix land base. This amendment would not prevent future vegetation management activities such as thinning that would benefit LSRs and also contribute to the local forest products industry.

The following evaluates the effects of the proposed amendment on the entire land management plan or land resources throughout a large portion of the planning area:

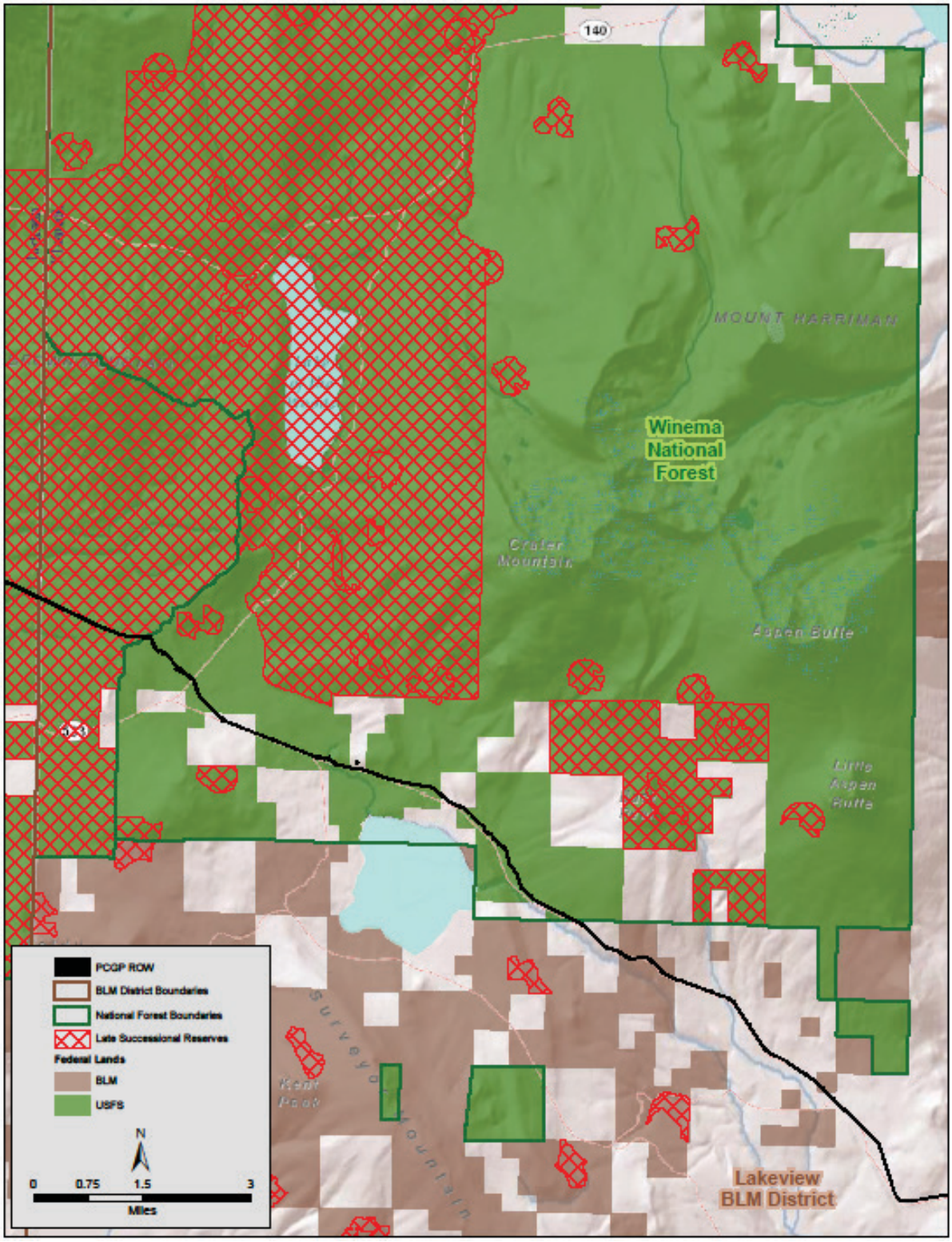
- Reducing the matrix land allocation of 191,839 acres by 512 acres or 0.3 percent would not be an important change because it would not alter the outputs of goods and services from the matrix lands during this planning period.
- The PCGP project would affect a very small portion of LSRs in the Rogue River National Forest. The construction right-of-way where most impacts would occur is approximately 209 acres of the 187,000 plus acres of LSR on the Rogue River National Forest. This is about 0.1 percent of the LSRs in the Rogue River National Forest.

For these reasons, the proposed amendment would not have an important effect on the entire land management plan or affect land resources throughout a large portion of the planning area.

2.3.3 Winema National Forest

There is no MAMU habitat in the Winema National Forest due to its distance from the ocean. The map in figure 2.3-14 demonstrates that all of the mapped LSRs as well as all KOACs would not be affected by the proposed PCGP project. Therefore, the proposed project does not alter any mapped or unmapped LSR in the Winema River National Forest.

Figure 2.3-14. Map of Proposed PCGP in the Winema National Forest



2.4 AGGREGATED LSR AMENDMENTS AND OFF-SITE MITIGATION

All combined, there is a total of seven proposed management plan amendments that would affect LSRs across two BLM districts and two Forest Service national forests to accommodate construction of the PCGP project. Table 2.4-1 summarizes the proposed amendments.

TABLE 2.4-1

Summary of Proposed BLM RMP and Forest Service LRMP Amendments

BLM/Forest Service Management Unit	Reallocate Matrix Land to LSR a/	Exemption from Requirement to Protect MAMU Habitat b/	Exemption from Requirement to Retain Habitat in KOACs c/
BLM Coos Bay District	Proposal to reallocate 387 acres of matrix Land to LSR 261	Proposal to waive requirement on twelve occupied MAMU stands	None
BLM Roseburg District	Proposal to reallocate 409 acres of matrix Land to LSR 259	Proposal to waive requirement on two occupied MAMU stands	Proposal to waive requirement on three KOACs
Forest Service Umpqua National Forest	Proposal to reallocate 588 acres of matrix land to LSR 223	None	None
Forest Service Rogue River National Forest	Proposal to reallocate 512 acres of matrix land to LSR 227	None	None

a/ Reallocated acres would become part of mapped LSRs.
b/ Occupied MAMU stands outside of mapped LSRs are designated as un-mapped LSRs.
c/ All KOACs are outside of mapped LSRs and are designated as un-mapped LSRs.

The total amount of LSR acres affected by the PCGP project directly and indirectly across all BLM and Forest Service lands is displayed in table 2.4-2 and figure 2.4-1.

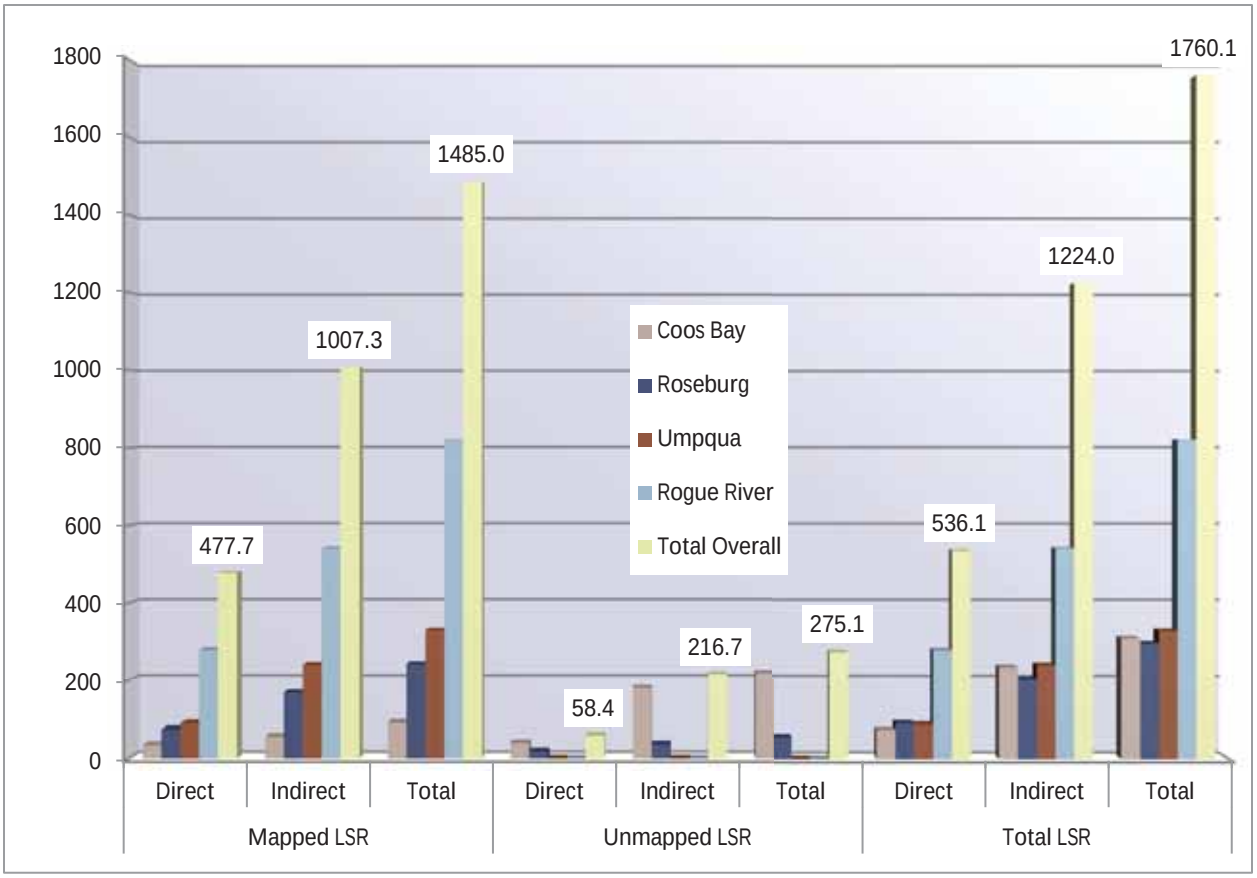
TABLE 2.4-2

Summary of Total LSR Acres Directly and Indirectly Affected a/ by PCGP Project

	Mapped LSR			Unmapped LSR		
Management Unit	**Direct**	**Indirect**	**Total**	**Direct**	**Indirect**	**Total**
BLM Districts						
Coos Bay	34.8	56.1	90.9	39.9	180.0	219.9
Roseburg	74.4	168.1	242.5	18.5	36.7	55.2
Total BLM	**109.2**	**224.2**	**333.4**	**58.4**	**216.7**	**275.1**
Forest Service National Forests						
Umpqua	89.9	241.1	330.1	0.0	0.0	0.0
Rogue River	279.5	542.0	821.5	0.0	0.0	0.0
Total USFS	**368.5**	**783.1**	**1151.6**	**0.0**	**0.0**	**0.0**
Total Overall	**477.7**	**1007.3**	**1485.0**	**58.4**	**216.7**	**275.1**

a/ PCGP total impacts include direct impacts (acres cleared in corridor and TEWAs, and UCSAs), and acres indirectly affected (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS data layers

Figure 2.4-1. Summary of Total LSR Acres Directly and Indirectly Affected the PCGP Project



Un-mapped LSRs for the most part were avoided with the routing of the proposed PCGP project due to their smaller size and greater dispersal except for BLM Coos Bay District, where numerous occupied MAMU stands are concentrated in the area of the proposed route (see figure 2.2-3). Mapped LSRs would be affected the most on Forest Service lands where the proposed route is in the general vicinity of large LSR areas, especially in the Rogue River National Forest (see figures 2.3-1 and 2.3-8).

In addition to the proposed amendments that reallocate matrix lands to LSR, numerous off-site mitigation actions have been proposed and designed with the goal that the overall impacts to LSRs on both BLM and Forest Service lands would be neutral or beneficial to the creation and maintenance of late-successional habitat. The off-site mitigation actions help create or maintain LSOG habitat within LSR by enhancing or accelerating development of late-successional habitat (thinning, placing large wood, creating snags, etc.), and by reallocating LSOG habitat within matrix lands to LSR. Off-site mitigation actions include fire hazard reduction, road decommissioning, stand-density management, coarse woody debris enhancement, and other treatments. Table 2.4-3 summarizes the proposed off-site mitigation actions for LSRs on BLM and Forest Service lands. Maps of the proposed off-site mitigation actions are displayed in figures 2.2-5, 2.2-27, 2.3-3, and 2.3-10.

TABLE 2.4-3

Summary of Proposed Off-site Mitigation Actions for LSR Impacts on BLM and Forest Service Lands

BLM/Forest Service Management Unit	Fire Hazard Reduction	Road Decommissioning	Stand-Density Management	Coarse Woody Debris Enhancement	Other Treatments
BLM Coos Bay District	Development of three heli-ponds				
BLM Roseburg District	Development of six dry hydrants		Fuel hazard reduction on 1000 acres		
Forest Service Umpqua National Forest		7.6 miles of road decommissioning	913 acres of stand-density management Fuel break treatments on 2,285 acres	Snag creation on 175 acres and LWD placement on 350 acres	80 acres of meadow restoration and 81 acres[a] of invasive plant treatment
Rogue River National Forest		53.2 miles of road decommissioning	Pre-commercial thinning of 600 acres	Snag creation and LWD placement on 600 acres	
Totals	**9 Sites**	**60.8 Miles**	**4,798 Acres**	**1,125 Acres**	**161 Acres**

a). Estimated acres based on 50 feet of treatment on each side of 6.7 miles of road (6.7*5280*100/43560)
Data source: BLM, Forest Service GIS Layers

2.4.1 Comparison of Total PCGP Project Impacts and Proposed Plan Amendments

Table 2.4.1-1 and figure 2.4-2 compare the total amount of LSR acres affected by the PCGP project with the total acres proposed for reallocation from matrix to LSR. In comparing the acres proposed for reallocation with the acres of LSR directly affected by the project (the acres cleared plus the acres modified by UCSAs), the ratio is approximately 4 to 1.

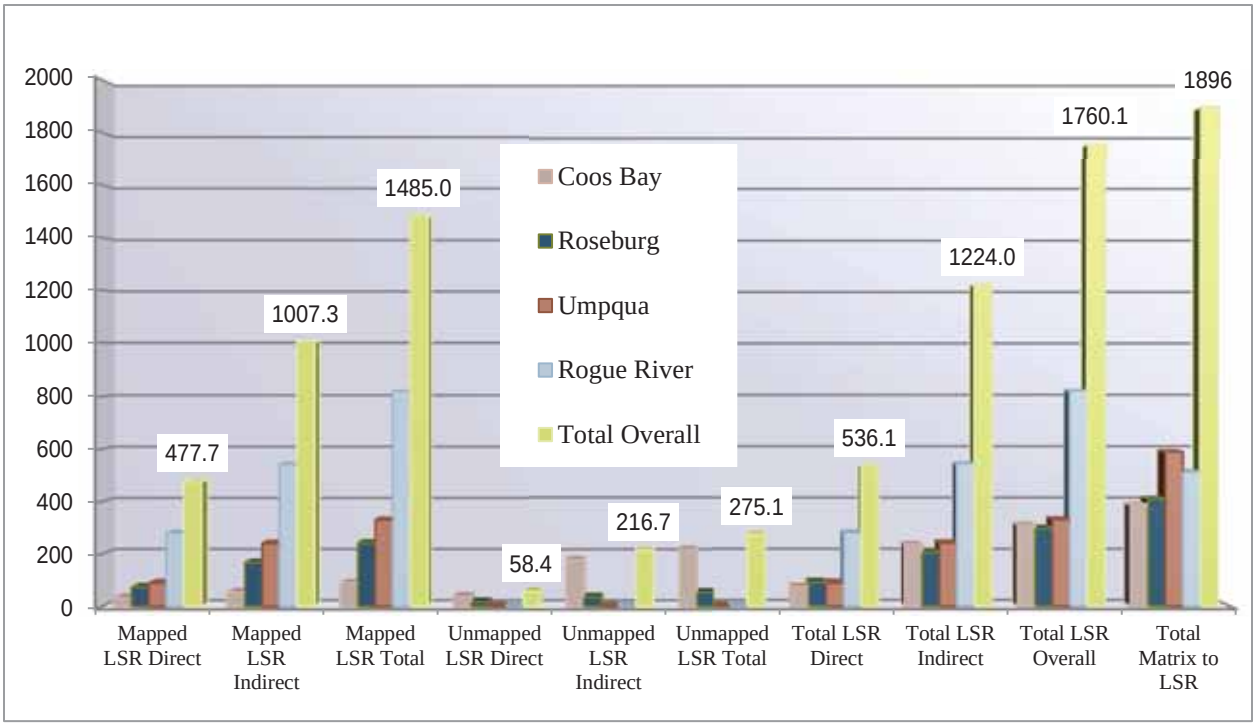
TABLE 2.4.1-1

Summary of the Total LSR Acres Affected Directly and Indirectlya/ by PCGP Project and Total Acres of Matrix Reallocated to LSR

	Mapped LSR			Unmapped LSR			Total LSR			Total
Unit	**Direct Effect**	**Indirect Effect**	**Total Effect**	**Direct Effect**	**Indirect Effect**	**Total Effect**	**Direct Effect**	**Indirect Effect**	**Overall Effect**	**Matrix to LSR**
BLM Districts										
Coos Bay	34.8	56.1	90.9	39.9	180.0	219.9	74.7	236.1	310.8	387
Roseburg	74.4	168.1	242.5	18.5	36.7	55.2	92.9	204.8	297.7	409
Total BLM	**109.2**	**224.2**	**333.4**	**58.4**	**216.7**	**275.1**	**167.6**	**440.9**	**608.5**	**796**
USFS National Forests										
Umpqua	89.0	241.1	330.1	0.0	0.0	0.0	89.0	241.1	330.1	588
Rogue River	279.5	542.0	821.5	0.0	0.0	0.0	279.5	542.0	821.5	512
Total Forest Service	**368.5**	**783.1**	**1151.6**	**0.0**	**0.0**	**0.0**	**368.5**	**783.1**	**1151.6**	**1100**
Total Overall	**477.7**	**1007.3**	**1485.0**	**58.4**	**216.7**	**275.1**	**536.1**	**1224.0**	**1760.1**	**1896**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS data layers, Cox 2010

Figure 2.4-2. Comparison of Total LSR Acres Affected by the PCGP Project and Total Acres of Matrix Reallocated to LSR



Comparing the matrix acres proposed for reallocation to LSR with the total LSR acres that would be directly and indirectly affected by the PCGP project, the ratio is slightly more than one to one. It should be noted however that a high percentage of the overall impact (slightly more than two-thirds) would be from the indirect effects of the project that would result from the creation of new edge and fragmentation of forested habitat. There is no precise way to measure the indirect impacts or compare them to the impacts of removing forest vegetation for the project. In considering the objectives of LSRs, a more important comparison is the overall impact the project would have on LSOG habitat with the amount of LSOG habitat that would be reallocated to LSRs (see table 2.4.1-2 and figure 2.4-3).

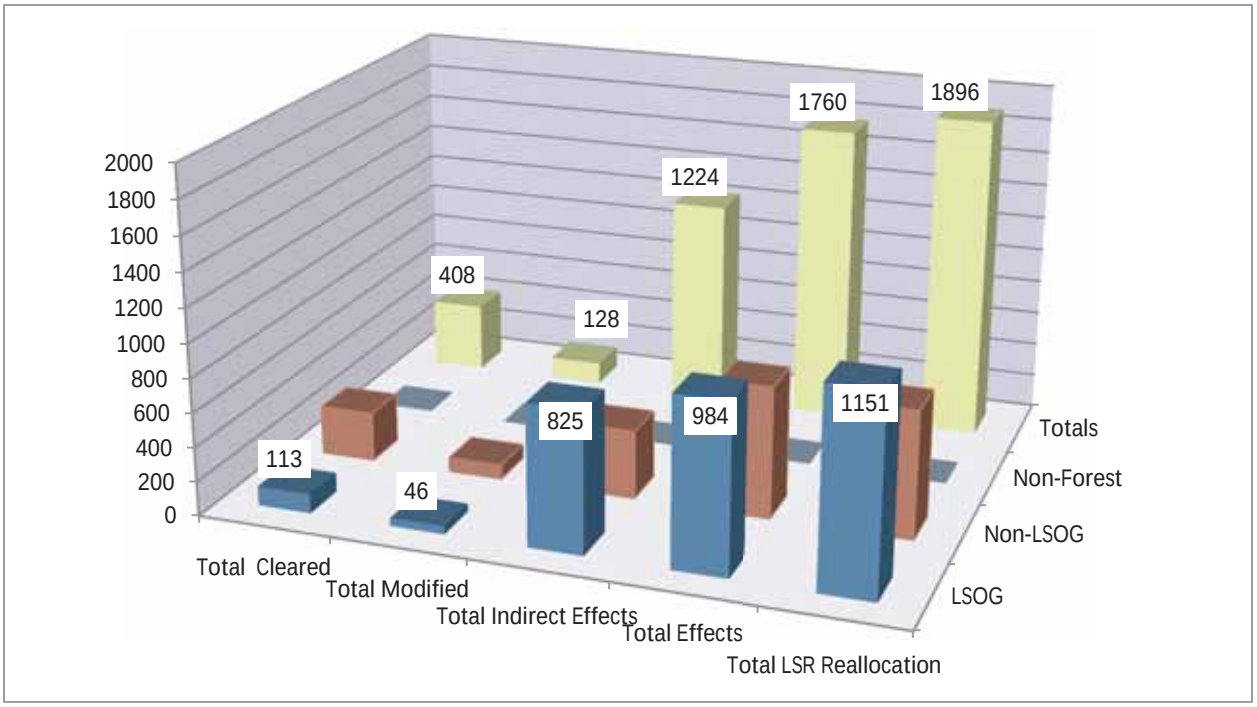
TABLE 2.4.1-2

Comparison of Total LSR Acres by Habitat Type Affected a/ by the PCGP Project and Total Acres of Matrix Reallocated to LSR

Habitat Type	Total Cleared	Total Modified	Total Indirect Effects	Total Effects	Total LSR Reallocation
LSOG	113	46	825	984	1151
Non-LSOG	286	82	399	766	743
Non-Forest	10	0	0	10	2
Totals	**408**	**128**	**1224**	**1760**	**1896**

a/ PCGP project impacts include (direct effects) cleared acres (corridor and TEWAs) and modified acres (UCSAs), and (indirect effects) 100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG.
Data source: BLM, Forest Service, GIS Layers, Cox 2010

Figure 2.4-3. Comparison of Total LSR Acres Affected by PCGP Project and Total Acres of Matrix Reallocated to LSR



In comparing the acres of LSOG habitat that would be reallocated to LSR with total amount of acres of LSOG habitat in LSRs that would be cleared by the PCGP project, the ratio would be approximately 10 to 1. This is due in part to the efforts to avoid LSOG habitat in the routing of the PCGP project and the efforts to identify larger blocks of LSOG habitat in the matrix areas proposed for reallocation.

Comparing the acres of LSOG habitat proposed for reallocation to LSR with the total LSR acres of LSOG habitat that would be directly and indirectly affected by the PCGP project, the ratio is approximately 1.2 to 1. It should be noted, however, that a high percentage (about 84 percent) of the overall impact on LSOG habitat would be from the indirect effects of the project on LSOG habitat that would result from the creation of new edge and fragmentation. There is no precise way to measure the indirect impacts on LSOG habitat or compare them to the impacts of removing LSOG habitat for the project. There are, however, measures that can be taken to reduce the impacts of edge and fragmentation over time. The proposed off-site mitigation actions include measures to reduce edge effects and fragmentation in the affected LSRs over time.

2.4.2 Comparison of Total PCGP Project Impacts and Off-site Mitigation Actions

A summary of the proposed off-site mitigation actions for LSRs on BLM and Forest Service lands is described in table 2.4-3 above. The mitigation actions are designed to accomplish two main objectives. The first objective is to enhance the development of LSOG habitat and its constituent elements. The second objective is to reduce the risk of losing LSOG habitat to intensive fires.

For the BLM lands, the focus of the mitigation actions would be to reduce the risk of LSOG habitat loss from intensive fire. This focus is due primarily to the highly fragmented ownership pattern in the area of the proposed PCGP project and the few remaining large blocks of LSOG habitat. Because of these factors, protecting the remaining LSOG habitat in the LSRs is the highest priority. The proposed development of the three heli-ponds, the six dry hydrants, and the 1,000 acres of fuel hazard reduction are spread across the Coos Bay and Roseburg Districts in the area of the proposed PCGP project and would provide added protection and reduced fire response times for both the mapped and un-mapped LSRs in this area (see figures 2.2-5 and 2.2-27).

For the Forest Service lands, the focus of the off-site mitigation actions would be on both reducing the risk of LSOG habitat loss from intensive fire and enhancing the development of LSOG habitat in LSRs. The Forest Service lands in the vicinity of the proposed PCGP project provide greater opportunities for LSOG habitat enhancement due to the large LSR areas and the larger blocks of LSOG habitat. The proposed treatments include more than 60 miles of road decommissioning, more than 1,500 acres of stand-density management, approximately 2,285 acres of integrated fuel hazard reduction/stand-density management, and approximately 1,125 acres of CWD enhancement. The integrated fuel hazard reduction treatments in the Umpqua National Forest are designed to tie into the treatments in the BLM Roseburg District so that it would provide for continuous fuel hazard reduction along the pipeline on both BLM and Forest Service lands in this area.

A portion of the Forest Service off-site mitigation actions have been designed to partially compensate for the fragmentation of LSOG habitat that would occur with the construction of the PCGP project in LSR 223 and 227. These off-site mitigation actions include the road decommissioning and the stand-density management proposals. Table 2.4.2-1 and figure 2.4-5 below compare the impacts that would occur from the construction of the project and the estimated amount of edge effect reduction that would occur over time with the off-site mitigation actions.

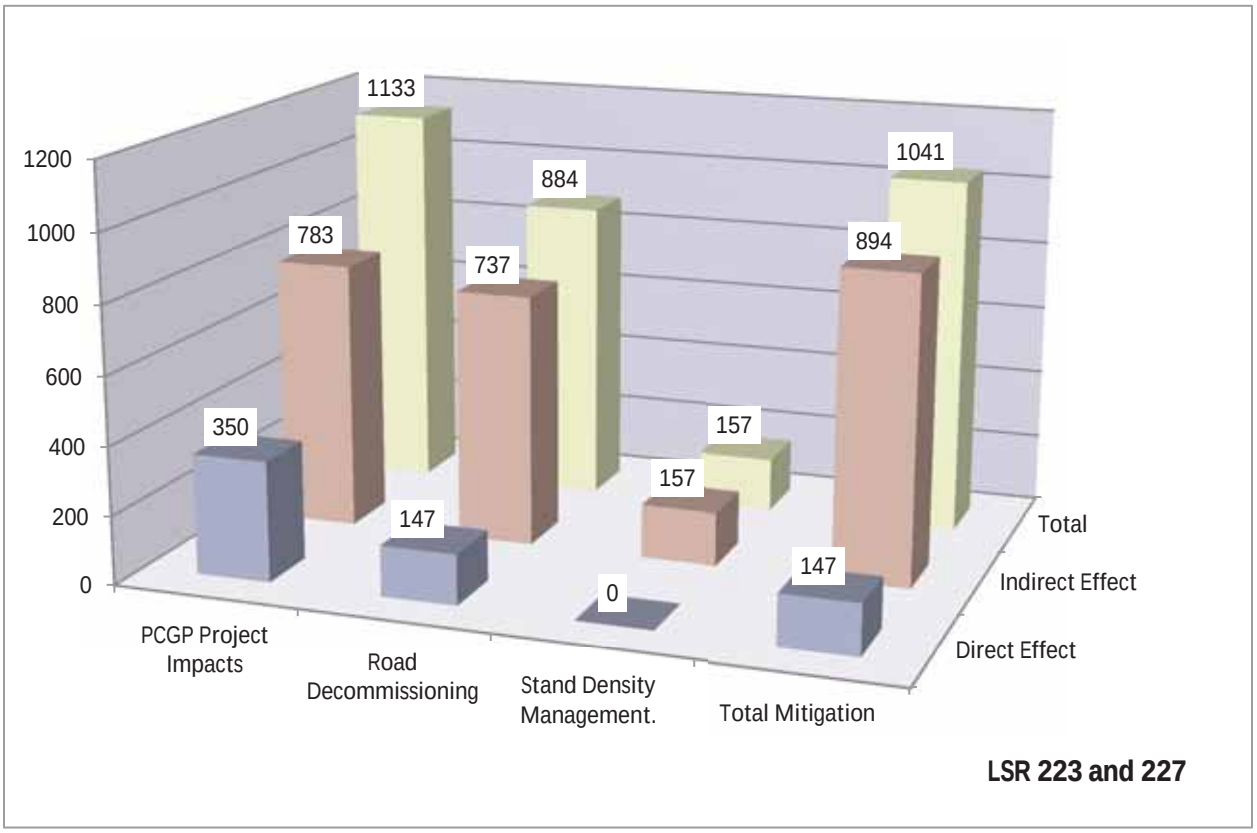
TABLE 2.4.2-1

Comparison of Total PCGP Project Impacts a/ on LSRs 223 and 227 and Estimated Edge Reduction Effect a/ of Proposed Off-site Mitigation Actions on Forest Service Lands (Acres)

LSR 223 and 227	Direct Effect	Indirect Effect	Total
	Total LSR Acres Affected on Forest Service Lands		
PCGP Project Impacts	350	783	1152
	Proposed Off-site Mitigation Actions on Forest Service Lands		
Road Decommissioning	147	737	884
Stand-Density Management.	0	157	157
Total	**147**	**894**	**1041**

a/ PCGP project direct effects include corridor clearing, TEWAs, and UCSAs. Indirect effects include 100 meters on each side of the corridor edge in LSOG and 30 meters on each side of corridor edge in non-LSOG.
b/ Direct edge reduction effects include acres of decommissioned roads revegetated (60.8*5280*20/43560) and indirect effects include 50 feet on each side of decommissioned roads and 100 feet along perimeter of stand-density treatments.
Data source: BLM, USFS GIS data layers, Hobson 2010

Figure 2.4-4. Comparison of Total PCGP Project Impacts on LSRs 223 and 227 and Estimated Edge Reduction Effect of Proposed Off-site Mitigations on Forest Service Lands (acres)



A more detailed discussion of these off-site mitigation actions and the assumptions used in estimating edge reduction effects is included in sections 2.3.1.4 and 2.3.2.4. The purpose of the comparison here is to show the total amount of off-site mitigation on Forest Service lands that has been designed to compensate for the indirect effects of edge fragmentation. In comparing the indirect beneficial effects of the off-site mitigation with the indirect effects of the PCGP project on LSRs (which is an estimate of the edge and fragmentation impacts), the ratio is slightly more than one to one. This is not a one to one comparison, however, since the adverse impacts would occur at the time of construction, but the beneficial effects of edge reduction would occur over several decades. This comparison, however, does not consider the beneficial effects of the on-site mitigation in edge reduction that would also occur over time from the reforestation of the project corridor except for a 30-foot area over the center of the pipeline.

2.4.3 Summary of PCGP Project Impacts on LSRs and Proposed Plan Amendments and Off-site Mitigation Actions at the Province Level

The NWFP included a comprehensive monitoring program to evaluate progress toward meeting the plan's desired outcomes (USDA and USDI 1994, page E-1 to E-12). In 1995, a scientifically based interagency monitoring program was developed (Mulder et al. 1999). The monitoring program is composed of six modules designed to answer key questions. The modules include

tracking the status and trends of watershed conditions, LSOG forests, social and economic conditions, tribal relationships, and the populations and habitats of MAMUs and NSOs. The module for LSOG habitat monitoring characterizes the status and trend of older forests to answer the key question: "Is the NWFP maintaining or restoring late-successional and old-growth forest ecosystems to desired conditions on federal lands in the NWFP area?" Monitoring results are evaluated and reported in 1- and 5-year intervals. Monitoring results for the first 10 and 15 years are documented in a series of general technical reports that are available online at http://www.fs.fed.us/pnw/publications/gtrs.shtml. The 15-year LSOG forest monitoring report was completed in 2011 (Mouer et al. 2011).

The monitoring program for LSOG habitat is based on physiographic provinces. The use of provinces allows differentiation between areas of common biological and physical processes. The provinces are useful for stratifying monitoring findings according to the climatic, topographic, and social gradients across the NWFP area that create significant differences in potential natural vegetation, current vegetation, natural disturbance regime, historical land use, and land ownership (Moeur et al. 2005). The twelve provinces used in the NWFP are shown in figure 2.4-5.

The proposed PCGP project would affect LSRs in three of the twelve provinces: the Oregon Coast Range, Oregon Klamath, and Oregon Western Cascades provinces. A map of the provinces crossed by the proposed PCGP project route is in figure 2.4-6.

Figure 2.4-5. Physiographic Provinces of the Northwest Forest Plan

The Northwest Forest Plan Area

An image of the area covered by the Northwest Forest Plan, provided by NASA's Moderate Resolution Imaging Spectroradiometer (MODIS), from over 400 mi above the Earth onboard the Terra satellite.

This image comes from a composite of images, from June through September 2001, combined to produce one single cloud-free portrait of the Earth, known as the NASA Blue Marble image.

Interstate highways

Urban areas

Physiographic provinces

1. Washington Olympic Peninsula
2. Washington Western Lowlands
3. Washington Western Cascades
4. Washington Eastern Cascades
5. Oregon Western Cascades
6. Oregon Eastern Cascades
7. Oregon Coast Range
8. Oregon Willamette Valley
9. Oregon Klamath
10. California Klamath
11. California Coast Range
12. California Cascades

N

0 50 100 150 200 Miles

0 80 160 240 320 Kilometers

Figure 2.4-6. Map of Physiographic Provinces Crossed by PCGP Project

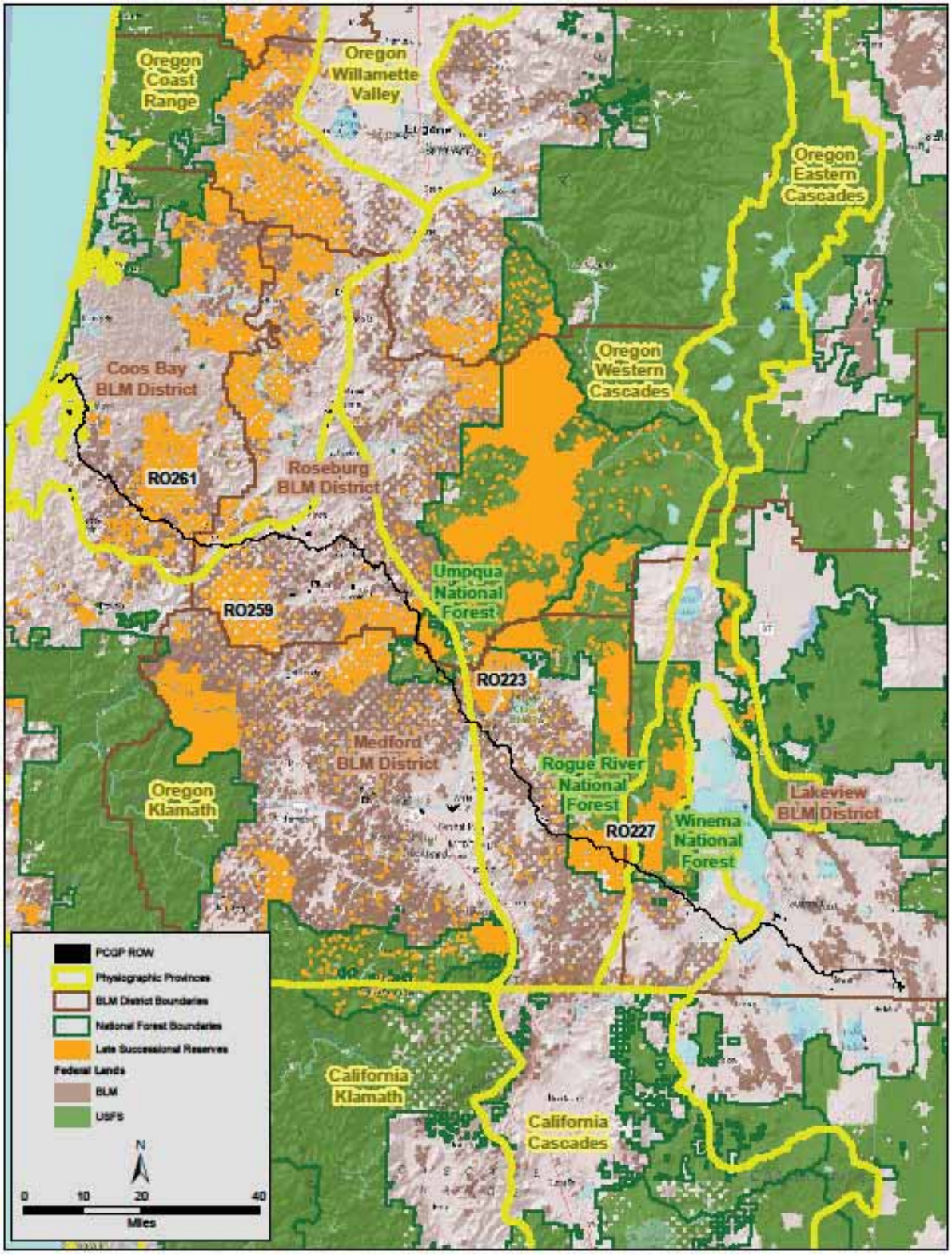


Table 2.4.3-1 and figure 2.4-7 provide a summary of the total LSOG acres in LSRs that would be affected directly and indirectly by the PCGP project and the total acres of LSOG habitat reallocated to LSR by province.

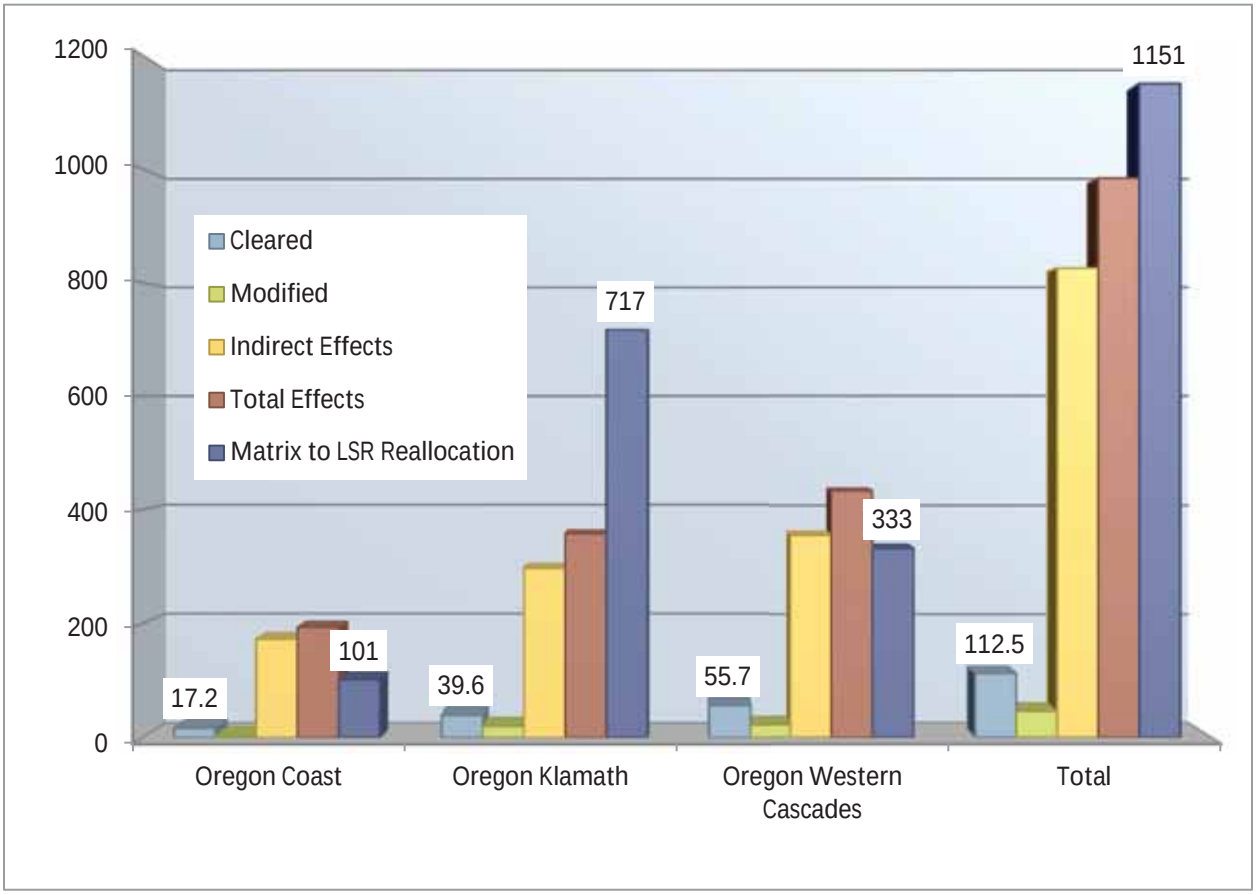
TABLE 2.4.3-1

Comparison of Total PCGP Project Effects a/ on LSOG Habitat in LSRs and LSOG Habitat in Matrix Reallocated to LSR by Province (Acres)

Province	Direct Effects: Cleared	Direct Effects: Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
Oregon Coast Range	17.2	3.3	172.0	**192.5**	101
Oregon Klamath	39.6	20.5	296.9	**357.0**	717
Oregon Western Cascades	55.7	22.3	356.4	**434.5**	333
Total	**112.5**	**46.1**	**825.3**	**984.0**	**1151**

a/ PCGP project effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG).
Data source: BLM, USFS GIS data layers

Figure 2.4-7. Comparison of Total PCGP Project Impacts on LSOG Habitat in LSRs and LSOG Habitat in Matrix Reallocated to LSR by Province (acres)



As illustrated by table 2.4.3-1 and figure 2.4-7, the impacts on LSOG habitat in LSRs from the PCGP project would be spread across three provinces, with the majority of the impacts occurring in the Oregon Klamath and Oregon Western Cascade Provinces, including the majority of the LSOG forest acres reallocated to LSR. Although a small portion of the proposed pipeline would also cross the Oregon Eastern Cascades Province in the Winema National Forest, it would not affect any LSRs in that province.

Table 2.4.3-2 summarizes the proposed off-site mitigation actions for LSRs on BLM and Forest Service lands by province. Maps of the proposed off-site mitigation actions are displayed in figures 2.2-5, 2.2-27, 2.3-3, and 2.3-10.

TABLE 2.4.3-2

Summary of Proposed Off-site Mitigation Actions for LSR Impacts on BLM and Forest Service Lands by Province

Physiographic Province	Fire Hazard Reduction	Road Decommissioning	Stand-Density Management	Coarse Woody Debris Enhancement	Other Treatments
Oregon Coast Range	Development of three heli-ponds				
Oregon Klamath	Development of six dry hydrants	7.6 mile of road decommissioning	Fuel hazard reduction on 1000 acres a/ 913 acres of stand-density management Fuel break treatments on 2,285 acres	Snag creation on 175 acres and LWD placement on 350 acres	80 acres of meadow restoration and 81 acres b/ of invasive plant treatment
Oregon Western Cascades		53.2 miles of road decommissioning	Pre-commercial thinning of 600 acres	Snag creation and LWD placement on 600 acres	
Totals	**9 Sites**	**60.8 Miles**	**4,798 Acres**	**1,125 Acres**	**161 Acres**

a/ A small portion of these acres would be within the Oregon Coast Province.
b/ Estimated acres based on 50 feet of treatment on each side of 6.7 miles of road (6.7*5280*100/43560)
Data source: BLM, Forest Service GIS Layers

The monitoring data from the 2011 LSOG forest monitoring report suggests a slight net loss of LSOG forest over the NWFP area, from 33.2 percent of federal forest in 1994/1996 to 32.6 percent in 2006/2007. The federal LSOG forest area decreased by an estimated 1.9 percent in the NWFP area during the monitoring period. This estimate includes loss from natural disturbances and timber harvesting, as well as the estimated gains from LSOG forest recruitment. The net change was positive in some provinces and negative in others. For the Oregon Coast, Oregon Klamath, and Oregon Western Cascades Provinces, the estimated net loss was 3.0, 1.1, and 7.9 percent, respectively (Mouer et al. 2011).

Similar to the findings of previous monitoring reports, wildfire was the most significant cause of LSOG habitat loss over the NWFP area. Most of the LSOG forest losses on federal lands (approximately 184,000 acres) were associated with wildfire, including several large fire events in the Oregon Klamath and Oregon Western Cascades Provinces. Most of the LSOG forest loss on federal land was from reserves and almost 90 percent of those losses were associated with wildfire. Less than 0.5 percent of the LSOG habitat loss on federal lands was associated with timber harvesting. The 2011 monitoring report concluded that the risk of loss of LSOG habitat

to wildfire will continue to be a critical consideration for policies affecting LSOG forests (Mouer et al. 2011).

The proposed plan amendments and off-site mitigation actions proposed by the BLM and Forest Service are consistent with the findings in the 2011 LSOG forest monitoring report. The plan amendments have been designed to increase the overall acres of LSOG habitat within LSRs in each of the provinces affected (see table 4.3.1 and figure 2.4-7). The off-site mitigation measures (see table 2.4.3-2) have been designed to both reduce the risk of loss of LSOG forest to wildfire and enhance the creation and maintenance of LSOG habitat in LSRs (see section 2.4.2). The proposed plan amendments and off-site mitigation actions have been designed with the goal that the overall impact of the PCGP project would be neutral or beneficial to the creation and maintenance of LSOG habitat within LSRs.

2.4.4 Summary of PCGP Project Impacts on Occupied MAMU Stands and Proposed Plan Amendments and Off-site Mitigation Actions at the Province Level

In addition to the NWFP monitoring module for LSOG forests (see section 2.4.3), the monitoring program also includes a module that assesses status and trends in MAMU populations and nesting habitat to answer the key questions: “Are the MAMU populations associated with the NWFP Plan area stable, increasing, or decreasing?” and “Is the NWFP maintaining and restoring MAMU nesting habitat?” (Mulder et al. 1999)

The monitoring for MAMUs is also based on the same provinces as the LSOG forest monitoring as well as MAMU Zones. There are two zones based on distance from the coast. In Oregon, Zone 1 extends approximately 35 miles inland. Zone 2, which extends approximately 12 miles further, is defined for survey purposes and was not included in the monitoring report for Oregon and California (Raphael et al. 2011). A map of the provinces and zones for MAMUs is in figure 2.4-8.

All of the occupied MAMU stands that would be affected by the PCGP project are located on BLM lands (twelve stands in the Coos Bay District and two stands in the Roseburg District). All of the stands are within Zone 1 and the Oregon Coast Range Province. Table 2.2.4-1 and figure 2.4-9 summarize the total amount of LSOG habitat that would be affected by the PCGP project in occupied MAMU stands and the amount of LSOG habitat that would be reallocated from Matrix to LSR.

Figure 2.4-8. Map of Physiographic Provinces and MAMU Zones

Northwest Forest Plan—the First 15 Years (1994–2008): Status and Trend of Nesting Habitat for the Marbled Murrelet

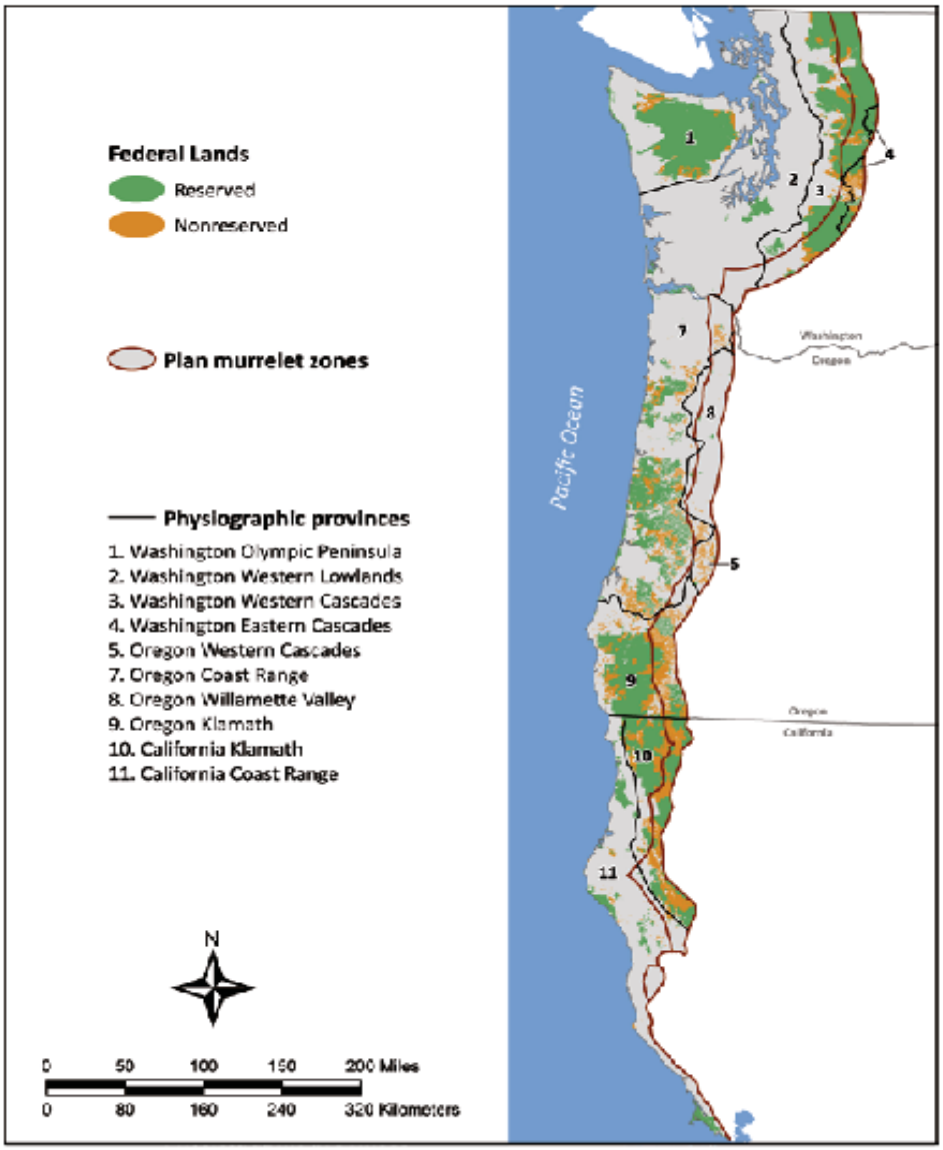


Figure 3—Locations of Northwest Forest Plan reserved and nonreserved land use allocations on federal lands within the range of the marbled murrelet (2009). Reserves include congressionally reserved lands (National Parks and wilderness), late-successional reserves, and other lands withdrawn from timber harvest. Nonfederal lands are depicted in gray. Plan murrelet zones are denoted as Zone 1 closer to the west coast and Zone 2 farther away from the coast.

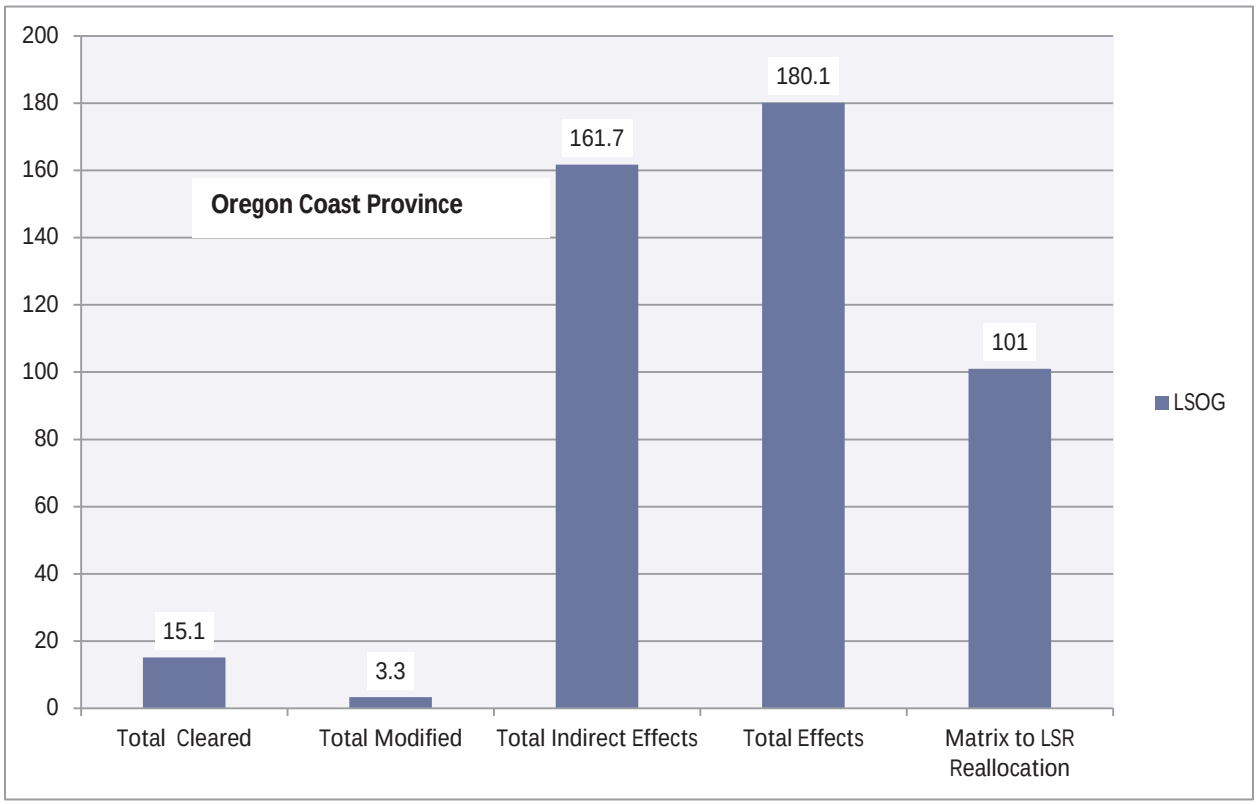
TABLE 2.4.4-1

Comparison of Total LSOG Habitat Acres in Occupied MAMU Stands Affected a/ by PCGP Project and Acres of LSOG Habitat in the Matrix Reallocated to LSR in the Oregon Coast Province

Habitat Type	Total Cleared	Total Modified	Total Indirect Effects	Total Effects	Matrix to LSR Reallocation
LSOG	15.1	3.3	161.7	180.1	101

a/PCGP project impacts include (direct effects) cleared acres (corridor and TEWAs) and modified acres (UCSAs), and (indirect effects) 100 meters on each side of the cleared corridor edge in LSOG.
Data source: BLM, Forest Service, GIS Layers,

Figure 2.4-9. Comparison of Total LSOG Habitat Acres in Occupied MAMU Stands Affected by PCGP Project and Acres of LSOG Habitat in the Matrix to LSR Reallocation in the Oregon Coast Province



Approximately two-thirds of the higher suitability nesting habitat for MAMUs within the NWFP area occurs on federal lands. Almost 90 percent of that habitat on federal land is protected under various reserve allocations. Based on monitoring data, the rate of loss of higher suitability habitat on reserved lands has been about 3.0 percent over the 10-year period from 1996 to 2006, with most of the loss due to wildfire, especially in Oregon. In the Oregon Coast Range Province, the loss of higher suitability habitat in federal reserves over the same period was approximately 2.4 percent (Raphael et al. 2011). The 2011 MAMU monitoring report found that fire was the major cause of loss of nesting habitat on federal lands since the plan was implemented and that MAMU population size is strongly and positively correlated with the amount of nesting habitat,

suggesting that conservation of remaining nesting habitat and restoration of currently unsuitable habitat is key to MAMU recovery (Raphael et al. 2011).

The proposed plan amendments and off-site mitigation actions proposed by the BLM are consistent with the findings in the 2011 MAMU monitoring report. The plan amendments have been designed to increase the overall acres of LSOG habitat within LSRs and a portion of the Matrix to LSR reallocation is in an area that contains a high concentration of occupied MAMU stands (see figure 2.2-6). The 101 acres of LSOG proposed for reallocation to LSR 261 on the Coos Bay District is in the immediate vicinity of the occupied MAMU stands that would be affected by the PCGP project (see figure 2.2-6 above). The total amount of acres proposed for designation to mapped LSR 261 on the Coos Bay District is about 998 acres, with a large portion of this area (approximately 611 acres) containing occupied MAMU stands. Although this MAMU habitat is currently protected by the management direction in the Coos Bay RMP, designating it as part of LSR 261 would provide additional protections and benefits for MAMUs. The additional protection would result from the area being protected, not just because of the existing MAMU occupation but as a land allocation dedicated to the management of late-successional habitat. The additional benefits would result from the surrounding non-habitat areas being managed in the future to become LSOG habitat, thereby consolidating larger contiguous blocks of nesting habitat over time. This is consistent with the findings in the 2011 MAMU monitoring report of the need to protect existing nesting habitat and restore currently non-suitable habitat.[17] The off-site mitigation actions (see table 2.4.3-2) have been designed to reduce the risk of loss of LSOG forest in occupied MAMU stands from wildfires. This is also consistent with the findings in the 2011 monitoring report that wildfire has been the major cause of the loss of nesting habitat since the NWFP was implemented.

[17] In addition to the Coos Bay reallocation of Matrix to LSR, the BLM Roseburg District is also proposing to reallocate 409 acres of which about 286 acres is LSOG Forest. Although these acres are within MAMU Zone 2 and the Oregon Klamath Province they are in the general vicinity of the MAMU habitat affected by the PCGP Project and would also compensate for loss of MAMU habitat in LSR (see section 4.1.3.6).

3.0 LIST OF REPORT PREPARERS AND CONTRIBUTORS

Name	Employer	Position	Experience	Contribution
Paul Uncapher	North State Resources, Inc.	Program Manager	33 years	Project Manager
Mike Redmond	North State Resources, Inc.	Senior Scientist	38 years	Primary Author
Kathryn McDonald	North State Resources, Inc.	Senior Writer/Editor	35 years	Technical Editor
Mike Hupp	North State Resources, Inc.	Senior Scientist	38 years	Contributor
Charles Comiskey, Ph.D.	Quantus LLC	Biologist/Economist	40 years	Contributor
Sylvia Cantu	North State Resources, Inc.	Desktop Publisher	34 years	Word Processing/Formatting

4.0 REFERENCES

Baker, W. 2011. Edge effect recovery on decommissioned roads.

Chen, J., J. Franklin, et al. 1993. "Contrasting microclimates among clearcut, edge, and interior of old-growth Douglas-fir forest." Agricultural and forest meteorology 63: 219-237.

Chen, J., J.F. Franklin, and T.A. Spies. 1995. Growing-Season Microclimatic Gradients from Clearcut Edges into Old-growth Douglas-fir Forests. Ecological Applications 5:74-86.

Clinton, W.J.; Gore, A., Jr. 1993. The forest plan for a sustainable economy and a sustainable environment. Washington, DC, Office of the President.

Forman, R.T.T. 1995. Land Mosaics: the Ecology of Landscapes and Regions. Press Syndicate of the University of Cambridge, Cambridge, UK.

Johnson, K.N.; Franklin J.F.; Thomas, J.W.; Gordon, J. 1991. Alternatives for management of late-successional forests of the Pacific Northwest. A report to the Agriculture Committee and the Merchant Marine and Fisheries Committee of the U.S. House of Representatives.

Harper, K. A., E. Macdonald, et al. 2005. "Edge Influence on Forest Structure and Composition in Fragmented Landscapes." Conservation Biology 19(3): 768-782.

Marcot, Bruce G.; Mellen, Kim; Livingston, Susan A.; Ogden, Cay. 2002. The DecAID advisory model: wildlife component. USDA Forest Service, Pacific Northwest Research Station.

Moeur, M.; Ohmann, J.L; Kennedy, R.E.; Cohen, W.B.; Gregory, M.J.; Yang, Z.; Roberts H.M.; Spies, T.A.; Fiorella, M. 2011. Northwest Forest Plan-the first 15 years (1994-2008): status and trends of late-successional and old-growth forests. PNW-GTR-853. Portland, OR: US Dept. of Agriculture, Forest Service, Pacific Northwest Research Station.

Morrison, M.L.; Marcot, B.G; Mannan, R.W. 2002. Wildlife-habitat relationships: concepts and applications. The University of Wisconsin Press.

Mulder, B.S.; Noon, B.R.; Spies, T.A.; Raphael, M.G.; Palmer, C.J.; Olsen, A.R.; Reeves, G.H.; Welsh, H.H. 1999. The strategy and design of the effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-437. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 138 p.

Raphael, Martin G.; Falxa, Gary A.; Dugger, Katie M.; Galleher, Beth M.; Lynch, Deanna; Miller, Sherri L.; Nelson, S.Kim; Young, Richard D. 2011. Northwest Forest Plan–the first 15 years (1994–2008): status and trend of nesting habitat for the marbled murrelet. Gen. Tech. Rep. PNWGTR-848. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, 52 p.

Switalski, T. A., J. A. Bissonette, et al. 2004. "Benefits and impacts of road removal." Frontiers in Ecology and the Environment 2(1): 21-28.

USDA-Forest Service: RRNF LRMP 1990. Rogue River National Forest Land and Resource Management Plan

USDA-Forest Service: UNF LRMP 1990. Umpqua National Forest Land and Resource Management Plan.

USDA-Forest Service_WNF_LRMP 1990. Winema National Forest Land and Resource Management Plan.

USDA Forest Service. 1993. A First Approximation of Ecosystem Health. National Forest System Lands. Pacific Northwest Region.

USDA Forest Service; USDI BLM 1994. Record of decision and Standards and Guidelines for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl.

USDA Forest Service. 2009. Letter dated November 6, 2009 from Pamela S, Olson, Forest Planner to Forest Supervisor, Rogue River NF.

USDA Forest Service. 2009a. Letter dated December 30, 2009 from Joyce E. Thompson, Planning and Products Staff, to Forest Supervisor, Umpqua NF.

USDA and USDI 1998a. South Cascades Late-Successional Reserve Assessment.

USDA and USDI 1998b. South Coast-Northern Klamath Late-Successional Reserve Assessment.

USDA and USDI 1999. South Umpqua River/Galesville Late-Successional Reserve Assessment.

USDA and USDI Memorandum 2001. Interpretation of the Northwest Forest Plan Standards and Guidelines Regarding New Developments in Late-Successional Reserves.

USDA and USDI 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines.

USDA and USDI Interagency MOU 2002. Interagency Agreement on Early Coordination of Required Environmental and Historic Preservation Reviews Conducted in Conjunction with the Issuance of Authorizations to Construct and Operate Interstate Natural Gas Pipelines Certificated by the Federal Energy Regulatory Commission.

USDA Forest Service; RRNF 2010. GIS Analysis, Fragmentation Assessment, LSR 227, USDA Forest Service, Roseburg, OR.

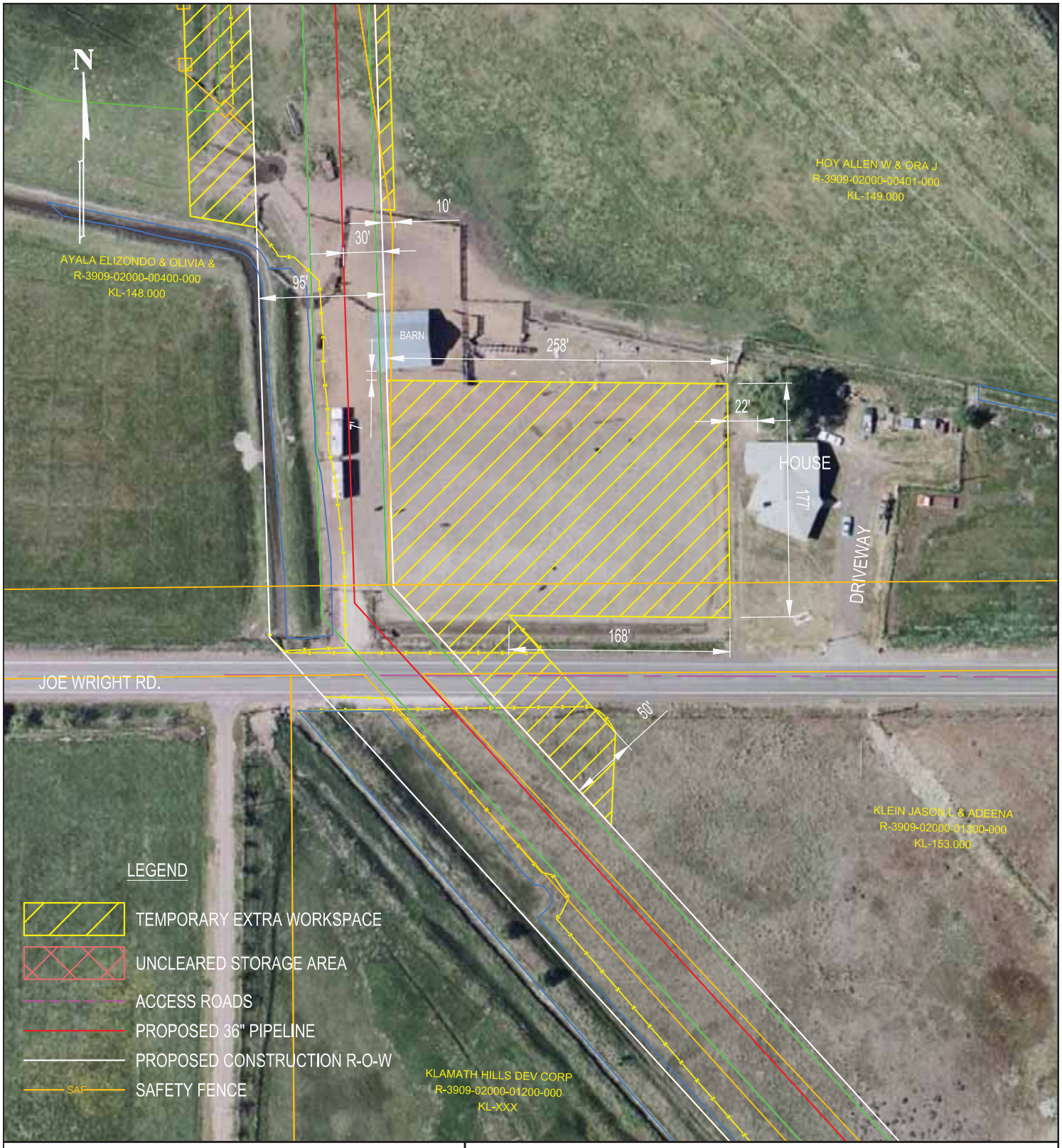
USDA Forest Service 2011. "GIS Analysis, Road Decommissioning."

USDI 1995a. Coos Bay District Resource Management Plan.

USDI 1995b. Roseburg District Resource Management Plan.

APPENDIX I

Site-Specific Residential Mitigation Plans



REFERENCE DRAWINGS	
DRAWING NO.	TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 203.32
36" PACIFIC CONNECTOR GAS PIPELINE
S-20, T-39-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0001	SHEET 1 OF 1

REFERENCE DRAWINGS	
DRAWING NO.	TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 199.71
36" PACIFIC CONNECTOR GAS PIPELINE
S-17, T-39-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0002	SHEET 1 OF 1

REFERENCE DRAWINGS	
DRAWING NO.	TITLE

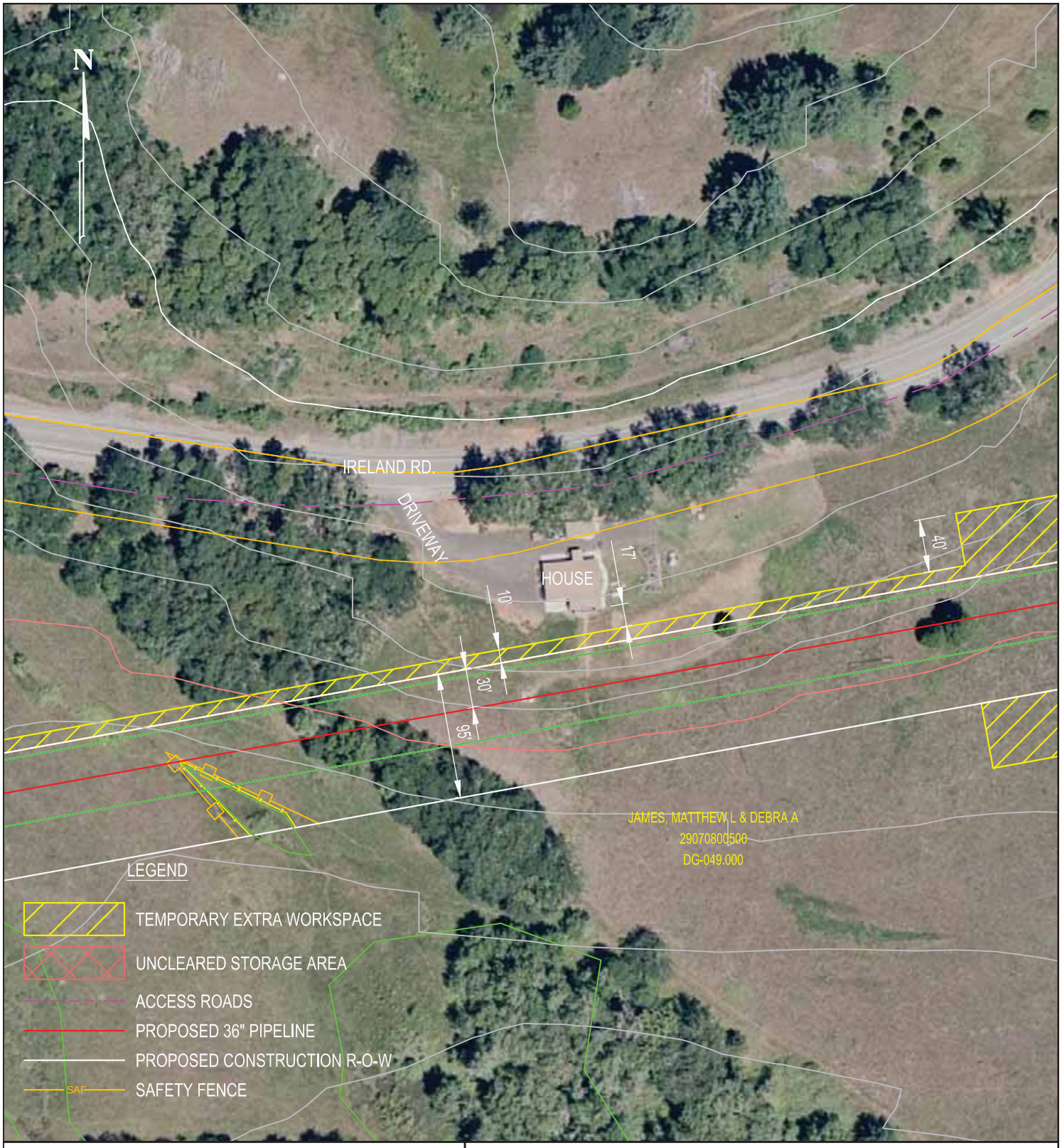
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 65.64
36" PACIFIC CONNECTOR GAS PIPELINE
S-4, T-29-S, R-6-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0011	SHEET 1 OF 1



REFERENCE DRAWINGS	
DRAWING NO.	TITLE

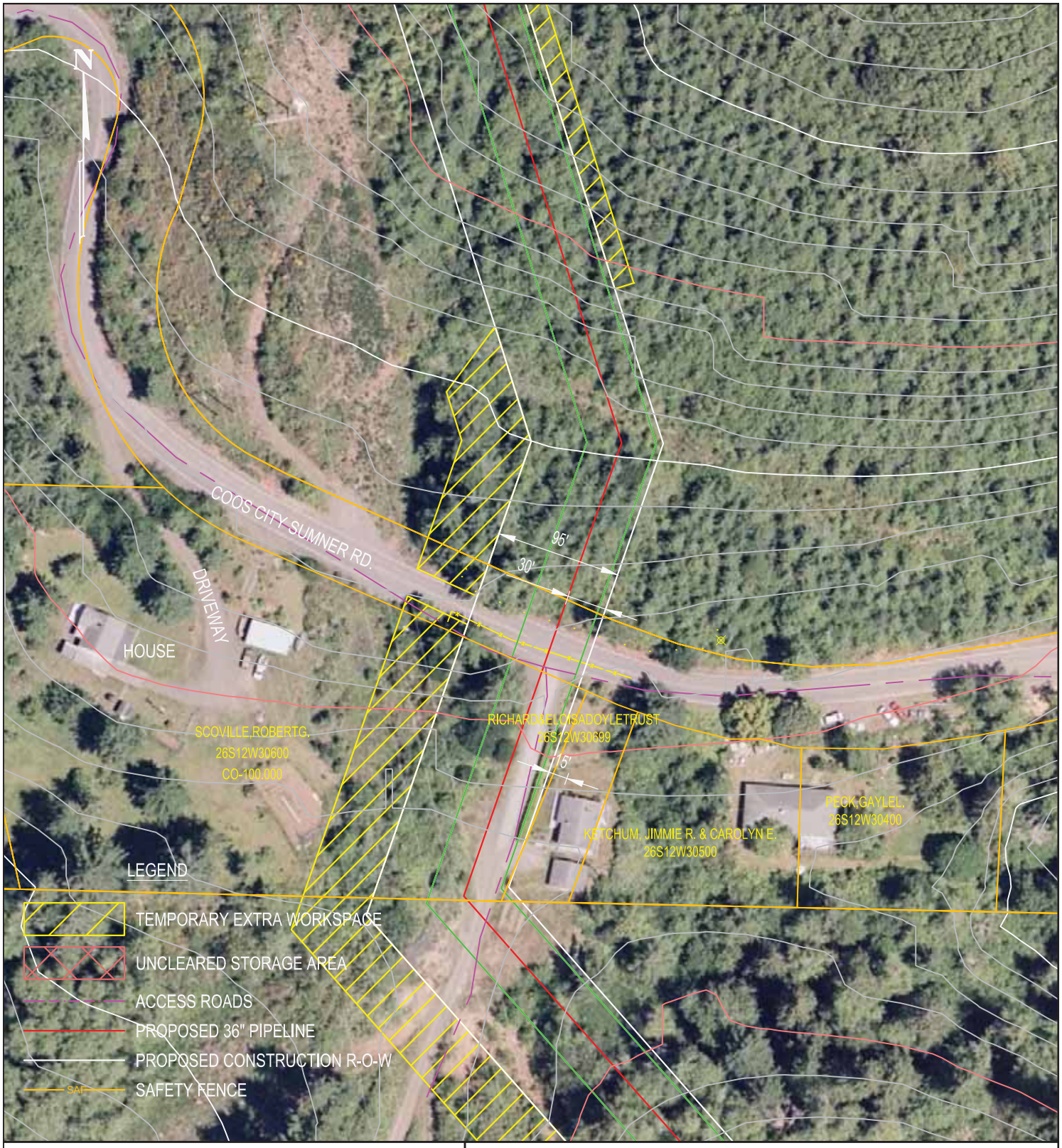
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 57.51
36" PACIFIC CONNECTOR GAS PIPELINE
S-8, T-29-S, R-7-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0012	SHEET 1 OF 1



REFERENCE DRAWINGS	
DRAWING NO.	TITLE

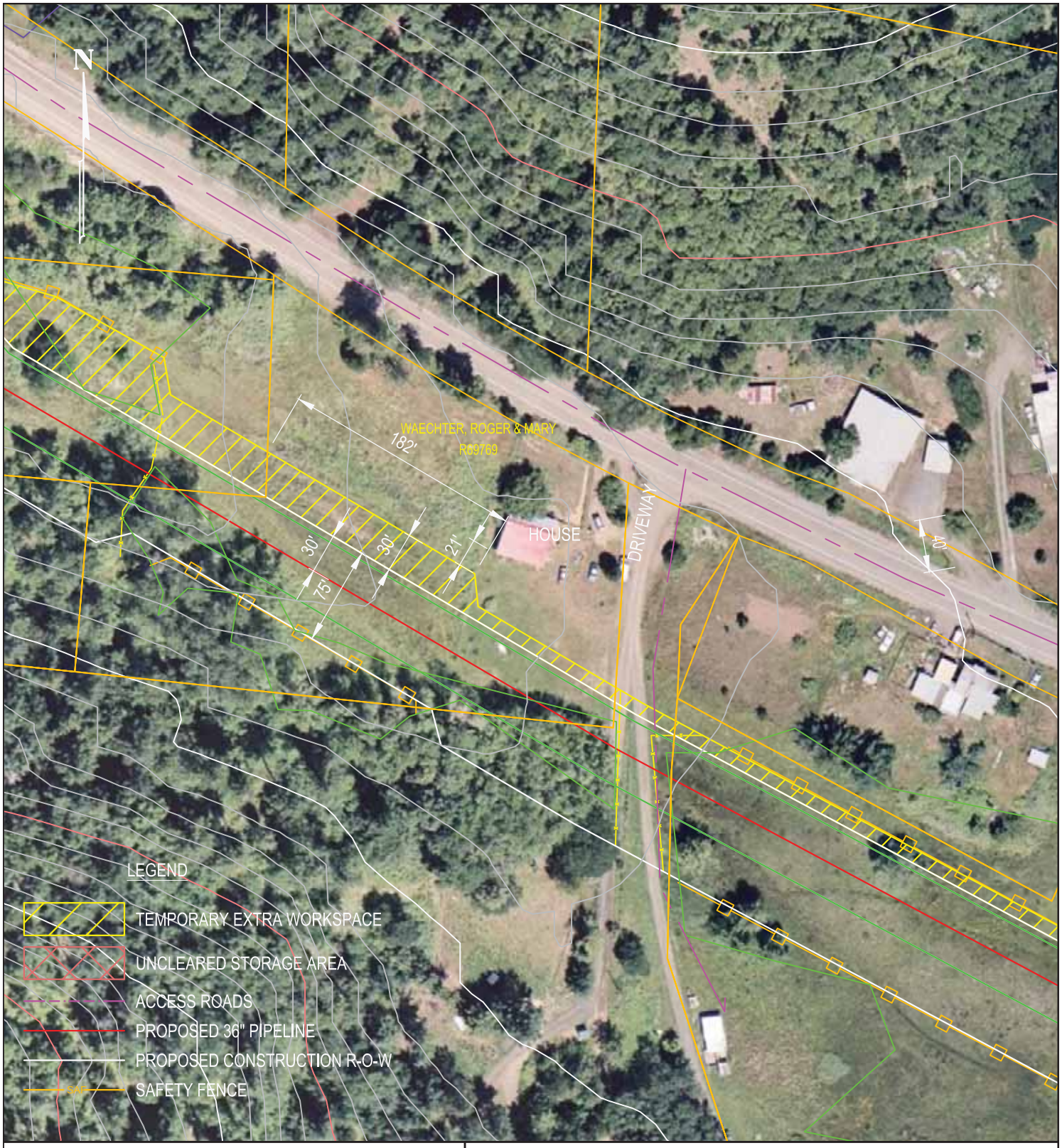
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 14.25
36" PACIFIC CONNECTOR GAS PIPELINE
S-30, T-26-S, R-12-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0013	SHEET 1 OF 1



REFERENCE DRAWINGS	
DRAWING NO.	TITLE

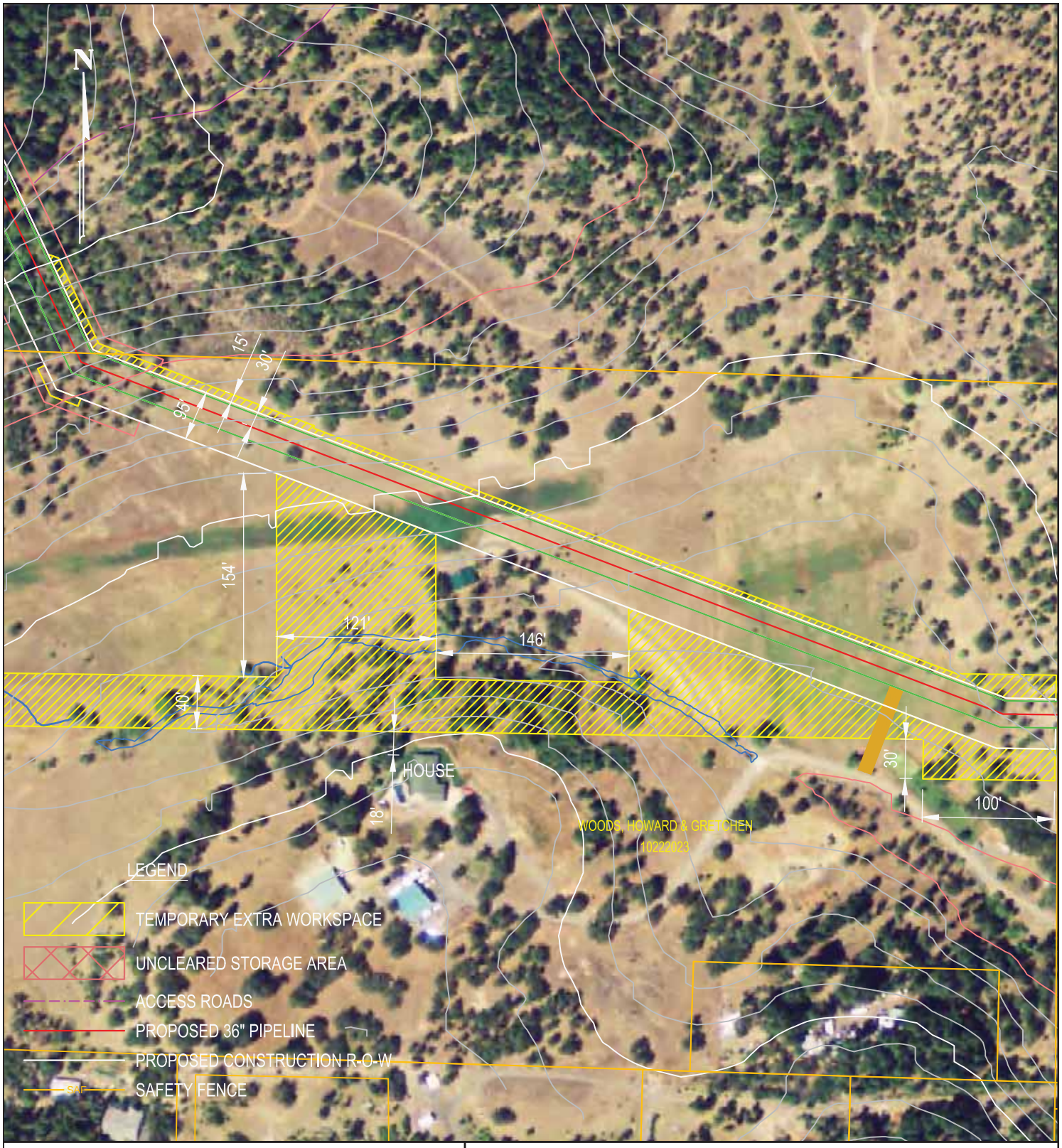
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 56.88
36" PACIFIC CONNECTOR GAS PIPELINE
S-7, T-29-S, R-7-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0014	SHEET 1 OF 1



REFERENCE DRAWINGS	
DRAWING NO.	TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
RESIDENTIAL SITE SPECIFIC MAP - M.P. 122.00
36" PACIFIC CONNECTOR GAS PIPELINE
S-35, T-34-S, R-1-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
A	MAY 2013	JCP	PRELIMINARY			

DRAWN BY: JCP	DATE: MAY 2013	ISSUED FOR BID:	SCALE: 1" = 250'
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.33-X-0015	SHEET 1 OF 1

APPENDIX J

Draft Aquatic Conservation Strategy Assessment

Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project Draft EIS

Appendix J

Draft Aquatic Conservation Strategy Assessment

Pacific Connector Gas Pipeline

Coos Bay, Roseburg, and Medford Districts and Klamath Falls Resource Area, Lakeview District, BLM Oregon; Umpqua, Rogue River, and Winema National Forests

Prepared for:

USDI Bureau of Land Management

USDA Forest Service

Prepared by:

North State Resources

Public Draft

Draft

Table of Contents

FIGURES 2

TABLES 4

ACRONYMS USED I

ORGANIZATION OF THIS ASSESSMENT AND SCALE OF ANALYSIS II

EXECUTIVE SUMMARY I

1.0 INTRODUCTION 1-11
- 1.1 Components of the Aquatic Conservation Strategy 1-15
  - 1.1.1 Riparian Reserves 1-15
  - 1.1.2 Key Watersheds 1-17
  - 1.1.3 Watershed Analysis 1-17
  - 1.1.4 Watershed Restoration 1-19
- 1.2 Determining Consistency with the ACS 1-20
  - 1.2.1 ACS Objectives 1-20
  - 1.2.2 Standards, Guidelines, and Management Direction 1-21
  - 1.2.3 BLM and Forest Service Decisions Related to the ACS 1-27
  - 1.2.4 Determining Consistency with the ACS at Multiple Scales 1-29
- 1.3 Environmental Consequences and Mitigation 1-34
  - 1.3.1 General Construction and Stream Crossing Methods and Effects 1-34
  - 1.3.2 Mitigation 1-76

2.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 2-1
- 2.1 Regional Context 2-1
  - 2.1.1 Historical Disturbance Processes and Patterns in the Pacific Northwest: 2-2
  - 2.1.2 Oregon Coast Range Province, MP 1-47 2-3
  - 2.1.3 Klamath – Siskiyou Province MP 47-105, 118-153 2-4
  - 2.1.4 Western Cascades Province MP 105-113 2-6
  - 2.1.5 High Cascades Province MP 153-180 2-6
- 2.2 Basins and Watersheds Crossed by the PCGP on BLM and NFS Lands 2-7
- 2.3 SOUTH OREGON COAST BASIN 2-17
  - 2.3.1 Geographic Setting 2-17
  - 2.3.2 Climate and Hydrology 2-18
  - 2.3.3 Coos Bay Frontal Fifth Field Watershed HUC 1710030403 2-18
  - 2.3.4 Coquille River Fifth Field Watershed HUC 1710030505 2-33
  - 2.3.5 North Fork Coquille River Fifth Field Watershed HUC 1710030504 2-45
  - 2.3.6 East Fork Coquille Fifth Field Watershed, HUC 1710030503 2-74
  - 2.3.7 Middle Fork Coquille Fifth Field Watershed, HUC 1710030501 2-98
- 2.4 UMPQUA RIVER BASIN 2-127
  - 2.4.1 Geographic Setting 2-127
  - 2.4.2 Climate and Hydrology 2-128
  - 2.4.3 Olalla-Lookingglass Fifth Field Watershed, HUC 1710030212 2-128
  - 2.4.4 Clark Branch-South Umpqua River Fifth Field Watershed, HUC 1710030211 ..2-146
  - 2.4.5 Myrtle Creek Fifth Field Watershed, HUC 1710030211 2-161
  - 2.4.6 Days Creek-South Umpqua River Fifth Field Watershed, HUC 1710030205 2-180

Draft

2.4.7 Elk Creek-South Umpqua River Fifth Field watershed, HUC 1710030204...2-204
2.4.8 Upper Cow Creek Fifth Field Watershed, HUC 1710030206 2-227
2.5 ROGUE RIVER BASIN.....2-268
2.5.1 Geographic Setting 2-268
2.5.2 Climate and Hydrology.....2-269
2.5.3 Trail Creek Fifth-Field Watershed HUC 1710030706 2-269
2.5.4 Shady Cove-Rogue River Fifth Field Watershed HUC 1710030707 2-296
2.5.5 Big Butte Creek Fifth Field Watershed, HUC 1710030704 2-323
2.5.6 Little Butte Creek Fifth Field Watershed, HUC 1710030708 2-348
2.6 KLAMATH RIVER BASIN.....2-403
2.6.1 Geographic Setting 2-403
2.6.2 Climate and Hydrology.....2-404
2.6.3 Spencer Creek Fifth Field Watershed, HUC 180102206.....2-405

3.0 ATTACHMENTS: DATA TABLES AND REFERENCES.....2-444
3.1 Reserved: NSR 2014 Stream Crossing Assessment (in Preparation) 2-444
3.2 Suspended Sediment 2-444
3.3 Aquatic Inventory and Evaluation 2-446
3.3.1 Watershed Data Tables 2-446
3.3.2 Aquatic and Riparian Evaluation and Monitoring Program (AREMP).....2-459
3.4 Road Decommissioning Data Tables.....2-460
3.4.1 Data Synopsis 2-460

4.0 FILED MITIGATION PLANS..... 473

5.0 BIBLIOGRAPHY.....2-498

Figures

Figure 1-1 Regional and Provincial Setting of the Pacific Connector Gas Pipeline Route 1-14

Figure 1.3-1 Matrix for Evaluation of Construction Impact and Site Response Potential 1-38

Figure 1.3-2 Installation of a dam in a dry open cut crossing of a small channel 1-54

Figure 1.3-3 Preparation of perennial stream crossing with equipment bridges and sediment fence installed.....1-55

Figure 1.3-4 Dam and pump crossing of perennial stream with flume. 1-55

Figure 1.3-5 Range of Predicted Severity Exposure Values (SEV) 1-64

Figure 1.3-5 Predicted Sediment Concentrations and Effects on Juvenile and Adult Salmonids for 1 and 5 Day Exposures.....1-67

Figure 2.2-1 Aquatic Provinces and Watersheds Crossed by the PCGP 2-14

Figure 2.2-2 Miles of PCGP Corridor by Watershed on BLM and NFS Lands by Administrative Unit 2-16

Figure 2.3-1 PCGP Routing and Subwatershed Boundaries, Coos Bay Frontal Fifth-Field Watershed 2-20

Draft

Figure 2.3-2 PCGP Routing and Subwatershed Boundaries, Coquille River Watershed..2-34

Figure 2.3-3 PCGP Routing and Subwatershed Boundaries, North Fork Coquille River Watershed 2-47

Figure 2.3-4 Middle Creek Crossing at MP 27.04 2-59

Figure 2.3-5 PCGP crossing of Middle Creek at MP 27.04 2-63

Figure 2.3-6 Comparison of Mitigation Measures and PCGP Effects 2-67

Figure 2.3-7 PCGP Routing and Subwatershed Boundaries, East Fork Coquille River Watershed 2-76

Figure 2.3.-8 Comparison of project Effects with Selected Mitigation Measures 2-95

Figure 2.3-9 PCGP Routing and Subwatershed Boundaries, Middle Fork Coquille River Watershed 2-101

Figure 2.3-10 Tributary of Big Cr. MP 37.35 2-112

Figure 2.3-11 Comparison of PCGP Project Impacts and Benefits of Off-site Mitigation Measures in the Middle Fork Coquille River Watershed 2-122

Figure 2.4-1 PCGP Routing and Subwatershed Boundaries, Olalla-Lookingglass Watershed 2-131

Figure 2.4-2 PCGP Routing and Subwatershed Boundaries, Clark Branch-South Umpqua River Watershed 2-149

Figure 2.4-3 PCGP Routing and Subwatershed Boundaries, Myrtle Creek Watershed....2-164

Figure 2.4-4 PCGP Routing and Subwatershed Boundaries, Days Creek-South Umpqua River Watershed 2-184

Figure 2.4-5 PCGP Routing and Subwatershed Boundaries, Elk Creek-South Umpqua River Watershed 2-207

Figure 2.4-6 PCGP Routing and Subwatershed Boundaries, Upper Cow Creek Watershed 2-230

Figure 2.4-7 Natural Turbidity and Stored Sediment in the East Fork of Cow Creek 2-238

Figure 2.4-7a Current Seven Day Average Maximum Temperatures, EF Cow Creek Perennial Streams 2-240

Figure 2.4.-8 Perennial Stream Channel Crossings in the East Fork Cow Creek Drainage.....2-256

Figure 2.4-9 East Fork of Cow Creek Culvert.....2-261

Figure 2.5-1 PCGP Routing and Subwatershed Boundaries, Trail Creek Fifth Field Watershed 2-273

Figure 2.5-2. Comparison of PCGP Project Impacts and Benefits of Off-site Mitigation Measures in the Trail Creek Watershed.....2-290

Figure 2.5-3 PCGP Routing and Subwatershed Boundaries, Shady Cove – Rogue River Watershed 2-300

Draft

Figure 2.5-4 Comparison of PCGP Impacts and Beneficial Effects of Off-site Mitigation Actions in the Shady Cove-Rogue River Watershed.....2-319

Figure 2.5-5 PCGP Routing and Subwatershed Boundaries, Big Butte Creek Watershed2-327

Figure 2.5-6 Comparison of PCGP Impacts and Beneficial Effects of Off-site Mitigation Measures on BLM Lands in the Big Butte Creek Watershed.....2-343

Figure 2.5-7 PCGP Routing and Subwatershed Boundaries, Little Butte Creek Watershed 2-353

Figure 2.5-8 Comparison of PCGP Effects with Selected Mitigation Measures on BLM lands.....2-386

Figure 2.5-9 Comparison of PCGP Effects and Proposed Road Decommissioning: Little Butte Creek Tier 1 Key Watershed.....2-391

Figure2.5-10 Change in Road Density with Implementation of Mitigation Plan: RRNF, LSR 227 in Little Butte Creek Tier 1 Key Watershed.....2-393

Figure 2.5-11 Proposed Mitigation Projects, Rogue River National Forest Little Butte Creek 2-396

Figure 2.6-1 PCGP Right-of-way and BLM Lands, Spencer Creek Watershed 2-408

Figure 2.6-2 Mitigation Proposals on the Winema National Forest, Spencer Creek...2-435

Figure 2.6-3 Comparison of PCGP Effects with Selected Mitigation Measures on BLM Lands.....2-436

Figure 2.6-4 Comparison of PCGP Effects and Proposed Road Decommissioning: Spencer Creek Tier 1 Key Watershed NFS lands.....2-437

Figure 2.6-5 Change in Road Density with Implementation of Mitigation Plan: WNF Spencer Creek Tier 1 Key Watershed.....2-437

Tables

TABLE ES-1 **Summary of Riparian Reserves, Stream Channels and Wetlands Crossed by the Pacific Connector Pipeline on BLM-and NFS Lands by Administrative Unit**.....ii

TABLE ES-2 **Vegetation Age Class Structure of Riparian Reserves Cleared in Construction Corridor and TEWAs by Administrative Unit, BLM and Forest Service**.....iii

TABLE 1.1.1-1 **BLM and Forest Service Land Allocations in Fifth-Field Watersheds Crossed by the Pacific Connector Project** 1-16

TABLE 1.1.2-1 **Miles of PCGP Project Right-of-Way in Key Watersheds by Administrative Unit**.....1-17

TABLE 1.1.3-1 **Watershed Assessments Reviewed for Watersheds Affected by the Pacific Connector Project** 1-18

TABLE 1.2.2-1 **Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors** 1-22

Draft

TABLE 1.2.2-2 **Cross References between ACS-Relevant NWFP Standards and Guidelines and BLM District RMP Management Direction** 1-26

TABLE 1.2.3-1 **Agency Decisions with a Nexus to the ACS** 1-27

TABLE 1.2.4-1 **General Matrix of Factors and Indicators of Aquatic Health** 1-32

TABLE 1.3.1.1-1 **Best Management Practices Common to All Crossings and to the Blue Category** 1-40

TABLE 1.3.1.1-2 **Stream Channel Crossings, Blue Category** 1-41

TABLE 1.3.1.1-3 **Best Management Practices for Crossings in the Yellow and Orange Categories** 1-46

TABLE 1.3.1.1-4 **Stream Crossings in the Yellow Category** 1-48

TABLE 1.3.1.1-5 **Best Management Practices for Crossings in the Green Category** 1-50

TABLE 1.3.1.1-6 **Stream Crossings in the "Green" Category** 1-52

TABLE 1.3.1.2-1 **Minimum Effective Ground Cover Requirements** 1-68

TABLE 1.3.2-1 **Habitat Elements, Processes, and Key Indicators for Evaluation of PCGP project Effects and Identification of Mitigation Measures** 1-77

TABLE 2.2-1 **Miles of PCGP project by Fifth Field Watershed and Federal Administrative Unit Within and Outside the Area of the NWFP on BLM and NFS Lands** 2-9

TABLE 2.2-2 **Fifth Field Watersheds and Land Allocations Crossed by the Pacific Connector Gas Pipeline Corridor R/W on BLM and NFS Lands** 2-11

TABLE 2.2-3 **Acres within Right of Way by BLM and Forest Service Land Allocations** 2-15

TABLE 2.3.1-1 **Land Ownership, Basin Area, and Approximate Stream Miles (3rd-order and greater) in the Coquille River Basin** 2-17

TABLE 2.3.3.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Coos Bay-Frontal Pacific Ocean Watershed HUC 1710030403** 2-21

TABLE 2.3.3.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in the Coos Bay-Frontal Pacific Ocean Watershed HUC 1710030403 by Land Ownership** 2-22

TABLE 2.3.3.1-3 **PCGP project Area (acres) on Federal Lands in the Coos Bay-Frontal Pacific Ocean watershed HUC 1710030403 by Agency and Land Allocation** 2-23

TABLE 2.3.3.1-4 **PCGP Effects, Riparian Reserves Coos Bay Frontal 5th Field Watershed HUC 1710030403** 2-24

Table 2.3.3.1-5 **Crossing Risk Analysis** 2-24

TABLE 2.3.3.4-1 **Pacific Connector Proposed BMPS for Use at Waterbody Crossings** 2-26

TABLE 2.3.3.4-2 **Project Effects and Historic Range of Variation** 2-27

TABLE 2.3.3.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction** 2-28

Draft

TABLE 2.3.3.7-1 **Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP** 2-30

TABLE 2.3.3.8-1 **Project Effects and ACS Objectives, Coos Bay Frontal Watershed** .. 2-31

TABLE 2.3.4.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Coquille River Watershed HUC 1710030505** 2-35

TABLE 2.3.4.1-2 **PCGP Project Corridor (miles) and project Area (acres) in the Coquille River Watershed HUC 1710030505 by Land Ownership** 2-36

TABLE 2.3.4.1-3 **PCGP project Area (acres) on Federal Lands in the Coquille River Watershed HUC 1710030505 by Agency and Land Allocation** 2-37

TABLE 2.3.4.1-4 **Riparian Reserve Effects in the Lower Coquille River Fifth Field Watershed HUC 1710030505** 2-38

TABLE 2.3.4.4-1 **Project Effects and Relevant Ecological Processes in the Coquille Watershed** 2-40

TABLE 2.3.4.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction** 2-41

TABLE 2.3.4.6-1 **Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP** 2-43

TABLE 2.3.4.7-1 **Project Effects and ACS Objectives, Coquille Watershed** 2-44

TABLE 2.3.5.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in North Fork Coquille Watershed HUC 1710030504** 2-48

TABLE 2.3.5.1-2 **PCGP Project Corridor (miles) and project Area (acres) in the North Fork Coquille watershed (HUC 1710030504) by Land Ownership** ... 2-48

TABLE 2.3.5.1-3 **PCGP Project Area (acres) on Federal Lands in the North Fork Coquille Watershed HUC 1710030504 by Agency and Land Allocation** 2-49

TABLE 2.3.1.5-4 **Riparian Reserve Effects North Fork Coquille River HUC 1710030504** 2-50

TABLE 2.3.5.1-5 **Stream Crossing Turbidity and Risk Assessment, North Fork Coquille Watershed** 2-52

TABLE 2.3.5.4-1 **Pacific Connector Proposed BMPS for Use at Waterbody Crossings** 2-56

TABLE 2.3.5.4-2 **PCGP Project Effects and Relevant Ecological Processes Described in the North Fork Coquille Watershed Assessment** 2-61

TABLE 2.3.5.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction** 2-64

TABLE 2.3.5.6-1 **Proposed Offsite Mitigation Projects for North Fork Coquille River Watershed** 2-66

TABLE 2.3.5.7-1 **Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP** 2-67

TABLE 2.3.5.8-1 **Relationship of PCGP project Effects to ACS Objectives on the North Fork Coquille River Watershed** 2-71

TABLE 2.3.6.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in East Fork Coquille River Watershed HUC 1710030503** 2-77

Draft

TABLE 2.3.6.1-2 **PCGP Project Corridor (miles) and project Area (acres) in the East Fork Coquille River Watershed (HUC 1710030503) by Land Ownership** . 2-77

TABLE 2.3.6.1-3 **PCGP Project Area (acres) on Federal Lands in the East Fork Coquille River Watershed HUC 1710030503 by Agency and Land Allocation** 2-79

TABLE 2.3.6.1-4 **Riparian Reserve Effects in the East Fork Coquille River Fifth Field Watershed HUC 1710030503** 2-80

TABLE 2.3.4.1-5 **Stream Crossing Turbidity and Risk Assessment, East Fork Coquille Watershed** 2-82

TABLE 2.3.6.4-1 **Pacific Connector Additional Proposed BMPS for Use at Waterbody Crossings in the Yellow and Orange Management Categories** 2-87

TABLE 2.3.6.4-2 **PCGP project Effects and Relevant Ecological Processes Described in the East Fork Coquille Watershed Assessment** 2-88

TABLE 2.3.6.5-1 **Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP** 2-89

TABLE 2.3.6.6-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction** 2-91

TABLE 2.3.6.7-1 **Proposed Offsite Mitigation Measures in the East Fork Coquille River Watershed** 2-93

TABLE 2.3.6.8-1 **Project Effects and ACS Objectives, East Fork Coquille River Watershed** 2-95

TABLE 2.3.7.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Middle Fork Coquille River Watershed HUC 1710030501** 2-102

TABLE 2.3.7.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in the Middle Fork Coquille River Watershed HUC 1710030501 by Land Ownership** 2-103

TABLE 2.3.7.1 3 **PCGP Project Area (acres) on Federal Lands in the Middle Fork Coquille River Watershed HUC 1710030501 by Agency and Land Allocation** 2-104

TABLE 2.3.7.1-4 **Riparian Reserve Effects Middle Fork Coquille River Watershed HUC 1710030501** 2-105

TABLE 2.3.7.1-5 **Stream Crossing Turbidity and Risk Assessment, Middle Fork Coquille River Watershed** 2-108

TABLE 2.3.7.2-1 **Headwaters Middle Fork Coquille River Watershed Conditions** 2-110

TABLE 2.3.7.4-1 **Pacific Connector Additional Proposed BMPs for Use at Waterbody Crossings in the Yellow and Orange Management Categories** 2-113

TABLE 2.3.7.4-2 **Project Effects and Relevant Ecological Processes Described in the Middle Fork Coquille and Upper Middle Fork Coquille Watershed Analyses** 2-114

TABLE 2.3.7.5-1 **Compliance with RMP Management Direction and NWFP Standards and Guidelines** 2-117

TABLE 2.3.7.6-1 **Proposed Off-Site Mitigation Measures in the Middle Fork Coquille Watershed** 2-120

Draft

TABLE 2.3.7.7-1 **Proposed Actions on BLM Lands that Contribute to Cumulative Effects in the Middle Fork Coquille Watershed** 2-123

TABLE 2.3.7.8-1 **Project Effects and ACS Objectives, Middle Fork Coquille River Watershed** 2-124

TABLE 2.4.3.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Olalla Creek-Lookingglass Creek watershed HUC 1710030212** 2-132

TABLE 2.4.3.1-2 **PCGP project Corridor (miles) and project Area (acres) in the Olalla Creek-Lookingglass Creek watershed (HUC 1710030212) by Land Ownership** 2-132

TABLE 2.4.3.1-3 **PCGP project Area (acres) on Federal Lands in the Olalla Creek-Lookingglass Creek watershed HUC 1710030212 by Agency and Land Allocation** 2-134

TABLE 2.4.3.4 1 **Project Effects and Relevant Ecological Processes Described in the Olalla-Lookingglass Watershed Assessment** 2-139

TABLE 2.4.3.5-1 **Consistency of PCGP project on Olalla-Lookingglass Subwatershed with BLM Roseburg District ACS-Related Management Direction** 2-141

TABLE 2.4.3.6-1 **Proposed Off-site Mitigation Projects for Olalla-Lookingglass Watershed** 2-143

TABLE 2.4.3.7-1 **Proposed Actions on BLM Lands that Contribute to Cumulative Effects in the Middle Fork Coquille Watershed** 2-144

TABLE 2.4.4.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Clark Branch-South Umpqua River Watershed HUC 1710030211** 2-150

TABLE 2.4.4.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in the Clark Branch-South Umpqua River watershed (HUC 1710030211) by Land Ownership** 2-150

TABLE 2.4.4.1-3 **PCGP Project Area (acres) on Federal Lands in the Clark Branch-South Umpqua River Watershed (HUC 1710030211) by Agency and Land Allocation** 2-151

TABLE 2.4.4.4-1 **Project Effects and Relevant Ecological Processes Described in the Clark Branch-South Umpqua River Watershed Assessment** 2-156

TABLE 2.4.4.5-1 **Consistency of PCGP project on Clark Branch-South Umpqua Subwatershed with BLM Roseburg District ACS-Related Management Direction.** 2-157

TABLE 2.4.4.6-1 **Proposed Off-site Mitigation Projects for Clark Branch-South Umpqua Watershed** 2-159

TABLE 2.4.5.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Myrtle Creek Watershed HUC 1710030210** 2-165

TABLE 2.4.5.1-2 **PCGP project Corridor (miles) and project Area (acres) in the Myrtle Creek watershed (HUC 1710030210) by Land Ownership** 2-165

TABLE 2.4.5.1-3 **PCGP Project Area (acres) on Federal Lands in the Myrtle Creek Watershed (HUC 1710030210) by Agency and Land Allocation** 2-166

Draft

TABLE 2.4.5.1-4 **Riparian Reserve Effects Myrtle Creek Watershed HUC 1710030210** .2-167

TABLE 2.4.5.4-1 **Project Effects and Relevant Ecological Processes Described in the Myrtle Creek Watershed Assessment** 2-174

TABLE 2.4.5.5-1 **Consistency of PCGP Project in Myrtle Creek Watershed with BLM Roseburg District ACS-Related Management Direction** 2-175

TABLE 2.4.5.6-1 **Proposed Off-site Mitigation Projects for Myrtle Creek Watershed**.....2-178

TABLE 2.4.5.8-1 **Project Effects and ACS Objectives, Myrtle Creek Watershed** 2-179

TABLE 2.4.6.1-1. **Land Ownership (acres) and Federal Land Allocations (acres) in Days Creek-South Umpqua River Watershed HUC 1710030205**.....2-185

TABLE 2.4.6.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in Days Creek-South Umpqua River Watershed (HUC 1710030205) by Land Ownership** 2-186

Table 2.4.6.1-3 **PCGP Project Area (acres) on Federal Lands in the Days Creek-South Umpqua River Watershed HUC 1710030205 by Agency and Land Allocation**.....2-187

TABLE 2.4.6.1-4 **Riparian Reserve Effects Days Creek-South Umpqua Fifth Field Watershed HUC 1710030205**.....2-189

TABLE 2.4.6.4-1 **Project Effects and Relevant Ecological Processes Described in the Days Creek-South Umpqua River Fifth-Field Watershed Assessment**.....2-196

TABLE 2.4.6.5-1 **Consistency of PCGP Project on Days Creek-South Umpqua Watershed with BLM Roseburg District and Umpqua National Forest ACS-Related Management Direction**.....2-198

TABLE 2.4.6.6-1 **Proposed Off-site Mitigation Projects for Days Creek-South Umpqua Watershed**.....2-200

TABLE 2.4.7.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Elk Creek Watershed HUC 1710030204** 2-208

TABLE 2.3.7.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in Elk Creek Watershed HUC 1710030204 by Land Ownership**.....2-208

TABLE 2.3.7.1 3 **PCGP Project Area (acres) on Federal Lands in the Elk Creek Watershed HUC 1710030204 by Agency and Land Allocation** 2-209

TABLE 2.4.7.2-1 **Past Activities in Elk Creek Since Publication of the Elk Creek Watershed Analysis, Oct. 1996** 2-213

TABLE 2.4.7.4-1 **Project Effects and Relevant Ecological Processes Described in the Elk Creek-South Umpqua Fifth Field Watershed Assessment**.....2-215

TABLE 2.4.7.5-1 **BLM Roseburg District Management Direction and Umpqua National Forest Standards and Guidelines Applicable to the ACS** 2-216

TABLE 2.4.7.5-2 **PCGP Consistency with Standards and Guidelines for Key Watersheds, Elk Creek Watershed** 2-217

TABLE 2.4.7.7-1 **UNF Projects that Contribute to Cumulative Effects with the PCGP in the Elk Creek South Umpqua Watershed** 2-224

Draft

TABLE 2.4.8.1-1. **Land Ownership (acres) and Federal Land Allocations (acres) in Upper Cow Creek Watershed HUC 1710030206** 2-231

TABLE 2.4.8.1-2 **PCGP project Corridor (miles) and project Area (acres) in Upper Cow Creek Watershed HUC 1710030206 by Land Ownership** 2-231

TABLE 2.3.7.1 3 **PCGP Project Area (acres) on Federal in Upper Cow Creek Watershed HUC 1710030206 by Agency and Land Allocation** 2-232

TABLE 2.4.8.1-4 **Riparian Reserve Effects Upper Cow Creek Fifth Field Watershed HUC 1710030206** 2-233

TABLE 2.4.8.1-5 **Stream Crossing Turbidity and Risk Rating, Upper Cow Creek Fifth Field Watershed** 2-236

TABLE 2.4.8.2-1 **Activities in Cow Creek since publication of the Cow Creek Watershed Analysis, Sept. 1995** 2-239

TABLE 2.4.8.4-1 **Pacific Connector Proposed BMPS for Use at Waterbody Crossings** ...2-242

TABLE 2.4.8.5-2 **SSTEMP Model Results for Perennial Stream Crossings in Upper Cow Creek by Hydro-Feature and Reach** 2-245

TABLE 2.4.8.4-2 **Preliminary Assessment of Stream Temperature Impacts at Perennial Stream Crossings in the East Fork of Cow Creek** 2-247

TABLE 2.4.8.4-2 **Project Effects and Relevant Ecological Processes Described in the Upper Cow Creek Fifth Field Watershed Assessment** 2-251

TABLE 2.4.8.5-1 **Compliance with Standards and Guidelines** 2-253

TABLE 2.4.8.6-1 **Off Site Mitigations in the Upper Cow Creek Watershed** 2-260

TABLE 2.4.8.7-1 **UNF Projects That Contribute to Cumulative Effects with the PCGP in the Elk Creek South Umpqua Watershed** 2-262

TABLE 2.5.3.1-1. **Land Ownership (acres) and Federal Land Allocations (acres) in Trail Creek Watershed HUC 1710030706 by Land Ownership** 2-274

TABLE 2.5.3.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in the Trail Creek Watershed HUC 1710030706 by Land Ownership** 2-274

TABLE 2.5.3.1-3 **PCGP Project Corridor (miles) and Project Area (acres) in the Trail Creek Watershed HUC 1710030706 by Agency and Land Allocation**...2-275

TABLE 2.5.3.1-4 **Riparian Reserve Effects Trail Creek Watershed HUC 1710030706** 2-276

TABLE 2.5.3.2-1 **Past Activities on NFS Lands in Trail Creek since Publication of the Trail Creek Watershed Analysis, June 1999** 2-279

TABLE 2.5.3.4-1 **Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth Field Watershed Assessment** 2-282

TABLE 2.5.3.5-1 **Compliance with Standards and Guidelines** 2-285

TABLE 2.5.3.6-1 **Offsite Mitigations on BLM and NFS Lands in the Trail Creek Watershed** 2-289

Draft

TABLE 2.5.3.7-1 **Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Trail Creek Watershed** 2-290

TABLE 2.5.4.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Shady Cove-Rogue River Watershed HUC 1710030707** 2-301

TABLE 2.5.4.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in the Shady Cove-Rogue River Watershed (HUC 1710030707) by Land Ownership** 2-301

TABLE 2.5.4.1-3 **PCGP Project Area (acres) on Federal Lands in the Shady Cove-Rogue River Watershed (HUC 1710030707) by Agency and Land Allocations** 2-302

TABLE 2.5.4-1-4 **Riparian Reserve Effects Shady Cove Rogue River Fifth Field Watershed HUC 1710030707** 2-303

TABLE 2.5.4.1-5 **Turbidity and Stream Crossing Risk, Shady Cove –Rogue River Watershed** 2-305

TABLE 2.5.4.4-1 **Project Effects and Relevant Ecological Processes Described in the Shady Cove-Rogue River Fifth Field Watershed Assessment** 2-311

TABLE 2.5.4.4-2 **Pacific Connector Proposed Best Management Practices for use at Waterbody Crossings** 2-314

TABLE 2.5.4.5-1 **Compliance with Standards and Guidelines** 2-316

TABLE 2.5.4.6-1 **Proposed Off-site Mitigations on BLM Lands in the Shady Cove-Rogue River Watershed** 2-318

TABLE 2.5.5.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Big Butte Creek Watershed HUC 1710030704** 2-328

TABLE 2.5.5.1- 2. **PCGP Project Corridor (miles) and Project Area (acres) in the Big Butte Creek Watershed (HUC 1710030704) by Land Ownership** 2-329

TABLE 2.5.5.1-3 **PCGP Project Area (acres) on Federal Lands in the in the Big Butte Creek Watershed HUC 1710030704** 2-330

TABLE 2.5.5.1-4 **Riparian Reserve Effects in the Big Butte Creek Fifth Field Watershed HUC 1710030704** 2-331

TABLE 2.5.5.1-5 **Turbidity and Stream Crossing Risk, Big Butte Creek Watershed** . 2-332

TABLE 2.5.5.4-1 **Pacific Connector Proposed Best Management Practices for Use at Waterbody Crossings** 2-336

TABLE 2.5.4.4-2 **Project Effects and Relevant Ecological Processes in the Big Butte Creek Fifth Field Watershed** 2-338

TABLE 2.5.5.5-1 **Compliance with BLM Management Direction** 2-341

TABLE 2.5.5.6-1 **Proposed Off-site Mitigations on BLM Lands in the Big Butte Creek Watershed** 2-342

TABLE 2.5.6.1-1. **Land Ownership (acres) and Federal Land Allocations (acres) in Little Butte Creek Watershed HUC 1710030708** 2-354

TABLE 2.5.6.1-2 **PCGP Project Corridor (miles) and Project Area (acres) in Little Butte Creek Watershed HUC 1710030708 by Land Ownership** 2-355

Draft

TABLE 2.3.7.1 3 **PCGP Project Area (acres) on Federal Lands in the Middle Fork Coquille River Watershed HUC 1710030501 by Agency and Land Allocation** 2-356

TABLE 2.5.6.1-4 **Riparian Reserve Effects Little Butte Creek HUC 1710030708** 2-358

TABLE 2.5.6.1-5 **Stream Crossing Turbidity and Risk Assessment** 2-361

TABLE 2.5.6.2-1 **Changes in Watershed Condition since publication of the Little Butte Creek Watershed Analysis** 2-363

TABLE 2.5.6.2-2 **Anadromous Fish Distribution in Subwatersheds Crossed by the PCGP (Miles)** 2-365

TABLE 2.5.6.2-3 **NWFP Aquatic and Riparian Monitoring Trends, Subwatersheds in Little Butte Creek** 2-365

TABLE 2.5.6.4-1 **Pacific Connector Proposed BMPs for Use at Waterbody Crossings** 2-369

TABLE 2.5.6.4-2 **Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth Field Watershed Assessment** 2-370

TABLE 2.5.6.5-1 **Compliance with Applicable Land Management Plan Direction** 2-373

TABLE 2.5.6.5-2 **Standards and Guidelines for Key Watersheds** 2-375

TABLE 2.5.6.6-1 **Proposed Mitigation Measures on BLM Lands in Little Butte Creek** ... 2-384

TABLE 2.5.6.6-2 **Proposed Mitigation Measures on NFS Lands in Little Butte Creek** 2-388

TABLE 2.5.6.6-3 **Comparison of PCGP Effects and Proposed Road Decommissioning on NFS Lands, Little Butte Creek Tier 1 Key Watershed** 2-391

TABLE 2.5.6.6-4 **Stream Crossings in Decommissioned Roads by Subwatershed and Stream Class on NFS Lands, Little Butte Creek** 2-391

TABLE 2.5.4.6-5 **Changes in Road Density with Implementation of Mitigation Plan, Little Butte Creek Tier 1 Key Watershed** 2-391

TABLE 2.5.6.7-1 **Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Little Butte Creek Watershed** 2-398

TABLE 2.6.3.1-1 **Land Ownership (acres) and Federal Land Allocations (acres) in Spencer Creek watershed HUC 1801020601** 2-409

TABLE 2.6.3.1.-2 **PCGP Project Corridor (miles) and Project Area (acres) in the Spencer Creek watershed HUC 1801020601 by Land Ownership** 2-409

TABLE 2.6.3.1-3 **PCGP Project Area (acres) on Federal Lands in the Spencer Creek Watershed (HUC 1801020601) by Agency and Land Allocation** 2-410

TABLE 2.6.3.1-4 **Riparian Reserve Effects Spencer Creek Fifth Field Watershed HUC 1801020601** 2-411

TABLE 2.6.3.1-5 **Stream Crossing Turbidity and Crossing Risk Assessment** 2-414

TABLE 2.6.2.2-1 **Changes in Watershed Condition since publication of the Spencer Creek Watershed Analysis** 2-416

Draft

TABLE 2.6.2.4-1 **Pacific Connector Proposed BMPs for Use at Waterbody Crossings** 2-420

TABLE 2.6.1.4-2 **Project Effects and Relevant Ecological Processes Described in the Spencer Creek Fifth Field Watershed Assessment** 2-422

TABLE 2.6.2.5-1 **Cross References between ACS-Relevant NWFP Standards and Guidelines and BLM District RMP Management Direction** 2-424

TABLE 2.6.2.5-2 **Standards and Guidelines for Key Watersheds** 2-425

TABLE 2.6.2.6-1 **Proposed Offsite Mitigation Projects on BLM and NFS Lands** 2-431

TABLE 2.6.3.6-2 **Comparison of PCGP Effects and Proposed Road Decommissioning on NFS Lands, Spencer Creek Tier 1 Key Watershed** 2-436

TABLE 2.6.3.6-3 **Changes in Road Density with Implementation of Mitigation Plan, WNF Spencer Creek Tier 1 Key Watershed** 2-436

TABLE 2.6.2.7-1 **Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Spencer Creek Watershed** 2-438

TABLE 3.3.1-1 **Watershed Condition Class Corn Creek Subwatershed** 2-447

TABLE 3.3.1-2 **Watershed Condition Class Lower Elk Creek Subwatershed** 2-448

TABLE 3.3.1-3 **Watershed Condition Class Drew Creek Subwatershed** 2-449

TABLE 3.3.1-4 **Watershed Condition Class South Fork Cow Creek Subwatershed** 2-450

TABLE 3.3.1-5 **Watershed Condition Class Upper Trail Creek** 2-451

TABLE 3.3.1-6 **Watershed Condition Class West Fork Trail Creek** 2-452

TABLE 3.3.1-7 **Watershed Condition Class Upper SF Little Butte Creek** 2-453

TABLE 3.3.1-8 **Watershed Condition Class Middle SF Little Butte Creek** 2-454

TABLE 3.3.1-8 **Watershed Condition Class Lower NF Little Butte Creek** 2-455

TABLE 3.3.1-9 **Watershed Condition Class Beaver Dam Creek Subwatershed** 2-456

TABLE 3.3.1-10 **Watershed Condition Class Buck Lake Subwatershed** 2-457

Table 3.3.2-1 **AREMP Summary for Subwatersheds Crossed by the PCGP** 2-459

TABLE 3.4.1-1 **Road Density Worksheet** 2-461

TABLE 3.4.1-2 **Proposed Road Decommissioning Projects, Rogue River National Forest** 2-463

TABLE 3.4.1-3 **Proposed Road Decommissioning Spencer Creek Watershed** 2-470

TABLE 4.0-1 **FS Filed Mitigation Plan Submitted to FERC** 2-474

TABLE 4.0-2 **BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector** 2-484

Draft

Acronyms Used

ACOE	Army Corps of Engineers
ACS	Aquatic Conservation Strategy
BLM	Bureau of Land Management
CWA	Clean Water Act
ECRP	Erosion Control and Revegetation Plan
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
HUC	Hydrologic Unit Code
KWS	Key Watershed
LMP	Land Management Plan
LRMP	Land and Resource Management Plan
LSR	Late Successional Reserve
MAMU	Marbled Murrelet
MP	Mile Post
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NSO	Northern Spotted Owl
NWFP	Northwest Forest Plan
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
PCGP	Pacific Connector Gas Pipeline
REO	Regional Ecosystem Office
RMP	Resource Management Plan
ROD	Record of Decision
RR	Riparian Reserve
SSC	Suspended Sediment Concentration
USDA	United States Department of Agriculture
USDI	United Stated Department of the Interior
USGS	United States Geological Survey
WA	Watershed Assessment, or Watershed Analysis

Draft

Organization of this Assessment and Scale of Analysis

The proposed Pacific Connector Gas Pipeline would cross BLM or National Forest lands in portions of sixteen fifth-field[1] watersheds where the Aquatic Conservation Strategy (ACS) applies. To maintain a watershed-scale connection across multiple watersheds, this ACS assessment is structured at the fifth-field watershed scale, but provides linkages to the river basin and aquatic province scales. Chapter 1 provides an overview of the ACS and discusses general project effects. Chapter 2 provides a regional and river basin context for the watersheds that would be crossed by the PCGP and discusses project effects in each fifth-field watershed by ACS objective. Chapter 3 provides supporting data tables and references. Chapter 4 provides copies of current mitigation plans. Chapter 5 is the bibliography.

The discussion for each fifth-field watershed addresses each component of the ACS and considers the existing condition, the range of natural variation as described by the watershed analysis for relevant watersheds, compliance with standards and guidelines of the affected forest Service and Bureau of Land Management land management plans, and the relationship of the proposed management action to the recommendations of the applicable watershed assessments.

The ACS requires that project impacts be evaluated at multiple scales. While the Pacific Connector is a large project, its impact in any single watershed is typically very small. Modern Geographic Information Systems allow very precise measurements. Inventories of land allocations and watersheds at larger scales are rounded to the nearest acre for simplicity. Area measurements at the project scale and percentage of areas affected by the project are carried to 2 decimal places so that small portions of the affected landscape are not overlooked. Working at that scale of precision, rounding of small numbers may result in slightly different values for the same data set. In some circumstances, numbers were simply too small to be meaningful. Where numbers would not round up to at least 1/100 of an acre or 1/100 percent, they are shown as zero. These are very small areas. The table below provides a physical sense of scale that may be useful for readers to evaluate effects.

Unit of Area Measure	Area	Square dimension	Circular Dimension
1 Acre	43,560 square feet	208 feet	117 foot radius circle
0.10 or 1/10 Acre	4,356 square feet	66 feet	37 foot radius circle
0.01 or 1/100 acre	437 square feet	21 feet	11.8 foot radius circle

Percentage	Proportion	Portion 100 acres	Portion of 1000 acres
1 percent	1/100 of a unit.	1 acre out of 100	10 acres out of 1000
0.1 percent	1/1,000 of a unit	0.1 acre out of 100	1 acre out of 1000
0.01 percent	1/10, 000 of a unit	0.01 acre out of 100	1/10th acre out of 1000

Impacts at the site Riparian Reserve and other land allocation inventories and impacts at the subwatershed, watershed and subbasin scale are described both in acres and as a percentage of the affected land allocation. Typically, the portions of landscapes affected by the Pacific Connector

[1] A "fifth field" watershed refers to the hierarchical coding system used by the US Geological Survey to stratify watersheds. A fifth-field watershed is typically 50-200 square miles and is the analytical basis for most BLM and Forest Service watershed assessments and ACS assessments.

project are very small. An impact of 0.1% would affect 1 acre out of 1000 of a given land allocation or landscape. An impact of 0.01% would affect 1 acre out of 10,000. If the assessment showed the project affecting 0.25% of a watershed, that would equate to

- 0.25 acres or 1/4 acre out of 100 acres,
- 2.5 acres out of 1000 acres or
- 25 acres out of 10,000 acres.

Inventories at the site scale are precise since they are based on the project corridor and in many cases, site-specific surveys. Inventories at larger scales are derived from agency inventories or estimates in watershed analyses that are reasoned estimates based on samples or GIS exercises.

Riparian Reserve effects are categorized according to the nature of the construction action.

- The construction corridor and associated Temporary Extra Work Areas (TEWA) clear most of the vegetation from the designated areas. All trees are removed, and most low growing vegetation is cleared. Accordingly, these areas are described as "cleared".

- Uncleared Storage Areas (UCSA) are places where stumps and other material are stored. In these areas, only smaller trees are cut as needed for safe and efficient operations. In the Riparian Reserves, UCSAs are described as "modified'.

The nature of effects on a stream channel and its associated Riparian Reserve depends on whether the stream channel is actually crossed by the pipeline trench. In some circumstances, the pipeline trench crosses the stream channel and its associated Riparian Reserve; in other cases, only Riparian Reserve vegetation is removed and the pipeline trench does not cross a stream channel. These types of impacts are separated in this assessment because a stream channel crossing has different effects than removal of vegetation only.

- Where the pipeline trench crosses a stream channel, the impact on the Riparian Reserve of the corridor clearing and TEWAs are described as "crossed". UCSAs are tallied as they occur in Riparian Reserves where streams are crossed but are counted separately from the area where vegetation is cleared as part of the construction corridor or TEWA.

- Where the "cleared" or "modified" areas affect a portion of the Riparian Reserve, but the pipeline trench does not cross the associated stream channel, the affected area is described as "clipped".

Because of rounding, small differences in GIS layers or the way GIS queries are constructed, there may be slightly different values between inventories in this assessment and those found in Pacific Connector's Resource Reports. For example, Pacific Connector acre estimates may include pipe yards in existing rock pits that are already cleared. Those are not included in this evaluation since the character of the landscape is not changed by the action or use. We do not consider these minor inventory differences to be significant, nor do these minor differences affect conclusions of significance of effects.

Draft

Executive Summary

This Appendix (Appendix J) provides information for BLM and Forest Service decision makers to evaluate whether the proposed Pacific Connector Gas Pipeline project (PCGP or project) would retard or prevent attainment the Aquatic Conservation Strategy (ACS) objectives contained in Attachment A (Forest Service and BLM 1994b) to the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (Forest Service and BLM 1994a), also known as the Northwest Forest Plan (NWFP). The NWFP established land allocations, management objectives and standards and guidelines for management and protection of aquatic resources on BLM and National Forest System (NFS) lands in the area of the northern spotted owl. BLM and Forest Service line officers must determine whether activities that occur on BLM or NFS lands retard or prevent attainment of the ACS objectives in the NWFP.

Private lands dominate the landscape in many of the watersheds that would be crossed by the project. The ACS applies only to lands managed by the BLM and the Forest Service within the area covered by the NWFP. On private lands, compliance with the Clean Water Act (CWA) is the best evidence of protection of aquatic values. Issuance of permits for the PCGP project under Section 401 of the CWA from the State of Oregon Department of Environmental Quality (ODEQ) and Section 404 of the CWA from the U.S. Army Corps of Engineers (ACOE) demonstrate compliance with the CWA. The Proponent's application to FERC will include the necessary information for the ODEQ and ACOE permits. The BLM and Forest Service require that the proponent secure those permits prior to making any findings related to the ACS. Chapter 4.04 of this EIS describes watershed impacts of the proposed Pacific Connector Project on private lands.

The Project would traverse approximately 40 miles of BLM lands and 31 miles of NFS lands on its 232 -mile route from Malin to Coos Bay, Oregon. The Project would cross portions of 19 fifth-field watersheds, 16 of which include BLM or NFS lands where the ACS applies. Table ES-1 and ES-2 summarize (1) the number and acreage of Riparian Reserves of perennial and intermittent streams and forested wetlands that would be crossed by the pipeline on BLM or NFS lands, and (2) the number and acreage of Riparian Reserves that would be "clipped" where a portion of the Riparian Reserve is impacted without the pipeline trench crossing a waterbody or wetland. In 11 of the 16 watersheds traversed by the pipeline on federal lands, the Project would cross perennial or intermittent streams or wetlands; in 5 of the watersheds crossed (Coquille River, Olalla Lookingglass, Clark Branch South Umpqua, Days Creek South Umpqua, Elk Creek South Umpqua), the Project would not cross any waterbodies but would clip Riparian Reserves. Two watersheds (Elk Creek South Umpqua and Olalla-Lookingglass have no waterbody crossings or Riparian Reserves affected.

TABLE ES-1

Summary of Riparian Reserves, Stream Channels and Wetlands Crossed by the Pacific Connector Pipeline on BLM-and NFS Lands by Administrative Unit

Agency a/	Perennial Streams Crossed a/		Intermittent Streams Crossed		Wetlands Crossed b/		Total Stream Channels or Wetlands Crossed		Riparian Reserves Clipped without Stream or Wetland Crossings c/		Total d/	
	Stream Channels Crossed e/ (number)	Riparian Reserves Cleared (Acres)	Stream Channels Crossed (number)	Riparian Reserves Cleared (Acres)	Wetlands Crossed (number)	Riparian Reserves Cleared (Acres)	Total Crossed (number)	Total Riparian Reserves Cleared (Acres)	Riparian Reserves Clipped (number)	Total Riparian Reserves (Acres)	Affected Riparian Reserves (number)	Cleared (Acres)
BLM Coos Bay District	2	3.05	12	8.69	3	3.68	17	15.42	18	14.51	35	29.93
BLM Roseburg District	1	3.51	0	0.00	2	2.78	3	6.29	19	4.93	22	11.22
BLM Medford District	0	0.00	11	18.20	2	1.63	13	19.83	9	5.39	22	25.22
BLM Lakeview District	0	0.00	1	2.11	0	0.00	1	2.11	0	0.00	1	2.11
Total BLM	**3**	**6.56**	**24**	**29.00**	**7**	**8.09**	**34**	**43.65**	**46**	**24.83**	**80**	**68.48**
Umpqua National Forest	4	6.77	2	2.06	1	0.00	7	8.83	8	2.00	15	10.83
Rogue River National Forest	1	2.58	1	1.03	0	0.00	2	3.61	2	0.80	4	4.41
Winema National Forest	0	0.00	4	3.63	1	0.00	5	3.63	7	3.32	12	6.95
Total Forest Service	**5**	**9.35**	**7**	**6.72**	**2**	**0**	**14**	**16.07**	**17**	**6.12**	**31**	**22.19**
Total BLM and Forest Service	**8**	**15.91**	**31**	**35.72**	**9**	**8.09**	**48**	**59.72**	**63**	**30.95**	**111**	**90.67**

Data Source: Resource Report 3, table 2A-3A and BLM and FS Riparian Reserve Assessment, database.

a/ "Crossed" means that the pipeline trench crosses the stream channel or delineated wetland area.

b/ "Wetlands" refers to delineated wetland areas that are not already counted as streams. Where the Riparian Reserve of a wetland is fully encompassed in the adjacent Riparian Reserve of a stream channel, the acres are counted as part of the stream channel to avoid double counting and are shown as 0 in this table. .

c/ "Clipped" means that the Riparian Reserve associated with a stream channel or wetland was cleared as part of the construction corridor or TEWA, but the pipeline trench did not cross the stream channel or delineated wetland area.

d/ This table includes only areas where vegetation is cleared in the construction corridor and Temporary Extra Work Areas (TEWA). Within the construction corridor and TEWAs, most vegetation would be cleared. An additional 11.05 acres of Riparian Reserves are used as Uncleared Storage Areas (UCSA) where habitat may be modified but vegetation is not removed.

e/ Irrigation ditches or other man-made water conveyances are crossed by the project, but they do not create Riparian Reserves and are not subject to the requirements of the NWFP

Draft

TABLE ES-2

Vegetation Age Class Structure of Riparian Reserves Cleared in Construction Corridor and TEWAs by Administrative Unit, BLM and Forest Service

Administrative Unit	Waterbody Type	LSOG (>80 Years) Forest Cleared (Acres)				Mid Seral (40-80 Years) Cleared (Acres)				Early Seral (0-40 Years) Cleared (Acres)				Total All Vegetation Classes (Acres)	Stream Channel or Wetland Area within Corridor (Acres)	Total within Cleared Area (Acres)
		Conifer Forest	Hardwood Forest	Mixed Conifer and Hardwood Forest	Total LSOG Cleared	Conifer Forest	Hardwood Forest	Mixed Conifer and Hard-wood Forest	Total Mid-Seral Cleared	Conifer Forest	Shrub or Brush-field	Grass-lands and non-forest	Total Early Seral Cleared			
BLM Coos Bay	Perennial Stream	3.67	0.00	0.00	3.67	0.06			0.06	0.02		1.28	1.30	5.03	0.19	5.22
	Intermittent Stream	0.84			0.84	11.00			11.00	9.17		0.02	9.19	21.03	0.00	21.03
	Wetland	0.01			0.01	3.67			3.67				0.00	3.68	0.00	3.68
	Total	**4.52**	**0.00**	**0.00**	**4.52**	**14.73**	**0.00**	**0.00**	**14.73**	**9.19**	**0.00**	**1.30**	**10.49**	**29.74**	**0.19**	**29.93**
BLM Roseburg	Perennial Stream				0.00	3.22			3.22	0.13			0.13	3.35	0.16	3.51
	Intermittent Stream	2.32		0.45	2.77	0.88			0.88	1.28			1.28	4.93		4.93
	Wetland	0.05			0.05	2.45			2.45				0.00	2.50	0.28	2.78
	Total	**2.37**	**0.00**	**0.45**	**2.82**	**6.55**	**0.00**	**0.00**	**6.55**	**1.41**	**0.00**	**0.00**	**1.41**	**10.78**	**0.44**	**11.22**
BLM Medford	Perennial Stream		0.92	0.22	1.14				0.00				0.00	1.14		1.14
	Intermittent Stream	1.60	3.74	7.67	13.01			1.06	1.06	3.23	3.80	1.02	8.05	22.12	0.33	22.45
	Wetland	0.52		0.02	0.54	0.56	0.00	0.43	0.99	0.03			0.03	1.56	0.07	1.63
	Total	**2.12**	**4.66**	**7.91**	**14.69**	**0.56**	**0.00**	**1.49**	**2.05**	**3.26**	**3.80**	**1.02**	**8.08**	**24.82**	**0.40**	**25.22**
BLM Lakeview	Intermittent Stream Total	1.91			1.91				0.00			0.17	0.17	2.08	0.03	2.11
Total BLM	Perennial Stream	3.67	0.92	0.22	4.81	3.28	0.00	0.00	3.28	0.15	0.00	1.28	1.43	9.52	0.35	9.87
	Intermittent Stream	7.19	4.00	8.42	19.61	11.88	1.20	1.49	14.57	13.68	3.99	1.21	18.88	53.06	0.40	53.49
	Wetland	0.06	0.00	0.00	0.06	6.68	0.00	0.00	6.68	0.03	0.00	0.00	0.03	6.77	0.29	7.06
	Total	**10.92**	**4.92**	**8.64**	**24.48**	**21.84**	**1.20**	**1.49**	**24.53**	**13.86**	**3.99**	**2.49**	**20.34**	**69.35**	**1.04**	**70.42**
Umpqua NF	Perennial Stream	2.43		0.38	2.81	1.54			1.54	3.28	0.09		3.37	7.72	0.12	7.84
	Intermittent Stream				0.00	1.90			1.90	0.13			0.13	2.03	0.03	2.06
	Wetland				0.00	0.93			0.93					0.93	0.00	0.93
	Total	**2.43**	**0.00**	**0.38**	**2.81**	**4.37**	**0.00**	**0.00**	**4.37**	**3.41**	**0.09**	**0.00**	**3.50**	**10.68**	**0.15**	**10.83**

Draft

TABLE ES-2

Vegetation Age Class Structure of Riparian Reserves Cleared in Construction Corridor and TEWAs by Administrative Unit, BLM and Forest Service

Administrative Unit	Waterbody Type	LSOG (>80 Years) Forest Cleared (Acres)				Mid Seral (40-80 Years) Cleared (Acres)				Early Seral (0-40 Years) Cleared (Acres)				Total All Vegetation Classes (Acres)	Stream Channel or Wetland Area within Corridor (Acres)	Total within Cleared Area (Acres)
		Conifer Forest	Hardwood Forest	Mixed Conifer and Hardwood Forest	Total LSOG Cleared	Conifer Forest	Hardwood Forest	Mixed Conifer and Hard-wood Forest	Total Mid-Seral Cleared	Conifer Forest	Shrub or Brush-field	Grass-lands and non-forest	Total Early Seral Cleared			
Rogue River NF	Perennial Stream	1.38			1.38				0.00	1.16			1.16	2.54	0.04	2.58
	Intermittent Stream				0.00	0.28			0.28		0.73	0.20	0.93	1.21	0.10	1.31
	Wetland	0.13			0.13				0.00	0.39			0.39	0.52	0.00	0.52
	Total	**1.51**	**0.00**	**0.00**	**1.51**	**0.28**	**0.00**	**0.00**	**0.28**	**1.55**	**0.73**	**0.20**	**2.48**	**4.27**	**0.14**	**4.41**
Winema NF	Perennial Stream	1.32			1.32				0.00				0.00	1.32		1.32
	Intermittent Stream	1.28			1.28	2.30			2.30		0.53	0.17	0.70	4.28	0.45	4.73
	Wetland	0.90			0.90				0.00				0.00	0.90		0.90
	Total	**3.50**	**0.00**	**0.00**	**3.50**	**2.30**	**0.00**	**0.00**	**2.30**	**0.00**	**0.53**	**0.17**	**0.70**	**6.50**	**0.45**	**6.95**
Total Forest Service	Perennial Stream	5.13	0.00	0.38	5.51	1.54	0.00	0.00	1.54	4.44	0.09	0.00	4.53	11.58	0.16	11.74
	Intermittent Stream	1.28	0.00	0.00	1.28	4.48	0.00	0.00	4.48	0.13	1.26	0.37	1.76	7.52	0.58	8.10
	Wetland	1.03	0.00	0.00	1.03	0.93	0.00	0.00	0.93	0.39	0.00	0.00	0.39	2.35	0.00	2.35
	Total	**7.44**	**0.00**	**0.38**	**7.82**	**6.95**	**0.00**	**0.00**	**6.95**	**4.96**	**1.35**	**0.37**	**6.68**	**21.45**	**0.74**	**22.19**
Total BLM and Forest Service	Perennial Stream	8.80	0.92	0.60	10.32	4.82	0.00	0.00	4.82	4.59	0.09	1.28	5.96	21.10	0.51	21.61
	Intermittent Stream	7.95	3.74	8.12	19.81	16.36	0.00	1.06	17.42	13.81	5.06	1.58	20.45	57.68	0.91	58.62
	Wetland	1.61	0.00	0.02	1.63	7.61	0.00	0.43	8.04	0.42	0.00	0.00	0.42	10.09	0.35	10.44
	Total	**18.36**	**4.66**	**8.74**	**31.76**	**28.79**	**0.00**	**1.49**	**30.28**	**18.82**	**5.15**	**2.86**	**26.83**	**88.87**	**1.77**	**90.67**

Minor rounding differences may result in totals across rows tallying to slightly different totals than column totals and subtotals. These differences are on the order of hundredths of an acre and are not significant.

Draft

The proposed Pacific Connector pipeline route would follow ridgelines and existing rights-of-way, such as powerlines and roads, wherever possible. This analysis shows that other than change in vegetative condition, impacts on BLM and NFS Riparian Reserves and aquatic habitats would be temporary or minor in scale in any given fifth-field watershed or sixth-field subwatershed with the exception of Riparian Reserves at MP 119.7, 126.59 and 131.7. At these locations, the PCGP would likely become a chronic source of fine sediments because of corridor routing. These chronic fine sediments would likely retard accomplishment of ACS objectives. Alternative routings at these locations have been developed by the Applicant and approved by the BLM, but have not yet been filed with FERC. This assessment would be modified when reroutes at these locations have been filed.

Project impacts at on aquatic habitats at stream crossings are generally comparable to construction of a road crossing with a culvert installation. Possible short-term impacts would be sediment transport to waterbodies where construction at stream crossings causes surface erosion, disturbance of banks and stream bottoms, and minor increases in water temperature from removal of effective shade. Removal of vegetation at stream crossings would result in a long-term change in vegetative condition at the site scale where mid and late seral forest vegetation is removed during corridor construction. Use of roads, including standards for reconstruction, would be subject to applicable ACS standards and guidelines. In order to minimize potential adverse impacts on fish, timing of instream work in streams with flowing water would be tied to work windows established by the ODFW. These time periods were established to avoid the vulnerable life stages of potentially affected fish species, including migration, spawning, and rearing.

Summary of Environmental Consequences Related to the ACS

Sediment

Corridor construction and stream crossings may create conditions where accelerated soil erosion and sediment transport to streams could occur in the absence of active and aggressive erosion control measures and rapid successful revegetation.

There are three project phases when sediment could be created:

1. **Corridor clearing and construction**. The ECRP for the project describes the erosion control measures that would be implemented during corridor clearing to minimize transport of sediment to adjacent and nearby aquatic habitats. The FERC Environmental Inspector (EI), in cooperation with agency representatives of the BLM and Forest Service, would determine appropriate temporary measures to be used to minimize potential erosion and sediment impacts during and after timber clearing operations. These measures include:

    - Leaving slash generated during timber clearing operations on the corridor to reduce erosion over the following winter. This minimizes raindrop impacts and overland flow.

    - Scarifying compacted surfaces, where appropriate, to promote infiltration and reduce runoff;

- Use of additional slash/brush piles and coarse woody debris (limbs to large logs) at appropriate locations to minimize offsite runoff and sedimentation. Coarse woody debris placed on contour has been shown to be an effective hillslope measure to reduce erosion (Robichaud et al. 2000).

- Installation of slope breakers (water bars) at appropriate locations and spacings to shorten slope lengths, prevent concentrated flow, and divert runoff to stabilized areas. Waterbars are a proven and effective method of reducing the erosive energy of overland flow, diverting overland flow and minimizing sediment transport;

- Installation of silt fences and straw bale sediment barriers to prevent transport of sediment to aquatic habitats. Pacific Connector has committed to install and maintain erosion control structures including silt fences at stream crossings until effective ground cover is reestablished. Silt fences are 90 to 95 percent efficient at trapping sediment (Robichaud et al. 2000).

- Temporary seeding (using appropriate quick-germinating cover crops such as annual ryegrass or other appropriate cover species), where not precluded by federal restrictions on introduced species; and/or

- Mulching of corridor areas that do not have sufficient cover. Geotextile fabric erosion control blankets may also be used to provide temporary ground cover. Mulching reduces raindrop impacts, and when in contact with the ground, limits overland flow and sediment transport.

2. **Stream channel crossing**. During stream crossings, Pacific Connector would use dam-and-pump construction methods on any flowing streams to isolate the crossing construction site from the flowing stream on both the upstream and downstream sides of the crossing. The BLM and Forest Service have used this same method to install culverts in flowing streams. A literature review of pipeline stream crossing studies showed this method to be effective at controlling sediment. During construction, the crossing site is isolated from the stream by dams, and water is pumped around the site to maintain downstream flows. When dams and pumps are removed and the stream is allowed to flow across the crossing site, there may be a short-term (typically a few hours) pulse of sediment that would vary by substrate type. When compared to sediment mobilized by natural disturbance events such as fires and high-intensity precipitation, the sediment created is expected minor, short-term and well within the range of natural variation and comparable in scale to a minor bank slough.

   Pacific Connector conducted an extensive engineering analysis of stream crossings that included substrate type, channel morphology and other variables (GeoEngineers 2013c; 2013d). The findings of this analysis were consistent with the findings noted above. (See EIS Chapter 4.4)

3. **Post construction**. The analysis discloses that in the first year or two following construction, a minor pulse of sediment could be observed following the first seasonal rain, but this sediment-laden water is likely to dissipate within a few hundred feet and is expected to be indistinguishable from background levels. With the exceptions noted below

at MP 119.7, 125.59 and 131.7, this is expected to be a very minor amount of sediment because of the requirements in the ECRP to establish and maintain erosion control structures, sediment barriers, effective ground cover and accomplish rapid revegetation. Pacific Connector has committed to maintain silt barriers until effective ground cover is reestablished. Silt fences are 90 to 95 percent efficient at trapping sediment (Robichaud et al. 2000). As a result of these measures, the Project corridor is not expected to become a chronic source of fine sediments. For areas with reclamation sensitivity (see section 4.3.4 of this EIS) the Forest Service and BLM would also require soil remediation with biosolids or other appropriate organic materials to ensure successful revegetation. Except as noted at MP 119.7, 126.59 and 131.7, the analysis discloses that with the application of measures in the ECRP and effective soil remediation, projected impacts from sediment would be short term, minor, and within the range of natural variability for the watersheds crossed by the Project (section 1.3.1.2; see also section 4.3.4 of this EIS).

At MP 119.7 (Trail Creek Watershed), 126.59 (Shady Cove - Rogue River Watershed) and 131.7 (Big Butte Creek Watershed), the Project, if constructed would likely become a chronic source of sediment that may retard attainment of ACS objectives at those locations. At MP 119.7 and 131.7, the filed alignment lies entirely within the Riparian Reserve, and is closely adjacent and parallel to intermittent stream channels. Clearing limits at these locations would remove most riparian vegetation adjacent to the affected stream channel leaving little or no undisturbed area adjacent to the channel. At MP 126.59, the filed alignment crosses three intermittent stream channels in close proximity in an area that is sparsely vegetated and is currently a chronic source of fine-grained sediment. Current, pre-project conditions at this location are likely retarding accomplishment of ACS objectives. Construction disturbance would likely exacerbate these conditions. In all three of these locations, soils inventories and agency experience indicate that revegetation would be difficult once these areas are disturbed. As a result, these three locations would likely become chronic sources of sediment that may retard attainment of ACS objectives. The BLM Medford District has requested the applicant to reroute the alignment at these locations. Preliminary changes in alignment have been developed with the concurrence of the Medford District BLM that would address these issues. At MP 119.7 and 131.7, a realignment proposal has been developed that would move the corridor out of the adjacent Riparian Reserve. At MP 126.59, an alignment modification has been developed that would eliminate a stream crossing and move the alignment into an area that would not become a chronic source of fine sediments because the new alignment has larger, more stable substrate on gentler slopes and it can be revegetated . Once final engineering of modified alignments on these locations has been completed, the filed alignment would be modified to reflect these changes. This assessment would then be modified to reflect the new alignment.

If implementation or post-project monitoring show evidence as defined by the BLM or Forest Service of unacceptable surface erosion on an area of at least 100 square feet and at least five feet wide, or unacceptable sediment transport to aquatic systems, Pacific Connector would be required by the terms of the right-of-way grant to take additional erosion control measures as needed, as directed by the BLM or Forest Service, to reduce sediment transport to background levels. Evidence of "unacceptable" levels of sediment transport would include silt fences or other sediment barriers that are not maintained, lack of effective ground cover, visible turbidity at

Draft

channel crossings, visible evidence of sheet or gulley erosion where sediment is transported to aquatic systems or deposition downstream of crossings

Streambed and Stream Bank Impacts

All stream crossings on BLM and NFS lands (whether intermittent or perennial, wet or dry) would have either: 1) a bridge; 2) a temporary culvert with temporary road fill to be removed after work is completed; or 3) a low water ford with a rock mat. If water is present in streambeds at the time of construction, Pacific Connector would utilize temporary construction bridges during all phases of construction to cross the waterbodies. Where feasible, Pacific Connector's contractors would attempt to lift, span, and set the bridges from the streambanks. Where it is not feasible to install or safely set the temporary bridges from the streambanks, only the equipment necessary to install the bridge or temporary support pier would cross the waterbody. Any equipment required to enter a waterbody to set a bridge would be inspected to ensure it is clean and free of dirt or hydrocarbons (PCGP Resource Report 2. 2013:31). Agency representatives would also participate in pre-construction evaluation of crossing methods as necessary.

At stream crossings, the corridor width would be reduced from 95 feet to 75 feet where it is feasible to do so and TEWAs would be set back at least 50 feet from the stream channel. The area of potential disturbance to stream banks and bottoms from equipment is generally less than 15 feet wide – about the width of a culvert installation. Measures described above would minimize disturbance of streambanks and channel bottoms. The stream crossing for the pipeline would be accomplished by constructing a trench 4 to 6 feet wide and deep enough to avoid possible channel scouring. Typically, this would be at least three to five feet below the stream bottom. In some locations, steep streambanks would be "laid back" (excavated) to a 2:1 to 3:1 backslope ratio to stabilize the banks and minimize bank erosion from the stream. These crossings are identified in the individual watershed descriptions. After installation of the pipeline , the trench would be backfilled with material excavated from the trench and capped with gravel as needed. Boulders and large woody debris (LWD) removed from the corridor would be placed as needed within the stream crossing area and Riparian Reserve to reestablish or improve pre-crossing conditions. Streambanks would be revegetated with native species and "armored" as needed and specified by Agency representatives with LWD and boulders to ensure stability. Channel breakers would be installed on each side of the trench to ensure that subsurface flows are not captured by the pipeline trench. A site-specific crossing evaluation has been completed by Pacific Connector that specifies likely BMPs to be applied (GeoEngineers 2013c). Prior to construction, a final evaluation which would include Agency representatives would be completed to determine crossing methods based on conditions at the time of construction. Site-specific restoration plans have been developed by the agencies for each of the eight perennial stream crossings that occur on BLM or NFS lands to ensure that the sites are restored to pre-crossing conditions (NSR, 2014). (Preliminary, in preparation at time of DEIS)

Temperature

Vegetation clearing that increases stream exposure to solar radiation may increase water temperatures. There are five perennial stream crossings on NFS lands and three on BLM lands where corridor construction potentially could remove shading vegetation. To evaluate whether corridor construction would increase water temperatures, a site-specific field evaluation of stream temperature impacts on the five perennial stream crossings on NFS lands was conducted. The evaluation showed that with mitigation measures, any temperature increases would be less than

Draft

0.2 °C and limited to the point of maximum impact. No impacts were predicted at the stream network scale because of the small volume of affected streams, likely groundwater inputs and the assimilative capacity of the stream network. On-the-ground conditions and water temperature model results suggest that it is unlikely that the stream temperature downstream of any of the perennial crossings would be increased above the ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F) (NSR 2009:41-42, Table 6.1.1). BLM personnel conducted a field review of perennial stream crossings on BLM lands and determined that increases in stream temperature were unlikely to occur as a result of construction (section 1.3.1.3; see also individual watershed discussions).

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on BLM and NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75 foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right of way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right of way clearing on stream temperatures. Given that mitigation for loss of effective shade would occur, and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects, including intermittent streams, of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be minor and well below detection in the field (GeoEngineers 2013f: 26).

Temporary Construction Corridor

The construction corridor would be 75 to 95 feet wide, excluding TEWAs and UCSAs. Clearing of the construction corridor would remove vegetation with both short-term and long-term effects. In the short-term, disturbed areas within the right-of-way would be revegetated after pipeline installation. Where mid or late-seral vegetation is removed this would result in a long-term change in vegetative condition. The analysis discloses that the scale of this impact would be minor in each single watershed and well within the range of natural variability for the watersheds crossed. Approximately 90.67 acres (Table ES-1) or approximately 0.05 percent of an estimated 186,050 acres of Riparian Reserves on BLM and NFS lands in watersheds crossed by the Project (Table 1.1.1-1) would cleared in the construction corridor or TEWAs. Approximately 11 acres of UCSAs would be located within Riparian Reserves (Table ES-1). Riparian habitat in these uncleared storage areas may be modified, but existing canopy would not be removed. On all BLM and NFS lands, approximately 32 acres of Riparian Reserves within the construction clearing are late-successional or old-growth (LSOG) forest that are generally at least 80 years old. Of these, approximately 18 acres are coniferous forests, 5 acres are deciduous hardwoods and 9 acres are mixed hardwood and coniferous forests. The remaining affected Riparian Reserves (approximately 61acres) consist of 27 acres of early seral (0-30 years old), 32 acres of mid-seral (30-80 years old), or 2 acres of non-forest vegetation (Table ES-2.). Where early seral or non-forest is cleared at a stream crossing, it would likely have no impact on stream temperature, because these areas are already not providing effective shade. There would be seven crossings of perennial fish-bearing streams where a total of 8 acres of LSOG would be within the clearing limits of the Project (Table ES-2).

Draft

Permanent Pipeline Easement

Pacific Connector would retain a 50-foot-wide operational permanent easement for the entire length of its pipeline. A 10-feet-wide corridor centered on the pipeline would be maintained in an herbaceous state, and trees more than 15-feet-high would be removed within 15 feet from the pipeline centerline. However, the remainder of the permanent easement would be fully restored with native vegetation, according to Pacific Connectors ECRP, including trees in forested areas. No service road would be established or maintained within this inspection corridor. LWD and boulders would be placed as needed within the permanent easement to minimize surface erosion, provide wildlife habitat, and discourage ORV use.

Hydrostatic Testing

Hydrostatic testing is the process used to pressure test the pipeline with water to identify potential leaks. Pacific Connector has prepared a Hydrostatic Test Plan that incorporates requirements from the BLM and Forest Service for discharge of water used in testing, erosion control measures at discharge sites and prevention of aquatic pathogen transmission (PCGP Hydrostatic Test Plan, January 2013). Key points of this plan relative to the ACS include:

- None of the water sources are federally controlled. All water sources are controlled by municipalities, local water districts or the State of Oregon. Pacific Connector would secure permits for water sources from the jurisdiction that controls the source site.
- All of the discharge sites have been reviewed in the field and approved by the BLM and Forest Service.
- Erosion control measures at discharge sites have been designed to allow the discharged water to soak into the ground without causing sediment transport to stream channels.
- No water would be discharged to streams or other waterbodies on BLM or NFS lands. Water that has soaked into the round may however indirectly reach stream channels as subsurface flows.
- Waters known to include aquatic pathogens would not be used for hydrostatic testing.
- All water from non-domestic sources would be treated with chlorine to prevent the transmission of aquatic pathogens. Chlorinated water would be discharged according to the Oregon Department of Environmental Quality, May 19, 1997 Memorandum for Chlorinated Water Discharges.

Use and Maintenance of Roads

Approximately 330 miles of existing BLM or NFS roads would be used during construction of the pipeline. Post-project monitoring and maintenance would use a much smaller subset of these roads and is expected to no more than light truck traffic. Pacific Connector prepared a TMP for federal lands as Attachment 25 of its POD. Road use standards and guidelines (Forest Service) and management direction (BLM) applicable to the ACS have been incorporated into the TMP (section 1.2.2). Any necessary reconstruction such as surfacing, culvert upgrades, running surface widening, or curve widening are also identified, with specifications, in the TMP. The Project is consistent with requirements in BLM and Forest Service LMPs for use of roads.

Draft

Compliance with Standards and Guidelines

Standards and guidelines regulate or prohibit activities to ensure that objectives of land management plans would be achieved. Compliance with standards and guidelines for activities in Riparian Reserves is an important part of ensuring that the objectives of the ACS would be achieved. The preliminary analysis discloses that the Project would be consistent with the requirements of the NWFP for activities in Riparian Reserves. As required by the Standard and Guideline for Lands, LH-4, requirements necessary to accomplish the objectives of the ACS would be incorporated into the Right-of-Way Grant if issued by the BLM. These conditions include:

- Seasonal restrictions on operations to the ODFW in-stream work window on all flowing streams.
- Use of temporary bridges at stream crossings to prevent bank and bottom disturbance from equipment.
- Use of dry dam-and-pump methods that isolate the stream from the crossing site to minimize sediment produced at perennial streams.
- Water quality BMPs that include:
  - Water bars as needed to divert water off of slopes,
  - Maintenance of effective ground cover according to agency standards until revegetation is completed,
  - Installation and maintenance of sediment barriers until permanent effective ground and revegetation is completed,
  - Monitoring after storm events to ensure that erosion control measures and sediment barriers are functioning,
  - Revegetation of Riparian Reserves and upland areas with native vegetation specified by the BLM and Forest Service,
- Soil remediation that includes decompacting compacted soils and the use of biosolids or other organic supplements as needed to accelerate revegetation, and
- Scattering LWD and slash in amounts specified by the BLM and Forest Service across the right of way to provide ground cover and maintain long-term site productivity.

Standard and Guideline WR-3 in the NWFP (Forest Service and BLM, 1994b) stipulates that mitigation measures not be used as substitutes for preventing habitat degradation. Standard and Guideline WR-3 does not mean that mitigation measures cannot be used to offset otherwise unavoidable impacts of a project. The BLM and Forest Service interpret WR-3 to mean that mitigation measures are not to be used as a substitute for appropriate design standards, or to allow an inappropriate standard of environmental compliance. Appropriate design measures and application of best management practices for water quality have been incorporated throughout the ECRP and other PODs. Mitigation measures are not being used as substitutes for preventing habitat degradation or to allow inappropriate environmental standards to be used.

Draft

The Project proposal would not be compliant with underlying and more restrictive standards and guidelines in the Umpqua, Rogue River, and Winema National Forests' LRMPs that apply to riparian areas. Although BMPs and appropriate design standards have been applied, these are otherwise unavoidable effects due to the limitations of routing and the linear nature of the project. These standards and guidelines are not specific to the ACS however the analysis must show that implementation of these amendments would not prevent attainment of ACS objectives. Site-specific amendments of these aquatic-related standards and guidelines are proposed to make provision for the Project:

- Rogue River National Forest, RRNF-5: Proposed site-specific amendment to allow utility transmission corridors in Management Strategy 26, Restricted Riparian Areas.
- Umpqua National Forest, UNF-1: Proposed site-specific amendment to allow removal of effective shade on perennial streams.
- Umpqua National Forest, UNF-2: Proposed site-specific amendment to allow utility corridors to parallel riparian areas.
- Winema National Forest, WNF-5: Proposed site-specific amendment to waive limitations on detrimental soil conditions within Riparian Areas (Management Area 8).

These amendments are discussed in the sections of this chapter that are applicable to the watershed where they occur.

Mitigation Measures

Off-site mitigation measures that are a part of the proposed action (see EIS table 2.1.4-1) would help ensure that watershed function would be maintained or restored during construction and operation of the Project as required by the ACS. These measures are considered in the individual watershed analyses in this appendix.

Offsite mitigation projects that contribute to the objectives of the ACS include:

- Approximately 103 miles of road decommissioning of which approximately 11 miles are in Riparian Reserves. Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the PCGP occur. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b)

- Approximately 49 miles of road resurfacing. Road surfacing reduces sediment by capping existing fine textured sediments in the running surface of a gravel road with coarser rock or by paving. Paving all but eliminates traffic-generated sediments. Drainage repair reestablishes out-sloping, cross-drains and in some cases ditchlines to ditch-relief culverts. These actions have the effect of getting water off the road before it can enter streamcourses. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b)

- Approximately 7 miles of road stormproofing to reduce the risk of road failures during storms. Drainage repair reestablishes out-sloping, cross-drains and in some cases ditchlines to ditch-

relief culverts. These actions have the effect of getting water off the road before it can enter streamcourses and reducing the risk of road failure. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (BLM and Forest Service 1994b)

- Approximately 30 miles of instream LWD projects. Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery et al. 2010) This is responsive to Aquatic Conservation Strategy objectives 2, 3, 4 and 5 (Forest Service and BLM 1994b) .

- 14 Fish passage culverts. Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS Objectives 1, 2, 3 and 9 (Forest Service and BLM 1994b) .

- Approximately 6500 acres of fuels reduction and stand density management and 2000 acres of underburning to reduce fuels. High intensity stand replacement fires may adversely affect riparian values by Stand density reductions in riparian zones have the dual benefit of reducing the risk of stand-replacing fire, while also accelerating the development of late successional stand conditions by accelerating growth of remaining trees. This is responsive to ACS objective 8 and 9.

- Reallocation of approximately 1800 aces from the matrix land allocation to the LSR land allocation. Managing lands for LSR objectives generally benefits aquatic resources. This measure is responsive to all 9 of the ACS objectives.

Draft

This page intentionally left blank.

Draft

1.0 INTRODUCTION

The purpose of this assessment is to provide the information and analysis necessary to support findings by USDI Bureau of Land Management (BLM) and USDA Forest Service (Forest Service) decision-makers regarding the consistency of the proposed Pacific Connector Gas Pipeline project (PCGP or project) with the Aquatic Conservation Strategy (ACS) contained in Attachment A to the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (Forest Service and BLM 1994a) also known as the Northwest Forest Plan (NWFP).

The ROD for the NWFP includes a description of the components and objectives of the ACS. The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands (Forest Service and BLM 1994b: B-9)

The Land and Resource Management Plans (LRMPs) for the Rogue River, Umpqua, and Winema National Forests were amended by the NWFP, which includes the ACS. The Resource Management Plans (RMPs) for the Coos Bay, Roseburg, and Medford Districts and the Klamath Falls Resource Area of the Lakeview District of the BLM were approved in 1995 after the ROD for the NWFP was signed but ACS objectives and components were integrated into those plans.[2] It is intended that the ACS be implemented through these BLM and Forest Service land management plans as a landscape-scale management strategy at the site (project), watershed, and regional scales (Forest Service and BLM 1994b).

The proposed PCGP would traverse portions of BLM and NFS lands in the High Cascade, Western Oregon Cascade, Klamath-Siskiyou and Coast Range Aquatic Provinces as described in Report of the Forest Ecosystem Management Assessment Team that was used in development of the NWFP (Forest Service et al. 1993) (figure 1-1). These provinces are highly diverse in terms of landscapes, climate, and land uses. Natural vegetation ranges from temperate rain forest with more than 120 inches of precipitation a year near the coast to the east-side grasslands near Klamath Lake that have an average of 12 inches of precipitation annually that falls primarily as snow. Within these four aquatic provinces, the PCGP would cross BLM and NFS lands in portions of 16 separate fifth-field watersheds. Table 1.1.2-1 shows the watersheds that would be traversed by the PCGP. The effects of the project must be addressed in the context of site- and watershed-scale conditions for each fifth-field watershed traversed by the project (Goodman et al. 2007).

Complying with ACS objectives means that the BLM and the Forest Service must manage the riparian-dependent resources needed to maintain existing conditions and implement actions to restore degraded conditions. Improvement relates to restoring biological and physical processes to their ranges of natural variability. This is a long term process that may take decades to a century or more for some watersheds so it is not expected that any single project would completely accomplish this objective; it is expected that projects be designed so as not to prevent attainment of ACS objectives, and that actions be taken where possible to restore degraded habitats to their historic range of natural variability. Watershed analysis (WA) (also called "watershed assessment) provides the baseline from which to assess maintaining or restoring watershed conditions.

[2] Collectively, Forest Service LRMPs and BLM RMPs are referred to as "land management plans" or "LMPs" in this document.

Watershed assessments have been developed for all 16 of the fifth-field watersheds where the ACS applies that would be crossed by the PCGP project.

Since the decision-maker must use the results of watershed analyses to support a finding that a project "meets" or "does not prevent attainment" of ACS objectives, this assessment makes full use of the relevant WAs. In order to support such a finding, the analysis must:

- provide a description of the existing conditions in each fifth-field watershed, including important physical and biological components and processes.
- evaluate both the immediate (short-term) and the long-term effects of the proposed action.
- review the effects of the project against the ACS objectives at the project or site scale as well as at the watershed scale for each of the fifth-field watersheds included in this analysis. This review should consider the incremental effect of the project added to the existing condition and the effects of other present and reasonably foreseeable future actions on watershed conditions.
- consider any proposed restoration or mitigation activities that are associated with the PCGP.
- The analysis must show that the effects of an action would be within the range of natural variability (Reeves 1999) at the various scales (site to watershed) where the effects occur or that the effects would not prevent attainment of ACS objectives (Forest Service and BLM 1994b: B-10). Minor or short-term adverse effects would not, in and of themselves, constitute noncompliance with the ACS.

The Federal Land Policy and Management Act (FLPMA) of 1976 and the National Forest Management Act (NFMA) of 1976 require that projects or activities be consistent with the management plans of the BLM or Forest Service unit where the activity occurs. Consistency with land management plans is gauged by whether an activity accomplishes or does not prevent attainment of the goals and objectives of the relevant plan, and whether the activity is consistent with applicable standards and guidelines (36 CFR 219.15; 43 CFR 1601.0-5). Management direction in BLM RMPs and Standards and Guidelines in Forest Service LRMPs are rules that regulate or prohibit activities to ensure that the land management plan objectives are achieved (USDA Office of the General Counsel 2002).

Plan amendments to land management plans that propose to significantly reduce protection for species associated with LSOG forests, or to reduce protection for aquatic ecosystems, are subject to review by the Regional Ecosystem Office (REO) to determine whether the objectives of ACS would be significantly affected (Forest Service and BLM 1994b). Amendments of BLM and Forest Service land management plans that would require review by the REO are discussed in Section 1.2.3.

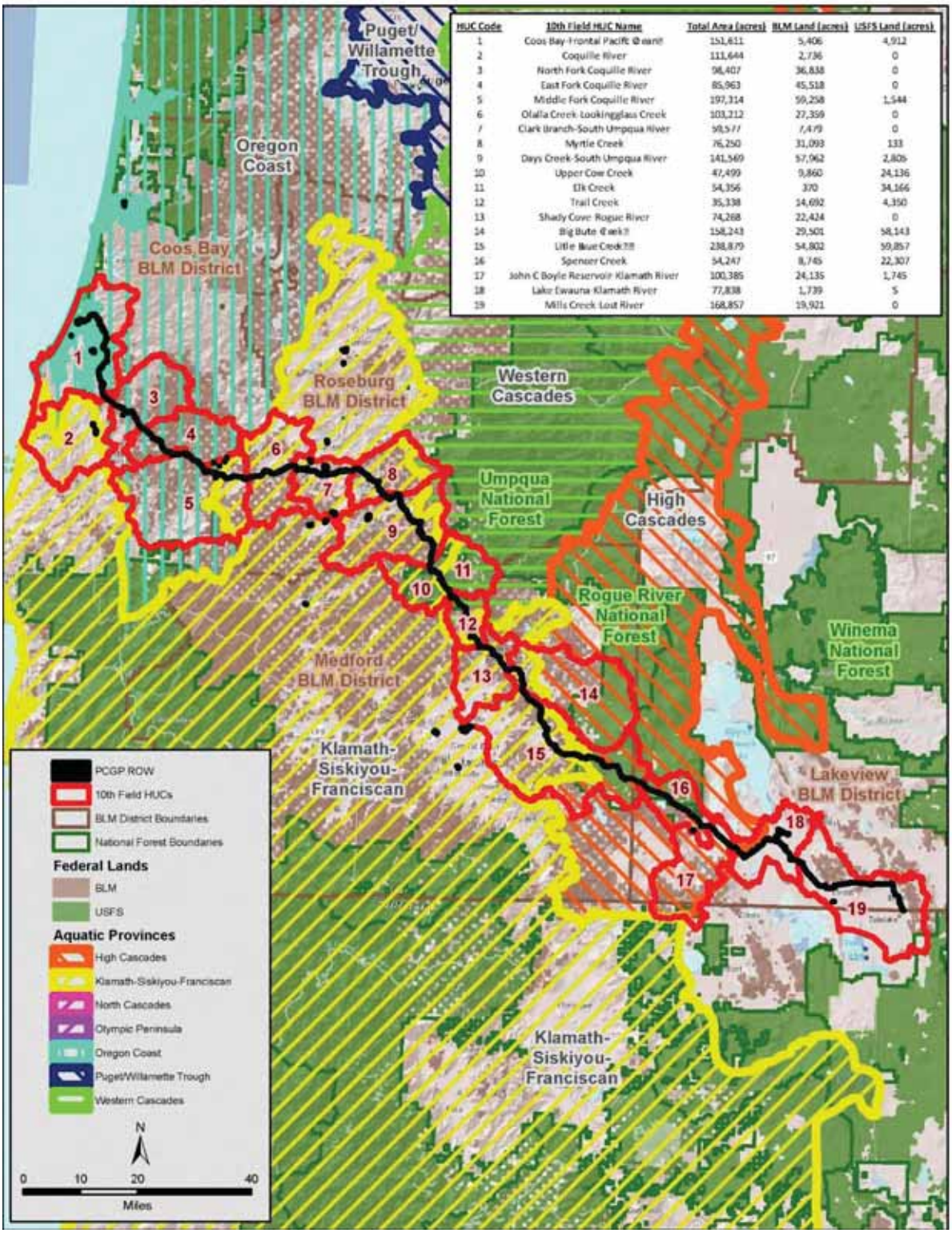
The governing NWFP standard and guideline for linear projects in Riparian Reserves is LH-4, which states that permits for rights-of-way are to be issued in a way that avoids effects that retard or prevent attainment of ACS objectives (Forest Service and BLM 1994b: C-37). This means that the BLM Right-of-Way Grant for the PCGP project must contain the terms and conditions necessary for the project to conform to the ACS. Other standards and guidelines applicable to the ACS are provided in Section 1.2.2.

The ROD for the NWFP requires that agency decision- makers—in this case, the BLM's Oregon State Director and the Forest Supervisor of the Umpqua National Forest "find" that Agency decisions related to the PCGP, and construction and operation of the project itself "meets" or "does not prevent attainment" of the ACS objectives (Forest Service and BLM 1994b). This finding would be made in the RODs for issuance of the Right-of-way Grant by the BLM and for BLM and Forest Service decisions to amend their respective land management plans for the project. It would be based on evidence and facts presented in the environmental document prepared to comply with the National Environmental Policy Act (NEPA) and appendices, including this ACS assessment.

Private lands dominate the landscape in many of the watersheds that would be crossed by the project. The ACS applies only to lands managed by the BLM and the Forest Service within the area covered by the NWFP. On private lands, compliance with the Clean Water Act (CWA) is the best evidence of protection of aquatic values. Issuance of permits for the PCGP project under Section 401 of the CWA from the State of Oregon Department of Environmental Quality (ODEQ) and Section 404 of the CWA from the U.S. Army Corps of Engineers (ACOE) demonstrate compliance with the CWA. The Proponent's application to FERC would include the necessary information for the ODEQ and ACOE permits. The BLM and Forest Service require that the proponent secure those permits prior to making any findings related to the ACS. Chapter 4.04 of this EIS describes watershed impacts of the proposed Pacific Connector Project on private lands.

Draft

Figure 1-1 Regional and Provincial Setting of the Pacific Connector Gas Pipeline



HUC Code	10th Field HUC Name	Total Area (acres)	BLM Land (acres)	USFS Land (acres)
1	Coos Bay-Frontal Pacific Ocean	151,611	5,406	4,912
2	Coquille River	111,644	2,736	0
3	North Fork Coquille River	98,407	36,838	0
4	East Fork Coquille River	85,963	45,518	0
5	Middle Fork Coquille River	197,314	59,258	1,544
6	Olalla Creek-Lookingglass Creek	103,212	27,359	0
7	Clark Branch-South Umpqua River	98,577	7,479	0
8	Myrtle Creek	76,250	31,093	133
9	Days Creek-South Umpqua River	141,569	57,962	2,806
10	Upper Cow Creek	47,499	9,860	24,136
11	Elk Creek	54,356	370	34,166
12	Trail Creek	35,338	14,692	4,350
13	Shady Cove-Rogue River	74,268	22,424	0
14	Big Butte Creek	158,243	29,501	58,143
15	Little Butte Creek	238,879	54,802	59,857
16	Spencer Creek	54,247	8,745	22,307
17	John C Boyle Reservoir-Klamath River	100,385	24,135	1,745
18	Lake Ewauna-Klamath River	77,838	1,739	5
19	Mills Creek-Lost River	168,857	19,921	0

Route

1.1 COMPONENTS OF THE AQUATIC CONSERVATION STRATEGY

1.1.1 Riparian Reserves

As a key element of the Aquatic Conservation Strategy, the Riparian Reserves provide an area along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving, for example, as dispersal habitat for certain terrestrial species. Riparian Reserves may also unstable or potentially unstable terrains in earthflows. Within Riparian Reserves, special NWFP standards and guidelines (expressed as BLM "management direction") control BLM and NFS land use. These reserves constitute the key ecosystem component of the ACS, as described in the NWFP standards and guidelines. All Riparian Reserves in the fifth-field watersheds crossed by the PCGP corridor are either in the late successional reserve (LSR) or matrix allocation (table 2.2-3 and figure 2.2-1).[3]

Under the ACS, Riparian Reserves serve to maintain and restore riparian structures and the functions of intermittent and perennial streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for species dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for terrestrial animals and plants, and provide for greater connectivity of the vegetation community within and between watersheds, particularly with regard to LSRs. The width of Riparian Reserves is typically one site-potential tree height (height of mature riparian tree in the particular fifth-field watershed) on each side of wetlands, intermittent and non-fish bearing perennial streams, and two potential heights on each side of fish-bearing streams. Irrigation ditches do not have Riparian Reserves, and are not considered as stream crossings.

Unstable areas may also be designated "Riparian Reserves" so that they can be managed under the framework of the ACS (Forest Service and BLM 1994b: B-30). Potentially unstable areas were initially identified during the project planning process for the PCGP. Areas determined to pose potential risks to either the PCGP project or the surrounding landscapes were further evaluated in the field to ensure that construction and operation of the project would not destabilize these areas. Reviews by licensed engineers and geologists concluded that none of the earthflow terrains that would be crossed by the PCGP were unstable. Therefore, no earthflow terrains that would be crossed by the PCGP were identified as areas that should be mapped as Riparian Reserves because of inherent instability.

Table 1.1.1-1 shows estimated acres of Riparian Reserves in each fifth-field watershed crossed by the Pacific Connector project. Acre estimates were derived from watershed assessments for each of the affected watersheds.

[3] Within the hierarchy of land allocations on page A-5 of the Standards and Guidelines for the Northwest Forest Plan, acres of the Late Successional Reserve land allocation are withdrawn before the acres for Riparian Reserves. Some have read this to mean that Standards and Guidelines for Riparian Reserves do not apply in Late Successional Reserves. That is not correct. The hierarchy on page A-5 is primarily an explanation of inventory layers. Riparian Reserves and their appurtenant standards and guidelines also apply where these reserves overlap with any other land allocations (Forest Service and BLM 1994(b): B-12)

TABLE 1.1.1-1

BLM and Forest Service Land Allocations in Fifth-Field Watersheds Crossed by the Pacific Connector Project

Unit	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						Late Successional Reserve		Matrix		Riparian Reserves a/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total
South Coast Basin												
Coos Bay Frontal	151,611	5,408	4,914	10,322	141,289	—	—	5,408	4,914	2,056	2,555	4,611
Coquille	111,644	2,737	—	2,737	108,907	—	—	2,737	—	1,094	—	1,094
NF Coquille River	98,407	36,854	—	36,854	61,553	16,268	—	20,585	—	19,275	—	19,275
EF Coquille River	85,963	45,540	—	45,540	40,424	24,066	—	21,474	—	25,097	—	25,097
MF Coquille River	197,314	59,286	1,545	60,831	136,483	16,386	—	42,901		23,715	618	24,333
South Coast Basin Total	**644,940**	**149,825**	**6,459**	**156,284**	**488,656**	**56,720**	**—**	**93,105**	**4,914**	**71,236**	**3,173**	**74,410**
South Umpqua River Sub-Basin												
Olalla - Lookingglass	103,212	27,373	—	27,373	75,839	12,642	—	14,731	—	8,755	—	8,755
Clark Branch S. Umpqua	59,577	7,483	—	7,483	52,094	—	—	7,483	—	2,698	—	2,698
Myrtle Creek	76,250	31,111	133	31,244	45,006	—	—	31,111	133	12,748	54	12,803
Days Creek S. Umpqua	141,569	57,997	2,807	60,804	80,765	24,193	2,417	33,804	390	21,852	142	21,994
Elk Creek S. Ump.	54,356	370	34,187	34,558	19,798	68	14,271	303	19,916	137	12,641	12,778
Upper Cow Creek	47,499	9,866	24,151	34,017	13,482	8,672	2,350	1,194	21,801	4,831	11,827	16,658
South Umpqua River Sub-Basin Total	**482,464**	**134,201**	**61,279**	**195,479**	**286,984**	**45,575**	**19,039**	**88,626**	**42,240**	**51,021**	**24,665**	**75,686**
Upper Rogue River Sub-Basin												
Trail Creek	35,338	14,701	4,353	19,055	16,283	3	—	14,699	4,353	3,232	957	4,189
Shady Cove Rogue River	74,268	22,439	—	22,439	51,828	5	—	22,434	—	6,941	—	6,941
Big Butte Creek	158,243	29,520	58,181	87,701	70,541	—	1,636	29,520	56,545	4,959	8,334	13,293
Little Butte Creek	238,879	54,843	59,900	114,743	124,135	0	52,813	54,843	7,088	5,155	5,631	10,786
Upper Rogue River Sub-Basin Total	**506,727**	**121,504**	**122,435**	**243,938**	**262,788**	**8**	**54,449**	**121,496**	**67,986**	**20,287**	**14,922**	**35,209**
Upper Klamath Sub-Basin												
Spencer Creek	**54,247**	**8,751**	**22,323**	**31,074**	**23,172**	**—**	**5,319**	**8,751**	**17,004**	**210**	**535**	**745**
Total All Watersheds	**1,688,377**	**414,281**	**212,495**	**626,775**	**1,061,600**	**102,303**	**78,807**	**311,978**	**132,144**	**142,754**	**43,295**	**186,050**

a/ Riparian Reserves occur within all land allocations. Acre estimates are derived from Watershed Assessments for watersheds crossed by the Project.

Draft

1.1.2 Key Watersheds

The NWFP identifies "key" watersheds that have regional significance for the protection of water quality and aquatic habitat. Tier 1 Key Watersheds are intended to benefit at-risk fish species and stocks by providing refugia for maintaining and recovering habitat. Tier 2 Key Watersheds provide high-quality water. Key Watersheds include areas of both high quality and degraded habitat. Key watersheds with high-quality habitat serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have a high potential for restoration and would become areas of high-quality habitat if appropriate restoration measures are implemented. The NWFP designates Key Watersheds as the highest priority for restoration. Table 1.1.2-1 identifies Key Watersheds that would be crossed by the PCGP right-of-way.

TABLE 1.1.2-1

Miles of PCGP Project Right-of-Way in Key Watersheds by Administrative Unit

Watershed	Coos Bay BLM Miles	Roseburg BLM Miles	Medford BLM Miles	Lakeview BLM Miles	Total BLM Miles	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total NF Miles	Total BLM and NF Miles
Elk Cr.-South Umpqua Days Cr. South Umpqua (Tier 1) (These 5th field watersheds are both part of the South Umpqua Key Watershed)	—	6.5	—	—	6.5	4.07	—	—	4.07	10.57
North and South Forks Subwatersheds, Little Butte Cr. (Tier 1)	—	—	3.89	—	3.89	—	13.70	—	13.70	17.59
Spencer Cr. (Tier 1)	—	—	—	0.89	0.89	—	—	6.04	6.04	6.93
Clover Cr. Subwatershed, Spencer Cr.(Tier 2)	—	—	—	0.15	0.15	—	—	—	—	0.15
Total	**0.0**	**6.5**	**3.89**	**1.04**	**11.43**	**4.07**	**13.7**	**6.04**	**23.81**	**35.24**

Source: Resource Report 2, Table 2.2-4

1.1.3 Watershed Analysis

The ACS establishes procedures for conducting watershed analyses (documented in a "Watershed Analysis" or "Watershed Assessment") to provide a baseline for geomorphic and ecologic processes operating at the watershed level. Watershed assessments provide the framework for formulating monitoring and restoration programs, delineating Riparian Reserves, and describing key watershed conditions. Watershed assessments provide information but they are not decision documents; they do not authorize or prohibit projects or change decisions made in LMPs or project-level NEPA documents.

Watershed condition considers more than the state of stream channels and riparian area. It also includes the condition of the uplands, type and distribution of seral classes of vegetation, land use history, effects of previous natural and land use–related disturbances, and distribution and abundance of species and populations throughout the watershed. All of these attributes can influence the structure and functioning of aquatic and riparian ecosystems.

Effective protection strategies for riparian and aquatic habitat on BLM and NFS lands under the jurisdiction of the ACS must accommodate the wide variability of landscape conditions across the

Draft

Pacific Northwest. Watershed assessments play a key role in the ACS process by ensuring that protection of aquatic systems is tailored to the specific landscape(s) at the appropriate scale(s).

Watershed assessments have been completed for all of the fifth-field watersheds where BLM and NFS lands would be crossed by the PCPG project. For this ACS assessment, each watershed assessment was reviewed and key information was summarized and synthesized. Since most of the watershed assessments were written between 10 and 15 years ago, the descriptions of current conditions were updated with information from recently published NWFP Monitoring Reports (Forest Service and BLM 2011; Forest Service and BLM 2011a; Forest Service and BLM 2012) and communication with local field units. A combination of updated information and the original watershed analysis was used to describe the important physical and biological processes and components of each fifth field watershed crossed by the PCGP. Table 1.1.3-1 lists the watershed assessments reviewed for this assessment.

TABLE 1.1.3-1

Watershed Assessments Reviewed for Watersheds Affected by the Pacific Connector Project

Fifth-Field Watershed	Watershed Assessment
Coos Bay Frontal	Bureau of Land Management. 2010. Catching-Beaver Watershed Analysis. Bureau of Land Management, Coos Bay District, Umpqua Resource Area, North Bend, OR. June 3, 2010.
Coquille River	Bureau of Land Management. 1997b. Watershed Analysis: Middle Main Coquille, North Coquille Mouth, [and] Catching Creek. [Ver. 1.1.] Bureau of Land Management, Coos Bay District, Umpqua Resource Area, North Bend, OR. September 30, 1997.
North Fork Coquille River	Bureau of Land Management. 2002a. North Fork Coquille Watershed Analysis. [Second iteration July 20, 2001; includes edits through January 9, 2002] Bureau of Land Management, Coos Bay District, Umpqua Resource Area, North Bend, OR.
East Fork Coquille River	Bureau of Land Management. 2000a. East Fork Coquille Watershed Analysis. [First iteration.] Bureau of Land Management, Coos bay District, Myrtlewood Resource Area, North Bend, OR. May 2000.
Middle Fork Coquille River	Bureau of Land Management. 1997a. Big Creek Watershed Analysis. [First iteration.] Bureau of Land Management, Coos Bay District, Myrtlewood Resource Area, North Bend, OR. May 1997; Bureau of Land Management. 1999a. Upper Middle Fork Coquille Watershed Analysis, Revised May 25, 1999. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. May 25, 1999; Bureau of Land Management. 2007. Watershed Analysis: Middle Fork Coquille Analytical Watershed. [Version 1.1.] Bureau of Land Management, Coos Bay District, Myrtlewood Resource Area, North Bend, OR. October 2007.
Olalla-Lookingglass	Bureau of Land Management. 1998. Olalla-Lookingglass Watershed Analysis, Revised April 2, 1998. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. April 2, 1998
Clark Branch South Umpqua	Bureau of Land Management. 1999c. Middle South Umpqua Watershed Analysis, Revised November 30, 1999. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. November 30, 1999.
Myrtle Creek	Bureau of Land Management. 2002b. Myrtle Creek Watershed Analysis and Water Quality Restoration Plan, Second Iteration October 2002. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. October 2002.
Days Creek South Umpqua	Bureau of Land Management. 2001. South Umpqua Watershed Analysis and Water Quality Restoration Plan, Second Iteration March 2, 2001. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. March 2, 2001.

Draft

TABLE 1.1.3-1 **Watershed Assessments Reviewed for Watersheds Affected by the Pacific Connector Project**	
Fifth-Field Watershed	**Watershed Assessment**
Elk Creek South Umpqua	Forest Service. 1996. Elk Creek Watershed Analysis. Forest Service, Umpqua National Forest, Tiller Ranger District. Roseburg, OR. October 16, 1996.
Upper Cow Creek	Forest Service. 1995a. Cow Creek Watershed Analysis. Forest Service, Umpqua National Forest, Tiller Ranger District, Roseburg OR. September 30, 1995
Trail Creek	Bureau of Land Management. 1999b. Trail Creek Watershed Assessment. Prepared by Western Watershed Analysts. Bureau of Land Management, Medford District. Medford, OR. June 1999.
Shady Cove Rogue River	Bureau of Land Management. 2012. Shady Cove-Rogue River Project-Specific Watershed Analysis; Pacific Connector Gas Pipeline Project, Pacific Connector Gas Pipeline, LP. Prepared by Edge Environmental for the Bureau of Land Management, Medford District. Medford, OR. March 2012.
Big Butte Creek	Forest Service 1995b. Upper Big Butte Creek Watershed Analysis. Rogue River National Forest, Butte Falls Ranger District. Medford, OR. December 1, 1995 Bureau of Land Management. 1999d. Lower Big Butte Watershed Analysis. Bureau of Land Management, Medford District, Butte Falls Resource Area. Medford, OR. September 1999;
Little Butte Creek	Bureau of Land Management and Forest Service. 1997. Little Butte Creek Watershed Assessment, Version 1.2. Bureau of Land Management, Medford District, Ashland Resource Area, Rogue River National Forest, Ashland Ranger District,. Medford, OR. November 1997.
Spencer Creek	Bureau of Land Management, USDA Forest Service, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service. 1995. Spencer Creek Pilot Watershed Analysis. Lakeview District, Bureau of Land Management, Lakeview District and Klamath Falls Resource Area; USDA Forest Service, Winema National Forest; U.S. Environmental Protection Agency; and U.S. Fish and Wildlife Service. August 1995.

1.1.4 Watershed Restoration

Watershed restoration is intended to be a comprehensive, long-term program to restore watershed health and aquatic ecosystems, including habitats that support riparian-dependent and riparian-related organisms. Watershed restoration recommendations in the watershed assessments provided guidance for the development of mitigation plans for the PCGP project. For example, a key element of the mitigation plans is upgrading or removing (decommissioning) roads. Such actions have been shown to be effective in controlling runoff and reducing sediment transport to aquatic habitats. Mitigation projects also include channel stabilization and restoration elements that would enhance channel and aquatic habitat complexity by placing large woody debris (LWD) in selected stream reaches. Another key element is accelerating the growth of large trees in the Riparian Reserves by thinning and fuels reduction to reduce the risk of stand-replacing fire in Riparian Reserves. These measures and others recommended in watershed assessments and recovery plans for threatened or endangered species guided development of mitigation measures with the intent that those measures contribute to watershed restoration objectives wherever possible.

These components – Riparian Reserves, Key Watersheds, Watershed Analysis and Watershed Restoration - are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. Late-Successional Reserves are also an important component of the Aquatic Conservation Strategy. The standards and guidelines under which Late-Successional Reserves are managed provide increased protection for all stream types. Because

these reserves possess late-successional characteristics, they offer core areas of high quality stream habitat that would act as refugia and centers from which degraded areas can be recolonized as they recover. Streams in these reserves may be particularly important for endemic or locally distributed fish species and stocks (Forest Service and BLM 1994b: B-12).

1.2 DETERMINING CONSISTENCY WITH THE ACS

1.2.1 ACS Objectives

The nine objectives of the ACS are listed in Appendix B of the Standards and Guidelines for the NWFP (Forest Service and BLM 1994b). Accordingly, BLM and NFS lands within the range of the northern spotted owl would be managed to:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, right-of-way, reproduction, and migration of individuals composing aquatic and riparian communities.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

These ACS objectives provide a framework for managing aquatic ecosystems with a focus at the fifth-field watershed and aquatic province (i.e., multiple watershed) scales. They address the distribution and attributes of aquatic ecosystems believed necessary to maintain viable populations of fish and other aquatic and riparian-dependent species and to recover degraded ecosystems. The objectives are intended to be flexible in that they can be applied at all spatial scales of concern. Application of the ACS is intended to maintain or move aquatic ecosystem functioning toward the range of natural variability at these several scales (Reeves 1999).

1.2.2 Standards, Guidelines, and Management Direction

Standards and Guidelines (also described as "Management Direction" in BLM RMPs) are implementation rules designed regulate or prohibit activities to ensure that the objectives associated with a given land allocation are achieved. In other words, by following the Standards and Guidelines for a given activity, the project or activity should not prevent attainment of objectives. In the NWFP, some standards and guidelines are applicable to all activities in all land allocations while others are specific to a particular activity and/or land allocation. The NWFP standards and guidelines for management activities are important for meeting ACS objectives (Reeves et al. 2006) These standards and guidelines were developed specifically to regulate or prohibit activities that may prevent attainment of ACS objectives. The efficacy of these standards and guidelines for achieving the desired benefits of fish habitat protection and restoration are described in the EIS for the NWFP (Forest Service and BLM 1994c).

The NWFP clearly anticipated that development projects, including utility corridors, could occur in Key Watersheds and Riparian Reserves, and provided standards and guidelines to ensure that ACS objectives would be achieved if such projects were implemented (table 1.2.2-1). All relevant standards and guidelines in table 1.2.2-1 except those related to protection of Survey and Manage (Survey and Manage) species are specific to Riparian Reserves. Evaluating compliance with these relevant standards and guidelines is an essential step for determining consistency with ACS objectives. Table 1.2.2-2 cross-references NWFP standards and guidelines with corresponding BLM management direction in the RMPs for the four BLM districts crossed.

Standard and Guideline LH-4 is the governing ACS direction for new developments that may affect aquatic resources. This standard and guideline does not prohibit new developments; it directs the BLM and Forest Service to include terms and conditions in right-of-way grants to ensure that ACS objectives are achieved. The Right-of-Way grant issued by the BLM for the project would include Plans of Development (PODs) such as an Erosion Control and Revegetation Plan (ECRP), Transportation Management Plan (TMP) and a Mitigation Plan that are intended to ensure compliance with standards and guidelines and accomplishment of ACS objectives. The PODs are conditions of the Right-of-Way grant and are binding on the applicant.

TABLE 1.2.2-1

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard / Guideline	Land Allocation	Description	Applicability
Standards and Guidelines Applicable to New Developments			
LH-4: Issuing leases, permits, right-of-way and easements.	Riparian Reserves	For activities other than surface water developments, issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.	Directs the BLM and Forest Service to include terms and conditions in right-of-way grants to ensure that ACS objectives are achieved.
Standards and Guidelines Related to Road Construction, Reconstruction and Maintenance			
RA-4: Locating water withdrawal sites.	Riparian Reserves	Locate water-drafting sites to minimize adverse effects on stream channel stability, sedimentation, and in-stream flows needed to maintain riparian resources, channel conditions, and fish habitat.	Applicable to water drafting sites for construction needs such as compaction, dust control and hydrostatic testing.
RF-2: Road construction standards and guidelines.	Riparian Reserves	For each existing or planned road, meet Aquatic Conservation Strategy objectives by: a. minimizing road and landing locations in Riparian Reserves. b. completing watershed analyses (including appropriate geotechnical analyses) prior to construction of new roads or landings in Riparian Reserves. c. preparing road design criteria, elements, and standards that govern construction and reconstruction. d. preparing operation and maintenance criteria that govern road operation, maintenance, and management. e. minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow. f. restricting sidecasting as necessary to prevent the introduction of sediment to streams. g. avoiding wetlands entirely when constructing new roads.	Applicable to roads constructed or reconstructed for the PCGP. Objectives of this Standard and Guideline are accomplished through the terms of the Right-of-Way grant which includes a Transportation Management Plan (TMP) Plan of Development (POD)
RF-4: New culverts, bridges and other stream crossings.	Riparian Reserves	New culverts, bridges and other stream crossings shall be constructed, and existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions would be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading would be based on the potential impact and the ecological value of the riparian resources affected. Crossings would be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	Provides direction for construction or reconstruction of permanent road crossings associated with the PCGP project through the TMP. (RF-4 is not applicable to crossings associated with the pipeline corridor because the pipeline is not a road.)

Draft

TABLE 1.2.2-1

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard / Guideline	Land Allocation	Description	Applicability
RF-5: Minimizing sediment delivery from roads.	Riparian Reserves	Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.	Applicable to the roads constructed, reconstructed, and maintained by the PCGP. RF-5 is accomplished through the terms of the TMP.
RF-6: Maintaining fish passage.	Riparian Reserves	Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.	Applicable to stream crossings constructed or reconstructed by the PCGP. RF-6 is accomplished through the terms of the TMP.
RF-7: Transportation Management Plan development.	Riparian Reserves	Develop and implement a Road Management Plan or a Transportation Management Plan that would meet the Aquatic Conservation Strategy objectives. As a minimum, this plan shall include provisions for the following activities: a. inspections and maintenance during storm events. b. inspections and maintenance after storm events. c. road operation and maintenance, giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources. d. traffic regulation during wet periods to prevent damage to riparian resources. e. establish the purpose of each road by developing the Road Management Objective.	Applicable to roads used by the PCGP during construction and operation of the project. RF-7 is accomplished through the terms of the TMP.
Standards and Guidelines Applicable to Mitigation Measures and Watershed Restoration			
WR-3: Proper use of planned mitigation and restoration.	Riparian Reserves	Do not use mitigation or planned restoration as a substitute for preventing habitat degradation.	Applicable to the project. Mitigations are not to be used as a substitute for appropriate design measures or applications of Best Management Practices.

Draft

TABLE 1.2.2-1

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard / Guideline	Land Allocation	Description	Applicability
Standards and Guidelines for Survey and Manage Species			
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	All Allocations	Survey and Manage species protection is a mitigation measure to ensure the persistence of species listed in the 2001 Survey and Manage ROD, as amended by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	Applicable to the known sites of Survey and Manage species that are dependent on riparian habitats and whose persistence in the area of the NWFP would be threatened by construction of the PCGP. This is responsive to ACS objective 9.
Standards and Guidelines for Retention of Late Successional Forest			
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction would be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent would include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.	All Allocations	Landscape areas where little late-successional forest persists should be managed to retain late-successional patches. This standard and guideline would be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. This assessment should include all allocations in the watershed. Within such an area, all remaining late-successional stands should be protected.	Applicable in each watershed affected by the project. This evaluation is included in the ACS evaluation since it is watershed based. None of the watersheds that would be crossed by the Pacific Connector Project are below the 15% threshold or would be reduced below the 15% threshold by the project.

Draft

TABLE 1.2.2-1

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard / Guideline	Land Allocation	Description	Applicability
Standards and Guidelines Related to Key Watersheds a/			
Outside Roadless Areas - Reduce existing system and nonsystem road mileage. If funding is insufficient to implement reductions, there would be no net increase in the amount of roads in Key Watersheds.	Key Watersheds	Where opportunities exist, system and non-system road miles should be reduced in Key Watersheds. This is accomplished by off-site mitigation measures.	Applicable in all Key Watersheds. Mitigation plans document relationship of projects to Key Watershed objectives.
Key Watersheds are highest priority for watershed restoration.	Key Watersheds	Watershed restoration accomplished with project mitigation should prioritize Key Watersheds commensurate with project effects.	Applicable in all Key Watersheds. Mitigation plans document relationship of projects to Key Watershed objectives.
Watershed analysis is required prior to management activities, except minor activities such as those Categorically Excluded under NEPA (and not including timber harvest). Watershed analysis is required prior to timber harvest.	Key Watersheds	This requires a Watershed Assessment to be completed prior to activities that affect vegetation in Key Watersheds.	Applicable in Key Watersheds. All Key Watersheds crossed by the Pacific Connector Project have completed Watershed Assessments. While the Pacific Connector is neither a "management activity" related to LMP implementation, nor a "timber harvest", watershed assessments provide useful information to ensure objectives of Key Watersheds are attained.
Standards and Guidelines for all Land Allocations Related to Watershed Analysis			
Watershed analysis is required to change Riparian Reserves widths in all watersheds.	Riparian Reserves	Modification of Riparian Reserve widths requires Watershed Assessment.	The BLM and Forest Service do not propose to modify Riparian Reserve widths however the Pacific Connector Project would cross Riparian Reserves. Watershed assessments have been completed for all watersheds that would be crossed by the Pacific Connector Project. Watershed assessments provide useful information to assess crossing effects None of the watershed assessments made a recommendation to prohibit crossings of Riparian Reserves.

a/ Standards and Guidelines for Key Watersheds also prohibit new road construction in Inventoried Roadless Areas (RARE II). The Pacific Connector Project does not cross any portion of, or construct any roads in, RARE II Inventoried Roadless Areas.

Draft

TABLE 1.2.2-2

Cross References between ACS-Relevant NWFP Standards and Guidelines and BLM District RMP Management Direction

NWFP Standard / Guideline	Coos Bay District RMP Management Direction	Roseburg District RMP Management Direction	Medford District RMP Management Direction	Klamath Falls Resource Area (Lakeview District) RMP Management Direction
Riparian Reserves - Lands; LH-4	Riparian Reserves - Lands, pg. 16, para. 2	Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last para. & pg. 28, para. 1	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Lands Mgmt., pg. 30, para. 2	Riparian Reserves - Lands, pg. 16, para. 2
Riparian Reserves - General Riparian Area Mgmt.; RA-4	Riparian Reserves - General Riparian Area Mgmt., pg. 16, para. 4	Specific Land Use Allocations, Riparian Reserves - General Riparian Area Mgmt., pg. 28, para. 4	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - General Riparian Area Mgmt., pg. 30, para. 4	Riparian Reserves - General Riparian Area Mgmt., pg. 17, para. 4
Riparian Reserves - Road Mgmt.; RF-2	Riparian Reserves - Roads Mgmt., pg. 13, para. 2	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 27, para. 2	Riparian Reserves - Roads Mgmt., pg. 14, para. 2
Riparian Reserves - Road Mgmt.; RF-4	Riparian Reserves - Roads Mgmt., pg. 13, last para. & pg. 14, para. 1	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 1	Riparian Reserves - Roads Mgmt., pg. 14, para. 4
Riparian Reserves - Road Mgmt.; RF-5	Riparian Reserves - Roads Mgmt., pg. 14, para. 2	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 5	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 2	Riparian Reserves, Roads Mgmt., pg. 14, para. 5
Riparian Reserves - Road Mgmt.; RF-6	Riparian Reserves - Roads Mgmt., pg. 14, para. 3	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 3	Riparian Reserves - Roads Mgmt., pg. 14, para. 6
Riparian Reserves - Road Mgmt.; RF-7	Riparian Reserves - Roads Mgmt., pg. 14, para. 4	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 7 & pg. 26, para. 1¶	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 4	Riparian Reserves - Roads Mgmt., pg. 14, para. 7
Riparian Reserves - watershed & Habitat Restoration; WR-3	Riparian Reserves watershed & Habitat Restoration, pg. 17, para. 3	Specific Land Use Allocations, Riparian Reserves - watershed & Habitat Restoration, pg. 28, para. 3	Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - watershed & Habitat Restoration, pg. 31, para. 3	Riparian Reserves - watershed & Habitat Restoration, pg. 17, para. 3
Management Recommendations for Survey and Manage Species	Management direction for Survey and Manage Species in BLM RMPs was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)			

Draft

1.2.3 BLM and Forest Service Decisions Related to the ACS

Proposals to amend BLM and NFS land management plans must consider whether the proposed amendments are related to the ACS; if so, the proposals must address whether the proposed changes to the land management plans would retard or prevent attainment of ACS objectives. BLM's decision concerning whether or not to issue a Right-of-Way Grant for the PCGP project must also consider whether issuing the grant would prevent attainment of ACS objectives. Land management plan amendments that propose to significantly reduce protection for LSOG-related species or reduce protection for aquatic ecosystems are subject to review by the REO to determine if the objectives of the NWFP standards and guidelines would be significantly affected (Forest Service and BLM 1994b: C-29)

Table 1.2.3-1 shows which of the proposed land management plan amendments associated with the Pacific Connector project have a nexus with the ACS, and whether that amendment requires review by the REO.

TABLE 1.2.3-1

Agency Decisions with a Nexus to the ACS

Amendment Number	Relevant Federal Jurisdiction	Amendment Description	ACS Nexus	REO Review Required for Aquatic Effects
BLM/Forest Service-1	All BLM and Forest Service jurisdictions	Waive management recommendations for Survey and Manage species	Yes	Yes. This amendment may reduce protections for aquatic-related Survey and Manage species (ACS Objective 9).
BLM-1	Coos Bay and Roseburg Districts	Allow removal of marbled murrelet (marbled murrelet) habitat	No	No
BLM-2	Roseburg District	Allow removal of KOAC habitat	No	No
BLM-3	Roseburg District.	Reallocation of 409 acres from the Matrix Land Allocation to LSR RO 259 while done as a mitigation for impacts to LSRs, also provides additional protections for Riparian Reserves.	Yes	No. This amendment does not reduce protections for aquatic habitats. However, it would be reviewed by the REO because it involves LSR.
BLM-4	Coos Bay District	Reallocation of 454 acres from the Matrix Land Allocation to LSR RO 261, while done as a mitigation for impacts to LSRs, also provides additional protections for Riparian Reserves	Yes	No. This amendment does not reduce protections for aquatic habitats. However, it would be reviewed by the REO because it involves LSR.
RRNF-1	Rogue River National Forest	Establishes a Forest Goal to facilitate transmission of energy	No	No
RRNF-2	Rogue River National Forest	Changes the Visual Quality Objective where the PCGP would cross Big Elk Road	No	No
RRNF-3	Rogue River National Forest	Changes the Visual Quality Objective where the PCGP crosses the Pacific Crest Trail	No	No
RRNF-4	Rogue River National Forest	Changes the Visual Quality Objective where the PCGP crosses Highway 140	No	No
RRNF-5	Rogue River National Forest	Allows the PCGP to cross approximately 2.5 acres of the Restricted Riparian Land Allocation	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing removal of riparian vegetation.

Draft

TABLE 1.2.3-1

Agency Decisions with a Nexus to the ACS

Amendment Number	Relevant Federal Jurisdiction	Amendment Description	ACS Nexus	REO Review Required for Aquatic Effects
RRNF-6	Rogue River National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction within the project right-of-way on an estimated 60 acres	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.
RRNF-7	Rogue River National Forest	Transfers 512 acres from the Matrix Land Allocation to LSR RO 227, while done as a mitigation for impacts to LSRs, also provides additional protections for Riparian Reserves.	Yes	No. This amendment does not reduce protections for aquatic habitats. However, it would be reviewed by the REO because it involves LSR.
UNF-1	Umpqua National Forest	Amends Standards and Guidelines for Fisheries and Water Quality to allow the removal of 3 acres of effective shading vegetation where perennial streams would be crossed by the PCGP	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing removal of effective shade.
UNF-2	Umpqua National Forest	Amends Prescriptions C2-I (IV-170) and C2-IV (IV-177) to allow the PCGP to run parallel to a Class II stream for approximately 0.1 mile	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing a utility corridor to parallel a Riparian Reserve for 0.1 mile.
UNF-3	Umpqua National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions on an estimated 70 acres from displacement and compaction within the project right-of-way	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.
UNF-4	Umpqua National Forest	Transfers approximately 588 acres from the Matrix Allocation to the LSR 223 land allocation while done as a mitigation for impacts to LSRs, also provides additional protections for Riparian Reserves.	Yes	No. This amendment does not reduce protections for aquatic habitats. However, it would be reviewed by the REO because it involves LSR.
WNF-1	Winema National Forest	By amending Standards and Guidelines for Management Area 3 on page 4-103-4, Lands, to allow the 95-foot-wide PCGP corridor in MA-3 from the Forest Boundary to the Clover Creek Road corridor	No	No.
WNF-2	Winema National Forest	Allows more time to achieve Visual Quality Objectives in the vicinity where the 75-foot-wide PCGP corridor would cross the Dead Indian Memorial Highway	No	No.
WNF-3	Winema National Forest	Allows more time to meet Visual Quality Objectives for Scenic Management, Foreground Partial Retention, where the PCGP would be in the vicinity of the Clover Creek Road corridor	No	No
WNF-4	Winema National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions on an estimated 30 acres from displacement and compaction within the project right-of-way	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.
WNF-5	Winema National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction on an estimated 4 acres within the project right-of-way that lies within Management Area 8 Riparian Area	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.

Draft

1.2.4 Determining Consistency with the ACS at Multiple Scales

The ACS does not prohibit project-level impacts so long as the effects of the action do not retard or prevent attainment of ACS objectives (Forest Service and BLM 1994b: B-9). Project impacts that result in minor and short-term degradation of the aquatic habitat do not necessarily constitute noncompliance with the ACS. Where impacts do occur, the analysis must show they are within the range of natural variability for the watershed where they occur or that the action would move the key processes that influence Riparian Reserves toward the range of natural variability (Reeves 1996). Under the ACS, a project cannot have a long-term negative effect on riparian-dependent resources (Forest Service and BLM, 1994c: 3&4 68-69). For example, short-term "pulse" disturbances that result in the deposition of sediment in amounts and texture that mimic natural events may fall within the range of natural variability for a watershed, and would likely not prevent attainment of ACS objectives. Conversely, actions that result in the chronic deposition of fine sediments that do not fall within the range of natural variability in a given watershed probably would not be consistent with the ACS. In all cases, agency decision makers must use the scale, duration, and intensity of impacts and professional judgment to determine whether an action prevents attainment of ACS objectives.

Spatial scales are defined as follows:

- The "site" in the context of this ACS assessment varies in size depending on effects. It encompasses the project footprint and areas of potential direct or indirect effects adjacent to the project location. The "site" is variable and is intended to reflect the ecological function and variable nature of riparian areas. The "site" may encompass areas outside of Riparian Reserves.
- The "subwatershed" is the sixth field Hydrologic Unit Code (HUC) scale as defined by the U.S. Geological Survey (USGS).
- The "watershed" is the fifth-field HUC scale as defined by the USGS.
- The "sub-basin" is an aggregation of fifth-field watersheds into one logical drainage (i.e., the South Umpqua sub-basin), typically at the fourth-field HUC scale. In the Coast Range Province, it may include small drainages that are not part of a larger river system but have common beneficial use and resource concerns.
- The "basin" is an aggregation of fourth-field sub-basins into a logical drainage. Basins (i.e. the Umpqua Basin) are generally described at the third field HUC scale.
- The "province" refers to the physiographic (also called aquatic) provinces established in the Report of the Forest Ecosystem Management Assessment Team (FEMAT) - Forest Service et al. 1993: IV-7). These are areas of similar geologic and general climatic conditions.
- "Riparian Reserves" are land allocations in BLM and Forest Service land management plans where special standards and guidelines apply. Riparian Reserves adjacent to fish-bearing streams are two site-potential tree heights wide. Riparian Reserves on wetlands and other waterbodies are one site potential tree height wide.

Temporal scales and intensity of effects are defined as follows:

Draft

- Short-term effects are generally limited to the season(s) of construction.
- Long-term effects are those that would persist beyond the season(s) of construction.
- Minor effects are defined as effects that are confined to the general construction site. They either are "short term" effects or longer term effects that are within the range of variability at the scale where the impact occurs and that do not prevent attainment of ACS objectives.
- Effects that are not "minor" are those that that are outside the range of natural variability and would prevent attainment of ACS objectives.
- "Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Only current and future projects that have environmental consequences that overlap the proposed PCGP spatially and temporally contribute to cumulative effects within the watershed. Cumulative effects are described in the individual watershed sections of this assessment.

The consistency of the project with the ACS is demonstrated by:

- Using watershed assessments to describe watershed conditions and ranges of natural variability for key physical and biological processes for each fifth-field watershed that would be crossed by the PCGP project.
- Evaluating direct, indirect, and cumulative effects at the site and watershed scale against the nine ACS Objectives for each fifth-field watershed.
- Compliance with applicable agency management direction (i.e., NWFP standards and guidelines, tables 1.2.2-1 and 1.2.2-2).
- Showing that the environmental consequences of agency decisions regarding land management plan amendments (table 1.2.3-1) do not prevent attainment of ACS objectives.
- Regional Ecosystem Office (REO) review of any proposed amendments of NWFP standards and guidelines that have been incorporated into land management plans that would reduce protections for aquatic resources. The purpose of this review is to determine if the objectives of standards and guidelines for the ACS would be significantly adversely affected by the proposed amendment(s) (Table 1.2.3-1).
- A finding by the agency decision makers in the ROD, based on evidence and facts presented in the PCGP project EIS and its appendices, that the action taken by the BLM and Forest Service (see first paragraph in Section 1.2.3.) would not prevent attainment of the ACS objectives at the appropriate scales.

Watersheds are often characterized as "Properly Functioning," "Functioning at Risk," or "Not Properly Functioning" or "Impaired Function". Absent other more watershed-specific data, *suggested* criteria for making these characterizations in southwest Oregon are displayed in table 1.2.4-1 (BLM 1999a: Table C-3). The fact that a watershed does not currently meet these

conditions does not mean that proposed projects within that watershed are not compliant with the ACS (Reeves 1999). The values described in table 1.2.4-1 are not descriptors of the natural range of variability for disturbance processes within a watershed. Disturbance processes in southwest Oregon (i.e. stand replacing fires and floods) may create conditions that exceed these values by orders of magnitude. The metrics in table 1.2.4-1 are most useful to determine current watershed conditions in the absence of information in the watershed assessment, and to help determine target ranges for mitigation projects such as in-stream large wood projects.

The Forest Service uses a similar three tiered condition class rating (Forest Service 2011) applied at the 6th field subwatershed HUC. In the Forest Service condition class rating, Properly functioning sub watersheds (Condition Class I) are resilient and able to recover to the desired condition when or if disturbed by large natural disturbances or land management activities. Functioning at Risk (Condition Class II) sub-watersheds maintain elements of ecological integrity but may lack the resilience to recover from large scale disturbances or management activities that have a significant adverse impact on watershed function. Functionally impaired (Condition Class III) subwatersheds lack resilience because some physical, hydrological or biological threshold has been exceeded. Where available, Forest Service 6th field HUC condition class assessments have been included in the individual watershed discussions and are found in Section 3.3.1 of this appendix.

Draft

TABLE 1.2.4-1

General Matrix of Factors and Indicators of Aquatic Health

Factors a/	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Water Quality	Temperature	2nd and 3rd order streams: <58 degrees F. 4th order and larger streams: <65 degrees F.	2nd and 3rd order: 59–65 degrees F. 4th order and larger basins: 66–72 degrees F.	2nd and 3rd order streams: > 65 degrees F. 4th order and larger basins: >72 degrees F.
	Sediment/Turbidity	<12% fines (<0.85 mm) in gravel, turbidity low, or cobble embeddedness <35%.	12–17% fines (<0.85 mm) in gravel	>17% fines (<0.85 mm) in gravel, turbidity high, or cobble embeddedness >35%.
	Chemical Contamination/Nutrients	Low levels of chemical contaminants from agricultural, industrial and other sources, no excess nutrients, no CWA 303d designated reaches.		Moderate levels of chemical contamination from agricultural, industrial and other sources, any level of excess nutrients, one or more CWA 303d designated reaches.
Habitat Access	Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows of age 1+ salmonids		Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at a range of flows of age 1+ salmonids
Habitat Elements	Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear), embeddedness <20%	Gravel and/or cobble is subdominant, or if dominant, embeddedness 20–35%	Bedrock, sand, silt, or small gravel dominant, or if gravel and cobble dominant, embeddedness >35%
	Large Woody Debris	>60 pieces/mile, >24 inches in diameter, and >50 feet long. Adequate sources of future LWD to maintain this standard. Little evidence of stream clean out or management-related debris flows.	30–60 pieces/mile, >24 inches in diameter, and >50 feet long or lacks potential sources of LWD sufficient to maintain or achieve the fully functioning standard	<30 pieces/mile, >24 inches in diameter, and >50 feet long and lacks potential sources of LWD. Evidence of stream clean out and/or management-related debris flows
	Pool Characteristics	>30% pool habitat by area. Little reduction in pool volume due to filling by fine sediment or unsorted substrates.	>30% pool habitat by area but with obvious filling by fines or unsorted substrates or <30% pool habitat by area and little reduction in pool volume due to filling	< 30% pool habitat by area and obvious reduction in pool volume due to filling with fines and/or unsorted substrates.
	Off-channel Habitat	Water velocity refugia present. Backwaters frequent and the resulting structural influence (LWD). Side channel connectivity maintained.		Little or no velocity refugia. Few or no backwaters; no off-channel ponds. Evidence of abandoned side channels due to past management activities.

Draft

TABLE 1.2.4-1

General Matrix of Factors and Indicators of Aquatic Health

Factors a/	Indicators	Properly Functioning	At Risk	Not Properly Functioning
	Refugia (important remnant habitat for sensitive aquatic species)	Habitat refugia exist and are adequately buffered (e.g., by intact Riparian Reserves); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or subpopulations.	Habitat refugia exist but are not adequately buffered (e.g., by intact Riparian Reserves); existing refugia are insufficient in size, number, and connectivity to maintain viable populations or subpopulations.	Adequate habitat refugia do not exist.
Channel Condition and Dynamics	Width/Depth Ratio	Width/depth ratio and channel types are within historic ranges and site potential as per Rosgen typing.		Width/depth ratios and channel types are outside of historic ranges and site potentials.
	Streambank Condition	Basinwide in low gradient reaches >90% stable; i.e., on average, less than 10% of banks are actively eroding.	Basinwide in low gradient reaches, streambanks 80-90% stable. Active erosion limited to outcurves.	<80% of streambanks are stable. Active erosion widespread throughout basin in low gradient reaches.
	Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland function, riparian vegetation and succession.		Obvious reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland extent noticeably reduced and riparian vegetation/succession altered significantly.
Flow/Hydrology	Drainage Network	Little increase in drainage network due to roads		Substantial increase in drainage network density due to roads (e.g., 20–25%)
watershed Conditions	Road Density and Location	<2 miles/square mile, with no valley bottom roads	2–3 miles/square mile, with some valley bottom roads	>3 miles/square mile and/or substantial amount of valley bottom roads
	Disturbance History	<5% equivalent clearcut acres/decade (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or Riparian Reserves		Riparian Reserves are fragmented, poorly connected, or provide inadequate protection of habitats and refugia for sensitive aquatic species. <80% are in late-seral condition.
	Landslide Rates	Within 20% of historic natural rates. Stream conditions not evidently altered due to management related landslides	0	Not within 20% of historic natural rates. Stream conditions obviously altered

a/ Source: Upper Middle Fork Coquille WA, BLM 1999a: Table C-3. These values are for the Western Cascades Physiographic Province but are referenced here as general indicators of watershed health that could be used in other provinces absent more watershed specific data.

Draft

1.3 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Most of the PCGP is routed on ridge tops to avoid stream and riparian area crossings. The project's cross-country route primarily follows ridgelines as it traverses the Coast Range Province, the Klamath Province, the Western Cascades Province and the High Cascades Province. This ridgeline alignment provides the most stable landscape position for the pipeline and minimizes the number of waterbodies and wetlands crossed as the route proceeds in a southeasterly direction from Coos Bay over these mountain ranges toward the terminus of the project near Malin, Oregon. Where Riparian Reserves could not be avoided, the project proponent has worked closely with the BLM and Forest Service to minimize effects. Most crossings are near or at right angles to the stream channel, thereby minimizing alterations to riparian zones, banks and channels. Water quality Best Management Practices would be used throughout the construction process. Timely restoration of stream banks and channels to pre-construction condition and replanting of riparian vegetation to foster succession to conifer forest would be implemented to minimize and mitigate project effects. Most of the waterbodies that are crossed by the PCGP project on BLM or NFS lands are intermittent streams that are expected to be dry or at very low flows during the summer construction activities.

1.3.1 General Construction and Stream Crossing Methods and Effects

By their linear nature, utility corridors have unavoidable effects at the site-scale where they cross Riparian Reserves. Pacific Connector would follow the *Stream Crossing Risk Analysis* (GeoEngineers 2013c) to identify design guidance, contingency measures, and monitoring protocol specific to each crossing/risk level. All methods including temporary crossings would be designed according to FERC's Procedures as well as according to the COE, ODSL, ODEQ, Forest Service, BLM, Reclamation, and ODFW approvals. See also Section 1.3.1.1 of this assessment which provides a summary of the GeoEngineers Risk Assessment for crossings on public lands.

As described in the *Stream Crossing Risk Analysis* (GeoEngineers 2013c), once the Project is approved and all permits and route access obtained, all stream crossings would have a pre-construction survey to confirm and clarify conditions developed in the risk analysis. This survey would be done by a team of professionals including agency representatives qualified to assess terrestrial and aquatic habitat and the geotechnical and geomorphic conditions relative to pipeline construction across stream channels and ditches. Following these surveys, if significant changes occur to parameters of the risk matrix for a crossing, changes would be made to risk level and appropriate final methods of crossing and BMPs made at each stream crossing. Project construction would then move forward as described in these permit documents.

Where stream channels have flowing water, crossings would be accomplished using a dry, isolated crossing method (typically dam and pump) consistent with the requirements of federal, state, and local agencies with specific authority to regulate the PCGP project's waterbody crossings. In dry, isolated crossings, the stream is temporarily dammed with sandbags or other structures. Water upstream of the temporary dam is pumped around the construction area. Any water present from hyporheic flows or leakage past dams in the construction area is pumped out and into an upslope sediment detention trap that allows the water to infiltrate back into the soil rather than back into the stream channel. Waterbody crossings would be made nearly perpendicular to the axis of the waterbody channel where practicable, based on engineering and routing constraints to minimize

Draft

parallel stream alignments and multiple stream crossings. To the degree possible, TEWAs have been located outside of Riparian Reserves to minimize effects.

The project would utilize temporary construction bridges during all phases of construction to cross stream channels on BLM and NFS lands whether streams are perennial or intermittent, wet or dry. These temporary bridge structures would be designed according to FERC's Wetland and Waterbody Procedures as well as according to the U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Department of Fish and Wildlife, BLM, and Forest Service approvals. The temporary equipment bridges would be constructed to maintain unrestricted flow and to prevent soil from entering the waterbody. Soil would not be used to stabilize temporary bridges. Bridges would be designed to withstand and pass the highest flow expected to occur while the bridge is in place, and, where feasible, bridges would be designed to span the entire Ordinary High Water Mark (OHWM) of the waterbody. If it is not possible to span the OHWM with the bridge, a temporary culvert or pier may be required. These culverts/piers would be installed to minimize flow restrictions that may deflect stream flow to banks to prevent streambank erosion or scour. Temporary footings or piers that could cause stream bank erosion or channel scour would be removed over winter if so requested by the BLM and Forest Service. Bankfull conditions occur in western Oregon on average every 1.1 to 1.2 years (Castro 1997). Based on this predicted interval, stabilizing the project for winter will be based on the assumption that bankfull conditions could occur in any given winter. The temporary bridges may include:

- equipment mats and culvert(s);
- equipment mats or railroad car bridges without culverts;
- clean rock fill and culvert(s); and
- flexi-float or portable bridges.

All stream crossings on BLM and NFS lands (whether intermittent or perennial, wet or dry) would be set during clearing operations in Year One construction as well as during mainline construction in Year Two. The temporary bridges set during clearing operations would be temporarily removed after clearing is complete and would not be left in place across a waterbody over the Year One / Year Two winter unless approved by the BLM and Forest Service. During mainline construction in Year Two, the temporary bridges would be reset and would be removed as soon as possible after permanent seeding. If there would be more than one month between final cleanup and the beginning of permanent seeding and reasonable alternate access to the right-of-way is available, equipment bridges would be removed as soon as possible after final cleanup as required by FERC Wetland and Waterbody Procedures.

Pacific Connector would not allow clearing equipment to cross waterbodies prior to bridge placement. Furthermore, where feasible, Pacific Connector's contractors would attempt to lift, span, and set the bridges from the streambanks. However, where it is not feasible to install or safely set the temporary bridges from the streambanks, only the equipment necessary to install the bridge or temporary support pier would cross the waterbody. Any equipment required to enter a waterbody to set a bridge would be inspected to ensure it is clean and free of dirt or hydrocarbons. Temporary bridges that have been used on other projects or in other locations on this project would be cleaned and inspected before and after use to reduce the probability of introduction or transport of invasive aquatic or terrestrial species.

Draft

Sediment barriers would be properly installed adjacent to stream crossings and at the edges of cleared areas in Riparian Reserves immediately after clearing and prior to initial ground disturbance (i.e., grading). Sediment barriers would be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete and revegetation has stabilized the disturbed areas. The contours of the streambed and banks would be restored to preconstruction configurations (i.e., contour/elevations) to restore the physical integrity/conditions of these features. At some stream crossings, steep, eroding streambanks may need to be regraded to a stable slope (2:1 to 3:1) to ensure physical integrity. Upslope areas would be restored according to the ECRP, which was developed with input from the Forest Service and BLM. Excess material excavated to stabilize banks would be placed by agreement with the BLM or Forest Service in a stable location that would not contribute sediment to stream channels. Streambank revegetation measures are outlined in Section 10.0 of the Erosion Control and Revegetation Plan (ECRP). In all cases, effective ground cover consistent with agency requirements would be in place prior to the onset of seasonal precipitation (table 1.3.1.2-1).

The construction corridor width would be narrowed to 75 feet at stream crossings where possible. Low-growing bank vegetation would be maintained to the extent possible.

The pipeline trench would be 4 to 5 feet wide and deep enough to insulate the pipe from channel scour and debris flows during the expected life of the project. Typically approximately 36" of overburden is placed on the pipe, but site specific conditions may require additional depth. Trench plugs would be installed on each side of the crossing to ensure that water from the channel does not enter the trench or that the trench does not drain adjacent wetlands. After the particular section of pipeline is in place and has been hydrostatically tested, the trench would be backfilled with excavated material and capped with rock and cobble of sufficient size to prevent erosion of the trench fill material. The streambed and banks and associated habitat components (e.g., LWD and boulders) would be restored to pre-construction configurations as determined by the BLM and Forest Service.

As a follow-up measure to help ensure crossing actions would not adversely affect stream bank and channel structure, Pacific Connector would monitor all stream crossings, regardless of risk, quarterly for 2 years after construction. Any adverse issues found during the monitoring with channel stability or habitat would be remediated. Additional monitoring would occur periodically over a 10-year period with implementation of remediation as needed (See EIS Section 4.4.2.2-Waterbody Crossing Methods).

1.3.1.1 Application of Best Management Practices for Water Quality

"Best Management Practices" are proven methods of reducing impacts on water quality that may result from a construction project if not taken. Applicability and selection of Best Management Practices depend on the site conditions and risk of an adverse consequence. The end result of application of Best Management Practices is moderation of effects of an action on water quality to an acceptable level.

At the request of the U. S. Fish and Wildlife Service (USFWS) and Oregon Department of Environmental Quality (ODEQ), Pacific Connector has completed a risk assessment, for stream

channel crossings, and has filed that report as part of their application with FERC (GeoEngineers, 2013c). The GeoEngineers' Risk Analysis provides:

- Predicted project effects on the short-term and long-term stability of the stream channel at the location of pipeline construction as well as upstream and downstream of the crossing site.
- Predicted project effects on the ecological functions and values of the streams and riparian areas being crossed by the project particularly with respect to hydrogeomorphic and ecological connectivity.

This evaluation is presented in a two-axis matrix with site or stream response potential on the X-axis, and construction impact potential on the Y-axis. (figure 1.3-1). Each of these two questions is evaluated individually on the X and Y axes of the risk matrix and assigned to a management category. Appropriate Best Management Practices are assigned to each management category. Channel. specific results of the analysis are provided in each of the watershed discussions in Chapter 2 of this report. The database and information used to support this analysis is provided in GeoEngineers' "Stream Crossing Risk Analysis" filed by Pacific Connector as part of the FERC application.

Draft

Figure 1.3-1 Matrix for Evaluation of Construction Impact and Site Response Potential

Project Impact Potential				
	H	Green Management Category: Pacific Connector Project Typical Construction with habitat enhancement Best Management Practices (Best Management Practices)		Red Management Category: Site Specific Design (In consultation with Agency Representatives)
	M	Blue Management Category: Pacific Connector Project Typical Construction (In consultation with Agency Representatives)	Yellow Management Category: Pacific Connector Project Typical Construction with Best Management Practices for sensitive bed, bank, or riparian revegetation conditions to be selected by Environmental Inspector (In consultation with Agency Representatives) during construction.	Orange Management Category: Pacific Connector Project Typical Construction with Best Management Practices for sensitive bed, bank, or riparian revegetation conditions selected by qualified professional prior to construction based site-specific information from pre-construction evaluation (in consultation with Agency Representatives).
	L			
		L	M	H
		Site Response Potential		

Note: At the request of ODFW and ODEQ, Pacific Connector, this table provides a framework to segregate stream crossings into different management prescriptions based on the potential site response (the X axis) and potential construction impacts (the Y axis). On BLM and NFS lands 30 stream crossings are in the Blue, or low risk management category, 8 are in the Yellow or moderate risk management category and 3 are in the Green category that have high risk to valuable aquatic habitats. Application of Best Management Practices (Best Management Practices) are tailored the risk predicted for the site. During pre-construction inspections, applicable Best Management Practices would be described as needed by the FERC EI and agency representatives to protect water quality and restore aquatic habitats after construction.

The "X" axis of the matrix addresses potential impacts related to channel stability. The four attributes on which the "X" axis is scored are:

- Channel Slope or Stream Type: higher gradient slopes—often associated with bedrock or coarse colluvial material in the streambed or banks—represent relatively low risk, while low gradient channels that are prone to depositional instability, lateral migration, or avulsion (as on an alluvial fan) are associated with high risk. Incised channels are also associated with high relative risk.
- Riparian Corridor: wide or unconfined riparian corridors represent relatively low risk and confined or infrastructure-constrained (e.g., with roads, levees) riparian corridors representing high risk.
- Bank Characteristics: bedrock represents a low-risk bank. Risk increases with more erodible banks, but erodibility is left open to consider the interactions of bank soil grain size, bank stratigraphy and consolidation/cementation, bank angle, and bank vegetation.
- Bed Materials: this attribute is directly related to the ease of erosion and arranged in risk order from low (bedrock) to high (sand). Risk order for granular materials is based on erosion thresholds rather than strictly grain size. Due to cohesion, a clay or silt bedded stream is less erodible than a sand-bedded stream.

The "Y" axis of the matrix addresses potential impacts to riparian structure and function. The four attributes on which this "Y" axis is scored are:

- Artificial Bed/Bank Stabilization: a low risk designation is given to those locations where existing bed or bank hardening is removed, allowing greater expression of normative

geomorphic processes. The high risk designation is given to those locations where rigid (i.e., non-deformable) bed or bank stabilization must be used to stabilize the channel to prevent post-construction instability as evaluated by the "X" axis of the Risk Matrix. Non-deformable stabilization includes any structures that are designed to maintain the location or grade of the channel margin in the face of extreme flood events.

- Construction Methods/Duration: based on the intensity of surface disturbance, low risk is allocated to trenchless techniques or simple excavated crossings of low-gradient streams, while higher risk is associated with locations requiring blasting or other means of invasive rock fracturing. Typical pipeline construction techniques score on the low- to moderate-part of this axis.
- Channel Disturbance Width: this attribute is based on the assumption that variations in channel geometry, such as pools and riffles, is an indication of high quality aquatic habitat. Because these morphologic variations typically occur on longitudinal dimensions proportional to channel width, fixed width construction activities that disrupt a narrower channel could potentially disturb more distinct aquatic habitat units than construction activities that disrupt a wider channel. Therefore, headwater streams would score high on this attribute.
- Floodplain Disturbance Width: this attribute assumes that perpendicular crossings of the stream would be associated with reduced loss of riparian and floodplain habitat because a relatively small proportion of the floodplain is disturbed in the down-valley direction, while alignments that parallel rivers are considered to more readily alter patterns of down-valley riparian values.

Blue Management Category

Waterbody crossings in this category have low or moderate scores for all 8 risk factors. Construction and site restoration would follow the methods and typical drawings shown in the ECRP (Appendix 1B of the JPA). Post construction site restoration would use Best Management Practices such as seeding, planting, and hydromulch or erosion control blankets to minimize surface erosion while new vegetation becomes established. Typical site revegetation and backfill would be used to address habitat issues at these sites. The "project typical" Best Management Practices used for waterbody crossings in this and the other four management categories are summarized in table 1.3.1.1-1. Stream crossings in the Blue category are found in table 1.3.1.1-2.

Draft

TABLE 1.3.1.1-1 **Best Management Practices Common to All Crossings and to the Blue Category**	
Crossing Component	**Best Management Practices and (Source)**
Streambed	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Typical erosion and sediment control Best Management Practices including mulch, hydromulch, placement of coarse woody debris for surface projection, seeding and fertilizing, erosion control blankets, silt fences. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) • Narrowed permanent management corridor (2,3,4) • Aggressive revegetation with native plant materials (3, 4,6)
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees, Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3)
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)
BMP Sources	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.

Draft

TABLE 1.3.1.1-2

Stream Channel Crossings, Blue Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Coos Bay Frontal	Catching Slough	17.42	I	1' wide V-shaped intermittent stream fed by road drainage		4.05					If/	I	I	BLUE
North Fork Coquille River	Hudson Cr.	21.36	I	3' wide incised intermittent stream in30-40 year old PSME forest, tributary to Steele Creek.	3	0	10.54		Highly erosion resistant	bedrock	M	L	M	BLUE
North Fork Coquille River	Middle Cr.	27.01	I	3-7' wide, parallel to BSI 136, ~10%gradient at top	5	12.69	48.34		Highly erosion resistant	cobbles-silt	M	L	M	BLUE
East Fork Coquille River	Elk Cr.	35.51	I	Intermittent stream	4	4.13	19.55		Erosion resistant	cobble/ gravel	M	L	M	BLUE
Middle Fork Coquille River	Big Cr.	36.54	I	Intermittent stream, 4'average width	6	6	13.29		Erosion resistant	cobble/ gravel	M	L	L	BLUE
Middle Fork Coquille River	Big Cr.	36.92	I	Intermittent stream, 3' average width		3.06					I	I	I	BLUE
Middle Fork Coquille River	Big Cr.	37.33	I	Narrow creek	2	2.75	21		Erosion resistant	gravel	M	L	M	BLUE

Draft

TABLE 1.3.1.1-2

Stream Channel Crossings, Blue Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Upper Cow Creek	SF Cow Cr.	109.69	P	HF-J Perennial stream on FS land, part of AW298 - Willow dominated wetland	12	10.2	13.15		erosion resistant	large cobble	M	L	M	BLUE
Upper Cow Creek	SF Cow Cr.	111.01	I/P	Perennial stream with summer flow diversion. Summer the stream intermittent because of diversion, drainage, U-shaped, cobble 1-2' wide		16.41					I	I	I	BLUE
Shady Cove-Rogue River	Indian Cr.	126.5	I	1-2' wide intermittent drainage – BLM designated	1	1.18	20.11		Highly erosion resistant	cobble/ gravel	M	L	M	BLUE
Shady Cove-Rogue River	Indian Cr	126.52	I	Intermittent U-shaped channel, 1-2' wide; 15% gradient		4.08					M	L	M	BLUE

Draft

TABLE 1.3.1.1-2

Stream Channel Crossings, Blue Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Shady Cove-Rogue River	Indian Cr	126.59	I	Intermittent U- shaped channel, 4'wide, 6-10% gradient	4	5.65	13.62		Highly erosion resistant	cobble/ gravel	M	L	L	BLUE
Shady Cove-Rogue River	Indian Cr	128.89	I	Forested wetland/stream	5	30	10.42		Erosion resistant	cobble/ gravel	L	L	L	BLUE
Shady Cove-Rogue River	Indian Cr	129.13	I	Intermittent Stream		1.42					I	I	I	BLUE
Big Butte Creek	McNeil Cr.	131.55 (This location to be rerouted)	I	1-3' wide, U-shaped channel; >10% gradient, tributary to ASI249	3	4.79	21.83		Erosion resistant	cobble/ gravel	M	L	M	BLUE
Big Butte Creek	McNeil Cr.	131.72	I	1-3' wide, U-shaped channel; >10% gradient, tributary to ASI249	1	3.95	13.45		Erosion resistant	cobble/ gravel	L	L	L	BLUE
Little Butte Creek	Salt Cr.	141.17	I	1-2' wide intermittent stream with little vegetation		2.51					I	I	I	BLUE

Draft

TABLE 1.3.1.1-2

Stream Channel Crossings, Blue Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Little Butte Creek	Salt Cr.	141.44	I	3-4' average width, U-shaped channel, 8%gradient	4	43.2	13.89		Highly erosion resistant	bedrock	L	L	L	BLUE
Little Butte Creek	Salt Cr.	141.49	I	1-2' wide intermittent drainage		4.45					L	I	I	BLUE
Little Butte Creek	Beaver Dam Cr.	166.21	I	Daley Creek. 30-40' wide braided channel, cobble/gravel substrate,		26.51					I	I	I	BLUE
Spencer Creek	Buck Lake	171.06	I	Small, ,,10 feet wide stream associated with wetland swale	12	154.82	3.3	0.75	Erodible	silt	M	L	M	BLUE
Spencer Creek	Buck Lake	171.57	P	2' wide stream that fans out into a wetland/stream complex		4.05					L	I	I	BLUE
Spencer Creek	Buck Lake	172.48	I	Wetland/Stream	5	64.25	1.98		Highly erosion resistant	gravel	M	L	M	BLUE
Spencer Creek	Upper Spencer Cr.	173.74	I	4' wide, snowmelt Intermittent stream		8.17					I	I	I	BLUE

Draft

TABLE 1.3.1.1-2

Stream Channel Crossings, Blue Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Spencer Creek	Upper Spencer Cr.	174.0	I	1-2' wide, snowmelt intermittent stream	3	3.02	5.3		Highly erosion resistant	gravel/ soil	L	L	L	BLUE
Spencer Creek	Upper Spencer Cr.	176.55	I	1' wide intermittent shrubbed stream Extension of ESI069' - wide, 2' deep	4	2.02	57.99		Erodible	gravel/ soil	M	L	M	BLUE

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Draft

Yellow and Orange Management Categories

Sites in the yellow management category represent moderate risk for stream channel stability based on this risk assessment scoring. This scoring typically requires at least one high-risk channel attribute and the remaining attributes to be at least moderate. These channels occur at all points in the watershed. More robust Best Management Practices, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of Best Management Practices, as described in table 1.3.1.1-3. Specific Best Management Practices would be selected by the Environmental Inspector or suitably trained professionals in consultation with Agency representatives prior to construction. Stream crossings in the Yellow category on BLM and NFS lands are shown in Table 1.3.1.1-4

TABLE 1.3.1.1-3

Best Management Practices for Crossings in the Yellow and Orange Categories

Crossing Component	Best Management Practices and (Source) (These would be selected as needed by the FERC EI after a preconstruction evaluation with Agency Representatives.)
Streambed	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)
Streambanks	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) • Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)
BMP Source	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.

Sites in the orange management category represent the highest potential risk for short and long- term channel stability. This scoring typically requires more than one high-risk (score of 4 or 5) channel attribute and the remaining attributes to be at least moderate.

Channel conditions that have placed streams in the yellow or orange management categories include:

- Channel incision: Incised channels represent the greatest risk observed on the Pacific Connector alignment because they are likely to result in continued bank erosion as channel banks evolve into a more stable configuration. For those incised channels that are not already eroded down to bedrock, additional scour is also possible depending on whether downstream grade control is present in proximity to the crossing site. Channel banks would require the incorporation of deformable stabilization during site restoration.
- Channel slope: Streams at lower and moderate slopes are more prone to channel migration, while streams on moderate slopes are prone to channel scour. Channel migration and scour risk were assessed previously for the named waterbodies (GeoEngineers, 2007) and are accounted for in location of the pipe overbend and burial depths. Streams with very high channel slopes (>20%) require selective placement of coarse materials available from the pipeline trench to provide additional grade control.
- Riparian condition: More robust woody vegetation in the riparian zone typically reduces avulsion risk and aids in reducing erosion of stream banks. Revegetation to maintain the continuity of the existing riparian zone is appropriate for these streams.
- Channel bed and bank materials: Erodible materials in the bed or bank present a greater short-term risk of scour or lateral migration than do non-erodible materials. Erodible banks are more likely to require the addition of deformable bank or bank toe stabilization. Channel scour is addressed by selection of the pipe burial depth and by the selective placement of available coarse materials in the backfill.

Draft

TABLE 1.3.1.1-4

Stream Crossings in the Yellow Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Stream-bed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
North Fork Coquille River	Middle Cr.	27.04	P	Middle Creek-steep banks, 30-60' wide,<2% gradient	45	65.03	0.4	10	Erodible sand; Somewhat non-erodible bedrock at base RB; widened as a result of incision	gravel and sand; 10-15 feet over bedrock	M	M	M	YELLOW
East Fork Coquille River	Brewster Canyon.	31.64	I	1' wide, flows subsurface in areas	1	1.17	22.07		Erosion resistant	cobble/ gravel		M	M	YELLOW
Middle Fork Coquille River	Big Cr.	37.35	P	10-15' wide broad U-shaped channel with cobble/silt substrate	13	14.93	6.2		Erosion resistant-toe protection	cobble/ silt	M	M	L	YELLOW
Middle Fork Coquille River	Headwaters MFC	48.27	P	Perennial stream	4	80.89	2.37		Highly erosion resistant	cobble/ gravel	M	M	M	YELLOW
Upper Cow Creek	SF Cow Cr.	109.17	P	HF-C Perennial stream with associated seep wetland with shrubs	5	12.02	18.6		erodible	sand	M	M	M	YELLOW
Upper Cow Creek	SF Cow Cr.	109.33	I	HF-F 3' wide intermittent		7.54					m	m	m	YELLOW

Draft

TABLE 1.3.1.1-4

Stream Crossings in the Yellow Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Stream-bed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Little Butte Creek	Lick Cr.	140.26	I	Lick Creek, 10-20'wide, U-shaped channel		12.33					M	m	m	YELLOW
Little Butte Creek	Upper SF Little Butte Cr.	162.45	P	U-shaped, 1% gradient	22	19.62	0.87		erosion resistant	gravel/ cobble	M	M	M	YELLOW

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Draft

Green Management Category

Streams in the green field, for sites with high habitat impact potential, would use typical site construction methods. In addition to these Best Management Practices emphasis would be placed on habitat restoration measures outlined below. Channels placed in this field typically are those that disturb a greater proportion of the existing floodplain or – in narrower streams – potentially disturb more varied aquatic habitat. During site restoration, however, particular effort would be made for opportunistic habitat enhancement Best Management Practices as detailed from observations obtained during the pre-construction survey. These could include riparian planting to improve existing habitat conditions in the floodplain, placement of large wood or rock to improve in-stream habitat, or modification of existing riprap to improve habitat. Where these channels require the addition of deformable bank stabilization, maximum use would be made of Best Management Practices that promote bank revegetation with woody materials. In addition to the "Project Typical" Best Management Practices, Pacific Connector would propose additional Best Management Practices for use at crossings in this management category, as shown in table 1.3.1.1-5.

TABLE 1.3.1.1-5

Best Management Practices for Crossings in the Green Category

Crossing Component	Best Management Practices and Source
Streambed	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) • Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Sources	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.

Best Management Practices to address specific components of waterbody crossings at sensitive crossing locations (i.e., with high project impact potential and moderate or high site or stream response potential) are summarized in table 1.3.1.1-6. Specific Best Management Practices would be selected by the Environmental Inspector suitably trained professionals prior to construction.

Draft

TABLE 1.3.1.1-6

Stream Crossings in the "Green" Category

Fifth Field Water-shed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Cross-ing (ft) a/	Channel Gradient (%)b/	Channel Incision (ft) b/	Bank Character b/	Stream-bed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
North Fork Coquille River	Hudson Cr.	20.34	I	2-3' wide v-shaped channel, 6' deep, in 30 year old PSME forest, tributary to Steele Creek	3	6.57	11.86	6	Highly erosion resistant	Bedrock	M	L	H	GREEN
Upper Cow Creek	SF Cow Cr.	109.47	P	HF-G EF Cow Creek – 28' wide, broad, cobbles, boulders, 2' wide	12	26.44	3.32	3.5	erosion resistant	Cobble and boulders	M	M	H	GREEN
Upper Cow Creek	SF Cow Cr.	109.78	P	HF-K Perennial stream on NFS Lands (INCORRECT LY ID AS INT in 2A-3A)	8	5.16	9.61	3	highly erodible	Cobble and gravel	M	M	H	GREEN

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Draft

Red Management Category

No channels were found to score in the red range on BLM or NFS lands presenting both a high risk of stream response and habitat impact with the range of construction methods and best management practices proposed for the Pacific Connector project. This field would require site specific design and specifications such as that which is required by FERC (2003) for major waterbodies (>100-ft crossing widths) prior to construction. Following the pre- construction survey, should more detailed information result in the re-classification of a site into this field (for example, due to the necessity of adding non-deformable bank stabilization), a site specific design would be developed and incorporated into project construction plans.

Pre-Construction Survey

BLM and Forest Service personnel have reviewed stream inventory data and have field-verified all perennial and most intermittent crossings. It is possible however for conditions to change between the time of inventory and time of construction. In order to ensure that prescriptions are still appropriate for the conditions at each crossing, a pre-construction review of all crossings would be completed prior to construction. At sites where conditions have changed significantly from those which are described in the Pacific Connector application (PCGP Wetland Delineation Report. 2013), GeoEngineers (2013c), BLM or Forest Service, this preconstruction survey would re-evaluate whether the management category for that site should be modified. Channel information to be verified during the pre-construction survey at the higher risk habitat sites (green management category) would include channel configuration/morphology; size and distribution of instream structure that affects the in-channel distribution of hydraulic energy (e.g., logs and large rock), substrate grain size and thickness of the active channel substrate, and bank geometry and material configuration. Appropriate permitting entities would be notified of changes in management approach and the rationale for such changes, With respect to habitat conditions, the pre- construction survey would document the type and frequency of individual aquatic habitat units; and specific information on current riparian vegetation. As provided the right-of-way grant, Agency representatives would be engaged and consulted during this survey and may require additional measures necessary to accomplish ACS objectives.

1.3.1.2 Water Quality—Sediment

Short-Term Sediment Related to Construction of Stream Crossings

Natural gas and oil transmission pipelines by their linear nature must traverse streams, rivers, and other water bodies. The PCGP would cross perennial streams that have flowing water year-round, and intermittent streams that typically stop flowing during dry summer months, and may or may not have flowing water at the time of construction. Watercourse crossing construction can increase downstream suspended sediment concentrations through trench excavation (trenching), backfilling; the storage of excavated material directly in the watercourse, the installation of isolation and diversion structures, erosion and run-off from adjacent upland worksites, and the discharge of water from hydrostatic pipe testing or trench dewatering. (Reid and Anderson 1999, Reid et al, 2004). Amounts and concentrations of sediments depend on the nature of the soil and streambed materials (gravel, silt etc.) at the crossing site, streamflow, construction methods and other variables (Levesque and Dube 2007).

All PCGP project stream crossings with flowing water at the time of construction on BLM and NFS lands would be accomplished using dry, dam-and-pump methods (figures 1.3-2, 1,3-3, 1,3-4). This stream crossing method maintains downstream flow while isolating the construction area between upstream and downstream dams from flowing water by pumping the water around the construction area. Dry dam-and-pump stream crossings typical of BLM and Forest Service landscapes would likely take from 1 to 5 days to complete, although construction periods can vary significantly with topography and flows. It is anticipated that many smaller stream channels on BLM and Forest Service lands can be crossed in less than 48 hours. On larger flowing streams, flumes may be added to the process if necessary to move water past the crossing or to maintain passage for aquatic biota (figure 1.3-4).

The objective of the dry dam-and-pump method is to isolate the construction crossing from waters in the stream being crossed to minimize the release of sediment. Sediment effects from isolated dry crossings are generally short term, and are associated with:

1. installation and removal of the upstream and downstream dams (figure 1.3-2);
2. water leaking through the upstream dam into the work area;
3. movement of in-stream rocks and boulders to allow proper pipeline alignment and installation of the dams; and,
4. return of streamflow to the construction work area after the crossing is complete and the dams are removed.

Figure 1.3-2 Installation of a dam in a dry open cut crossing of a small channel

Draft

Figure 1.3-3 Preparation of perennial stream crossing with equipment bridges and sediment fence installed

Figure 1.3-4 Dam and pump crossing of perennial stream with flume.

Background Sediment Concentrations

Background sediment concentrations and range of variation from disturbance provide a baseline to consider potential effects of the project. Project-generated sediment added to background levels provides an estimate of total sediment concentration associated with project construction. These total sediment amounts can be compared to historical ranges of sediment concentration to provide a framework to evaluate effects of the PCGP related to ACS objectives.

Sediment amounts in Pacific Northwest streams vary by orders of magnitude with flows, precipitation, stream position in the watershed, disturbance events, watershed conditions and many other variables. Episodic high intensity storms may generate the majority of the sediment transported for the entire year while suspended sediments during summer months generally remain low in the absence of disturbance events. For example, a review of 6 months of USGS gage data in Cow Creek prior to the construction of Galesville Dam showed that 95% of the sediment transport for the reporting period occurred in one three day storm. Sediment concentrations reached nearly 1000 mg/L during this three-day event, but averaged 3.5 mg/L for the rest of the year (Curtis, 1982). USGS gage data from watersheds crossed by the project for dates that overlap the ODFW instream work window ranged from 1 – 13 mg/L, and averaged 3.4 mg/L (USGS 2013). Historical USGS gage data (1950-1979) for the Klamath River, which is part of the Klamath Siskiyou physiographic province[4] south of the project area range from less than 5mg/L low summer flows to over 5000 mg/L during winter high flows although sediment concentrations greater than 1000 mg/L have been recorded during summer months (Bureau of Reclamation. 2012. VII: C16).

Stand-replacement fire and high-intensity rainstorms are the primary historical disturbance factors that mobilize sediment in Pacific Northwest watersheds (see Section 2.1). Changes in sediment concentrations following a fire vary with fire intensity, rainfall intensity, topography, remaining duff layer, soil type and many other factors. There are many anecdotal records of flow and sediment increases following fires, however pre and post-fire measurements that quantify such events are rare because of the stochastic nature of stand replacement fire; watersheds with instrumentation are only rarely involved in high intensity fire. Where pre and post-fire surveys have been completed, high intensity fire has generally shown a substantial increase in sediment transport and deposition in streams.

- The accelerated erosion associated with intense fire combined with normal background levels may cause a fivefold increase in sediment yield in Douglas-fir and western hemlock forests (Swanson, 1981, cited in Catching Beaver WA).
- When site disturbances, such as severe fire, produce hydrologic conditions that are poor (less than 10 percent of the ground surface covered with plants and litter), surface runoff can increase over 70 percent and erosion can increase by three orders of magnitude (Robichaud et al, 2000).
- In a study in New Mexico, a stand replacement fire in a pine and mixed conifer forest resulted in flow and sediment concentration increases of two orders of magnitude over pre-fire conditions, with most of the fine sediment transport occurring in the first two years following the fire (Malmon et al, 2007). Timing of precipitation can mitigate these effects in some

[4] Portions of the Coquille, Umpqua, Rogue River and Klamath basins are in the Klamath-Siskiyou geologic province, and have similar geology, soils, weather patterns, and likely have similar sediment responses to storms.

circumstances. Post-fire measurements in Glacier National Park in the northern Rocky Mountains showed little increase in sediment concentrations when snow fell on the fire area early in the winter, buffering it from high intensity rainfall events. This is consistent with observations of Pettigrew et al (2006) in central British Columbia suggesting that increases in sediment transport following wildfires is transport-limited, not supply limited.

- In Wyoming, three stations on the Little Granite Cr. Watershed of the Gros Ventre range near Bondurant, Wyoming were monitored in 2002 and 2003 following a large fire in 2000 that burned most of the Boulder Cr. subwatershed. The primary sources of sediment in the watershed are mass wasting, including active earthflows from unstable hill slopes, and slumping from undercut terraces and road cuts. Estimates of peak concentrations during the first post-fire year (2001) ranged from 300 to 1,200 mg/L and 350 to 5,700 mg/L at two different measuring stations during the snowmelt period. During baseflow periods in 2003, suspended sediment concentrations ranged from 2 to 7 mg/L a the upper site and 0.2 to 10 mg/L at the lower site. During a summer thunderstorm, sediment concentrations peaked at 200 mg/L (Ryan et al. 2006).
- In northern California, high intensity rainfall following a high-intensity fire in 2012 showed a five-fold increase in turbidity (and by inference, sediment concentrations) in the McCloud River. The Forest Service estimates the rain events following the fire mobilized 4.5 million cubic yards of sediment (Shasta-Trinity NF, 2014).
- Monitoring of the ACS showed that of watersheds that declined in condition during the 10 years since strategy implementation, the largest declines included watersheds where wildfires burned 30-60% of their area (Reeves et al. 2009).

For most of the Coast Range, Klamath-Siskiyou and Western Cascades provinces, high intensity winter rainfall events have had the most impact on erosional processes. For example, the North Fork Coquille Watershed Assessment noted over 70 naturally occurring landslide events associated with high intensity rainstorms some of which ran for miles in Parks Creek, (also called Middle Creek) and major tributaries (BLM 2002a: 3-7). In the High Cascades province, most precipitation falls as snow. In these areas, geologically recent volcanic deposits may be less impacted by rainfall, but are subject to mass wasting when saturated by snowmelt.

From this review of data and literature, the following basic conclusions are drawn concerning background sediment concentrations:

- Sediment in Pacific Northwest stream systems is delivered in pulses associated with disturbance events. High intensity fire followed by high intensity rainfall can mobilize huge pulses of sediments. Typically, these occur in winter storms, but may occur in snowmelt runoff at higher elevations, with the onset of seasonal precipitation in the fall and in summer thunderstorms. These events are infrequent.
- Based on USGS gage data, sediment concentrations in high-flow winter events may reach 1,000 -5000 mg/L and remain at high levels for days during large storms.
- Based on limited USGS gage data, sediment concentrations in summer base flows in watersheds crossed by the project typically range from 1 to 13 mg/L. Based on this data, small mountain streams with gravel substrates, sediment concentrations would be expected to run 0-4 mg/L. Valley bottom streams with silt and sand substrates would be expected to run 2-7 mg/L. Streams that have ongoing irrigation activities may consistently run above these natural

ranges. This is consistent with literature citations for the Klamath Basin (Bureau of Reclamation, 2012).

- Summer thunderstorms following a stand replacement fire can cause short-term spikes in sediment concentrations that may increase over ambient sediment concentrations by orders of magnitude. No local data is available, levels of 200 mg/L have been documented in Wyoming during a summer thunderstorm. USGS gage data showed a sediment concentration spike of 1,000 mg/L in the Klamath River in August though causality is unknown.

Increases in Sediment Associated with Pipeline Crossing Construction

Measurement of sediment can be expressed many different ways. For example, a 5 gallon bucket of silt could generate suspended sediment concentrations in the thousands of mg/L at the point of origin and remain suspended in the water column for long distances. Without some estimate of the volume of sediment (5 gallons), the concentration (thousands of mg/L) would not provide a meaningful measure of watershed effects. Duration of exposure is also important to aquatic biota. Several days of chronic exposure to lower concentrations of sediment can be much more impacting than a single high spike in sediment concentration. In this assessment, the scale (where and how far), the duration (how long) and magnitude (how much, expressed both as concentration and estimated volume) are used to provide an assessment of effects on aquatic biota. Precise predictions are impossible to make because of background variables and site conditions, so where appropriate, an expected range of values is used to describe project effects.

Several studies of buried pipeline stream crossing construction have evaluated sediment increases associated with dam-and-pump isolated construction methods.[5] Levesque and Dube (2006) reviewed and summarized the effects of various crossing construction methods noting that pipeline-crossing construction may have detrimental effects on aquatic ecosystems. Reid and Anderson (2002) studied sediment transport at eight dam-and-pump crossings with measurable flow in northern Alberta, Canada in winter 1999/2000. Habitat alteration (i.e., sediment deposition) was studied at 3 of these crossings. Between 1 and 9 days were required for instream construction. All but one had flow of 0.1 m^3/sec or less. Samples were collected across the duration of construction. Background sediment concentrations ranged from 2.4 to 14.6 mg/L. Results showed that the dam-and-pump technique was very effective in limiting sediment release in these small watercourses. Mean sediment concentration increase above background was 8.3 mg/L and median concentration above background[6] was 7.5 mg/L. Increases in downstream concentrations were generally limited to installation and removal of the dams and bypass pumps. Concentrations above background were generally greater during dam and pump removal (1.0 to 703 mg/L) than during

[5] The studies cited here are from eastern Canada and the eastern US since that is where most pipeline construction has occurred, but they provide the best available evidence of possible increases in sediment concentrations. While these may be different environments than the PCGP, the entrainment, transport and deposition of sediment are physical processes dependent on flows, sediment texture etc., not the location of the study. Stream crossings on the PCGP range from silty clays to gravels. By representing a range of likely outcomes, we account for possible differences in background conditions.

[6] Most of the available literature on this topic report measurements of sediment concentrations expressed as mg/L of sediment. Turbidity is also used to measure suspended sediments. Turbidity is a measurement of the decrease in transparency of stream water as light is scattered by suspended particulate matter, generally expressed as Nephelometric Turbidity Units (NTU). Relationships between turbidity and sediment concentrations are complex and vary with instrumentation and the nature of the sediment in suspension and generally need to be calibrated on-site to provide consistent measurement of sediment concentrations. In this review sediment concentration rather than turbidity is used for comparison of effects.

installation (average less than 76 mg/L over background). Duration of effects during installation and removal of dams and pumps ranged from 20 minutes to 6.5 hours. During other phases of construction (trenching and backfilling), increases above background were generally less than 8 mg/L (Reid and Anderson, 2002: 738). Sediment was more evident at crossing sites with bed and bank materials consisting of fine-grained sediments. No impacts to downstream habitat due to sedimentation were found. There was no evident pattern related to watercourse size or flow.

In another evaluation, Reid et al (2002) conducted suspended sediment sampling during dam and pump crossings of four brook trout streams in Nova Scotia and Ontario, Canada (watered widths ranging from 1.1 to 3.6 m). Samples were collected at downstream distances ranging from 13 to 30 meters. Instream work ranged from 16 hours to 41 hours, spread over 2 to 6 days. During periods of increased sediment loading, samples were collected about every 30 minutes and less frequently during periods of no instream construction. Sampling continued after completion of construction until downstream turbidity levels returned to background (typically less than 2.5 hrs.). Background (upstream) sediment concentrations ranged from < 2 to 4 mg/L. Mean increases above background ranged from 4 to 20 mg/L for dam and pump crossings. Spikes in sediment concentration in association with dam and pump installation and removal ranged from 61 to 1032 mg/L. These spikes were short-term with downstream sediment concentrations returning to the background level within 10 hours. This study found little evidence for downstream deposition of fine sediment or habitat alteration by sediment deposition. Reid et al (2004) reviewed a number of studies and reported similar findings noting that 90% of dam and pump crossings showed increases in sediment concentrations above background of less than 25 mg/L. In contrast, wet, open cut crossings where water is not diverted had sediment increases 20 times that of isolated dam-and-pump crossings.

Distance transported and concentration of sediment transported downstream in suspension are highly variable and depend on the particle size (e.g. silt vs. sand etc.), stream volume, stream velocity and other variables. Reid et al (2002) measured sediment deposition 20 and 115 meters downstream of dam-and-pump pipeline crossings and found surficial streambed material was generally unaffected noting that a thin veneer of fine sediment was temporary and resuspended within less than 3 days.

Pacific Connector calculated watershed-specific projected sediment concentrations for dam-and-pump crossings at the construction site, 10 meters, 50 meters and 100 meters downstream. Estimated TSS concentrations downstream from flumed dry open-cut construction ranged from less than 94 mg/L to 2 mg/L (see Table 3.2-25). Estimated TSS concentrations downstream from dam-and-pump dry open-cut construction range from about 23 mg/L to 2 mg/L (see Table 3.2-25). Estimates of TSS concentrations produced during pipeline construction under average and peak low flow conditions are highest for the four waterbodies crossed within the Coquille River Fifth-field Watershed, followed by estimates produced within the Coos Bay-Frontal Pacific Ocean Fifth-field Watershed. The elevated concentrations are due to high levels of silt and organics in stream substrates within those two watersheds. For the other fifth-field watershed crossed, estimated average TSS concentrations produced during fluming and dam-and-pump construction are equal to or near background TSS estimates (2 mg/L) between 10 and 100 meters

downstream from construction sites (PCGP Resource Report 3, table 3.2-25). Predicted sediment concentrations calculated by Pacific Connector are consistent with empirical data from studies of

pipeline crossings using dam-and-pump crossing methods by Reid and Anderson (2002), Reid et al (2002) and Reid et al (2004).

Culvert removals are a routine management activity on federal lands and provide a familiar comparison of relative effects. In a study of culvert removals in Idaho and Washington, sediment concentrations were monitored at 11 stream crossings in 3 areas to measure the sediment concentrations associated with culvert removal (Foltz et al, 2008). Flow rates at two areas (Horse Creek and Wendover Cr.) were low (0.1 to 0.6 L/s) and higher (9-13 L/s) at the third (Granite Cr.). In one area (Wendover Cr.), the five culverts removed and monitored were log constructed and old. Mitigations, including diverting the stream channel around the work area and installation of straw bales downstream of the crossings, were implemented at four Wendover Cr. stations, but not at the others. At one of the Horse Cr. stations, culvert removal occurred during several storm events. Peak sediment concentrations at unmitigated removals ranged from 2,060 mg/L to 28,400 mg/L w/ a mean of 13,000 mg/L. Sediment yields ranged from 3 kg (7 pounds) to 170 kg (375 pounds), with a mean of 67 kg (148 pounds). At the 4 locations on Wendover Creek where mitigation was applied (diversion and straw bales), peak sediment concentrations were between 300 mg/L and 1300 mg/L w/ a mean of 830 mg/L. Sediment yields ranged from 0.2 kg (1/2 pound) to 3 kg (7 pounds), with a mean of 1.6 kg (4 pounds). At the three locations on Horse Creek with 100-m downstream monitoring stations, concentrations were an order of magnitude lower than at the culvert outlet, and at 810 m downstream, there was very little increase above ambient levels (10 mg/L) for the two locations not influenced by storms. At 3 of 10 locations (including the storm-influenced location), suspended sediments exceeded 6,000 mg/L for more than 1 hour and at 5 locations, sediment concentrations exceeded 500 mg/L for 10 hours. These sediment concentrations are significantly higher than those predicted for dry isolated dam-and-pump crossings.

Based on these reviews of literature, the following basic conclusions can be drawn concerning increases in sediment concentrations associated with dam-and-pump pipeline crossing construction:

- Measured sediment concentrations associated with installation of structures for dam-and-pump crossings at the beginning of crossing construction and removal of structures when the crossing is completed range from 60 to 1100 mg/L with an average of 76 mg/L above background levels. These are short-term effects; once work activity stopped, sediment concentrations returned to background levels within 2-10 hours.

- Increase in sediment concentration over background levels during the in-stream construction (trenching and backfilling) of crossings using dam-and-pump methods cited in the literature generally ranged from 4-20 mg/L with a mean concentration above background of 8.5 mg/L. Pacific Connector's predicted sediment concentrations are consistent with the literature and well within this range (PCGP Resource Report 3, table 3.2-25).

- Total sediment yield varies with the size of the crossing, stream velocity, substrate and bank material and other factors. Using culvert removal with some mitigation as a comparison (Foltz et al, 2008) total sediment amounts mobilized during crossing construction are expected to be in the range of 0.1 to 0.5 cubic feet, or less than a wheelbarrow of material on most crossings. This is roughly equivalent to a small bank slough.

- Duration of increased sediment concentrations depend on the time it takes to complete the crossing. Most BLM and NFS streams are small and can be crossed in 1-2 days. Larger perennial streams may take as long as 5 days to complete construction. Once work activity stops, sediment concentrations typically return to background levels within 2-10 hours.

- The distance that increased sediment concentrations and deposition occur downstream depends on the size of the material in suspension, stream velocity and other variables. See Table 3.2-25, Resource Report 3,

- Predicted project-related increases in sediment concentrations are well within the historic range of variation for episodic pulses of sediment in Pacific Northwest watersheds.

- By comparison, culvert removal, which is a routine management action conducted by the BLM and Forest Service may generate sediment concentrations that are an order of magnitude higher than those observed in dam-and-pump pipeline crossings where the construction area is isolated from the stream. Where culvert removal projects diverted the stream from the work area and installed sediment traps, amounts were similar to those expected from dam and pump crossings.

Effects of Increased Sediment Concentrations on Aquatic Biota

Effects of sediment on salmonids and other aquatic biota have been the subject of numerous studies. Both fish and invertebrate communities may be impacted by increases in sediment concentration.

One of the most widely cited studies of the effects of sediment concentrations on fish was conducted by Newcombe and Jensen (1996) who utilized 80 published and adequately documented studies to develop empirical equations (multiple regression models) relating biological response of fish receptor groups to suspended sediment concentrations (mg/L) and duration of exposure (hrs.), which combined constituted "dose." The five receptor groups of direct relevance to assessing impacts of PCGP Project stream crossings are as follows:

- juvenile and adult salmonids (171 data triplets);
- juvenile salmonids (63 data triplets);
- adult salmonids (108 data triplets);
- salmonid and nonsalmonid eggs and larvae (43 data triplets);
- adult nonsalmonids (22 data triplets).

For each of these receptor groups, the documented effect(s) of suspended sediment exposure were categorized into one of 15 severity of ill effects categories (SEV), from 0 being no effect to 14 being >80% mortality. These categories were then aggregated into four effect groups, as follows:

- nil effect (SEV=0);
- behavioral effects (SEV = 1 to 3);
- sublethal effects (SEV = 4 to 8); and,
- paralethal and lethal effects (SEV = 9 to 14).

Newcombe and Jensen's paper noted the sensitivity of egg and sac-fry stages to increased sediment concentrations. Instream work windows regulated by the Oregon Department of Fish and Wildlife

(ODFW) restrict timing to avoid periods when sensitive life stages of salmonids such as eggs or sac-fry are present.

Following on the work of Newcombe and Jensen (1996), Anderson et al. (1996) developed a dose-response (multiple regression) model to relate habitat alteration and changes in productivity to sediment concentration duration, finding that the duration of exposure played a more dominant role in determining habitat effects than did sediment concentration. The authors suggested that Newcombe and Jensen's (1996) SEV level of 7 be used to identify when sediment concentrations might be expected to cause habitat damage as measured by a change in the invertebrate community (p. 32).

Reid et al (2004) conducted a detailed examination of the effects of elevated sediments associated with pipeline construction on fish physiology. The author studied the physiological response of caged rainbow trout downstream of simulated open cut stream crossings on Serviceberry Creek in Alberta (0.46 m3/s discharge, construction duration 30.7 hr., cages 19 and 40 m downstream, background sediment concentration of 226 mg/L) and Conestoga River in Ontario (4.8 m3/s discharge, construction duration 28.9 hrs., cages 40 and 100 m downstream, background SC 50 mg/L). Mean sediment concentrations in Serviceberry Cr. were raised to between 55 & 70 mg/L, and peaked at >1400 mg/L. On Conestoga River, mean sediment concentrations were raised by 65 mg/L and peak sediment concentrations. by more than 450 mg/L. Physiological stress increased, as reflected by elevated rates of respiration (i.e., oxygen consumption) and loss of equilibrium, as well as by altered blood hematocrit levels indicating potential damage to gills and hence decreased transfer of oxygen. The authors found that their results were consistent with the acute stress response defined by Newcombe & Jensen (1996).

Applying these concepts to the effects of pipeline construction, Trettel et al (2002) collected data on sediment concentrations at stream crossings on a pipeline project in New Hampshire constructed using the dam-and-pump method and compared that to Newcombe and Jensen's (1996) SEV model for juvenile and adult salmonids. The average SEV rating for dam-and-pump crossings was 6.42, a sublethal score that would equate to moderate physiological stress on juvenile and adult salmonids on Newcombe and Jensen's SEV model. Thirty-six (36) percent of the crossings in Trettel et al (2002) exceeded SEV of 7.0. The authors note that it is unlikely that an SEV of 7 would cause long-term damage to fish populations or habitats because of the short-term nature of most crossings and the rapid removal of the small amounts of fine sediments deposited downstream, typically in the first post-construction storm event. Due to the small stream reach impacted by increased suspended sediment loading, fish could temporarily move out of the area if they are under stress. The authors also discuss the relationship of SEV to grain size of sediments in the construction area. One hundred (100) per cent of sand & boulder crossings, 80% of sandy crossings, and 81% of the loamy sand crossings had SEV <7. By contrast, 29% of crossings with 0-20% silt, 42% of the crossings with 21-40% silt, and 89% of the crossings with 41-60% silt have SEV >7. Trettel et al (2002) note that high-silt crossings require more time, thereby extending the duration of exposure (and hence increasing the SEV). The study notes that construction during low flow periods could lead to higher SEV values due to higher residency time of suspended sediment and concludes that an SEV of 8.0 or 9.0 would better represent damage to fish populations.

Downstream transport and deposition of suspended sediment depends on many factors including the size of particles mobilized, stream gradient and velocity and stream volume. For most

individual crossings the downstream distance where sediment concentrations above 17 mg/L (a level that may cause avoidance or stress) is estimated to be about 61 feet, with a range of 40 to 211 feet depending on stream size (FERC 2010, p. 4-367). Typically, crossing takes 24 to 48 hours at most sites so this displacement would be short term, minor and generally limited to the construction site.

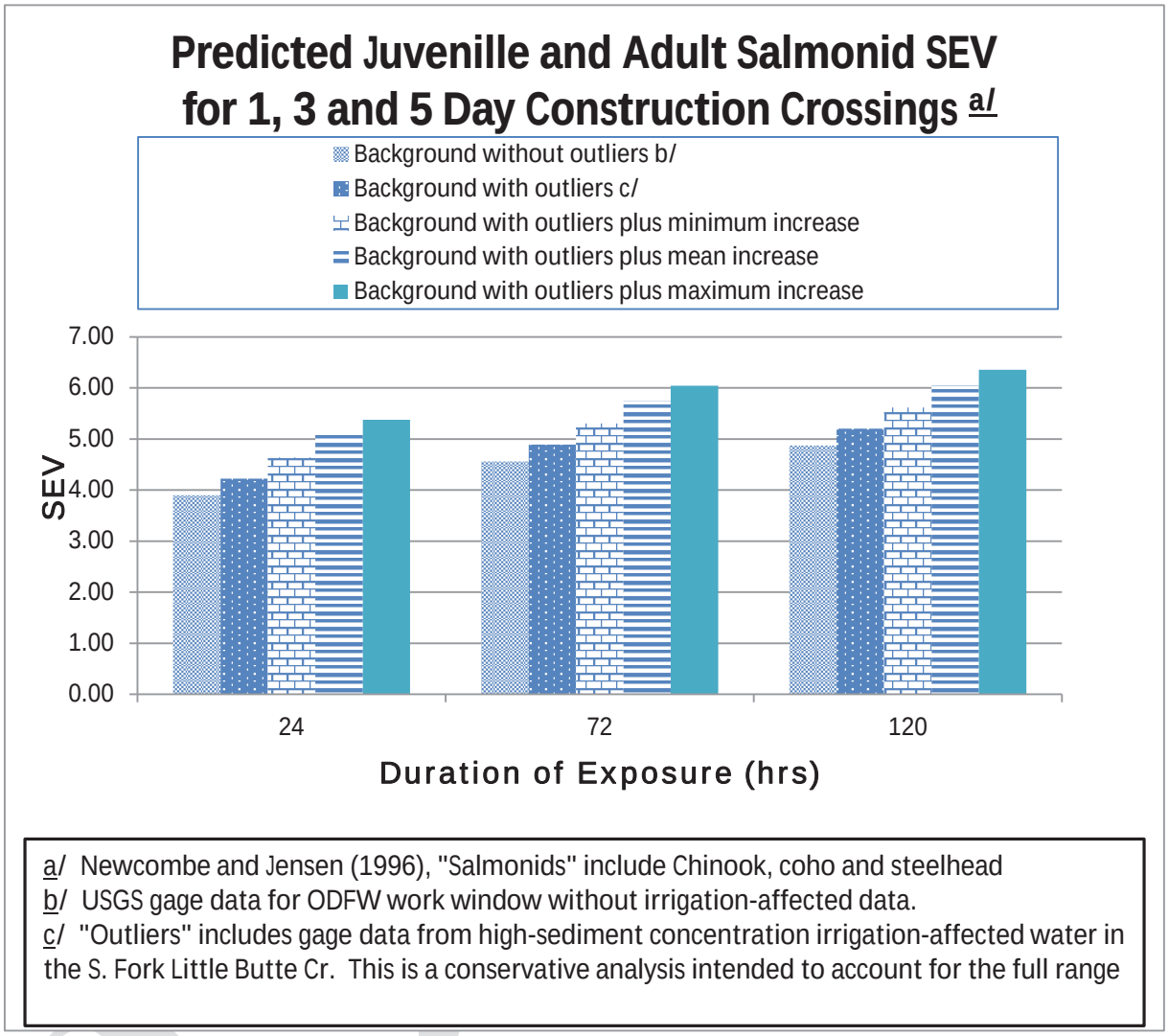
Using Newcombe and Jensen's (1996) model, SEV values for juvenile and adult salmonids were calculated for one, three and five day sediment concentration exposures predicted for dam-and-pump crossings by the PCGP corridor (figure 1.3-5). Based on this evaluation, sediment associated with construction, when added to background is likely to cause behavioral changes such as avoidance or cause minor physiological stress (SEV 4-6) and may cause moderate physiological stress (SEV 6) depending on the duration of exposure, but is unlikely to have para lethal or lethal effects (SEV 9 and above). This evaluation using empirical data is consistent with results from Pacific Connector's application of Newcombe and Jensen's model (Resource Report 3, table 3.2-22 – see Chapter 4, References).

Many studies have reported a decrease in invertebrate abundance and a change in community composition as a result of sediment increases. Invertebrate species may be affected by pulses in sediment concentrations similar to those predicted with dam-and-pump crossing construction.

Newcombe and MacDonald (1991) reviewed more than 70 papers on the effects of suspended sediments and concluded that aquatic biota respond to both the concentration of suspended sediments and duration of exposure, noting that aquatic invertebrates are at least as sensitive to high levels of suspended sediment as salmonid fishes, and perhaps more so. Based on Newcombe and MacDonald's findings, shorter term crossings (1-2 days) and/or crossings in coarser sediments (sand and gravel) would have relatively less impact on invertebrate communities than longer duration crossings that may include more silt and clay components.

Shaw and Richardson (2001) exposed invertebrate and juvenile rainbow trout to periodic pulses of sediments every 2 days for 9 days at a concentration of 704 mg/L. This study did not show a dose-related response until the 5th pulse (day 9). By this point, both drift and benthos abundance as well as benthos family richness were altered. This is consistent with Newcombe and MacDonald's (1991) finding that aquatic biota respond to both the concentration of suspended sediments and the duration of exposure. In evaluation of a wet-open cut pipeline crossing (which may generate 20 times the sediment associated with dry, dam and pump crossings) in Ohio, Reid et al (2002) found increased fine sediments in a riffle habitats downstream of the construction site coincided with a reduction in benthic invertebrates, however populations rebounded and no long-term (>1 year) effects were observed.

Figure 1.3-5 Range of Predicted Severity Exposure Values (SEV)



a/ Newcombe and Jensen (1996), "Salmonids" include Chinook, coho and steelhead
b/ USGS gage data for ODFW work window without irrigation-affected data.
c/ "Outliers" includes gage data from high-sediment concentration irrigation-affected water in the S. Fork Little Butte Cr. This is a conservative analysis intended to account for the full range

In coastal streams, coleoperans (beetles) are most common during summer and fall and would be most likely to be affected locally, as benthic and/or lotic habitats, by downstream turbidity and at the in-stream construction sites. Dipterans, caddisflies, mayflies, and stoneflies are prey for juvenile coho salmon and are likely to be relatively more abundant in some benthos and water columns during summer and fall (FERC, 2010).

In the Oregon Cascades, dipterans are most common during summer and fall and would be most likely to be affected locally, as benthic and/or lotic habitats, by downstream turbidity and at the in-stream construction sites. As noted above, dipterans (true flies) are prey for juvenile coho salmon and so are mayflies (ephemeropterans) and stoneflies (plecopterans) which become relatively more abundant in some benthos and water columns during the fall. Mayflies and stoneflies are likely to become more abundant in lotic communities during fall construction while springtails (collembolids) and mayflies are expected to be present in stream water columns during summer and fall, with stonefly abundance increasing during fall in the streams within the South

Umpqua watershed. Those species would be most likely to be affected in the short-term by turbidity generated during dry open cut construction (FERC, 2010).

Considering the lack of long-term impact on downstream habitats from levels of sediment predicted with dam-and-pump crossings (Reid and Anderson, 2002, Reid et al, 2002), any impact on invertebrate populations is expected to be localized to the area of construction or immediately downstream and of short duration. Since downstream habitat is not likely to be substantially altered by crossing construction it is expected that affected areas would quickly be recolonized should local populations be affected.

Summary and Conclusions

Figure 1.3-6 summarizes predicted sediment concentrations and effects of phases of project implementation expressed in terms of SSC. Based on this review, the following basic conclusions can be drawn concerning increases in sediment concentrations associated with dam-and-pump pipeline crossing construction on aquatic resources:

- Construction-generated sediment concentrations that may adversely affect aquatic biota are generally short term (brief spikes that quickly dissipate) and limited to the construction area or short distances (<100 meters) downstream.
- Juvenile and adult salmonids are mobile and are most likely to simply move away or avoid the affected area during periods of construction.
- Eggs and sac-fry are extremely sensitive to sediment and would likely be adversely affected by predicted sediment levels. These life stages cannot move away to avoid sediment however in-stream work windows used during construction also avoid periods when sensitive egg or sac-fry life stages are present.
- Short term spikes in sediments (< 24 hours) associated with installation and removal of dams may cause moderate physiological stress for juvenile or adult salmonids that remain in the project area but would be unlikely to cause paralethal or lethal effects because sediment concentrations are unlikely to reach paralethal or lethal concentrations for periods greater than 24 hours and sediment levels quickly return to background levels once disturbance stops, even when sediment concentrations are above 1000 mg/L.
- The amounts expressed in total weight of entrained sediment from crossings are expected to be small and comparable to natural events such as a bank slough.
- Duration of exposure has more of an effect than magnitude of exposure (figure 1.3-5). It is anticipated that stream crossings on BLM and NFS land can be accomplished in one to five days with most accomplished in less than 48 hours. Based on past studies (Reid and Anderson 2002, Reid et al, 2002, Trettel et al, 2002) elevated sediment concentrations associated with dam-and-pump crossing construction periods are not predicted to reach sustained levels that would have paralethal or lethal effects even if crossing construction spans several days (figure 1.3-5).

- Invertebrate populations may experience increased drift or mortality in the immediate project area, but these effects are expected to be short-term and minor in scale because habitat would not be lost.

- Sediment concentrations predicted by Pacific Connector using models developed by Ritter (1984) and Reid et al (2004) are within the range of sediment concentrations reported from empirical data (Reid and Anderson 2002, Reid et al 2002). In other words, predicted sediment concentrations using two different approaches (calculated from models vs. empirical data) are consistent and relatively close.

- Sediment related cause and effect relationship thresholds on salmonids for physiological stress, paralethal and lethal effects are widely separated in terms of magnitude and duration (figure 1.3-6). Because of this separation in scale, predicted increases in sediment concentration and duration of sediment exposure are unlikely to cause paralethal or lethal effects in salmonids.

- Background sediment concentrations (typically < 5 mg/L) plus project-caused sediment associated with trenching and backfilling (typically 4-20 mg/L) would result in total sediment concentrations that would likely be in the tens of mg/L during construction of stream crossings with flowing water. Reid et al (2002) found 90% of dam-and-pump crossings increased sediment concentrations over background by less than 25 mg/L. These levels may, depending on duration cause behavioral changes or moderate physiological stress for any fish that remain in the project area but are unlikely to cause paralethal or lethal effects.

- Sediment concentrations in the hundreds of mg/L for several days are necessary to cause paralethal effects. Although project-related sediment concentrations may have brief spikes (2-10 hours) in the hundreds up to 1100 mg/L, these are of insufficient duration to cause paralethal effects.

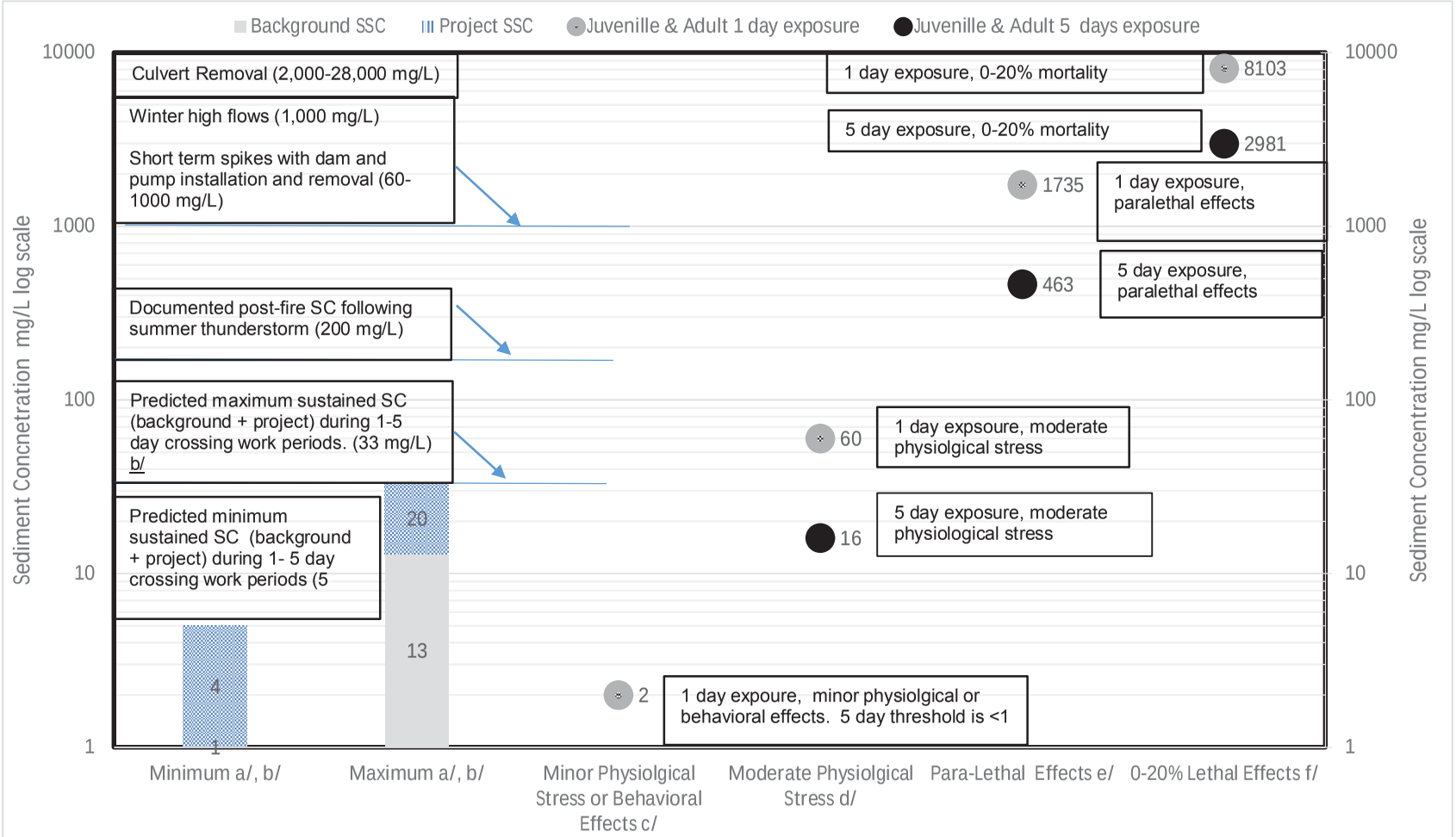
- Sediment concentrations in the thousands of mg/L are necessary to cause mortality. Project-related sediment concentrations are not predicted to reach these levels.

- The large differences in magnitude between predicted project effects (tens of mg/L) and thresholds for paralethal (hundreds of mg/L) and lethal effects (thousands of mg/L) reinforces the conclusion that project effects on salmonids would be limited to an avoidance – moderate physiological stress response and that construction-generated sediment is not likely to have paralethal or lethal effects on fish.

- Predicted increased sediment concentrations associated with dam-and-pump crossings are limited in time and space and are not outside the range of variation for timing, duration or magnitude of effects when compared to sediment concentrations associated with natural disturbance events. The amount of sediment likely to be suspended in the water column is comparable to a site-scale event such as a bank slough or a bankside tree uprooting. A fire or intense rainstorm event would likely generate sediment concentrations and amounts that are orders of magnitude larger.

Draft

Figure 1.3-5 Predicted Sediment Concentrations and Effects on Juvenile and Adult Salmonids for 1 and 5 Day Exposures



a/ Background Sedmient Concentration range is taken from USGS gage data during the ODFW in-stream work window in watersheds where the project occurs.
b/ Predicted Project SC is based on literature review and empirical data collected from dam and pump stream crossings (Reid et al, 2002).
c/ Newcombe and Jensen (1996) as summarized by ODEQ (2008). Behavioral effects include avodance, alarm reaction etc. Sublethal effects include reduction in feeding, minor physiological stress etc. .
d/ Newcombe and Jensen (1996) as summarized by ODEQ (2008). Moderate physiological stress, increased respiration, coughing etc.
e/ Newcombe and Jensen (1996) as summarized by ODEQ (2008). Paralethal effects include reduction in feeding rate, poor physical condition, delayed hatching, etc.
f/ Newcombe and Jensen (1996), Figure 1B (Adult and Juvenille Salmonids) p. 699.

Surface Erosion and Sediment Routing

Pacific Connector assumes that the soils within the construction right-of-way would be categorized within the high to very high erosion hazard classes because all vegetation within the right-of-way would be removed and soils would be disturbed during grading, trenching, backfilling, and restoration activities (ECRP p 46). Surface erosion risk would be highest in the first winter following clearing for the project. Without application of erosion control measures, significant surface erosion within the construction corridor would likely occur. Where stream intersects occur, or where overland flows could reach stream channels, eroded material could be deposited in stream channels and adversely impact aquatic habitats. Possible effects of uncontrolled erosion include loss of topsoil and soil productivity, rill and gulley formation and excessive sediment transport and deposition to stream systems. While many of the landscapes crossed by the project are erosionally active, the chronic fine-grained sediment created by *uncontrolled* surface erosion would not be consistent with the objectives of the ACS.

No combination of erosion control measures can achieve 100% control of all erosion, however it is possible to substantially reduce surface erosion and sediment transport to aquatic systems. Seeding, while an excellent erosion control method, has a low probability of reducing the first season erosion because most of the benefits of the seeded grass occurs after the initial early season events that may cause surface erosion (Robichaud et al, 2000). Conversely, erosion control structures should be considered only as temporary expedients to hold the soil in place until vegetation can become established and stabilize stream banks and disturbed surfaces permanently (Forest Service 2013). Effective control of surface erosion would require a combination of mechanical erosion control methods, maintenance of effective ground cover and aggressive reestablishment of native vegetation.

To minimize potential soil erosion, Pacific Connector has prepared an Erosion Control and Prevention Plan with active participation and engagement from the BLM and Forest Service. Pacific Connector would assume that all areas along the construction right-of-way where slash is redistributed would have a high to very high erosion hazard class, and therefore Pacific Connector would apply slash (including wood chips, where available) at a minimum percent effective cover of 65 to 85 percent of the right-of-way. Table 10.15-1 of the ECRP provides effective ground cover requirements based on potential erosion hazard and is reproduced below as table 1.3.1.2-1.

TABLE 1.3.1.2-1

Minimum Effective Ground Cover Requirements

Erosion Hazard Class	Minimum Percent of Effective Ground Cover a/, b/
Low	25%
Moderate	45%
High	65%
Very High	85%

a/ Effective ground cover is considered to be all living or dead herbaceous or woody materials, synthetic materials, and rock fragments greater than 3/4" in diameter that is in contact with ground surface and considered to be stable and resistant to downslope movement.

b/ As recommended by the Forest Service on the Umpqua National Forest, between about MPs 109 and 110 provide 100% post-construction ground cover on all disturbed areas to minimized surface erosion and prevent mobilization of naturally occurring Mercury from the Thomason cinnabar claim group (see Contaminated Substances Discovery Plan/Appendix E of the POD).

The ECRP for the project describes the erosion control measures that would be implemented during corridor clearing to minimize transport of sediment to adjacent and nearby aquatic habitats. The FERC Environmental Inspector (EI) in cooperation with the BLM and Forest Service, would determine appropriate temporary measures to be used to minimize potential erosion and sedimentation effects during and after timber clearing operations. These measures may include:

- Leaving slash generated during timber clearing operations on the corridor to reduce erosion over the following winter. This minimizes raindrop impacts and overland flow.
- Scarifying compacted surfaces, where appropriate, to promote infiltration and reduce runoff;
- Use of additional slash/brush piles and coarse woody debris (limbs to large logs) at appropriate locations to minimize off-site runoff and sedimentation. Coarse woody debris placed on contour has been shown to be an effective hillslope measure to reduce erosion (Robichaud et al, 2000).
- Installation of slope breakers (water bars) at appropriate locations and spacings to shorten slope lengths, prevent concentrated flow, and divert runoff to stabilized areas. Waterbars are a proven and effective method of reducing the erosive energy of overland flow, diverting overland flow and minimizing sediment transport;
- Installation of silt fences and straw bale sediment barriers to prevent transport of sediment to aquatic habitats. Pacific Connector has committed to install and maintain erosion control structures including silt fences at stream crossings until effective ground cover is reestablished. Silt fences are 90-95% efficient at trapping sediment (Robichaud et al, 2000).
- Temporary seeding (using appropriate quick-germinating cover crops such as annual ryegrass or other appropriate cover species), where not precluded by federal restrictions on introduced species; and/or
- Mulching of corridor areas that do not have sufficient cover. Geotextile fabric erosion control blankets may also be used to provide temporary ground cover. Mulching reduces raindrop impacts, and when in contact with the ground, limits overland flow and sediment transport.

Mulch materials specified in the ECRP (Pacific Connector Gas Pipeline 2013:44) include:

- Slash from clearing.
- Wood fiber mulch applied as hydromulch at 2000 pounds/acre.
- Bonded fiber mix (BFM) on slopes greater than 2.5 to 1 (i.e., 40 percent). BFM is similar to wood fiber mulch, but it has properties that allow it to remain strong and insoluble after its initial drying. BFM reduces erosion by a) absorbing the impact of rainfall while still allowing water to filter through, and b) absorbing water like a sponge to prevent overland water flow and rilling. It creates a strong and durable mat of interlocking fiber strands held together by a bonding agent which is water resistant and which would withstand re-exposure to moisture without re-dissolving or losing its adhesive quality. Once dry, it forms a water-absorbent protective mat which is porous and breathable and secures soil and seed until vegetation is established. BFM is designed to mix and flow easily when wet and yet remain strong and

insoluble once dry, protecting the soil surface from repeated rains and sheet flows. BFM can be applied prior to a rainy season or late in the year as it is formulated to endure the harsh conditions of heavy rains and snow. In time, BFM biodegrades completely into natural organic compounds which are beneficial to plant life. It is safe to use in riparian zones and watersheds. Because BFM is sprayed on, the site remains relatively undisturbed, further reducing the risk of erosion.

- Straw mulch that is certified weed-free by the appropriate state certification program. In 2009, Oregon established a voluntary pilot Weed Free Forage Program which certifies both grass and alfalfa hay and straw. The contractor would deliver weed-free certification documents from this program to the EI prior to applying any straw mulch. However, if the certification program is not in place at the time of construction, or if there are not sufficient quantities of certified weed free straw available for the project, the contractor would request review/inspection of the straw by the local soil and water conservation district, county agent, or other appropriate official or authorized agency representative on federal lands. Any straw that is found to contain noxious weeds during application would be immediately removed from the project right-of-way and properly disposed of in a public landfill. The mulch would be uniformly applied at a rate of 2 tons/acre to cover the ground surface. Mulching would occur immediately after seeding where broadcast or drill seeding occurs. Anchoring the mulch is not expected to be necessary because strong winds, which could dislodge the mulch, typically occur during the winter rainy season when the moist conditions would bind the straw to the soil. Liquid mulch binders are not expected to be utilized unless hydromulch is applied. Liquid binders would not be used in wetlands or waterbodies.

Erosion control following high-intensity fire provides a useful comparison for effectiveness of erosion control methods. It has been demonstrated that sediment transport in post-fire situations can be reduced by 85-95% (Robichaud et al, 2000; Wagenbrenner et al., 2006). Effective erosion control requires a combination of actions. Effective ground cover prevents the mobilization of sediment by absorbing rain drop impacts and, when in contact with the ground, minimizing overland flow of water. Waterbars minimize erosion by shortening the distance water can travel overland and diverting water off of disturbed slopes. Erosion control seeding provides temporary vegetation until permanent revegetation is accomplished. Maintained silt fences provide a backstop that is 90-95% effective at trapping sediment, including fine-grained silt (Robichaud et al, 2000). Weed-free straw bales placed as part of the installation create a resilient, highly effective sediment barrier that requires little or no maintenance.

The combination of effective ground cover from mulch and coarse woody debris, waterbars to slow and divert water off of the construction area, installation and maintenance of silt fences and other sediment barriers and aggressive grass seeding and fertilization followed by reestablishment of native vegetation is expected to reduce any sediment transport to aquatic systems by 85-95% from levels that would be experienced without application of these methods. Sediment contributions from the pipeline corridor are expected to be at, or near background levels during dry summer months. During winter rains, some increase in sediment transport from the corridor may occur, but this is expected to be minor and undiscernible against background levels. When compared to current watershed conditions in watersheds crossed by the project, sediment contributions from existing roads and past management activities, any sediment mobilized from the PCGP corridor would likely be an insignificant contribution to the overall sediment budget of

Draft

the affected watersheds. It is highly unlikely that the PCGP corridor would become a chronic source of fine sediments with the application of measures specified in the ECRP.

If implementation or post-project monitoring show evidence of unacceptable sediment transport, as defined by the BLM or Forest Service, to aquatic systems, Pacific Connector would be required by the terms of the Right of Way Grant to take additional erosion control measures as needed, as directed by the BLM or Forest Service, to reduce sediment transport to background levels. Evidence of "unacceptable" levels of sediment transport would include silt fences or other sediment barriers that are not maintained, lack of effective ground cover, visible turbidity at channel crossings, visible evidence of sheet or gulley erosion where sediment is transported to aquatic systems or chronic deposition of fine sediments as evidenced by turbidity or sediment deposition downstream of crossings.

Site-specific erosion concerns are addressed as needed in individual watershed sections.

General Use and Maintenance of Roads

The Transportation Management Plan (TMP) which is part of the POD provides maintenance standards for use of roads by the project. Standards and guidelines from the NWFP and BLM management direction for road maintenance, construction and reconstruction are part of the TMP (table 1.2.2-1). Compliance with these standards and guidelines is intended to ensure the use of roads associated with the project does not prevent attainment of the ACS objectives.

Individual road construction or reconstruction issues are addressed in the watershed where they occur.

1.3.1.3 Water Quality—Temperature

Stream temperatures are highly variable both temporally and spatially (Poole et al. 2001). Stream temperature fluctuations of several degrees in a 12 hour period are possible is small channels. As a result, measuring and interpreting stream temperatures is inherently complex . It is possible to record data at any given point with a great deal of precision, but it quickly becomes speculative to apply that data at broader scales with the same degree of precision.

Topography, slope position, aspect, and effective shade cover influence water temperatures during the summer months. Stream temperatures are also influenced by stream position in the watershed, channel condition and volume of flow. Large woody debris influences channel condition by narrowing stream channels, creating pools and affecting water velocity. Conditions favoring high daily maximum stream temperatures include: shallow and wide streams, north south channel orientation, low groundwater influx or hyporheic exchange with the channel, and low gradient (Nicoleta and Janisch 2007).

The PCGP would remove vegetation that may currently provide effective shade at perennial and intermittent stream crossings. The degree of effective shade loss from corridor construction varies by stream, and depends on stream orientation, topography, channel width and adjacent tree height. Loss of shade on intermittent streams is not expected to measurably influence water temperatures because stream crossings are generally widely separated, intermittent streams are typically discontinuous or dry by late summer when water temperature becomes an issue, or stream volumes are so low as not to influence larger perennial channels. For perennial streams, position of the

stream in the watershed influences the effects of shade loss. Loss of effective shade on reaches of perennial streams in upper parts of a watershed appears to be important to elevation of stream temperatures and may in some cases influence stream temperatures downstream from the point where the loss occurs. On the downstream reaches of perennial streams, shading appears to have much less effect on water temperature (Brown 1970, cited in North Fork Coquille watershed assessment, p. 7-12), possibly due to the higher volume of flow in these lower reaches.

There are five perennial stream crossings on NFS lands and three on BLM lands where corridor construction potentially could remove shading vegetation (table ES-1). To evaluate whether corridor construction would increase water temperatures, a site-specific field evaluation of stream temperature impacts on the five perennial stream crossings on NFS lands was conducted (NSR 2009). The evaluation showed that with mitigation measures, any temperature increases would be less than 0.2 °C and limited to the point of maximum impact. No impacts were predicted at the stream network scale because of the small volume of affected streams, likely groundwater inputs and the assimilative capacity of the stream network. On-the-ground conditions and water temperature model results suggest that it is unlikely that the stream temperature downstream of any of the perennial crossings would be increased above the ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F) (NSR 2009:41-42, Table 6.1.1).

Perennial crossings on BLM lands at Middle Creek Deep Creek, Big Creek, and on NFS lands in the East Fork of Cow Creek were reanalyzed in 2013 to reflect minor changes in alignment and updated temperature and flow data (NSR 2014, in preparation). The Stream Segment Temperature Model (SSTEMP; Bartholow 2002) model was selected for this analysis because it is the modeling tool most often used by the agencies and could provide outputs for single stream segments using available data. This is also the model used in the NSR 2009 analysis. Data recorders were placed at selected locations and 7 day average high temperatures were recorded for each crossing during the warmest part of the summer with lowest recorded flows. Flows in the 2013 data year were about 33% of those modeled in 2009 and bordered on intermittent at a perennial stream crossing at MP 109.69 (HF-J). This provided a "worst case" assessment of potential project impacts on stream temperatures. To validate the model, existing conditions were entered, and predicted temperatures were compared to measured temperatures. When compared to measured existing conditions, the SSTEMP model overstated actual stream temperature increases by as much as 2.0°F. If the SSTEMP model overstated the existing condition, then it would also be expected to overstate the post-construction impacts. This highlights the inherent uncertainty and high variability in measuring stream temperatures in low volume channels.

Stream temperatures at perennial crossings on BLM lands at Middle Creek Deep Creek, Big Creek, and on NFS lands in the East Fork of Cow Creek were reanalyzed in 2013 to reflect minor changes in alignment and to provide updated temperature and flow data (NSR 2014, in preparation). The Stream Segment Temperature Model (SSTEMP; Bartholow 2002) model was selected for this analysis because it is the modeling tool most often used by the federal agencies and could provide outputs for single stream segments using available data. This is also the model used in the NSR 2009 analysis. Data recorders were placed at selected locations and 7 day average high temperatures were recorded for each crossing during the warmest part of the summer when lowest flows occurred. Flows in the 2013 data year were about 33% of those modeled in 2009 and bordered on intermittent at a perennial stream crossing at MP 109.69 (HF-J) in the East Fork of Cow Creek. This provided a drought condition assessment of potential project impacts on

perennial stream temperatures. To validate the model, existing conditions were entered, and predicted temperatures were compared to measured temperatures. When compared to measured existing conditions, the SSTEMP model overstated actual stream temperature increases by as much as 2.0°F. If the SSTEMP model overstated the existing condition, then it would also be expected to overstate the post-construction impacts by comparable amounts. This highlights the inherent uncertainty and high variability in measuring stream temperatures in low volume channels.

Preliminary results based on provisional data available just prior to publication of the DEIS showed almost no temperature impacts on the BLM channel crossings in Middle Creek, Deep Creek and Big Creek because of higher channel volumes, cooler air temperatures and relative position of the channels in the watershed. Modeling of stream temperatures in the perennial crossings in the East Fork of Cow Creek on the Umpqua National Forest using SSTEMP showed potential temperature increases without mitigation of 1.2°F to 4.2°F at the point of maximum impact in the corridor clearing.[7] Measured stream volumes ranged from 0.045 CFS to 0.115 CFS with modeled post-construction shade levels of 1.2% to 3.7%. As noted above, this is a drought condition assessment and may not be typical of most years or of post-construction shade levels. While there is a great deal of inherent variation in the stream conditions, and a measure of uncertainty in the SSTEMP model results, preliminary results of the NSR 2014 analysis suggest that in a low-flow scenario without mitigation, there could be potential for temperature increases above the TMDL thresholds (0.1°C or 0.18°F at the point of maximum impact) or ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F) in small perennial channels in the East Fork of Cow Creek. The 2014 analysis showed larger temperature impacts than those reported in NSR 2009. Model differences between NSR 2009 and the NSR 2014 analysis are explained by the much lower flows measured in the 2013 water year and the sensitivity of the SSTEMP model to low flows.

Although exposure to solar radiation may cause temperature increases, temperatures downstream from limited stream-side forested clearings have often been found to cool rapidly once the stream re-enters forested regions (Zwienieck and Newton 1999). Other studies have noted downstream cooling below timber harvest areas as well, but the extent of this cooling is not entirely clear and varies by stream (Moore et al. 2005; Poole et al. 2001). Although there is some debate on the magnitude of cooling provided by riparian vegetation and the extent to which stream temperatures return to non-cleared temperature levels after exiting a cleared area, studies emphasize that riparian buffers assist in maintaining water temperatures (Correll 1997; Gomi et al. 2006). Generally, changes in temperature, especially in small streams, may recover quickly from cooler surrounding conditions downstream (e.g., streambed cooling, evaporation, hyporheic inflows, shade). This was validated by stream temperature data recorded on the Umpqua National Forest in 2013. Preliminary results from field measurements of existing conditions on the Umpqua National Forest showed decreasing stream temperatures of as much as -7.6°F / 100 feet with an overall average over 2,040 feet of the East Fork of Cow Creek of - 0.1°F / 100 feet. (NSR 2014, in preparation). The presence of number of small wetlands adjacent to the stream channel provide evidence of likely groundwater interactions. Most of this 2,040 foot reach also has substantial shade. This suggests the retention of shading structures, or at least partial shade, may greatly reduce increases in stream temperature. This data also supports the NSR 2009 finding that potential

[7] These results have not been indexed or adjusted to reflect the measured overstatement of impacts by the SSTEMP model noted above. Actual temperature impacts are likely to be less.

temperature increases are partially offset by cooling from groundwater interactions in the stream channel.

Observations as part of both NSR 2009 and NSR 2014 show that large woody debris and low-growing willows, huckleberries and other brush species can provide effective shade for small, narrow channels. For example Hydrofeature G at MP 109.47 has dense overhanging willows and other brush species that shade much of the channel. In many cases, low growing brush outside of the immediate crossing construction area can be maintained thus minimizing shade loss. In the mainstem of the East Fork of Cow Creek, large woody debris provides significant shade and creates a complex channel structure with high retention of sand and gravel that helps maintain cooler water temperatures. As described in the ECRP and waterbody crossing requirements for the project, all LWD and boulders removed from the crossing area would be replaced during site restoration and low growing brush will be retained where it is possible to do so. Many of the channels crossed by the PCGP are very small, and could easily be shaded by the placement of large woody debris, larger logs and willow plantings. Where site-specific modeling suggests temperature increases may be possible, a restoration plan to reestablish pre-crossing shade conditions using willows, logs, boulders and large woody debris will be prepared for each of the perennial stream crossings NFS lands. With the maintenance of existing shading brush on small channels, the placement of large woody debris and the replanting of willows and other brush species, downstream temperatures are expected to be comparable to the existing condition and to remain below ODEQ thresholds on the East Fork of Cow Creek because these measures would provide immediate and effective shade. In small first and second order streams any temperature increase that does occur would likely be masked by the assimilative capacity of larger streams at the stream network scale (NSR 2009).

In addition to onsite mitigation measures, there are also a number of LWD mitigation projects associated with the PCGP. These mitigation projects are addressed by watershed where the projects are proposed.

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on BLM and NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75 foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right of way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right of way clearing on stream temperatures. Given that mitigation for loss of effective shade would occur, and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects, including intermittent streams, of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be minor and well below detection in the field (GeoEngineers 2013f: 26).

Effects associated with loss of shade at specific crossings are discussed as necessary by watershed (Section 2).

1.3.1.4 Aquatic Connectivity

Connectivity for fish and other aquatic organisms could be affected for a short time while a waterbody is being crossed if water is flowing at the time of construction (most intermittent streams would be dry at the time of crossing, and aquatic connectivity would not be impacted). Dry open-cut stream crossings typically take about one to five days to complete, and access to habitat upstream or downstream of the construction area would be interrupted during that time. All stream crossings would be accomplished within the authorized instream work periods established by federal and state fish and wildlife management agencies (typically July 1 – September 15) in order to minimize potential effects. Specific in-channel work periods are addressed in Section 2 for each channel crossing. Once a crossing is completed, bed and banks would be restored to their original configuration, and passage through the construction area would once again be unimpeded. Interruptions in connectivity are expected to short-term and minor in scale.

1.3.1.5 Watershed Condition

The watershed assessments prepared for the relevant fifth-field watersheds indicate that road networks are extensive on many federal lands crossed by the project. In addition, the watershed assessments document that road construction and timber harvesting within and adjacent to Riparian Reserves have resulted in degraded conditions with respect to flow and sediment regimes as well as riparian vegetation structure throughout these fifth-field watersheds.

Changes to peak flows are influenced by timber harvest, overall basin condition; the age and pattern of forest stands within a larger basin; the location, age, and extent of road networks; and the extent (both laterally and longitudinally) of riparian buffers (Grant et al. 2008). Likely effects of the project on peak flows were assessed in the FEIS for the Jordon Cove – Pacific Connector FEIS (FERC 2009). That analysis found that it was highly unlikely that the Pacific Connector project could cause detectable changes in peak flows because of the general ridgetop routing and relative lack of stream intersects when compared to road networks, the dispersed nature of the project across multiple watersheds and the small area (typically fractions of a per cent) affected in any single watershed. The current EIS reached similar conclusions.

Soil conditions may affect watershed conditions. The proposed pipeline right-of-way would be 95 feet wide and consist of a 65-foot wide construction corridor, with 10 feet of trench and 20 feet of excavation storage. Within Riparian Reserves and visually sensitive areas, the corridor may be reduced to 75 feet where possible. Areas that receive greater than three passes by low p.s.i. equipment result in soil compaction which is defined on BLM and NFS lands as >15 percent increase in bulk density over an undisturbed reference soil condition (Forest Service 1994b: IV-67). Therefore, for the purpose of this document it is assumed that on the 65-foot wide working side, 80 percent to 100 percent of the cleared area would be compacted, a 10-foot wide trench area would be displaced and mixed, and a 20-foot excavation storage area would be compacted or mixed during trenching and backfilling operations.

Compacted soils or barren areas may contribute to soil erosion or altered flow patterns. For the purposes of this analysis, all of the project area on the working side of the construction corridor and TEWAs would be subject to multiple passes of heavy equipment and truck traffic and as a result, would likely have some degree of compaction. The spoil storage area may some degree of

compaction depending on heavy equipment passage. Soil texture, moisture content and exposure (number of passes and type of equipment) would determine the severity of compaction that may occur. Soils in this sensitive group were determined based on the NRCS rating of high or severe for the Haul Roads, Log Landings, and Soil Rutting category. Soils in this group are rated based on Unified soil texture classification, rock fragments on or below the surface depth to a restrictive layer, depth to a water table and slope. Unmitigated soil compaction can result in long-term impacts to soil productivity and increased erosion due to increased runoff (PCGP Resource Report 7, 2013).

Upon completion of construction activities, the construction corridor, with the exception of the area over the installed pipeline would be decompacted using a winged subsoil ripper. On NFS and BLM lands, detrimental compaction would not exceed 15 percent or more over adjacent undisturbed soils. On NFS lands, within 100 feet of perennial or intermittent streams, detrimental compaction would not exceed 10 percent of the activity area within 100 feet of each stream, to assure maintenance/reestablishment of 90% of pre-disturbance infiltration rates within 100 feet of streams as confirmed through compaction testing. The FERC Environmental Inspector would also test for soil compaction on UCSAs on federal lands to determine appropriate measures necessary to mitigate compacted areas (ECRP, p. 19) For areas with reclamation sensitivity (see section 4.3.4 of this EIS) the Forest Service and BLM would also require soil remediation with biosolids or other appropriate organic materials to ensure successful revegetation.

Specific measurements for the function and value of these and other ACS-relevant indicators of watershed condition, to the degree that they have been reported, are discussed for individual watersheds in Section 2 of this report.

1.3.2 Mitigation

CEQ Regulations (40 CFR 1502.16 (h)) require that the EIS discuss the "means to mitigate adverse environmental effects" and provide appropriate mitigation measures as alternatives if not already part of the proposed action (40 CFR 1502.14 (f)). In cooperation with BLM and the Forest Service, the project proponent has identified relevant, reasonable mitigation measures that could alleviate the environmental consequences of the project, including any that are outside the lead agency's (FERC's) jurisdiction (Council on Environmental Quality 1981 # 19b). These measures have been included as part of the project description in Chapter 2 of the FERC EIS for the PCGP.

Mitigation as defined in CEQ Regulations 40 CFR 1508.20 includes:

- Avoiding effects altogether by not taking a certain action or parts of an action
- Minimizing effects by limiting the degree or magnitude of the action and its implementation
- Rectifying effects by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating effects over time by preservation and maintenance operations during the life of the action
- Compensating for effects by replacing or providing substitute resources or environments

It is anticipated that the proposed project design and on-site mitigation measures would help maintain or improve current watershed functions on the federal lands crossed within each fifth-

field watershed. Wherever practicable, the project corridor has been routed on ridge tops or routed to avoid stream crossings and other sensitive riparian and aquatic habitats. Areas of potentially unstable soils were thoroughly evaluated prior to routing to help minimize potential effects.

No maintenance roads would be established along the pipeline corridor. Additionally, as described in the project TMP, use of the existing road system would result in improvement of existing conditions, thereby reducing potential sediment source areas.

The project proponent has filed off-site mitigation plans developed in cooperation with the BLM and the Forest Service to minimize effects of the PCGP project on BLM and NFS lands as part of its application to FERC. The actions proposed in the off-site plan supplement on-site mitigations that are part of the project description. These off-site mitigations are intended to provide watershed benefits to offset effects of the PCGP project that cannot be completely addressed at the site level. The Right-of-Way Grant issued by the BLM would include the proposed project mitigation plans to ensure implementation.

Key ACS-related on-site mitigations (shown for each Habitat Element or Process and Key Indicator(s) in table 1.3.2-1) include covering streambeds crossed by the project with appropriately-sized gravel or cobbles, replacing boulders and LWD at the channel crossing, restoring channel and adjacent banks to pre-construction contours, replanting the adjacent banks and riparian zone to encourage forest growth, and placing LWD (felled during right-of-way clearance) on the floodplains to provide microsite habitat for riparian species and protect riparian vegetation during flood events. These on-site mitigations would contribute to restoring ecosystem structure and functioning and enhancing habitat complexity at the site level.

Table 1.3.2-1 summarizes key indicators of aquatic health, and site-specific and typical off-site mitigation measures proposed for the project. Each of these habitat elements or processes are discussed in the following sections. The off-site mitigations in table 1.3.2-1 emphasize LWD placement, road decommissioning/improving, and replanting of disturbed areas. All of these mitigations have been shown to be particularly effective in improving watershed conditions.

Site-specific mitigation projects are described in Section 2 under the appropriate fifth-field watershed. All proposed off-site mitigation projects are site specific, feasible, and consistent with the respective agency's land management plan objectives, and can be accomplished in a reasonable time.

TABLE 1.3.2-1

Habitat Elements, Processes, and Key Indicators for Evaluation of PCGP project Effects and Identification of Mitigation Measures

Habitat Element or Process	Key Indicator	Mitigation
Water Quality - Sediment	Erosion & sediment transport associated with corridor construction	• On-Site: Apply Best Management Practices and ECRP with onsite FERC EI oversight. • Off-site: Decommission & improve roads. Place LWD in stream channels to facilitate retention of sediment.

TABLE 1.3.2-1

Habitat Elements, Processes, and Key Indicators for Evaluation of PCGP project Effects and Identification of Mitigation Measures

Habitat Element or Process	Key Indicator	Mitigation
	Affected Riparian Reserves / stream crossing	• On-site: Avoid & minimize stream crossings by using ridge top routes where possible. Use dry open-cut crossings, with pumping to remove sediment-laden water from the work area. Re-contour banks and channel bottom; replace LWD & boulders in channel. • Off-site: Rehabilitate existing road crossings. Place LWD in stream channels.
Water Quality - Temperature	Removal of effective shade by corridor construction	• On-site: Avoid and minimize stream crossings by using ridge top routes. Where possible, narrow right-of-way to 75 feet. Replant trees in riparian zone to provide replacement shade. Replace LWD and boulders at channel crossing. • Off-site: Replant effective shade in Riparian Reserves that currently have inadequate shading. Place LWD & boulders in stream channels.
Habitat Access	Blockage of stream channel during construction	• On-site: Use flumes when crossing fish-bearing streams, , to facilitate upstream-downstream connectivity across the construction area as appropriate if this is a critical issue. No flumed passages are currently proposed or anticipated on BLM or NFS lands. • Offsite: Install fish-friendly culverts at selected sites.
Aquatic Habitat Structure	Substrate at crossing	• On-site: Restore channel bed and banks to original configuration, cap trench with cobble and gravel, restore LWD in stream channel. • Off-site: Place LWD in stream channels.
	LWD at crossing	• On-site: Place LWD in stream channels. • Off-site: Place LWD in stream channels.
	Pool quality	• On-site Select pipeline route to minimize stream intersects. Place LWD in stream channels. • Off-site: Place LWD in stream channels.
	Off-channel habitat	• On-site: Place LWD in stream channels. • Off-site: Place LWD in stream channels.
	Refugia concerns	• On-site: Place LWD in stream channels. • Off-site: Place LWD in stream channels.
Channel Conditions and Dynamics	Stream width-to-depth ratio	• On-site: Restore channel bed and banks to original configuration, cap trench with cobble and gravel, & restore LWD in stream channels. • Off-site: Place LWD in stream channels.
	Streambank condition	• On-site: Minimize disturbance of riparian vegetation. Restore channel bed and banks to original configuration or modify to stable configuration if incised or unstable, cap trench with cobble and gravel, revegetate with plantings & restore LWD in riparian zone and stream channel. • Off-site: Replant areas without effective bank cover.
	Floodplain connectivity	• On-site: Restore channel bed & bank to original configuration. Revegetate construction area with plantings. Restore LWD in stream channels. • Off-site: Replant areas lacking effective bank cover with appropriate riparian vegetation. Decommission roads in & adjacent to riparian zone.
	Peak/base flow regime; Effective size of the drainage network	• On-site: Ridge top routing of right-of-way. Implement ECRP during construction. Post-construction recontouring of stream channel in corridor to original condition. • Off-site: Decommission and improve roads.

Draft

TABLE 1.3.2-1

Habitat Elements, Processes, and Key Indicators for Evaluation of PCGP project Effects and Identification of Mitigation Measures

Habitat Element or Process	Key Indicator	Mitigation
Watershed Condition	Road density and location	• On-site: Ridge top routing of right-of-way. Post-construction recontouring of stream channel in corridor to original condition. • Off-site: Decommission roads.
	Disturbance history	• On-site: Road decommissioning in Riparian Reserves. • Off-site: Manage stand density to facilitate forest succession and resiliency. Reduce fuel on forest floor to prevent catastrophic fires. Decommission roads. Replant riparian zone and restore adjacent meadows.
	Condition of Riparian Reserves	• On-site: Decommission roads in Riparian Reserves. Thin overstocked stands in Riparian Reserves to accelerate growth of large trees and restore riparian vegetation. • Off-site: Manage stand density to facilitate forest succession. Reduce fuel on forest floor to prevent catastrophic fires. Decommission roads. Replant riparian zone and restore adjacent meadows.

Draft

2.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

2.1 REGIONAL CONTEXT

The ACS is applied at multiple scales. In order to provide a logical framework for assessment, the report of the Forest Ecosystem Management Assessment Team (FEMAT) established physiographic provinces (Forest Service et al: IV-7). Physiographic provinces (also referred to as "provinces" or “aquatic provinces") incorporate physical, biological and environmental factors that shape broad-scale landscapes. Physiographic provinces reflect differences in geology (e.g., uplift rates, and recent volcanism, tectonic disruption) and climate (e.g., precipitation, temperature, and glaciation). These factors result in broad-scale differences in soil development and natural plant communities. Within each province, variable characteristics of rock stability affect steepness of local slopes, soil texture, soil thickness, drainage patterns, and erosional processes. Thus, physiographic provinces have utility in the description of both terrestrial and aquatic ecosystems (Forest Service et al. 1993).

Within provinces, vegetation types, land-use practices, and responses to disturbance are typically similar. The PCGP would cross the Coast Range, Klamath-Siskiyou, Western Cascades, and High Cascades provinces (figure 1-1). In the following sections, each of these four provinces is described in terms of climate, geology, soils, vegetation, and the fifth field watersheds within each of them (figure 2.2-1).

Key Watersheds

The NWFP identifies “key” watersheds that have regional significance for the protection of water quality and aquatic habitat. Tier 1 Key Watersheds are intended to benefit at-risk fish species and stocks by providing refugia for maintaining and recovering habitat. Tier 2 Key Watersheds provide high-quality water. Key Watersheds include areas of both high quality and degraded habitat. Key watersheds with high-quality habitat serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have a high potential for restoration and would become areas of high-quality habitat if appropriate restoration measures are implemented. The NWFP designates Key Watersheds as the highest priority for restoration. Table 4.1.3.5-2a identifies Key Watersheds that would be crossed by the PCGP right-of-way.

TABLE 4.1.3.5-2a

Miles of PCGP Project Right-of-Way in Key Watersheds by Administrative Unit

Watershed	Coos Bay BLM Miles	Roseburg BLM Miles	Medford BLM Miles	Lakeview BLM Miles	Total BLM Miles	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total NF Miles	Total BLM and NF Miles
Elk Cr.-South Umpqua Days Cr. South Umpqua (Tier 1) (These 5th field watersheds are both part of the South Umpqua Key Watershed)		6.5			6.5	4.07			4.07	10.57
North and South Forks Subwatersheds, Little Butte Cr. (Tier 1)	—	—	3.89	—	3.89	—	13.70	—	13.70	17.59

Spencer Cr. (Tier 1)	—	—	—	0.89	0.89	—	—	6.04	6.04	6.93
Clover Cr. Subwatershed, Spencer Cr.(Tier 2)				0.15	0.15					0.15
Total	**0.0**	**6.5**	**3.89**	**1.04**	**11.43**	**4.07**	**13.70**	**6.04**	**23.81**	**35.24**
Source: Resource Report 2, Table 2.2-4										

Specific effects of the Pacific Connector Project in Key Watersheds are addressed in the watershed descriptions in this section.

2.1.1 Historical Disturbance Processes and Patterns in the Pacific Northwest:

A critical aspect of the Pacific Northwest riverine and riparian environment is the widespread occurrence of steep, unstable hillslopes. Recent geologic uplift, weathered rocks and soil, and heavy rainfall all contribute to high landslide frequency and to high sediment loads in many of the region's rivers. Hillslope steepness is one of the simplest indicators of areas prone to mass wasting (e.g. rapid mass movements of soil and organic material down hillslopes and stream channels). The response of these steep hillslopes to disturbance processes shaped the evolution of aquatic environments in the region.

In the Pacific Northwest, fire historically was the dominant watershed disturbance process (Everest and Reeves 2007). Synergy between fire and subsequent intense rainstorms and flood events may be the sequence of disturbances with the greatest effect on riparian ecosystems in the Pacific Northwest (Benda et al. 1998 cited in Everest and Reeves 2007). Wildfires temporarily increase the supply of water and sediment to fluvial systems (Malmon et al. 2007). Runoff-initiated erosion events tend to peak during the first year after a forest fire but these effects are typically short-lived (i.e., 2–4 years) due to vegetative recovery, decreased soil hydrophobicity, and changes in surface coarseness (Legleiter et al. 2003). During that period, affected drainages may produce visibly turbid water during each heavy storm or snowmelt event. Landslides, however may occur several years after a severe fire (Wondzell and King 2003). The lag is largely due to the relatively slow decay of roots of fire-killed trees and shrubs. Once these anchors are lost, the soil is more likely to slough from steep slopes when saturated with rainfall or snowmelt.

Mass wasting (i.e. debris torrents, landslides and movement of unstable earthflow terrains) following a fire can transport tremendous amounts of sediment and wood debris to stream channels. Reeves (1996–cited in the Catching-Beaver watershed assessment) observed that mass wasting following fire can deposit so much material that 2 or 3 meters of accumulated sediment, and coarse debris can still remain in the channel 100 years after the deposition event. Many terrace-like features next to mountain streams in the Pacific Northwest are relic depositions of debris avalanche transported material that streams subsequently cut down through. Small, third to fifth order forested streams are in close proximity to sediment sources (adjacent hillslopes and channel banks). Large woody debris and boulders form persistent structures that trap significant volumes of sediment in these channels, reducing sediment transport in the short term and substantially increasing channel stability. External sediment inputs such as mass wasting & bank collapse, along with wood accumulation, tend to dominate channel morphology of smaller streams, while larger streams are primarily influenced by downstream fluvial sediment transport and bank erosion. Bed material transport occurs under relatively high flow conditions for a very short period

of time. Since major erosional events are almost always associated with excessive amounts of precipitation, their occurrence depends on these storms occurring during periods of increased susceptibility to surface erosion and mass wasting following intense wildfire (Wondzell and. King 2003).

The effects of these disturbance pulses can range from increases in sediment transport in streams to mass wasting events that impact riparian stands at the site to subwatershed scale, and deposit large amounts of sediment and large woody debris in, and adjacent to stream channels. These "pulse" disturbances of sediment occurred infrequently at any given site or subwatershed and affected a relatively small portion of the watershed at any one time, though at the watershed or regional scale, disturbance processes were (and are) a constant factor in Pacific Northwest landscapes. Pulse disturbances generally allow ecosystems to remain within their normal historical range of states and conditions since there is sufficient time between disturbances to enable ecosystems to recover to pre-disturbance conditions (Everest and Reeves, 2007, p. 19).

The large-scale ecological structure, function and processes that shaped Pacific Northwest watersheds have been substantially altered by anthropogenic factors. Fire suppression has altered the historical frequency and intensity of fire events in the Pacific Northwest. As result of fire suppression and timber harvest, there has been a general shift in vegetation patterns, structures and ecological processes from relatively larger patches of late-successional and old-growth forest with frequent low-intensity fires to more fragmented landscapes that are dominated by early and mid-seral plant communities. Large, high-intensity fires do occur (e.g. the Biscuit Fire in 2003), possibly with increasing frequency and intensity. In the past, forest practices (timber harvest) in the Pacific NW increased mass wasting events and sediment yields. Road related mass wasting is a major source of sediment (Hassan et al, 2005). Land use patterns and, in particular, forest roads have altered sediment regimes in many stream networks, replacing episodic pulses of coarse sediments with chronic deposition of fine sediments.

2.1.2 Oregon Coast Range Province, MP 1-47

After leaving Coos Bay, the proposed PCGP corridor traverses the southernmost part of the Coast Range Province for approximately 47 miles (figure 2.2-1). This province includes all lands in Oregon from the Coquille River basin north and the Pacific Ocean eastward to the crest of the Coast Range. It is 30 to 60 miles wide and averages about 1,500 feet above msl in elevation. The Coos Bay Frontal, Lower Coquille North, East and Middle Fork Coquille fifth-field watersheds are included in in the Coast Range Province.

2.1.2.1 Landform and Erosional Processes

The southern part of the Coast Range province generally consists of steep slopes with narrow ridges developed on resistant sedimentary rocks. Westward flowing streams erode headward to mountain passes on the east side of the Coast Range. Many of the higher peaks are composed of resistant igneous rocks. Steep, highly dissected slopes are subject to mass wasting (i.e. debris flows). Tributary channels join at relatively low angles, which allow debris flows to travel for long distances. Unstable landscapes (i.e. earthflows) may constrict or deflect stream channels, creating local low-gradient depositional stream reaches upstream.

The Coast Range is composed primarily of soft marine sedimentary rocks overlying basalt at depth. Combined with the wet climate of the western slopes of the Coast Range and the typically steep terrain, these non-resistant rocks produce an active erosional environment with frequent landslides. Natural disturbance regimes in this province tend to be highly episodic, with large pulses of sediment delivery associated with high intensity fire, flooding, and wind events followed by a recovery period with low-level chronic sediment delivery extending over decades (BLM 2010 p. 26). Debris torrents generally begin in first and second order streams and come to rest in lower third order and upper fourth order draws.

In the Coast Range, very large stand replacement fire cycles are widely variable, but have an average return rate of about 240 years. Based on that return rate, the Coast Range experienced elevated sediment levels 8% to 12% of the time when periods long enough to include stand replacement fires are considered. Smaller fires and less severe fires would have caused additional smaller spikes of fire-associated sediment (BLM 2010 p. 18).

2.1.2.2 Climate

The mountainous areas on the western slope of the Coast Range receive some of the highest precipitation totals in the continental U.S., with some areas receiving up to 200 inches per year. The Oregon Coast near Coos Bay is typically cool and foggy, with annual precipitation (rainfall equivalent) of about 65 inches. Almost all of the low elevation precipitation falls as rain. As elevation increases, the amount of precipitation that falls as snow increases. Rain typically falls from October to June, though trace amounts as well as coastal fog help keep the vegetation green throughout the summer. Periodic high-intensity storms may drop several inches of rainfall in a few hours causing "peak flow" events that are primary drivers of natural disturbance and watershed conditions, particularly in Riparian Reserves. Summer thunderstorms, though rare, can also result in localized high intensity rainfall events.

2.1.2.3 Vegetation

The Coast Range Province is dominated by forests of Douglas-fir, western hemlock and western redcedar. Vegetative recovery after disturbance is very rapid. Salmonberry and other brush species rapidly occupy disturbed sites. The southern half of the province includes a mixture of private, BLM and NFS, lands. The northern half is largely in private and state ownership. Logging and several extensive wildfires during the last century have changed most of the late-successional and old-growth forest in the northern end the province to early and mid-seral forest. Older forests in the southern half of the province are highly fragmented, especially on BLM lands, which are typically intermixed with private lands in a checkerboard pattern of alternating square-mile sections.

2.1.3 Klamath – Siskiyou Province MP 47-105, 118-153

The Klamath Siskiyou Province encompasses the Klamath and Siskiyou Mountains and lies between the Coast Range and Cascades, south of the Willamette Valley. The PCGP project would traverse the northeast corner of the Klamath-Siskiyou Province for approximately 93 miles (figure 2.2-1). It includes parts of the Roseburg and Medford BLM Districts and Umpqua and Rogue River-Siskiyou National Forests, and is typified by deeply dissected valleys and jutting ridges and foothills. Much of this province lies within a rain shadow, sheltered from the Pacific maritime

influences by the Coastal Mountain Range. The region has a rugged landscape, with high peaks and deep canyons. Elevations range from about 1,000 to 5,000 feet above msl. Portions of the Middle Fork Coquille River, Olalla-Lookingglass, Myrtle Creek, Clark's Branch-South Umpqua, Elk Creek – South Umpqua, Upper Cow Creek, Trail Creek, Shady Cove Rogue River, Big Butte and Little Butte Creek fifth field watersheds are in the Klamath- Siskiyou Province.

2.1.3.1 Landform and Erosional Processes

The Klamath-Siskiyou province is rugged and deeply dissected. Tributary streams generally follow the northeast-southwest orientation of rock structure created by accretion of rocks onto the continent. Variable materials juxtapose steep slopes subject to debris flows and gentle slopes subject to earthflows. Scattered granitic rocks are subject to debris flows and severe surface erosion. High rates of uplift have created steep streamside hillslopes known as inner gorges, especially near the coast. The Klamath-Siskiyou Province is known for its highly complex geology. Most of the area is composed of highly deformed volcanic and marine sedimentary rocks with some metamorphic terranes. Also included are deformed pieces of oceanic crust and granitic intrusive bodies. Bedrock is often intensely metamorphosed and fractured. Well-developed floodplains and terraces near major rivers give way to highly dissected mountains with high-gradient streams. Many streams in this Province are intermittent in flow because of high gradients and low summer precipitation.

Similar to the Coast Range province, erosional processes are dominated by mass wasting associated high intensity rainfall events. Erosional processes would be accelerated where these rainfall events overlap with large, stand replacement fires. Precipitation gradients decrease from west to east, so landslide frequency decreases with decreased precipitation. Hydraulic mining that occurred in the 19th century dramatically altered landscapes and downstream channels where this activity occurred.

2.1.3.2 Climate

The valleys and foothills of the Klamath-Siskiyou Province experience a Mediterranean-type climate, while higher-elevation demonstrate more montane effects. Precipitation in the lowlands ranges from 25-50 inches a year, while higher elevations may receive up to 130 inches per year. Areas outside the Coast Range rain shadow receive considerably more precipitation. Most precipitation falls as rain and snow during the winter, though summer thunderstorms may produce measureable amounts.

2.1.3.3 Vegetation

This area is dominated by mixed conifer and mixed conifer/hardwood forests. Land ownerships include a mixture of BLM, NFS, private and state lands. Forests are highly fragmented by natural factors (e.g., poor soils, dry climate, and wildfires) and human-induced factors (e.g., harvest and roads). Much of the historical harvest in this area has been selective cutting rather than clearcutting. As a result, many stands that were logged in the early 1900's include a mixture of old trees left after harvest and younger trees that regenerated after harvest. Much of the area within the Province is characterized by high fire frequencies and stand-replacement fires. Any plan to protect LSOG forests in these areas must include careful consideration of fire management.

Draft

2.1.4 Western Cascades Province MP 105-113

Approximately 13 miles of the pipeline corridor crosses the north-south trending Western Cascades Province (figure 2.2-1) crossing portions of the Umpqua National Forest and Medford District BLM. This province, which drains westward to the Pacific Ocean, reaches elevations of 5,800 feet above msl. Portions of the Upper Cow Creek and Trail Creek fifth-field watersheds are in the Western Cascades Province.

2.1.4.1 Landform and Erosional Processes

The landforms in the Western Cascades Province are distinguished from the High Cascades by older volcanic activity and longer glacial history. Ridge crests at generally similar elevations are separated by steep, deeply dissected valleys. Complex volcanoclastic formations juxtapose relatively stable volcanic deposits that weather to thick soils and are subject to earthflows. Unconsolidated alluvial and glacial deposits are subject to stream bank erosion and landslides. Tributary channels flow at large angles into wide, glaciated valleys. Stream gradients are typically moderate to high (2-30%).

2.1.4.2 Climate

Lowland areas may receive as little as 60 inches of precipitation per year, while higher elevations may receive up to 120 inches annually. Much of the precipitation that falls above 4000 feet amsl is snow. Average January temperatures range from 26 to 41 degrees while average July temperatures range from 44 to 78 degrees.

2.1.4.3 Vegetation

Forests of this province consist primarily of Douglas-fir and western hemlock at lower to middle elevations. Land ownerships include a mixture of private and state lands, NFS and BLM. The BLM and Forest Service administer extensive areas in this Province. Private and state lands within this area are managed intensively for timber production under the forest practice and water quality laws of the State of Oregon and are primarily early and mid-seral forests whereas Federally administered lands still include significant areas (albeit highly fragmented) of LSOG forest. Forests at the southern section of the Province are largely replaced by mixed conifer forests of Douglas-fir, grand fir and incense-cedar. A large proportion of the known NSO population in Washington and Oregon occurs in the Western Cascades.

2.1.5 High Cascades Province MP 153-180

Approximately 23 miles of the proposed PCGP corridor would be located in the High Cascades Province (figure 2.2-1), crossing portions of the Rogue River National Forest and the Klamath Falls Resource Area of the Lakeview District, BLM. This Province consist the Cascades, a north-south trending mountain chain that drains both westward to the Pacific Ocean and eastward into Klamath and Columbia basin (figure 1-1). The High Cascades Province reach a peak elevation of 9,493 feet msl at the summit of Mt. McLoughlin. Portions of the Little Butte Creek, Spencer Creek and Mills Creek – Lost River fifth-field watersheds are in this Province.

Draft

2.1.5.1 Landform and Erosional Processes

The province consists of volcanic landforms with varying degrees of glaciation. Lava flows form relatively stable plateaus, capped by the recent Cascade volcanoes. Drainages are generally not yet well-developed or otherwise disperse into highly permeable volcanic deposits. Geologically recent volcanic deposits are subject to large debris flows when saturated by snowmelt. This province is composed primarily of approximately 3 million year old volcanic material, primarily andesite and basalt that was subsequently glaciated. Mountains in this province are moderately dissected. Headwater streams have medium to high gradients and are often associated with large meadow-spring complexes such as Buck Lake in the Spencer Creek drainage. Expansive pumice plateaus associated with the eruption of Mt. Mazama about 5000 years ago (Dead Indian Plateau, Clover Creek) with droughty soils characterized by high snowmelt infiltration and low summer water retention fill valley floors adjacent to volcanic peaks.

2.1.5.2 Climate

The High Cascades Province is climatically diverse, with mild valleys, snowy mountains, and alpine conditions at the highest elevations. Precipitation ranges from 45 to 100 inches per year and is largely associated with orographic influences of the mountains in this province. In the lowlands, average January temperatures range from 30 to 45 degrees while average July temperatures range from 49 to 85 degrees. At higher elevations, average January temperatures range from 23 to 37 degrees while average July temperatures range from 44 to 74 degrees.

2.1.5.3 Vegetation

This province is dominated by mixed-conifer and ponderosa pine forests at mid- to lower elevations and by true fir forests at higher elevations. The higher elevations of the High Cascades Province support forests of silver fir and mountain hemlock. Some National Parks and wilderness areas within this province include significant areas of mid-elevation LSOG forest. Land ownership patterns include a mixture of Forest Service, private, state, Indian, National Park Service and BLM lands. Forests in this region are highly fragmented due to a variety of natural factors (e.g., poor soils, high fire frequencies, and high elevations) and human-induced factors (i.e., clearcutting and selective harvest). Before the advent of fire suppression in the early 1900's, wildfires played a major role in shaping the forests of this region. Intensive fire suppression efforts in the last 60 years have resulted in significant fuel accumulations in some areas and shifts in tree species composition. These changes may have made forests more susceptible to large high severity fires and to epidemic attacks of insects and diseases. Any plan to protect LSOG forests in this area must include considerable attention to fire management and to the resilience of forest stands.

2.2 BASINS AND WATERSHEDS CROSSED BY THE PCGP ON BLM AND NFS LANDS

The proposed pipeline corridor crosses BLM or NFS lands where the ACS applies in 16 fifth field watersheds in four different river basins that lie in portions of the Coast Range, Klamath-Siskiyou, Western Cascades and High Cascade aquatic provinces. Watersheds and river basins may lie in one or more aquatic provinces. All of the lands within these watersheds include a mix of federal and non-federal ownership (table 2.2-1 and figure 2.2-1). Of the total 232.07 miles of the proposed corridor, 40.0 miles would be on BLM lands and 30.6 miles would be on NFS lands. Bureau of

Draft

Land Management and NFS lands would account for just over 30 percent of the project length. Four BLM Districts (Coos Bay, Roseburg, Medford, and Klamath Falls Resource Area of the Lakeview District) and three National Forests (Umpqua, Rogue River and Winema) would be crossed by the project. table 2.2-1 summarizes the BLM and NFS administrative units crossed by the PCGP by fifth field watershed:

- In eleven (11) watersheds, generally west of the South Umpqua River, BLM lands would be crossed, but no NFS lands would be affected by the project.
- BLM and NFS land would be crossed in the Elk Creek-South Umpqua, South Umpqua, Little Butte Creek, and Spencer Creek Key Watersheds. The Trail Creek watershed also has both BLM and NFS lands that would be crossed by the project but Trail Creek is not designated as a key watershed.
- In Upper Cow Creek, the PCGP corridor crosses NFS land but does not cross BLM land (table 2.2-2, figure 2.2-2).

Tables 2.2-2 and 2.2.-3 summarize the acres affected by the project right-of-way on BLM and NFS lands by land allocation.

Approximately 791 acres of BLM land and 593 acres of NFS land are within the project Right of Way (table 2.2-3). On BLM lands, approximately 140.57 acres are within the LSR land allocation; 92.18 acres are mapped (or "designated") LSR and 48.39 acres are unmapped LSR associated with marbled murrelet activity centers and known owl activity centers. Unmapped LSRs are areas that are not within designated LSRs, but which are managed as part of the LSR network. On national forests, all LSR in the project Right of Way (374.5 acres) is in designated LSRs.

Draft

TABLE 2.2-1

Miles of PCGP project by Fifth Field Watershed and Federal Administrative Unit Within and Outside the Area of the NWFP on BLM and NFS Lands

Province	River basin	Fifth field Watershed	Hydrologic Unit Code	Key Water-shed	Total Miles All Owners	Coos Bay BLM Miles	Roseburg BLM Miles	Medford BLM Miles	Lakeview BLM Miles	Total BLM Miles	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total Forest Service Miles	Total BLM and Forest Service Miles
Watersheds Crossed by the PCGP in the Area of the NWFP a/															
Coast Range	Coos	Coos Bay Frontal	1710030403	No	20.40	0.29	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.29
Coast Range	Coos	Lower Coquille River	1710030505	No	2.03	0.06	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.06
Coast Range	Coquille	North Fork Coquille	1710030504	No	8.35	2.86	0.00	0.00	0.00	2.86	0.00	0.00	0.00	0.00	2.86
Coast Range	Coquille	East Fork Coquille	1710030503	No	10.21	2.78	0.00	0.00	0.00	2.78	0.00	0.00	0.00	0.00	2.78
Coast Range	Coquille	Middle Fork Coquille	1710030501	No	15.46	4.84	1.91	0.00	0.00	6.75	0.00	0.00	0.00	0.00	6.75
Western Cascades	Umpqua	Olalla-Lookingglass	1710030212	No	8.87	0.00	1.29	0.00	0.00	1.29	0.00	0.00	0.00	0.00	1.29
Western Cascades	Umpqua	Clark Br. - S. Umpqua	1710030210	No	13.34	0.00	0.57	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.57
Western Cascades	Umpqua	Myrtle Creek	1710030211	No	8.74	0.00	2.50	0.00	0.00	2.50	0.00	0.00	0.00	0.00	2.50
Klamath Siskiyou -	Umpqua	Days Cr. - S. Umpqua	1710030205	Yes	19.97	0.00	6.56	0.00	0.00	6.56	1.56	0.00	0.00	1.56	8.12
Klamath Siskiyou - Western Cascades	Umpqua	Elk Cr.-S. Umpqua	1710030204	Yes	3.42	0.00	0.09	0.00	0.00	0.09	2.86	0.00	0.00	2.86	2.95
Klamath Siskiyou - Western Cascades	Umpqua	Upper Cow Cr.	1710030206	No	5.15	0.00	0.00	0.00	0.00	0.00	4.36	0.00	0.00	4.36	4.36
Western Cascades	Upper Rogue	Trail Cr.	1710030706	No	10.60	0.00	0.00	3.88	0.00	3.88	2.09	0.00	0.00	2.09	5.97
Western Cascades	Upper Rogue	Shady Cove - Rogue R.	1710030707	No	8.14	0.00	0.00	4.38	0.00	4.38	0.00	0.00	0.00	0.00	4.38
Western Cascades – High Cascades	Upper Rogue	Big Butte Cr.	1710030704	No	5.00	0.00	0.00	0.69	0.00	0.69	0.00	0.00	0.00	0.00	0.69
Western Cascades - High Cascades	Upper Rogue	Little Butte Cr.	1710030708	Yes	32.90	0.00	0.00	5.97	0.00	5.97	0.00	13.69	0.00	13.69	19.66
High Cascades	Upper Klamath	Spencer Cr.	1801020601	Yes	15.13	0.00	0.00	0.00	1.04	1.04	0.00	0.00	6.06	6.06	7.10
Total PCGP Project Miles on BLM and NFS Lands Within NWFP Area					**187.71**	**10.83**	**12.92**	**14.92**	**1.04**	**39.71**	**10.87**	**13.69**	**6.06**	**30.62**	**70.33**

Draft

TABLE 2.2-1

Miles of PCGP project by Fifth Field Watershed and Federal Administrative Unit Within and Outside the Area of the NWFP on BLM and NFS Lands

Province	River basin	Fifth field Watershed	Hydrologic Unit Code	Key Water-shed	Total Miles All Owners	Coos Bay BLM Miles	Roseburg BLM Miles	Medford BLM Miles	Lakeview BLM Miles	Total BLM Miles	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total Forest Service Miles	Total BLM and Forest Service Miles
Watershed Crossed by the PCGP Project Outside the Area of the NWFP b/															
High Cascades	Upper Klamath	John C. Boyle Reservoir	1801020602	N/A	5.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High Cascades	Lost River	Lake Ewauna-Upper Klamath River	1801020412	N/A	16.44	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00
High Cascades	Lost River	Mills Creek Lost River	1801020409	N/A	22.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Outside NWFP Area					**44.36**	**0.00**	**0.00**	**0.00**	**0.26**	**0.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.26**
Total PCGP Project All Watersheds c/					**232.07**	**10.83**	**12.92**	**14.92**	**1.30**	**39.97**	**10.87**	**13.69**	**6.06**	**30.62**	**70.59**

Data Source: Resource Report 2, Tables 2.2-2 and 2.2-3

a/ The ACS applies only to BLM and NFS lands in watersheds within the area of the NWFP.

b/ The ACS does not apply to BLM and NFS lands outside the area of the NWFP. These lands would not be addressed further in this report. These areas are however subject to the Right of Way Grant issued by the BLM.

c/ This includes 0.65 miles of R/W located on Bureau of Reclamation Lands in the Lake Ewauna-Upper Klamath Watershed that are subject to the Right of Way Grant issued by the BLM.

Draft

TABLE 2.2-2

Fifth Field Watersheds and Land Allocations Crossed by the Pacific Connector Gas Pipeline Corridor R/W on BLM and NFS Lands

Unit	Agency	Federal Land Allocation															
		LSR				Matrix				Riparian Reserves2				All Allocations3			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
South Oregon Coast Basin																	
Coos Bay Frontal	BLM	0.00	0.00	0.00	0.00	3.19	0.00	0.06	0.00	0.43	0.00	0.02	0.00	3.19	0.00	0.07	0.00
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**3.19**	**0.00**	**0.03**	**0.00**	**0.43**	**0.00**	**0.01**	**0.00**	**3.19**	**0.00**	**0.03**	**0.00**
Coquille River	BLM	0.00	0.00	0.00	0.00	1.37	0.00	0.05	0.00	1.21	0.00	0.11	0.00	1.37	0.00	0.05	0.00
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**1.37**	**0.00**	**0.05**	**0.00**	**1.21**	**0.00**	**0.11**	**0.00**	**1.37**	**0.00**	**0.05**	**0.00**
North Fork Coquille River	BLM	0.00	0.00	0.00	0.00	41.92	0.00	0.20	0.00	16.55	0.00	0.09	0.00	41.92	0.00	0.11	0.00
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**41.92**	**0.00**	**0.20**	**0.00**	**16.55**	**0.00**	**0.09**	**0.00**	**41.92**	**0.00**	**0.11**	**0.00**
East Fork Coquille River	BLM	18.40	3.34	0.08	0.01	20.91	1.04	0.10	0.00	3.81	0.73	0.02	0.00	39.31	4.38	0.09	0.00
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**18.40**	**3.34**	**0.08**	**0.01**	**20.91**	**1.04**	**0.10**	**0.00**	**3.81**	**0.73**	**0.02**	**0.00**	**39.31**	**4.38**	**0.09**	**0.01**
Middle Fork Coquille River	BLM	28.35	18.57	0.17	0.11	67.05	9.73	0.16	0.02	14.19	1.57	0.34	0.04	95.40	28.30	0.16	0.05
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**28.35**	**18.57**	**0.17**	**0.11**	**67.05**	**9.73**	**0.16**	**0.02**	**14.19**	**1.57**	**0.03**	**0.00**	**95.40**	**28.30**	**0.16**	**0.05**
Subtotal South Coast Subbasin	BLM	46.75	21.91	0.08	0.04	134.44	10.77	0.14	0.01	36.19	2.30	0.05	0.00	139.27	32.79	0.09	0.02
	FS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**46.75**	**21.91**	**0.08**	**0.04**	**134.44**	**10.77**	**0.14**	**0.01**	**36.19**	**2.30**	**0.05**	**0.00**	**139.27**	**32.79**	**0.09**	**0.02**

Draft

TABLE 2.2-2

Fifth Field Watersheds and Land Allocations Crossed by the Pacific Connector Gas Pipeline Corridor R/W on BLM and NFS Lands

Unit	Agency	Federal Land Allocation															
		LSR				Matrix				Riparian Reserves2				All Allocations3			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
South Umpqua River Subbasin																	
Olalla-Lookingglass	BLM	3.11	0.94	0.02	0.01	15.59	4.84	0.11	0.03	0.00	0.00	0.00	0.00	18.70	5.78	0.07	0.02
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**3.11**	**0.94**	**0.02**	**0.01**	**15.59**	**4.84**	**0.11**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**18.70**	**5.78**	**0.07**	**0.02**
Clark Branch S. Umpqua	BLM	0.00	0.00	0.00	0.00	8.19	3.03	0.11	0.04	0.01	0.10	0.00	0.00	8.19	3.13	0.11	0.04
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**8.19**	**3.03**	**0.11**	**0.04**	**0.01**	**0.10**	**0.00**	**0.00**	**8.19**	**3.13**	**0.11**	**0.04**
Myrtle Creek	BLM	0.00	0.00	0.00	0.00	40.30	46.60	0.13	0.15	0.41	3.83	0.00	0.03	40.30	46.60	0.13	0.15
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**40.30**	**46.60**	**0.13**	**0.15**	**0.41**	**3.83**	**0.00**	**0.03**	**40.30**	**46.60**	**0.13**	**0.15**
Days Cr. S. Umpqua	BLM	41.19	16.26	0.17	0.07	79.10	50.09	0.23	0.15	4.54	4.32	0.02	0.02	120.29	66.35	0.21	0.11
	NFS	10.56	20.81	0.44	0.86	17.96	24.72	4.61	6.35	0.00	0.00	0.00	0.00	28.52	45.53	1.02	1.62
	Total	**51.75**	**37.07**	**0.19**	**0.14**	**97.06**	**74.81**	**0.28**	**0.22**	**4.54**	**4.32**	**0.02**	**0.02**	**148.81**	**111.88**	**0.24**	**0.18**
Elk Cr. South Umpqua	BLM	1.87	0.56	2.77	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.56	0.51	0.15
	NFS	21.45	0.00	0.15	0.00	8.72	1.75	0.04	0.00	0.00	0.00	0.00	0.00	30.17	1.75	0.09	0.01
	Total	**23.32**	**0.56**	**0.16**	**0.00**	**8.72**	**1.75**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**32.04**	**2.31**	**0.09**	**0.01**
Upper Cow Creek	BLM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	NFS	38.63	0.00	1.64	0.00	36.98	0.00	0.17	0.00	10.83	0.00	0.09	0.00	75.61	0.00	0.31	0.00
	Total	**38.63**	**0.00**	**0.35**	**0.00**	**36.98**	**0.00**	**0.16**	**0.00**	**10.83**	**0.00**	**0.07**	**0.00**	**75.61**	**0.00**	**0.22**	**0.00**
Subtotal South Umpqua River Subbasin	BLM	46.17	17.76	0.10	0.04	143.18	104.56	0.16	0.12	4.96	8.25	0.01	0.02	189.35	122.42	0.14	0.09
	FS	70.64	20.81	0.37	0.11	63.66	26.47	0.15	0.00	10.83	0.00	0.04	0.00	134.30	47.28	0.22	0.08
	Total	**116.81**	**38.57**	**0.18**	**0.06**	**206.84**	**131.03**	**0.16**	**0.10**	**15.79**	**8.25**	**0.02**	**0.01**	**323.65**	**169.70**	**0.17**	**0.09**

Draft

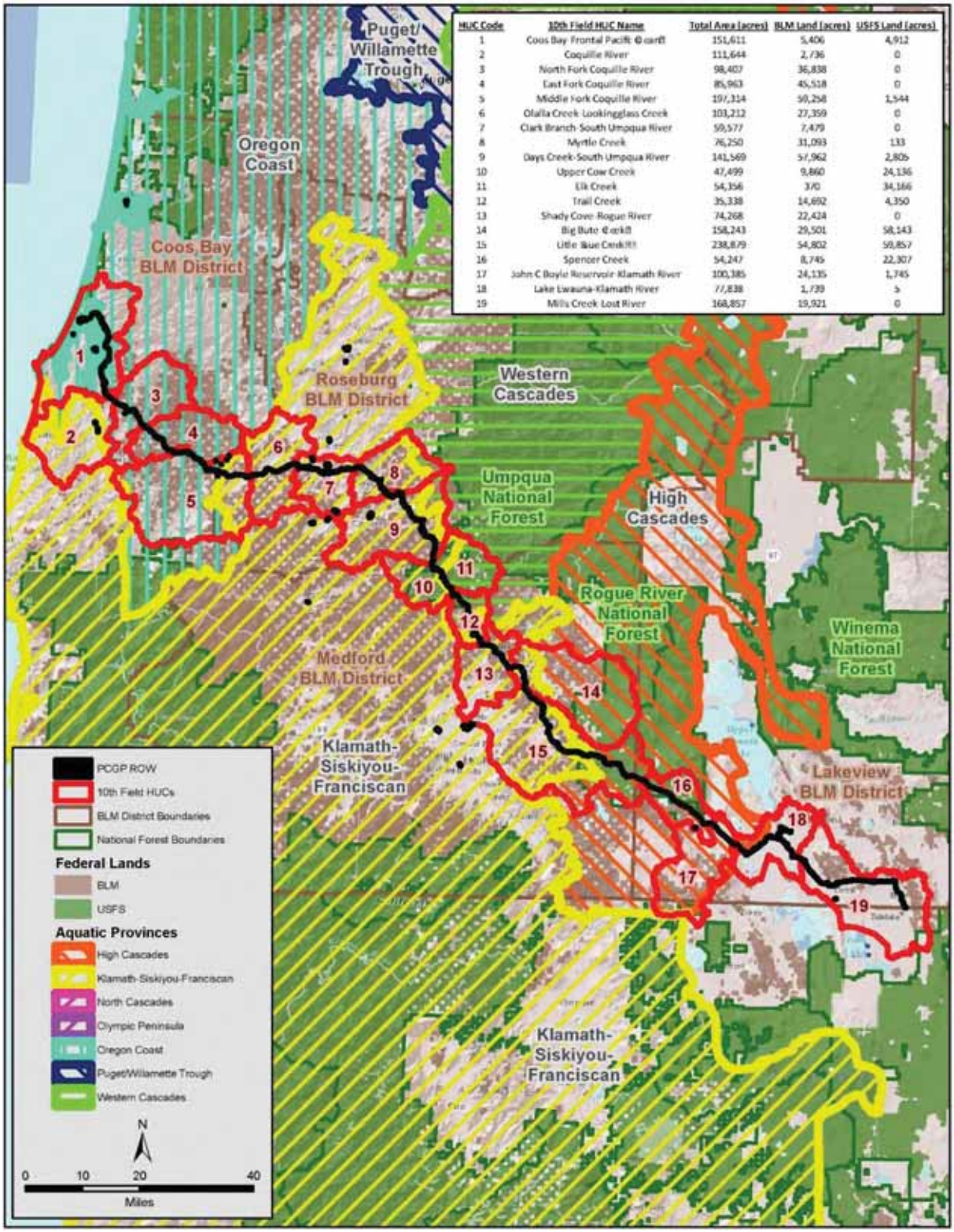
TABLE 2.2-2

Fifth Field Watersheds and Land Allocations Crossed by the Pacific Connector Gas Pipeline Corridor R/W on BLM and NFS Lands

		Federal Land Allocation															
		LSR				Matrix				Riparian Reserves2				All Allocations3			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
Unit	**Agency**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Upper Rogue River Subbasin																	
Trail Creek	BLM	0.00	0.00	0.00	0.00	57.38	16.84	0.39	0.11	2.92	0.20	0.09	0.01	57.38	16.84	0.39	0.11
	NFS	0.00	0.00	0.00	0.00	41.28	8.96	0.95	0.21	0.00	0.00	0.00	0.00	41.28	8.96	0.95	0.21
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**98.66**	**25.80**	**0.52**	**0.14**	**2.92**	**0.20**	**0.07**	**0.00**	**98.66**	**25.80**	**0.52**	**0.14**
Shady Cove Rogue River	BLM	0.00	0.00	0.00	0.00	69.31	6.23	0.31	0.03	4.60	0.20	0.07	0.00	69.31	6.23	0.31	0.00
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**69.31**	**6.23**	**0.31**	**0.03**	**4.60**	**0.20**	**0.07**	**0.00**	**69.31**	**6.23**	**0.31**	**0.00**
Big Butte Creek	BLM	0.00	0.00	0.00	0.00	11.66	0.03	0.04	0.00	6.91	0.00	0.14	0.00	11.66	0.03	0.01	0.00
	NFS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**11.66**	**0.03**	**0.01**	**0.00**	**6.91**	**0.00**	**0.05**	**0.00**	**11.66**	**0.03**	**0.01**	**0.00**
Little Butte Creek	BLM	0.00	0.00	0.00	0.00	96.76	11.10	0.18	0.02	7.56	0.81	0.15	0.00	96.76	11.10	0.18	0.00
	NFS	209.07	70.44	0.40	0.13	0.00	0.00	0.00	0.00	7.64	1.09	0.14	0.02	209.07	70.45	0.35	0.12
	Total	**209.07**	**70.44**	**0.40**	**0.13**	**96.76**	**11.10**	**0.18**	**0.02**	**15.20**	**1.90**	**0.14**	**0.02**	**305.83**	**81.55**	**0.27**	**0.07**
Subtotal Upper Rogue River Subbasin	BLM	0.00	0.00	0.00	0.00	235.11	34.20	0.19	0.00	21.99	1.21	0.11	0.01	235.11	34.20	0.19	0.03
	NFS	209.07	70.44	0.38	0.13	41.28	8.96	0.06	0.01	7.64	1.09	0.05	0.01	250.35	79.41	0.20	0.00
	Total	**209.07**	**70.44**	**0.38**	**0.13**	**276.39**	**43.16**	**0.15**	**0.00**	**29.63**	**2.30**	**0.08**	**0.01**	**485.46**	**113.61**	**0.20**	**0.05**
Upper Klamath Subbasin																	
Spencer Creek	BLM	0.00	0.00	0.00	0.00	14.86	0.00	0.17	0.00	2.11	0.00	1.01	0.00	12.96	0.00	0.15	0.00
	NFS	0.00	0.00	0.00	0.00	81.61	11.22	0.48	0.00	6.95	0.08	1.30	0.01	81.61	11.22	0.37	0.05
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**96.47**	**11.22**	**0.37**	**0.00**	**9.06**	**0.08**	**1.22**	**0.01**	**94.57**	**11.22**	**0.30**	**0.04**
Total All Watersheds																	
	BLM	92.92	39.67	0.09	0.04	512.73	149.53	0.16	0.05	65.25	11.76	0.04	0.01	563.73	189.41	0.14	0.05
	NFS	279.71	91.25	0.35	0.12	186.55	46.65	0.14	0.04	25.42	1.17	0.06	0.00	466.26	137.91	0.22	0.06
	Total	**372.63**	**130.92**	**0.21**	**0.07**	**714.14**	**196.18**	**0.16**	**0.04**	**90.67**	**12.93**	**0.05**	**0.01**	**1042.95**	**327.32**	**0.17**	**0.00**

Draft

Figure 2.2-1 Aquatic Provinces and Watersheds Crossed by the PCGP



HUC Code	10th Field HUC Name	Total Area (acres)	BLM Land (acres)	USFS Land (acres)
1	Coos Bay-Frontal Pacific Ocean	151,611	5,406	4,912
2	Coquille River	111,644	2,736	0
3	North Fork Coquille River	98,407	36,838	0
4	East Fork Coquille River	85,963	45,518	0
5	Middle Fork Coquille River	197,314	59,268	1,544
6	Olalla Creek-Lookingglass Creek	103,212	27,359	0
7	Clark Branch-South Umpqua River	59,577	7,479	0
8	Myrtle Creek	76,250	31,093	133
9	Days Creek-South Umpqua River	141,569	57,962	2,805
10	Upper Cow Creek	47,499	9,860	24,136
11	Elk Creek	54,356	370	34,166
12	Trail Creek	35,338	14,692	4,350
13	Shady Cove-Rogue River	74,268	22,424	0
14	Big Butte Creek	158,243	29,501	58,143
15	Little Blue Creek	238,879	54,802	59,857
16	Spencer Creek	54,247	8,745	22,307
17	John C Boyle Reservoir-Klamath River	100,385	24,135	1,745
18	Lake Ewauna-Klamath River	77,838	1,739	5
19	Mills Creek-Lost River	168,857	19,921	0

TABLE 2.2-3

Acres within Right of Way by BLM and Forest Service Land Allocations

Agency a/	Total Area Within Right-of-Way (Acres)	Matrix Lands (Acres / % of Total Project)	Mapped and Unmapped LSR (Acres /% of Total Project)	Riparian Reserves b/ (Acres / % of Total)
BLM	790.78	650.21 / 46.99%	140.57 /10.15%	74.90 / 4.36%
NFS	592.99	218.48 / 15.78%	374.51 / 27. 06%	26.59 / 2.03%
Total BLM and NFS Lands in Right-of-Way c/	**1383.77**	**868.69 / 61.77%**	**515.08 / 37.22%**	**103.6 / 6.40%**

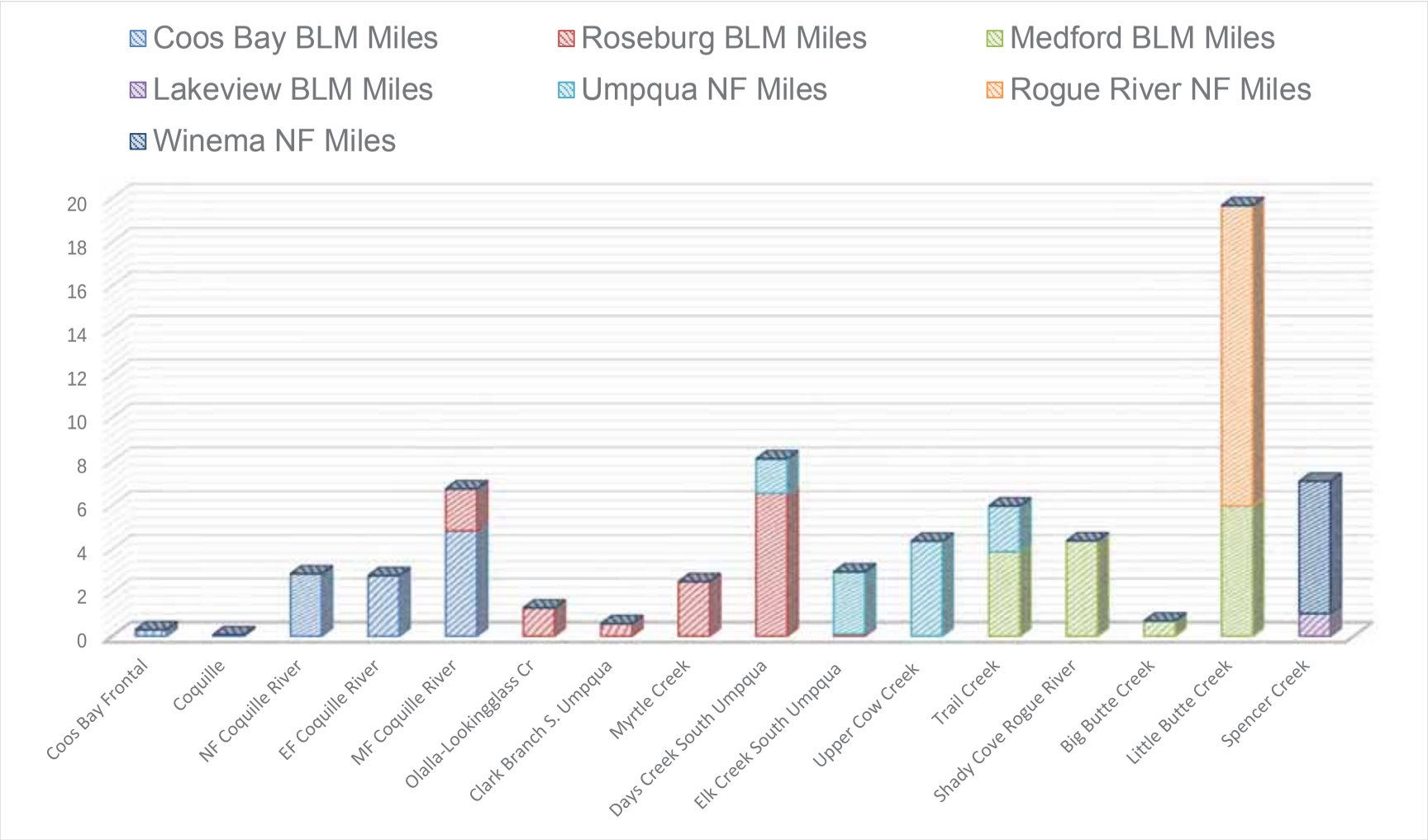
a/ Data Adapted from Resource Report 8, Table 8.5-3.
b/ Riparian Reserves occur in all land allocations.
c/ Includes the construction corridor, TEWAs, USCAs and temporary facilities. Table 2.2-2 contains only the project corridor and associated TEWAs and USCAs, so there are minor differences in totals when compared to PCGP Resource Reports.

Late Successional Reserves are an important component of the ACS because the standards and guidelines under which LSRs are managed provide additional protection for aquatic resources Forest Service and BLM, 1994b: B-12). Mapped LSRs are crossed on BLM land in five fifth field watersheds (table 2.2-2). Of the BLM watersheds crossed by the PCGP, the Middle Fork of Coquille River watershed (46.9. acres) and the Days Creek - South Umpqua watershed (57.4 acres) have the most acres of mapped LSR within the project right-of-way. The South Umpqua watershed is a Key watershed. On NFS lands, five of the fifth field watersheds have mapped LSRs crossed by the PCGP corridor. Of these five, by far the most affected is the Little Butte Creek watershed (279.51 acres), followed by the Upper Cow Creek watershed (38.63 acres), the Days Creek - South Umpqua watershed (31.37 acres) and the Elk Creek-South Umpqua watershed (21.45 acres). Marbled murrelet habitat effects are relevant in the East Fork Coquille River and Middle Fork Coquille River watersheds, while KOACs are relevant in the Myrtle Creek, Olalla-Lookingglass and South Umpqua watersheds. Appendix H of the EIS provides a complete assessment of project effects and mitigations within LSRs.

Riparian Reserves would be affected in 12 of the 17 fifth field watersheds (table 2.2-2) where BLM are NFS lands are crossed by the project. In only two watersheds (Little Butte Creek and Spencer Creek) were Riparian Reserves on both BLM and NFS land affected. Of the nine BLM watersheds where Riparian Reserves were impacted, acreages affected ranged from 4.24 acres in the Myrtle Creek watershed to 16.55 acres in the Middle Fork Coquille River watershed, with two watersheds with more than 10 acres of Riparian Reserves affected. Of the three watersheds where Riparian Reserves are crossed on NFS lands, acreages affected ranged from 7.03 acres in Spencer Creek to 10.83 acres in Upper Cow Creek.

Draft

Figure 2.2-2 Miles of PCGP Corridor by Watershed on BLM and NFS Lands by Administrative Unit



2.3 SOUTH OREGON COAST BASIN

2.3.1 Geographic Setting

The South Oregon Coast basin is bounded on the north by the Umpqua basin and on the south by the Rogue River basin. The Coos Bay Frontal watershed and the Coquille River, Chetco River and Sixes River Sub-basins comprise the South Oregon Coast basin. The Coos Bay Frontal watershed and the Coquille subbasin are traversed by the pipeline corridor. Fifth-field watershed and land allocations crossed by the Pacific Connector Project are shown in table 2.3.1-. Acres cleared or modified by corridor construction in the Southern Oregon Coast Basin are shown in Table 2.2.3-1

The Coquille River subbasin is the largest of several river and stream systems in the South Coast Basin of Oregon, bordered by the Coos Bay Frontal watershed and the Umpqua River basin to the north and the Rogue River basin to the south. The Coquille River drains approximately 1059 square miles (677,760 acres) and has four major tributaries: the North, East, Middle and South Forks (table 2.3.1-1). The lower mainstem river is tidally influenced for approximately 40 miles from the city of Bandon on the Pacific coast to just upstream from the town of Myrtle Point.

TABLE 2.3.1-1

Land Ownership, Basin Area, and Approximate Stream Miles (3rd- order and greater) in the Coquille River Basin

Basin Name	Total Acres	Other Ownership (mi)%	BLM Ownership (mi)%	Forest Service (mi)
Lower Mainstem	138,240	100% (153)	0	0
North Fork	98,560	63% (166)	37% (97)	0
East Fork	86,400	49% (113)	51% (118)	0
Middle Fork	197,760	78% (344)	22% (97)	0
South Fork	156,800	48% (74)	5% (7)	47% (72)
Total	**677,760**	**820 miles**	**320 miles**	**72 miles**

The Coquille River subbasin is situated between two large areas of consolidated Federal ownership, the Siskiyou National Forest to the south and the Siuslaw National Forest. to the north. Federal agencies (BLM and Forest Service) manage approximately 30% of the Coquille watershed, most of which is in sections interspersed with private ownership creating a "checkerboard" pattern across the landscape. Despite its fragmented landscape pattern, the Coquille River basin can potentially provide crucial connectivity for flora and fauna dispersal between adjacent and more contiguous ecosystems and landscapes.

Moving up the Coquille River from the coastline the coastal mountains, land surfaces and elevations change from dunes and marine terraces (5%), to flood plains and stream terraces (4%), to low hills (28%), and finally to mountains (63%). The 4% of the basin in floodplains and terraces historically provided highly productive areas critical to anadromous salmonid fish species. These riparian and stream habitats were the focal point of early European human settlement and disturbance. Table 2.3.1-1 provides an overview of the Coquille basin.

The South Fork Coquille River forms the boundary between two major physiographic provinces, the Coast Range province to the north and the Klamath Mountain province to the south. These provinces are described by their unique geology, mineralogy, soils and vegetation. The North,

Draft

Middle, and East Forks are wholly within the Coast Range province, while approximately half of South Fork lies within the Klamath Mountain province (BLM 2007).

2.3.2 Climate and Hydrology

Climate and hydrology in the South Oregon Coast Range Basin are consistent with those described in the Coast Range aquatic province in section 2.1.2.

2.3.3 Coos Bay Frontal Fifth Field Watershed HUC 1710030403

2.3.3.1 Overview

The PCGP corridor begins in the Coos Bay Frontal watershed, which is the western frontal edge of the Coast Range Province (figure 1-1). This fifth field watershed includes Coos Bay, the Coos River drainage and several coastal sloughs. The corridor leaves the Coos Bay Frontal watershed at MP 17.9, moving into the Coquille River watershed. See figure 2.3-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the PCGP corridor.

The 241 sq. mile (151,611 acre) Coos Bay Frontal watershed includes eight subwatersheds: Big Creek, Catching Slough, Coos Bay, Coos River, Haynes Inlet, Isthmus Slough, North Spit and Winchester Slough (figure 2.3-1). The PCGP corridor traverses parts of four of these eight subwatersheds (i.e., Coos Bay two segments), Haynes Inlet, Coos River, and Catching Slough). The PCGP crosses BLM lands only in the Catching Slough subwatershed.

Topography in the Coos Bay Frontal watershed varies from coastal plains near the coast to deeply dissected coastal mountains that rise to approximately 1000 ft. above mean sea level (amsl). Typically, the watershed experiences dry summers and mild, wet winters. Frontal storms originating over the Pacific Ocean deliver most of the rainfall (58 to 80 inches annually) between October and May. Rainfall intensity tends to be low, and storms often last several days. More intense storms of shorter duration also occur. On November 18, 1996, the North Bend airport recorded 6.67 inches of rain and the Burnt Mountain remote automated weather station in the Coos watershed measured 9.47 inches of precipitation. The expected 2-year 24-hour maximum rainfall is 3 to 4 inches, and the expected 100-year 24-hour maximum is 6 to 8 inches (BLM 2010: 31).

Over 93% of the watershed is in private ownership. The BLM manages about 5,406 acres (3.6%) of the watershed (figure 2.3-1). While this BLM land is found in six of the eight subwatersheds, the majority (57.2%) is in the Catching Slough subwatershed (figure 2.3-1, table 2.3.3.1-1). The Forest Service manages 4,911.9 acres of land in the watershed, comprising 3.2% of the total acreage Forest Service land and 95% of the BLM land in the watershed are in the Matrix allocation (table 2.3.3.1-1). The Coos River and Catching Slough subwatersheds together contain only 280.6 acres of LSR. Riparian Reserves comprise approximately 45% of the landscape.

Location and Routing

All PCGP project effects on federal land in the Coos Bay Frontal watershed occur on BLM land in the southeast corner of Catching Slough subwatershed (figure 2.3-1, table 2.3.3.1-2). While on this BLM land, the pipeline corridor runs for 0.29 miles through second- growth forest on and near a broad ridge next to a power line corridor that lies adjacent to South Sumner Road. A total of

3.19 acres would be cleared. This constitutes 0.10% of the BLM land in the Catching Slough subwatershed and 0.06% of all BLM land in the watershed. Over all (federal and private) land ownership, PCGP corridor construction would impact 403.67 acres, which constitutes 0. 27% of the Coos Bay Frontal watershed (table 2.3.3.1-2).

All of the pipeline right-of-way in the Catching Slough watershed is in matrix lands. None of the LSR land allocation would be affected by project construction in the watershed (table 2.3.3.1-3). The affected matrix land (3.19 acres) represents 0.10% of the Matrix land in the Catching Slough subwatershed and 0.06% of the Matrix land in the entire watershed.

In the Coos Bay Frontal watershed, the PCGP corridor would cross an intermittent stream on BLM lands at MP 17.42 in the Catching Slough subwatershed (figure 2.3-1). This crossing would clear 0.43 acres of Riparian Reserve of which 0.15 acres is mid-seral and 0.28 acres is early seral vegetation (tables 2.3.3.1-4 and 2.3.3.1-5). This constitutes about 0.02% of the Riparian Reserves in the watershed. This is the only crossing on federal land in the watershed. No other federal Riparian Reserves are affected in the watershed.

Draft

Figure 2.3-1 PCGP Routing and Subwatershed Boundaries, Coos Bay Frontal Fifth-Field Watershed

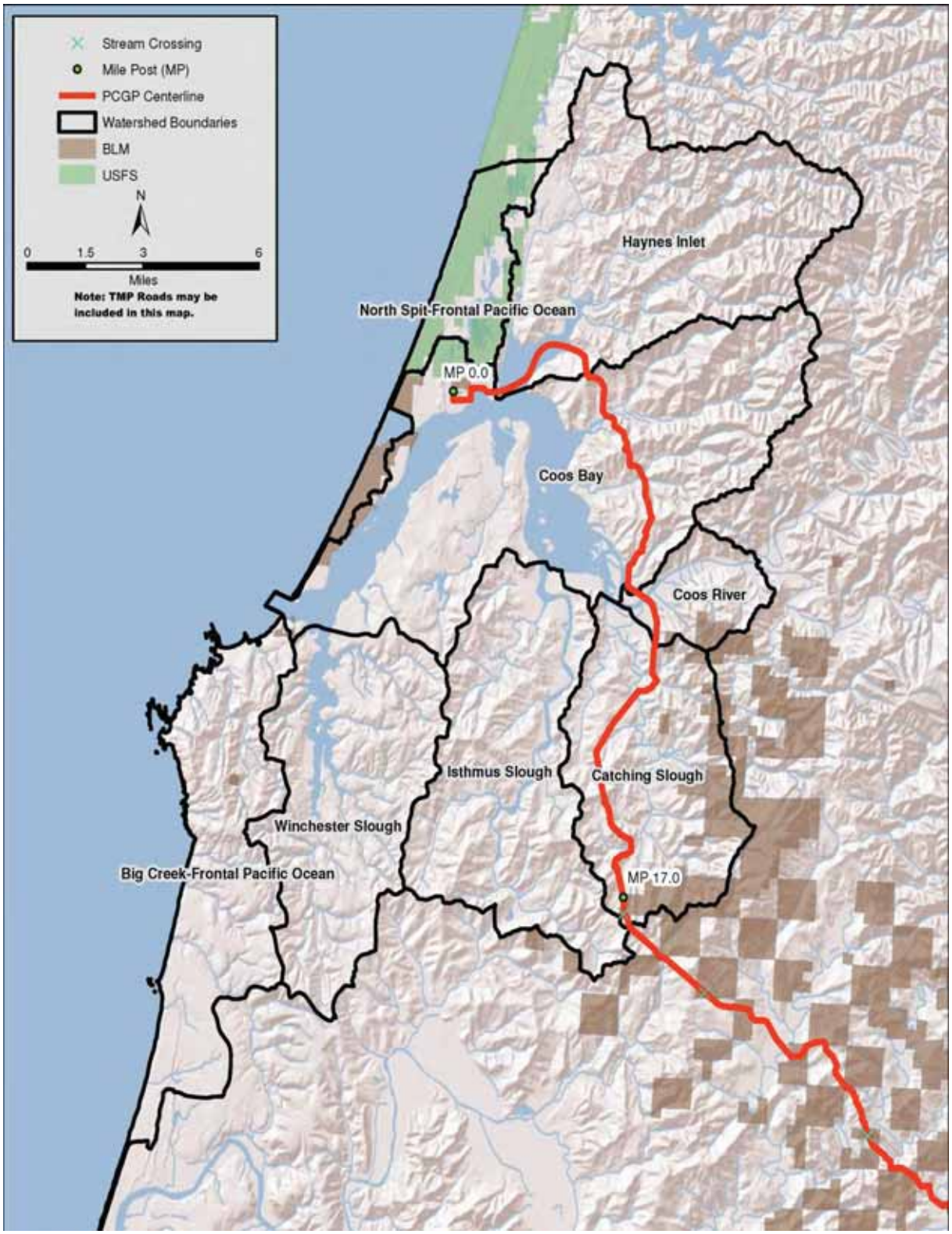


TABLE 2.3.3.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Coos Bay-Frontal Pacific Ocean Watershed HUC 1710030403

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Big Creek	16,945.07	73	0	73	16,872			73	0	0	0	0
Catching Slough	16,837.19	3,092	0	3,092	13,745			3,092	0	1,608	0	1,608
Coos Bay	38,812.89	825	668	1,493	37,319			825	668	0	348	348
Coos River	4,539.94	430	0	430	4,110			430	0	254	0	254
Haynes Inlet	26,401.41	0	389	389	26,013			0	389	0	202	202
Isthmus Slough	21,623.31	60	0	60	21,564			60	0	24	0	24
North Spit	6,815.35	929	3,857	4,786	2,029			929	3,857	0	2,006	2,006
Winchester Slough	19,635.97	0	0	0	19,636			0	0	170	0	170
Watershed Total	**151,611.13**	**5,408**	**4,914**	**10,322**	**141,289**	**0**	**0**	**5,408**	**4,914**	**2,056**	**2,555**	**4,611**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap
c/ Occur within LSR and Matrix Land Allocations. Riparian Reserves comprise approximately 45% of the landscape.

Draft

TABLE 2.3.3.1-2

PCGP Project Corridor (miles) and Project Area (acres) in the Coos Bay-Frontal Pacific Ocean Watershed HUC 1710030403 by Land Ownership

Unit a/	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Big Creek									0.00	0.00										
Catching Slough	0.29	3.19		0.10					0.29	3.19		0.10	8.09	125.04	1.27	0.92	8.38	128.23	1.27	0.77
Coos Bay									0.00	0.00			5.94	131.03	0.00	0.35	5.94	131.03	0.00	0.34
Coos River									0.00	0.00			2.59	45.33	0.00	1.10	2.59	45.33	0.00	1.00
Haynes Inlet									0.00	0.00			3.47	97.30	0.00	0.37	3.47	97.30	0.00	0.37
Isthmus Slough									0.00	0.00			0.02	0.51	0.00	0.00	0.02	0.51	0.00	0.00
North Spit									0.00	0.00										
Winchester Slough									0.00	0.00										
Watershed Total	**0.29**	**3.19**	**0.00**	**0.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.29**	**3.19**	**0.00**	**0.03**	**20.11**	**399.21**	**1.27**	**0.28**	**20.40**	**402.40**	**1.27**	**0.27**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.3.1-3

PCGP project Area (acres) on Federal Lands in the Coos Bay-Frontal Pacific Ocean watershed HUC 1710030403 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Big Creek	BLM																
	NFS																
Catching Slough	BLM					3.19		0.10		0.43		0.03		3.19		0.10	
	NFS																
Coos Bay	BLM																
	NFS																
Coos River	BLM																
	NFS																
Haynes Inlet	BLM																
	NFS																
Isthmus Slough	BLM																
	NFS																
North Spit	BLM																
	NFS																
Winchester Slough	BLM																
	NFS																
Watershed Total	**BLM**					**3.19**		**0.06**		**0.43**		**0.02**		**3.19**		**0.07**	
	NFS																

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.3.3.1-4

PCGP Effects, Riparian Reserves Coos Bay Frontal 5th Field Watershed HUC 1710030403

Admin Unit	Waterbody	MP	Type	Crossed	Buffer Only	Wetland Acres Crossed	Description	Construction Window	Fish Bearing	Anadromy	Site Potential Tree	Acres Cleared in Right-of-way										Gross Right-of-way Acres in Riparian Reserve	R/W Acres Riparian Reserve in Roads	Net Riparian Reserve Acres in Right-of-way
												LSOG	Mid Seral	Early Seral	Cc forest	Forest Wetland	Non-Forest Wetland	Unaltered Non-Forest	Agriculture	Altered Habitat	Total Affected			
Catching Slough Subwatershed HUC 171003040302																								
CB	Trib Catching Slough Cr.	17.42	I	Y			Small, 1 ft. wide intermittent stream crossed (Not in WWBC Report, Field verified by BLM)	Jul 1 - Sep 15			220	—	0.15	0.28	—	—	—	—	—	—	0.43	0.43	—	0.43

Table 2.3.3.1-5

Crossing Risk Analysis

Fifth Field Water-shed	Sixth Field Subwater shed	MP	Type a/	Descrip-tion a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Stream-bed Material b/	Turbidity Rating c/	Site Response Rating d/	Construc-tion Impact Rating d/	Overall Rating e/
Coos Bay Frontal	Catching Slough	17.42	I	1' wide V-shaped int. stream fed by road drainage		4.05					If/	I	I	BLUE

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ Lower case italic red letters are presumed ratings until field verified

Draft

2.3.3.2 Existing Conditions Coos Bay Frontal watershed

Original watershed Analysis Findings

The Catching-Beaver watershed assessment was completed in June 2010. There have been no recent large-scale aquatic or terrestrial disturbance events, restoration projects or other management activities in the Catching Slough subwatershed that would alter the conditions described in the watershed assessment in 2010.

- BLM land in the analysis area is roughly evenly split between Riparian Reserves and matrix lands.
- The dominant erosion process in the analysis area are shallow rapid slope failure on areas underlain with sandstone and basalt parent material, and by rotational slumping and chronic sediment delivery in areas underlain by siltstone parent material.
- Streams in the analysis area; exhibit rapid rise and falls in flows in response to storm events. Little water is stored as either snow or ground water. Rain on snow events are not a major concern as elevations in the analysis area are below the transient snow zone.
- Intense precipitation over long duration increases landslide rates. In recent history, major storm events resulted in numerous landslides. Data from NOAA Cooperative Weather Stations in the analysis area show intense rain storms (at least 4 inches in 24-hours) have a return frequency of 5+ years.
- Almost all of the federal forestland in the analysis area has recovered hydrologically from past timber harvest.
- Late successional forest stands currently comprise 17.7% of the Analysis Area. Standards and Guidelines for the NWFP require at least 15% of the watershed be retained in late successional forest.

- Annual stream flow closely correlates with annual precipitation. Fall rains recharge soil moisture depleted by summertime evapotranspiration. Winter rainfall rapidly converts to runoff because soils remain wet between frequent storms and evapotranspiration diminishes. During spring, runoff decreases due to less rainfall, increasing transpiration by plants, and increasing canopy interception and evaporation of precipitation. Both rainfall and discharge drop to seasonally low levels in the summer. First and second order streams exhibit low base flows in summer months and may dry up entirely. These low order streams account for 90% of the channel length on BLM lands in the analysis Area. Conversely, shallow soils and low water retention make these streams very responsive to precipitation events. Flows increase rapidly, peak in close synchronicity with precipitation amount, and decreased fall as precipitation tapers off.

2.3.3.3 Natural Disturbance Processes

Natural disturbance regimes in the Coos Bay Frontal watershed are consistent with those described for the Coast Range in Section 2.1.1. Historically fires and high intensity rainfall / wind events were the primary natural disturbance factors in this watershed. Fire events in the Coast Range Province occasionally reset very large proportions (hundreds to thousands of acres) of the Province to early seral conditions. Between major fire events (50-300 years), long climatic periods of

Draft

relatively stable conditions occurred (BLM 2010 p. 58). Occasional smaller low intensity fire events or windstorms created complex stand structures, and created openings and "snag patches." High intensity rainfall events (at least 4 inches in 24 hours) occurred on a cycle of 5+ years (BLM 2010 p. 17). Occasionally, large, stand replacement fires overlapped with high intensity rainfall events resulting in a major pulse of sediments and a synergistic change in watershed / stream conditions.

2.3.3.4 Project Effects and Natural Range of Variation

Table 2.3.3.4-1 describes Best Management Practices that would be used at the single stream crossing in the Coos Bay Frontal watershed. With application of Best Management Practices, project effects are expected to be minor and short term.

TABLE 2.3.3.4-1

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**17.42**	**None**	**None**
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization

Draft

TABLE 2.3.3.4-1

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	Best Management Practices for Moderate Risk "Yellow" Crossings	Best Management Practices for High Habitat Risk "Green" Crossings
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Source	FERC Guidelines FEIS, JPA, Appendix C, Project Description JPA Appendix 1B, ECRP JPA Appendix F, Affected Waters, Section 2.1.8.3 JPA Appendices 2C, 2D JPA Appendix H, Compensatory Mitigation Plan		

Table 2.3.3.4-2 describes the range of variation of five key ecological processes in the Coos Bay Frontal watershed. All processes have been affected to some degree by human activity. Also included in table 2.3.3.4-2 are evaluations of PCGP project effects relative to the ranges of variability, considered in the context of past and ongoing natural and human disturbances in the watershed.

TABLE 2.3.3.4-2

Project Effects and Historic Range of Variation

Ecological Processes Relevant to the PCGP	Historic Range of Variation	Pacific Connector Effects
Erosional Processes	Mass wasting was historically the dominant sediment delivery mechanism to stream systems. Erosional processes were highly variable and episodic in nature. Large scale, high intensity rain / wind events that occasionally overlapped temporally and spatially with large stand replacing fires were the primary causes of pulses of sediment.	The Project corridor would clear about 0.0.43acres or about 0.02 percent of the Riparian Reserves in the Coos Bay Frontal watershed. The Project would be located on or near a ridgetop and would affect 3.19 acres or about 0.03 percent of the BLM-managed lands in the watershed (Tables 2.3.3.1-2, 2.3.3.1-3). With application of aggressive erosion control (see ECRP) and watershed Best Management Practices, PCGP project effects are expected to be minor and localized at the site scale. No effects to water quality from the PCGP project are expected on BLM lands in the Coos Bay Frontal watershed or the Catching Slough subwatershed.

Draft

TABLE 2.3.3.4-2 **Project Effects and Historic Range of Variation**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variation**	**Pacific Connector Effects**
Ecological Succession / Vegetative Condition	BLM lands in the Catching Slough subwatershed have been affected by both aboriginal and contemporary human use. Most BLM stands date from the Coos Bay fire of 1868 or subsequent timber management. Natural fire regimes created a complex mosaic of multi - age class stands with large numbers of snags and fire-maintained natural openings.	The PCPG project corridor would be adjacent to an existing road and powerline corridor or in second-growth forest. The scale of vegetative effects of the PCGP project at the subwatershed (0.03%) or watershed scale (0.02%) is minor compared to historic disturbance processes.
Flow Regimes	Landscape conditions were highly variable with respect to flows. Where fire events overlapped with high intensity rainfall events, substantial increases in flows over background conditions were possible because of lack of interception by forest canopies. High intensity rain events (>4 inches in 24 hours) typically on a highly variable cycle that averaged 5+ years.	The vegetation in the Catching Slough subwatershed is hydrologically recovered. The PCGP project is located on, or near a ridgetop on BLM lands and is very unlikely to cause changes in the flow regime because of the location and limited scale of the project (0.03% of the subwatershed on BLM lands). Effects of the PCGP project are expected to be insignificant with respect to changes in flow regimes.
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below today's temperature standard. Similar forested headwater streams monitored in 2003 through 2005 in the Umpqua basin to the north and elsewhere in the South Coast basin had 7-day average maximum temperatures ranging from 58.2 ºF to 62.9 ºF .These streams were cool and exhibited relatively little diurnal temperature fluctuation (BLM 2010:79)	PCGP is not expected to affect water temperature at this location because flows in first order intermittent streams are often discontinuous or may dry up entirely during late summer when warm temperatures are a concern. Additionally, vegetative recovery is often rapid with salmon berry sprouting from rhizomes within a few weeks of disturbance and providing cover (Fowler 2012 personal communication).

2.3.3.5 Consistency with Land Management Plans

Applicable Standards and Guidelines are identified in table 1.2.2-1. Compliance is described in table 2.3.3.5-1.

TABLE 2.3.3.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard/ Guideline**	**PCGP Compliance**
Riparian Reserves - Lands, pg. 16, 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan etc.
Riparian Reserves - General Riparian Area Mgmt., pg. 16, 4	RA-4: Locating water withdrawal sites.	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions because all such needs would be provided by municipal sources.
Riparian Reserves - Roads Mgmt., pg. 13, 2	RF-2: Road construction standards and guidelines.	No new road construction is proposed in Riparian Reserves on BLM lands in the Coos Bay Frontal watershed.

Draft

TABLE 2.3.3.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard/ Guideline**	**PCGP Compliance**
Riparian Reserves - Roads Mgmt., pg. 13, last & pg. 14, 1st	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Riparian Reserves - Roads Mgmt., pg. 14, 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction.
Riparian Reserves - Roads Mgmt., pg. 14, 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Riparian Reserves - Roads Mgmt., pg. 14, 4	RF-7: Transportation Management Plan development.	The TMP meets all the requirements of RF-7.
Riparian Reserves watershed & Habitat Restoration, pg. 17, 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		There are no known impacts to Survey and Manage Species in the Coos Bay Frontal River watershed.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the Coos Bay Frontal Watershed are currently 17.7% LSOG (BLM 2010:48) The PCGP does not remove any LSOG in this watershed.

2.3.3.6 Off-Site Mitigation Measures

No offsite mitigation measures are proposed in the Coos Bay Frontal watershed.

2.3.3.7 Cumulative Effects

Activities on BLM Lands

The BLM manages less than four percent of the Coos Bay Frontal watershed. The following projects are scheduled to occur on BLM lands in the Coos Bay Frontal Watershed. These projects are designed to be consistent with standards and guidelines and objectives for the Coos Bay RMP (table 2.3.3.7-1).

Collectively, these projects are expected to improve watershed conditions on BLM lands by:

- Reducing road-related sediment,

- Reestablishing conifers in Riparian Reserves that are now occupied by hardwoods and
- Improving stand health by reducing stand density on existing conifer stands.

TABLE 2.3.3.7-1

Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP

5th Field Watershed	6th Field Subwatershed	Project Name	Project Description	Resources Affected
Coos Bay Frontal	Catching Slough	**Proposed Action:** Catching Creek Conversion timber sale. NEPA complete; sale planned for 2016.	108 acres of hardwood conversion, including 53 acres in riparian reserve; with 0.4 miles temporary road construction and 1.8 miles renovation.	Upland and riparian vegetation, road network, water quality.
Coos Bay Frontal	Catching Slough	**Proposed Action:** Wilson Creek 4 timber sale. NEPA complete; sale planned for 2015.	213 acres of stand density management, including 90 acres in riparian reserve; 114 acres of hardwood conversion including 52 acres in riparian reserve; with 1.0 miles temporary road construction and 1.9 miles renovation.	Upland and riparian vegetation, road network, water quality.

Activities on Private Lands

Private lands comprise about 96 percent of the Coos Bay Frontal watershed. Private lands in the Coos Bay Frontal watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.03 percent of the BLM lands, and 0.28% of private lands in the Coos Bay Frontal watershed (table 2.3.3.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the Pacific Connector project, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Coos Bay Frontal watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.3.3.8 Project Effects Compared by ACS Objective

Table 2.3.3.8-1 compares the PCGP project effects against the objectives of the ACS. The PCGP intersects one intermittent stream and affects less than 0.03% of the Riparian Reserves in the Coos Bay Frontal watershed.

Draft

TABLE 2.3.3.8-1

Project Effects and ACS Objectives, Coos Bay Frontal Watershed

ACS Objective	Pacific Connector Gas Pipeline Effects
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape scale features. The Project corridor would clear about 0.0.43acres or about 0.02 percent of the Riparian Reserves in the Coos Bay Frontal watershed. The Project would be located on or near a ridgetop and would affect 3.19 acres or about 0.03 percent of the BLM-managed lands in the watershed (Tables 2.3.3.1-2, 2.3.3.1-3). The Project would be located adjacent to an existing powerline corridor or in second-growth timber. Impacts to aquatic systems are expected to be short-term, minor, and well within the range of natural variability for the Coast Range because of application of Best Management Practices, erosion control measures, and rapid revegetation. Approximately 18% of the watershed is currently LSOG (BLM 2010:48). No LSOG would be removed by the Project corridor in the Coos Bay Frontal watershed (Table 2.3.3.1-4). BLM cannot restore diversity, complexity and landscape-scale features at the 5th field scale as BLM manages less than 5% of the lands within the watershed.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project has one intermittent stream crossing in the Coos Bay Frontal watershed. The crossing would not affect spatial or temporal connectivity because the pipeline would be buried and the actual area of bank and stream bottom disturbance would be small (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored on-site and banks and stream bottoms restored to conditions similar to the pre-construction condition. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project has one intermittent stream crossing in the Coos Bay Frontal watershed. During construction, the actual area of bank and stream bottom disturbance would be small at each crossing (<15 feet wide). Long-term impacts on the bed and banks of these features would be minor and limited to the site of construction because the pipeline would be buried. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions, consistent with Wetland and Waterbody Crossing Plan. See table 2.3.1.1-5 for specific measures. This level of disturbance is well within the historical and current range of natural variability for bank and channel stability in watersheds of the Coast Range Province.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	It is possible that there may be minor amounts of sediment mobilized during construction (see section 1.3.2). No longer term impacts on water quality are expected from the Project in the Catching Slough subwatershed or Coos Bay Frontal watershed because of application of Best Management Practices during construction, implementation of the ECRP, and the ridgetop location of the Project.

Draft

TABLE 2.3.3.8-1 **Project Effects and ACS Objectives, Coos Bay Frontal Watershed**	
ACS Objective	**Pacific Connector Gas Pipeline Effects**
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Any sediment impacts from the Project are expected to be minor and short-term and well within the range of natural variability for the Coast Range Province. The Project location, application of Best Management Practices for water quality, restoration of bed and banks, LWD placement, aggressive erosion control, and the rapid natural revegetation capacity of the Coast-Range Province are expected to limit any potential sediment impacts.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project is not expected to have any effect on instream flows. The single stream crossing in this watershed is a first-order intermittent stream. It is unlikely that flow regimes could be altered because vegetation in the Catching Slough subwatershed is hydrologically recovered, the Project is located on or near a ridgetop, and the scale of the Project in the Coos Bay Frontal subwatershed is limited (0.15 percent of BLM-managed lands in the subwatershed).
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project is not expected to have any impact on floodplain inundation or water table elevation because of its location and lack of connectivity to floodplains and wet meadows.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The Project impacts on riparian vegetation would be minor and limited to the site of construction. Most of the Riparian Reserve vegetation at this site is second-growth upland forest. Existing herbaceous and brush cover would be maintained to the extent practicable within the clearing limits. LWD and boulders would be restored to the disturbed areas after construction. Revegetation would be accomplished using native riparian species.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The Project impacts on riparian vegetation would be minor and limited to the site of construction. Affected Riparian Reserve vegetation is upland second-growth forest. Existing herbaceous and brush cover within the clearing limits would be maintained to the extent practicable. LWD and boulders would be restored to the disturbed areas after construction. Revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.3.3.9 Summary

Given the location of the PCGP Right-of-way on or near ridgetops on BLM lands and the relatively small area of the BLM administered lands in the Coos Bay Frontal watershed affected by the PCGP (3.19 acres or 0.06% of the watershed), it is highly improbable that actions related to the PCGP on BLM lands could affect watershed condition in the Coos Bay Frontal watershed or the Catching Slough subwatershed. Although there are possible project-related effects in the form of sediment at one intermittent stream crossing, those are minor and short-term (table 2.3.3.7-1). Vegetative condition would change in the Riparian Reserve, but this is a minor impact at the project scale. No LSOG vegetation would be removed in Riparian Reserves. No project effects relevant to the ACS have been identified that are outside of the natural range of variability for watersheds on BLM lands in the Coast Range Province.

2.3.4 Coquille River Fifth Field Watershed HUC 1710030505

2.3.4.1 Overview

The Coquille River watershed is located in the Coast Range Province. It is the lowest in elevation of the four fifth-field watersheds (Lower Coquille, North Fork Coquille, Middle Fork Coquille, and East Fork Coquille) that comprise the Coquille River basin. The Coquille River discharges into the Pacific Ocean at Bandon, Oregon, about 23 miles south of Coos Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

The 111,644 acre (174.4 square mile) watershed contains six subwatersheds: Bear Creek, Beaver Slough, Coquille Estuary, Cunningham Creek, Hall Creek and Lamp Creek (figure 2.3-2). Topography varies from coastal plains at elevations near sea level to deeply dissected coastal mountains that rise to approximately 1000 ft. above mean sea level (amsl). The watershed experiences dry summers and mild, wet winters. Frontal storms originating over the Pacific Ocean delivery most of the rainfall (58 to 80 inches annually) between October and May. Rainfall intensity tends to be low, and storms often last several days. More intense storms of shorter duration do occur however. On November 18, 1996, the North Bend airport recorded 6.67 inches of rain and the Burnt Mountain remote automated weather station in the Coos watershed measured 9.47 inches of precipitation. The expected 2-year 24-hour maximum rainfall is 3 to 4 inches, and the expected 100-year 24-hour maximum is 6 to 8 inches (BLM 2010: 31).

Approximately 97.5% of the land in the watershed is privately owned (table 2.3.4.1-1). There are no Forest Service lands in the watershed. The BLM manages 2,737 acres (2.5% of the watershed, table 2.3.4.1-1), most of it in the upper portion of the Cunningham Creek subwatershed, the only one traversed by the PCGP corridor. Seventy-five (75) percent of the BLM land in the watershed is in the Cunningham Creek subwatershed, with smaller percentages in the Beaver Slough and Hall Creek subwatersheds. All BLM lands in the watershed are in the Matrix allocation (table 2.3.4.1-1). Riparian reserve densities are expected to be similar to those in the Coos Bay Frontal watershed or about 40-50% of the watershed.

Location and Routing

All PCGP corridor effects to BLM lands in the Coquille River watershed are in the upper Cunningham Creek subwatershed (figure 2.3-2, table 2.3.4.1-2). The corridor enters the watershed from the Coos Bay Frontal watershed at MP 17.9 and leaves the watershed at MP 19.8, passing into the North Fork Coquille River fifth-field watershed. In its 2.02 mile journey through the watershed (table 2.3.4.1- 2), only 0.06 miles of the corridor are on BLM land where the corners of two BLM blocks join (figure 2.3-2). On this parcel of federal land, the corridor is located on or near a broad ridge.

No streams are crossed on these federal lands and there are no effects to LSRs (table 2.3.4.1- 3). The PCGP corridor would affect 1.37 acres of Matrix land, or 0.07% of the 2,049 acres of BLM (Matrix) lands in the Cunningham Creek subwatershed and 0.05% of the BLM land in entire Coquille watershed. Approximately 1.21 acres or 0.11% of Riparian Reserves in the watershed would be affected (Table 2.3.4.1-4). There are no stream intersects in the Coquille watershed.

Figure 2.3-2 PCGP Routing and Subwatershed Boundaries, Coquille River Watershed

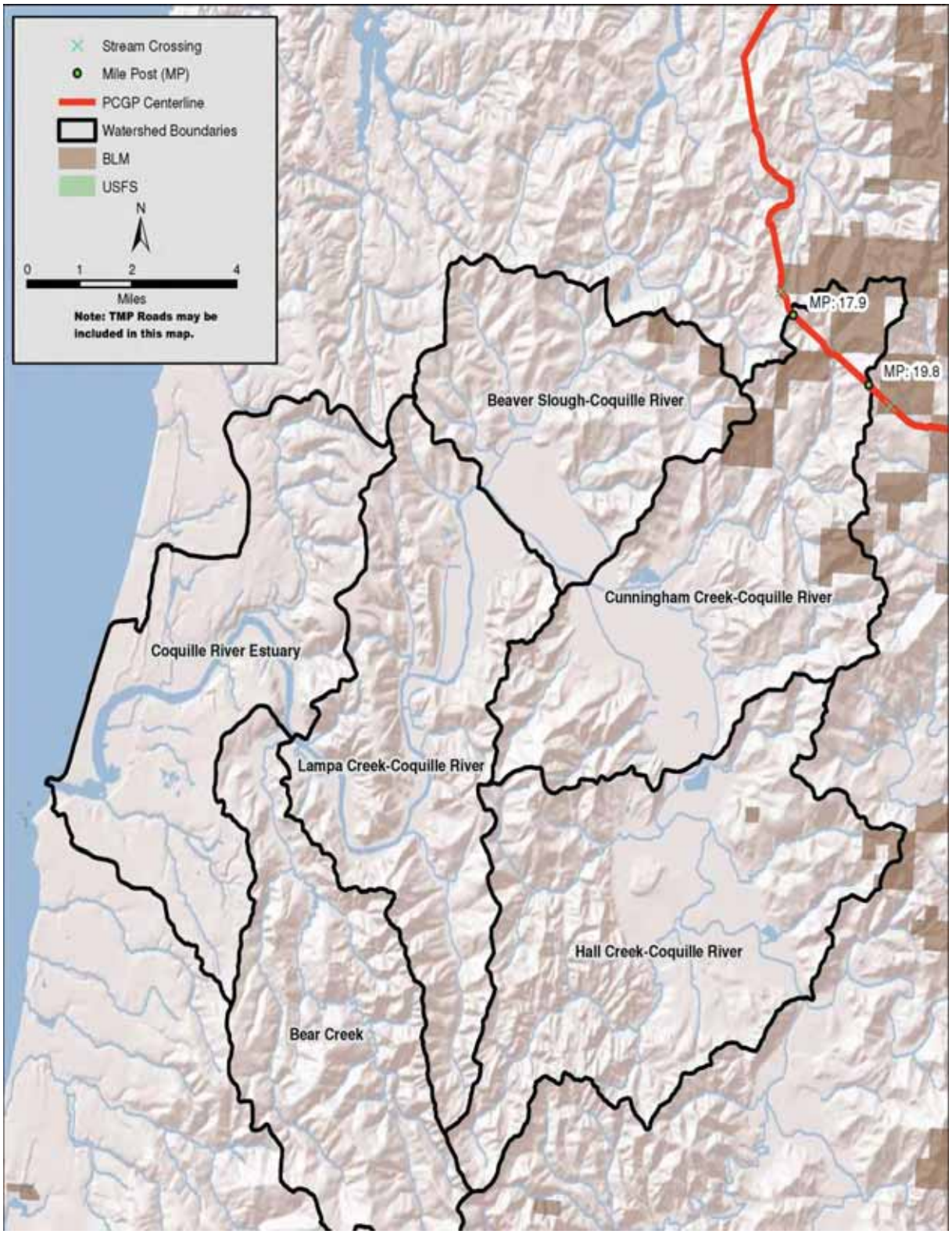


TABLE 2.3.4.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Coquille River Watershed HUC 1710030505

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
		BLM	NFS	Other	LSR b/		Matrix		Riparian Reserves c/	
					BLM	NFS	BLM	NFS	BLM	NFS
Bear Creek	15,422	0	0	15,422			0	0	—	
Beaver Slough	13,314	430	0	12,883			430	0	172	
Coquille River Estuary	18,349	0	0	18,349			0	0	—	
Cunningham Creek	21,354	2,050	0	19,304			2,050	0	820	
Hall Creek	24,077	257	0	23,820			257	0	103	
Lampa Creek	19,129	0	0	19,129			0	0	—	
Watershed Total	**111,644**	**2,737**	**0**	**108,907**	**0**	**0**	**2,737**	**0**	**1,094**	

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap
c/ Occur within LSR and Matrix Land Allocations. Riparian reserve are estimated to be 40% of the BLM lands.

Draft

TABLE 2.3.4.1-2

PCGP Project Corridor (miles) and project Area (acres) in the Coquille River Watershed HUC 1710030505 by Land Ownership

Unit a/	Land Ownership															
	BLM				Forest Service				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Forest Service Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Bear Creek																
Beaver Slough																
Coquille River Estuary																
Cunningham Creek	0.06	1.37		0.07					1.96	30.66	0.00	0.16	2.02	32.03	0.00	0.15
Hall Creek																
Lampa Creek																
Watershed Total	**0.06**	**1.37**	**0.00**	**0.05**					**1.96**	**30.66**	**0.00**	**0.03**	**2.02**	**32.03**	**0.00**	**0.03**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.4.1-3

PCGP project Area (acres) on Federal Lands in the Coquille River Watershed HUC 1710030505 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Bear Creek	BLM																
	NFS																
Beaver Slough	BLM																
	NFS																
Coquille River Estuary	BLM																
	NFS																
Cunningham Creek	BLM					1.37	0.00	0.07	0.00	1.21		0.15		1.37	0.00	0.07	0.00
	NFS																
Hall Creek	BLM																
	NFS																
Lampa Creek	BLM																
	NFS																
Watershed Total	**BLM**					**1.37**	**0.00**	**0.05**	**0.00**	**1.21**		**0.11**		**1.37**	**0.00**	**0.05**	**0.00**
	NFS																

a/ All data derived from NSR-based GIS layers,
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.3.4.1-4

Riparian Reserve Effects in the Lower Coquille River Fifth Field Watershed HUC 1710030505

Jurisdiction	MP	Description	Waterbody		Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/																	
										RR_Conifer_LSOG	RR_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
Cunningham Creek Subwatershed HUC 171003050502																											
CBD BLM	18.83	RR of lateral stream clipped	Trib to Cunningham Creek		I	No			Yes			0.00	1.21			1.21				0.00		1.21		1.21		1.21	No	No
Subtotal Cunningham Creek and Coquille River Watershed			Crossed: None	Clipped: 1 Int. RR	1	0			1				1.21							0.00		1.21		1.21				

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.

Draft

2.3.4.2 Existing Conditions

Original watershed Analysis Findings

The Middle Main Coquille Watershed Analysis (BLM 1997b) covers this watershed. The Coquille watershed is similar to the Catching Beaver watershed in terms of climate, topography and watershed conditions. There have been no recent large-scale aquatic or terrestrial disturbance events, restoration projects or other management activities in the Cunningham Creek subwatershed that would alter the conditions described in the watershed assessment.

- BLM land in the analysis area is roughly evenly split between Riparian Reserves and matrix lands.
- Dissolved oxygen limits water quality in the mainstem Coquille River and Cunningham Creek.
- Resident trout, coho and steelhead use Cunningham Creek and the mainstem Coquille River
- The dominant erosion process in the analysis area are shallow rapid slope failure on areas underlain with sandstone and basalt parent material, and by rotational slumping and chronic sediment delivery in areas underlain by siltstone parent material.
- Streams in the analysis area; exhibit rapid rise and falls in flows in response to storm events. Little water is stored as either snow or ground water. Rain on snow events are not a major concern as elevations in the analysis area are below the transient snow zone.
- Intense precipitation over long duration increases landslide rates. In recent history, major storm events resulted in numerous landslides. Data from NOAA Cooperative Weather Stations in the analysis area show intense rain storms (at least 4 inches in 24-hours) have a return frequency of 5+ years.
- Annual stream flow closely correlates with annual precipitation. Fall rains recharge soil moisture depleted by summertime evapotranspiration. Winter rainfall rapidly converts to runoff because soils remain wet between frequent storms and evapotranspiration diminishes. During spring, runoff decreases due to less rainfall, increasing transpiration by plants, and increasing canopy interception and evaporation of precipitation. Both rainfall and discharge drop to seasonally low levels in the summer. First and second order streams exhibit low base flows in summer months and may dry up entirely. These low order streams account for 90% of the channel length on BLM lands. Conversely, shallow soils and low water retention make these streams very responsive in the analysis area. Flows increase rapidly, peak in close synchronicity with precipitation amount, and decrease as precipitation tapers off.

- At the time of the watershed analysis in 1997, the Coquille watershed was estimated to be below the 15% threshold for LSOG conditions measured on BLM lands at the watershed scale. (An evaluation in 2013 showed the watershed was 17% LSOG and above the threshold required in the NWFP.)

Draft

Changes in watershed Condition

There have been no large-scale disturbance events that would change the conditions in the Coquille watershed from those described in the applicable watershed assessment.

Current watershed Conditions

The conditions in the Cunningham Creek subwatershed of the Coquille watershed are adequately described in the watershed assessment with the exception of LSOG conditions. An evaluation of LSOG by the BLM in 2013 showed that 17% of the watershed was LSOG.

2.3.4.3 Natural Disturbance Processes

Natural disturbance regimes in the Cunningham Creek subwatershed are consistent with those described for the Coast Range Province in Section 2.1.1. Forest fires and high intensity rainfall / wind events were the primary natural disturbance factors in this watershed. Fire episodes in the region occasionally reset very large proportions (hundreds to thousands of acres) of the province to early seral conditions. Between major fire episodes (50-300 years), long climatic periods of relatively stable conditions occurred (BLM 2010: 58). Occasional smaller low intensity fire events or windstorms resulted in complex stand structures, and created openings and "snag patches." High intensity rainfall events (at least 4 inches in 24 hours) occurred on a cycle of 5+ years (BLM 2010: 17). Occasionally, large, stand replacement fires overlapped with high intensity rainfall events resulting in a major pulse of sediments and a synergistic change in watershed / stream conditions.

2.3.4.4 Project Effects and Natural Range of Variability

Table 2.3.4.4-1 describes the range of variation of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) on the Coquille River watershed. All processes have been affected to some degree by human activity. Also included in table 2.3.4.4-1 are evaluations of PCGP project effects on these ecological processes relative to the ranges of variability, considered in the context of past and ongoing natural and human disturbances in the watershed.

TABLE 2.3.4.4-1

Project Effects and Relevant Ecological Processes in the Coquille Watershed

Ecological Processes Relevant to the PCGP	Natural Range of Variation	Pacific Connector Effects
Erosional Processes	Landslides were the dominant sediment delivery mechanism to stream systems. Erosional processes were highly variable and episodic in nature. Large scale, high intensity rain / wind events that occasionally overlapped temporally and spatially with large stand replacing fires were the primary causes of pulses of sediment.	The PCGP affects about 1.37 acres or 0.07% of the BLM lands in the Cunningham Creek sub watershed and 0.05% of the BLM lands in the Coquille watershed. With application of aggressive erosion control (see ECRP) and watershed Best Management Practices, project effects are expected to minor and localized at the site scale. No effects to water quality from the PCGP are expected on BLM lands in the Cunningham Creek subwatershed.

TABLE 2.3.4.4-1 **Project Effects and Relevant Ecological Processes in the Coquille Watershed**		
Ecological Processes Relevant to the PCGP	**Natural Range of Variation**	**Pacific Connector Effects**
Ecological Succession / Vegetative Condition	BLM lands in the Cunningham subwatershed have been heavily affected by both aboriginal and contemporary human use. Most BLM stands date from the Coos Bay fire of 1868 or subsequent timber management. Natural fire regimes created a complex mosaic of multi - age class stands with large numbers of snags and fire-maintained natural openings.	The PCPG corridor is on a broad ridge and affects about 0.03% of the vegetation in the Coquille watershed (Table 2.3.2.1-3. Approximately 1.21 acres of riparian reserve or 0.11% of total Riparian Reserves in the watershed may be impacted. This is a minor portion of the watershed and well within the natural range of variability for changes in vegetation.
Flow Regimes	Landscape conditions were highly variable with respect to flows. Where fire events overlapped with high intensity rainfall events, substantial increases in flows over background conditions were possible because of lack of interception by forest canopies. High intensity rain events (>4 inches in 24 hours) typically on a highly variable cycle that averaged 5+ years.	The PCGP corridor is located on, or near a ridgetop on BLM lands and is very unlikely to contribute any change in peak flows because of the location and limited scale of the project (0.07% of the subwatershed on BLM lands).
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below today's temperature standard. Similar forested headwater streams monitored in 2003 through 2005 in the Umpqua basin to the north and elsewhere in the South Coast basin had 7-day average maximum temperatures ranging from 58.2 ºF to 62.9 ºF. These streams were cool and exhibited relatively little diurnal temperature fluctuation (BLM 2010: 79)	PCGP is not expected to affect water temperature at this location because there are no streams intersected in the Coquille River watershed.

2.3.4.5 Compliance with Land Management Plans

Compliance with Standards and Guidelines contributes to compliance with the ACS. Where applicable Standards and Guidelines cannot be met, the analysis must show that does not prevent attainment of the ACS (table 2.3.4.5-1).

TABLE 2.3.4.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Riparian Reserves - Lands, pg. 16, para. 2	LH-4: Issuing leases, permits, right-of-way and easements	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, etc.
Riparian Reserves - General Riparian Area Mgmt., pg. 16, para. 4	RA-4: Locating water withdrawal sites	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions because all such needs would be provided by municipal sources.
Riparian Reserves - Roads Mgmt., pg. 13, para. 2	RF-2: Road construction standards and guidelines	No new PCGP roads intersect Riparian Reserves in the Coquille watershed.
Riparian Reserves - Roads Mgmt., pg. 13, last & pg. 14, 1st ¶	RF-4: New culverts, bridges and other stream crossings	No new road crossings of streams are proposed in the watershed. Existing road crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.

Draft

TABLE 2.3.4.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Riparian Reserves - Roads Mgmt., pg. 14, para. 2	RF-5: Minimizing sediment delivery from roads	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction.
Riparian Reserves - Roads Mgmt., pg. 14, para. 3	RF-6: Maintaining fish passage	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Riparian Reserves - Roads Mgmt., pg. 14, para. 4	RF-7: Transportation Management Plan development	The TMP meets all the requirements of RF-7.
Riparian Reserves - watershed & Habitat Restoration, pg. 17, para. 3	WR-3: Proper use of planned mitigation and restoration	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		There are no known impacts to Survey and Manage Species in the Coquille River watershed.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the Coquille River are currently 17% LSOG.

2.3.4.6 Cumulative Effects

Activities on BLM Lands

The BLM manages less than three percent of the Coquille watershed. The following projects are scheduled to occur on BLM lands in the Coquille watershed (table 2.3.4.6-1). These projects are designed to be consistent with standards and guidelines and objectives for the Coos Bay RMP.

Collectively, these projects are expected to improve watershed conditions on BLM lands by:

- Reducing road-related sediment,
- Reestablishing conifers in Riparian Reserves that are now occupied by hardwoods and
- Improving stand health by reducing stand density on existing conifer stands.

Activities on Private Lands

Private lands comprise about 97 percent of the Coquille watershed. Private lands in the Coquille watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Draft

TABLE 2.3.4.6-1 **Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP**				
5th Field Watershed	**6th Field Subwatershed**	**Project Name**	**Project Description**	**Resources Affected**
Coquille River	Cunningham Creek	**Proposed Action:** Calloway Creek timber sale. NEPA complete; sale planned for 2017.	265 acres of stand density management, including 110 acres in riparian reserve; 127 acres of hardwood conversion including 56 acres in riparian reserve; with 2.2 miles temporary road construction, 1.1 miles road improvement, and 1.7 miles renovation.	Upland and riparian vegetation, road network, water quality.
Coquille River	Cunningham Creek	**Proposed Action:** Catching Creek Conversion timber sale. NEPA complete; sale planned for 2016.	2 acres of hardwood conversion, including 1 acre in riparian reserve; with 0.2 miles renovation.	Upland and riparian vegetation, road network, water quality.
Coquille River	Cunningham Creek	**Proposed Action:** Hungry Mountain timber sale. NEPA complete; sale planned for 2016.	178 acres of stand density management, including 77 acres in riparian reserve; 57 acres of hardwood conversion including 26 acres in riparian reserve; with 1.5 miles temporary road construction.	Upland and riparian vegetation, road network, water quality.
Coquille River	Cunningham Creek	**Proposed Action:** West Cunningham timber sale. NEPA complete; sale planned for 2016.	222 acres of stand density management, including 66 acres in riparian reserve [2 acres of the 222 are within the pipeline R/W; 1 of which is in riparian reserve]; 67 acres of hardwood conversion including 34 acres in riparian reserve; with 0.9 miles tempo	Upland and riparian vegetation, road network, water quality.
Coquille River	Cunningham Creek	**Proposed Action:** Wilson Creek 4 timber sale. NEPA complete; sale planned for 2015.	69 acres of stand density management, including 20 acres in riparian reserve; 4 acres of hardwood conversion; with 0.2 miles temporary road construction and 0.6 miles renovation.	Upland and riparian vegetation, road network, water quality.

Cumulative Effects

The Pacific Connector Right of Way comprises about 1.37 acres or 0.05 percent of the BLM lands, and 0.03% of private lands in the Coquille watershed (table 2.3.4.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the Pacific Connector project, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Coquille watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

Draft

2.3.4.7 Project Effects Compared by ACS Objective

The PCGP corridor intersects one riparian reserve near a ridgetop near the watershed boundary in Cunningham Creek, but does not intersect any stream channels. Approximately 1.21 acres or 0.11% of the Riparian Reserves in the Coquille watershed are affected (table 2.3.4.7-1).

TABLE 2.3.4.7-1

Project Effects and ACS Objectives, Coquille Watershed

ACS Objective	Pacific Connector Gas Pipeline Effects Coquille watershed
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are a landscape-scale feature. The pipeline corridor would affect approximately 1.21 acres or 0.11 percent of Riparian Reserves in the Coquille River watershed (Appendix J Table 2.3.4.1-3). This is well within the range of natural variability for changes in vegetative condition in the Coast Range Province. No stream channels are crossed in the watershed. The Coquille River watershed on BLM-managed lands is approximately 39% LSOG.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project would not intersect any streams and would affect 0.11 percent of Riparian Reserves in the Coquille River watershed; therefore, discernible impacts on aquatic- and riparian-dependent species are unlikely.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project would not affect streambanks or stream bottoms in the Coquille River watershed because the Project would not intersect stream channels.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	The Project would not intersect any streams in the Coquille River watershed; therefore, it would have no impact on aquatic- and riparian-dependent species.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Project would not affect the sediment regime for aquatic species because of the limited scale of the Project, application of Best Management Practices and the requirements of the ECRP, and the lack of intersections with stream channels.
Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project would not affect instream flows because there are no stream intersections.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not affect floodplains and water table elevations in meadows because there would be no intersections with these features.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The impacts of the Project on riparian vegetation would be minor and limited to the site of construction. Most of the Riparian Reserve vegetation at this site is second-growth upland forest. Existing herbaceous and brush cover would be maintained to the extent practicable within the clearing limits. LWD would be placed back within the cleared area. No stream channels would be intersected.

TABLE 2.3.4.7-1 **Project Effects and ACS Objectives, Coquille Watershed**	
ACS Objective	**Pacific Connector Gas Pipeline Effects Coquille watershed**
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The impacts of the Project on riparian vegetation would be minor and limited to the site of construction. Most of the Riparian Reserve vegetation is upland second-growth forest. Existing herbaceous and brush cover within the clearing limits would be maintained to the extent practicable. LWD and boulders would be restored to the disturbed areas after construction. Revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.3.4.8 Summary

Given the location of the pipeline corridor on BLM lands, the very small proportion of BLM Riparian Reserves (0.11%) and the relatively small area of the BLM administered lands in the Coquille River watershed affected by the PCGP (1.37 acres or 0.05 percent of the watershed), it is highly improbable that actions related to the PCGP on BLM lands could affect watershed condition in the Coquille River watershed or the Cunningham Creek subwatershed. No project effects relevant to the ACS have been identified that are outside of the natural range of variability for watersheds on BLM lands in the Coast Range Province.

2.3.5 North Fork Coquille River Fifth Field Watershed HUC 1710030504

2.3.5.1 Overview

The North Fork Coquille River watershed is located within the Coast Range Province. It is a tributary of the Coquille River which discharges into the Pacific Ocean at Bandon, Oregon, about 23 miles south of Coos Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

The 153.7 sq. mile (98,407 acre) watershed includes four subwatersheds: Moon Creek, Hudson Creek, Middle (or Cherry) Creek and Johns Creek (table 2.3.5.1-1, figure 2.3-3). Topography in the watershed is mountainous with elevations ranging from near mean sea level (msl) to approximately 2,000 ft above msl The North Fork Coquille watershed contains approximately 1,060 miles of streams based on the GIS streams layer. Headwater areas are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising 80% of the stream miles in the watershed (BLM 2002a: 6-1). The overall stream density in the watershed is 6.9 mi./sq. mi. Approximately 37.5% of the land in the watershed is managed by the Coos Bay BLM District. The rest (62.5%) is in non-federal ownership. There are no NFS lands in this watershed.

Figure 2.3-3 shows the checkerboard pattern of the BLM-managed lands. Land allocations are summarized in table 2.3.5.1-1. LSRs constitute around five per cent of BLM land in the Hudson and Johns Creek subwatersheds, more than half of the Middle Creek subwatershed BLM land, and almost 85% of the BLM land in the Moon Creek subwatershed. Designated LSRs constitute 45% of the BLM lands in the entire North Fork Coquille River watershed. All mapped LSR lands are in LSR RO 261. There are 1,099 acres of unmapped LSRs of which 170 acres are associated with

Draft

KOACs and 929 acres are associated with marbled murrelets. No unmapped LSRs are affected by the PCGP project in the North Fork Coquille watershed.

Location and Routing

The PCGP corridor enters the North Fork Coquille River watershed at MP 19.9 and travels 8.3 miles in a southeasterly direction through the Hudson and Middle Creek subwatersheds before exiting the watershed at MP 28.2 (figure 2.3-3). Moon Creek and John Creek subwatershed are not affected by the PCGP corridor.

Within the North Fork Coquille River, the PCGP corridor traverses a total of 2.86 miles in several tracts of BLM land; 2.14 miles are in the Hudson Creek Subwatershed, and 0.72 miles are in the Middle Creek subwatersheds (table 2.3.5.1-2). A total of 5.49 miles of non-federal land is also crossed in these two subwatersheds. The PCGP corridor effects about 31.9 acres (0.41%) and 10 acres (0.21%) of the Hudson and Middle Creek subwatersheds, respectively, and 138 acres (0.15%) of the entire fifth field watershed (table 2.3.5.1-2).

No LSRs would be affected by project construction in the North Fork Coquille River watershed. Approximately 41.92 acres of BLM matrix land would be affected by PCGP project construction (table 2.3.5.1-3). This constitutes 0.20% of the matrix land and 0.11% of all BLM land the watershed. Over the entire watershed (i.e., all ownerships), 138.11 acres would be cleared, and 7.99 acres would be modified; 0.15% of all ownerships in the watershed area would be affected (table 2.3.5.1-2).

To minimize aquatic and riparian effects, the PCGP corridor parallels, to the extent practicable, an existing powerline corridor and road as it traverses the North Fork Coquille River watershed (figure 2.3-3). Where the corridor leaves these facilities, it runs mainly on or near ridge tops. One perennial fish bearing stream, Middle Creek at MP 27.04, two intermittent tributaries to Steele Creek at MP 20.34 and 21.36, one intermittent tributary to Middle Creek at MP 27.01 and three small (<0.5 acre in size) forested wetlands are crossed by the corridor in the North Fork Coquille River watershed (Table 2.3.5.1-4). The Riparian Reserves adjacent to 6 intermittent channels and 1 perennial channel are clipped, but channels are not crossed. Approximately 16.55 acres of vegetation in Riparian Reserves (0.11% of the total Riparian Reserves in the North Fork Coquille River watershed) would be cleared, of which 9.13 acres are associated with channel crossings and 7.42 acres are within Riparian Reserves of stream channels that are adjacent to, but not crossed by the project (table 2.3.5.1-3). Nearly all of this vegetation is mid or early seral coniferous forest with red alder (table 2.3.5.1-4).

Draft

Figure 2.3-3 PCGP Routing and Subwatershed Boundaries, North Fork Coquille River Watershed

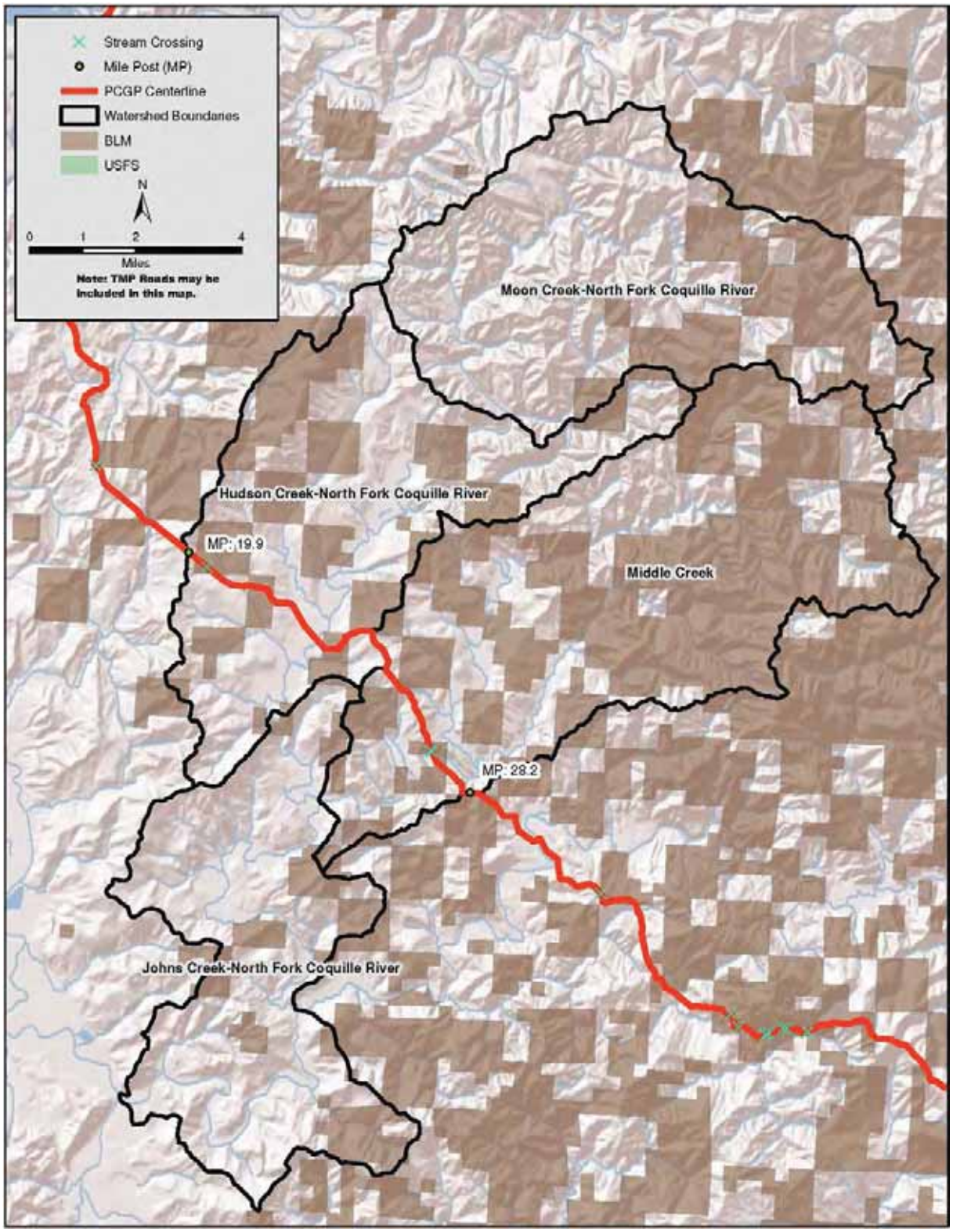


TABLE 2.3.5.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in North Fork Coquille Watershed HUC 1710030504

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
					Designated LSR b/		Matrix		Riparian Reserves c/	
		BLM	Forest Service	Other	BLM	Forest Service	BLM	Forest Service	BLM	Forest Service
Hudson Creek Subwatershed	23,018.59	7,814.75	0.00	15,203.84	91.49		7,723.26		3,825	
Johns Creek Subwatershed	18,779.64	3,171.29	0.00	15,608.35			3,171.29		1,857	
Middle Creek Subwatershed	32,467.94	19,399.00	0.00	13,068.94	10,704.76		8,694.24		9,939	
Moon Creek Subwatershed	24,140.63	6,468.71	0.00	17,671.92	5,472.07		996.64		3,654	
Watershed Total	**98,406.80**	**36,853.75**	**0.00**	**61,553.05**	**16,268.32**	**0.00**	**20,585.43**	**0.00**	**19,275**	

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 1099 acres (170 acres KOAC, 929 acres MAMU stands) are unmapped LSRs.
c/ Occur within LSR and Matrix Land Allocations; Acres derived from North Fork Coquille watershed assessment, Table Intro-2, page 1-4.

TABLE 2.3.5.1-2

PCGP Project Corridor (miles) and project Area (acres) in the North Fork Coquille watershed (HUC 1710030504) by Land Ownership

Unit a/	Land Ownership															
	BLM				Forest Service				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Forest Service Land Affected	Corridor Length (miles)	Project Area (acres)		% of Other Land Affected	Corridor Length (miles)	Project Area (acres)		% of Unit Affected
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Hudson Creek Subwatershed	2.14	31.90		0.41					2.84	43.01		0.28	4.98	74.91		0.33
Johns Creek Subwatershed																
Middle Creek Subwatershed	0.72	10.00		0.05					2.65	53.20	7.99	0.47	3.37	63.20	7.99	0.22
Moon Creek Subwatershed																
Watershed Total	**2.86**	**41.90**	**0.00**	**0.11**	**0.00**	**0.00**	**0.00**	**0.00**	**5.49**	**96.21**	**7.99**	**0.17**	**8.35**	**138.11**	**7.99**	**0.15**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.5.1-3

PCGP Project Area (acres) on Federal Lands in the North Fork Coquille Watershed HUC 1710030504 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Hudson Creek Subwatershed	BLM					31.92		0.41		13.72		0.36		31.92		0.41	
	NFS																
Johns Creek Subwatershed	BLM																
	NFS																
Middle Creek Subwatershed	BLM					10.00		0.12		2.83		0.03		10.00		0.05	
	NFS																
Moon Creek Subwatershed	BLM																
	NFS																
Watershed Totals	**BLM**					**41.92**		**0.20**		**16.55**		**0.09**		**41.92**		**0.11**	
	NFS																

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.3.1.5-4

Riparian Reserve Effects North Fork Coquille River HUC 1710030504

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Hudson Creek Subwatershed HUC 171003050403																													
CBD BLM	20.14	Trib to Steele Creek	RR clipped	I	No			Yes				0.00	2.90			2.90	0.41			0.41		3.31		3.31		3.31	No	No
CBD BLM	20.34	ESI028Trib. to Steele Creek	2-3' wide v-shaped channel, 6' deep, in30 year old PSME forest, tributary to Steele Creek	I	Yes	6.57		No				0.00	1.95			1.95	0.33		0.02	0.35		2.30		2.30		2.30	No	No
CBD BLM	20.48	Trib to Steele Creek	BLM RR of stream crossing on Private land	I	No			Yes				0.00	1.83			1.83	0.51			0.51		2.34		2.34		2.34	No	No
CBD BLM	21.36	ESI029Trib. to Steele Creek	3' wide incised intermittent stream in30-40 year old PSME forest, tributary to Steele Creek.	I	Yes	0.00		No				0.00	0.99			0.99				0.00		0.99		0.99		0.99	No	No
CBD BLM	21.57	Trib. to Steele Creek	RR of Adjacent lateral	I	No			Yes				0.00	0.34			0.34				0.00		0.34		0.34		0.34	No	No
CBD BLM	23.38	CW-10	Red alder dominated forested wetland	W	Yes		0.46	No				0.00			1.93	1.93				0.00		1.93		1.93		1.93	No	No
CBD BLM	23.53	CW-11	Red alder dominated forested wetland	W	Yes		0.07	No				0.00			1.74	1.74				0.00		1.74		1.74		1.74	No	No
CBD BLM	23.74	Unnamed Trib, NF Coquille	RR of Adjacent lateral	I	No			Yes				0.00	0.77			0.77				0.00		0.77		0.77		0.77	No	No
Subtotal Hudson Creek Subwatershed		Crossed: 2 Int. Channels 2 Wetlands	Clipped: 4 Int. Channel RR	8	4		0.53	4	0.00	0.00	0.00	0.00	8.78	0.00	3.67	12.45	1.27	0.00	0.02	1.27	0.00	13.72	0.00	13.72	0.00	13.72	0	0
Middle Creek Subwatershed HUC 171003050402																													
CBD BLM	27.01	BSI137Trib. to Middle Creek	3-7' wide, parallel to BSI 136, ~10%gradient at top	I	Yes	12.69		No				0.00				0.00				0.00		0.00		0.00		0.00	No	Yes

TABLE 2.3.1.5-4

Riparian Reserve Effects North Fork Coquille River HUC 1710030504

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
CBD BLM	27.02	BW134	Non forested wetland Flat area; intermittent stream outfalls from wetland	W	Yes	0.00	0.01	No	0.01			0.01				0.00				0.00		0.01		0.01		0.01	No	No
CBD BLM	27.02	BSI136Trib. to Middle Creek	2-4' wide intermittent drain; joins BSI 135 near Middle Creek	I	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	Yes
CBD BLM	27.04	BSP133Middle Creek	Middle Creek-steep banks, 30-60' wide,<2% gradient	P	Yes	65.03		No	1.38			1.38	0.01			0.01	0.02		0.62	0.64	0.13	2.16		2.16	0.21	2.37	Yes	Yes
CBD BLM	27.04	BSI135Trib. to Middle Creek	Narrow intermittent drainage that starts atBW134, steep at top	I	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	Yes
CBD BLM	27.07	RR of Middle Creek	RR on non-forest pasture land cleared by TAR	P	No			Yes				0.00				0.00			0.66	0.66		0.66		0.66		0.66	No	Yes
Subtotal Middle Creek Subwatershed		Crossed: 1 Int. Channel 1 Per. Channel 1 Wetland	Clipped: 2 Int. Channel RR 1 Per. Channel RR	6	3		0.01	3	1.39	0.00	0.00	1.39	0.01	0.00	0.00	0.01	0.02	0.00	1.28	1.30	0.13	2.83	0.00	2.83	0.21	3.04	1	5
Total NF Coquille Watershed		Crossed: 3 Int. Channels 1 Per. Channel 3 Wetlands	Clipped: 6 Int. Channel RR 1 Per. Channel RR	14	7		0.54	7	1.39	0.00	0.00	1.39	8.79	0.00	3.67	12.46	1.27	0.00	1.30	2.57	0.13	16.55	0.00	16.55	0.21	16.76	1	5

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

TABLE 2.3.5.1-5

Stream Crossing Turbidity and Risk Assessment, North Fork Coquille Watershed

Fifth Field Water-shed	Sixth Field Subwater shed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
North Fork Coquille River	Hudson Cr.	20.34	I	2-3' wide v-shaped channel, 6' deep, in30 year old PSME forest, tributary to Steele Creek	3	6.57	11.86	6	Highly erosion resistant	Bedrock	M	L	H	GREEN
North Fork Coquille River	Hudson Cr.	21.36	I	3' wide incised intermittent stream in30-40 year old PSME forest, tributary to Steele Creek.							m	l	h	Green
North Fork Coquille River	Middle Cr.	27.01	I	3-7' wide, parallel to BSI 136, ~10%gradient at top	5	12.69	48.34		Highly erosion resistant	Cobbles-silt	M	L	M	BLUE
North Fork Coquille River	Middle Cr.	27.04	P	Middle Creek-steep banks, 30-60' wide,<2% gradient	45	65.03	0.4	10	Erodible sand; Somewhat non-erodible bedrock at base RB; widened as a result of incision	Gravel and sand; 10-15 feet over bedrock	M	M	M	YELLOW

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified:

Draft

2.3.5.2 Existing Conditions

Original Watershed Analysis Findings

The North Fork Coquille River watershed assessment was completed in January 2002. General watershed conditions at that time can be summarized as follows (BLM 2002a: 2-1

- Most upland and riparian habitats have been modified by past and ongoing timber harvest although timber management is primarily on matrix lands. As a result, early and mid-seral stage stands dominate the landscape. Most stands had previously been managed to maximize merchantable wood production. Some stands are now overstocked from lack of thinning to reduce stand density. Agricultural use on private lands have altered riparian vegetation in valley bottoms and floodplains. Past actions in areas currently identified as Riparian Reserves (including substantial road construction) have resulted in the establishment of alders and other hardwoods next to many stream channels, thus reducing future recruitment of large, longer living conifers.

- The dominant erosion process throughout the watershed is shallow rapid landslides. In addition, roads are a source of chronic sediment delivery in some areas. Sediments transport and delivery associated with the development and maintenance of the road system in the watershed have negatively affected aquatic habitats.

- The watershed exhibits rapid rise and fall in streamflow in response to storm events. Little water is stored as either snow or ground water. Rapid runoff is attributable, at least in part, to shallow soils with limited water storage capacity. The increase in runoff, combined with the rapid modifications to the flow regime results in an increase in erosion of the bed and banks, and could scour functional spawning habitat. If channel scour occurs during the spawning period, mortality of juvenile salmonids is likely to occur. **This is significant for the PCGP corridor because it indicates that rapid runoff during storm events is possible if effective ground cover is not present.**

- Roads paralleling streams and crossing tributaries restrict interactions between the aquatic and riparian habitats, and can be barriers to recruitment of large woody debris (LWD) and gravel from upslope areas.

- Removal of LWD from streams through stream cleaning, wood salvaging, and road construction has greatly reduced the amount of LWD in many channels. This has resulted in loss of structural and habitat complexity and the subsequent inability of the drainage network to retain sediments. Past loss of large riparian and upslope trees (particularly conifers) along many streams would reduce the future potential for recruitment of LWD to the channels and floodplains.

- The 303(d) listed streams in the North Fork Coquille River watershed includes six reaches with elevated temperatures and one with unacceptably high fecal coliform counts. Several other stream reaches are in ODEQ's Water Quality Limited Streams Database based on other water quality concerns, but the data for these parameters are insufficient to either list or classify them with regard to standards.

- The watershed contains habitat for northern spotted owls and coho salmon, which are listed as "Threatened" under the federal Endangered Species Act. In addition, Survey and Manage species occupy habitat at locations throughout the watershed. Many of these species use habitats commonly associated with late-successional forests.
- Numerous culverts partially or entirely block fish and amphibian passage, and may, therefore, impact listed species by limiting access to suitable habitat upstream of road crossings.

In summary, the combined effects of agricultural uses on private lands and timber harvest on both private and BLM lands, along with substantial road construction, have degraded stream habitat conditions to varying degrees throughout the watershed. These types of degraded stream habitat conditions are common throughout much of the Oregon Coast Range Province. Except for some improvement in vegetative recovery, instream LWD placement projects, and sediment reduction projects at select locations in the watershed, most of these watershed conditions persist currently.

In 2001, BLM prepared a Water Quality Restoration Plan for the North Fork Coquille River Basin required under Section 303(d) of the Clean Water Act of 1972. This document was intended to explore the causes of water quality impairment and design restorative management strategies The plan revealed that "most reaches on BLM-administered lands are at or near maximum shade values" (BLM and ODEQ 2001b: 22). Data collected by the BLM in 2000 show the upper portions of the North Fork Coquille River, Cherry Creek, Middle Creek and Woodward Creek did not exceed the temperature standard (BLM 2001: 15).

Changes in Watershed Condition

No large disturbance events that could alter watershed conditions have been documented since the North Fork Coquille River watershed assessment was prepared. Project-level watershed restoration actions have focused on two particularly effective types of activities, the reduction of road-related sediment transport and delivery to streams and restoration of instream LWD. Riparian Reserves in the watershed continue to recover their intended functions slowly from past management activities, particularly with respect to increases in canopy cover as hardwoods (e.g., alder, maple) reestablish and conifers continue to increase in both height and diameter. Collectively, the overall amount of canopy cover and vegetative complexity within the Riparian Reserves continues to increase, thereby providing additional shade during the warmer summertime periods. Timber management on private industrial timberlands in the watershed has been active and is on-going.

Watershed monitoring conducted by the BLM from 2002 to the present shows improving overall watershed and vegetation conditions on agency-administered lands in the Moon Creek, Middle Creek and Hudson Creek subwatersheds. Roads, particularly native and aggregate surfaced roads not managed by the BLM, remain significant sources of aquatic habitat sedimentation in these three subwatersheds (Fowler 2012; Forest Service and BLM 2012).

The Oregon watershed Enhancement Board (OWEB) published an analysis of watershed conditions for the Coquille River and other coastal river basins in 2008 (Bauer et al. 2008). watershed conditions in the Hudson and Middle Creek subwatersheds were found to be limiting for most parameters and watershed processes. These results are not surprising, given past and (on non-federal land) ongoing management practices in the watershed. Aquatic and riparian habitat is

generally in fair to good condition in upper reaches of the watershed. Downstream, in lower gradient stream reaches, aquatic and riparian habitat is in poor to fair condition. Most of these low gradient reaches are located outside of BLM administered lands (BLM and ODEQ 2001a: 34). Numerous culvert replacement projects where culverts that blocked upstream migration of aquatic biota on BLM lands have substantially improved access to aquatic habitats. A substantial amount of instream restoration work occurred in the Hudson Creek and Middle Creek watersheds subsequent to the 2007 analysis.

Current Watershed Conditions

Although restoration projects have substantially increased access to habitat and improved condition in the stream reaches where restoration projects have occurred, current watershed conditions in the North Fork Coquille River watershed are similar to those in the watershed assessment, with emphasis on the following:

- The North Fork Coquille River watershed is "At Risk" or "Not Properly Functioning" for multiple watershed indicators, including water temperature, presence of spawning gravel, availability of summer and winter rearing habitat, status of LWD, and channel modification
- The North Fork Coquille River remains 303 (d) listed for temperatures and sediment
- High road densities and road-related sediment continue to negatively impact aquatic habitats
- Upland fine sediment sources may be limiting aquatic habitat condition
- Loss of pool habitat for overwintering juvenile salmonids remains a major concern.
- Access to habitat has improved substantially on BLM lands.

2.3.5.3 Natural Disturbance Processes

Natural disturbance regimes in the North Fork Coquille River watershed are consistent with the episodic pulse-type disturbance processes described for the Coast Range Province in Section 2.1.1. Forest fires and high intensity rainfall / wind events are the primary natural disturbance factors. According to the North Fork Coquille Watershed Analysis (BLM 2002):

Aerial photographs from 1950, 1955 and 1959 showed a large number of natural origin slides totaling 28 debris avalanches and 52 debris torrents. Some of these slides were major disturbances that ran for miles affecting Park Creek and Middle Creek and major tributaries (BLM 2002: 3-7). This concentration of naturally occurring avalanches and torrents suggests intense storms during the late 1940s and 1950s.

Major fire episodes occasionally reset large portions (hundreds to thousands of acres) of this province to early seral conditions. Between major fire episodes (50-300 years), the landscape typically experiences relatively stable climatic conditions, during which secondary succession proceeds (BLM 2010: 58). Occasional smaller low intensity fire events and windstorms occur, creating a complex forest stand structure, with openings and "snag patches." High intensity rainfall events (4 inches or more in 24 hours) occur on a cycle of 5+ years (BLM 2010: 17). Occasionally, high intensity rainfall events have occurred in areas recently burned by large, stand replacement fires, resulting in major pulses of sediment to aquatic habitats along with numerous other changes in land-water interactions (BLM 2002: 7-3).

2.3.5.4 Project Effects and Natural Range of Variability

Tables 2.3.5.1-4 and 5 describe affected Riparian Reserves and stream channel intersects in the North Fork Coquille watershed.

Table 2.3.5.1-5 summarizes the risk of increased turbidity and the overall crossing risk associated with each stream crossing in the watershed (Adapted from GeoEngineers, 2013c). Sites in the "green category are considered low risk for construction impacts (see Section 1.3). Sites in the yellow management category represent moderate risk to stream channel stability based on this risk assessment scoring. More robust Best Management Practices, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of Best Management Practices on "yellow" crossings. Where potential habitat impacts are high, Best Management Practices in the "Green" Category may also be applied. Table 2.3.5.4-1 describes the applicable Best Management Practices.

TABLE 2.3.5.4-1

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**27.01**	**27.04**	**20.34, 21.36**
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization

Draft

TABLE 2.3.5.4-1

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Source	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.		

Two channel crossings at MP 20.34 and 21.36 ranked as "Green" (high potential for site response) because of bank incision and channel gradient. Middle Creek at MP 27.04 ranked "Yellow" (moderate potential for both construction impacts and site response because of potential for bank erosion. The remaining crossings are ranked as "blue" for construction impacts and site response.

Channel conditions that have placed streams in the yellow category (GeoEngineers, 2011) include:

- Channel incision: Incised channels represent the greatest risk observed on the Pacific Connector alignment because they are likely to result in continued bank erosion. For those incised channels that are not already eroded down to bedrock, additional scour is also possible depending on whether downstream grade control is present in proximity to the crossing site. Channel banks would require the incorporation of deformable stabilization during site restoration.

- Channel slope: streams at lower and moderate slopes are more prone to channel migration, while streams on moderate slopes are prone to channel scour.

Draft

- Riparian condition: More robust woody vegetation in the riparian zone typically reduces avulsion risk and aids in reducing erosion of stream banks. Revegetation to maintain the continuity of the existing riparian zone is appropriate for these streams.
- Channel bed and bank materials: Erodible materials in the bed or bank present a greater short-term risk of scour or lateral migration than do non-erodible materials. Erodible banks are more likely to require the addition of deformable bank or bank toe stabilization. Channel scour is addressed by selection of the pipe burial depth and by the selective placement of available coarse materials in the backfill.

The only perennial stream crossing in the watershed occurs at Middle Creek at MP 27.04. This is one of the larger stream crossing on the BLM or FS lands on the project in terms of channel width (table 2.3.5.1-5). This crossing has moderate potential for bank erosion because of channel configuration and silty banks. Site-specific field review of the crossing at Middle Creek MP 27.04 (GeoEngineers 2013c: C-7) documented that:

> Middle Creek flows west across a terraced valley floor at an elevation of approximately 104 feet at the crossing location. The creek has incised through non-cohesive silt and sand to bedrock, creating steep banks up to 10 feet high (figure 2.3-4). The moderately hard, sedimentary bedrock is exposed along the lower stream banks and on the streambed upstream of the crossing. Field evidence indicates that the stream banks failed recently within the study area, widening the active channel up to 60 feet (roughly 30 feet on each bank) at several locations. Debris from the failures apparently obstructed the channel temporarily, creating deep slack-water ponds upstream of the failures.
>
> The bed at the crossing is composed of sand and gravel. Although no bedrock is observable at the pipeline crossing, bedrock outcrops are present on the streambed and in the banks upstream of the crossing. Extrapolation of the exposed outcrops, along with geotechnical borings located near the site, indicate that bedrock may be present at depths ranging from 2 to 7 feet beneath the channel floor at the crossing. The shallow depth to bedrock likely affects channel performance in the vicinity of the pipe crossing in two ways: 1) it limits future channel incision to the elevation of the bedrock, and 2) bedrock exposed on the channel floor diverts flow energy from the streambed to the banks, causing erosion and channel widening.

Draft

Figure 2.3-4 Middle Creek Crossing at MP 27.04

North State Resources conducted a field review of the Middle Creek crossing in February, 2013. Numerous bank failures of 10-60 yards^3 were observed that likely serve as a chronic source of sediments. These deposits may be associated directly or indirectly with debris flows documented in the watershed analysis (BLM, 2002a: 3-7).

This field review concluded that:

1. Any or stream widening effects caused by the PCGP would likely be substantially less than the observed effects of historic and current bank failures and sloughs and would be well within the range of natural variability for this reach of Middle Creek. Rapid revegetation of banks would be appropriate to reduce the probability of any additional stream widening or bank erosion. The Best Management Practices proposed for "Yellow" crossings are appropriate for this crossing and are likely to be successful at limiting post-construction erosion and bank-widening. Attempts to "armor" the crossing are not recommended as they would likely create new erosion nick points downstream and are unlikely to stay in place.

2. The silty stream banks are a potential source of sediment. Appropriate erosion control measures for this crossing include:

    a. Taper or 'lay-back' the existing near vertical stream banks upstream and downstream of the pipeline crossing to blend with the elevation of the finished pipeline centerline. Existing bank material below the high water mark would be excavated 50' either side of the pipeline construction area. (ie., do not leave a hard transition from the existing near vertical banks to the slot cut through the banks over the pipeline).

    b. Establishing effective ground cover within the Riparian Reserve prior to the onset of seasonal precipitation in the fall.

    c. Aggressive erosion control seeding to establish 100% effective ground cover at this site.

    d. Redistributing/scattering slash generated during timber clearing within the construction area to a point area 50' either side from mean high water mark during final cleanup after seeding (per ECRP p. 26.).

    e. Aggressive revegetation using willow cuttings to plant an area 15'-wide above low-flow water mark paralleling the stream. Planting area to include newly tapered stream banks.

    f. Limiting stream-side operations during periods of wet weather.

    g. Avoid "armoring" banks with logs or rip-rap at the crossing site as this is likely to create turbulence during higher flows that would accelerate rather than reduce bank erosion.

With application of project Best Management Practices described above, downstream sediment generated during construction should be consistent with effects described in Section 1.3.1 for dry, isolated crossings and far less than amounts of sediment created by naturally occurring bank sloughs and failures. During construction, emphasis should be placed on appropriate storage of excavated material and an effective sediment trap for hyporheic flows that are pumped out of the crossing.

Erosion control measures and bank stability Best Management Practices are expected to be effective for longer term stability of the site. Post-operations sediment related to the PCGP corridor is expected to be minor and well within the range of natural variability for the Coast Range Province.

Table 2.3.5.4-2 provides the range of variability of five key ecological processes in the North Fork Coquille River watershed. All processes have been affected to some degree by human activity. Also included in table 2.3.5.4-2 are evaluations of PCGP project effects on these ecological processes relative to the ranges of variability, considered in the context of past and ongoing natural and human disturbances in the watershed.

Draft

TABLE 2.3.5.4-2

PCGP Project Effects and Relevant Ecological Processes Described in the North Fork Coquille Watershed Assessment

Ecological Processes Relevant to the PCGP Project	Natural Range of Variability	Pacific Connector Effects
Erosional Processes	Naturally occurring landslides are well-documented in the watershed analysis (BLM 2002a: 3-7). Landslides are the dominant sediment delivery mechanism to stream systems. Erosional processes are highly variable and episodic in nature. Large scale, high intensity rain / wind events that occasionally overlap, temporally and spatially, with large stand-replacing fires are the primary causes of large pulses of sediment (BLM 2002a: 7-3). Exposed soils are subject to rapid surface erosion during storm events because of their shallow nature and limited water storage capacity.	The North Fork Coquille watershed assessment mapped areas of mass wasting and erosional risk (BLM 2002: 3-4, Appendix Map EROD-1). All areas crossed by the PCGP project corridor are classified as low, or very low probability of mass wasting (GeoEngineers 2009). The project is generally located adjacent to existing facilities and on ridge tops. Stream crossings have been avoided to the degree possible. Because of limited potential for mass wasting, project routing, application of erosion control measures and Best Management Practices, and anticipated rapid revegetation of disturbed areas, sediment effects are expected to be minor, short-term, and well within the range of natural variability for erosional processes for the Coast Range Province.
Ecological Succession / Vegetative Condition	BLM lands have been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was fire. Natural fire regimes created a complex mosaic of multi - age class stands with large numbers of snags and fire-maintained natural openings. Winds have also extensively modified some stand conditions. Flood (peak flows) and debris flows are major influences on riparian vegetation patch dynamics (Jones et al. 2000, cited in North Fork Coquille watershed assessment p.5-2). Current vegetative condition throughout the North Fork Coquille River watershed has been significantly altered by timber management and agricultural development.	The PCPG corridor lies adjacent to an existing road and a major powerline corridor or is in second growth forest for much of its length in the watershed. No LSOG forest is removed from Riparian Reserves in the Hudson Creek subwatershed, and 0.01 acres of LSOG forest is removed from Riparian Reserves in the Middle Creek subwatershed. The small scale of project vegetative effects at both the subwatershed scale (0.36% and 0.03% for Hudson and Middle Creeks, respectively.) and watershed scale (0.09%), along with replanting efforts during site restoration are well within the natural range of variability for changes in vegetative condition given the disturbance history of the coast range.
Flow Regimes	Because of shallow soils and limited water holding capacity, flow regimes are, by nature, highly variable. Where high intensity rainfall events occur on lands experiencing recent fire events, substantial increases in peak flows over background conditions are possible. Such high intensity rain events (>4 inches in 24 hours) occur on a highly variable cycle that averaged 5+ years in duration.	The PCGP project is unlikely to contribute discernible changes in peak flows because of the corridor routing and the limited scale of the project. Improvements to access roads identified in the TMP are intended to reduce the road-related effects to flow regimes in the watershed, and should more than mitigate any project effects.

Draft

TABLE 2.3.5.4-2

PCGP Project Effects and Relevant Ecological Processes Described in the North Fork Coquille Watershed Assessment

Ecological Processes Relevant to the PCGP Project	Natural Range of Variability	Pacific Connector Effects
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Similar forested headwater streams monitored in 2003 through 2005 in the Umpqua basin to the north and elsewhere in the South Coast basin had 7-day average maximum temperatures ranging from 58.2 ºF to 62.9 ºF (BLM 2010: 79). Stand replacement fires and human disturbance have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range (BLM 2002 p. 7-3). Stream temperatures in the watershed are influenced by position, orientation, channel condition, volume and shading. Elevation of stream temperature, in response to increased exposure to sunlight is inversely related to stream volume (BLM 2002a: 7-12). Therefore, loss of shading in downstream reaches has significantly less influence on (elevating) stream temperatures than loss of shade along upstream reaches (Brown, 1970, cited in BLM 2002a: 7-12).	Intermittent stream crossings have a low probability of increasing stream temperature because flows are discontinuous, with many streams drying up entirely by the critical late summer period, and stream volumes tend to be very low when they are flowing. Middle Creek is 303(d) listed for temperature along most of its length. Data collected by the BLM in 2000 show the upper portions of the North Fork Coquille River, Cherry Creek, **Middle Creek** and Woodward Creek did not exceed the temperature standard during the monitoring period (BLM 2001: 15). The PCGP project corridor has one crossing of Middle Creek at MP 27.04. Much of this reach lacks effective shade because of past timber management, agricultural development and presence of adjacent roads (figure 2.3-5). Construction would remove 75 feet of riparian vegetation on the south side of Middle Creek in the riparian reserve, possibly resulting in a small increase in solar exposure of the channel. Shading vegetation retained on the southwest side of the channel would continue to provide shade during later afternoon hours (figure 2.3-5). .
Aquatic Habitat and Stream Channel Complexity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and stream bank vegetation was indicative of relatively stable stream banks and channels that were relatively resilient during floods.	Past management practices have simplified channel conditions, removing LWD from channels, and eliminated future sources of LWD. During construction, the PCGP project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects are expected to be localized, minor and short-term.

Draft

Figure 2.3-5 PCGP crossing of Middle Creek at MP 27.04

2.3.5.5 Consistency with Land Management Plans

Standards and Guidelines are intended to regulate activities that occur within Riparian Reserves to ensure that objectives of the ACS are achieved. In the North Fork Coquille River watershed, NWFP standards and guidelines have been incorporated into the Coos Bay District RMP direction. Table 2.3.5.5-1 describes ACS-related BLM management direction, the corresponding NWFP standard or guideline and PGCP compliance with that management direction. These RMP directions address issuance of right-of-way, locating water withdrawal sites, road management issues (e.g. fish passage, sediment delivery), and proper use of mitigation and restoration. One RMP amendment is proposed related to management direction for protection of Survey and Manage Species (see Appendix M). This amendment would not prevent attainment of ACS objectives because the project does not threaten the persistence of any riparian related or riparian dependent Survey and Manage species would be affected by the project.

TABLE 2.3.5.5-1

Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction

RMP Management Direction	NWFP Standard / Guideline	PCGP Compliance
Riparian Reserves - Lands, pg. 16, para. 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, etc.
Riparian Reserves - General Riparian Area Mgmt., pg. 16, para. 4	RA-4: Locating water withdrawal sites.	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions because all such needs would be provided by municipal sources.
Riparian Reserves - Roads Mgmt., pg. 13, para. 2	RF-2: Road construction standards and guidelines.	One new temporary access road (TAR 27.1) is planned within a Riparian Reserves. TAR 27.1 would access the south side of the Middle Creek crossing. It lies within 440 feet of Middle Creek; therefore, it is within a Riparian Reserve. This temporary access route would cross an upland meadow and would, therefore, not require removal of streamside vegetation. No riparian vegetation or trees shading Middle Creek would be removed during road construction and the roadway would be restored to pre-construction condition following use.
Riparian Reserves - Roads Mgmt., pg. 13, last para. & pg. 14, 1st para.	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Riparian Reserves - Roads Mgmt., pg. 14, para. 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction.
Riparian Reserves - Roads Mgmt., pg. 14, para. 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road activities are implemented.
Riparian Reserves - Roads Mgmt., pg. 14, para. 4	RF-7: Transportation Management Plan development.	The TMP meets all the requirements of RF-7.
Riparian Reserves watershed & Habitat Restoration, pg. 17, para. 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.

Draft

TABLE 2.3.5.5-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project effects Survey and Manage species within the North Fork Coquille River watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix K). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the North Fork Coquille watershed are currently 45% LSOG.

2.3.5.6 Proposed Offsite Mitigation Measures

Offsite mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of offsite mitigation actions for the PCGP project. All proposed offsite projects related to effects in the North Fork Coquille River watershed are located in the watershed (table 2.3.5.6-1). Because of the checkerboard nature of BLM lands, it is often difficult to locate site-specific projects in the subwatershed where the impact occurred.

Offsite mitigation efforts in North Fork Coquille River watershed are focused on: (1) replacement of LWD in channels; and (2) surfacing and otherwise improving existing roads throughout the watershed to minimize sediment delivery and transport to aquatic habitats (table 2.3.5.6-1; Figure 2.3-6). Lack of LWD in channels greatly reduces habitat complexity and the ability of the channel to provide alluvial habitat suitable for salmonid spawning and rearing. Improvement of road drainage, road stabilization measures and reduction in road related sediment are major factors in maintaining and restoring functional aquatic habitat in the watershed reduction.

Large Wood Instream: LWD instream projects proposed by BLM as offsite mitigation of PCGP effects in the North Fork Coquille River watershed are described in table 2.3.5.6-1. Placement of LWD in channels adds structural complexity to the aquatic habitat by creating pools and riffles, and trapping fine sediments. This action can also contribute to reductions in stream temperatures over time, primarily by increasing the number and quality of pools in these channels (Tippery, Jones et al. 2010). Approximately 80 pieces of LWD per mile of channel would be placed in 1.5 miles of channel in Steinnon Creek and 2.2 miles of the Upper North Fork Coquille River (table 2.3.5.6-1). These mitigation actions are responsive to ACS objectives 2, 3, 4 and 5.

Road Surfacing and Repair: Road surfacing projects proposed by BLM as offsite mitigation of PCGP effects in the North Fork Coquille River watershed are described in table 2.3.5.6-1. Road surfacing reduces sediment transport to aquatic habitats by capping the fine textured sediments in the running surface of a gravel or dirt road with coarser rock or paving. Paving all but eliminates traffic-generated sediment transport. Bridge approaches on Woodward and Alder Creek Roads

Draft

would be paved to reduce sediment transport to nearby aquatic habitats. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 (Forest Service and BLM 1994b p. B-11, C-7).

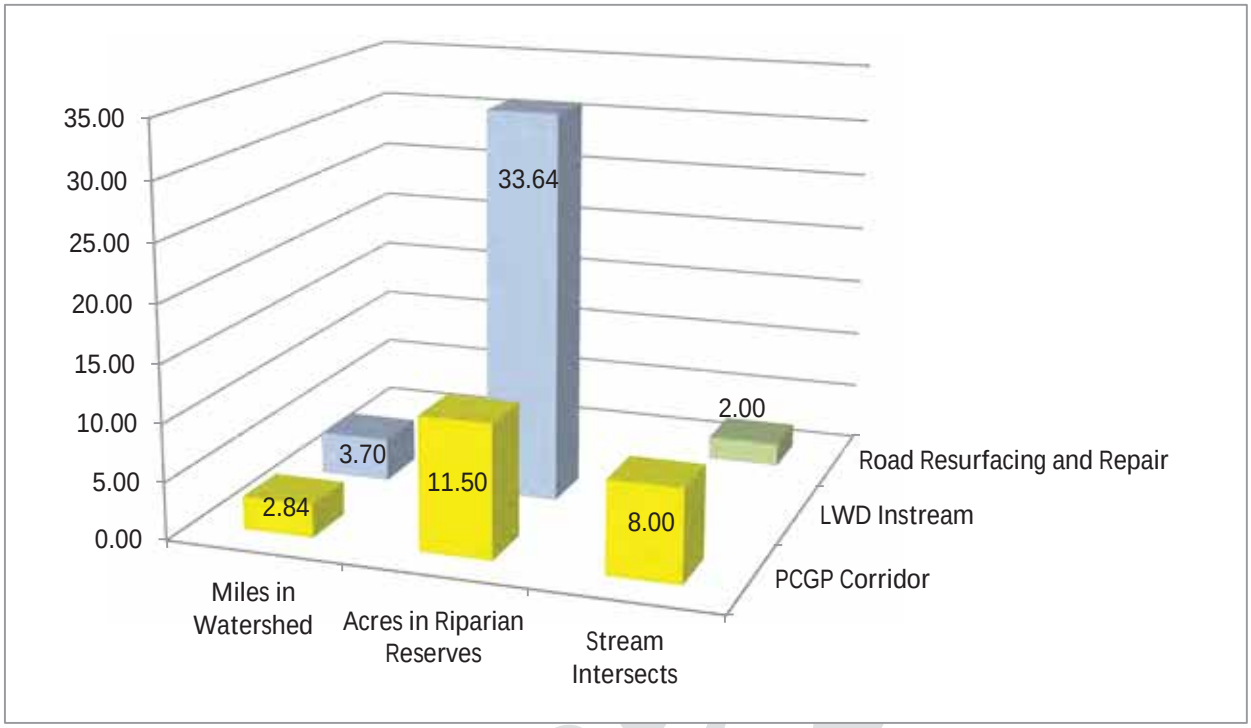
TABLE 2.3.5.6-1

Proposed Offsite Mitigation Projects for North Fork Coquille River Watershed

Project Type	Mitigation Group	Project Name	Qty.	Project Rationale
LWD Instream Placement	Aquatic Habitat	Steinnon Creek Instream Large Wood Placement	1.5 miles	Lack of recruitment of LWD into channels is a consistent factor limiting aquatic habitat quality in watersheds crossed by the PCGP. Implementation of the project would result in the removal of a small amount of LWD from the Riparian Reserves associated with intermittent and perennial channels. The removal of trees within and adjacent to the channel would reduce future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and Riparian Reserves would offset both the short-term and long-term effects of loss of LWD recruitment to these areas, thereby contributing to attainment of ACS objectives. Collectively, these mitigation measures would result in placement of almost 300 pieces of LWD in 3.7 miles of channels.
LWD Instream Placement	Aquatic Habitat	Upper North Fork Coquille River Instream Large Wood Placement	2.2 miles	
Road Surfacing	Road Sediment Reduction	Bridge Approach Paving – Woodward & Alder Creek Roads	1 site	Road-related sediment has negatively affected the North Fork Coquille River watershed. While Best Management Practices would be implemented, construction of the PCPG would likely cause some sediment to reach channels and potentially impact the aquatic habitat. Surfacing the approaches to the Woodward Creek and Alder Creek bridges would reduce, if not eliminate, sediment input to aquatic habitat for anadromous and resident salmonids underneath and adjacent to these bridges.

Draft

Figure 2.3-6 Comparison of Mitigation Measures and PCGP Effects



2.3.5.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 37.5 percent of the North Fork Coquille watershed. The following projects are scheduled to occur on BLM lands in the Coquille watershed (table 2.3.5.7-1). These projects are designed to be consistent with standards and guidelines and objectives for the Coos Bay RMP.

TABLE 2.3.5.7-1

Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP

5th Field Watershed	6th Field Subwatershed	Project Name	Project Description	Resource
North Fork Coquille River	Hudson Creek	**Proposed Action:** Manual Maintenance	Brush and hardwood control on 36 acres of young stands (<11 yrs old); 1 acre of which is within the pipeline R/W.	Upland and riparian vegetation.
North Fork Coquille River	Hudson Creek	**Proposed Action:** Cloud 19 CT timber sale. NEPA complete; sale planned for 2015.	106 acres of stand density management, including 58 acres in riparian reserve; with 0.1 miles temporary road construction and 0.3 miles renovation.	Upland and riparian vegetation, road network, water quality. (concurrent use of access roads)

TABLE 2.3.5.7-1

Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP

5th Field Watershed	6th Field Subwatershed	Project Name	Project Description	Resource
North Fork Coquille River	Hudson Creek	**Proposed Action:** Hungry Mountain timber sale. NEPA complete; sale planned for 2016.	37 acres of stand density management, including 10 acres in riparian reserve; 38 acres of hardwood conversion including 17 acres in riparian reserve; with 0.5 miles temporary road construction and 1.9 miles renovation.	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Hudson Creek	**Proposed Action:** Iron Monkey CT timber sale. NEPA complete; sale planned for 2014.	173 acres of stand density management, including 100 acres in riparian reserve [6 acres of the 173 are within the pipeline R/W; 5 of which are in riparian reserve].	Upland and riparian vegetation.
North Fork Coquille River	Hudson Creek	**Proposed Action:** North Fork 25 timber sale. NEPA complete; sale planned for 2014.	223 acres of stand density management, including 50 acres in riparian reserve [9 acres of the 223 are within the pipeline R/W; 1 of which is in riparian reserve]; with 0.7 miles temporary road construction [0.2 of which is in the pipeline R/W], and 3.0	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Hudson Creek	**Proposed Action:** Steele 23 CT timber sale. NEPA complete; sale planned for 2015.	278 acres of stand density management, including 118 acres in riparian reserve [7 acres of the 278 are within the pipeline R/W, 2 of which are in riparian reserve]; with 1.2 miles road construction, 1.1 miles improvement [0.2 of which are in the pipeline	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Hudson Creek	**Proposed Action:** Whistle Stop CT timber sale. NEPA complete; sale planned for 2015.	77 acres of stand density management, including 22 acres in riparian reserve; with 0.4 miles temporary road construction, and 0.5 miles improvement.	Upland and riparian vegetation, road network, water quality. (concurrent use of access roads)
North Fork Coquille River	Hudson Creek	**Proposed Action:** Woodward 11 timber sale. NEPA complete; sale planned for 2015.	171 acres of stand density management, including 100 acres in riparian reserve; 75 acres of hardwood conversion including 18 acres in riparian reserve; with 0.5 miles temporary road construction, 1.1 miles improvement, and 3.1 miles renovation.	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Hudson Creek	**Proposed Action:** North Coquille Junction timber sale. NEPA complete; sale planned for 2015.	1.5 miles renovation [0.2 of which are in the pipeline R/.W].	Road network, water quality.
North Fork Coquille River	Hudson Creek	**Proposed Action:** Rock Prairie timber sale. NEPA analysis on-going; sale planned for 2016.	30 acres of hardwood conversion including 10 acres in riparian reserve; with 0.2 miles temporary road construction and 0.3 miles renovation.	Upland and riparian vegetation, road network, water quality.

Draft

TABLE 2.3.5.7-1

Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP

5th Field Watershed	6th Field Subwatershed	Project Name	Project Description	Resource
North Fork Coquille River	Middle Creek	**Current Action:** Parkview timber sale. Ongoing – sold 2013.	251 acres of stand density management, including 119 acres in riparian reserve; 43 acres of hardwood conversion including 23 acres in riparian reserve; with 0.4 miles temporary road construction and 5.4miles renovation.	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Middle Creek	**Current Action:** S Bridge timber sale. Ongoing – sold 2013.	322 acres of stand density management, including 100 acres in riparian reserve; 9 acres of hardwood conversion including 5 acres in riparian reserve; with 0.6 miles temporary road construction, 4.1 miles renovation and 0.4 miles existing road decommission	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Middle Creek	**Current Action:** Vaughns Junction sale. Ongoing – sold 2012.	199 acres of stand density management, including 71 acres in riparian reserve; 9 acres of hardwood conversion including 5 acres in riparian reserve; with 0.1 miles temporary road construction, 0.5 miles improvement, and 0.5 miles renovation.	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Middle Creek	**Proposed Action:** North Fork 25 timber sale. NEPA complete; sale planned for 2014.	0.2 miles renovation [0.1 of which is in the pipeline R/W].	Road network, water quality.
North Fork Coquille River	Middle Creek	**Proposed Action:** Big Bend timber sale. NEPA analysis on-going; sale planned for 2015.	78 acres of stand density management, including 32 acres in riparian reserve; 44 acres of hardwood conversion including 26 acres in riparian reserve[4 acres of the 44 are in the pipeline R/W, 1 acre of which is riparian reserve]; with 0.1 miles temporary	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Middle Creek	**Proposed Action:** Dora timber sale. NEPA analysis on-going; sale planned for 2014.	67 acres of stand density management, including 36 acres in riparian reserve; 9 acres of hardwood conversion including 6 acres in riparian reserve; with 0.3 miles temporary road construction, 0.1 miles improvement, and 0.5 miles renovation.	Upland and riparian vegetation, road network, water quality.
North Fork Coquille River	Middle Creek	**Proposed Action:** North Coquille Junction timber sale. NEPA analysis on-going; sale planned for 2015.	59 acres of stand density management, including 27 acres in riparian reserve; with 0.4 miles temporary road construction and 2.6 miles renovation [0.1 of which is in the pipeline R/W].	Upland and riparian vegetation, road network, water quality.

Draft

TABLE 2.3.5.7-1 **Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP**				
5th Field Watershed	**6th Field Subwatershed**	**Project Name**	**Project Description**	**Resource**
North Fork Coquille River	Middle Creek	**Proposed Action:** Steele Cherry timber sale. NEPA analysis on-going; sale planned for 2016.	31 acres of stand density management, including 16 acres in riparian reserve; 40 acres of hardwood conversion including 12 acres in riparian reserve.	Upland and riparian vegetation.
North Fork Coquille River	Middle Creek	**Proposed Action:** Yankee timber sale. NEPA analysis on-going; sale planned for 2015.	88 acres of stand density management, including 46 acres in riparian reserve; 68 acres of hardwood conversion including 39 acres in riparian reserve; with 0.1 miles temporary road construction, and 2.9 miles renovation.	Upland and riparian vegetation, road network, water quality.

These projects are expected to be consistent with the Coos Bay RMP management direction and objectives. Collectively, these projects are expected to improve watershed conditions on BLM lands by:

- Reducing road-related sediment,
- Reestablishing conifers in Riparian Reserves that are now occupied by hardwoods and
- Improving stand health by reducing stand density in existing conifer stands.

Activities on Private Lands

Private lands comprise about 62.5 percent of the North Fork Coquille watershed. Private lands in the North Fork Coquille watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.11 percent of the BLM lands, and 0.17% of private lands in the North Fork Coquille watershed (table 2.3.5.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality (CWA Section 401) and the Army Corps of Engineers (CWA Section 404) applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the North Fork Coquille watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

Draft

2.3.5.8 Project Effects and ACS Objectives

This section addresses the relationship between project effects and components of the ACS. The PCGP corridor intersects two intermittent and one perennial stream channel and 2 forested wetlands. Two channel intersects are intermittent streams in the Hudson Creek subwatershed. The other two channel intersects are approximately 7 miles away in the Middle Creek subwatershed so the potential for downstream aggradation of effects is very low. Approximately 16.55 acres of Riparian Reserves (0.09% of the Riparian Reserves in the watershed) are in the project right-of-way.

TABLE 2.3.5.8-1

Relationship of PCGP project Effects to ACS Objectives on the North Fork Coquille River Watershed

ACS Objective	Effects
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape-scale features that would be affected by the Project corridor. The Project corridor is located primarily in early or mid-seral forests (table 2.3.5.1-4) adjacent to an existing utility corridor and road and largely on or near ridgetops to minimize impacts on aquatic habitats. The Project corridor would affect 41.92 acres of BLM-managed lands or about 0.11 percent of the North Fork Coquille River watershed and about 16.55 acres or 0.09 percent of the Riparian Reserves within the watershed (Table 2.3.5.1-3). Most of the habitats crossed by the corridor are already disturbed from past management practices. Impacts to aquatic systems are expected to be short-term and minor because of application of Best Management Practices and erosion control measures and anticipated rapid revegetation of disturbed areas. Impacts of the Project are expected to be within the range of natural variability for natural disturbance processes in the Coast Range Province. BLM-managed lands in the North Fork Coquille watershed are approximately 45% LSOG.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the North Fork Coquille River watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the POD, Wetland and Waterbody Crossing Plan. At each crossing, bed and bank disturbances from crossing construction would be small (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored on-site and the bed and banks would be returned to pre-construction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project corridor would cross three intermittent streams and one perennial fish-bearing stream in the North Fork Coquille River watershed. During construction, the actual area of bank and stream bottom disturbance from excavation at each crossing would be is small (<15 feet wide). Impacts on the bed and banks of these features would be minor and limited to the site of construction because the pipeline would be buried. During construction of the Middle Creek crossing, steep streambanks would be laid back to a stable configuration. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions where appropriate, consistent with the POD requirements. A site-specific crossing plan is in preparation to ensure accomplishment of these objectives. See section 2.3.5 for specific measures. This level of disturbance is well within the historical and current range of natural variability for bank and channel stability in watersheds of the Coast Range Province.

Draft

TABLE 2.3.5.8-1

Relationship of PCGP project Effects to ACS Objectives on the North Fork Coquille River Watershed

ACS Objective	Effects
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment would be mobilized during construction, particularly during the crossing of Middle Creek, a perennial stream with silty sand banks and stream bottom. These impacts are expected to be short-term and limited to the general area of construction. No long-term impacts on water quality are expected because of application of the ECRP, including maintenance of effective ground cover (see section 1.3.1.2) and Best Management Practices during construction. A small amount of shading vegetation would be removed where the corridor crosses Middle Creek, which is already listed under Section 303(d) of the Clean Water Act for temperature due to sparse riparian cover along much of its length (see figure 2). No change in water temperature is expected because shading appears to have much less effect on water temperature on the downstream reaches of perennial streams (Brown 1970, cited in BLM 2002: 7-12), possibly due to the higher volume of flow in these lower reaches.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in corridor routing. Dry open-cut methods would be used to cross stream channels (see section 1.3.2.1). Any sediment impacts are expected to be minor and short-term (e.g., first wet season) and well within the range of natural variability for the Coast Range Province due to implementation of the ECRP, including Best Management Practices for water quality, restoration of bank and bottom configurations, LWD placement, and erosion control along with the anticipated rapid revegetation characteristic of the Coast Range Province. Road repairs would also help reduce sediment levels in the watershed and move the sediment regime toward the desired condition.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	On streams with flowing water at the time of crossing, the dam-and-pump method (described in section 1.3.1) would be used to maintain flows in the channel downstream of the crossing. No alterations of flows resulting from construction beyond the short-term, site-scale level are anticipated. The Project corridor would occupy about 0.15 percent of the North Fork Coquille River watershed. It is highly unlikely that any impacts in this small part of the watershed could affect the timing, magnitude, and duration of peak flows in the watershed, especially in light of other past and ongoing human activities.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project corridor crosses two forested wetlands in the Hudson Creek subwatershed and one forested wetland in the Middle Creek subwatershed, together affecting a total of 0.54 acres of wetland habitat. Trench plugs would be installed on each side of these wetlands to block subsurface flows and maintain water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. Regardless, Project construction may have short-term impacts on water tables in these isolated forest wetlands. These site-specific impacts would be minor (i.e., limited to the general area of construction) and would not be hydrologically connected to larger wetland areas, and may also regulated under Section 404 of the Clean Water Act. By restricting crossings to the dry season (July 1 to September 15), possible impacts on the water tables in these wetland areas are expected to be minor and short-term.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the North Fork Coquille River watershed would be minor. In the short term, all vegetation would be removed from the Project corridor except for low-growing herbaceous and shrub material adjacent to stream channel crossings. About 1.39 acres of vegetation within the Riparian Reserve to be cleared along the Project corridor is LSOG forest; 12.47 acres are mid-seral conifers and hardwoods and 2.57 acres are early seral forest (see table.2.3.5.1-1-4). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Overall, Project construction would affect approximately 0.09 percent of the Riparian Reserves in the watershed. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Project impacts on vegetation are expected to be well within the range of natural variability given the disturbance history of the Coast Range.

TABLE 2.3.5.8-1 **Relationship of PCGP project Effects to ACS Objectives on the North Fork Coquille River Watershed**	
ACS Objective	**Effects**
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the North Fork Coquille River watershed would be minor (16.55 acres or 0.09 percent of the Riparian Reserves in the watershed (Table 2.3.5.1-1-3). Most of the cleared Riparian Reserve vegetation is upland second-growth conifers and hardwoods. Existing herbaceous and brush cover within the Project clearing limits would be maintained to the extent practicable. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. . The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.3.5.9 Summary, North Fork Coquille Watershed

The routing of the Project through BLM lands, coupled with the relatively small area of BLM land that would be affected by Project construction (41.92 acres or 0.11 percent of the fifth-field watershed-Table 2.3.5.1-2), make it highly improbable that Project impacts would affect conditions at the subwatershed or watershed scale. Although there are site-level impacts (e.g., short-term sediment and a change in vegetative condition at stream crossings), these would be minor or limited to the boundaries of the project area (Section 2.3.5.4).

Clearing of vegetation within Riparian Reserves (16.55 acres or 0.09 percent of Riparian Reserves in the watershed. Table 2.3.5.1-1-3) would have long-term but minor impacts on vegetation condition because the areas are widely dispersed and most of the vegetation that would be cleared is early or mid-seral; about 1.39 acres of LSOG vegetation in Riparian Reserves would be removed by construction of the Project corridor in the North Fork Coquille River watershed (Table 2.3.5.1-1-4). These impacts are limited to the Project corridor and are well within the range of natural variability given the disturbance history within the Coast Range (Section 2.3.5.4). The watershed would remain well above the 15% LSOG minimum threshold established in the NWFP (section 2.3.4.5)

Riparian vegetation along Middle Creek, the only perennial stream crossed by the Project within the watershed, is confined to narrow bands due to previous timber harvesting, agriculture, and road construction. Middle Creek is currently on the Clean Water Act Section 303(d) list of impaired water bodies for elevated temperatures, which appear to be related to low canopy cover over the stream. The crossing of Middle Creek (MP 27.04) would be unlikely to affect stream temperature (section 2.3.5.4, section 2.3.5.8) because it minimally affects the existing solar loading. A site-specific stream temperature assessment of the Middle Creek crossing by the BLM confirmed that stream temperatures are not likely to be affected by this crossing.

Off-site mitigation would further reduce Project impacts. Logs generated in the corridor clearing process or otherwise provided by Pacific Connector would be used as LWD placed at 80 pieces/mile in 3.7 miles of in-stream projects to restore aquatic habitats in the watershed. Road surfacing at the bridge approach on Woodward and Alder Creek roads would greatly reduce transport of sediments to nearby aquatic habitats. These off-site mitigation measures proposed for BLM-managed lands would supplement on-site minimization, mitigation, and restoration actions. Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.3.5.6).

Proposed amendments of the Coos Bay RMP to waive protection measures for Survey and Manage species and to cross MAMU habitat in this watershed would not prevent attainment of ACS objectives (section 2.3.4.5) because the project does not threaten the persistence of any riparian-dependent species. All relevant Project impacts are within the range of natural variability for watersheds in the Coast Range Province (Section 2.3.5.4). No project impacts have been identified that would prevent attainment of ACS objectives (Section 2.3.4.8).

2.3.6 East Fork Coquille Fifth Field Watershed, HUC 1710030503

2.3.6.1 Overview

The East Fork Coquille River fifth-field watershed is located within the Coast Range Province. It is bordered on the northwest and west by the North Fork Coquille River fifth- field watershed, on the south by the Middle Fork Coquille River fifth-field watershed, and on the east by the Olalla-Lookingglass fifth-field watershed of the South Umpqua River drainage system. The East Fork Coquille River joins the North Fork Coquille River at the western edge of the watershed in the vicinity of the town of Myrtle Point. The Coquille River discharges into the Pacific Ocean at Bandon, Oregon, about 23 miles south of Coos Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

The 134.3 sq. mile (85,963 acre) East Fork Coquille watershed includes six subwatersheds. Moving west to east, these subwatersheds are Yankee Run, Elk Creek, Brewster Canyon, Brummit Creek, Camas Creek and Lost Creek (figure 2.3-7, table 2.3.6.1-1). Topography in the watershed is mountainous with elevations ranging from 500 feet amsl to approximately 2000 feet amsl. Headwater areas are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising 80% of the stream miles. The GIS data show Riparian Reserves comprising approximately 55.11% of the BLM lands in the watershed. Approximately 53% of the land in the watershed is managed by the BLM Coos Bay District. The rest (47.0%) is in non-federal ownership. There are no Forest Service lands in the watershed.

Figure 2.3-7 shows the checkerboard pattern of the BLM-managed lands and their land allocation status. BLM lands are found in all six subwatersheds, ranging 4,561 acres in the Elk Creek subwatershed to 10,749 acres in the Brummit Creek subwatershed (table 2.3.6.1-1). LSRs constitute around 24,066 acres or approximately 53% of the BLM land in the watershed, and 31.2% of all land in the watershed. They are also found in all six subwatersheds, with acreage ranging from 964 acres in the Yankee Run subwatershed to 10,633 acres in the Brummit Creek subwatershed (table 2.3.6.1-1). All mapped LSR lands are in LSR RO 261. An additional 4,052 acres (188 acres KOAC, 3,864 MAMU stands) are unmapped LSR. Matrix land, which is also found in all six subwatersheds, constitutes 47% of the BLM land and 25% of all land in the watershed.

Location and Routing

The PCGP corridor enters the East Fork Coquille River watershed from the North Fork Coquille watershed at MP 28.3 and travels in a southeasterly direction through the Yankee Run, Brewster Creek, Elk Creek, and Camas Creek subwatersheds before finally exiting the watershed at MP 28.2 (figure 2.3-7). After traversing the lower East Fork Coquille River valley in the Yankee Run

subwatershed (total length of corridor, all ownerships is 3.43 miles), the corridor enters the southwest corner of the Brewster Canyon subwatershed at MP 31.38 and proceeds along the watershed divide with the Elk Creek subwatershed. Total corridor length in the Brewster Canyon watershed is 1.00 mile. The corridor then turns southward and proceeds through the Elk Creek subwatershed. After travelling 3.59 miles in the Elk Creek subwatershed, the corridor crosses into the Big Creek subwatershed of the Middle Fork Coquille River watershed at MP 35.9. The corridor subsequently rejoins the East Fork Coquille River watershed (Camas Creek subwatershed) at MP 38.4. The corridor then runs along the watershed divide with the Sandy Creek subwatershed of the Middle Fork Coquille River watershed along the divide between the Middle Fork and East Fork Coquille River watersheds. The corridor leaves the East Fork Coquille River watershed for good at MP 42.6 when it enters the Upper Rock Creek subwatershed of the Middle Fork Coquille River watershed. Total length of corridor in the Camas Creek subwatershed is 2.20 miles. Total corridor length in the East Fork Coquille River fifth-field watershed is 10.22 miles (table 2.3.6.1-2).

Within the East Fork Coquille River watershed, the PCGP corridor traverses a total of 2.78 miles of BLM land in four subwatersheds: 0.39 miles in the Yankee Run subwatershed, 0.80 miles in the Brewster Canyon subwatershed, 1.23 miles in the Elk Creek subwatershed, and 0.36 miles in the Camas Creek subwatershed (table 2.3.6.1-2). Effects in these subwatersheds ranged from 4.04 acres cleared in the Camas Creek subwatershed to 17.68 acres in the Elk Creek subwatershed. A total of 39.3 acres of BLM land would be cleared and another 4. 38 acres would be modified during corridor construction, together constituting 0.10% of the BLM land in the watershed. Over all land ownership, 154.22 acres of land would be affected by PCGP corridor construction (135.17 acres cleared and 19.05 acres modified), constituting 0.18% of the land in the watershed (table 2.3.6.1-2).

Approximately 21.7 acres of the LSR land allocation would be affected by project construction in the East Fork Coquille River watershed (18.4 acres cleared and 3.34 acres modified, table 2.3.6.1-3). This constitutes 0.09% of the LSR land in the watershed. Approximately 21.95 acres of BLM matrix land also would be affected by PCGP project construction (20.91 acres cleared and 1.04 acres modified, table 2.3.6.1-3). This constitutes 0.10% of the Matrix land in the watershed.

To minimize aquatic and riparian effects on federal lands, the PCGP corridor is routed along ridge tops on BLM lands to the maximum extent possible. For example, there are no stream crossings or riparian effects in Camas Creek, which is traversed by the corridor along the watershed divide with the Middle Coquille River watershed (figure 2.3-7). In the East Fork Coquille watershed, two intermittent streams are crossed with effects to bordering Riparian Reserves but one of these at MP 35.51 is in an existing road crossing. An additional six Riparian Reserves are clipped but not crossed. For the entire fifth-field watershed, 3.81 acres of Riparian Reserves are affected; all of the Riparian Reserves crossed by the project in the East Fork Coquille River watershed, all are either early seral vegetation or altered habitat (Table 2.3.6.1-4).

Figure 2.3-7 PCGP Routing and Subwatershed Boundaries, East Fork Coquille River Watershed

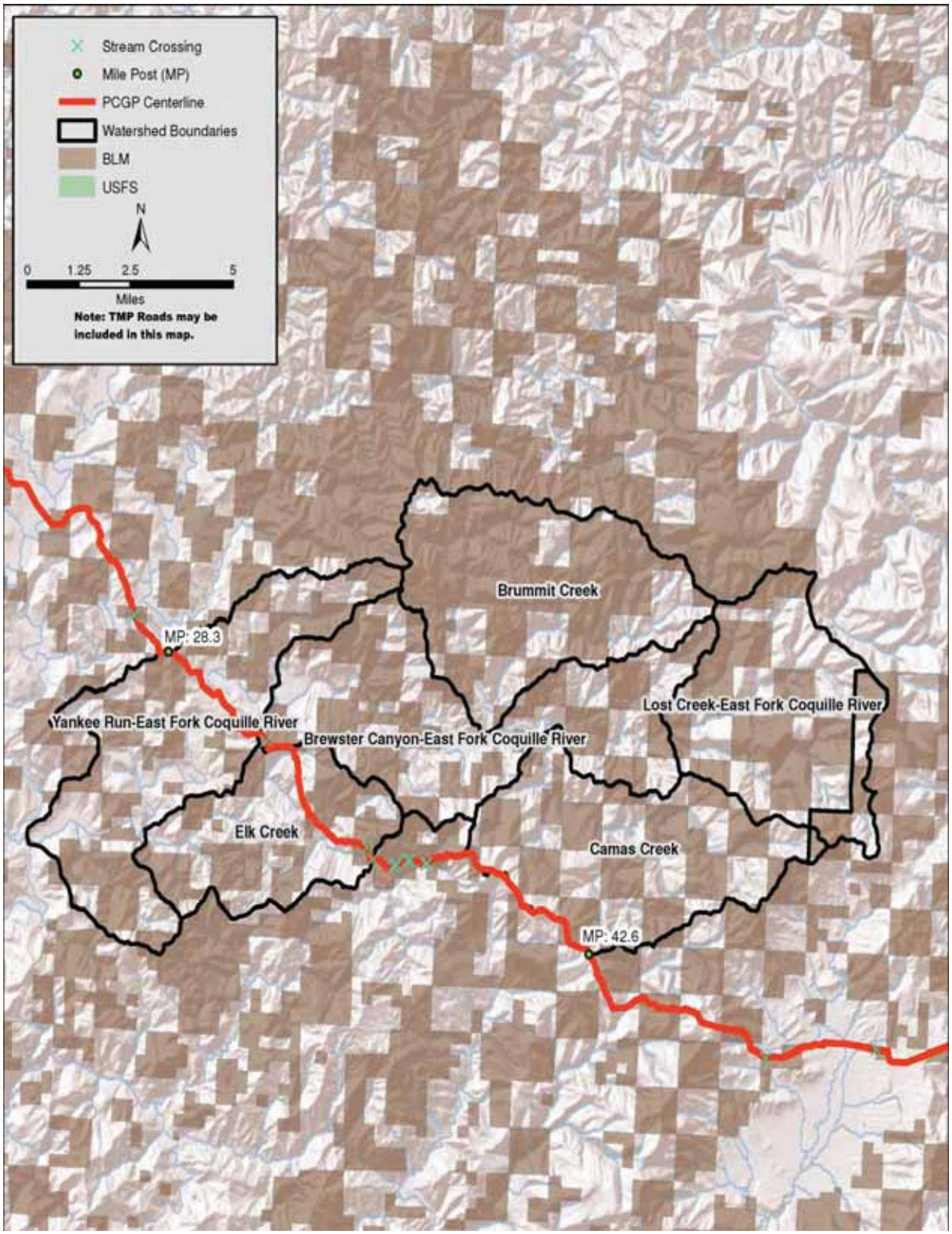


TABLE 2.3.6.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in East Fork Coquille River Watershed HUC 1710030503

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
					Designated LSR b/		Matrix		Riparian Reserves c/	
		BLM	NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS
Brewster Canyon	17,060.51	8,471.20		8,589.31	5,774.48		2,696.72		4,668.48	
Brummit Creek	15,600.99	10,749.64		4,851.35	10,633.25		116.39		5,924.13	
Camas Creek	14,213.96	7,200.49		7,013.47	4,882.35		2,318.14		3,968.19	
Elk Creek	9,702.27	4,530.75		5,171.52	681.25		3,849.50		2,496.90	
Lost Creek	12,947.56	7,025.59		5,921.97	1,129.79		5,895.80		3,871.80	
Yankee Run	16,438.18	7,561.92		8,876.26	964.84		6,597.08		4,167.37	
Watershed Total	**85,963.47**	**45,539.59**	**0.00**	**40,423.88**	**24,065.96**	**0.00**	**21,473.63**	**0.00**	**25,096.87**	

a/ All Data derived from NSR GIS Layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 4,052 acres (188 acres KOAC, 3,864 MAMU stands) are unmapped LSR.
c/ Occur within the LSR and Matrix Land Allocations

TABLE 2.3.6.1-2

PCGP Project Corridor (miles) and project Area (acres) in the East Fork Coquille River Watershed (HUC 1710030503) by Land Ownership

Unit a/	Land Ownership															
	BLM				NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Forest Service Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Brewster Canyon	0.80	11.47		0.14					0.20	3.77		0.04	1.00	15.24	0.00	0.09
Brummit Creek																
Camas Creek	0.36	4.04	1.03	0.07					1.84	35.70	0.75	0.52	2.20	39.74	1.78	0.29
Elk Creek	1.23	17.68	3.35	0.46					2.36	17.68	3.35	0.41	3.59	35.36	6.70	0.43
Lost Creek																

Draft

Yankee Run	0.39	6.11	0.00	0.08					3.04	38.72	10.57	0.56	3.43	44.83	10.57	0.34
Watershed Total	**2.78**	**39.30**	**4.38**	**0.10**					**7.44**	**95.87**	**14.67**	**0.27**	**10.22**	**135.17**	**19.05**	**0.18**
a/ All data derived from NSR-based GIS layers																

Draft

TABLE 2.3.6.1-3

PCGP Project Area (acres) on Federal Lands in the East Fork Coquille River Watershed HUC 1710030503 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Brewster Canyon	BLM					11.47		0.43	0.00	1.31		0.03		11.47	0.00	0.14	0.00
	NFS																
Brummit Creek	BLM																
	NFS																
Camas Creek	BLM	1.81	0.00	0.04	0.00	2.24	1.03	0.10	0.04	0.00				4.05	1.03	0.06	0.01
	NFS																
Elk Creek	BLM	16.59	3.34	2.44	0.49	1.09	0.01	0.03	0.00	1.89	0.73	0.08	0.03	17.68	3.35	0.39	0.07
	NFS																
Lost Creek	BLM																
	NFS																
Yankee Run	BLM					6.11		0.09	0.00	0.61		0.01		6.11	0.00	0.08	0.00
	NFS																
Watershed Total	**BLM**	**18.40**	**3.34**	**0.08**	**0.01**	**20.91**	**1.04**	**0.10**	**0.00**	**3.81**	**0.73**	**0.02**	**0.00**	**39.31**	**4.38**	**0.09**	**0.01**
	NFS																

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.3.6.1-4

Riparian Reserve Effects in the East Fork Coquille River Fifth Field Watershed HUC 1710030503

Jurisdiction	Milepost	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs (Acres) c/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Yankee Run Subwatershed HUC 171003050306																													
CBD BLM	28.80	Unnamed Trib, EF Coquille	RR Clipped, adjacent lateral stream	I	No			Yes				0.00				0.00	0.61			0.61		0.61		0.61		0.61	No	No
Brewster Canyon HUC 171003050304																													
CBD BLM	31.58	Trib to EF Coquille	RR Clipped, lateral trib	I	No			Yes				0.00				0.00	0.08			0.08		0.08		0.08	0.07	0.15	No	No
CBD BLM	31.64	BSI070Trib. to E. Fork Coquille	1' wide, flows subsurface in areas	I	Yes	1.17		No				0.00				0.00	1.22			1.22		1.22		1.22	0.47	1.69	No	No
CBD BLM	31.76	BSI069 Trib. to E. Fork Coquille	RR clipped, but not crossed. 2' wide, 10-20% gradient	I	No	0.00		Yes				0.00				0.00	0.01			0.01		0.01		0.01	0.01	0.02	No	No
Subtotal Brewster Canyon Subwatershed			Crossed: 1 Int. Channel / Clipped: 2 Int. Channel	3	1			2	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	1.31	0.00	0.00	1.31	0.00	1.31	0.00	1.31	0.55	1.86		
Elk Creek Subwatershed HUC 171003050306																													
CBD BLM	32.46	Trib to EF Coquille	RR Clipped; stream crossing on private land	I	No			Yes	0.25			0.25				0.00				0.00		0.25		0.25		0.25	No	No
CBD BLM	35.27	BSI251Trib. to S. Fork Elk Creek	Intermittent stream	I	No			Yes				0.00				0.00	0.80			0.80		0.80	0.73	1.53		1.53	No	No
CBD BLM	35.30	BSI251Trib. to S. Fork Elk Creek	Intermittent stream	I	No			Yes				0.00				0.00	0.48			0.48		0.48		0.48		0.48	No	No
CBD BLM	35.51	BSI251Trib. to S. Fork Elk Creek	Intermittent stream (crossing is in existing road)	I	Yes	4.13		No	0.36			0.36				0.00				0.00		0.36		0.36	0.52	0.88	No	No
Subtotal Elk Creek Subwatershed			Crossed: 1 Int. Channel / Clipped: 3 Int. Channel	4	1			3	0.61	0.00	0.00	0.61	0.00	0.00	0.00	0.0	1.28	0.00	0.00	1.28	0.00	1.89	0.73	2.62	0.52	3.14		
Total East Fork Coquille River Watershed			Crossed: 2 Int. Channel / Clipped 6 Int. Channel	8	2			6	0.61	0.00	0.00	0.61	0.00	0.00	0.00	0.00	3.20	0.00	0.00	3.20	0.00	3.81	0.73	4.54	1.07	5.61		

Draft

TABLE 2.3.6.1-4

Riparian Reserve Effects in the East Fork Coquille River Fifth Field Watershed HUC 1710030503

Jurisdiction	Milepost	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs (Acres) c/													Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral	Stream Channel or Wetland Area	Net Riparian Reserve Cleared					

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.

Draft

TABLE 2.3.4.1-5

Stream Crossing Turbidity and Risk Assessment, East Fork Coquille Watershed

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
East Fork Coquille River	Brewster Canyon.	31.64	I	1' wide, flows subsurface in areas	1	1.17	22.07		Erosion resistant	cobble/ gravel		M	M	YELLOW
East Fork Coquille River	Elk Cr.	35.51	I	Intermittent stream	4	4.13	19.55		Erosion resistant	cobble/ gravel	M	L	M	BLUE

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified:

Draft

2.3.6.2 Existing Conditions

Original watershed Analysis Findings

The East Fork Coquille watershed assessment (BLM 2000a) was completed in May, 2000. A Water Quality Restoration Plan (WQRP) was also completed in cooperation with the Oregon Department of Water Quality in 2000 (BLM and ODEQ 2000). Both documents are referenced in this assessment. The watershed assessment summarized watershed conditions as follows:

- **Erosion**: The dominant erosional process has been mass wasting (landslides). Landslide occurrences are related to underlying geologic formation. Landslides occur disproportionately on land underlain by Tyee and Flournoy formations, which comprise 25% of the watershed. There is a strong correspondence between extremely steep landforms and landslide locations, with most of the recorded landslides originating on slopes steeper than 65%, which account for only 18% of the watershed acreage.

- **Hydrology**: Hydrologic conditions include rapid runoff because of shallow soil, limited soil water storage, and bedrock units resistant to groundwater accumulation. Flow volumes are typical of streams in the Coast Range Province. Peak flows depend on the occurrence of frontal storms. Snow can accumulate temporarily in higher elevations, and when warm winter rain events melt snow rapidly, peak flows can be increased. The Upper East Fork Coquille, Camas Creek and Brummit Creek subwatersheds are most susceptible to this phenomenon. These subwatersheds comprise approximately 50% of the watershed. Streams have very low summer flow and require pools for maintenance of aquatic life.

- **Stream Channels:** Landslides are the primary source of sediment to stream channels in the watershed. The Upper East Fork Coquille subwatershed has the highest sediment delivery risk because of high drainage density, relief, and runoff (including rain-on-snow). Bank erosion is the second most important source of sediment and stream turbidity. Although most streambeds are adequately armored, fine textured bank material is susceptible to erosion at annual high flows or greater, or where there is lateral migration of the channel, bank collapse, and bank undercutting. Small stream channels in the Brummit Creek and Brewster Canyon subwatersheds show the highest evidence of rapid debris flows and road failure at channel intersections. Roads also confine streams to narrower channels, thereby increasing velocities and simplifying the hydrological characteristics within the channels (i.e., China Creek for example). Both natural and human-related fires and landslides have also modified riparian and stream channel characteristics dramatically. Paving has been successful as a means to reduce road-related sediments.

- With the exception of Steel Creek and Camas Creek surveyed tributaries are in good condition with regard to width-to-depth ratio. Steel Creek and Camas Creek channels have been incised to bedrock and subsequently have widened through bank erosion. The high width-to-depth ratios result from low summer flows over bedrock substrates. This condition also is typical of unconstrained reaches of the river. A high width-to-depth ratio is problematic, because the increase in surface area renders the stream more susceptible to warming. High stream temperatures are determined to be a major limiting factor for summer rearing of juvenile salmonids. There is an overabundance of fine sediments (silt, sand, and organic material) in riffles of Weekly, Yankee Run, Dead Horse, and Knepper Creeks. This problem is the result

Draft

of excessive fine-sediment delivery and/or a stream's inability to adequately sort, store, and transport fine sediments. Weekly, Elk, Yankee Run, Hantz and lower Steel Creeks are deficient in the quantity and quality of LWD present. Large conifers (>20" DBH) generally are scarce in the associated Riparian Reserves, and there is little current recruitment to these channels to, primarily due to disturbances such as fire and logging, and the resultant young and maturing stands. Loss of complex pool habitat for over-wintering of juvenile salmonids is determined to be a major limiting factor.

- **Water Quality:** Prior timber harvest in riparian areas has subjected streams to diminished long-term large wood input throughout the watershed. Increased human activities which reduce shade (timber harvest and agriculture) have caused temperature increases in the East Fork Coquille River. Roads constructed directly adjacent to streams (e.g. valley bottom roads) have compounded the problem by converting riparian areas to younger seral habitat, and increasing sediment delivery to streams. Roads traversing Riparian Reserves (like portions of the Coos Bay Wagon Road) where there is no surfacing, or where roads are improperly maintained, contribute sediment to streams, which impairs water quality (e.g. turbidity). Typically, turbidity levels fall quickly after major storm events. Temperatures in the East Fork Coquille River strongly increase in a downstream direction. In 1996, the East Fork Coquille River and its tributaries (from the mouth to the headwaters) were placed on ODEQ's 303(d) list of water quality limited streams for exceeding the South Coast basin temperature standard. Stream temperature from shade loss, habitat modification from past land management and agricultural uses and flow modification, primarily for irrigation were identified in the WQRP as factors limiting water quality (BLM and ODEQ 2000).

- **Vegetation:** 52% of the analysis area is comprised of young stands <40 years of age). 'Pole-timber' (41-80 years) and late-successional forests (>80 years) each make up 22% of the forested area, while old-growth forests (201+ years) comprise 12%. The oldest remaining unmanaged stands are concentrated in the Brummit Creek subwatershed. Brewster Canyon, Camas Creek, and Upper East Fork Coquille subwatersheds also contain older unmanaged stands. Younger unmanaged stands (<120 years old), naturally-developed after fires in the early- and mid-1800s, exist throughout the watershed. Unmanaged stands greater than 161 years old are found solely on BLM lands.

- **Fisheries:** Inherently, the lower East Fork Coquille River, below Brewster Gorge, is a high value salmonid fish watershed in the South Coast basin. Despite the disturbance history including timber harvest and downstream agriculture uses, the East Fork Coquille has good numbers of Coho salmon and winter steelhead spawning during most years (BLM and ODEQ 2000).

Changes in watershed Condition

There have been no large disturbance events that would alter watershed conditions on BLM lands since the East Fork Coquille watershed assessment was prepared. Project-level watershed restoration focused on road-related sediment reduction and restoration of in stream LWD has been on-going on BLM lands as funding has allowed. Timber management on industrial timberlands in the watershed has been active and on-going.

Draft

Current watershed Conditions

The Oregon watershed Enhancement Board (OWEB) published an analysis of watershed condition for the Coquille and other coastal basins in 2008 (Bauer et al. 2008) Based on the OWEB assessment, current conditions in the East Fork Coquille watershed are limiting for most watershed conditions and processes.

Overall, current watershed conditions (all ownerships) in the East Fork Coquille watershed are as follows (FERC 2010):

- The mainstem is 303(d) listed for temperatures but summer temperatures in the upper watershed above Camas Creek meet the temperature standards.
- The East Fork Coquille River watershed is "At Risk" or "Not Properly Functioning for multiple watershed indicators.
- The East Fork Coquille River watershed up to Brewster Gorge in T28N R10W Section 9 is within the range of anadromy for coho salmon.
- High road densities and road-related sediment have negatively affected aquatic habitats. There is an over-abundance of fine sediments in Weekly, Yankee Run, Dead Horse and Knepper Creeks. Weekly, Elk, Yankee Run and lower Steel Creeks are deficient in LWD.
- Disturbed soils are susceptible to surface erosion during rainfall events.
- Rapid runoff may occur because of shallow soils and limited water storage capacity.
- Loss of pool habitat for over wintering juvenile salmonids is a major limiting factor.

The PCGP project crosses BLM lands in the Camas Creek, Yankee Run, Elk Creek, and Brewster Creek subwatersheds. watershed condition monitoring conducted by the BLM shows positive trends for overall watershed condition and vegetative conditions in Camas Creek, Elk Creek and Brewster Creek. The Yankee Run subwatershed showed a slightly negative trend for overall watershed condition. Roads had a negative impact and showed a negative trend in the Yankee Run, Brummit Creek and Elk Creek subwatersheds (Fowler 2012; Forest Service and BLM 2012).

2.3.6.3 Natural Disturbance Processes

Natural disturbance regimes in the East Fork Coquille River watershed are consistent with those described for the Coast Range Province in Section 2.1.1. The East Fork Coquille watershed historically was an active landscape with respect to disturbance processes. Forest fires and high intensity rainfall / wind events were the primary natural disturbance factors in this watershed (BLM 2000a: III-38). Fire episodes in the Coast Range and adjacent Klamath-Siskiyou Provinces occasionally reset very large proportions (hundreds to many thousands of acres) of the landscape to early seral conditions. On average, fires occurred every 21 years between 1534 and 1936 at the watershed scale. If only large fires are considered the average time between fires is 31 years. At the watershed scale, the longest time between known fires is 112 years and the shortest is four years (BLM 2000a: III-39). Occasional smaller low intensity fire events or windstorms created complex stand structures, and created openings and "snag patches." High intensity rainfall events (at least 4 inches in 24 hours) occurred on a cycle of 5+ years (BLM 2010: 17). Occasionally, high intensity rainfall events overlapped with areas that had burned in large, stand replacement fires resulting in a major pulse of sediments and a synergistic change in watershed / stream conditions.

These episodic pulses of landslide-generated coarse sediments provided building blocks of aquatic habitats and are in contrast to the negative effects of chronic inputs of fine-grained sediments resulting from roads, agriculture and upland land management practices that are typical of the current conditions in the East Fork Coquille watershed.

2.3.6.4 Project Effects and Natural Range of Variability

Tables 2.3.6.1-4 and -5 describe affected Riparian Reserves and stream channel – PCGP corridor intersects in the East Fork Coquille watershed. Table 2.3.4.1-5 summarizes the risk of increased turbidity and the overall crossing risk associated with each stream crossing in the watershed (Adapted from GeoEngineers, 2013c). Table 2.3.6.4-1 shows Best Management Practices that would be applied at each of these crossings. There are two intermittent stream crossings in this watershed. Using the GeoEngineer's matrix one (PM 35.51) is rated as "Blue" or low risk and other is rated as "Yellow" or moderate risk because of relatively high gradients (MP 31.64). Sites in the yellow management category represent moderate risk to stream channel stability based on this risk assessment scoring.

More robust Best Management Practices, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of Best Management Practices on "yellow" crossings.

Channel conditions applicable to stream crossings that have placed streams in the yellow management categories (GeoEngineers, 2011) in the East Fork Coquille River watershed include:

- Channel slope: streams at lower and moderate slopes are more prone to channel migration, while streams on moderate slopes are prone to channel scour.
- Riparian condition: More robust woody vegetation in the riparian zone typically reduces avulsion risk and aids in reducing erosion of stream banks. Revegetation to maintain the continuity of the existing riparian zone is appropriate for these streams.

There is no reason to believe that the erosion control and bank stability Best Management Practices described in table 2.3.6.4.-1 would not be effective. These are proven methods. With application of project Best Management Practices described in table 2.3.6.4.-1, downstream sediment generated during construction is expected to be consistent with effects described in Section 1.3.1 for dry, isolated crossings and far less than amounts of sediment created by naturally occurring bank sloughs and failures typical of this watershed.

Draft

TABLE 2.3.6.4-1

Pacific Connector Additional Proposed BMPS for Use at Waterbody Crossings in the Yellow and Orange Management Categories

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**
Crossing MP	**35.51**	**31.64**
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)

Post-operations sediment related to the PCGP corridor is expected to be minor and well within the range of natural variability for the Coast Range Province.

Table 2.3.6.4-2 provides the range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) in the East Fork Coquille River watershed. Also included in table 2.3.6.4-2 are evaluations of PCGP project effects on these ecological processes relative to the ranges of variability, considered in the context of past and ongoing natural and human disturbances in the watershed.

Draft

TABLE 2.3.6.4-2

PCGP project Effects and Relevant Ecological Processes Described in the East Fork Coquille Watershed Assessment

Ecological Processes Relevant to the PCGP project	Natural Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are the dominant sediment delivery mechanism to stream systems. Erosional processes are highly variable and episodic in nature. Large scale, high intensity rain / wind events that occasionally overlap, temporally and spatially, with large stand-replacing fires are the primary causes of large pulses of sediment (BLM 2002a: 7-3). Exposed soils are subject to rapid surface erosion during storm events because of their shallow nature and limited water storage capacity. The Upper East Fork Coquille subwatershed has the highest sediment delivery potential because of high drainage density, relief, and runoff (including rain-on-snow). Bank erosion is the second most important source of sediment and stream turbidity.	The PCGP corridor does not cross any areas of unstable lands that are prone to mass wasting in the East Fork Coquille River (GeoEngineers 2009). The Upper East Fork subwatershed, which has the highest risk of sediment delivery from mass wasting, is not crossed by the project. Bank erosion at stream crossings is not expected to be significant on BLM lands. No streams are crossed in Yankee Run, Weekly or Steel Creek Subwatersheds on BLM lands. The only crossing in Elk Creek is in an intermittent stream already crossed by a road at location, is not expected to contribute significant sediment amounts from bank erosion. Maintenance of effective ground cover, application of Best Management Practices during construction and implementation of erosion control measures in the ECRP are expected to limit erosional effects from the project. Sediment amounts are expected to be well within the natural range of variability of erosional processes for the East Fork Coquille River.
Ecological Succession Vegetative Condition	Vegetative condition throughout the East Fork Coquille River watershed has been significantly altered by timber management and agricultural development. BLM lands have been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was fire. Natural fire regimes created a complex mosaic of multi - age class stands with large numbers of snags and fire-maintained natural openings. Winds have also extensively modified some stand conditions.	Approximately 39.3 acres of vegetation would be cleared in the PCGP corridor in the East Fork Coquille watershed, of which 3.81 acres are in Riparian Reserves. Most of this vegetation is early or mid-seral: Less than one acre of LSOG vegetation is removed in Riparian Reserves in the East Fork Coquille watershed (table 2.3.4.1-4). The small scale of project vegetative effects at both the subwatershed and watershed scale is well within the range of variability for vegetative disturbance within the East Fork Coquille River watershed.
Flow Regimes	Because of shallow soils and limited water holding capacity, flow regimes are, by nature, highly variable. Where high intensity rainfall events occur on lands experiencing recent fire events, substantial increases in peak flows over background conditions are possible. Such high intensity rain events (>4 inches in 24 hours) occur on a highly variable cycle that averages a 5+ years return interval.	The PCGP project is unlikely to contribute discernible changes in peak flows because of the corridor routing and the limited scale of the project. Subwatersheds that are most prone to peak flows (Upper East Fork and Brummit Creek) are not crossed by the PCGP. Although Camas Creek is susceptible to peak flows, less than 0.5 acres on the hydrologic divide with the Middle Fork Coquille River watershed is in the corridor area and is too small an area to generate a peak-flow response to a storm. Improvements to access roads identified in the TMP are intended to reduce the road-related effects to flow regimes in the watershed.
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Similar forested headwater streams monitored in 2003 through 2005 in the Umpqua basin to the north and elsewhere in the South Coast basin had 7-day average maximum temperatures ranging from 58.2 ºF to 62.9 ºF. (BLM 2010: 79). Stand replacement fires and human disturbance have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range (BLM 2002a p. 7-3).	Although portions of the East Fork Coquille River are 303(d) listed for water temperature, it is highly improbable that the PCGP corridor steam crossings on BLM lands would influence stream temperature. Two intermittent streams are crossed by the PCGP in the East Fork Coquille River. Intermittent stream crossings have a low probability of increasing stream temperature because flows are discontinuous, with many streams drying up entirely by the critical late summer period. No perennial streams are crossed by the PCGP on BLM lands in the East Fork Coquille River watershed.

TABLE 2.3.6.4-2 PCGP project Effects and Relevant Ecological Processes Described in the East Fork Coquille Watershed Assessment		
Ecological Processes Relevant to the PCGP project	**Natural Range of Variability**	**Pacific Connector Effects**
Aquatic Habitat and Stream Channel Complexity	Past management practices have simplified channel conditions, removing LWD from channels, and eliminated future sources of LWD. Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and stream bank vegetation was indicative of relatively stable stream banks and channels that were relatively resilient during floods.	Two intermittent channels are affected by the PCGP, one of which (MP 35.51) is within an already existing road crossing. During construction, the PCGP project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be localized and short-term and can be fully mitigated.

2.3.6.5 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 53 percent of the East Fork Coquille watershed. The following projects are scheduled to occur on BLM lands in the East Coquille watershed (table 2.3.6.5-1). These projects are designed to be consistent with standards and guidelines and objectives for the Coos Bay RMP.

TABLE 2.3.6.5-1

Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP

5th Field Watershed	6th Field Subwatershed	Project Name	Project Description	Affected Resource
East Fork Coquille River	Yankee Run	**Proposed Action:** Crosby timber sale. NEPA analysis on-going; sale planned for 2014.	226 acres of stand density management, including 90 acres in riparian reserve; 25 acres of hardwood conversion including 5 acres in riparian reserve; with 1.4 miles temporary road construction and 1.8 miles renovation.	Upland and riparian vegetation, road network, water quality.
East Fork Coquille River	Yankee Run	**Proposed Action:** Frona timber sale. NEPA analysis on-going; sale planned for 2013.	299 acres of stand density management, including 142 acres in riparian reserve; 21 acres of hardwood conversion including 9 acres in riparian reserve; with 2.8 miles road construction and 2.6 miles renovation.	Upland and riparian vegetation, road network, water quality.
East Fork Coquille River	Yankee Run	**Proposed Action:** Steele Cherry timber sale. NEPA analysis on-going; sale planned for 2016.	159 acres of stand density management, including 80 acres in riparian reserve; 28 acres of hardwood conversion including 17 acres in riparian reserve.	Upland and riparian vegetation.

Draft

TABLE 2.3.6.5-1

Projects on BLM Lands that Contribute to Cumulative Effects with the PCGP

5th Field Watershed	6th Field Subwatershed	Project Name	Project Description	Affected Resource
East Fork Coquille River	Yankee Run	**Proposed Action:** Yankee timber sale. NEPA analysis on-going; sale planned for 2015.	260 acres of stand density management, including 130 acres in riparian reserve; 64 acres of hardwood conversion including 30 acres in riparian reserve; with 1.5 miles temporary road construction, 0.6 miles improvement, and 6.7 miles renovation.	Upland and riparian vegetation, road network, water quality.
East Fork Coquille River	Brewster Canyon	**Proposed Action:** East Cherry timber sale. NEPA complete; sale planned for 2014.	64 acres of hardwood conversion including 20 acres in riparian reserve.	Upland and riparian vegetation.
East Fork Coquille River	Brewster Canyon	**Current Action:** Wagon Road Pilot timber sale. Ongoing – sold 2012.	96 acres of regeneration harvest, 5 acres of stand density management in riparian reserve, and 9 acres of hardwood conversion in riparian reserves; with 1.1 miles temporary road construction, 1.1 miles improvement, and 2.9 miles renovation.	Upland and riparian vegetation, road network, water quality.
East Fork Coquille River	Elk Creek	**Current Action:** Wagon Road Pilot timber sale. Ongoing – sold 2012.	3 acres of regeneration harvest; with 0.1 miles road improvement.	Upland vegetation, road network, water quality.
East Fork Coquille River	Elk Creek	**Proposed Action:** Weed Treatment	112 acres of herbicide treatment of roadside noxious weeds; 55 on BLM [3 of which are in the pipeline R/W]– 57 on private lands.	Upland vegetation.

These projects are expected to be consistent with the Coos Bay RMP management direction and objectives. Collectively, these projects are expected to improve watershed conditions on BLM lands by:

- Reducing road-related sediment,
- Reestablishing conifers in Riparian Reserves that are now occupied by hardwoods and
- Improving stand health by reducing stand density in existing conifer stands.
- Limiting the spread of noxious weeds.

Activities on Private Lands

Private lands comprise about 47 percent of the East Fork Coquille watershed. Private lands in the East Fork Coquille watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Draft

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.09 percent of the BLM lands, and 0.38% of private lands in the East Fork Coquille watershed (table 2.3.6.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the East Fork Coquille watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.3.6.6 Consistency with Land Management Plans

Standards and Guidelines are intended to regulate activities that occur within Riparian Reserves to ensure that objectives of the ACS are achieved. In the East Fork Coquille River watershed, NWFP standards and guidelines are implemented as BLM Coos Bay District management direction. Table 2.3.6.6-1 describes, for each ACS-related BLM management direction, the corresponding NWFP standard or guideline and PGCP compliance with that management direction. These directions address issuance of right-of-way, locating water withdrawal sites (for hydrostatic testing and dust control), several road management issues (including fish passage, sediment delivery, and development of the TMP), and proper use of mitigation and restoration.

The project is in full compliance with all management direction except as it relates to Survey and Manage species (table 2.3.6.6-1). A plan amendment would be needed to waive this protective management direction. Such an amendment is justified because in no case is the persistence of an Survey and Manage species threatened. See table 2.3.6.6-1 for a description of each relevant NWFP standard and guideline.

TABLE 2.3.6.6-1

Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction

RMP Management Direction	NWFP Standard / Guideline	PCGP Compliance
Riparian Reserves - Lands, pg. 16, para. 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan etc..
Riparian Reserves - General Riparian Area Mgmt., pg. 16, 4	RA-4: Locating water withdrawal sites.	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions because all such needs would be provided by municipal sources.
Riparian Reserves - Roads Mgmt., pg. 13, 2	RF-2: Road construction standards and guidelines.	No new road construction would occur in the East Fork Coquille River watershed.
Riparian Reserves - Roads Mgmt., pg. 13, last & pg. 14, 1st ¶	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.

Draft

TABLE 2.3.6.6-1 **Consistency of PCGP project with BLM Coos Bay District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Riparian Reserves - Roads Mgmt., pg. 14, 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction.
Riparian Reserves - Roads Mgmt., pg. 14, 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Riparian Reserves - Roads Mgmt., pg. 14, 4	RF-7: Transportation Management Plan development.	The TMP meets all the requirements of RF-7.
Riparian Reserves watershed & Habitat Restoration, pg. 17, 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
	Standards and Guidelines for new developments in LSR	Approximately 15 acres of mapped LSR and unmapped LSR associated with marbled murrelet activity centers would be removed by the project corridor in the East Fork Coquille watershed. A plan amendment to reallocate matrix lands to LSR has been proposed to mitigate the effect of the corridor on the LSR land allocation (see Appendix L). The loss of 15 acres of LSR (0.05% of the LSR in the watershed) is not expected to prevent attainment of ACS objectives.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		Management recommendations for Survey and Manage species are not applied in the East Fork Coquille River watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the East Fork Coquille are currently 39% LSOG and exceed this threshold.

2.3.6.7 Proposed Off-Site Mitigation Measures

Offsite mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of offsite mitigation actions for the PCGP project. All proposed offsite projects related to effects in the East Fork Coquille River watershed are located in the watershed (table 2.3.6.7-1, figure 2.3-8). Because of the checkerboard nature of BLM ownership (figure 2.3-7), it is often difficult to locate site-specific projects in the subwatershed where the impact occurred. With the exception of fire suppression measures noted below, these proposed mitigation measures are fully consistent with the recommendations of the East Fork Coquille River watershed Assessment and the East Fork Coquille Water Quality Restoration Plan.

Offsite mitigation efforts in East Fork Coquille River watershed are focused on:.

1. Road Surfacing and Repair: Road surfacing projects proposed by BLM as offsite mitigation of PCGP effects in the East Fork Coquille River watershed are described on table 2.3.6.7-1. Paving all but eliminates traffic-generated sediment. Paving projects are proposed on Yankee Run mainline (2.0 miles), Yankee Run Spurs (0.9 miles), & South Fork Elk Road (2.6 miles). . This mitigation is responsive to ACS objectives 2, 3, and 4.

2. Large Wood Instream: LWD instream projects proposed by BLM as offsite mitigation of PCGP effects in the East Fork Coquille River watershed are described in table 2.3.6.7-1. Placement of LWD in channels adds structural complexity to the aquatic habitat by creating pools and riffles, and trapping fine sediments. This action can also contribute to reductions in stream temperatures over time, primarily by increasing the number and quality of pools in these channels (Tippery, Jones et al. 2010). The Coos Bay District mitigation target is 80 pieces of LWD per mile of channel. Approximately 2.75 miles of channel would be treated; therefore, the total LWD placed Yankee Run is 220 pieces of LWD (table 2.3.6.7-1). These mitigation actions are responsive to ACS objectives 2, 3, 4 and 5.

3. Increasing Fire Suppression Capacity: High intensity fire has been identified as the single factor most impacting LSOG habitats on federal lands in the area of the NWFP. Large, contiguous areas of early and mid-seral forests are particularly prone to stand replacement fire. Increasing fire suppression capacity reduces the probability that existing LSOG forests in Riparian Reserves would be lost to stand-replacing fire, and increases the probability that existing early and mid-seral vegetation in Riparian Reserves, would over time, mature into LSOG without being lost to stand replacing fire. This measure is responsive to ACS objectives 1, 2, and 4,

4. Reallocation of matrix lands to LSR: Although this measure is driven by maintenance of LSR habitat for the marbled murrelet, reallocation of matrix to LSR is responsive to the ACS. LSR provides additional protection for Riparian Reserves because the LSR land allocation is managed for late successional stand development which complements the objectives of the ACS. The "backfill" of acquisition of matrix lands also complements the ACS because it would create additional Riparian Reserves on the lands that are acquired. Reallocation and acquisition are responsive to all nine ACS objectives.

TABLE 2.3.6.7-1

Proposed Offsite Mitigation Measures in the East Fork Coquille River Watershed

Project Type	Mitigation Group	Project Name	Qty.	Project Rationale
Road Surfacing	Road Sediment Reduction	Road Surfacing – South Fork Elk Creek	2.6 miles	Road-related sediment has negatively affected the East Fork Coquille. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to the South Fork Elk Creek would reduce if not eliminate sediment input to adjacent Chinook, coho, steelhead, and cutthroat habitat. Surfacing the BLM road which is parallel to Yankee Run Creek would reduce if not eliminate road-related sediment input to coho, steelhead, and cutthroat habitat.
Road Surfacing	Road Sediment Reduction	Road Surfacing – Yankee Run Mainline	2.0 miles	
Road Surfacing	Road Sediment Reduction	Road Surfacing – Yankee Run Spurs	0.9 miles	

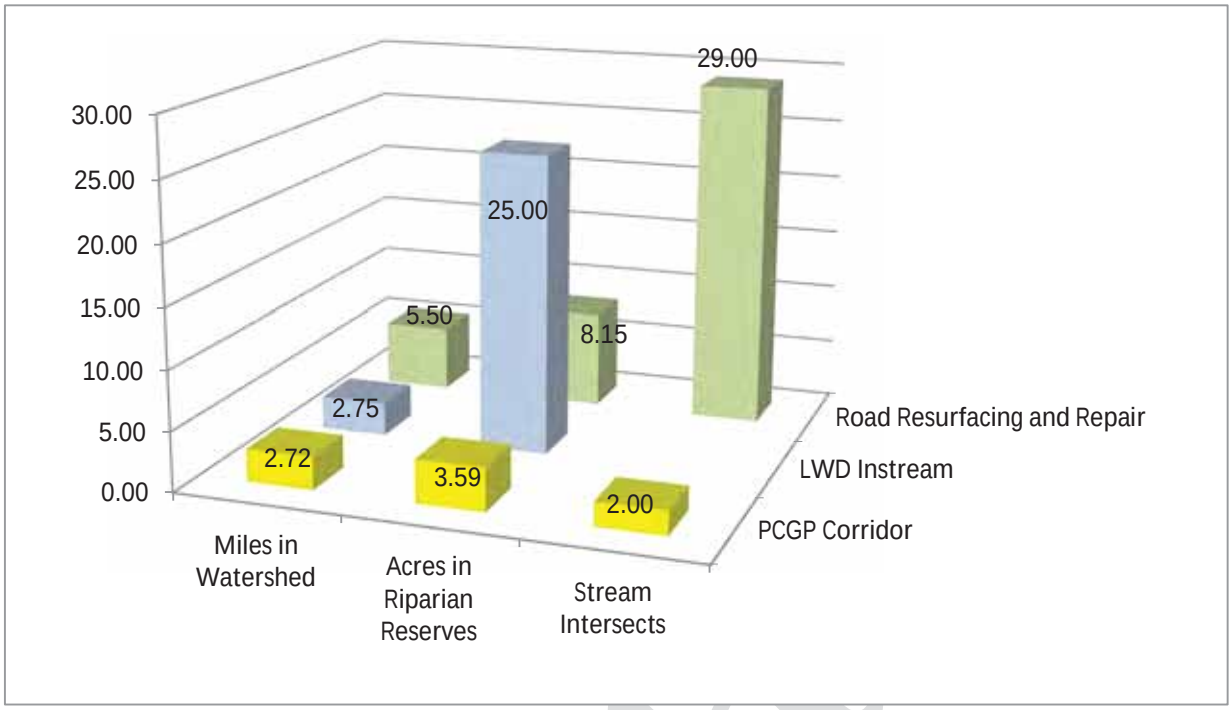
TABLE 2.3.6.7-1

Proposed Offsite Mitigation Measures in the East Fork Coquille River Watershed

Project Type	Mitigation Group	Project Name	Qty.	Project Rationale
LWD instream	Aquatic Habitat	Yankee Run In-stream Large Wood Placement	2.75 miles	Lack of LWD and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the PCGP. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing LWD at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term effects from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.
Fire Suppressio n	Fire suppression	Heli-Pond construction	3 Sites	High intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity, however the corridor also provides a fuel break. Within the East/Middle Fork subwatersheds, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heli-ponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect LSRs and endangered species habitat should a wildfire occur.
Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation & Land Acquisition	409 acres	This action contributes to the “neutral to beneficial” standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the PCGP. The action also compensates for the removal of occupied marbled murrelet habitat and suitable spotted owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of matrix lands adjacent to occupied murrelet sites by reallocating the entire parcel to LSR.

Draft

Figure 2.3.-8 Comparison of project Effects with Selected Mitigation Measures.



2.3.6.8 Project Effects Compared by ACS Objective

This section addresses the relationship between project effects and components of the ACS. There are two intermittent stream channels intersected in the East Fork Coquille River watershed. These crossings are approximately 5 miles apart in separate subwatersheds, so the potential for aggradation of effects is very low (table 2.3.6.8-1).

TABLE 2.3.6.8-1

Project Effects and ACS Objectives, East Fork Coquille River Watershed

ACS Objective	Pacific Connector Gas Pipeline Effects
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves and aquatic systems are landscape-scale features that would be crossed by Project. The Project corridor would intersect two intermittent streams, one of which is at an existing road crossing and is located primarily in early or mid-seral forests where it crosses Riparian Reserves (table 2.3.6.1-4). The Project corridor would clear 39.31 acres (0.09 percent) of the East Fork Coquille River watershed of which 3.81 acres are in Riparian Reserves. Impacts of the Project are expected to be within the range of natural variability for natural disturbance processes in the Coast Range Province (Table 2.3.6.4-2). BLM-managed lands in the East Fork Coquille River are approximately 39 percent LSOG.

TABLE 2.3.6.8-1 **Project Effects and ACS Objectives, East Fork Coquille River Watershed**	
ACS Objective	**Pacific Connector Gas Pipeline Effects**
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the East Fork Coquille River watershed because the pipeline would be buried in the two intermittent stream channels that would be crossed. At each crossing, bed and bank disturbances from crossing construction would be small (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored on-site and the bed and banks would be returned to pre-construction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. The residual levels of disturbance are anticipated to be well within the range of natural variability the Coast Range Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project corridor would cross two intermittent stream channels in the East Fork Coquille River watershed, one of which is at an existing road crossing During construction, the actual area of bank and stream bottom disturbance would be small at each crossing (<15 feet wide). Long-term impacts on the bed and banks of these features would be minor and limited to the site of construction because the pipeline would be buried. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions, consistent with the POD requirements. See table 2.3.5.4-1 for specific measures. This level of disturbance is well within the historical and current range of natural variability for bank and channel stability in the watersheds of the Coast Range Province.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment could be mobilized during the crossing of two intermittent streams. These impacts are expected to be short term and limited to the general area of construction (see section 1.3.1.2). No long-term impacts on water quality are expected because of application of the ECRP and Best Management Practices during construction. The two channel intersections in this watershed are in separate subwatersheds approximately 5 miles apart, so the potential for accumulation impacts is very low.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in corridor routing. Dry open-cut stream crossings would be used to cross stream channels. Any sediment impacts are expected to be minor and short-term and well within the range of natural variability for the Coast Range Province due to application of the POD, including Best Management Practices for water quality, restoration of bank and bottom configurations, LWD placement, and erosion control along with the anticipated rapid revegetation characteristic of the Coast Range Province. See table 2.3.5.7-1 for specific measures. As a result, potential sediment impacts are expected to be well within the range of natural variability for historical and current conditions in the Coast Range Province. Road repairs would also help reduce sediment levels in the watershed and move the sediment regime toward the desired condition.
Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	If either of the intermittent streams is flowing at the time of construction, the dam-and-pump method (described in section 1.3.1) would be used to maintain flows in the channel downstream of the crossing. No alterations of flows resulting from construction beyond the short-term, site-scale level are anticipated. The Project corridor would occupy about 0.08 percent of the East Fork Coquille River watershed. It is highly unlikely that any impacts in this small part of the watershed would affect the timing, magnitude, and duration of peak flows in the watershed, especially in light of other past and ongoing human activities (section 1.3.1.6).

Draft

TABLE 2.3.6.8-1 **Project Effects and ACS Objectives, East Fork Coquille River Watershed**	
ACS Objective	**Pacific Connector Gas Pipeline Effects**
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	No wetland or meadows would be affected by the Project on BLM-managed lands in the East Fork Coquille River watershed; therefore, the water tables in these features would not be affected.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the East Fork Coquille River watershed would be minor. Vegetation that would be cleared in the Riparian Reserve along the Project corridor consists of early and mid-seral conifers and hardwoods (see Table 2.3.5.1-4). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Overall, Project construction would affect 0.02 percent of the Riparian Reserves in the watershed. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. .
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the East Fork Coquille River watershed would be minor (3.81 acres or 0.73 percent of the Riparian Reserves in the watershed). Most of the Riparian Reserve vegetation that would be cleared is upland second-growth forest. Existing herbaceous and brush cover within the Project clearing limits would be maintained to the extent practicable. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.3.6.9 Summary

The routing of the Project through BLM lands, coupled with the relatively small area of BLM land that would be affected by Project construction (39.31 acres or 0.09 percent of the fifth-field watershed), makes it highly improbable that Project impacts would affect conditions at the subwatershed or watershed scale. Although there are site-level impacts (e.g., small amounts of sediment and a change in vegetative condition at stream crossings), these would be minor and largely limited to the boundaries of the project area (Section 2.3.6.3).

Clearing of vegetation within Riparian Reserves (3.81 acres or 0.73 percent of the Riparian Reserves in the watershed) would cause long-term but minor changes in vegetation condition. Less than one acre of the Riparian Reserve vegetation that would be cleared in the East Fork of the Coquille is LSOG. The remaining 3.2 acres that would be cleared is all early seral vegetation.

Off-site mitigation would further offset Project impacts in the watershed. Logs generated in the corridor clearing process or otherwise provided by Pacific Connector would be used as LWD placed at 80 pieces/mile in 2.75 miles of instream projects to restore aquatic habitats. Approximately 5.5 miles of road surfacing projects in the South Fork of Elk Creek and Yankee Run Creek would greatly reduce transport of sediments to nearby aquatic habitats. Reallocation of approximately 409 acres of matrix lands to LSR would provide additional aquatic protections to streams that are within the reallocation area. These offsite mitigation measures identified by BLM would supplement onsite minimization, mitigation, and restoration actions. Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.3.6.7). Table 4.1.3.5-8 describes proposed offsite mitigation measures in the East Fork Coquille River Watershed.

Proposed amendment of the Coos Bay RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species. (section 2.3.6.6). All relevant Project impacts are within the range of natural variability for watersheds in the Coast Range Province (section 2.3.6.3). No project impacts have been identified that would prevent attainment of ACS objectives (section 2.3.6.8).

2.3.7 Middle Fork Coquille Fifth Field Watershed, HUC 1710030501

2.3.7.1 Overview

The Middle Fork Coquille River watershed is located within the Coast Range Province. It is bordered on the north by the East Fork and North Fork Coquille River fifth-field watersheds, on the west by the South Fork Coquille River fifth-field watershed and the Rogue River basin, and on the east by the Olalla-Lookingglass fifth-field watershed of the South Umpqua River drainage system. The Middle Fork Coquille River joins the South Fork Coquille River at the western edge of the watershed in the vicinity of the town of Myrtle Point. The Coquille River discharges into the Pacific Ocean at Bandon, Oregon, about 23 miles south of Coos Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

The 308.3 sq. mile (197,314 acre) Middle Fork Coquille River watershed includes 10 subwatersheds. Moving west to east, these subwatersheds are Indian Creek, Myrtle Creek, Big Creek, Rock Creek, Belieu Creek, Sandy Creek, Slater Creek, Upper Rock Creek, Twelve Mile Creek, and Headwaters Middle Fork (figure 2.3-9, table 2.3.7.1-1). Of the ten subwatersheds, the PCGP corridor traverses Big Creek, Sandy Creek, Upper Rock Creek, and Headwaters Middle Fork subwatersheds (figure 2.3-8).

Topography in the watershed is mountainous with elevations ranging from 200 feet above msl to approximately 3,880 feet above msl. The Middle Fork Coquille River watershed analysis identified 97 miles of third order and higher streams. No inventory was available of first and second order streams. Headwater areas are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising the majority of the stream miles. Approximately 30.0% of the land in the watershed is managed by the BLM between the Coos Bay District (approximately 39,686 acres) and the Roseburg District (approximately 19,571 acres). Approximately 0.80% is in the Siuslaw National Forest. The rest (69.2%) is in non-federal ownership.

Figure 2.3-9 shows the checkerboard pattern of the federally-managed lands. BLM lands are found in all ten subwatersheds, ranging in sizes from 1,655 acres in the Myrtle Creek subwatershed to 10,975 acres in the Headwaters Middle Fork subwatershed (table 2.3.7.1-1). LSRs constitute 16,386 acres or about 28% of the BLM land in the watershed, and about 8% of all land in the watershed. Lands in the LSR land allocation are found in eight of the ten subwatersheds, ranging from 475 acres in the Myrtle Creek subwatershed to 5,126 acres in the Twelve Mile Creek subwatershed (table 2.3.7.1-1). In the four subwatersheds crossed by the PCGP corridor, LSR acreage ranges from 2,126 acres in the Upper Rock Creek subwatershed to 4296 acres in the Headwaters Middle Fork subwatershed. LSR acres north of Highway 42 and Camas Valley are in LSR 261. LSR lands south of Highway 142 and Camas Valley are in LSR 259. All mapped LSR lands traversed by the PCGP are in LSR RO 261. An additional 7,943 acres (701 acres KOAC,

7,242 MAMU stands) within the Middle Fork Coquille River watershed are unmapped LSRs. Other land allocations (primarily matrix lands) constitute 72% of BLM land and about 8% of all land in the watershed, and are also found in all ten subwatersheds (table 2.3.7.1-1). Riparian Reserves constitute approximately 40% of the landscape on BLM lands across all land allocations.

Location and Routing

The PCGP corridor enters the Middle Fork Coquille River watershed from the East Fork Coquille watershed at MP 35.9 and travels15.45 miles in an east-southeast direction through the Big Creek subwatershed (2.93 miles), Sandy Creek subwatershed (1.98 miles), Upper Rock Creek subwatershed (3.93 miles) and Headwaters Middle Fork subwatershed (6.61 miles), before finally exiting the watershed at MP 52.9 (figure 2.3-9). Upon first entering the Big Creek subwatershed, the corridor leaves the ridge tops and crosses several waterbodies before rising again to the watershed divide with the Camas Creek subwatershed of the East Fork Coquille River watershed. Along this divide, the corridor crosses land in both the Sandy Creek subwatershed of the Middle Fork Coquille River watershed and the Camas Creek subwatershed of the East Fork Coquille River watershed. Upon leaving the divide, the corridor travels eastward through the Upper Rock Creek and Headwaters Middle Fork subwatersheds, crossing diverse topography on federal land. Upon leaving the Middle Fork Coquille River watershed, the corridor enters the Olalla-Lookingglass fifth-field watershed of the South Umpqua River drainage system. Total corridor length in the Middle Fork Coquille River watershed is 15.23 miles.

Within the Middle Fork Coquille River watershed, the PCGP corridor traverses a total of 6.76 miles of BLM land: 2.92 miles in the Big Creek, subwatershed, 0.53 miles in the Sandy Creek subwatershed, 1.39 miles in the Upper Rock Creek subwatershed, and 1.92 miles in the Headwaters Middle Fork subwatershed (table 2.3.7.1-2). Effects in these subwatersheds range from approximately 8 acres in the Sandy Creek subwatershed to approximately 28 acres in the Headwaters Middle Fork subwatershed. A total of 95.4 acres of BLM land would be cleared and another 28.3 acres would be modified during corridor construction, together amounting to 0.21% of the BLM land in the watershed. No NFS land is crossed by PCGP corridor construction. Over all land ownership, 264.81 acres of land would be affected by PCGP corridor construction (243.19 acres cleared and 21.62 acres modified), constituting 0.13% of the land in the watershed (table 2.3.7.1-2).

Approximately 46.92 acres of the LSR land allocation would be affected by project construction in the Middle Fork Coquille River watershed (28.3 acres cleared and 18.57 acres modified, table 2.3.7.1-3). This constitutes 0.28% of the LSR land in the watershed. Approximately 76.78 acres of BLM matrix land would also be affected by PCGP project construction (67.05 acres cleared and 9.73 acres modified, table 2.3.7.1-3). This constitutes 0.18% of the Matrix land in the watershed.

To minimize aquatic and riparian effects on federal lands, the PCGP corridor is routed along ridge tops to the maximum extent possible. Approximately 15.76 acres or 0.07% of Riparian Reserves in the watershed are within the corridor. Of the affected Riparian Reserves, approximately 14.19 acres would be cleared and 1.57 acres would be modified.

In the Big Creek subwatershed, six intermittent streams and one perennial stream are crossed. and riparian zones of two intermittent tributaries and one perennial tributary of Big Creek are clipped. Four of the crossings in the Big Creek subwatershed (intermittent stream crossings at MP 36.54,

36.92 and 37.33 and the perennial stream crossing at MP 37.35) are located in occupied marbled murrelet stands (C3073 and C3090, table 2.3.7.1-4). Within the Big Creek subwatershed, approximately 7.93 acre of Riparian Reserves would be cleared by corridor construction, and approximately 1.07 acres would be modified. Approximately 2.52 acres of cleared Riparian Reserve vegetation would be LSOG, 0.91 acres would be mid-seral and 4.44 acres would be early seral (Table 2.3.1.7-4).

In the Upper Rock Creek drainage, 1.01 acres of early seral vegetation in Riparian Reserves would be clipped along two tributaries to Upper Rock Creek.

In Headwaters Middle Fork subwatershed one perennial stream would be crossed and Riparian Reserves along two intermittent streams would be clipped. Within the Headwaters Middle Creek subwatershed, approximately 5.25 acres of Riparian Reserve vegetation would be cleared and 0.14 acres would be modified. Approximately 0.91 acres of cleared Riparian Reserve vegetation would be LSOG, 4.05 acres would be mid-seral and 0.13 acres would be early seral.

Over all BLM land in the Middle Fork Coquille fifth-field watershed, 14.19 acres of Riparian Reserves would be cleared, of which 3.43 acres are LSOG, 4.96 acres are mid seral, 5.58 acres are early seral and 0.22 acres are willows within the Deep Creek or Big Creek channels (table 2.3.7.1-4).

Draft

Figure 2.3-9 PCGP Routing and Subwatershed Boundaries, Middle Fork Coquille River Watershed

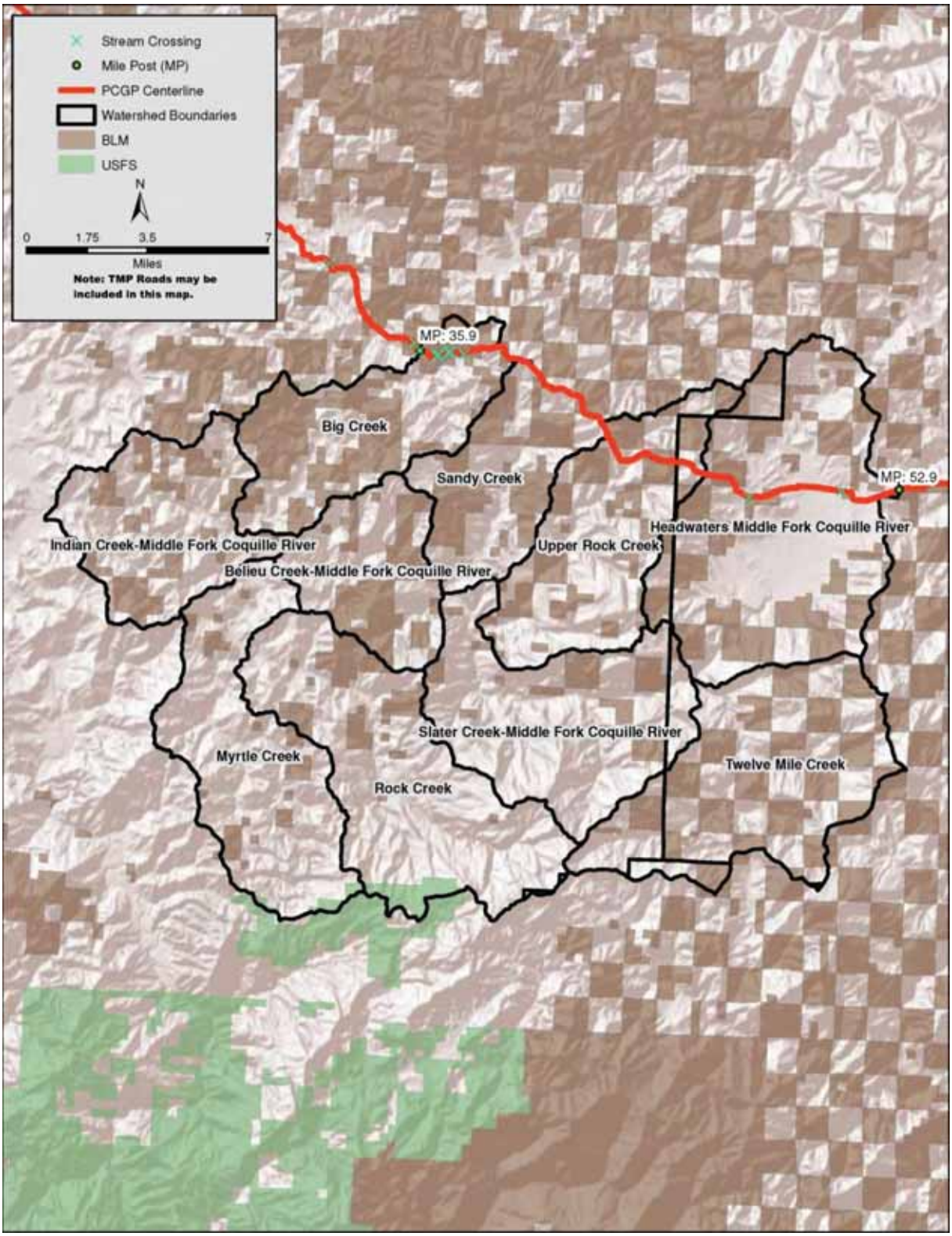


TABLE 2.3.7.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Middle Fork Coquille River Watershed HUC 1710030501

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						Designated LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Belieu Creek	11,362.40	4,311.38	0.00	4,311.38	7,051.02	1,207.07		3,104.31		1,724.55	0.00	1,724.55
Big Creek	16,654.37	8,941.52	0.00	8,941.52	7,712.85	322.31		8,619.21		3,576.61	0.00	3,576.61
Headwaters Middle Fork Coquille River	31,554.00	10,974.60	0.00	10,974.60	20,579.40	4,296.32		6,678.28		4,389.84	0.00	4,389.84
Indian Creek	15,455.52	4,440.80	0.00	4,440.80	11,014.72			4,440.80		1,776.32	0.00	1,776.32
Myrtle Creek	19,996.44	1,655.44	423.83	2,079.27	17,917.17	475.47		1,179.97	423.83	662.18	169.53	831.71
Rock Creek	25,555.68	2,940.54	1,121.05	4,061.59	21,494.09	654.13		2,286.41	1,121.05	1,176.22	448.42	1,624.64
Sandy Creek	12,608.91	5,918.05	0.00	5,918.05	6,690.86	2,177.50		3,740.55		2,367.22	0.00	2,367.22
Slater Creek	21,521.28	3,174.39	0.00	3,174.39	18,346.89			3,174.39		1,269.76	0.00	1,269.76
Twelve Mile Creek	24,156.10	10,365.91	0.00	10,365.91	13,790.19	5,126.14		5,239.77		4,146.36	0.00	4,146.36
Upper Rock Creek	18,449.35	6,563.79	0.00	6,563.79	11,885.56	2,126.84		4,436.95		2,625.52	0.00	2,625.52
Watershed Total	**197,314.05**	**59,286.42**	**1,544.88**	**60,831.30**	**136,482.75**	**16,385.78**	**0.00**	**42,900.64**	**1,544.88**	**23,714.57**	**617.95**	**24,332.52**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 7,943 acres (701 acres KOAC, 7,242 MAMU stands) are unmapped LSR.
c/ Occur within LSR and Matrix Land Allocations. Data Source: MF Coquille WA, page 12 Approximately 40% of the landscape is Riparian Reserve

Draft

TABLE 2.3.7.1-2

PCGP Project Corridor (miles) and Project Area (acres) in the Middle Fork Coquille River Watershed HUC 1710030501 by Land Ownership

Unit a/	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Belieu Creek									0.00	0.00	0.00	0.00								
Big Creek	2.92	39.11	6.86	0.51					2.92	39.11	6.86	0.51	0.01	4.53	0.48	0.06	2.93	43.64	7.34	0.31
Headwaters Middle Fork Coquille River	1.92	26.15	0.14	0.24					1.92	26.15	0.14	0.24	4.69	68.33	1.00	0.34	6.61	94.48	1.14	0.30
Indian Creek									0.00	0.00	0.00	0.00								
Myrtle Creek									0.00	0.00	0.00	0.00								
Rock Creek									0.00	0.00	0.00	0.00								
Sandy Creek	0.53	7.74	0.40	0.14					0.53	7.74	0.40	0.14	1.45	33.70	0.75	0.51	1.98	41.44	1.15	0.34
Slater Creek									0.00	0.00	0.00	0.00								
Twelve Mile Creek									0.00	0.00	0.00	0.00								
Upper Rock Creek	1.39	22.40	3.40	0.39					1.39	22.40	3.40	0.39	2.54	41.23	8.59	0.42	3.93	63.63	11.99	0.41
Watershed Total	**6.76**	**95.40**	**10.80**	**0.18**	**0.00**	**0.00**	**0.00**	**0.00**	**6.76**	**95.40**	**10.80**	**0.17**	**8.69**	**147.79**	**10.82**	**0.12**	**15.45**	**243.19**	**21.62**	**0.13**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.7.1 3

PCGP Project Area (acres) on Federal Lands in the Middle Fork Coquille River Watershed HUC 1710030501 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Belieu Creek	BLM																
	NFS																
Big Creek	BLM	9.37	0.00	2.91	0.00	29.74	6.86	0.35	0.08	7.93	1.07	0.22	0.03	39.11	6.86	0.44	0.08
	NFS																
Headwaters Middle Fork Coquille River	BLM	8.01	17.49	0.00	0.41	18.13	0.14	0.27	0.00	5.25	0.14	0.12	0.00	26.14	17.63	0.24	0.16
	NFS																
Indian Creek	BLM																
	NFS																
Myrtle Creek	BLM																
	NFS																
Rock Creek	BLM																
	NFS																
Sandy Creek	BLM	7.20		0.33		0.54	0.40	0.01	0.01					7.74	0.40	0.13	0.01
	NFS																
Slater Creek	BLM																
	NFS																
Twelve Mile Creek	BLM																
	NFS																
Upper Rock Creek	BLM	3.77	1.08	0.18	0.05	18.64	2.33	0.42	0.05	1.01	0.36	0.04	0.00	22.41	3.41	0.34	0.05
	NFS																
Watershed Total	**BLM**	**28.35**	**18.57**	**0.17**	**0.11**	**67.05**	**9.73**	**0.16**	**0.02**	**14.19**	**1.57**	**0.06**	**0.01**	**95.40**	**28.30**	**0.16**	**0.05**
	NFS									**0.00**	**0.00**						
	Total BLM & NFS	**28.35**	**18.57**	**0.17**	**0.11**	**67.05**	**9.73**	**0.16**	**0.02**	**14.19**	**1.57**	**0.06**	**0.01**	**95.40**	**28.30**	**0.16**	**0.05**

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.3.7.1-4

Riparian Reserve Effects Middle Fork Coquille River Watershed HUC 1710030501

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Big Creek Subwatershed HUC 171003050109																												
CBD BLM	35.87	BLM 35.9 Trib. to Big Creek	small intermittent stream	I	Yes	1.50		No				0.00				0.00	0.79			0.79		0.79		0.79	0.27	1.06	No	No
CBD BLM	36.15	BLM 36.48 Trib. To Big Creek	RR Clipped	I	No	2.26		Yes				0.00				0.00	1.05			1.05		1.05		1.05		1.05	No	No
CBD BLM	36.48	BLM 36.48 Trib. To Big Creek	small intermittent stream	I	Yes	2.26		No				0.00				0.00	0.86			0.86		0.86		0.86		0.86	No	No
CBD BLM	36.54	GSI025/BSI253	Intermittent stream, 4'average width	I	Yes	6.00		No				0.00	0.59			0.59	0.17			0.17		0.76		0.76		0.76	No	No
CBD BLM	36.85	BLM 36.85 Trib. To Big Creek	small intermittent stream in road prism	I	Yes	1.50		No	0.23			0.23				0.00	0.30			0.30		0.53		0.53	0.26	0.79	No	No
CBD BLM	36.92	BSI252Trib. to Big Creek	Intermittent stream, 3' average width in road prism	I	Yes	3.06		No				0.00	0.27			0.27	0.18			0.18		0.45		0.45	0.24	0.69	No	No
CBD BLM	37.26	ESI019Trib. to Big Creek	RR of lateral stream clipped	I	No	2.75		Yes				0.00				0.00	1.09			1.09		1.09		1.09	0.11	1.20	No	No
CBD BLM	37.33	ESI019Trib. to Big Creek	Narrow creek	I	Yes	2.75		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
CBD BLM	37.35	ESP020Trib. to Big Creek	10-15' wide broad U-shaped channel with cobble/silt substrate	P	Yes	14.93		No	0.78			0.78	0.05			0.05				0.00	0.06	0.89	0.14	1.03		1.03	Yes	Yes
CBD BLM	37.44	Trib to Big Creek	Riparian Reserve associated with trib of Big Creek that is not crossed	p	No			Yes	1.51			1.51				0.00				0.00		1.51	0.93	2.44		2.44	No	No

Draft

TABLE 2.3.7.1-4

Riparian Reserve Effects Middle Fork Coquille River Watershed HUC 1710030501

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Subtotal Big Creek Subwatershed		Crossed: 6 Int. Channels 1 Per. Channel	Clipped: 2 Int. Channel RR 1 Per. Channel RR		7			3	2.52	0.00	0.00	2.52	0.91	0.00	0.00	0.91	4.44	0.00	0.00	4.44	0.06	7.93	1.07	9.00	0.88	9.88	1	
Upper Rock Creek Subwatershed HUC 171003050103																													
RD BLM	43.36	Trib to Upper Rock Cr.	RR of lateral stream clipped	I	No			Yes				0.00				0.00	0.64			0.64		0.64	0.36	1.00	0.07	1.07	No	No
RD BLM	44.99	Trib to Upper Rock Cr.	RR of lateral stream clipped	I	No			Yes				0.00				0.00	0.37			0.37		0.37		0.37		0.37	No	No
Subtotal Upper Rock Creek Subwatershed		Crossed: None	Clipped: 2 Int. Channel RR		0			2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	1.01	0.00	1.01	0.36	1.37	0.07	1.44	0	
Headwaters Middle Fork Coquille Subwatershed HUC 171003050101																													
RD BLM	48.27	BSP257Deep Creek	Perennial stream (also a willow dominated wetland) (Dry in Oct. 2013)	P	Yes	80.89		No				0.00	3.22			3.22	0.13			0.13	0.16	3.51	0.14	3.65	0.54	4.19	Yes	No
RD BLM	48.72	Trib of Headwaters, MFC	RR of lateral stream clipped	I	No			Yes				0.00	0.83			0.83				0.00		0.83		0.83		0.83	No	No
RD BLM	51.02	GSI038Trib to Middle Fork Coquille	RR of stream crossed on private land	I	No	19.07		Yes	0.91			0.91				0.00				0.00		0.91		0.91		0.91	No	No
Subtotal Headwaters MFC Subwatershed		Crossed: 1 Per. Channel	Clipped: 2 Int. Channels		1		0.00	2	0.91	0.00	0.00	0..91	4.05	0.00	0.00	4.05	0.13	0.00	0.00	0.13	0.16	5.25	0.14	5.39	0.54	5.93	1	

Draft

TABLE 2.3.7.1-4

Riparian Reserve Effects Middle Fork Coquille River Watershed HUC 1710030501

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/																			
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
Total MF Coquille Watershed		Crossed: 6 Int. Channels 2 Per. Channels	Clipped: 6 Int. Channel RR 1 Per. Channel RR		8			7	3.43	0.00	0.00	3.43	4.96	0.00	0.00	4.96	5.58	0.00	0.00	5.58	0.22	14.19	1.57	15.76	1.49	17.25	2	

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

TABLE 2.3.7.1-5

Stream Crossing Turbidity and Risk Assessment, Middle Fork Coquille River Watershed

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Middle Fork Coquille River	Big Cr.	35.9	I	Intermittent stream in existing road crossing (Not in RR 2A-3a)					In existing road		I	I	I	BLUE
Middle Fork Coquille River	Big Cr.	36.48		Intermittent stream (Not in RR 2A-3a)					In existing road		I	I	I	BLUE
Middle Fork Coquille River	Big Cr.	36.54	I	Intermittent stream, 4'average width	6	6	13.29		Erosion resistant	Cobble/ gravel	M	L	L	BLUE
Middle Fork Coquille River	Big Cr.	36.85	I	Intermittent stream in existing road crossing (Not in RR 2A-3a)					In existing road		I	I	I	BLUE
Middle Fork Coquille River	Big Cr.	36.92	I	Intermittent stream, 3' average width		3.06					I	I	I	BLUE
Middle Fork Coquille River	Big Cr.	37.33	I	Narrow creek	2	2.75	21		Erosion resistant	Gravel	M	L	M	BLUE
Middle Fork Coquille River	Big Cr.	37.35	P	10-15' wide broad U-shaped channel with cobble/silt substrate	13	14.93	6.2		Erosion resistant-toe protection	Cobble/ silt	M	M	L	YELLOW
Middle Fork Coquille River	Headwaters MFC	48.27	P	Perennial stream	4	80.89	2.37		Highly erosion resistant	cobble/ gravel	M	M	M	YELLOW

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified:

Draft

2.3.7.2 Existing Conditions

Two watershed analyses have been completed for the Middle Fork Coquille River watershed. In 1999, the Roseburg District BLM completed a watershed assessment for the Upper Middle Fork, which included the Headwaters Middle Fork Coquille and Upper Rock Creek subwatersheds. In 2007, version 1.1 of the Middle Fork Coquille watershed assessment was completed that that updated an earlier version of the watershed assessment, and addressed the entire Middle Fork Coquille River fifth field watershed. Both of these documents are referenced in this assessment.

Original Watershed Analysis Findings

- **Fisheries**: Nehlsen et al. (1991) reported Coquille River stocks of spring Chinook salmon, coho salmon, and sea-run cutthroat trout to be "at risk" of extinction as a result of habitat degradation, over fishing, ocean conditions, and other factors (BLM 2007). There is barrier to anadromy that prevents coho salmon from accessing habitat in the Headwaters MFC subwatershed.

- **Riparian Areas**: Riparian communities within the Middle Fork Coquille River watershed have been radically altered by processes associated with logging and agriculture. For example, early logging practices relied on streams to transport logs, and as such, much of the timber harvested was adjacent to stream channels. Furthermore, in the era of splash damming, riparian vegetation was denuded to facilitate log transport. The riparian areas in the watershed are presently dominated by hardwoods and young-aged stands of Douglas-fir. Only a small fraction of existing riparian areas are comprised of mature stands of mixed conifer and hardwood species (BLM 2007).

- **Aquatic Habitat**: The removal of large woody debris from within stream channels has reduced the amount and quality salmonid spawning and rearing habitat. The harvest of conifers in riparian areas opened up the streams to potential temperature increases and a lack of long-term LWD input. In addition road building practices increased sedimentation and prevented fish passage into the many of the tributaries. Roads placed directly adjacent to streams also compounded the problem by confining streams to narrow channels, thereby increasing velocities and simplifying the hydrological characteristics within the channels. The flow of sediments has also been altered as a result of channel simplification in the Middle Fork Coquille River basin (BLM 2007). Many stream channels in the Middle Fork Coquille River watershed are deeply incised, disconnected from the floodplain, and dominated by bedrock. Most of the Middle Fork of the Coquille River and many tributaries are constrained by roads. Instream structure (large woody debris) and channel complexity are lacking throughout the Middle Fork of the Coquille River basin (BLM 1999a).

- **Water Quality**: Many of the processes previously detailed are intimately associated with water quality: 1) riparian cover with stream temperature, 2) stream habitat/channel structure with sedimentation (turbidity, suspended sediment and bedload), and 3) nutrients/organic carbon cycling with water chemistry and biology (pH, total dissolved solids, microorganisms). A critical link with these "in-stream" processes are "upland" processes which provide many of the primary inputs (organic material and sediment) essential to their functioning(BLM 2007).

Draft

- **Road Condition / Road Risk**: High road density, valley bottom roads adjacent to streams and road-related sediments have negatively affected water quality and aquatic habitats in the Middle Fork Coquille watershed (BLM 1999a; BLM 2007).

The Upper Middle Fork watershed assessment (BLM 1999a: C-1, table C-1) provided metrics for watershed condition for the Headwaters Middle Fork Coquille Subwatershed as follows (table 2.3.7.2-1):

TABLE 2.3.7.2-1

Headwaters Middle Fork Coquille River Watershed Conditions

Subwatershed Name	Road Density	Stream Density	Percent BLM-administered Land	Stream Crossing Density	Percent Stands Less Than 30 Years Old (BLM)	Percent of Riparian Reserves at Least 80 Years Old
Headwaters Middle Fork Coquille Subwatershed	5.42 miles / square mile	6.69 miles / square mile	32	2.28 road crossings / stream mile	29%	29% (1036 acres based on estimated 40% Riparian Reserve Density)

In summary, the combined effects of agricultural and timber harvest practices, splash dams in mainstem channels along with substantial road construction, have degraded stream habitat conditions to varying degrees throughout the watershed. These types of degraded conditions are common throughout much of the Coast Range Province. Except for some improvement in vegetative condition, habitat improvement from instream LWD placement projects, and sediment reduction projects at select locations in the watershed, most of these conditions persist currently.

Changes in watershed Condition

No large disturbance events that could alter watershed conditions have been documented since the Middle Fork Coquille watershed assessment and Upper Middle Fork Coquille watershed assessment were prepared. A 55 acre wildfire occurred in the Headwaters, Middle Fork Coquille subwatershed in 2001. A 74 acre wildfire occurred in Upper Rock Creek in 2009. These events may have had site and subwatershed effects but at the watershed scale, these were minor events, and unlikely to change watershed conditions.

Current Watershed Condition

The Oregon Watershed Enhancement Board (OWEB) published an analysis of watershed conditions for the Coquille River and other coastal river basins in 2008 (Bauer et al. 2008) Watershed conditions in the Middle Fork Coquille River watershed were found to be limiting for most parameters and watershed processes. These factors consider all ownerships and may not be representative of any single location or ownership.

- Five streams, in two subwatersheds, and the mainstem are listed as impaired for temperature. Summer water temperatures have been noted as a concern to juvenile salmonids. Upper Rock Creek and Wildcat Creek have good summer temperatures.
- Summer flows are naturally low. Water withdrawals, together with poor channel and riparian conditions, in the lower elevations exacerbate the effects of low flows.

Draft

- Eighteen (45%) of 40 surveyed streams were found to be limited due to excessive fines in spawning gravels. These streams occurred throughout the watershed.
- Based on habitat surveys of 40 streams, LWD was found to be limiting in 80% of streams and pools were limiting in 68% of streams. These habitat components often function to form slow-water refugia used by wintering salmonids. .
- Based on a review of 40 surveyed streams, riparian conifers, LWD, pools and fines in spawning gravels are limiting. The affected streams occur in all subwatersheds.
- Based on a review of 40 surveyed streams, riparian conifers were limited in 39 (98%) of the streams.
- Based on the road density and amount of developed land, it appears fine sediment delivery from upland sources to stream channels likely has a moderate impact.

Several restoration projects have been completed in several subwatersheds on BLM lands in the Middle Fork Coquille River watershed:

- **Boulder Creek:** Culvert replaced on tributary to Boulder Creek restoring 3.5 miles of resident fish habitat.
- **Headwaters Middle Fork Coquille:** Decommissioned 2.0 miles of road; Culvert replaced on tributary to Bingham Creek restoring 1.8 miles of resident fish habitat; Culvert replaced on Holmes Creek restoring 3.7 miles of resident fish habitat.
- **Big Creek and Sandy Creek Subwatershed:** Instream LWD projects, riparian thinning and road improvements have been completed.

Generally, under the NWFP, watershed conditions have been improving on BLM lands but BLM lands make up less than half of the watershed (table 2.3.7.1-1) (Fowler 2012 personal communication; Forest Service and BLM 2012).

While conditions are improving on BLM lands in the Middle Fork Coquille River stream temperature and road-related sediment remain key issues at the watershed scale. Riparian Reserve condition is generally poor due to homogenous stands of overstocked timber. LWD and LWD recruitment potential is lacking. Quality spawning gravels and pools are limited.

2.3.7.3 Natural Disturbance Processes

Natural disturbance regimes in the Middle Fork Coquille River watershed are consistent with those described for the Coast Range in Section 2.1.1. Fire and occasional overlapping high intensity winter storms were the primary natural disturbance processes in the Middle Fork Coquille River watershed.

Draft

Figure 2.3-10 Tributary of Big Cr. MP 37.35

The Middle Fork Coquille watershed is considered to have a high-severity fire regime where large fires are very infrequent (more than 100 years between fires) but are usually high-intensity, stand replacing fires when they do occur. High-severity fire regimes typically occur in cool, moist forest types. In high-severity fire regimes, fires occur under unusual conditions such as during droughts, during east wind weather events (hot and dry foehn winds), and with an ignition source such as lightning. Fires are often of short duration (days to weeks) but of high intensity and severity (Pickford et al. 1980). Most of the lands in the Middle Fork Coquille watershed are classified as being in the high-severity fire regime, which is common to the coastal mountains of Oregon, the middle to northern Cascades, the Olympic Mountains, and other typical Westside forests (BLM 1999a).

Occasional smaller low intensity fire events or windstorms created complex stand structures, and created openings and "snag patches." High intensity rainfall events (at least 4 inches in 24 hours) occur in the Coast Range Province on a cycle of 5+ years (BLM 2010: 17). Occasionally, high intensity rainfall events overlapped with areas that had burned in large, stand replacement fires resulting in a major pulse of sediments and a synergistic change in watershed / stream conditions as described in Section 2.2.1. These episodic pulses of landslide-generated coarse sediments provided building blocks of aquatic habitats and are in contrast to the negative effects of chronic inputs of fine-grained sediments resulting from roads, agriculture and upland land management practices that are typical of the current conditions in the Middle Fork Coquille River watershed.

2.3.7.4 Project Effects and Natural Range of Variability

Tables 2.3.7.1-3 and 2.3.5.1-4 describe affected Riparian Reserves and stream channel intersects in the Middle Fork Coquille watershed. Table 2.3.7.1-5 summarizes the risk of increased turbidity and the overall crossing risk associated with each stream crossing in the watershed (Adapted from GeoEngineers, 2013c). There are six intermittent and two perennial stream crossings in this watershed. Two crossings are rated as "Yellow" or moderate risk (MP 37.35 and 48.27), using the GeoEngineer's matrix. The remaining crossings are all "Blue", or low risk for construction impacts and site response.

At the request of the BLM, North State Resources conducted a field evaluation of the stream crossings in Big Creek with emphasis on the perennial crossing of a tributary of Big Creek at MP 37.35. The purpose of this review was evaluation of erosion and stability risk associated with the Pacific Connector project as compared to historic erosion and disturbance processes. In the last half of the 19th century this part of Big Creek was heavily burned during several wildfires. Subsequent heavy rainfall resulted several large debris flows that have choked the system with deposits. The current valley floor of Big Creek is buried by deposits from these debris flows. The

Draft

downstream portion shows a braided stream drainage pattern typical in a stream course that has difficulty moving a large amount of sediment. Over the last 150 or so years the yearly stream flows have slowly removed parts of these debris flow deposits leaving behind large boulders. Over a long time (next few centuries) Big Creek would continue to remove sand and gravel debris flow deposits but leave behind the Volkswagen-size boulders. It is unlikely that the proposed pipeline crossing would have erosional effects in the Big Creek drainage that are outside the range of natural variability (Koler 2013). This field review resulted in a minor realignment to move the corridor clearing upstream (north) approximately 100 feet to better utilize a bench between the intermittent channel at MP 37.33 and the perennial tributary of Big Creek at MP 37.35.

A second purpose of this field review was to evaluate the multiple crossings of five intermittent streams that occur between MP 36.4 and the Deep Creek Crossing at MP 37.35. While all of five of these crossings are considered low risk, and 3 of them are in an existing road there is a possibility of aggradation of sediment downstream from multiple crossings in a short distance that are tributary to one stream system. The field review concluded that cumulative effects from the 5 crossing were unlikely. If visible erosion or sediment transport is evident at these crossings, Pacific Connector would need to take additional steps to reduce erosion from sediment sources. These would include adding appropriate Best Management Practices from the "Yellow" risk crossing group to further reduce the entrainment and transport of sediment (table 2.3.7.4-1).

For stream channel crossings in the "Yellow" category, more robust Best Management Practices, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of Best Management Practices for "Blue" or low-risk crossings.

TABLE 2.3.7.4-1

Pacific Connector Additional Proposed BMPs for Use at Waterbody Crossings in the Yellow and Orange Management Categories

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**
Crossing MP	**35.9; 36.48; 36.54; 36.85; 36.92; 37.33; 51.02**	**MP 37.35; 48.27**
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)

TABLE 2.3.7.4-1

Pacific Connector Additional Proposed BMPs for Use at Waterbody Crossings in the Yellow and Orange Management Categories

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)

Based on evaluations by both GeoEngineers and North State Resources, there is no reason to believe that the erosion control and bank stability Best Management Practices described in table 2.3.7.4-1 would not be effective as these are proven methods appropriate for the sites where they are being applied. With application of project Best Management Practices downstream sediment generated during construction is expected to be consistent with effects described in Section 1.3.1 for dry, isolated crossings and well within the range of natural variability for the Middle Fork Coquille watershed. Post-operations sediment related to the PCGP corridor is expected to be minor and well within the range of natural variability for the Coast Range Province (Section 1.4.2.1).

Table 2.3.7.4-2 describes the range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) in the Middle Fork Coquille River watershed. All processes have been affected to some degree by human activity. Also included in table 2.3.7.4-2 are evaluations of PCGP project effects relative to the ranges of variability.

TABLE 2.3.7.4-2

Project Effects and Relevant Ecological Processes Described in the Middle Fork Coquille and Upper Middle Fork Coquille Watershed Analyses

Ecological Processes Relevant to the PCGP project	**Natural Range of Variability**	**Pacific Connector Effects**
Erosional Processes	Similar to other watersheds in the Coast Range Province, the Middle Fork Coquille River watershed is an active erosional environment. Landslides are the dominant sediment delivery mechanism to stream systems. Landslide occurrence is strongly correlated with heavy precipitation events. Soils on slopes that are less than the angle of repose are not at risk for landslides. The angle of repose for most local soils is around 68% (BLM 2007: 90). Erosional processes are highly variable and episodic in nature. Exposed soils are subject to rapid surface erosion during storm events because of their shallow nature and limited water storage capacity. Historically in the Coast Range, very large stand replacement fires have a return rate of about 240 years. Based on that return rate, the Coast Range experienced elevated sediment levels 8% to 12% of the time when periods long enough to include stand replacement fires are considered. Smaller fires and less severe fires would have caused additional	The PCGP avoids overly steepened slopes that pose a landslide risk so erosion from mass wasting is not expected to occur (GeoEngineers 2009) on the PCGP right-of-way. Application of Best Management Practices and maintenance of effective ground cover are expected to minimize exposure of bare mineral soil during the wet season. Effective ground cover is the considered to be the amount of cover necessary to maintain an area in a "low" hazard category (Section 1.4.2.1). Surface erosion is expected to be limited to the site, and to be well within the natural range of variability for the Coast Range Province.

TABLE 2.3.7.4-2

Project Effects and Relevant Ecological Processes Described in the Middle Fork Coquille and Upper Middle Fork Coquille Watershed Analyses

Ecological Processes Relevant to the PCGP project	Natural Range of Variability	Pacific Connector Effects
	smaller spikes of fire-associated sediment (BLM 2010: 18). Surface erosion and mass wasting is minimized by not exposing bare mineral soils on steep sites (BLM 2007: 90).	
Ecological Succession / Vegetative Condition	BLM lands in the Middle Fork Coquille River watershed have been heavily affected by both aboriginal and contemporary human use. Infrequent large fires of several hundred acres to many thousands of acres are a part of the history of the western hemlock zone (Agee, 1993). The occurrence of a large fire in 1868 - the same year as the Coos Bay fire – created extensive stands dominated by Douglas-fir (BLM 2007: 57; BLM 2010) Natural fire regimes created a complex mosaic of multi - age class stands with large numbers of snags and fire-maintained natural openings. Landslides associated with fires and overlapping high-intensity rainstorms occasionally "sluiced out" channels with debris flows that removed riparian vegetation and reset succession to early seral conditions. Historically in the Coast Range, very large stand replacement fires have a return rate of about 240 years. Based on that return rate, the Coast Range on average had 10-15% of the area in early seral plant communities from large fires at any point in time. Currently, an estimated 40% of the BLM lands in the watershed are LSOG forest (BLM 2007:12).	Vegetative condition throughout the Middle Fork Coquille River watershed has been significantly altered by timber management and agricultural development. The PCGP project affects 0.18% or about 107 acres of BLM lands in the watershed. About 14.19 acres of Riparian Reserves are affected in the entire watershed. All of these effects to Riparian Reserves occur within three subwatersheds: Big Creek, Upper Rock Creek and Headwaters Middle Fork Coquille. In Big Creek, the project affects approximately 9.0 acres (0.25%) of the Riparian Reserves in the subwatershed. In the Headwaters Middle Fork Coquille the project affects 5.39 acres (0.12%) of the Riparian Reserves in the subwatershed. A total of about 3.43 acres of LSOG would be cleared by the project in Riparian Reserves on BLM lands in the entire MF Coquille watershed (2.52 acres in the Big Creek subwatershed and 0.91 acres in the Deep Creek subwatershed). The remaining 10.76 acres of Riparian Reserve vegetation removed by the project are early (5.58 acres) and mid-seral (4.96 acres). The clearing of LSOG in Riparian Reserves is a long-term change in vegetative conditions, however this is a minor impact that is occurs in two widely separated subdrainages. Considering the historical size of large, stand replacement fires and the effects of natural landslides on stream channels, this is well within the natural range of variability for changes in vegetative conditions within the watershed. Site restoration would be accomplished with native species (ECRP).
Flow Regimes	Because of shallow soils and limited water holding capacity, flow regimes are, by nature, highly variable and closely follow precipitation patterns. Where high intensity rainfall events occur on lands experiencing recent fire events, substantial increases in peak flows over background conditions are possible. Such high intensity rain events (>4 inches in 24 hours) occur on a highly variable cycle that averaged 5+ years in duration. Roads and timber harvest units have likely contributed to increases in peak flows (BLM 1999a; BLM 2007). Portions of Upper Rock Creek are in the Transient Snow Zone where Rain-on-Snow events may increase peak flow intensity.	The PCGP project is unlikely to contribute discernible changes in peak flows because of the corridor routing and the limited scale of the project within any single drainage. The PCGP occupies approximately 0.32% of the Middle Fork Coquille River watershed and 0.23% of BLM lands in the watershed. (table 2.3.7.1-2.). Improvements to access roads identified in the TMP are intended to reduce the road-related effects to flow regimes in the watershed, and would mitigate any project effects.
Stream Temperatures	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Similar forested headwater streams monitored in 2003 through 2005 in the Umpqua basin to the north and elsewhere in the South Coast basin had 7-day average maximum temperatures ranging from 58.2 ºF to 62.9 ºF. (BLM 2010: 79).	Although portions of the Middle Fork Coquille River watershed are 303(d) listed for temperature, it is highly improbable that the PCGP corridor stream crossings on BLM lands would influence stream temperature. Seven intermittent streams and 2 perennial streams are crossed by the PCGP in the Middle Fork Coquille River watershed. Intermittent stream crossings have a low probability of increasing stream temperature because flows are discontinuous, with many streams drying up entirely by the critical late summer period. The channel

Draft

TABLE 2.3.7.4-2 **Project Effects and Relevant Ecological Processes Described in the Middle Fork Coquille and Upper Middle Fork Coquille Watershed Analyses**		
Ecological Processes Relevant to the PCGP project	**Natural Range of Variability**	**Pacific Connector Effects**
		crossing of perennial Big Creek in the Big Creek subwatershed at MP 37.35 is on a roughly east-west orientation, so shading vegetation on the south side of the crossing would continue to provide effective shade for a portion of the channel. Stream channels on BLM lands in this area have good canopy coverage above and below the crossing. Give the orientation of the channel to the crossing, the right-of-way clearing width, and size of adjacent trees, it is unlikely that stream temperatures would be increased by this crossing. The crossing of perennial Deep Creek in the Headwaters Middle Fork Coquille subwatershed at MP 48.27 is oriented East-West and is adjacent to an existing road. Given the orientation of the stream relative to the crossing, the right-of-way clearing width, and the size of adjacent hardwoods, it is unlikely that stream temperatures would be increased by this crossing. These perennial stream crossings lie in two separate subwatersheds and are miles apart, making any kind of aggradation of effects improbable. .
Aquatic Habitat and Stream Channel Complexity	Prior to settlement, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and stream bank vegetation was indicative of relatively stable stream banks and channels that were relatively resilient during floods. PFC for channel complexity is >60 pieces LWD /mile and more than 30% pools except for those periods when large landslide events have altered channels or created large channel / floodplain deposits (see Section 2.1.1). Past management practices have simplified channel conditions, removing LWD from channels, and delayed or eliminated many future sources of LWD.	During construction, the PCGP project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be localized and short-term (typically 1-5 days of construction per crossing). LWD removed from the corridor would be placed back within Riparian Reserves to provide effective ground cover and armor flood plains. LWD would also be placed in channel as needed at crossings. These actions and off-site mitigations would help move toward conditions that more closely reflect the range of natural variability. Upon completion, the conditions at channel crossings are expected to be within the natural range of variability for channel conditions.

2.3.7.5 Consistency with Land Management Plans

Standards and Guidelines are intended to regulate activities that occur within Riparian Reserves to ensure that objectives of the ACS are achieved. In the Middle Fork Coquille River watershed, NWFP standards and guidelines have been incorporated into the Coos Bay and Roseburg District RMP direction. Table 2.3.7.5-1 describes ACS-related BLM management direction, the corresponding NWFP standard or guideline and PGCP compliance with that management direction. These RMP directions address issuance of right-of-way, locating water withdrawal sites, road management issues (e.g. fish passage, sediment delivery), and proper use of mitigation and restoration. One RMP amendment is proposed related to management direction for protection of Survey and Manage Species (see Appendix M). This amendment would not prevent attainment of

ACS objectives because the project does not threaten the persistence of any riparian related or riparian dependent Survey and Manage species would be affected by the project.

TABLE 2.3.7.5-1

Compliance with RMP Management Direction and NWFP Standards and Guidelines

Coos Bay RMP Management Direction	Roseburg District RMP Management Direction	NWFP Standard / Guideline	PCGP Compliance
Riparian Reserves - Lands, pg. 16, para. 2	Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last & pg. 28, 1st para.	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, etc..
Riparian Reserves - General Riparian Area Mgmt., pg. 16, para. 4	Specific Land Use Allocations, Riparian Reserves - General Riparian Area Mgmt., pg. 28, para. 4	RA-4.: Locating water withdrawal sites.	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions because all such needs would be provided by municipal sources.
Riparian Reserves - Roads Mgmt., pg. 13, para. 2	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	RF-2: Road construction standards and guidelines.	No new Permanent Access or Temporary Access Roads would be constructed in the Middle Fork Coquille River watershed.
Riparian Reserves - Roads Mgmt., pg. 13, last para. & pg. 14, 1st para.	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Riparian Reserves - Roads Mgmt., pg. 14, para. 2	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 5	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction.
Riparian Reserves - Roads Mgmt., pg. 14, para. 3	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Riparian Reserves - Roads Mgmt., pg. 14, para. 4	Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 7 & pg. 26, 1st para.	RF-7: Transportation Management Plan development.	The TMP meets all the requirements of RF-7.
Riparian Reserves watershed & Habitat Restoration, pg. 17, para. 3	Specific Land Use Allocations, Riparian Reserves - watershed & Habitat Restoration, pg. 28, para. 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
		Standards and Guidelines for new developments in LSR	LSRs contribute to ACS objectives by providing areas of older forests. Approximately 48 acres of mapped LSR and unmapped LSR associated with marbled murrelet activity centers would be removed by the project corridor in the Middle Fork Coquille River watershed. A plan amendment to reallocate matrix lands to LSR has been proposed to mitigate the effect of the corridor on the LSR land allocation (see Appendix L). The loss of 45 acres of LSR (0.019% of the LSR in the watershed) is not expected to prevent attainment of ACS objectives.

TABLE 2.3.7.5-1 **Compliance with RMP Management Direction and NWFP Standards and Guidelines**			
Coos Bay RMP Management Direction	**Roseburg District RMP Management Direction**	**NWFP Standard / Guideline**	**PCGP Compliance**
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)			The PCGP project effects Survey and Manage species within the Middle Fork Coquille watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.			BLM lands in the Middle Fork Coquille are currently 40% LSOG and exceed this threshold (BLM 2007:12).

2.3.7.6 Proposed Off-Site Mitigation Measures

Offsite mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of offsite mitigation actions for the PCGP project. All proposed offsite projects related to effects in the Middle Fork Coquille River watershed are located in the watershed (table 2.3.7.6-1; figure 2.3-11). Because of the checkerboard nature of BLM ownership (figure 2.3-9), it is often difficult to locate site-specific projects in the subwatershed where the impact occurred.

Offsite mitigation efforts in Middle Fork Coquille River watershed are focused on:.

1. **Road Surfacing and Repair:** Road surfacing projects proposed by BLM as offsite mitigation of PCGP effects in the Middle Fork Coquille River watershed are described in table 2.3.7.6-1. Road surfacing reduces sediment transport to aquatic habitats by capping the fine textured sediments in the running surface of a gravel or dirt road with coarser rock or paving. Paving would all but eliminate traffic-generated sediment on 0.9 miles of the Fall Creek system and bridge approaches at Sandy Creek and Jones Creek. Storm proofing and repair of 3.5 miles of the Camas Mountain Road would reduce road related sediment transport to adjacent streams. In total 4.4 miles of road surfacing and repair of 2 bridge approaches would substantially contribute to meeting ACS objectives where these projects are completed. This mitigation is responsive to ACS objectives 2, 3, 4 and would help move the watershed toward PFC for road-related sediment.

2. **Large Wood Instream:** LWD instream projects proposed by BLM as offsite mitigation of PCGP effects in the Middle Fork Coquille River watershed are described in table 2.3.7.6-1. Placement of LWD in channels adds structural complexity to the aquatic habitat by creating pools and riffles, and trapping fine sediments. This action can also contribute to reductions in stream temperatures over time, primarily by increasing the number and quality of pools in these channels (Tippery, Jones et al. 2010). Approximately 4.7 miles of channel would be treated by placing approximately 80 pieces of LWD at selected

instream and floodplain locations. These mitigation actions are responsive to ACS objectives 2, 3, 4 and 5 and would meet PFC criteria for LWD where the projects occur.

3. **Fish passage:** Removing barriers access barriers makes more aquatic habitat available and reconnects previously isolated aquatic pathways and biota. Removing the culverts at Loveseat Creek would access 0.3 miles of aquatic habitat, and also remove a chronic source of sediment. . This is responsive to ACS Objectives 1, 2, 3 and 9 and contributes to PFC for sediment and habitat access.

4. **Increasing Fire Suppression Capacity:** High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Large, contiguous areas of early and mid-seral forests are particularly prone to stand replacement fire. Increasing fire suppression capacity reduces the probability that existing LSOG forests in Riparian Reserves would be lost to stand-replacing fire, and increases the probability that existing early and mid-seral vegetation in Riparian Reserves, would over time, mature into LSOG without being lost to stand replacing fire. This measure is responsive to ACS objectives 1, 2, and 4.

5. **Reallocation of matrix lands to LSR:** Although this measure is driven by maintenance of LSR habitat for marbled murrelets, reallocation of matrix to LSR is responsive to the ACS. LSR provides additional protection for Riparian Reserves because the LSR land allocation is managed for late successional stand development which complements the objectives of the ACS. The "backfill" of acquisition of matrix lands also complements the ACS because it would create additional Riparian Reserves on the lands that are acquired. Reallocation and acquisition are responsive to all nine ACS objectives.

Draft

TABLE 2.3.7.6-1

Proposed Off-Site Mitigation Measures in the Middle Fork Coquille Watershed

Project Type	Mitigation Group	Project Name	Project Rationale	Quantity	Unit
Fire suppression	Fire suppression	Heli-Pond construction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity; however the corridor also provides a fuel break. Within the East/Middle Fork watersheds, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heli-ponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur.	1	ea
Fish Passage	Fish Passage	Loveseat Creek culvert removal	Man-made barriers to fish passage have negatively affected access to habitat in the MF Coquille. The stream crossing is a fish barrier to resident fish. Removing the culvert and associated road fill would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. Sediment introductions to the stream network would also cease.	1	project
Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation& Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of LSR habitat due to the construction and operation of the PCGP. The action also compensates for the removal of occupied marbled murrelet habitat and suitable RNF spotted owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of Matrix lands adjacent to occupied murrelet sites by reallocating the entire parcel to LSR.	330	acres
LWD instream	Aquatic Habitat	Twelvemile Creek Large Wood and Boulder Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor,9 stream crossings and nearly 30 Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term effects from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2	miles
LWD instream	Aquatic Habitat	Upper Rock Creek In-stream Large Wood Placement		2.1	miles
LWD instream	Aquatic Habitat	Middle Fork Coquille LWD Placement		0.6	miles
Road Drainage and Surface Enhancement	Road Sediment Reduction	Camas Mountain Road Drainage and Surface Enhancement	Road-related sediment and stream network extension from ditchlines have negatively affected the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Roads do not meet current Best Management Practices and are a source of chronic sediment delivery to fish bearing streams. The 9.1 and 9.2 roads currently show signs of water rutting and stream network extension.	3.5	miles
Road Surfacing	Road Sediment Reduction	Road Surfacing -Fall Creek System		0.9	miles

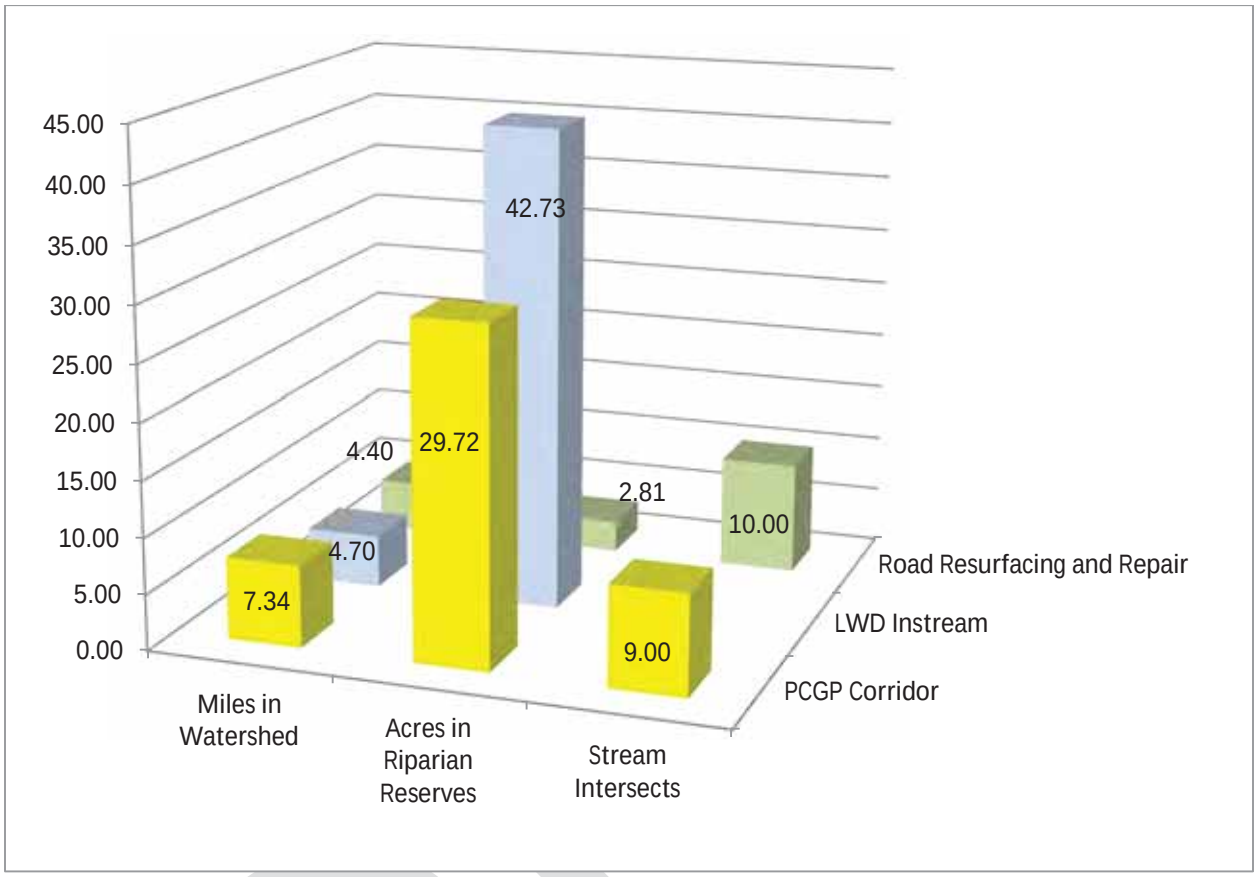
TABLE 2.3.7.6-1

Proposed Off-Site Mitigation Measures in the Middle Fork Coquille Watershed

Project Type	Mitigation Group	Project Name	Project Rationale	Quantity	Unit
Road Surfacing	Road Sediment Reduction	Bridge Approach paving -Sandy & Jones Creek Roads	Stormproofing and blocking the road would reduce the potential for sediment-laden water to be carried off the road surface and into the ditch where it could be transmitted to the stream network. Surfacing the BLM road which is parallel to Fall Creek would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat. Surfacing the bridge approach would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat from this location.	2	ea

Draft

Figure 2.3-11 Comparison of PCGP Project Impacts and Benefits of Off-site Mitigation Measures in the Middle Fork Coquille River Watershed



2.3.7.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 30 percent of the Middle Fork Coquille watershed. The following projects are scheduled to occur on BLM lands in the Middle Coquille watershed (table 2.3.7.7-1). These projects are designed to be consistent with standards and guidelines and objectives for the Coos Bay District and Roseburg District RMP.

TABLE 2.3.7.7-1

Proposed Actions on BLM Lands that Contribute to Cumulative Effects in the Middle Fork Coquille Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Affected Resource
CB_BLM	Middle Fork Coquille River	Big Creek	Proposed Action: Manual Maintenance	Brush and hardwood control on 65 acres of young stands (<11 yrs old); 3 of which are within the pipeline R/W.	Upland and riparian vegetation.
CB_BLM	Middle Fork Coquille River	Big Creek	Proposed Action: Weaver Tie timber sale. NEPA analysis on-going; sale planned for 2016.	27 acres of stand density management, including 7 acres in riparian reserve; 43 acres of hardwood conversion including 21 acres in riparian reserve; with 0.2 miles temporary road construction and 0.3 miles renovation.	Upland and riparian vegetation, road network, water quality.
CB_BLM	Middle Fork Coquille River	Big Creek	Proposed Action: Weed Treatment	171 acres of herbicide treatment of roadside noxious weeds; 132 on BLM [3 of which are in the pipeline R/W] – 39 on private lands.	Upland vegetation.
RD_BLM	Middle Fork Coquille River	Headwaters Middle Fork Coquille	Suicide Bar Commercial Thinning	Thinning; Temporary Road Construction; Road Renovation, Improvement And Maintenance	Upland and riparian vegetation, and road network Above limits to anadromy (Bradford Falls), so no effect for Oregon Coast coho salmon No stream crossing construction planned, so no effect on aquatic connectivity Would thin in Riparian Reserves but apply

Collectively, these projects are expected to improve watershed conditions on BLM lands by:

- Reducing road-related sediment,
- Reestablishing conifers in Riparian Reserves that are now occupied by hardwoods,
- Improving stand health by reducing stand density in existing conifer stands, and
- Limiting the spread of noxious weeds.

Activities on Private Lands

Private lands comprise about 70 percent of the Middle Fork Coquille watershed. Private lands in the Middle Fork Coquille watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.17 percent of the BLM lands, and 0.12% of private lands in the Middle Fork Coquille watershed (table 2.3.7.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory

framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Middle Fork Coquille watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.3.7.8 Project Effects Compared by ACS Objective

This section addresses the relationship between project effects and objectives of the ACS. Channel intersects occur in two separate subwatersheds that are approximately 10 miles apart (figure 2.3-9 and table 2.3.7.8-1). In the Big Creek subwatershed there are six intermittent streams and one perennial stream crossed between MP 35.9 and MP 37.35; three of the intermittent streams are in an existing road. Approximately 10 miles away in Headwaters Middle Fork Coquille subwatershed, one perennial stream is crossed (table 2.3.1.7-4, 2.3.7.1-5). The probability of aggradation of effects between the Big Creek subwatershed and the Headwaters Middle Fork Coquille subwatershed is very low because of the wide separation of project effects.

TABLE 2.3.7.8-1

Project Effects and ACS Objectives, Middle Fork Coquille River Watershed

ACS Objective	Pacific Connector Gas Pipeline Effects
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape-scale features that would be affected by the Project. Within the Middle Fork Coquille River watershed, the Project would cross two perennial streams (tributary of Big Creek MP 37.35 and Deep Creek MP 48.27). These perennial crossings are in different subwatersheds and are miles apart. Seven intermittent streams would be crossed. Six of these are in the Big Creek subwatershed, of which three are co-located with existing crossings in roads. One intermittent stream crossing is in the Deep Creek subwatershed. The Project corridor and TEWAs would clear 95.4 acres or about 0.16 percent (table 2.3.7.1-3) of the BLM-managed lands in the watershed, of which 14.19 acres are Riparian Reserves table 2.3.7.1-4). This is about 0.06 percent of the Riparian Reserves in the watershed (table 2.3.7.1-3). Applying the estimate from the Upper Middle Fork subwatershed that 29 percent of the Riparian Reserves are LSOG there are approximately 6,800 acres of LSOG in Riparian Reserves (table 2.3.7.1-1-23,703.15*.29=6,873) in the Middle Fork Coquille River watershed on BLM-managed lands. Approximately 3.43 acres of LSOG vegetation or 0.05 percent of estimated LSOG in Riparian Reserves would be cleared for the corridor and TEWAs. Over 3 miles of the corridor on BLM-managed lands in the watershed are located on or adjacent to existing roads. Impacts to aquatic systems are expected to be short term and minor because of application of Best Management Practices, erosion control measures, and anticipated rapid revegetation of disturbed areas. Impacts of the Project are expected to be within the range of natural variability for natural disturbance processes in the Coast Range Province (table 2.3.7.4-2). Approximately 35 percent of the BLM-managed lands in the Middle Fork Coquille watershed are LSOG (Data Summaries, table 3.7-1)

Draft

TABLE 2.3.7.8-1

Project Effects and ACS Objectives, Middle Fork Coquille River Watershed

ACS Objective	Pacific Connector Gas Pipeline Effects
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	Wherever possible, the Project is proposed to be located on roads and ridgetops to minimize crossings of stream channels and Riparian Reserves. No forested wetlands outside of stream crossings would be affected by the Project in the Middle Fork Coquille River watershed. The Project is not expected to affect spatial or temporal connectivity in the watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the Wetland and Waterbody Crossing Plan. At each crossing, bed and bank disturbances would be small (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Proposed mitigation projects would improve aquatic connectivity by repairing culverts that currently preclude passage of aquatic organisms. The residual levels of disturbance are anticipated to be well within the range of natural variability in the Coast Range Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project corridor would cross seven intermittent streams and two perennial fish-bearing streams in the Middle Fork Coquille River watershed. Impacts to the bed and banks of these features would be minor and limited to the site of construction because the pipeline would be buried and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions, consistent with the Wetland and Waterbody Crossing Plan. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained, although during construction, streambanks and bottoms would be disturbed. Given the fire and landslide history of the Coast Range Province, this level of disturbance is well within the range of natural variability for the Middle Fork Coquille River watershed.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment would be mobilized during construction, particularly during the dry open-cut crossing (i.e., dam and pump) of tributaries to Big Creek and Deep Creek that are perennial streams. These impacts are expected to be short term and limited to the general area of construction (see section 1.3.1). No long-term impacts on water quality are expected because of the rapid regrowth of vegetation typical of the Coast Range Province and application of the ECRP and Best Management Practices during construction. A small amount of shading vegetation would be removed where the corridor would cross perennial tributaries of Deep Creek and Big Creek.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in corridor routing (GeoEngineers 2009). Dry open-cut stream crossings would be used to cross stream channels (see section 1.3.1). Any sediment impacts are expected to be minor and short term and well within the range of natural variability for the Coast Range Province due to application of the POD, including Best Management Practices for water quality, restoration of bank and bottom configurations, LWD placement, and erosion control along with the anticipated rapid revegetation characteristic of the Coast Range Province. Potential for cumulative sediment impacts exists in Big Creek because of the close proximity of channel crossings. If project monitoring detects cumulative sediment impacts, Pacific Connector would be required to take corrective actions to reduce sediment to background levels. Road repairs would also help reduce road-related sediment in the watershed, thereby moving the sediment regime closer to the desired condition.

TABLE 2.3.7.8-1 **Project Effects and ACS Objectives, Middle Fork Coquille River Watershed**	
ACS Objective	**Pacific Connector Gas Pipeline Effects**
Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	On streams with flowing water at the time of crossing, the dam-and-pump method (described in section 1.3.1) would be used to maintain flows in the channel downstream of the crossing. No alterations of flows resulting from construction beyond the short-term, site-scale level are anticipated. The Project corridor would occupy about 0.23 percent of the Middle Fork Coquille River watershed (table 2.3.7.1-2). It is highly unlikely that any impacts in of this scale would affect the timing, magnitude, and duration of peak flows in the watershed, especially in light of other past and ongoing human activities (section 1.3.1.6). The Project would not create the kinds of conditions (e.g., large openings with many stream connections) that historically altered peak flows.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	No wet meadows would be crossed in the Middle Fork Coquille River watershed. Floodplain crossings associated with perennial streams are narrow and likely consist of unconsolidated landslide deposits where the water table fluctuates seasonally. Channel breakers (internal plugs) would be installed so that the trench would not lower the water table if wet areas are encountered during floodplain crossings. The Project would not affect water tables in wet meadows and floodplains in the Middle Fork Coquille River watershed. Instream LWD mitigation projects would improve stream channel conditions and help restore floodplain connectivity where these mitigation projects occur.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Middle Fork Coquille River watershed would be minor. In the short term, all vegetation would be removed from the Project corridor, including about 14.19 acres of Riparian Reserves table 2.3.7.1-3). This is about 0.06 percent of the Riparian Reserves in the watershed (table 2.3.7.1-3). Approximately 3.43 acres of LSOG vegetation or 0.05 percent of estimated LSOG vegetation in Riparian Reserves in the Middle Fork Coquille River watershed would be cleared for the Project corridor and TEWAs (table 2.3.7.1-4). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Stream temperatures and sediment regimes are not expected to change as a result of the Project (see previous discussions). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. These restoration efforts would help maintain and restore the biological and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Middle Fork Coquille River watershed would be minor 14.19 acres or 0.06 percent of the Riparian Reserves in the watershed).Early-seral (5.58 acres and mid-seral (4.96 acres) comprise most of the Riparian Reserve vegetation that would be cleared. Existing herbaceous and brush cover within the Project clearing limits would be maintained to the extent practicable. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.3.7.9 Summary

The routing of the Project through BLM- lands, coupled with the relatively small area of BLM land that would be affected by Project construction (95.4 acres or 0.17 percent of the BLM lands in the fifth-field watershed- (table 2.3.7.1-2), make it highly improbable that Project impacts would affect conditions at the subwatershed or watershed scale. Although there are site-level impacts (e.g., small amounts of sediment and a change in vegetative condition at stream crossings), these would be minor and largely limited to the project area and well within the range of natural variability for disturbance processes in the Coast Range Province (section 2.3.7.4).

Widely separated small changes in vegetative condition in Riparian Reserves (14.19 acres or 0.06 percent of Riparian Reserves in the Middle Fork Coquille River watershed) have long-term but minor impacts. This level of vegetation change is well within the range of natural variability given the fire and landslide history of the Coast Range Province (see sections 2.1.1 and 2.3.7.4.). Reforestation and revegetation with appropriate riparian vegetation would restore the terrestrial riparian environment over time. The probability of accumulation of impacts on BLM lands between stream crossings in the Big Creek subwatershed and stream crossings in the Headwaters Middle Fork Coquille River subwatershed is very low because of the wide separation of the watersheds.

Off-site mitigation would further reduce Project impacts. Instream LWD projects would contribute to the restoration of 4.7 miles of perennial fish-bearing streams. Approximately 4.4 miles of road surfacing and repair projects would substantially reduce transport of sediments to nearby aquatic habitats. Paving of selected stretches of road would further reduce potential sediments. These offsite mitigation measures identified by BLM would supplement onsite minimization, mitigation, and restoration actions. Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.3.7.6). Table 4.1.3.5-10 describes proposed offsite mitigation measures in the Middle Fork Coquille River watershed

Proposed amendments of the Coos Bay RMP and the Roseburg District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (section 2.3.7.5). All relevant Project impacts are within the range of natural variability for watersheds in the Coast Range Province (section 2.3.7.4). No Project-related impacts that would prevent attainment of ACS objectives have been identified (section 2.3.7.8).

2.4 UMPQUA RIVER BASIN

2.4.1 Geographic Setting

The Umpqua basin is flanked to the north by the Siuslaw and Willamette River basins, to the east by the Deschutes and Klamath River drainages, and to the south by the Rogue and Coquille River basins. The basin has its headwaters in the Cascade Range, is bounded on the south by the Klamath Mountains, and transects the Coast Range before entering the Pacific Ocean (fig. 1). The estuary of the Umpqua River is one of largest on the Oregon coast and has a large seawater wedge that extends as far inland as Scottsburg, Oregon at river mile 27.9.

The Umpqua River drains approximately 4,670 square miles of western Oregon, heading in the Cascade Range and Klamath Mountains before traversing the Coast Range and entering the Pacific Ocean through Winchester Bay at Reedsport. The mainstem Umpqua River begins about 110 miles from its mouth at the confluence of the North and South Umpqua Rivers near the city of Roseburg.

The North Umpqua River drains 1,359 square miles, with headwaters in the High Cascades. The South Umpqua River drains part of the northern Klamath Mountains Province and part of the Western Cascades Province. At its confluence with the North Umpqua River, the South Umpqua River has a drainage area of about 1,800 square miles.

All of the watersheds crossed by the PCGP in the Umpqua Basin lie in the South Umpqua Subbasin which is in the Klamath Siskiyou and Western Cascades Provinces.

2.4.2 Climate and Hydrology

The Umpqua River basin is characterized by a temperate, maritime climate with wet, mild winters and moderately dry, warm summers. Because the river begins at high elevations in the Cascade Mountains, it receives a heavier snowpack than lower elevation headwater coastal rivers. Most precipitation falls in the winter and varies from around 30 inches in interior valleys to over 80 inches per year in upper elevations of the basin.

Both the North and South Umpqua Rivers have a rugged topography with steep canyons and rapid elevation changes, and both have been heavily influenced by volcanic activity. Shallower and rockier soils, which characterize the South Umpqua River, release runoff quickly. Consequently, winter runoff dominates the hydrology in the South Umpqua Subbasin. High winter runoff results in scouring and flash winter floods, like those in 1955 and 1964, which occurred when warm rains and condensation melted a deep snowpack. In the South Umpqua River basin, Galesville Reservoir was constructed in the upper Cow Creek basin in 1985 to reduce flooding along the lower reaches of Cow Creek. Although Galesville Reservoir has a pronounced effect on peak flows below the dam on Cow Creek, peak flows farther downstream on the South Umpqua River near Brockway did not show a marked decline following dam construction.

Total Maximum Daily Load (TMDL) thresholds and a Water Quality Restoration Plan (WQRP) were established for temperature and other pollutants for the Umpqua Basin in 2006 (http://www.deq.state.or.us/wq/tmdls/docs/umpquabasin/umpqua/execsumm.pdf).

2.4.3 Olalla-Lookingglass Fifth Field Watershed, HUC 1710030212

2.4.3.1 Overview

The Olalla-Lookingglass watershed (figure 2.4-1) is located in the South River Resource Area in the BLM Roseburg District. It is one of 13 fifth-field watersheds comprising the South Umpqua Sub-basin, which drains about 1,800 square miles of Southern Oregon. The Klamath Mountain Province (79% of the watershed) and Coast Range Province (21% of the watershed) meet in the Olalla-Lookingglass watershed. The watershed is bordered on the west by the Middle Fork Coquille River fifth-field watershed and on the east by the Clarks Branch-S. Umpqua River fifth-field watershed, both of which are traversed by the PCGP corridor. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the PCGP corridor.

The Olalla-Lookingglass drainage flows into the South Umpqua River near Winston, Oregon. At Roseburg Oregon, the South and North Umpqua Rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. Seventy-nine (79) percent of the watershed in in the Coast Range Geologic Province and 21 percent is in the Klamath Mountains Province.

Elevations in the watershed range from about 524 feet amsl at the mouth of Lookingglass Creek near Winston to 3,527 feet amsl at Nickel Mountain, in the southeastern portion of the watershed (figure 2.4-1). Most of the watershed has elevation less than 2000 feet amsl.

The 161.3 sq. mile (103,212 acre) fifth-field watershed includes six subwatersheds: Berry Creek, Lookingglass Creek, Morgan Creek, Olalla Creek, Tenmile Creek and Thompson Creek-Olalla Creek (figure 2.4-1). Together, these six subwatersheds encompass 28 separate drainages (BLM, 1998). Of the six, the pipeline corridor traverses the Berry Creek, Tenmile Creek and Olalla Creek subwatersheds. Berry Creek Dam, which forms Ben Irving Reservoir, is located near the confluence of Berry Creek and Olalla Creek.

The watershed experiences a Mediterranean type climate, with cool, wet winters and hot, dry summers. Annual rainfall varies considerably across the watershed (about 30-70 inches per year), decreasing away from the coast. About 85% of the precipitation falls from October through April. Due to generally low elevations across the watershed, most falls as rain. Summer rainfall is typically less than 5 inches. Most of the watershed is considered to have a high-severity fire regime characterized by infrequent stand-replacing incidents.

Human influences (including agriculture and extensive timber harvesting) have greatly influenced conditions in the watershed.

Timber harvesting, agriculture (pasture lands for sheep, cattle and hay production), mining and recreation have been the dominant human uses of the watershed and have substantially affected forest cover (BLM, 1998). Approximately 59% of the watershed has, at one time or another had timber harvest activity.

Approximately 26.5% (27,373 acres or 42.8 square miles) of the land in the watershed is managed by the BLM Roseburg District. BLM lands are found in all six subwatersheds (figure 2.4-1, table 2.4.3.1-1). The rest of the land in the Olalla-Lookingglass watershed (73.5%) is in non-federal ownership. Most of the lower valleys in the watershed are privately owned. Most federal (BLM) lands are in the uplands. There is no Forest Service-administered land (i.e., national forests) in the watershed. Towns within the watershed include Lookingglass, Tenmile and the western portion of Winston.

Figure 2.4-1 shows the checkerboard pattern of BLM-managed lands. The BLM lands in the Olalla-Lookingglass Creek watershed are fairly evenly split between LSR and Matrix allocations (46% and 54%, respectively). LSR allocations (12,642 acres or about 19.8 square miles) are found in all six subwatersheds, as are matrix lands (table 2.4.3.1-1). Mapped LSRs as well as marbled murrelet and known owl activity centers (unmapped LSRs) are present in the watershed. Riparian Reserves, which occur in both LSRs and Matrix lands, account for about 8,754 acres or 32% of the BLM lands in the watershed. There are 37 Known Owl Activity Centers, which are protected as unmapped LSRs. Marbled murrelet unmapped LSR total 5,348 acres, which is 20% of the federal land in the watershed.

The watershed contains approximately 725 miles of streams (BLM 1998, p 63). Headwater areas, characteristic of much of BLM's land in the watershed, are dominated by dendritic drainage patterns. Stream drainage density varies widely across the watershed, from 2.24 miles/square mile in the Lookingglass Creek subwatershed to over 6.0 miles/square mile in the Thompson Creek subwatershed. Consistent with the rainfall regime, the vast majority of the streamflow occurs from November through May, with a maximum in January. Small upland intermittent tributaries characteristic of the areas through which the PCGP corridor passes are typically dry in the mid-

summer period. Streamflows in Olalla and Lookingglass Creeks have been influenced by Ben Irving Reservoir since 1980.

Winter steelhead and resident rainbow trout, fall and spring Chinook salmon, coho salmon, and sea-run cutthroat and resident cutthroat trout have been documented in streams in the watershed. The Oregon Coast coho salmon is listed as Threatened under the ESA of 1973.

Location and Routing

The PCGP corridor enters the Olalla-Lookingglass watershed at MP 53.0 and travels 9.10 miles in an easterly direction through the Berry Creek, Tenmile Creek and Olalla Creek subwatersheds before exiting the watershed at MP 62.2 (figure 2.4-1, table 2.4.3.1-2). Upon entering the watershed, the corridor runs along the boundary of the Berry Creek and Tenmile Creek subwatersheds, then descends into the Tenmile Creek subwatershed. The corridor then runs upslope, crossing the Tenmile Creek/Olalla Creek divide at MP 56.9 before descending to the valley floor where the corridor would cross several stream channels on private lands. The proposed route then climbs to the western watershed divide with the Clark Branch-South Umpqua watershed, and runs along this ridge until leaving the watershed. In all, the PCGP corridor traverses 1.27 miles of the Berry Creek subwatershed, 2.77 miles of the Tenmile Creek subwatershed and 5.06 miles of the Olalla Creek subwatershed.

All federal lands crossed in the Olalla-Lookingglass Creek watershed are BLM lands (figure 2.4-1, table 2.4.3.1-2). Of the 1.29 miles of corridor, 0.49 miles are in the Berry Creek subwatershed, 0.16 miles are in the Tenmile Creek subwatershed, and 0.64 miles are in the Olalla Creek subwatershed (table 2.4.1.1-2). Total BLM land crossed in the Olalla-Lookingglass watershed is 1.34 miles**.**

Approximately 4.05 acres of designated LSR would be affected by project construction (3.11 acres cleared and 0.94 acres modified, table 2.4.3.1-3). An additional 1.7 acres of unmapped LSR in KOAC P2199 would be cleared (See also EIS Section 4.1.3.6 and. These effects, which occur in the Berry Creek and Tenmile Creek subwatersheds, constitute 0.03% of the LSR lands in the watershed. Approximately 19.84 acres of Matrix land would be affected by project construction. Considering all federal land allocations, 24.48 acres would be affected by project construction (18.7 acres cleared and 6.78 acres modified), together accounting for 0.09% of the Olalla-Lookingglass fifth-field watershed (table 2.4.3.1-3). There are no stream crossings or Riparian Reserves affected by the PCGP corridor on BLM lands in the Olalla-Lookingglass watershed.

Draft

Figure 2.4-1 PCGP Routing and Subwatershed Boundaries, Olalla-Lookingglass Watershed

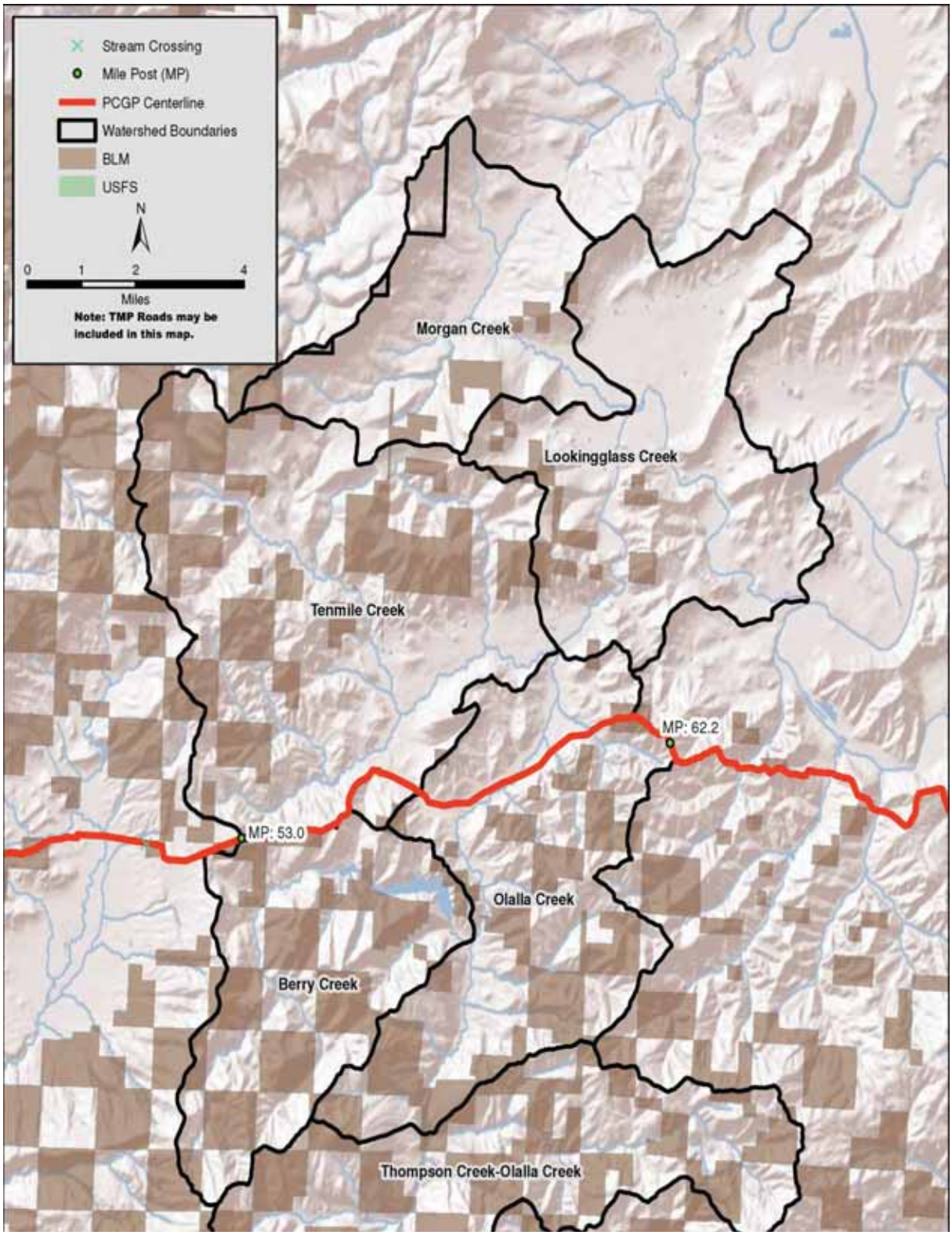


TABLE 2.4.3.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Olalla Creek-Lookingglass Creek watershed HUC 1710030212

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
		BLM	NFS	Other	Designated LSR b/		Matrix		Riparian Reserves c/	
					BLM	NFS	BLM	NFS	BLM	NFS
Berry Creek	12,460.56	4,915.93		7,544.63	949.98		3,965.95		1,572.16	—
Lookingglass Creek	17,824.96	1,215.69		16,609.27	124.86		1,090.83		388.8	—
Morgan Creek	11,673.56	954.96		10,718.60	738.80		216.16		305.42	—
Olalla Creek	17,112.12	5,258.94		11,853.18	589.48		4,669.46		1,681.93	—
Tenmile Creek	25,529.32	6,773.55		18,755.77	4,307.96		2,465.59		2,166.39	—
Thompson Creek-Olalla Creek	18,611.52	8,254.35		10,357.17	5,931.34		2,323.01		2,639.94	—
Watershed Total	103,212.04	27,373.42	0.00	75,838.62	12,642.42	0.00	14,731.00	0.00	8,754.64	

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 1,230 acres (623 acres KOAC, 607 acres MAMU stands) are unmapped LSR.
c/ Occur within LSR and Matrix Land Allocations. Riparian Reserves are estimated to be 32% of BLM lands (BLM 1998)

TABLE 2.4.3.1-2

PCGP project Corridor (miles) and project Area (acres) in the Olalla Creek-Lookingglass Creek watershed (HUC 1710030212) by Land Ownership

Unit a/	Land Ownership															
	BLM				NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Berry Creek	0.49	6.70	2.52	0.19					0.78	12.98	5.30	0.24	1.27	19.68	7.82	0.22
Lookingglass Creek																
Morgan Creek																
Olalla Creek	0.64	9.43	3.26	0.24					4.19	65.19	1.20	0.56	4.83	74.62	4.46	0.46
Tenmile Creek	0.16	2.58		0.04					2.61	39.28	8.71	0.26	2.77	41.86	8.71	0.20

Draft

Thompson Creek-Olalla Creek																
Watershed Total	**1.29**	**18.71**	**5.78**	**0.09**					**7.58**	**117.45**	**15.21**	**0.17**	**8.87**	**136.16**	**20.99**	**0.15**
a/ All data derived from NSR-based GIS layers																

Draft

TABLE 2.4.3.1-3

PCGP project Area (acres) on Federal Lands in the Olalla Creek-Lookingglass Creek watershed HUC 1710030212 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Berry Creek	BLM	2.82	0.94	0.30	0.10	3.87	1.58	0.10	0.04					6.69	2.52	0.14	0.05
	NFS																
Lookingglass Creek	BLM																
	NFS																
Morgan Creek	BLM																
	NFS																
Olalla Creek	BLM					9.43	3.26	0.20	0.07					9.43	3.26	0.18	0.06
	NFS																
Tenmile Creek	BLM	0.29		0.01	0.00	2.29		0.09						2.58	0.00	0.04	0.00
	NFS																
Thompson Creek-Olalla Creek	BLM																
	NFS																
Watershed Total	**BLM**	**3.11**	**0.94**	**0.02**	**0.01**	**15.59**	**4.84**	**0.11**	**0.03**					**18.70**	**5.78**	**0.07**	**0.02**
	NFS																

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

2.4.3.2 Existing Conditions in the Olalla-Lookingglass watershed

Original watershed Analysis Findings

The BLM completed a revised version of the watershed assessment for the Olalla-Lookingglass watershed in 1998 (BLM 1998). Watershed conditions are summarized as follows:

- Timber harvesting (which began in the 1940s) and road construction over the past 45 years have had major effects in the watershed, including increased peak flows, accelerated sediment transport to streams, increased risks of landslides, higher stream temperatures, and reductions in stream channel morphology and habitat complexity.

- Based on interpretation of historical records, between 45 and 75% of the watershed was covered with forest >80 years old prior to major timber harvesting. Early and mid seral forest communities have increased and LSOG stands have decreased relative to these historic conditions.

- Based on WODIP 1997 satellite imagery data, 21% of the watershed was nonforested (mainly agriculture and pasture land with emphasis on livestock production), 36% was early seral (30 years old or less), 23% was mid seral (31-80 years old) and 20% was late seral (80 years old or older, watershed assessment, 1998). In 1936, the watershed was 42% late seral conifer forest, and all structural classes were represented in large uniform blocks. The major changes over the past 60 years have been the decline in late seral stage acreage (and concomitant increase in early seral stages) and the fragmentation of stands. About 19% of the watershed is in agriculture (including pasture).

- The WODIP 1997 satellite imagery data revealed that Riparian Reserves outside LSRs constituted about 32% of the BLM land in the watershed (total of 8,634 acres). Of these Riparian Reserves, 2% were nonforest, 30% were early seral, 28% were mid seral and 40% were late seral. Numerous streams reaches had insufficient riparian growth and stream cover, possibly resulting in bank erosion, reduction in stream LWD, channel instability, and elevated stream temperatures. The riparian areas in the watershed can be improved in the long term by decommissioning roads, placing of LWD and gravel in streams, and planting conifers in riparian areas. It is recommended that young riparian stands be managed to maintain or improve stand growth, vigor, structure and composition (e.g., thinning densely-stocked young stands).

- Wildfires have had a major impact on the vegetation patterns in the watershed, creating a mosaic of types of varying sizes. Over the past 75 years, fire suppression has been successful in minimizing the number of forested acres lost to wildfires (due predominantly to lightning strikes). From 1980 to 1984 there were 16 fires in the watershed, but only 35 total acres were burned. Prescribed burns have also been used extensively to prevent major fires and prepare the site for reforestation. The potential exists for additional large-scale fires in the watershed where there are large fuel reservoirs. It was recommended that fire management in the watershed should be directed toward aggressive suppression of wildfires.

- On steeper slopes (60% or greater), there are substantial areas of soils susceptible to landslides when burned, cleared or affected by poor road construction. Landslides

Draft

associated with poorly constructed roads are a major source of sediment transport to downstream aquatic habitats i the watershed.

- Road densities in the watershed ranged from 3.40 to 4.87 miles/square mile with an average of 4.43 miles/square mile. There were, on average, 2.02 stream crossings/square mile in the watershed. They effectively extend the stream network substantially, thereby increasing peak flows and inputs of sediment to the stream channels. This has, in turn, resulted in bank and channel erosion. Many of these roads are in need of maintenance and are a major source of sediment transport in the watershed. Many stream channels in the Olalla-Lookingglass watershed have been eroded down to bedrock, probably due to increased peak flows associated with timber harvesting and high road densities. It is recommended that poorly constructed or maintained roads be improve and preferably decommissioned wherever possible.

- Timber clearing in the TSZ (land with elevations between 2,000 and 5000 foot amsl) may contribute to elevated peak flows during warm rain-on-snow events. These concerns are exacerbated by roads that extent the drainage system, and recommendations are made to decommission roads in the TSZ zone in subwatersheds with fish-bearing stream reaches.

- PFC surveys conducted on selected reaches of the Olalla-Lookingglass watershed (totaling about 3 miles) found 33% were nonfunctional, over 59% were functioning at risk, and 8% were in proper functioning condition. Stream channels were downcutting causing accelerated bank erosion, floodplain abandonment, and narrowing of riparian areas. A stream that has been straightened to accommodate an adjacent road would down cut and widen as it seeks a new equilibrium (WA, 1998). Included among the causes were road encroachment, lack of LWD, and lack of riparian vegetation. These results show substantially lower physical functioning on streams in this watershed compared to most others in the Roseburg District.

- Current water quality concerns in some streams include (decreased) flows, dissolved oxygen levels, turbidities and sedimentation levels that do not meet state water quality standards.

- Based on a 1995 ODFW Aquatic Habitat Inventory of 35 reaches on 8 stream main stems in the watershed (43 of the 725 stream miles), none were in excellent condition, 8 were in good condition, 20 were in fair condition, and 7 were in poor condition. All reaches in good condition were higher elevation streams above anadromous fish barriers. Sediments in streams, poor width to depth ratios, and lack of LWD and pools were some of the limiting factors reported. Timber harvesting, road construction, and mining activities contributed to these habitat conditions.

- Past stream clearing practices have removed LWD and boulders from many streams in the watershed. This has resulted in decreased habitat complexity, reduced sediment holding capacity, and higher flood peaks. It is recommended that restoration efforts be undertaken to address this issue throughout the watershed.

- Culverts not designed for fish passage prevent upstream fish migration in numerous streams, thereby impacting aquatic habitat connectivity. It is recommended that existing

culverts be inspected and those that are failing or have potential to fail be identified and renovated/replaced with those that do not restrict flows and fish passage. Replacing culverts that block fish passage is a high priority for fisheries restoration in the watershed.

Changes in watershed Condition

There have been no large-scale disturbance events that would change the conditions in the Olalla-Lookingglass watershed from those described in the applicable watershed assessment. The following restoration projects have been completed:

- Tenmile Creek - 0.2 miles of road have been decommissioned.
- Berry Creek - 1.7 miles of road have been decommissioned.
- Thompson Creek Instream (2011) – Approximately 1/2 mile of instream log and boulder placement in a reach of Thompson Creek located in Section 5, T. 30 S., R. 7 W., W.M. The project was conducted in concert with Partnership for the Umpqua Rivers (PUR) which conducted similar efforts on a one-mile reach upstream of the BLM project.
- Muns Creek Instream (2011) – Instream placement of logs in a one-mile reach of Muns Creek located in Section 3, T. 28 S., R. 8 W. W.M.
- Thompson Creek Tree-Lining (2002) – felled and pulled trees from adjoining riparian forest into a ¾-mile reach of Thompson Creek in Section 3, T. 30 S. R. 7 W., W.M.
- Suicide Creek Culvert Replacement (2002) – Replaced two side-by-side perched culverts on Suicide Creek with a precast bridge reducing sedimentation and restoring upstream access to approximately one mile of anadromous habitat.
- Little Muley Creek Culvert Replacement (2004) – Replacement of a culvert at the confluence of Little Mule Creek with Suicide Creek to reduce sedimentation and restore access to an additional mile of anadromous habitat above the crossing.

Current watershed Conditions

Stream temperature and road-related sediment remain key issues. Riparian Reserve condition is generally poor due to homogenous stands of overstocked timber. LWD recruitment potential is lacking because of past timber harvest adjacent to streams. Quality spawning gravels and pools are limited. Road density is high in several of the subwatersheds in the Olalla-Lookingglass Creek.

2.4.3.3 Natural Disturbance Processes

Disturbance processes in the Olalla-Lookingglass drainage are consistent with those described Coastal and Klamath – Siskiyou Provinces.

Natural disturbance processes in the Olalla-Lookingglass watershed are typically associated with wildfires started by lightning strikes. The Olalla-Lookingglass WAU is considered to have a high-severity fire regime, where fires are very infrequent (more than 100 years between. fires) and may be high-intensity, stand replacing events. As a result of wildfires, a vegetation mosaic characterized by large blocks of vegetation of the same age class predominated under natural conditions, resulting in high connectivity in the terrestrial ecosystem.

Draft

Streamflows and aquatic habitat were affected by vegetative conditions driven by the fire regime. During the long intervals between stand-replacing fires, the peak flow conditions resulting from heavy rainfall would be ameliorated by canopy interception and ground cover. The subsequent slow release to the drainage system would not only dampen peak flows but also support base flow during the long dry season. The effects of peak flow events to the aquatic habitat under natural conditions were also mitigated by the complexity and hydraulic stability of the drainage network. Under natural conditions, LWD and boulders in the streams and active floodplain dynamics helped reduce peak flows and their effects to the aquatic ecosystem. In-stream structure created pool habitats and substrate conditions conducive to spawning by anadromous and resident fish populations and the absence of man-made obstructions (culverts and dams) facilitated access of fish populations to upstream habitats.

In areas where large, stand-replacement fires occurred, lack of canopy and exposed soils (particularly those on steep slopes) likely resulted in substantial increases in flows and landslides during heavy precipitation events. Landslides associated with these peak flow events were the primary source of coarse sediments and large woody debris that are the building blocks of aquatic habitat (Everest and Reeves, 2007; Malmon et al, 2007).

2.4.3.4 Project Effects and Range of Natural Variability

The South Umpqua River historically supported healthy populations of resident and anadromous salmonid fish. A survey conducted in 1937 by the Umpqua National Forest reported that salmon, steelhead, and cutthroat trout were abundant throughout many reaches of the river and its tributaries (Roth 1937, cited in BLM 1998). Excellent fishing opportunities for resident trout and anadromous salmon and trout historically existed within the South Umpqua River. The historical condition of the riparian zone along the South Umpqua River favored conditions typical of old-growth forests found in the Pacific Northwest. Roth noted the shade component that existed along the reaches of streams surveyed. The majority of the stream reaches surveyed were "arboreal" in nature, meaning "tall timber along the banks, shading most of the stream". The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambanks were provided protection by the massive root systems of these trees (Roth 1937 cited in BLM 1998: 77).

The PCGP affects approximately 24.49 acres or 0.09% of the BLM lands in the Olalla-Lookingglass watershed. This small affected area is well within the scale of natural disturbance processes described by Everest and Reeves (2007), Agee (1993) and others for the Klamath-Siskiyou Province and is unlikely to affect watershed condition.

No waterbodies would be crossed and no Riparian Reserves would be affected by the PCGP in the Olalla-Lookingglass watershed. Best Management Practices would be implemented to ensure that all effects are minimized. Off-site mitigations, which include road upgrade/stabilization and culvert replacement, would help bring erosion processes, stream flow, and aquatic connectivity closer to the natural ranges of variability.

Table 2.4.3.4-1 describes the natural range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) in the Olalla-Lookingglass Creek watershed. Also presented are the PCGP project effects on these processes relative to the ranges of variability

Draft

resulting from past and ongoing natural and human disturbances in the watershed. All processes have been affected to some degree by human activity.

TABLE 2.4.3.4 1

Project Effects and Relevant Ecological Processes Described in the Olalla-Lookingglass Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are a dominant sediment delivery mechanism to stream systems in the watershed under natural conditions. Historically, landslides were associated with high intensity rainfall events that overlapped with infrequent high intensity fires These events resulted in large depositions of large woody debris and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed has resulted in chronic fine-grained sediment becoming the primary sediment source. Numerous roads, some affected by landslides, can be a chronic source of fine grained sediment fluxes to waterbodies. Roads in the watershed have extended the drainage system substantially during storms, resulting in increased sediment transport and peak flows. Many exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in drainage waters.	Landslide prone areas have been avoided in routing of the PCGP. All areas crossed by the PCGP project corridor are classified as low or very low probability of mass wasting (Geoengineers, 2009). The project is generally located on ridge tops. There are no stream crossings or impact to Riparian Reserves in the Olalla-Lookingglass watershed. Erosion control measures and Best Management Practices would be implemented to minimize sediment transport. Rapid revegetation of disturbed areas, encouraged by plantings of native vegetation in riparian zones, is anticipated. Road drainage, surface enhancement and stabilization mitigation projects would minimize important sources of sediments. As a result, sediment effects are expected to be minor, short-term, and well within the range of variability currently experienced in the watershed, and reductions of sediment fluxes to waterbodies may result from project activities.
Ecological Succession / Vegetative Condition	The watershed has been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, even-age stands with substantial numbers of snags and fire-maintained natural openings. Logging has greatly modified the seral composition of forests in the watershed, with increases in early and mid seral stages, and substantial fragmentation of the forest stands. Approximately 40% of the Riparian Reserves on BLM land in the watershed is LSOG (BLM 1998: C-4).	The PCPG corridor would have minimal impact on vegetation condition in general, and no impact on Riparian Reserves or stream channels on federal lands in the watershed. No streams or Riparian Reserves are crossed on federal land in the Olalla Lookingglass watershed.
Flow Regime	Flow regimes are directly related to the precipitation regime, which in the Olalla-Lookingglass watershed is largely rainfall. Under natural conditions, most rainfall percolates into the soils, where its movement toward aquatic habitats is delayed. Roads extend the drainage system, thereby accelerating the transport of runoff downstream. Clearing of the TSZ in past and ongoing logging and road construction operations have likely contributed to increased peak flows during warm rain-on-snow events. Removal and absence of LWD and boulders in streams has also fostered increased peak flows.	The PCGP project is unlikely to contribute discernibly to changes in peak flows because of the corridor routing (along ridge tops) and the limited scale of the project, including no stream crossings or effects to Riparian Reserves. Improvements to access roads identified in the TMP along with the off-site Olalla Tie Road renovation are intended to reduce road-related effects to flow regimes in the watershed and mitigate any unavoidable project effects. The amount of project-related clearing on TSZ lands is small and should not contribute to elevated peak flows during warm rain-on-snow events. See also EIS Section 4.4.
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced in streams in the watershed. Stand replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range in a number of drainages. Absence of LWD in streams has also likely contributed to higher stream temperatures.	No effective shade would be removed from Riparian Reserves by the PCGP in the Olalla-Lookingglass watershed, so there would be no impact from the project on stream temperatures on BLM lands.

Draft

TABLE 2.4.3.4 1 **Project Effects and Relevant Ecological Processes Described in the Olalla-Lookingglass Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Aquatic Habitat and Stream Channel Complexity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable stream banks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones has substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. Presence of poorly designed and faulty culverts restrict access of anadromous and resident fish populations to upstream habitat.	There are no stream crossings on BLM lands in the Olalla Lookingglass watershed so there would be no effects to stream channel complexity and connectivity on BLM lands in the watershed. No LWD or boulders would be removed from streams during construction. About 1.2 miles of Olalla Creek would have LWD and boulder placement as an off-site mitigation project. This would contribute to restoring aquatic habitat and stream channel complexity in the watershed.

2.4.3.5 Consistency with Land Management Plans

Table 2.4.3.5-1 provides NWFP standards and guidelines relevant to the ACS, the related BLM management direction (as provided in the Roseburg District RMP), and PCGP compliance with this management direction on BLM land in the Olalla-Lookingglass watershed.

Draft

TABLE 2.4.3.5-1

Consistency of PCGP project on Olalla-Lookingglass Subwatershed with BLM Roseburg District ACS-Related Management Direction

RMP Management Direction	NWFP Standard / Guideline	PCGP Compliance
Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last para. & pg. 28, 1st para.	Riparian Reserves - Lands; LH-4	Terms and conditions to assure compliance with ACS objectives in the Olalla-Lookingglass watershed have been incorporated into the BLM Right-of-Way Grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-way Clearing Plan, the Traffic Management Plan (TMP) etc.
Specific Land Use Allocations, Riparian Reserves - General Riparian Area Mgmt., pg. 28, para. 4	Riparian Reserves - General Riparian Area Mgmt.; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the Olalla-Lookingglass watershed because all such needs would be provided by municipal sources.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	Riparian Reserves - Road Mgmt.; RF-2	No new PCGP project roads intersect Riparian Reserves in the Olalla-Lookingglass watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	Riparian Reserves - Road Mgmt.; RF-4	No new project-related road crossings of streams are proposed in the Olalla-Lookingglass watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 5	Riparian Reserves - Road Mgmt.; RF-5	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction in the Olalla-Lookingglass watershed. In addition, off-site mitigations (road stabilization and drainage/surface enhancement) would improve road conditions, further minimizing sediment transport to adjacent aquatic habitats.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	Riparian Reserves - Road Mgmt.; RF-6	Fish passage would be maintained at all road crossings where project-related road repairs are implemented in the Olalla-Lookingglass watershed. Some existing crossings would be upgraded.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 7 & pg. 26, 1st ¶	Riparian Reserves - Road Mgmt.; RF-7	The project TMP meets all the requirements of RF-7 in the Olalla-Lookingglass watershed.
Specific Land Use Allocations, Riparian Reserves - watershed & Habitat Restoration, pg. 28, para. 3	Riparian Reserves - watershed & Habitat Restoration; WR-3	Application of Best Management Practices and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation in the Olalla-Lookingglass watershed. In addition, off-site mitigation measures (LWD placement) would be implemented to improve stream habitat and channel complexity. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project effects Survey and Manage species within the Olalla Lookingglass watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective

Draft

TABLE 2.4.3.5-1 **Consistency of PCGP project on Olalla-Lookingglass Subwatershed with BLM Roseburg District ACS-Related Management Direction**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the Olalla-Lookingglass watershed are currently 34% LSOG.

2.4.3.6 Off-Site Mitigations

Offsite mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of offsite mitigation actions for the PCGP project. All proposed off-site mitigation projects related to effects in the Olalla-Lookingglass watershed are located in the watershed (table 2.4.3.6-1). Because of the checkerboard nature of BLM ownership (figure 2.4-1), it is often difficult to locate site-specific projects in the subwatershed where the impact occurred.

Offsite mitigation efforts in Olalla-Lookingglass watershed are focused on: (1) replacement of LWD in stream channels; (2) road renovation to minimize sediment delivery and transport to aquatic habitats; and (3) reallocation of Matrix land to LSR land (table 2.4.3.6-1). Lack of LWD in channels greatly reduces habitat complexity and the capacity of the channels to provide alluvial habitat suitable for salmonid spawning and rearing. Improvement in road drainage and implementation of road stabilization measures are major factors in maintaining and restoring functional aquatic habitat in the watershed. Reallocation of Matrix land to LSR would provide additional protections to the reallocated acreage, which can only enhance the quality of aquatic habitats in the reallocated lands. With these additional offsite mitigation measures, ACS objectives would be met.

Large Wood In-stream: LWD in-stream projects proposed by BLM as offsite mitigation of PCGP effects in the Olalla-Lookingglass watershed are described in table 2.4.3.6-1. Placement of LWD and boulders in channels adds structural complexity to the aquatic habitat by creating pools and riffles, and trapping fine sediments. This mitigation can also contribute to reductions in stream temperatures over time, primarily by increasing the number and quality of pools in these channels (Tippery, Jones et al. 2010). The Roseburg District mitigation target is 80 pieces of LWD per mile of channel. Approximately 1.2 miles of channel would be mitigated; therefore, the total LWD placed in Olalla Creek is 96 logs (table 2.4.3.6-1). These mitigation actions are responsive to ACS objectives 2, 3, 4 and 5 (table 2.4.3.5-1).

Draft

TABLE 2.4.3.6-1 **Proposed Off-site Mitigation Projects for Olalla-Lookingglass Watershed**			
Project Type	**Mitigation Group**	**Project Name**	**Project Rationale**
Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation and Land Acquisition	This mitigation contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres and related habitat from the construction and operation of the PCGP. It also contributes to objectives of the ACS by managing forests for late-successional stand conditions (Forest Service and BLM 1994: B-12).
LWD instream	Aquatic Habitat	Olalla Creek Large Wood and Boulder Placement	Lack of LWD and sources of recruitment of this LWD in many streams are major factors limiting aquatic habitat quality in the watershed. Implementation of the PCGP project would result in no removal of LWD or clearing of woody vegetation from Riparian Reserves. However, many stream reaches in the watershed are greatly lacking in LWD. Placing LWD and boulders at key locations along a 1.2 mile reach of the Olalla Creek channel and associated Riparian Reserves would help further ACS Objectives by adding approximately 96 pieces of LWD to the stream channel.
Road Stabilization	Road Sediment Reduction	Olalla Tie Road Renovation	Transport of road sediment to stream channels is a primary concern in the Olalla-Lookingglass watershed. Many existing roads do not meet current Best Management Practices and serve as sources of chronic sediment delivery to fish bearing streams. General renovation of the Olalla Tie Road (e.g., resurfacing and drainage channel repair, along with stabilization of several landslides that cross the road) would reduce the delivery of road-related sediments to stream channels.

Road Renovation: Road renovation projects proposed by BLM as off-site mitigation of PCGP effects in the Olalla-Lookingglass watershed are described in table 2.4.3.7-1. Road surfacing and storm proofing reduce sediment transport to aquatic habitats by capping the fine textured sediments in the running surface of a gravel or dirt road with coarser rock or paving. Stabilization of landslide areas would greatly reduce sediment transport to downgradient waterbodies. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 (Forest Service and BLM 1994b: B11, C-7).

Matrix to LSR Reallocation: Reallocation of lands from Matrix to LSR would provide additional protection of aquatic resources on the reallocated land by restricting timber harvest and other intensive forest management activities. In addition to effects to Mapped LSRs, this action compensates for effects to three unmapped LSRs (northern spotted owl habitat). The 409 acres of reallocation would be over five times the (81) acres of LSR affected by construction.

2.4.3.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 26 percent of the Olalla-Lookingglass watershed. The following projects are scheduled to occur on BLM lands in the Olalla-Lookingglass watershed (table 2.4.3.7-1. These projects are designed to be consistent with standards and guidelines and objectives for the Roseburg District RMP.

TABLE 2.4.3.7-1 Proposed Actions on BLM Lands that Contribute to Cumulative Effects in the Middle Fork Coquille Watershed					
Unit	**5th Field Watershed**	**6th Field Watershed**	**Project Name**	**Project Description**	**Affected Resource**
RD_BLM	Olalla-Lookingglass	Berry Creek	Suicide Bar Commercial Thinning	Thinning; Temporary Road Construction; Road Renovation, Improvement and Maintenance	Upland and riparian vegetation, and road network No stream crossing construction planned, so no effect on aquatic connectivity Would thin in Riparian Reserves but apply no-treatment buffers on streams to prevent sedimentation and maintain stream temperature

This project is expected be consistent with the Roseburg District RMP management direction and objectives. Collectively, these projects are expected to improve watershed conditions on BLM lands by:

- Reducing road-related sediment,
- Reestablishing conifers in Riparian Reserves that are now occupied by hardwoods, and
- Improving stand health by reducing stand density in existing conifer stands.

Activities on Private Lands

Private lands comprise about 74 percent of the Olalla-Lookingglass watershed. Private lands in the Olalla-Lookingglass watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.10 percent of the BLM lands, and 0.18% of private lands in the Olalla-Lookingglass watershed (table 2.4.3.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Olalla-Lookingglass watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects

2.4.3.8 Project Effects Compared by ACS Objective

Table 2.4.3.8-1compares the Project impacts to the objectives of the ACS for the Olalla Creek–Lookingglass Creek watershed. The Project corridor would not intersect any waterbodies or Riparian Reserves on federal land in this watershed. No direct or indirect impacts on riparian resources in this watershed have been identified. Watershed conditions and recommendations are described in the Olalla-Lookingglass Watershed Analysis (BLM 1998) and described in detail in Appendix J.

TABLE 2.4.3.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Olalla Creek–Lookingglass Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	The Project watershed would have minimal impact on landscape-level features in the Olalla-Lookingglass Creek because it would affect 0.09 percent (about 9 acres out of 10,000 acres) of the federal land in the watershed. No Riparian Reserves in the watershed would be affected.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project would have no stream intersections in the Olalla-Lookingglass Creek watershed; therefore, it would have no impact on connectivity in aquatic and riparian species habitats.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project would not affect streambanks or stream bottoms in the Olalla-Lookingglass Creek watershed because the Project would not intersect stream channels.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	The Project has no stream intersections in the Olalla-Lookingglass Creek watershed; therefore, it would have no impact on aquatic- and riparian-dependent species.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Project would not affect the sediment regime in aquatic habitats in the Olalla-Lookingglass Creek watershed because of the limited scale of the Project, application of Best Management Practices and other requirements of the ECRP, lack of intersections with stream channels, and absence of riparian impacts.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project would not affect instream flows in the Olalla-Lookingglass Creek watershed because there would be no stream intersections.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not affect floodplains and water table elevations in meadows and wetlands in the Olalla-Lookingglass Creek watershed because there would be no intersections with these features.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The Project would not affect species composition and structural diversity of Riparian Reserves in the Olalla-Lookingglass Creek watershed because no Riparian Reserves would be affected by the Project.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The Project would not affect any riparian-dependent species in the Olalla-Lookingglass Creek watershed because no Riparian Reserves would be affected by the Project.

Draft

2.4.3.9 Summary

Given the location of the Project corridor on BLM lands, the lack of intersections with waterbodies, and the absence of Riparian Reserve impacts, it is highly unlikely that Project construction and operation would negatively affect watershed conditions on BLM land in the Olalla-Lookingglass Creek watershed. No Project impacts relevant to ACS objectives have been identified that are outside the current range of natural variability for the watershed (section 2.4.3.4). Proposed amendments of the Roseburg District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (section 2.4.3.5). Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.4.3.6).

2.4.4 Clark Branch-South Umpqua River Fifth Field Watershed, HUC 1710030211

2.4.4.1 Overview

The Clark Branch-South Umpqua River watershed (figure 1-1) is one of 13 fifth-field watersheds comprising the South Umpqua Sub basin, which drains about 1,800 square miles of Southern Oregon. It is located in the Klamath – Siskiyou Province and in the middle of the South River Resource Area on the BLM Roseburg District. It is bordered on the west by the Olalla-Lookingglass fifth-field watershed and on the east by the Myrtle Creek fifth-field watershed, both of which the PCGP corridor also traverses.

Originating in the mountains of the Klamath Province, the Clark Branch drainage flows into the South Umpqua River near Dillard, Oregon. At Roseburg Oregon, the South and North Umpqua Rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the PCGP corridor.

Topography consists of low foothills with wide, flat valleys in the northern and eastern portions of the watershed with the more mountainous headwater areas to the south (figure 1-1). Elevations range from about 517 feet amsl near the town of Dillard to about 3,247 feet near Nickel Mountain in the southwest part of the watershed. The watershed is comprised of volcanic and sedimentary rocks of the Klamath Mountains geological province (BLM, 1999c).

The Clark Branch-S. Umpqua watershed experiences a Mediterranean type climate, with cool, wet winters and hot, dry summers. Annual rainfall varies considerably across the watershed (about 30-70 inches per year), decreasing away from the coast. About 85% of the precipitation falls from October through April. Due to generally low elevations across the watershed, most falls as rain. Summer rainfall is typically less than 5 inches. The watershed is considered to have a high-severity regime. Large fires are infrequent and of short duration, but are typically high in intensity and severity.

The 93.1 sq. mile (59,577 acre) Clark Branch-South Umpqua watershed includes three subwatersheds, two of which (Rice Creek and Willis Creek) are broadly crossed by the PCGP project (figure 2.4-2). BLM land is found in all three subwatersheds (figure 2.4-2, table 2.4.4.1-1). Approximately 12.6% (7,483 acres or 11.7 square miles) of the land in the watershed is

managed by the BLM Roseburg District. The rest (87.4%) is in non-federal ownership. Private ownership in the three subwatersheds ranges from 83% to 87%. There are no Forest Service-managed lands in the watershed. The towns of Dillard and Tri City lie in the watershed.

Logging, agriculture and transportation have been the major human uses of the watershed, and have had a profound impact on vegetation composition and connectivity. As of 1999, about 34% of the watershed was nonforested, the vast majority in agriculture (BLM 1999c). Livestock and hay production are the predominant agricultural activities.

The watershed contains approximately 580.5 miles of streams (BLM 1999c), of which 82.9 miles are anadromous streams. Due to their general upland location, only 3 miles out of the 68.4 miles of streams on BLM lands were anadromous. Dams on Clark Branch and East Fork of Willis Creek block upstream fish movement.

Headwater areas, characteristic of BLM-administered lands in the watershed, are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising most of the stream miles in the watershed. Stream drainage density ranges from 5.90 miles/square mile in the Rice Creek subwatershed to 6.49 miles/square miles in the Willis Creek subwatershed, with a watershed average of 6.26 miles/square mile. These relatively high densities indicate that streamflow responds quickly to precipitation events, possibly contributing to high flows and channel scouring.

Closely following rainfall amounts, the vast majority of the streamflow occurs from November through May, with a maximum in January. Small upland intermittent tributaries characteristic of the areas through which the PCGP corridor passes are typically dry in the mid-summer period. About 10% of the watershed and 23.5% of the BLM land in the watershed are in the Transient Snow Zone (TSZ, lands between 2,000 feet amsl and 5000 feet amsl). Drainages with high road densities, high stream crossing densities, >25% in the TSZ, and a large percentage of land covered by early seral forests may be susceptible to increased peak flows.

Winter steelhead and resident rainbow trout, fall and spring Chinook salmon, coho salmon, and sea-run cutthroat and resident cutthroat trout have historically used streams in the watershed. Several of these species are listed by NMFS under the ESA of 1973.

Figure 2.4-2 shows the checkerboard pattern of the BLM-managed lands and table 2.4.4.1-1 shows land allocations. BLM lands in the Clark Branch-South Umpqua watershed are in the Matrix land allocation. Riparian Reserves account for about 2,698 acres or about 36% of the BLM land in the watershed (BLM 1999c: p. 7). Approximately 101 acres of the watershed are unmapped LSR associated with a KOAC. In the vicinity of the PCGP corridor in the Rice Creek subwatershed, BLM lands are scattered, and none are in the vicinity of the corridor in the Willis Creek subwatershed (figure 2.4-2). Approximately 26% of BLM land in the watershed has been harvested in the 30 years prior to the watershed assessment (BLM 1999c).

One KOAC is located on BLM land. No marbled murrelet sites have been located in the watershed.

Location and Routing

The PCGP corridor enters the Clark Branch-South Umpqua watershed at MP 62.3 and travels 13.34 miles in an easterly direction through the Rice Creek and Willis Creek subwatersheds,

leaving the watershed and moving into the Myrtle Creek watershed at MP 74.5 (figure 2.4-2, table 2.4.4.1-2). Upon entering the watershed, the corridor first runs along ridge tops before running cross-country across minor drainages and rising again to the Rice Creek-Willis Creek subwatershed divide. In Willis Creek subwatershed, the corridor again crosses several minor drainages before rising to ridge tops across the eastern half of the subwatershed. In all, the PCGP corridor traverses 4.77miles of the Rice Creek subwatershed and 8.57 miles of the Willis Creek subwatershed.

Rice Creek is the only subwatershed where BLM lands are crossed (table 2.4.4.1-2). Approximately 8.19 acres of Matrix land would be cleared and 3.03 acres of Matrix land would be modified, all in the Rice Creek subwatershed (table 2.4.4.1-3). Together, the cleared plus modified acreage accounts for 0.15% of the federal land in the watershed.

There are no wetland or waterbody crossings or Riparian Reserves affected on federal lands in the Clark Branch-South Umpqua watershed.

Draft

Figure 2.4-2 PCGP Routing and Subwatershed Boundaries, Clark Branch-South Umpqua River Watershed

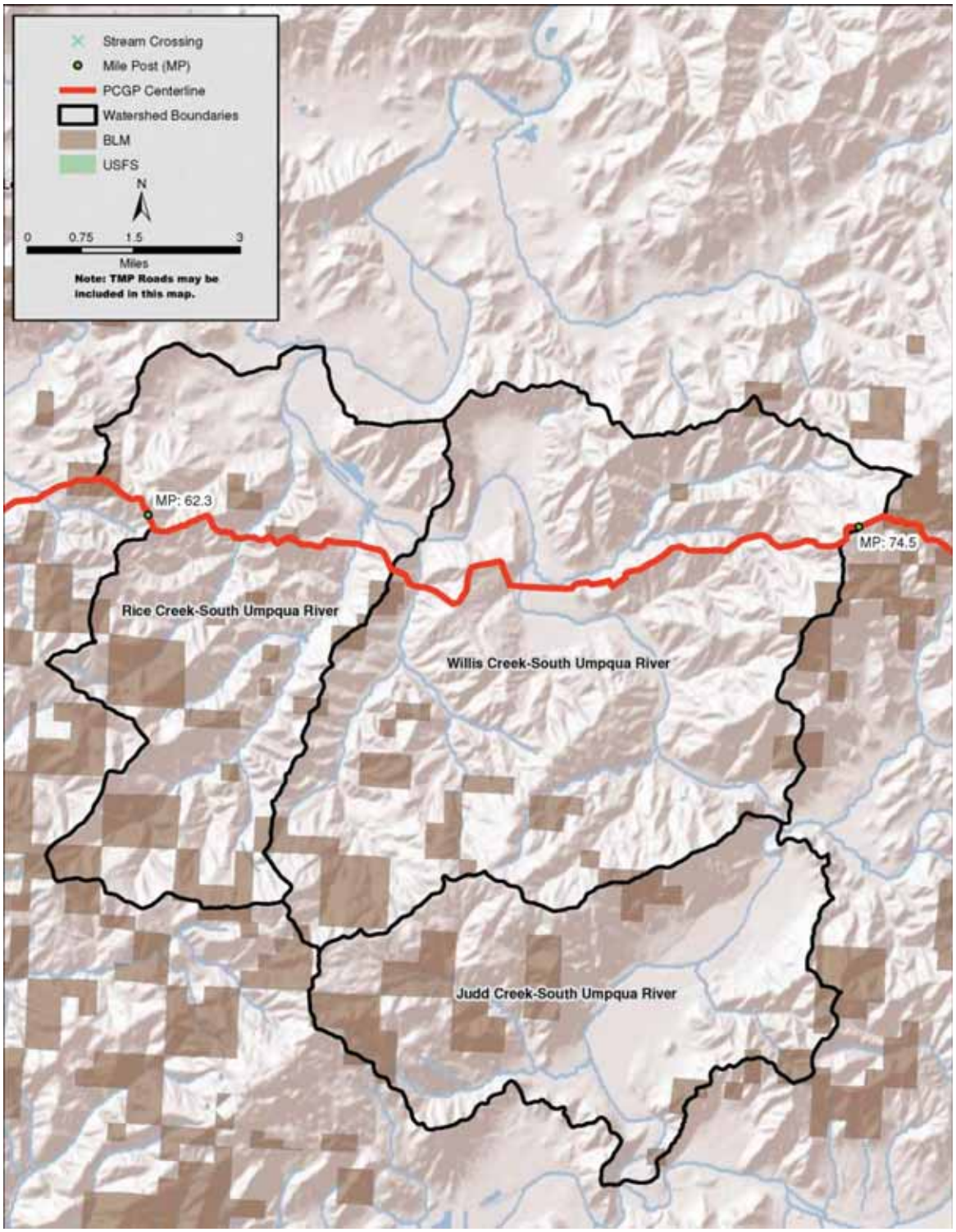


TABLE 2.4.4.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Clark Branch-South Umpqua River Watershed HUC 1710030211

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
					Designated LSR b/		Matrix		Riparian Reserves c/	
		BLM	FS	Other	BLM	FS	BLM	FS	BLM	NFS
Judd Creek-South Umpqua River	14,205	2,383	0	11,822	0	0	2,383		859	
Rice Creek-South Umpqua River	16,976	2,663	0	14,314	0	0	2,663		960	
Willis Creek-South Umpqua River	28,395	2,437	0	25,958	0	0	2,437		879	
Watershed Total	**59,577**	**7,483**	**0**	**52,094**	**0**	**0**	**7,483**	**0**	**2,698**	

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. There is one KOAC of 101 acres that is managed as an unmapped LSR.
b/ Occur within LSR and Matrix Land Allocations. Riparian Reserves are estimated 35% of land base in watershed assessment (BLM 1999c, p. 31)

TABLE 2.4.4.1-2

PCGP Project Corridor (miles) and Project Area (acres) in the Clark Branch-South Umpqua River watershed (HUC 1710030211) by Land Ownership

Unit a/	Land Ownership															
	BLM				FS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Judd Creek - South Umpqua River																
Rice Creek - South Umpqua River	0.57	8.19	3.03	0.42					4.20	59.72	39.28	0.69	4.77	67.91	42.31	0.65
Willis Creek - South Umpqua River									8.57	120.16	4.32	0.48	8.57	120.16	4.32	0.44
Watershed Total	**0.57**	**8.19**	**3.03**	**0.15**					**12.77**	**179.88**	**43.60**	**0.43**	**13.34**	**188.07**	**46.63**	**0.39**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.4.4.1-3

PCGP Project Area (acres) on Federal Lands in the Clark Branch-South Umpqua River Watershed (HUC 1710030211) by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Judd Creek-South Umpqua River	BLM																
	NFS																
Rice Creek-South Umpqua River	BLM					8.19	3.03	0.31	0.11	0.01	0.10			8.19	3.03	0.31	0.11
	NFS																
Willis Creek-South Umpqua River	BLM																
	NFS																
Watershed Total	**BLM**					**8.19**	**3.03**	**0.11**	**0.04**	**0.01**	**0.10**	**0.00**	**0.00**	**8.19**	**3.13**	**0.11**	**0.04**
	NFS																

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

2.4.4.2 Existing Conditions Clark Branch-South Umpqua River HUC

Original watershed Analysis Findings

The BLM completed a watershed assessment for the Clark Branch-S. Umpqua watershed in 1999 (BLM 1999c). Watershed conditions are summarized as follows:

- Timber harvesting (which began in the 1940s) and road construction have had major effects in the watershed, including increased peak flows, accelerated sediment transport to streams, increased risks of landslides, higher stream temperatures, and reductions in stream channel morphology and habitat complexity.

- The major changes over the past 60 years have been the decline in late seral stage acreage (and concomitant increase in early seral stages) and the fragmentation of stands, due largely to past and ongoing logging operations. Based on 1993 satellite imagery data, 35% of the watershed was nonforested (mainly agriculture and pasture land with emphasis on livestock production), 40% was early seral (30 years old or less), 12% was mid seral (31-80 years old) and 13% was late seral (80 years old or older). In 1936, LSOG forests covered 24% of the watershed. On BLM land, which is mainly in the upland areas, 6% was nonforest, 26% was early seral, 27% was mid seral, and 41% was LSOG, with 16% of the vegetation on BLM lands being >200 years old. Most drainages in the watershed have been affected by human activities.

- Based on 1999 data presented in the watershed assessment, 4% of the Riparian Reserves in the watershed are nonforest, 28% are early seral, 30% are mid seral, 38% are LSOG (greater than 80 years old), and 16% are greater than 200 years old. This age class distribution indicates that stream channels over much of the watershed are less complex, the substrate more degraded, and fish habitat poor in many areas. Many stream reaches have insufficient riparian growth and stream cover, possibly resulting in bank erosion and sedimentation, lack of stream LWD, channel instability and uniformity, and elevated stream temperatures.

- The riparian areas in the watershed can be improved in the long term by decommissioning roads, placing LWD in streams, and planting conifers in riparian areas. It is recommended that young riparian stands be managed to maintain or improve stand growth, vigor, structure and composition (e.g., thinning densely-stocked young stands).

- Wildfires have had a major impact on the vegetation patterns in the watershed, creating a mosaic of types of varying but generally large sizes or blocks. Over the past 75 years, fire suppression has been successful in minimizing the number of forested acres lost to wildfires (due predominantly to lightning strikes). From 1980 to 1992, seven fires burned about 458 acres in the watershed. The vast majority of the burned acreage was attributable to human activities. Prescribed burns have been used extensively to prevent major fires and prepare the site for reforestation. Fire management in the watershed should be directed toward aggressive suppression of wildfires.

- On steeper slopes (60% or greater), there are substantial areas of soils susceptible to landslides when burned, cleared or affected by poor road construction. Landslides

Draft

associated with poorly constructed roads are a major source of sediment transport to downgradient aquatic habitats in the watershed.

- Road densities range from 4.49 miles/square mile in the Rice Creek subwatershed to 4.92 miles/square mile in the Judd Creek subwatershed, with a watershed average of 4.67 miles/square mile. About half of the roads in Riparian Reserves are within 100 feet of streams and pose sedimentation risks. They effectively extend the stream network, thereby increasing peak flows and fluxes of sediment to the stream channels. Many of these roads have not been maintained are in need of repair or decommissioning. This situation has resulted in considerable bank and channel erosion. It is recommended that some of these roads be improved and preferably decommissioned wherever possible.

- Timber harvest in the TSZ (land with elevations between 2,000 and 5000 foot amsl) may contribute to elevated peak flows during warm rain-on-snow events. These concerns are exacerbated by roads that extent the drainage system in the zone. Recommendations were made to decommission roads in the TSZ zone in subwatersheds with fish-bearing stream reaches.

- A PFC survey conducted on about ¾ mile reach of Rice Creek in 1997 found it to be non-functioning. Included among the causes were road encroachment and related channelization as well as upstream channel conditions.

- The South Umpqua River from its mouth to the headwaters is on Oregon's Final 1998 Water Quality Limited Streams 303(d) list for temperature. Stream temperatures and dissolved oxygen levels in Rice Creek do not meet state water quality standards for salmonid habitat. Kent, Lane and Rice Creeks were all listed as water quality limited due to habitat modifications, including lack of LWD and pool frequency.

- Based on an ODFW Aquatic Habitat Inventory of 32 stream reaches in the watershed, only one was in good condition, 21 were rated as fair, and nine reaches were rated as poor in condition. None were rated as being in excellent condition.

- Past stream clearing practices have removed LWD and boulders from many streams in the watershed. This has resulted in decreased habitat complexity, reduced sediment holding capacity, and higher flood peaks. It is recommended that restoration efforts be undertaken to address this issue throughout the watershed.

- Poorly designed or damaged culverts as well as dams prevent upstream fish migration in numerous streams, thereby impacting aquatic habitat connectivity. It is recommended that existing culverts be inspected and those that are failing or have potential to fail be identified and renovated/replaced with those that do not restrict flows or fish passage.

Changes in Watershed Condition

There have been no large-scale disturbance events that would change the conditions in the Clark Branch-S. Umpqua watershed from those described in the applicable watershed assessment. Two small fires burned approximately 33 acres in Rice Creek and 30 acres Willis Creek. Completed Restoration projects include:

Draft

- Rice Creek Culvert Replacement (2007) – Replacement of a stream crossing culvert with a concrete bridge in the NENE, section 25, T. 29 S., R. 7 W., W.M. reducing sediment and restoring access approximately one-mile of aquatic habitat.
- Rice Creek Culvert Replacement (2010) – Replacement of a culvert with a metal pipe arch, upstream of the bridge installation, in the NE¼SW¼, Section 25, T. 29 S., R. 7 W., W.M. to reduce sediment and restore access to approximately one-half mile of additional stream habitat.
- Clarks Branch Fish Passage (2008) – Replacement, in partnership with PUR, of culvert under Dole Road, Interstate Highway 5, and Richardson Road, identified by PUR as the 1st, 2nd and 4th highest priorities for restoration in the watershed. In total, access to nearly two miles of stream habitat was accomplished.
- Rice Creek - Decommissioned 0.2 miles of road.
- Willis Creek - Decommissioned 0.2 miles of road.

Current Watershed Conditions

The conditions in the Clark Branch-South Umpqua watershed are adequately described in the watershed assessment. Stream temperature and road-related sediment remain key issues. Riparian Reserve condition is generally poor due to homogenous stands of overstocked timber. LWD recruitment potential is lacking due to past timber harvest adjacent to streams. Quality spawning gravels and pools are limited. Road density is high in most subdrainages. Toxic blue-green algae blooms have been detected in the South Umpqua River.

2.4.4.3 Natural Disturbance Processes

Disturbance processes in the Clark Branch-South Umpqua watershed are consistent with those described for the Coast Range and Klamath – Siskiyou Province.

Natural disturbance processes in the Clark Branch South Umpqua watershed are typically associated with wildfires started by lightning strikes. The Clark Branch – South Umpqua WAU is considered to have a high-severity fire regime, where fires are very infrequent (more than 100 years between. fires) and are usually high-intensity, stand replacing events. Streamflows were affected by vegetative conditions driven by the fire regime. During the long intervals between stand-replacing fires, the peak flow conditions resulting from heavy rainfall would be ameliorated by canopy interception and ground cover. The subsequent slow release to the drainage system would not only dampen peak flows but also support base flow during the long dry season. The effects of peak flow events to the aquatic habitat under natural conditions were also mitigated by the complexity and hydraulic stability of the drainage network. In areas where large, stand-replacement fires occur, lack of canopy and exposed soils (particularly those on steep slopes) can result in substantial increases in flows and can become prone to landslides during heavy precipitation events. As a result of wildfires, a vegetation mosaic characterized by large blocks of vegetation of the same age class predominated under natural conditions, resulting in high connectivity in the terrestrial ecosystem. Under natural conditions, LWD and boulders in the streams and active floodplain dynamics helped reduce peak flows and their effects to the aquatic ecosystem. In-stream structure created pool habitats and substrate conditions conducive to

Draft

spawning by anadromous and resident fish populations and the absence of man-made obstructions (culverts and dams) facilitated access of fish populations to upstream habitats.

2.4.4.4 Project Effects and Range of Natural Variability

Table 2.4.4.4-1 provides the natural range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) in the Clarks Branch South Umpqua watershed. Also presented are the PCGP project effects on these processes relative to the ranges of variability resulting from past and ongoing natural and human disturbances in the watershed. All processes have been affected to some degree by human activity.

Current watershed conditions (all ownerships) do not reflect natural ranges of variability of key ecological processes in the Clark Branch-South Umpqua watershed. The Clark Branch South Umpqua watershed Analysis documented that historically, the WAU (all ownerships) was about 24% late seral forest. By 1993 (the data used in the WA) late seral forest had declined to 13% of the watershed (BLM 1999c: 17).

The historical condition of the riparian zone along the upper South Umpqua River favored conditions typical of old-growth forests found in the Pacific Northwest (Roth 1937, cited in BLM 1999c: 77). Roth noted the shade component that existed along the surveyed stream reaches. The majority of the stream reaches surveyed were "arboreal" in nature, meaning "tall timber along the banks, shading most of the stream". The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambanks were provided protection by the massive root systems of these trees.

BLM lands in the Clark Branch-South Umpqua were approximately 40% LSOG (3,105 acres out of 7,682 acres) at the time of the WA were late successional forest stands at least 80 years old (BLM 1999c: 37). The PCGP project affects approximately 11.22 acres (8.19 cleared, 3.03 modified) or 0.15% of BLM lands in the watershed and .approximately 235 acres or 0.39% of all ownerships within the watershed. This small impact area is well within the scale of natural disturbance processes described by Everest and Reeves (2007), Agee (1993) for the Coast Range and Klamath – Siskiyou Provinces, and the Clark Branch – South Umpqua watershed Analysis and is unlikely to change watershed condition.

No waterbodies would be crossed and no Riparian Reserves would be affected in the Clark Branch South Umpqua watershed. Best Management Practices would be implemented to ensure that all effects are minimized. Off-site mitigations, which include road upgrade/stabilization and culvert replacement, would help bring erosion processes, stream flow, and aquatic connectivity closer to the natural ranges of variability.

TABLE 2.4.4.4-1

Project Effects and Relevant Ecological Processes Described in the Clark Branch-South Umpqua River Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are a dominant sediment delivery mechanism to stream systems in the watershed under natural conditions. Historically, landslides were associated with high intensity rainfall events that overlapped with infrequent high intensity fires These events resulted in large depositions of coarse wood and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed has resulted in chronic fine-grained sediment becoming the primary sediment source. Numerous stretches of poorly constructed roads, some affected by landslides, can be a chronic source of fine grained sediment transport to waterbodies. In some cases, culverts are undersized and plugged. Roads in the watershed have extended the drainage system substantially during storms, resulting in increased sediment transport and peak flows. Many exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in drainage waters.	Landslide prone areas have been avoided in routing of the PCGP. All areas crossed by the PCGP project corridor are classified as low probability of mass wasting (Geoengineers 2009). The project is generally located on ridge tops. There are no stream crossings or impact to Riparian Reserves on the Clark Branch-S. Umpqua watershed. Erosion control measures and Best Management Practices would be implemented to minimize sediment transport off the corridor. The off-site project to remove and/replace undersized and plugged culverts would help minimize an important sources of sediments to downgradient waterbodies. As a result, sediment effects are expected to be minor, short-term, and well within the range of variability currently experienced in the watershed, and reductions of sediment fluxes to waterbodies may result from project activities.
Ecological Succession / Vegetative Condition	The watershed has been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, even age stands with large numbers of snags and fire-maintained natural openings. Logging has greatly modified the seral composition of forests in the watershed, with increases in early and mid seral stages, and substantial fragmentation of the forest stands. The watershed assessment projected that about 39% of the Riparian Reserves on BLM land in the watershed at least 80 years old (BLM 1999c: 42) some areas have inadequate riparian cover due mainly to logging and road construction.	The PCPG corridor would have minimal impact on vegetation condition in general, and no impact on Riparian Reserves or stream channels on federal lands in the watershed. No streams or Riparian Reserves are crossed on federal land in the Clark Branch South Umpqua watershed.
Flow Regime	Flow regimes are directly related to the precipitation regime, which in this watershed largely involves rainfall. Under natural conditions, most of the rain falling in the watershed percolates into the soils, where its movement toward aquatic habitats is delayed. Roads extend the drainage system, thereby accelerating the transport of runoff to downstream channels. Logging and road construction operations have likely contributed to increased peak flows during warm rain-on-snow events. Absence of LWD and boulders in streams, also fosters increased peak flows.	The PCGP project is unlikely to contribute discernibly to changes in peak flows because of the corridor routing along ridge tops, the lack of stream intersects, the limited amount of the project area in the TSZ and the limited scale of the project on the landscape. Improvements to access roads identified in the TMP, along with the off-site culvert mitigation projects are intended to reduce road-related effects to flow regimes in the watershed and mitigate any unavoidable project effects. The amount of project-related clearing on TSZ lands is small and would not contribute to elevated peak flows during periods of warm rain-on-snow (EIS Section 4.4).
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Stand replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range in a number of drainages. Absence of LWD in streams has also likely contributed to higher stream temperatures.	No effective shade would be removed from Riparian Reserves by the PCGP in the Clark-Branch South Umpqua watershed, so there would be no impact from the project on stream temperatures on BLM lands.

Draft

TABLE 2.4.4.4-1 **Project Effects and Relevant Ecological Processes Described in the Clark Branch-South Umpqua River Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Aquatic Habitat and Stream Channel Complexity and Connectivity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable stream banks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones has substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. Presence of poorly designed and faulty culverts restrict access of anadromous and resident fish populations to upstream habitat.	There are no stream crossings in the Myrtle Creek watershed so there would be no effects to stream channel complexity and connectivity on BLM lands. No LWD or boulders would be removed from streams during construction, and no riparian vegetation would be impacted. Therefore, no long or short term effects to aquatic habitats or channel complexity are expected. Off-site culvert mitigation projects would contribute to aquatic connectivity by making upstream habitat available to migrating and resident fish populations.

2.4.4.5 Consistency with Land Management Plans

Table 2.4.4.5-1 provides NWFP standards and guidelines relevant to the ACS, the related BLM management direction as provided in the Roseburg District RMP and PCGP compliance with this management direction on BLM land in the Clark Branch-S. Umpqua watershed. .

TABLE 2.4.4.5-1 **Consistency of PCGP project on Clark Branch-South Umpqua Subwatershed with BLM Roseburg District ACS-Related Management Direction.**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last para. & pg. 28, 1st para.	Riparian Reserves - Lands; LH-4	Terms and conditions to assure compliance with ACS objectives in the Clark Branch-S. Umpqua watershed have been incorporated into the BLM Right-of-Way Grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-way Clearing Plan, the Traffic Management Plan (TMP) etc.
Specific Land Use Allocations, Riparian Reserves - General Riparian Area Mgmt., pg. 28, para. 4	Riparian Reserves - General Riparian Area Mgmt.; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the Clark Branch-S. Umpqua watershed because all such needs would be provided by municipal sources.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	Riparian Reserves - Road Mgmt.; RF-2	No new PCGP project roads intersect Riparian Reserves in the Clark Branch-S. Umpqua watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	Riparian Reserves - Road Mgmt.; RF-4	No new project-related road crossings of streams are proposed in the Clark Branch-S. Umpqua watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.

Draft

TABLE 2.4.4.5-1 **Consistency of PCGP project on Clark Branch-South Umpqua Subwatershed with BLM Roseburg District ACS-Related Management Direction.**		
RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25,para 5	Riparian Reserves - Road Mgmt.; RF-5	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction in the Clark Branch-S. Umpqua watershed. In addition, off-site mitigations (culvert replacements) would improve road conditions, further minimizing sediment transport to adjacent aquatic habitats.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	Riparian Reserves - Road Mgmt.; RF-6	Fish passage would be maintained at all road crossings where project-related road repairs are implemented in the Clark Branch-S. Umpqua watershed. Some existing crossings would be upgraded. In addition, off-site mitigations (culvert replacement) would be implemented to expand fish passage in the watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, 7 & pg. 26, para. 1	Riparian Reserves - Road Mgmt.; RF-7	The project TMP meets all the requirements of RF-7 in the Clark Branch-S. Umpqua watershed.
Specific Land Use Allocations, Riparian Reserves - watershed & Habitat Restoration, pg. 28, para. 3	Riparian Reserves - watershed & Habitat Restoration; WR-3	Application of Best Management Practices and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation in the Clark Branch-S. Umpqua watershed. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project affects Survey and Manage species within the Clark Branch South Umpqua watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the Clark Branch – South Umpqua watershed are currently 26% LSOG.

2.4.4.6 Off-Site Mitigation

Offsite mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of off-site mitigation actions for the PCGP project. All proposed off-site projects related to effects in the Days Creek-S. Umpqua watershed are located in the watershed (table 2.4.4.6-1). Because of the checkerboard nature of BLM ownership (figure 2.4-2), it is often difficult to locate site-specific projects in the subwatershed where the impact occurred.

Offsite mitigation efforts in Clark Branch-South Umpqua watershed are focused on replacement of culverts at several locations to (1) enhance fish passage through the area and (2) minimize

existing and potential sources of sedimentation of waterbodies. These projects, which are described in table 2.4.4.6-1, include replacement of 2 culverts on Rice Creek mainly to enhance fish passage, replacement of a plugged and undersized culvert in the East Fork of Willis Creek, and the removal of a plugged and undersized culvert in Judd Creek and storm proofing the road at the crossing.

TABLE 2.4.4.6-1

Proposed Off-site Mitigation Projects for Clark Branch-South Umpqua Watershed

Project Type	Mitigation Group	Project Name	Project Rationale
Fish Passage	Fish Passage	Rice Creek Culvert Replacements	Man-made barriers to fish passage, such as culverts not designed for fish passage, malfunctioning and plugged culverts, have restricted access of fish populations to quality upland habitat in the Clark Branch-S. Umpqua watershed. If one of these small, old culverts were to plug up with debris, road fill might enter the stream network. Replacing these faulty culverts with well-designed crossing structures that allow passage of adult and juvenile salmonids through the stream crossing at a range of flows would extend the availability of upstream habitat. This contributes to reestablishing historic connectivity with habitat in the watershed.
Road Drainage	Road Sediment Reduction	East Fork Willis Creek Tributary Culvert Replacement	Sediment is one of the primary water quality problems identified in the MS Umpqua watershed assessment in the Clark Branch-S. Umpqua watershed. Analyses clearly indicated that the sediment-turbidity habitat indicator is at risk or more likely not functioning properly. This particular culvert in the East Fork of Willis Creek is old, undersized, shot-gunned, plugged with debris, and eroding the road fill. The culvert also has poor alignment with the stream at the outlet. Replacing the culvert with a properly sized one would reduce the risk of road fill failure.
Road Drainage	Road Sediment Reduction	Judd Creek Culvert Removal	This culvert is undersized and there is a large amount of road fill associated with it. Were the culvert to become plugged, fluxes of sediment to the channel and deposition downstream in fish bearing reaches could occur. Pulling the culvert and fill material and storm proofing the road would prevent such sediment dynamics. In addition, the road is blocked by a landslide just beyond. Access to the stream crossing is gradually being lost due to soil slumping and vegetation growth. Implementing this project also means that access to the crossing would not be lost.

2.4.4.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 13 percent of the Clark Branch South Umpqua watershed. There are currently no projects proposed on BLM lands in the watershed that would contribute to cumulative effects.

Activities on Private Lands

Private lands comprise about 87 percent of the Clark Branch South Umpqua watershed. Private lands in the Clark Branch South Umpqua watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Draft

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.15 percent of the BLM lands, and 0.60 percent of private lands in the Clark Branch South Umpqua watershed (table 2.4.4.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Clark Branch South Umpqua watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.4.4.8 Project Effects by ACS Objective

Table 2.4.4.8-1 compares the PCGP project effects against the objectives of the ACS. The PCGP corridor does not intersect any waterbodies or Riparian Reserves on federal land in the Clark Branch South Umpqua watershed.

TABLE 2.4.4.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Clark Branch-South Umpqua River Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	The Project would have no impact on landscape-level features in the Clark Branch–South Umpqua River watershed because it would not intersect any Riparian Reserves and would affect 0.14 percent of the federal land in the watershed.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project has no stream intersections in the Clark Branch-South Umpqua River watershed; therefore, it would have no impact on connectivity in aquatic and riparian species habitats.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project would not affect streambanks or stream bottoms in the Clark Branch-South Umpqua River watershed because the Project would not intersect stream channels.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	The Project would have no stream intersections in the Clark Branch-South Umpqua River watershed; therefore, it would have no impact on aquatic- and riparian-dependent species.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Project would not affect the sediment regime in aquatic habitats on the Clark Branch-South Umpqua River watershed because of the limited scale of the Project, application of Best Management Practices and other requirements of the ECRP, lack of intersections with stream channels, and absence of riparian impacts.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project would not affect instream flows in the Clark Branch-South Umpqua River watershed because there would be no stream intersections and clearing in the TSZ would be minimal.

Draft

TABLE 2.4.4.8-1 **Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Clark Branch-South Umpqua River Watershed**	
ACS Objective	**Project Impacts**
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not affect floodplains and water table elevations in meadows and wetlands in the Clark Branch–South Umpqua River watershed because there would be no intersections with these features.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The Project would not affect species composition and the structural diversity of Riparian Reserves in the Clark Branch-South Umpqua River watershed because no Riparian Reserves would be affected by the Project.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The Project would not affect any riparian-dependent species in the Clark Branch–South Umpqua River watershed because no Riparian Reserves would be affected by the Project.

2.4.4.9 Summary

Given the location of the Project corridor on BLM lands, the lack of intersections with waterbodies, and the absence of impacts on Riparian Reserve, it is highly unlikely that Project construction and operation would prevent attainment of the ACS objectives in this watershed (section 2.4.4.8). Proposed amendments of the Roseburg District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (section 2.4.3.5). No Project impacts relevant to ACS objectives have been identified that are outside the current range of natural variability for the watershed (section 2.4.4.4).

2.4.5 Myrtle Creek Fifth Field Watershed, HUC 1710030211

2.4.5.1 Overview

The Myrtle Creek watershed (figure 2.4-3) is one of 13 fifth-field watersheds comprising the South Umpqua Sub-basin, which drains about 1,800 square miles of Southern Oregon. It is bordered on the west by the Clark Branch-South Umpqua River fifth-field watershed and on the south by the Days Creek – South Umpqua River fifth-field watershed, both of which the PCGP corridor also traverses. The town of Myrtle Creek is the only population center in the watershed.

Originating in the foothills of the Cascade Mountains, Myrtle Creek flows into the South Umpqua River near Myrtle Creek, Oregon. At Roseburg Oregon, the South and North Umpqua Rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the PCGP corridor.

The 119.1 sq. mile (76,250 acre) Myrtle Creek watershed includes four subwatersheds, two of which (Lower North Myrtle Creek and Lower South Myrtle Creek) are crossed by the PCGP corridor and another (Upper South Myrtle Creek) traversed for a short distance along its divide with the Days Creek subwatershed of the Days Creek-S. Umpqua watershed, into which the

Draft

corridor immediately proceeds (figure 2.4-3). Much of the private land along North and South Myrtle Creeks is used for agriculture.

Topography in the watershed is mountainous with elevations ranging from around 600 feet amsl at the confluence of Myrtle Creek and the South Umpqua in the western portion of the watershed to 4500 feet amsl near Deadman Mountain in the eastern portion of the watershed. Soils have developed mainly from granitic and sedimentary rocks. Approximately 58% of the BLM land (17,972 acres) is considered to have Category I soils (mainly granitic soils on slopes greater than 35%) that are erosional and highly sensitive to prescribed slash burning.

The Myrtle Creek watershed experiences a Mediterranean type climate, with cool, wet winters and hot, dry summers. Annual precipitation ranges from about 30 inches in the western valleys to more than 60 inches at the highest elevations. About 85% of the precipitation falls from October through April. At the highest elevations, a substantial portion of the precipitation falls as snow. Summer rainfall is typically less than 5 inches.

The western portion of the watershed (i.e., Lower North Myrtle Creek and Lower South Myrtle Creek subwatersheds) was originally vegetated by a mix of prairies and savannahs in the valleys and hardwood, conifer and mixed species forests on the uplands. These prairies and savannas were likely maintained by Native Americans by burning. This practice was continued by the settlers and is still applied to some degree today. The Upper North Myrtle Creek and Upper South Myrtle Creek subwatersheds were predominantly mixed-conifer forests in a mosaic of age classes and structures. Human influences (including agriculture and extensive timber harvesting) have greatly influenced conditions in the watershed.

Approximately 40.8% (31,111 acres or 40.8 square miles) of the land in the watershed is managed by the BLM Roseburg District (table 2.4.5.1-1). BLM land is found in all four subwatersheds. There exists a small amount of Forest Service land (133 acres or 0.21 square miles) in the Upper South Myrtle Creek subwatershed, but it constitutes only 0.2% of the watershed. The rest of the watershed (59.2%) is in non-federal ownership. Private lands capable of timber production encompass about 45% of the watershed. There is no Forest Service-administered land (i.e., national forests) in the watershed.

Figure 2.4-3 shows the checkerboard pattern of BLM-managed lands and their allocation status under the NWFP standards and guidelines (table 2.4.5.1-1). The majority of the federal lands in the Myrtle Creek watershed are in the Matrix land allocation (95.9% of BLM land and all of Forest Service land). Unmapped LSRs associated with KOACs account for 1,260 acres (figure 2.4-3).

About 23% of the watershed and 40% of BLM land in the watershed is in the Transient Snow Zone (TSZ, lands between 2,000 feet amsl and 5000 feet amsl). Drainages with high road densities, high stream crossing densities, >25% in the TSZ, and a large percentage covered by early seral stages may be susceptible to increased peak flows. This includes a substantial portion of federal land in the watershed.

The watershed contains approximately 875 miles of streams, of which 313.4 miles are on BLM land (BLM 2002b: 110). Headwater areas, where BLM administers much of its land, are dominated by dendritic drainage patterns where first and second order streams make up the majority of the stream miles. Stream drainage densities in the subwatersheds are typically above

6.0 (average of 7.35 miles/square mile over the entire watershed and 6.45 miles/square miles on BLM land). These relatively high densities indicate that streamflow responds quickly to precipitation events, possibly contributing to high flows and channel erosion. Consistent with the rainfall regime, the vast majority of the streamflow occurs from November through May, with a maximum in January. Small upland intermittent tributaries characteristic of the areas through which the PCGP corridor passes are typically dry in the mid-summer period.

The watershed is a high value salmonid fish watershed. Winter steelhead and resident rainbow trout, fall and spring Chinook salmon, coho salmon, and sea-run cutthroat and resident cutthroat trout have historically used these streams. The Oregon Coast coho salmon are listed as Threatened under the ESA of 1973. Approximately 145 miles of streams in the watershed are considered to be fish-bearing, and 93 miles are considered to be anadromous fish-bearing streams.

Location and Routing

The PCGP corridor enters the Myrtle Creek watershed at MP 74.6 and travels 8.74 miles in a southeasterly direction through the Lower North Myrtle Creek and Lower South Myrtle Creek subwatersheds before exiting the watershed at MP 82.7 (figure 2.4-3, table 2.4.5.1-2). At MP 85.8, the corridor re-enters the watershed (Upper South Myrtle Creek) for a short distance (0.2 miles), and leaves at MP 86.3 entering the Days Creek-South Umpqua fifth-field watershed.

All corridor crossings of federal lands in the Myrtle Creek watershed are on BLM lands (figure 2.4-3, table 2.4.5.1-2). A total of 2.5 miles of BLM lands are crossed (1.63 miles in Lower North Myrtle Creek, 0.68 miles in Lower South Myrtle Creek and 0.19 miles in Upper South Myrtle Creek). For the entire Myrtle Creek watershed, 40.30 acres would be cleared and 46.60 acres would be modified during pipeline construction for a total of 112.75 acres impacted. This constitutes 0.28% of the BLM lands in the watershed. When all land ownerships are considered, 271.51 acres would be affected by pipeline construction. This constitutes 0.28% of the watershed (table 2.4.5.1-2).

Within the Myrtle Creek Watershed, the Pacific Connector lies almost entirely on matrix lands. Approximately 40.30 acres would be cleared and 46.6 acres would be modified, affecting approximately 0.15% of the matrix lands in the watershed. Approximately 1.1 acres of KOAC P2294 would be cleared.

Routing in the Myrtle Creek watershed has resulted in minimum effects to Riparian Reserves and aquatic resources (i.e., waterbodies and wetlands). No streams are crossed, but five Riparian Reserves are minimally clipped at their upper extension near ridgetops by the project Right-of-Way (table 2.4.5.1-4). Approximately 0.41 acres of LSOG would be removed in Riparian Reserves affected by the project Right-of-Way.

Figure 2.4-3 PCGP Routing and Subwatershed Boundaries, Myrtle Creek Watershed

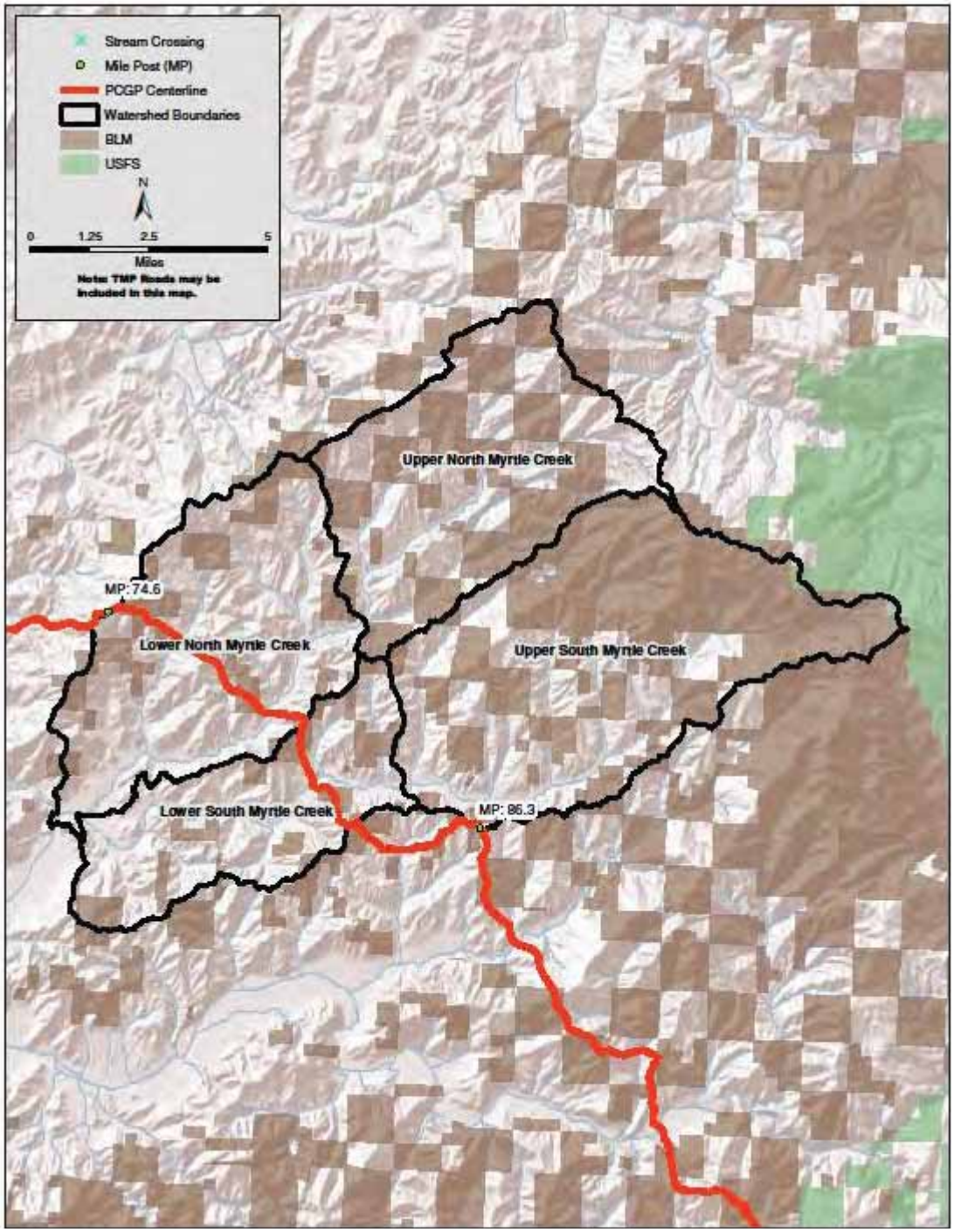


TABLE 2.4.5.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Myrtle Creek Watershed HUC 1710030210

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
		BLM	NFS	Other	Designated LSR b/		Matrix		Riparian Reserves c/	
					BLM	NFS	BLM	NFS	BLM	NFS
Lower North Myrtle Creek	18,991.69	3,665.15		15,326.54			3,665.15		1,501.83	
Lower South Myrtle Creek	12,126.63	2,600.94		9,525.69			2,600.94		1,065.76	
Upper North Myrtle Creek	18,487.33	8,671.92		9,815.41			8,671.92		3,553.43	
Upper South Myrtle Creek	26,644.80	16,173.12	133.03	10,338.65			16,173.12	133.03	6,627.03	54.47
Watershed Total	76,250.45	31,111.13	133.03	45,006.29	0.00	0.00	31,111.13	133.03	12,748.05	54.47

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. Approximately 1.260 acres are unmapped LSR associated with KOACs.
c/ Occur within LSR and Matrix Land Allocations. An estimated 41% of the watershed is in Riparian Reserves (BLM 2002b).

TABLE 2.4.5.1-2

PCGP project Corridor (miles) and project Area (acres) in the Myrtle Creek watershed (HUC 1710030210) by Land Ownership

Unit a/	Land Ownership															
	BLM				Forest Service				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Forest Service Land Impacted	Corridor Length (miles)	project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Lower North Myrtle Creek	1.63	24.98	28.27	1.45					3.86	67.47	49.32	0.76	5.49	92.45	77.59	0.90
Lower South Myrtle Creek	0.68	13.22	15.07	1.09					2.16	36.34	25.30	0.65	2.84	49.56	40.37	0.74
Upper North Myrtle Creek																
Upper South Myrtle Creek	0.19	2.10	3.26	0.03					0.22	2.04	4.14	0.06	0.41	4.14	7.40	0.04
Watershed Total	**1.63**	**24.98**	**28.27**	**1.45**					**3.86**	**67.47**	**49.32**	**0.76**	**5.49**	**92.45**	**77.59**	**0.90**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.4.5.1-3

PCGP Project Area (acres) on Federal Lands in the Myrtle Creek Watershed (HUC 1710030210) by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Other Land Allocations				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Lower North Myrtle Creek	BLM					24.98	28.27	0.68	0.77	0.41	3.74	0.03	0.25	24.98	28.27	0.68	0.77
	NFS																
Lower South Myrtle Creek	BLM					13.22	15.07	0.51	0.58		0.09	0.01		13.22	15.07	0.51	0.58
	NFS																
Upper North Myrtle Creek	BLM																
	NFS																
Upper South Myrtle Creek	BLM					2.10	3.26	0.01	0.02					2.10	3.26	0.01	0.02
	NFS																
Watershed Total	**BLM**					40.30	46.60	0.13	0.15	0.41	3.83	0.00	0.03	40.30	46.60	0.13	0.15
	FS																

a/ All data derived from NSR-based GIS layers.
b/ Occur within LSR and Other Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.4.5.1-4

Riparian Reserve Effects Myrtle Creek Watershed HUC 1710030210

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats	Gross Riparian Reserves	Fish Bearing	Anadromy
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Lower North Myrtle Subwatershed HUC 171003021004																												
RD BLM	78.19	Trib to Lower N. Myrtle Cr.	RR of lateral stream clipped	I	No			Yes				0.00				0.00				0.00		0.00	0.29	0.29		0.29	No	No
RD BLM	78.37	Trib to Lower N. Myrtle Cr.	RR of lateral stream clipped	I	No			Yes				0.00				0.00				0.00		0.00	0.47	0.47		0.47	No	No
RD BLM	78.48	Trib to Lower N. Myrtle Cr.	RR of lateral stream clipped	I	No			Yes				0.00				0.00				0.00		0.00	0.19	0.19		0.19	No	No
RD BLM	78.72	Trib to Lower N. Myrtle Cr.	RR of lateral stream clipped	I	No			Yes	0.41	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	2.79	3.20		3.20	No	No
Subtotal Lower N. Myrtle Subwatershed		Crossed: None	Clipped: 4 Int. Channels																									
Lower South Myrtle Creek Subwatershed HUC 171003021002																												
RD BLM	80.16	Trib of Lower South Myrtle Cr.	RR of lateral stream clipped	I	No			Yes	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09		0.09	No	No
Total Myrtle Creek Watershed		Crossed: None	Clipped: 5 Int. Channel RR		0			5	0.41	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	3.83	4.24		4.24		

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody. Acre values shown as "0.00" are GIS slivers that are less than 0.01 acres.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

2.4.5.2 Existing Conditions Myrtle Creek, HUC 1710030211

Original watershed Analysis Findings

The BLM completed a watershed assessment for the Myrtle Creek watershed in 2002 (BLM 2002b). watershed conditions documented in the watershed assessment are summarized as follows:

- Timber harvesting (which began in the 1940s) and road construction over the past 45 years have had major effects in the watershed, including increased peak flows, accelerated sediment transport to streams, increased risks of landslides, higher stream temperatures, and reductions in stream channel morphology and habitat complexity.

- The amount of late-successional forests on BLM-administered land in the Myrtle Creek watershed is within the range of natural variability and is expected to be maintained because 50 percent is in reserved land use allocations and about 56 percent of the BLM-administered land in the watershed is in late-successional forest conditions (BLM 2002b: 200)

- Based on interpretation of historical records, between 45 and 75% of the watershed was covered with forest >80 years old prior to major timber harvesting.

- Based on data from 2001 Operations Inventory Databases, 15% of the watershed was nonforested (mainly agriculture and pasture land with emphasis on livestock production), 18% was early seral (30 years old or less), 40% was mid seral (31-80 years old) and 25% was late seral (80 years old or older). Most of this late seral forest is located on BLM land. For BLM-administered lands, 2% was nonforest, 24% early seral, 17% mid seral, and 56% late seral. Thirty-six (36) percent of the BLM land sustains vegetation 200 years and older.

- In 2001, about 26% of the Riparian Reserves in the watershed were early seral stages (30 years or less in age), while mid seral forests (30-80 years old) covered 21% of these riparian zones. Old growth forest (>80 years) constituted 52% of the Riparian Reserves, and almost two-thirds of these LSOG forests were >200 years old. Nonforested lands constitute only 1% of Riparian Reserve land. Regardless, there are reaches of numerous streams that have insufficient riparian growth and stream cover, possibly resulting in bank erosion, reduction in stream LWD, channel instability, and elevated stream temperatures. It is recommended that young riparian stands be managed to maintain or improve stand growth, vigor, structure and composition (e.g., thinning densely-stocked young stands).

- Wildfires have had a major impact on the vegetation patterns in the watershed, creating a mosaic of types of varying sizes. The 1987 North Myrtle Fire burned many mature stands in the Lee Creek and North Myrtle Creek headwaters drainages. Fires have also been used to maintain the prairies and savannahs in the Lower South and Lower North Myrtle Creek subwatersheds. Prescribed burns have been used extensively to prevent major fires and prepare the site for reforestation. The potential exists for additional large-scale fires in this watershed with large fuel reservoirs.

- On steeper slopes, there are substantial areas of soils susceptible to landslides when burned, cleared or affected by poor road construction. Landslides associated with poorly

Draft

constructed roads are a major source of sediment transport to downstream aquatic habitats in the watershed.

- Road densities in the watershed ranged from 3.03 to 5.94 miles/square mile with an average of 4.39 miles/square mile. On BLM land, the average was 3.93 miles/square mile, and there were about 521 stream crossings (average of 1.66 crossings/square mile). Within the Riparian Reserves, road density averaged 3.23 miles/square mile overall and 2.90 miles/square mile within 100 feet of a stream. Many of these roads are in need of maintenance and are a major source of sediment transport in the watershed (BLM 2002b). They serve to extend the stream network substantially, thereby increasing peak flows and fluxes of sediment to the stream channels. This has, in turn, resulted in bank and channel erosion. From 1996 to 2002, about 16 miles of roads in the watershed had been improved and about another 6 miles had been decommissioned. To improve water quality, it is recommended that roads that are sediment sources be either decommissioned or improved if possible.

- Numerous culverts are faulty or inadequate to handle large floods, resulting in blockage of passage of fish and other aquatic organisms through the area.

- Timber clearing in the TSZ (land with elevations between 2,000 and 5000 foot amsl) may contribute to elevated peak flows during warm rain-on-snow events.

- North Myrtle Creek is on the water quality limited list for habitat modification (including LWD removal). South Myrtle Creek and Riser Creek are on the water quality limited list for temperature. South Myrtle Creek (from the mouth of Weaver Creek) is on the water quality limited list for flow modification.

- Based on an ODFW Aquatic Habitat Inventory of 12 streams in the watershed (74 of the 875 stream miles in the watershed), three were in poor condition and nine were rated as being in fair condition. Sediments in streams, poor width to depth ratios, and lack of LWD and pools were some of the limiting factors reported. Timber harvesting, road construction, and mining activities contributed to these habitat conditions.

- BLM Pfankuch surveys conducted from 1995 to 2001 on 45 stream segments found 6 (on Curtin Creek) were in good condition, 27 in fair condition, and 9 in poor condition with regard to resistance to disruption by flood events. BLM found that 32% of the reaches in 14 miles of stream surveyed from 1996-2001 were considered to be in proper functioning condition and 68% were functioning-at-risk. No reaches surveyed were classed as nonfunctional.

- Past removal of LWD and boulders from streams in the watershed as part of area logging operations has resulted in decreased habitat complexity, reduced sediment holding capacity, and higher flood peaks. It is recommended that restoration efforts be undertaken to address this issue throughout the watershed.

- Resident fish and aquatic life as well as salmonid spawning and rearing are challenged in all of North Myrtle Creek by habitat modification, on a section of South Myrtle Creek (draining relatively little federal land) by temperature and flow modification, and on all of Riser Creek by temperature.

- Culverts not designed for fish passage prevent upstream fish migration on numerous streams, thereby impacting aquatic habitat connectivity. A BLM culvert inventory found that nine major and 32 minor culverts in the Myrtle Creek watershed are blocking anadromous or resident fish passage. It is recommended that the culverts already identified be repaired/replaced, and that locations of other problematic culverts be identified.

Changes in watershed Condition

There have been no large-scale disturbance events that would change the conditions in the Myrtle Creek from those described in the applicable watershed assessment. The following restoration projects have been completed:

- **Road Decommissioning (2002)** – Decommissioning of 0.33 miles of BLM Road No. 29-4-23.1 located in Section 23, T. 29 S., R. 4 W., W.M.

- **Weaver Creek Culvert Replacement (2002)** – Replacement of a stream crossing with a pre-cast concrete bridge in the NW¼NW¼, Section 33, T. 28 S., R. 3 W., W.M. reducing sedimentation and restoring access to upstream habitat.

- **Road Decommissioning (2003)** – Long-term decommissioning of approximately 0.29 miles of BLM Road No. 28-4-22.0 in the NW¼NW¼, Section 22, T. 28 S., R. 4 W., W.M.

- **Riser Creek Culvert Replacement (2003)** – Replacement of an existing culvert with an arched pipe on Riser Creek in Section 26, T. 28 S. R. 4 W., W.M. to reduce sedimentation and restore access to approximately two miles of stream habitat.

- **Tributary to North Myrtle Creek Culvert Replacement (2003)** – Replaced a stream crossing on a tributary to North Myrtle Creek in the NW¼ ¼NW, Section 13, T. 28 S., R. 4 W., W.M, reducing sedimentation and restoring access to approximately two miles of stream habitat.

- **Lee Creek Culvert 4 Replacement (2003)** – Replacement of a stream crossing located in the NE¼SE¼, Section 15, T. 28 S., R. 4 W., W.M. reducing sedimentation and restoring access to approximately one-mile of upstream habitat.

- **Lee Creek Culverts 1 and 2 (2003)** – Replacement of two stream crossings located in the SE¼NE¼, Section 28 and SE¼SE¼, Section 21, T. 28 S., R. 4 W., W.M., reducing sedimentation and restoring access to more than three miles of anadromous spawning habitat.8

- **Slide Creek Instream (2003)** – Placement of large wood in a stream reach approximately 0,9-miles in length, located in Section 35, T. 28 S., R. 4 W., W.M., combined with manual removal of Himalayan blackberries and planting of conifers in the lower half of the reach.

- **Ben Branch Culvert Replacement (2003, already noted in Appendix K)** – Replacement of stream crossing in the SWNE, Section 15, T. 29 S., R. 4 W., W.M., reducing

[8] PUR and a private landowner cooperatively replaced two perched culverts (Culvert 3) in 2005 or 2006, removing all barriers to fish passage in the Lee Creek system.

sedimentation and restoring anadromous access to approximately one-mile of stream habitat.

- **Weaver Creek Culvert Replacement (2004)** – Replacement of a culvert with a pre-cast concrete bridge located in the SW¼SE¼, Section 16, T. 29 S., R. 3 W, W.M., reducing sediment and restoring access to an estimated five miles of stream habitat.
- **Buck Fork Culvert Replacement (2004)** – Replacement of a large stream crossing culvert on Buck Fork Creek in the NW¼NW¼, Section 17, T. 28 S., R. 3 W., W.M. Project designed to reduce sedimentation and restore access to one-mile of anadromous habitat and 1.5-mles of resident habitat.
- **North Myrtle Creek Culvert Replacement (2005)** – Replaced stream crossing in the SW¼SW¼, Section 12, T. 28 S., R. 4 W., W.M., reducing sedimentation and restoring access to approximately one mile of anadromous habitat.
- **Weaver Creek Instream (2005)** – Placement of large wood in a 1/4 mile reach of Weaver Creek located in Section 9, T. 29 S., R. 3 W., W.M.
- **North Myrtle Creek Instream (2007)** – Placement of large wood in two reaches of North Myrtle Creek, approximately one-mile in combined length, in Sections 1 and 13, T. 28 S., R. 4 W., W.M.
- **Letitia Creek Habitat Enhancement (2008)** – In stream log placement on a one-half mile reach of Letitia Creek located in Section 17, T. 29 S. R. 3 W., W.M.
- **South Myrtle Creek Instream (2011)** – Placement of logs and boulders in two reaches of South Myrtle Creek, approximately one-mile in combined length, located in the W½NW¼, Section 11, T. 29 S., T. 3 W., and NW¼NE¼ and NE¼NW¼, Section 15, T. 29 S., R. 3 W., W.M.
- Stream crossing repair on Lee Creek that opened the system to anadromy.
- Stream crossings were replaced on Riser Creek, North Myrtle Creek, Weaver Creek and Letitia Creek.

Current Watershed Conditions

The conditions in the Myrtle Creek watershed are adequately described in the watershed assessment. Myrtle Creek was removed from the Oregon DEQ 303(d) list of water quality impaired streams when the Umpqua Basin TMDL was adopted in 2007, however stream temperature and road-related sediment remain key issues. Riparian Reserve condition is generally poor due to homogenous stands of overstocked timber. LWD recruitment potential has been reduced by past timber harvest in Riparian Reserves. Quality spawning gravels and pools are limited. Road density averaged 4.37 miles/square mile in Lower South Myrtle subwatershed and 4.19 miles/square mile in the Lower North Myrtle subwatershed.

Draft

2.4.5.3 Natural Disturbance Processes

Disturbance processes in the Myrtle Creek drainage are consistent with those described for the Klamath – Siskiyou Provinces.

Natural disturbance processes in the Myrtle Creek watershed are typically associated with wildfires started by lightning strikes. The Myrtle Creek watershed is considered to have a high-severity fire regime, where fires are very infrequent (more than 100 years between. fires) but can be high-intensity, stand replacing events. Streamflows were affected by vegetative conditions driven by the fire regime. During the long intervals between stand-replacing fires, the peak flow conditions resulting from heavy rainfall would be ameliorated by canopy interception and ground cover. The subsequent slow release to the drainage system would not only dampen peak flows but also support base flow during the long dry season. The effects of peak flow events to the aquatic habitat under natural conditions were also mitigated by the complexity and hydraulic stability of the drainage network. In areas where large, stand-replacement fires occurred, lack of canopy and exposed soils (particularly those on steep slopes) likely resulted in substantial increases in flows and landslides during heavy precipitation events. As a result of wildfires, a vegetation mosaic characterized by large blocks of vegetation of the same age class predominated under natural conditions, resulting in high connectivity in the terrestrial ecosystem. Under natural conditions, LWD and boulders in the streams and active floodplain dynamics helped reduce peak flows and their effects to the aquatic ecosystem. In-stream structure created pool habitats and substrate conditions conducive to spawning by anadromous and resident fish populations, and the absence of man-made obstructions (culverts and dams) facilitated access of fish populations to upstream habitats

2.4.5.4 Project Effects and Natural Range of Variability

Table 2.4.5.4-1 provides the natural range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) in the Myrtle Creek watershed. Also presented are the PCGP project effects on these processes relative to the ranges of variability resulting from past and ongoing natural and human disturbances in the watershed. The current condition does not reflect “natural” conditions as all processes have been affected by human activity.

The Myrtle Creek watershed Analysis documented that historically, the Myrtle Creek WAU was between 45% and 75% LSOG forest (BLM 2002(b): 20). The BLM administered lands in Myrtle Creek watershed are within natural range of variability for LSOG forests (BLM 2002b: 200). The PCGP project affects approximately 0.37% of the watershed. This small impact area is well within the scale of natural disturbance processes described by Everest and Reeves (2007), Agee (1993) and others for the Klamath – Siskiyou Provinces, and is not sufficient to change watershed condition.

The historical condition of the riparian zone along the upper South Umpqua River favored conditions typical of old-growth forests found in the Pacific Northwest (Roth 1937, cited in BLM, 2002, p. 136). Roth noted the shade component that existed along the surveyed stream reaches. The majority of the stream reaches surveyed were "arboreal" in nature, meaning "tall timber along the banks, shading most of the stream" (Roth 1937, Cited in BLM 2002b:136). The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambanks were

provided protection by the massive root systems of these trees (BLM 2002b: 143. Similar forested headwater streams monitored in 2003 through 2005 in the Umpqua basin had 7-day average maximum temperatures ranging from 58.2 ºF to 62.9 ºF (BLM 2008b, cited in BLM 2010).

No waterbodies would be crossed and less than 1/2 acre of Riparian Reserves, located adjacent to upper elevation intermittent streams that would likely be dry during construction, would be affected by the PCGP. Best Management Practices would be implemented to ensure that all effects are minimized. Off-site mitigations, which include road upgrade/stabilization and culvert replacement, would help bring erosion processes, stream flow, and aquatic connectivity closer to the natural ranges of variability.

Draft

TABLE 2.4.5.4-1

Project Effects and Relevant Ecological Processes Described in the Myrtle Creek Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are a dominant sediment delivery mechanism to stream systems in the watershed. Historically, landslides were associated with high intensity rainfall events that overlapped with infrequent high intensity fires These events resulted in large depositions of coarse wood and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed has resulted in chronic fine-grained sediment becoming the primary sediment source. Numerous stretches of poorly constructed roads show evidence of effects from landslides, and can be a chronic source of sediment fluxes to waterbodies. Roads in the watershed have extended the drainage system substantially during storms, resulting in increased sediment transport and peak flows (BLM 2002b). Exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in drainage water.	Landslide prone areas have been avoided in routing of the PCGP. All areas crossed by the PCGP project corridor are classified as low or very low probability of mass wasting. The project is generally located on ridge tops. There are no stream crossings. A small amount (0.41 acres) of Riparian Reserve acreage is affected in the Myrtle Creek watershed. Erosion control measures and Best Management Practices would be implemented to minimize sediment transport off the corridor. Rapid revegetation of disturbed areas, encouraged by plantings of native vegetation in Riparian Reserves is anticipated. Road drainage, surface improvement and stabilization mitigation projects would minimize important sources of sediments. As a result, sediment effects are expected to be minor, short-term, and well within the range of variability currently experienced in the watershed, and reductions of sediment fluxes to waterbodies may result from project activities.
Ecological Succession / Vegetative Condition	BLM lands have been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, age class stands with substantial numbers of snags and fire-maintained natural openings. Logging has greatly modified the seral composition of forests in the watershed, with increases in early and mid seral stages. While a substantial portion of the Riparian Reserves on BLM land is old growth, other areas have inadequate riparian cover due mainly to logging and road construction.	The PCPG corridor would have minimal impact in vegetation in Riparian Reserves. No streams are crossed; 0.41 acres, in ridge top areas bordering intermittent tributaries to Little Lick Creek would be impacted. While the removal of trees in a Riparian Reserve is a long-term impact, the scale is minor (0.41 acres or 0.03%) and well within the natural range of variability for disturbance processes described by Everest and Reeves (2007) Agee (1993) and the Myrtle Creek watershed assessment (BLM 2002b).
Flow Regime	Flow regimes are directly related to the precipitation regime, which in the Myrtle Creek watershed is largely rainfall. Under natural conditions, most rainfall percolates into the soils, where its movement toward aquatic habitats is delayed. Roads extend the drainage system, thereby accelerating the transport of runoff to downgradient stream channels. Clearing of the TSZ in past and ongoing logging and road construction operations have likely contributed to increased peak flows during warm rain-on-snow events. Removal and absence of LWD and boulders in streams has also fostered increased peak flows.	Increases in peak flows are unlikely where more than 75% of the drainage is hydrologically recovered (i.e. forest vegetation is >30 years old). All of the drainages in the watershed are more than 75% hydrologically recovered (BLM 2002b:114). The PCGP affects less than 1% of the watershed; therefore clearing associated with the PCGP is unlikely to affect peak flows, The PCGP project is unlikely to affect flow regimes because of the extent of hydrologic recovery in the watershed, corridor routing along ridge tops, the limited acreage of the project and lack of stream connectivity. Improvements to access roads identified in the TMP along with several off-site road improvement mitigation projects are intended to reduce road-related effects to flow regimes in the watershed and mitigate any unavoidable project effects. The amount of clearing in TSZ lands is small and is highly unlikely to contribute to elevated peak flows during warm rain-on-snow events (See also EIS Chapter 4.4)

TABLE 2.4.5.4-1 **Project Effects and Relevant Ecological Processes Described in the Myrtle Creek Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Water temperatures of 58°F and 64°F have been placed on salmonid and non-salmonid streams as the upper limits of the natural temperature ranges except on days that are abnormally hot. Stand replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range on a number of drainages. Absence of LWD in streams has also contributed to elevated stream temperatures.	No effective shade would be removed from Riparian Reserves by the PCGP in the Myrtle Creek watershed, so there would be no impact from the project on stream temperatures. All riparian areas cleared in the watershed are at near ridge top positions, and the intermittent streams draining them are expected to be dry during the critical summer period when elevated stream temperatures are a concern. Therefore, the project should have no effect on temperatures further down the drainage system.
Aquatic Habitat, Stream Channel Complexity and Connectivity and Complexity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable stream banks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones has substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. Presence of poorly designed and faulty culverts restrict access of anadromous and resident fish populations to upstream habitat.	There are no stream crossings in the Myrtle Creek watershed so there would be no effects to stream channel complexity and connectivity. No LWD or boulders would be removed from streams during construction. Very limited riparian effects (0.41 acres) would be short-lived and mitigated by replanting with native species. Replacement of the faulty culvert on Slide Creek should enhance aquatic connectivity, making upstream areas available to anadromous fish species and other aquatic organisms. Therefore, no long or short term effects to aquatic habitat and channel complexity are expected.

2.4.5.5 Consistency with Standards and Guidelines

Table 2.4.5.5-1 provides NWFP standards and guidelines relevant to the ACS, the related BLM management direction (as provided in the Roseburg District RMP), and PCGP compliance with this management direction on BLM land in the Myrtle Creek watershed.

TABLE 2.4.5.5-1 **Consistency of PCGP Project in Myrtle Creek Watershed with BLM Roseburg District ACS-Related Management Direction**		
RMP Management Direction	**NWFP/UNF Standard / Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last para. & pg. 28, 1st para.	Riparian Reserves - Lands; LH-4	Terms and conditions to assure compliance with ACS objectives in the Myrtle Creek watershed have been incorporated into the BLM Right-of-Way Grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-way Clearing Plan, the Traffic Management Plan (TMP) etc.
Specific Land Use Allocations, Riparian Reserves	Riparian Reserves - General Riparian Area Mgmt.; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the

TABLE 2.4.5.5-1 **Consistency of PCGP Project in Myrtle Creek Watershed with BLM Roseburg District ACS-Related Management Direction**		
RMP Management Direction	**NWFP/UNF Standard / Guideline**	**PCGP Compliance**
- General Riparian Area Mgmt., pg. 28, para. 4		Myrtle Creek watershed because all such needs would be provided by municipal sources.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	Riparian Reserves - Road Mgmt.; RF-2	No new PCGP project roads intersect Riparian Reserves in the Myrtle Creek watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	Riparian Reserves - Road Mgmt.; RF-4	No new project-related road crossings of streams are proposed in the Myrtle Creek watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 5	Riparian Reserves - Road Mgmt.; RF-5	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction in the Myrtle Creek watershed. In addition, off-site mitigations (road stabilization and drainage/surface enhancement) would improve road conditions, further minimizing sediment transport to adjacent aquatic habitats.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	Riparian Reserves - Road Mgmt.; RF-6	Fish passage would be maintained at all road crossings where project-related road repairs are implemented in the Myrtle Creek watershed. Some existing crossings would be upgraded. In addition, off-site mitigations (culvert replacement) would be implemented to expand fish passage in the watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 7 & pg. 26, 1st para.	Riparian Reserves - Road Mgmt.; RF-7	The project TMP meets all the requirements of RF-7 in the Myrtle Creek watershed.
Specific Land Use Allocations, Riparian Reserves - watershed & Habitat Restoration, pg. 28, para. 3	Riparian Reserves - watershed & Habitat Restoration; WR-3	Application of Best Management Practices and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation in the Myrtle Creek watershed. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project effects Survey and Manage species within the Middle Fork Coquille watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in Myrtle Creek are currently 39% LSOG and exceed this threshold.

2.4.5.6 Proposed Off-Site Mitigation Measures

Offsite mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of offsite mitigation actions for the PCGP project. All proposed off-site mitigation projects related to effects in the Myrtle Creek watershed are located in the watershed (table 2.4.5.6-1). Because of the checkerboard nature of BLM ownership (figure 2.4-3), it is often difficult to locate site-specific projects in the subwatershed where the impact occurred.

Offsite mitigation efforts in the Myrtle Creek watershed are focused on: (1) enhancement of fish passage and (2) surfacing and otherwise repairing existing roads throughout the watershed to minimize sediment transport and delivery to aquatic habitats. Enhancement of fish passage would improve access of resident and anadromous fish species to quality habitat, thereby contributing to watershed connectivity. Improvements in road drainage, road stabilization, and other enhancement measures would result in reduction in road-related sediment, thereby helping maintain and restore functional aquatic habitat in the watershed.

Fish Passage: The existing culvert on Slide Creek is faulty and restricts passage of resident and anadromous fish through the area, thereby restricting connectivity in the aquatic habitat (table 2.4.5.6-1). Should this undersized culvert become blocked with debris, bank overflow and subsequent deposition of sediments in the aquatic habitat could occur. Replacing this culvert would make additional habitat available for anadromous fish species, thereby increasing the likelihood of the persistence of local population and the species.

Road Drainage/Surface Enhancement and Stormproofing: Road surfacing projects proposed by BLM as off-site mitigation of PCGP effects in the Myrtle Creek watershed are described in table 2.4.5.6-1. The proposed road surfacing, drainage enhancement, and slide repairs at South Myrtle Hill and Ben Branch would reduce sediment transport to aquatic habitats by stabilizing slopes, capping the fine textured sediments in the running surface of gravel or dirt roads with coarser rock or paving, and improving drainage conditions. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 (Forest Service and BLM 1994b: B-11, C-7).

Draft

TABLE 2.4.5.6-1 **Proposed Off-site Mitigation Projects for Myrtle Creek Watershed**			
Project Type	**Mitigation Group**	**Project Name**	**Project Rationale**
Fish Passage	Fish Passage	Slide Creek Culvert Replacement	Man-made barriers to fish passage have negatively affected access to habitat in the Myrtle Creek watershed. The existing culvert in Slide Creek is perched, undersized, and a barrier to anadromous and resident fish passage. Replacing this culvert with one that would pass adult and juvenile salmonids at a range of flows would extend the availability of upstream habitat, mitigating unavoidable effects to habitat quality in stream reaches crossed by the pipeline corridor. In addition, old, undersized culverts like this one are at risk of failure. Culvert plugging could cause bank topping and the transport of road fill to the stream network.
Road Stabilization	Road Sediment Reduction	South Myrtle Hill Slide Repair	Sediment in streams resulting from road-related landslides is a limiting factor in the Myrtle Creek watershed. The South Myrtle Hill Road has been affected by upslope failure and landslides. Stabilizing these upslope areas would help reduce the potential for catastrophic slope failure and related sediment delivery to downslope and nearby aquatic habitats.
Road Drainage and Surface Enhancement	Road Sediment Reduction	Ben Branch Road Drainage and Surface Enhancement	Sediment in streams is a major concern in the Myrtle Creek watershed. Many roads in the watershed do not meet current Best Management Practices and, as such, are sources of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair to about 1.0 miles of Ben Branch Road would help reduce sediment delivery to a fish bearing stream.

2.4.5.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 41 percent of the Myrtle Creek watershed. There are currently no projects proposed on BLM lands in the watershed that would contribute to cumulative effects.

Activities on Private Lands

Private lands comprise about 59 percent of the Myrtle Creek watershed. Private lands in the Clark Branch South Umpqua watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.28 percent of the BLM lands, and 0.37 percent of private lands in the Myrtle Creek watershed (table 2.4.5.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Clark Branch South Umpqua watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

Draft

2.4.5.8 Project Effects Compared by ACS Objective

Table 2.4.5.8-1 compares the PCGP project effects against the objectives of the ACS. The PCGP corridor does not intersect any waterbodies on federal land in the Myrtle Creek watershed.

TABLE 2.4.5.8-1

Project Effects and ACS Objectives, Myrtle Creek Watershed

ACS Objective	Pacific Connector Gas Pipeline Effects
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	The Project is not expected to affect landscape-scale features on BLM-managed lands in the Myrtle Creek watershed because of Project routing and the limited nature of Project impacts. The Project corridor would clear approximately 40.3 acres or 0.13 percent of the federal land in the Myrtle Creek watershed and 0.41 acres of Riparian Reserves (table 2.4.5.1-1-3). Any impacts in aquatic systems are expected to be localized, short term, and minor because of the lack of intersects with aquatic systems, application of Best Management Practices and erosion control measures, and the anticipated rapid revegetation of disturbed areas. Impacts of the Project are expected to be within the range of natural variability for natural disturbance processes in the Klamath-Siskiyou Province (section 2.4.5.4).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Myrtle Creek watershed because there would be no stream crossings and Riparian Reserve impacts would be minimal. Aquatic system connectivity would be enhanced by repairs to culverts in Slide Creek that currently preclude passage of anadromous fish species and other aquatic organisms. Any residual levels of disturbance are anticipated to be minor, short-term and well within the range of natural variability in the Klamath-Siskiyou Province (section 2.4.5.4).
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project would not affect streambanks or stream bottoms in the Myrtle Creek watershed because the Project would not intersect stream channels or riparian habitat directly bordering the channels.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment could be mobilized during construction, but the impacts of the sediment are expected to be short term and limited to the immediate area. Since no streams would be crossed, riparian impacts would be minimal. With application of the ECRP and Best Management Practices during construction, there should be no long-term impacts associated with sediment transport or elevated temperatures due to reduced shading. Minor amounts of riparian vegetation adjacent to the two intermittent tributaries would be affected; however, the tributaries would likely be dry at the time of construction and would not contribute to the temperature balance of downstream reaches during the critical summer season. Road stabilization, drainage enhancement, and surface upgrade mitigation projects are expected to contribute to improvements in overall watershed condition.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in corridor routing. The landslide on South Myrtle Hill would be cleaned up and the hill stabilized as part of offsite mitigation. No streams would be crossed and only a very minor amount of riparian vegetation would be affected. Any sediment impacts are expected to be minor and short term (e.g., first wet season) and well within the range of natural variability for the Klamath-Siskiyou Province due to application of POD Best Management Practices and the anticipated rapid revegetation that is characteristic of the province. As a result, potential sediment impacts would be kept to negligible levels. Road repairs and drainage enhancements would help reduce sediment impacts in the watershed, thereby moving the sediment regime closer to the desired condition.

Draft

TABLE 2.4.5.8-1 **Project Effects and ACS Objectives, Myrtle Creek Watershed**	
ACS Objective	**Pacific Connector Gas Pipeline Effects**
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project would not affect instream flows because there would be no stream intersections and very minor riparian zone impacts. All of the drainages in the watershed are more than 75 percent hydrologically recovered (BLM 2002b:114). The Project would affect less than 1 percent of the watershed; therefore, clearing associated with the Project is unlikely to affect peak flows. The Project is unlikely to affect flow regimes because of the extent of hydrologic recovery in the watershed, corridor routing along ridgetops, the limited acreage of the Project, and lack of stream connectivity.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not affect floodplains and water table elevations in meadows because there would be no intersections with these features and no change to stream morphology or functioning that would cause abandonment of floodplains (e.g., by down cutting).
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts in riparian vegetation in the Myrtle Creek watershed would be minor. Overall, Project construction would affect 0.44 acre of the Riparian Reserves in the watershed. Following construction, replanting with native species would facilitate reestablishment of riparian communities.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts in riparian vegetation in the Myrtle Creek watershed would be minor (0.44 acre) and would occur in early to mid-seral stages of forest growth in upland areas adjacent to intermittent creeks. LWD from corridor clearing would be placed in riparian zones to increase habitat diversity. Revegetation of conifer forest communities would be encouraged by planting of native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.4.5.9 Summary

Given the location of the Project corridor on BLM lands, the lack of intersections with waterbodies, and the small area of Riparian Reserves affected, it is highly unlikely that Project construction and operation would adversely affect watershed conditions on BLM land in the Myrtle Creek watershed. No Project impacts relevant to the ACS objectives have been identified that are outside the current range of natural variability for the watershed (section 2.4.5.4). Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.4.5.6).

2.4.6 Days Creek-South Umpqua River Fifth Field Watershed, HUC 1710030205

2.4.6.1 Overview

The portion of the Days Creek – South Umpqua watershed crossed by the PCGP is Tier One Key Watershed (see Section 1.1.3). Key watersheds contribute directly to conservation of at-risk anadromous salmonids and resident fish species by providing high quality habitat. A network of Tier 1 Key Watersheds ensures that refugia for at-risk species are widely distributed across a landscape to provide requisite connectivity.

Draft

Originating in the Cascade Mountains, the 221.2 sq. mile (141,569 acre) Days Creek-South Umpqua River watershed is one of 13 fifth-field watersheds comprising the South Umpqua Sub-basin, which drains about 1,800 square miles of Southern Oregon. Located about 20 miles southeast of Roseburg in the southeast portion of the South River Resource Area, the watershed is bordered on the north by the Myrtle Creek fifth-field watershed and on the south by the Upper Cow Creek and Elk Creek-South Umpqua fifth-field watersheds, all of which are partly traversed by the PCGP corridor (figure 2.4-4). At Roseburg Oregon, the South and North Umpqua Rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the PCGP corridor.

Logging, agriculture, mining, transportation and residential areas dominate human land use in the watershed. The communities of Canyonville, Days Creek, Milo and Tiller are located in the watershed. I-5 runs north-south through the watershed. The Seven Feathers Casino and Resort is located in north Canyonville along I-5.

The geology of the Days Creek-South Umpqua fifth-field watershed includes sedimentary, igneous, metamorphic and volcanic rocks. Soils from metamorphic parent materials cover about 44% of the watershed, while those from granodiorite parent material cover 23% and those from mica schist parent material cover 13% (together accounting for 80% of the watershed area). Both the granodiorite and mica schist soils have high erosion potential when bare. Approximately, 21,041 acres of BLM land (35%) are considered to have Category 1 soils, which are highly sensitive to prescribed slash burning BLM 2001: 114.

Elevations in the watershed range from about 640 feet where Cow Creek flows into the South Umpqua River in the northwest part of the watershed to about 4,040 feet at the head of Days Creek in the northeast part of the watershed. Fifty-two (52) percent of the watershed lies at elevations less than 2000 feet amsl.

The Days Creek-South Umpqua watershed experiences a Mediterranean type climate, with cool, wet winters and hot, dry summers. Annual precipitation ranges from about 30 inches at Canyonville to more than 60 inches at the highest elevations. About 85% of the precipitation falls from October through April. At the highest elevations, a substantial portion of the precipitation falls as snow. Summer rainfall is typically less than 5 inches.

The Days Creek-South Umpqua River watershed includes eight subwatersheds, four of which (Days Creek, Saint John Creek, Corn Creek and Stouts Creek) are crossed by the PCGP corridor (figure 2.4-4). Approximately 41.0% (57,997 acres or 90.6 square miles) of the land in the watershed is managed by the BLM Roseburg District and 2.0% (2805 acres or 4.4 square miles) lies in the Umpqua National Forest. The majority of the BLM land is managed by the South River Resource Area. BLM land is found in all eight subwatersheds, while national forest land is found only in the Corn Creek and Stouts Creek subwatersheds (figure 2.4-4, table 2.4.6.1-1). The rest of the land in the watershed (57.0%) is in non-federal ownership. The forests on these private holdings are characterized by early and mid seral stages. Only 3% of these holdings are covered by forests >80 years old.

Fire severity is low for the Interior Valleys and Foothills Zone, low to moderate for the Douglas-fir/Chinkapin Zone, moderate for the Grand Fir zone, and high for the Cool Douglas-fir/Hemlock

and Western Hemlock zones (BLM 2001). High severity regimes have infrequent fires but when they do occur, they are often intense and stand replacing.

The watershed contains approximately 1,407 miles of streams, of which 516.3 miles are on BLM land (BLM, 2001). Headwater areas, characteristic of much of federally-administered land in the watershed, are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising most of the stream miles in the watershed.

Stream drainage densities in entire watershed average 6.37 miles / square mile and 5.70 miles / square mile on BLM land (BLM 2001: 132). These relatively high densities indicate that streamflow responds relatively quickly to rainfall, possibly contributing to high flows and channel erosion.

Closely following rainfall amounts, the vast majority of the streamflow occurs from November through May, with a maximum in January. Small upland intermittent tributaries characteristic of the areas through which the PCGP corridor passes are typically dry in the mid-summer period. About 14% of the watershed and 25% of the BLM land in the watershed are in the Transient Snow Zone (TSZ, lands between 2,000 feet amsl and 5000 feet amsl). Drainages with high road densities, high stream crossing densities, >25% in the TSZ, and a large percentage of land covered by early seral forests may be susceptible to increased peak flows.

Winter steelhead and resident rainbow trout, fall and spring Chinook salmon, coho salmon, and sea-run cutthroat and resident cutthroat trout have historically used streams in the watershed. Several of these species are listed by NMFS under the ESA of 1973. Approximately 145 miles of streams in the watershed are considered to be fish-bearing, and 93 miles are considered to be anadromous fish-bearing streams. Poorly designed or damaged culverts as well as dams prevent upstream fish migration in numerous streams.

The BLM lands in the Days Creek-South Umpqua watershed are roughly 60% matrix and 40% LSR (table 2.4.6.1-1). Designated LSR (components of the South Umpqua River/Galesville LSR – LSR #RO223) on BLM land are found in all eight subwatersheds and total 24,193.26 acres or 41.2 square miles), (table 2.4.6.1-1). LSR allocations (RO223) on Forest Service land total 2,417 acres or 3.8 square miles but constitute 86% of the Forest Service total in this watershed. An additional 1,906 acres are unmapped LSR associated with KOACs. Federally-administered land occurs mainly in the higher elevations of the watershed. Approximately 32% of the BLM land is available for intensive forest management.

Riparian Reserves cover almost 22,000 acres of BLM land (about 38% of the watershed), with a little more than half being found outside LSRs. Approximately 142 acres of NFS lands are in Riparian Reserves.

Location and Routing

The PCGP corridor enters the Days Creek-South Umpqua River watershed at MP 82.8 and, after briefly reentering the Myrtle Creek watershed (from MP 85.8 to MP 86.3), travels in an south southeasterly direction through the Days Creek, Saint John Creek, Corn Creek, and Stouts Creek subwatersheds before exiting the watershed at MP 102.3 (figure 2.4-4, table 2.4.6.1-2). The corridor runs predominantly along ridge tops, particularly in the last segment where it straddles the Corn Creek-Stouts Creek subwatershed divide. In all, the PCGP corridor traverses 19.63 miles

of the Days Creek-South Umpqua River watershed, including 7.46 miles in the Days Creek subwatershed, 3.32 miles in the Saint John Creek subwatershed, 5.48 miles in the Corn Creek subwatershed, and 3.37 miles in the Stouts Creek subwatershed.

Both BLM and Forest Service lands are crossed in the Corn Creek and Stouts Creek subwatersheds, while in the Days Creek subwatershed, only BLM lands are crossed (figure 2.4-4, table 2.4.6.1-2). Over the entire fifth-field watershed, 6.60 miles of BLM land and 1.57 miles of Forest Service land are crossed by the PCGP corridor.

Approximately 57.45 acres of LSR on BLM lands (41.19 acres cleared and 16.26 acres modified) and 31.37 acres of LSR on Forest Service lands (10.56 acres cleared and 20.81 acres modified, see table 2.4.4.1-3) are in the PCGP Right-of-Way in the Days Creek South Umpqua watershed. All these designated LSR effects would be in the Corn and Stouts Creek subwatersheds, and accounted for 0.24% of the total BLM LSR lands and 1.22% of the total Forest Service LSR lands in the watershed. An additional 4.4 acres of KOAC P0361 and approximately 1 acre of KOAC P2294 would also be cleared in the Days Creek subwatershed. Approximately 171.87 acres of Matrix land would be affected by project construction. On BLM, 79.1 acres would be cleared and 50.99 acres would be modified; on NFS lands, 17.96 acres would be cleared and 24.72 acres modified. Over all federal land allocations, PCGP project construction would impact 260.69 acres (186.64 acres BLM land and 74.05 acres Forest Service land); these effects represent 0.33% of the BLM land and 1.89% of the Forest Service lands in the watershed (table 2.4.6.1-3).

Project effects on aquatic resources are minimal considering the number of miles of the PCGP corridor in the watershed. There are no stream channel crossings on BLM or NFS lands in the Days Creek – South Umpqua watershed. Two ridge top slope/seep wetlands (CW056 and CW057) would be crossed at MP 102.18 and 102.24 respectively. The PCGP corridor would impact 2.78 acres of Riparian Reserves associated with these wetlands. At five locations a total of 0.72 acres of Riparian Reserves of intermittent streams near the ridgetop are in the clearing limits of the corridor. Total construction effects to Riparian Reserves in the Days Creek-South Umpqua River fifth-field watershed is approximately 3.55 acres or 0.02% of the Riparian Reserves in the watershed cleared and 2.47 acres or 0.01% of the Riparian Reserves in the watershed modified. (tables 2.4.6.1-3, 4).

Draft

Figure 2.4-4 PCGP Routing and Subwatershed Boundaries, Days Creek-South Umpqua River Watershed

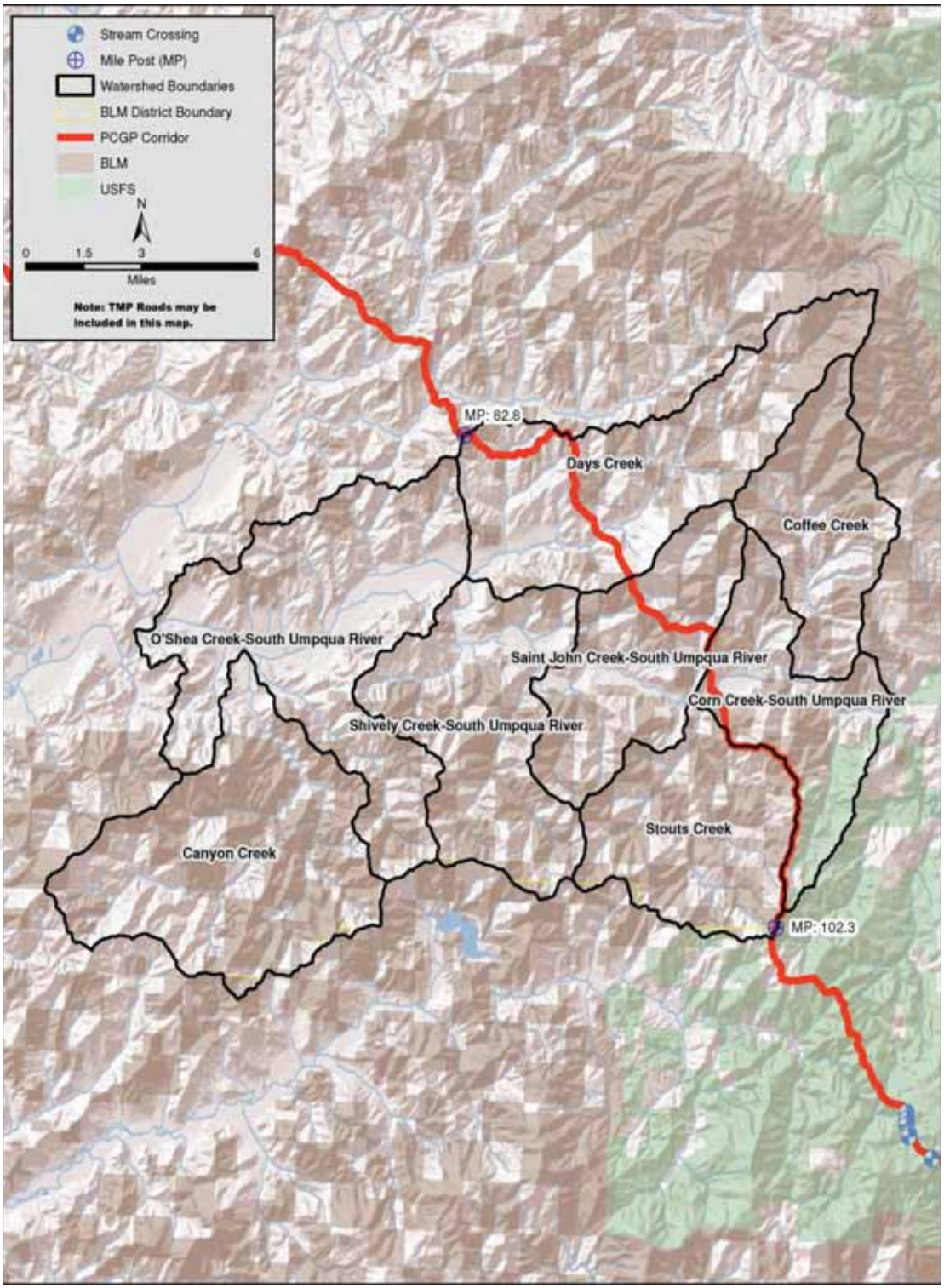


TABLE 2.4.6.1-1.

Land Ownership (acres) and Federal Land Allocations (acres) in Days Creek-South Umpqua River Watershed HUC 1710030205

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Canyon Creek	24,173.64	13,395.08	0.00	13,395.08	10,778.56	3,722.14		9,672.94		4,860.00		4,860.00
Coffee Creek	11,335.74	6,709.57	0.00	6,709.57	4,626.17			6,709.57		3,818.00		3,818.00
Corn Creek-South Umpqua River	12,014.87	3,837.63	2,624.04	6,461.67	5,553.20	2,070.94	2,385.98	1,766.69	238.06	1,075.00	142	1,217.00
Days Creek	22,024.29	7,983.00	0.00	7,983.00	14,041.29			7,983.00		2,790.00		2,790.00
O'Shea Creek-South Umpqua River	26,490.27	5,342.13	0.00	5,342.13	21,148.14	2,509.74		2,832.39		2,149.00		2,149.00
Saint John Creek-South Umpqua River	13,835.72	6,046.98	0.00	6,046.98	7,788.74	2,136.73		3,910.25		2,238.00		2,238.00
Shively Creek-South Umpqua River	17,328.30	7,008.79	0.00	7,008.79	10,319.51	6,327.72		681.07		2,772.00		2,772.00
Stouts Creek	14,366.06	7,673.90	182.86	7,856.76	6,509.30	7,425.99	31.35	247.91	151.51	2,150.00		2,150.00
Watershed Total	**141,568.89**	**57,997.08**	**2,806.90**	**60,803.98**	**80,764.91**	**24,193.26**	**2,417.33**	**33,803.82**	**389.57**	**21,852.00**	**142.00**	**21,994.00**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap
c/ Occur within LSR and Matrix Land Allocations. Data Source: MF Coquille WA, page 12 Approximately 40% of the landscape is Riparian Reserve

Draft

TABLE 2.4.6.1-2

PCGP Project Corridor (miles) and Project Area (acres) in Days Creek-South Umpqua River Watershed (HUC 1710030205) by Land Ownership

Unit a/	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Canyon Creek									0.00	0.00	0.00	0.00								
Coffee Creek									0.00	0.00		0.00								
Corn Creek-South Umpqua River	1.94	22.90	7.49	0.79	0.87	8.84	15.89	0.94	2.81	31.74		0.49	2.67	66.91	17.52	1.52	5.48	98.65	40.90	1.16
Days Creek	2.26	39.34	39.91	0.99					2.26	39.34		0.49	5.25	93.89	97.78	1.37	7.51	133.23	137.69	1.23
O'Shea Creek-South Umpqua River									0.00	0.00		0.00								
Saint John Creek-South Umpqua River	1.31	28.83	7.68	0.60					1.31	28.83		0.48	2.02	39.44	14.92	0.70	3.33	68.27	22.60	0.66
Shively Creek-South Umpqua River									0.00	0.00		0.00								
Stouts Creek	1.09	21.84	9.24	0.41	0.69	12.45	17.93	16.61	1.78	34.29		0.44	1.61	27.27	14.60	0.64	3.39	61.56	41.77	0.72
Watershed Total	**6.60**	**112.91**	**64.32**	**0.31**	**1.56**	**21.29**	**33.82**	**1.96**	**8.16**	**134.20**	**0.00**	**0.22**	**11.55**	**227.51**	**144.82**	**0.46**	**19.71**	**361.71**	**242.96**	**0.43**

a/ All data derived from NSR-based GIS layers

Draft

Table 2.4.6.1-3

PCGP Project Area (acres) on Federal Lands in the Days Creek-South Umpqua River Watershed HUC 1710030205 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations[3]			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Canyon Creek	BLM																
	FS																
Coffee Creek	BLM																
	FS																
Corn Creek-South Umpqua River	BLM	19.39	7.02	0.94	0.34	10.89	2.50	0.62	0.14	0.27	0.67	0.03	0.06	30.28	9.52	0.79	0.25
	FS	7.78	13.06	0.33	0.55	8.29	14.54	3.48	6.11					16.07	27.60	0.61	1.05
Days Creek	BLM					39.34	39.91	0.49	0.50	0.45	1.49	0.02	0.05	39.34	39.91	0.49	0.50
	FS																
O'Shea Creek-South Umpqua River	BLM																
	FS																

Draft

Table 2.4.6.1-3

PCGP Project Area (acres) on Federal Lands in the Days Creek-South Umpqua River Watershed HUC 1710030205 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations[3]			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Saint John Creek-South Umpqua River	BLM					28.83	7.68	0.74	0.20					28.83	7.68	0.48	0.13
	FS																
Shively Creek-South Umpqua River	BLM																
	FS																
Stouts Creek	BLM	21.80	9.24	0.29	0.12	0.04	0.00	0.02	0.00	2.83	0.31	0.13	0.01	21.84	9.24	0.28	0.12
	FS	2.78	7.75	8.87	24.72	9.67	10.18	6.38	6.72					12.45	17.93	6.81	9.81
Watershed Total	BLM	41.19	16.26	0.17	0.07	79.10	50.09	0.23	0.15	3.55	2.47	0.02	0.01	120.29	66.35	0.21	0.11
	FS	10.56	20.81	0.44	0.86	17.96	24.72	4.61	6.35	0.00	0.00	0.00	0.00	28.52	45.53	1.02	1.62
Total BLM and FS		51.75	37.07	0.19	0.14	97.06	74.81	0.28	0.02	3.55	2.47	0.02	0.01	148.81	111.88	0.24	0.18

a/ All data derived from NSR-based GIS layers

b/ Occur within LSR and Matrix Land Allocations

Draft

TABLE 2.4.6.1-4

Riparian Reserve Effects Days Creek-South Umpqua Fifth Field Watershed HUC 1710030205

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed	Width of Crossing (feet)	Wetland Acres Crossed	Clipped	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/																				
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats	Gross Riparian Reserves	fish bearing	Anadromy
Days Creek Subwatershed HUC 171003020505																													
RD BLM	82.95	Trib of Days Cr	RR of lateral stream clipped	I	No			Yes				0.00				0.00				0.00		0.00	0.49	0.49		0.49	No	No
RD BLM	83.19	Trib of Days Cr.	RR of lateral stream clipped	I	No			Yes			0.45	0.45				0.00				0.00		0.45	1.00	1.45	0.26	1.71	No	No
Subtotal Days Creek Subwatershed			Crossed: None / Clipped: 2 Int. Channel RR	2	0			2			0.45	0.45				0.00				0.00		0.45	1.49	1.94	0.26	2.20		
Corn Creek Subwatershed HUC 171003020502																													
RD BLM	100.21	Trib of Corn Cr.	RR of lateral stream clipped	I	No			Yes	0.27			0.27				0.00				0.00		0.27	0.67	0.94		0.94	No	No
Subtotal Corn Creek			Crossed: None / Clipped: 1 Int. Channel RR	1	0			1	0.0.27			0.27				0.0						0.27	0.67	0.94		0.94		
Stouts Creek Subwatershed HUC 171003020503																													
	97.97	Trib of Stouts Cr	RR of lateral stream clipped. 499770, 4750417 UTM	I	No			Yes					0.05			0.05						0.05		0.05		0.05		
RD BLM	99.97	Trib of Stouts Cr.	RR of lateral stream clipped	I	No			Yes				0.00				0.00				0.00		0.00	0.31	0.31		0.31	No	No

Draft

TABLE 2.4.6.1-4

Riparian Reserve Effects Days Creek-South Umpqua Fifth Field Watershed HUC 1710030205

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed	Width of Crossing (feet)	Wetland Acres Crossed	Clipped	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats	Gross Riparian Reserves	fish bearing	Anadromy
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
RD BLM	102.18	CW057	Small wetland within a clearing in Douglas fir forest	W	Yes		0.13	No	0.05			0.05	1.04			1.04				0.00	0.13	1.22		1.22	0.08	1.30	No	No
RD BLM	102.24	CW058	Slope Seep Wetland	W	Yes		0.15	No				0.00	1.41			1.41				0.00	0.15	1.56		1.56	0.20	1.76	No	No
Subtotal Stouts Creek			Crossed 2 Wetlands Clipped 2 Int. Channel RR	4	2		0.28	5	0.05			0.05	2.50			2.50				0.00	0.28	2.84	0.31	3.14	0.28	3.42		
Total Days Creek South Umpqua			Crossed: 2 Wetlands Clipped 5 Int. Channel RR	7	2		0.28	5	0.32	0.00	0.45	0.77	2.50	0.00	0.00	2.50	0.27	0.00	0.00	0.27	0.28	3.55	2.42	6.02	0.54	6.56		

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody. Acre values shown as "0.00" are GIS slivers that are less than 0.01 acres.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings.

Draft

2.4.6.2 Existing Conditions Days Creek-South Umpqua River, HUC 1710030205

Original watershed Analysis Findings

The BLM completed the Second Iteration watershed assessment for the Days Creek-S. Umpqua watershed in 2001 (BLM 2001). watershed conditions are summarized as follows:

- Timber harvesting and road construction over the past 60 years have had major effects in the watershed, including increased peak flows, accelerated sediment transport to streams, increased risks of landslides, higher stream temperatures, reductions in aquatic habitat complexity and connectivity, and debilitating alterations to stream channel morphology (Beschta, 1978, Harr and McCorison 1979, Jones and Grant 1996, and Wemple et al. 1996 all cited in BLM 2001).

- Based in data from 2000 Operations Inventory Vegetation Data, 13% of the watershed was nonforested (mainly agriculture and pasture land with emphasis on livestock production), 18% was early seral (30 years old or less), 39% was mid seral (31-80 years old) and 27% was late seral (80 years old or older). About 84% is in conifer forest and 3% covered in hardwood-dominated forest. For BLM-administered lands, 1% was nonforest, 25% was early seral forest, 16% was mid seral forest and 57% was LSOG forest (BLM 2001).

- In 2001, about 27% of the Riparian Reserves in the watershed were early seral forests (30 years or less in age), while mid seral forests (30-80 years old) covered 20.8% of these riparian zones. A substantial portion of the Riparian Reserves on BLM land (50.2%) were 120 year or older LSOG, and of these LSOG forests, 70.2% are greater than 200 years old. Nonforested lands constitute only 1.8% of the Riparian Reserves on BLM land. Regardless, there are reaches of numerous streams that have insufficient riparian growth and stream cover, possibly resulting in bank erosion, reduction in stream LWD, channel instability, and elevated stream temperatures. It is recommended that restoration efforts such as planting of native vegetation and thinning densely-stocked young stands be undertaken.

- Wildfires have had a major impact on the vegetation patterns in the watershed, creating a mosaic of types of varying sizes. The 1987 Canyon Mountain and Bland Mountain fires burned approximately 15,000 acres of the watershed, furthering the shift to early seral forest that resulted largely from logging. Regardless, over the past 75 years, fire suppression has been successful in minimizing the number of acres burned by wildfires. At the same time, prescribed burns have been used extensively to prevent major fires and prepare the site for reforestation. The potential exists for additional large-scale fires in this watershed where there are large fuel reservoirs.

- On steeper slopes, there are substantial areas of soils susceptible to landslides when burned, cleared or affected by road construction. Landslides associated with roads are a major source of sediment transport to downstream aquatic habitats in the watershed.

- Road densities averaged 4.56 miles/square mile over the watershed, with most drainages having densities less than 5.0 miles/square mile. On BLM land, the average was 3.60 miles/square mile, and within the Riparian Reserve allocation, road density averaged 3.19 miles/square mile overall and 3.14 miles/square mile within 100 feet of a stream. Many of

Draft

these roads are in need of maintenance and are a major source of elevated peak flows and sediment transport in the watershed (BLM 2001). They serve to extend the stream network substantially, thereby increasing peak flows and fluxes of sediment to the stream channels. This has, in turn, resulted in bank and channel erosion. From 1997 to 2001, about 12 miles of roads in the watershed had been improved and about another 4 miles had been decommissioned, and the recommendation is to improve and preferably decommission roads wherever possible.

- Timber clearing in the TSZ (land with elevations between 2,000 and 5000 foot amsl) could result in elevated peak flows during warm rain-on-snow events. Forty eight (48) percent of the watershed and 50.1% of BLM land lie above 2,000 feet amsl.
- The South Umpqua River from its mouth to the headwaters is on Oregon's Final 1998 Water Quality Limited Streams 303(d) list for temperature. Beals Creek, Days Creek and Shivley Creek were on the water quality limited list for habitat modification (including lack of LWD and pool frequency), while Fate Creek, Stouts Creek, and the East Fork of Stouts Creek were listed for temperature. The South Umpqua River was listed for toxics, flow modification, aquatic weeds or algae, bacteria, dissolved oxygen, sediment, pH and temperature.
- Based on an ODFW Aquatic Habitat Inventory of 82 stream reaches in the watershed, only three were in good condition, 57 were rated as fair, and 22 reaches were rated as poor in condition. None were rated as being in excellent condition (BLM 2001, p. 169).
- Past removal of LWD and boulders from streams in the watershed as part of area logging operations has resulted in decreased habitat complexity, reduced sediment holding capacity, and higher flood peaks. It is recommended that restoration efforts be undertaken to address this issue throughout the watershed.
- Numerous culverts are faulty or inadequate to handle large floods, resulting in blockage of passage of fish and other aquatic organisms through the area. It is recommended that these culverts be identified and repaired/replaced, and that locations for other poorly designed or damaged culverts be identified.
- Suitable northern spotted owl habitat covers approximately 32,663 acres of the watershed. This constitutes 23% of the watershed. The watershed assessment (2001) noted 79 known spotted owl sites representing 50 northern spotted owl pairs.

Changes in watershed Condition

There have been no large-scale disturbance events that would change the general conditions in the Days Creek-South Umpqua watershed from those described in the applicable watershed assessment. Restoration projects have improved conditions in specific stream reaches and subwatersheds. The following restoration projects have been completed:

- Fate Creek Dam Removal (1999) –Removal of an old irrigation dam located in the SE¼SE¼, Section 31, T. 29 S., R. 3 W., W.M. allowing access to approximately one-mile of upstream habitat.

- Fate Creek Restoration (2001) – Modification of an irrigation dam to allow access for fish passage to approximately and construction of a livestock crossing on private lands in Section 32, T. 29 S., R. 3 W., W.M.
- Days Creek Restoration (2001) – Stabilization of approximately 200 feet of undercut and eroding stream bank on Days Creek located in the SW¼NE¼, Section 27, T. 29 S., R. 3 W., W.M.; renovation of approximately 9.3 miles of BLM Road No 29-3-33.0, including armoring of two side channel stream crossings to allow fish passage; and replacement of a large stream crossing on BLM Road No. 29-3-33.0 in the SE¼NW¼, Section 13, T. 29 S., R. 3 W., W.M.
- St. John Creek Culvert Replacement (2002) – Replacement of two large stream crossing culverts in the SE¼NE¼ and NW¼SE¼, Section 22, T. 30 S., R. 3 W., W.M. reducing sedimentation and restoring access to an estimated 3.5 miles of stream habitat.
- East Fork Stouts Creek Culvert Replacement (2002) – Replacement of a culvert with an arched pipe located in the NW¼NE¼, Section 22, T. 31 S., R. 3 W., W.M. to reduce sedimentation and restore upstream access by resident fish.
- West Fork Canyon Creek Restoration (2002) – Decommissioning of 2.5 miles of road, and placement of wood in a 1/4 mile reach of an unnamed tributary to West Fork Canyon Creek in Section 10, T. 31 S., R. 5 W., W.M.
- Fate Creek Culvert Replacement (2002) – Replacement of a culvert under Douglas County Highway 34 just above the confluence of Fate Creek with Days Creek, and removal of an earthen irrigation dam just upstream of the stream crossing under the highway. The actions were located in the NW¼SE¼, Section 6, T. 30 S. R 3 W., W.M. Combined with the preceding two projects, access to stream habitat is restored along the entire length of Fate Creek.
- Beals Creek Culvert Replacement (2005) – Replacement of a stream crossing in the SE¼SE¼, Section 21, T. 30 S., R. 4 W., W.M. to reduce sedimentation and restore access to approximately one-mile of anadromous fish habitat.
- Stouts Creek Instream (2006) – Placement of logs in a 1/4 mile reach of Stouts Creek located in section 3, T. 31 S., R. 3 W., W.M.
- Culvert Replacement on an Unnamed Tributary to West Fork Canyon Creek (2006) – Replacement of a stream crossing with a concrete bridge to reduce sedimentation and restore access to an estimated 2.5-miles of fish habitat. Project area was located in the SW¼SW¼, Section 11; NW¼NW¼, Section 14; and NE¼NE, Section 15, T. 31 S., R. 5 W., W.M.
- Shively Creek Instream (2006) – Placement of logs in two stream reaches a combined 1.25 miles in length in Section 35, T. 30 S., R. 4 W. and Section 31, T. 31 S., R. 4 W., W.M.
- Fate Creek Livestock Exclusion (2007) – In cooperation with PUR, riparian fencing and installation of a rail car bridge as a livestock crossing over Fate Creek in Section 6, T. 30 S., R. 3 W., W.M.
- Fish Passage (2007) – In cooperation with PUR, replacement of two culverts on Stouts Creek, in Section 8, T. 30 S., R. 3 W. with a railcar bridge to allow access of approximately six miles of stream habitat.

Draft

- South Umpqua Fish Habitat Enhancement (2009) – Placement of large wood in two reaches of Days Creek in Sections 13 and 23, T. 29 S., R. 3 W., W.M. and two reaches of St. John Creek in Sections 15 and 27, T. 30 S., R. 3 W., W.M.
- Morgan Creek Fish Passage (2009) – In partnership with PUR, replacement of a stream crossing on Morgan Creek in the SWSW, section 13, T. 30 S., R. 5 W., W.M. reducing sedimentation and restoring access to approximately two mile of stream habitat.
- Poole Creek Fish Passage (2009) - In partnership with PUR, replacement of two stream crossings on Poole Creek and East Fork Poole Creek in the SESW, Section 30, T. 30 S., R. 3 W., W.M., reducing sedimentation and restoring access to approximately one-mile of upstream fish habitat.
- Days Creek - Decommissioned 2.3 miles of road.
- Days Creek - Installation of LWD structures on 3 miles of Days Creek
- St. John Creek - Decommissioned 0.6 miles of road.
- St. John Creek - Installation of LWD structures on 1.3 miles of St. John Creek.
- St. John Creek - Replaced culvert on St. John Creek restoring 0.5 miles of anadromous and an additional 11 miles of resident fish habitat.
- Stouts Creek – Decommissioned 0.7 miles of road.
- Corn Creek: Decommissioned 1.7 miles of road.

Current watershed Conditions

Watershed conditions have improved in the Days Creek South Umpqua watershed with accomplishment of restoration projects and implementation of the Northwest Forest Plan. NWFP monitoring showed improving watershed condition trends in Stouts Creek, Days Creek and St. John's Creek subwatersheds. High road densities and high fuel loading linked to the risk of high intensity stand replacing fire negatively impact watershed conditions (Attachments: Section 3.3.2).

2.4.6.3 Natural Disturbance Processes

Natural disturbance processes in the Days Creek-S. Umpqua watershed are typically associated with wildfires started by lightning strikes. The severity of risk to catastrophic fires varies with the nature of the forest community, and the Days Creek-S. Umpqua watershed includes some areas of high risk for severe, stand-replacing fires. In areas where fires have recently occurred, soils (particularly those on steep slopes) can become unstable and may be prone to landslides during heavy precipitation events. As a result of wildfires, a vegetation mosaic characterized by large blocks of vegetation of the same age class predominated under natural conditions, resulting in high connectivity in the terrestrial ecosystem. Under natural conditions, the peak flow conditions resulting from heavy rainfall would be ameliorated, to a substantial degree, by infiltration of much of the fallen water into the soil system. The subsequent slow release to the drainage system would not only dampen peak flows but also support base flow during the long dry season. The effects of peak flow events to the aquatic habitat under natural conditions were also mitigated by the complexity and hydraulic stability of the drainage network. Under natural conditions, LWD and boulders in the streams and active floodplain dynamics helped reduce peak flows and their effects to the aquatic ecosystem. In-stream structure created pool habitats and substrate conditions

Draft

conducive to spawning by anadromous and resident fish populations, and the absence of man-made obstructions (culverts and dams) facilitated access of fish populations to upstream habitats.

2.4.6.4 Project Effects and Range of Natural Variability

Table 2.4.6.4-1 describes the natural range of variability of five key ecological processes and project effects on these processes relative to the ranges of variability resulting from past and ongoing natural and human disturbances in the watershed. All processes have been affected to some degree by human activity.

Current watershed conditions do not reflect natural ranges of variability of key ecological processes in the Days Creek-S. Umpqua watershed. The South Umpqua watershed Analysis documented that historically, the WAU was about 85% LSOG forest (BLM 2001, p. 76). At the time the watershed assessment was written in 2001, approximately 58 percent (35,540 acres out of 60,812 acres) of the Federally administered land in the South Umpqua watershed fifth field watershed was in forest stands at least 80 years old (late successional) (BLM 2001, p. 76). The PCGP project affects approximately 0.32% of BLM lands, 2% of NFS lands, and 0.44% of all ownerships within the watershed. This small impact area is well within the scale of natural disturbance processes described by Everest and Reeves (2007), Agee (1993) for the Coast Range and Klamath – Siskiyou Provinces, and the South Umpqua watershed Analysis and is unlikely to change watershed condition.

The historical condition of the riparian zone along the upper South Umpqua River favored conditions typical of old-growth forests found in the Pacific Northwest (Roth 1937, cited in BLM 2001). Roth noted the shade component that existed along the surveyed stream reaches. The majority of the stream reaches surveyed were "arboreal" in nature, meaning "tall timber along the banks, shading most of the stream". The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambanks were provided protection by the massive root systems of these trees (Roth, 1937, cited in BLM 2001: 164).

Effects to Riparian Reserves are minor. Two forested wetlands in a ridgetop swale on the hydrologic divide with the Elk Creek-South Umpqua would be crossed. About six acres of Riparian Reserves, all located adjacent to intermittent streams or forested wetlands that would likely be dry during construction, would be impacted. Best Management Practices are expected to be effective at minimizing sediment entrainment the transport. Off-site mitigations, which include road upgrade/stabilization and culvert replacement, would help bring erosion processes, stream flow, and aquatic connectivity closer to the natural ranges of variability.

TABLE 2.4.6.4-1

Project Effects and Relevant Ecological Processes Described in the Days Creek-South Umpqua River Fifth-Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are a dominant sediment delivery mechanism to stream systems in the watershed under natural conditions. Historically, landslides were associated with high intensity rainfall events that overlapped with infrequent high intensity fires. These events resulted in large depositions of coarse wood and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed has resulted in chronic fine-grained sediment becoming the primary sediment source. Roads, some affected by landslides, can be a chronic source of sediment transport to waterbodies. In some cases, culverts are undersized and plugged. Roads in the watershed have extended the drainage system substantially during storms, resulting in increased sediment transport and peak flows. Many exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in streams.	Landslide prone areas have been avoided in routing of the PCGP. All areas crossed by the PCGP project corridor are classified as low, or very low probability of mass wasting (Geoengineers, 2009). The project is generally located on ridge tops. Erosion control measures and Best Management Practices would be implemented to minimize sediment transport off the corridor. Rapid revegetation of disturbed areas, encouraged by replanting with native species, is anticipated. As a result, sediment effects are expected to be minor, short-term, and well within the range of natural variability for the watershed. Road drainage, surface enhancement and storm proofing mitigation projects would likely reduce significant sources of sediments. Fire suppression and fuels reduction off-site mitigation projects in the watershed would help reduce the risk and probability of high-intensity stand replacement fire and associated sediment.
Ecological Succession / Vegetative Condition	The watershed has been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, even age stands with large numbers of snags and fire-maintained natural openings. Logging has greatly modified the seral composition of forests in the watershed, with increases in early and mid seral forests and extensive fragmentation of the forest stands. While a substantial portion of the Riparian Reserves on BLM land in the watershed are LSOG forests, some areas have inadequate riparian cover due mainly to logging and road construction.	The PCPG corridor would have minimal impact on vegetation in Riparian Reserves. A very minimal amount of Riparian Reserves (6.02 acres), all located in ridge top areas and bordering intermittent streams, would be impacted. Less than 0.5 acres of Riparian Reserves affected by the projects are in LSOG condition. The remainder of the affected Riparian Reserves are early and mid-seral plant communities.
Flow Regime	Flow regimes are directly related to the precipitation regime, which in this watershed largely involves rainfall. Under natural conditions, most of the rain falling in the watershed percolates into the soils, where its movement toward aquatic habitats is delayed. Large, high intensity fires may create conditions that significantly increase flows. Roads extend the drainage system, and accelerate the transport of runoff to stream channels. Clearing of the TSZ in past and ongoing logging and road construction operations have likely contributed to increased peak flows during warm rain-on-snow events. Absence of LWD and boulders in streams, also fosters increased peak flows.	Vegetative conditions may contribute to peak flows when more than 25% of a watershed is in the transient snow zone and less than 30 years old, or where there has been extensive vegetation loss after a stand-replacing fire. The South Umpqua watershed Analysis estimated that 94% of the BLM and Forest Service lands in the watershed are hydrologically recovered and unlikely to contribute to increases in peak flows (BLM 2001, p. C-3). The PCGP affects less than 1% of the watershed and therefore would not cause conditions likely to increase peak flows. The limited scale of vegetative impact, project location on or near ridgetops and limited connectivity to aquatic systems make it unlikely that the PCGP would contribute to an increase in peak flows. Improvements to access roads identified in the TMP along with several off-site road improvement mitigation projects are intended to reduce road-related effects to flow regimes in the watershed and mitigate any project effects. The amount of project-related clearing in TSZ lands is small and should not contribute to elevated peak flows during warm rain-on-snow events. See EIS Chapter 4.4.

TABLE 2.4.6.4-1 **Project Effects and Relevant Ecological Processes Described in the Days Creek-South Umpqua River Fifth-Field Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced in streams in the watershed. Stand replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range in a number of drainages (e.g., Fate Creek, Stouts Creek, and the East Fork of Stouts Creek). Absence of LWD in streams has also likely contributed to higher stream temperatures by reducing pool frequency and size and allowing streams to widen.	The small acreage of riparian vegetation to be cleared and modified during project construction is unlikely to have any effect on stream temperature since no stream channels would be crossed or exposed to solar radiation. All riparian areas cleared in the watershed are at near ridge top positions, and the Intermittent streams draining them are dry during the critical summer period when elevated stream temperatures are a concern. Therefore, they should have no effect on temperatures further down the drainage system.
Aquatic Habitat and Stream Channel Complexity and Connectivity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable stream banks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones has substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. Presence of poorly designed and faulty culverts restrict access of anadromous and resident fish populations to upstream habitat.	No LWD or boulders would be removed from streams during construction because there are no channel crossings in the watershed. The very limited effects to Riparian Reserves in the watershed would be mitigated by replanting with native vegetation. Off-site mitigations on West Fork Canyon Creek and Days Creek would replenish the LWD and boulder stocks of 1.2 miles of streams. Therefore, no long term effects to aquatic habitat and channel complexity are expected.

2.4.6.5 Compliance with Land Management Plans

Table 2.4.6.5-1 provides NWFP standards and guidelines relevant to the ACS, the related BLM management direction (as provided in the Roseburg District RMP), and PCGP compliance with this management direction on BLM land in the Days Creek-S. Umpqua watershed.

Draft

TABLE 2.4.6.5-1

Consistency of PCGP Project on Days Creek-South Umpqua Watershed with BLM Roseburg District and Umpqua National Forest ACS-Related Management Direction

RMP Management Direction	UNF / NWFP Standard / Guideline	PCGP Compliance
Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last para. & pg. 28, 1st para.	Riparian Reserves - Lands; LH-4	Terms and conditions to assure compliance with ACS objectives in the Days Creek-S. Umpqua watershed have been incorporated into the BLM Right-of-Way Grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-way Clearing Plan, the Traffic Management Plan (TMP) etc.
Specific Land Use Allocations, Riparian Reserves - General Riparian Area Mgmt., pg. 28, para. 4	Riparian Reserves - General Riparian Area Mgmt.; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the Days Creek-S. Umpqua watershed because all such needs would be provided by municipal sources.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	Riparian Reserves - Road Mgmt.; RF-2	No new PCGP project roads intersect Riparian Reserves in the Days Creek-S. Umpqua watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	Riparian Reserves - Road Mgmt.; RF-4	No new project-related road crossings of streams are proposed in the Days Creek-S. Umpqua watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 5	Riparian Reserves - Road Mgmt.; RF-5	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction in the Days Creek-S. Umpqua watershed. In addition, off-site mitigations (culvert replacements) would improve road conditions, further minimizing sediment transport to adjacent aquatic habitats.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	Riparian Reserves - Road Mgmt.; RF-6	Fish passage would be maintained at all road crossings where project-related road repairs are implemented in the Days Creek-S. Umpqua watershed. Some existing crossings would be upgraded. In addition, off-site mitigations (culvert replacement) would be implemented to expand fish migration in the watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 7 & pg. 26, 1st para.	Riparian Reserves - Road Mgmt.; RF-7	The project TMP meets all the requirements of RF-7 in the Days Creek-S. Umpqua watershed.
Specific Land Use Allocations, Riparian Reserves - Watershed & Habitat Restoration, pg. 28, para. 3	Riparian Reserves - watershed & Habitat Restoration; WR-3	Application of Best Management Practices and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation in the Days Creek-S. Umpqua watershed. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project effects Survey and Manage species within the Days Creek South Umpqua watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective

Draft

TABLE 2.4.6.5-1 **Consistency of PCGP Project on Days Creek-South Umpqua Watershed with BLM Roseburg District and Umpqua National Forest ACS-Related Management Direction**		
RMP Management Direction	**UNF / NWFP Standard / Guideline**	**PCGP Compliance**
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM and NFS lands in the Days Creek South Umpqua watershed are currently 32% LSOG and exceeds this threshold.

2.4.6.6 Off-Site Mitigation

Off-site mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. BLM used the agency Offsite Mitigation Policy (BLM 2008) to develop the appropriate suite of offsite mitigation actions for the PCGP project. All proposed off-site projects related to effects in the Days Creek-S. Umpqua watershed are located in the watershed (table 2.4.6.6-1). Because of the checkerboard nature of BLM ownership (figure 2.4-4), it is often difficult to locate site-specific projects in the subwatershed where the impact occurred.

Offsite mitigation efforts in Days Creek-S. Umpqua watershed are focused on:

1. Replacement of LWD in channels;
2. Surfacing and otherwise repairing existing roads throughout the watershed to minimize sediment transport and delivery to aquatic habitats; and
3. Fuels reduction and other fire suppression actions (table 2.4.6.6-1).

Lack of LWD in channels greatly reduces habitat complexity and the ability of the channel to provide alluvial habitat suitable for salmonid spawning and rearing. Improvement of road drainage and implementation of road stabilization measures are major factors in maintaining and restoring functional aquatic habitat in the watershed. Suppression and control of high intensity fires is critical to ensuring development of LSOG on federal lands.

Large Wood In-stream: LWD in-stream projects proposed by BLM as off-site mitigation of PCGP effects in the watershed are described in table 2.4.6.6-1. Placement of LWD in channels adds structural complexity to the aquatic habitat by creating pools and riffles, and trapping fine sediments. This action can also contribute to reductions in stream temperatures over time, primarily by increasing the number and quality of pools in these channels (Tippery, Jones et al. 2010). The Roseburg District mitigation target is 80 pieces of LWD per mile of channel. Approximately 1.2 miles of channel would be mitigated; therefore, the total LWD placed in West Fork of Canyon Creek and Days Creek is 96 logs (table 2.4.6.6-1). These mitigation actions are responsive to ACS objectives 2, 3, 4 and 5 (table 2.4.6.8-1).

Road Drainage/Surface Enhancement and Stormproofing: Road surfacing projects proposed by BLM as off-site mitigation of PCGP effects in the Days Creek-S. Umpqua watershed are described in table 2.4.6.6-1. Road surfacing, drainage enhancement, and storm proofing reduce

sediment transport to aquatic habitats by capping the fine textured sediments in the running surface of a gravel or dirt road with coarser rock or paving. Paving all but eliminates traffic-generated sediment transport. Removal of the culvert on Shively Creek would help reduce sediment transport to nearby aquatic habitats. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 (Forest Service and BLM 1994b: B-11, C-7).

Fire Suppression: Fuels reduction would be implemented adjacent to the corridor along the Days Creek to Shady Cove fuel break. This would increase the effectiveness of the corridor as a fuel break. Installation of 6 dry hydrants would make water more available to fire vehicles. By implementing these mitigations, the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire would be reduced.

TABLE 2.4.6.6-1

Proposed Off-site Mitigation Projects for Days Creek-South Umpqua Watershed

Project Type	Mitigation Group	Project Name	Project Rationale
Fire Suppression	Fire suppression	Dry Hydrants	By installing 6 dry hydrants, fire vehicles would have an easier time filling up with water, and additional water sources would be available. In this way, areas that have had restoration work for fish populations could still be safely accessed for fire suppression. Over all, better water sources would improve fire suppression success and therefore help protect natural resources.
Fish Passage	Fish Passage	Beal Creek Culvert Replacement	Man-made barriers to fish passage have restricted access to quality habitat in the watershed. Both culverts targeted for replacement are undersized and obstructing anadromous and resident fish passage. Replacing these two culverts with ones properly sized for the stream (can handle peak flows) would allow fish passage and reduce the risk of them plugging up and causing road fill failures.
Fuels Reduction	Stand Density Fuel Break	Hazardous Fuel Reduction	High intensity wildfire has been identified as the single natural factor most impacting late successional and old growth forest habitats in the Days Creek-S. Umpqua watershed. Like a road, the corridor serves a fuel break. Fuels reduction on 1000 acres adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. The mitigated area is part of the Days Creek to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.
LWD in-stream	Aquatic Habitat	West Fork Canyon Creek Large Wood and Boulder Placement	The Days Creek-S. Umpqua watershed is a Tier 1 Key watershed. Lack of LWD and sources of recruitment of this LWD in many streams are major factors limiting aquatic habitat quality in the watershed. There are approximately 6.23 miles of corridor and 3 stream crossings in the watershed. Implementation of the PCGP project would result in the removal of LWD and clearing of woody vegetation from about 6 acres of Riparian Reserves associated with near ridge top intermittent streams. This vegetation clearing would impact future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD and boulders at key locations along 0.8 miles of the West Fork Canyon Creek channel and associated Riparian Reserves would offset both the short- and long-term unavoidable effects associated with loss of LWD recruitment to Riparian Reserves, thereby contributing to the accomplishment of ACS objectives. Approximately 88 logs would be placed in 0.8 miles of stream.

Draft

TABLE 2.4.6.6-1 **Proposed Off-site Mitigation Projects for Days Creek-South Umpqua Watershed**			
Project Type	**Mitigation Group**	**Project Name**	**Project Rationale**
LWD in-stream	Aquatic Habitat	Days Creek Large Wood and Boulder Placement	The Days Creek-S. Umpqua watershed is a Tier 1 Key watershed. Lack of LWD and sources of recruitment of this LWD in many streams are major factors limiting aquatic habitat quality in the watershed. There are approximately 6.23 miles of corridor and 3 stream crossings in the watershed. Implementation of the PCGP project would result in the removal of LWD and clearing of woody vegetation from about 6 acres of Riparian Reserves associated with near ridge top intermittent streams. This vegetation clearing would impact future recruitment of LWD into the channel and associated Riparian Reserves. Placing LWD and boulders at key locations along 0.4 miles of the Days Creek channel and associated Riparian Reserves would offset both the short- and long-term unavoidable effects associated with loss of LWD recruitment to Riparian Reserves, thereby contributing to the accomplishment of ACS objectives. Approximately 40 logs would be placed in 0.4 miles of stream.
Road Drainage and Surface Enhancement	Road Sediment Reduction	South Umpqua Road Drainage and Surface Enhancement	The Days Creek-S. Umpqua watershed is a Tier 1 Key watershed. Sediment is likely the most limiting factor to aquatic functioning in streams of the watershed. Roads do not meet current Best Management Practices and are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair along 10 miles of roads in the watershed would reduce sediment delivery to fish bearing streams, thereby contributing to the attainment of ACS objectives.
Road Storm-proofing (culvert removal)	Road Sediment Reduction	31-4-3.2 Road Storm proofing in Shively Creek	The Days Creek-S. Umpqua watershed is a Tier 1 Key watershed. Sediment is likely the most limiting factor to aquatic function in the South Umpqua basin. The effects of the PCGP include habitat fragmentation and potential effects to flow and sediment regimes. There is concern that the Shively Creek culverts may fail, resulting in substantial sediment transport to Shively Creek. Removing these faulty culverts would prevent possible deposition of fine road sediments in stream channels. This mitigation project should occur before road becomes too narrow for heavy equipment access.

2.4.6.7 Cumulative Effects

Activities on BLM and NFS Lands

The BLM manages approximately 41 percent and the Forest Service two percent of the Days Creek South Umpqua watershed. There are currently no projects proposed on BLM or NFS lands in the watershed that would contribute to cumulative effects.

Activities on Private Lands

Private lands comprise about 57 percent of the Days Creek South Umpqua watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.32 percent of the BLM lands, two percent of NFS lands and 0.57 percent of private lands in the Days Creek South Umpqua watershed (table

2.4.6.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Clark Branch South Umpqua watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.4.6.8 Project Effects by ACS Objective

Table 2.4.6.8-1 compares the PCGP project effects against the objectives of the ACS. The PCGP does not cross any stream channels and affects less than 6 acres of the Riparian Reserves in the Days Creek-S. Umpqua watershed. All affected Riparian Reserves are near ridge tops. The intermittent streams associated with them would likely be dry during construction. The two wetlands are ridge top swales have no apparent surface connection to drainages.

TABLE 2.4.6.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Days Creek–South Umpqua River Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape-scale features that would be affected by the Project. The Project corridor would impact 0.33 percent of the BLM-managed land and 0.99 percent of the NFS land in the Days Creek–South Umpqua River watershed. Approximately 3.5 acres of Riparian Reserves would be cleared (0.03 percent of Riparian Reserves on federal lands). Nearly all of the vegetation cleared is mid-seral. While the cutting of trees where the corridor intersects Riparian Reserves would result in a long-term change in vegetation condition, it would be minor in scale and well within the range of natural variability for vegetative change given the fire history of the Days Creek–South Umpqua River watershed. The application of Best Management Practices and erosion control measures, use of native vegetation, and the anticipated rapid revegetation of disturbed areas would likely further reduce Project impacts. The level of impacts is well within the range of natural variability for disturbance processes described by Everest and Reeves (2007) and Agee (1993) and as documented in the South Umpqua River watershed assessment (BLM 2001). The Days Creek South Umpqua watershed is approximately 32 percent LSOG.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Days Creek–South Umpqua River watershed. No streams would be crossed, and impacts in Riparian Reserves would be minimal. Aquatic system connectivity would be enhanced by replacement of culverts on Beal Creek that currently preclude passage of anadromous fish species and other aquatic organisms. Any residual levels of disturbance are anticipated to be well within the range of natural variability.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project would have no discernible impact on streambanks or bottoms in the Days Creek–South Umpqua River watershed because no stream channels would be crossed. The few impacts in Riparian Reserve are associated with near ridge top intermittent streams or ridgetop (wetland) swales that have no apparent surface connectivity to the drainage system and, therefore, little influence on the physical integrity of the aquatic system. Offsite mitigation measures involving LWD and boulder placement in several miles of stream channel would help restore physical integrity and complexity.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and	Sediment impacts are expected to be as described in section 1.3.1. Minor amounts of sediment would be mobilized during construction, but these impacts are expected

TABLE 2.4.6.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Days Creek–South Umpqua River Watershed

ACS Objective	Project Impacts
wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	to be short term and limited to the immediate project area. Connectivity to aquatic systems is limited since no stream channels would be crossed. With application of the ECRP and Best Management Practices, no long-term impacts associated with sediment transport are anticipated. No impacts on water temperature are expected because no channels would be crossed and no effective shade would be removed. Any sediment transport to aquatic systems that may occur would be offset by mitigation projects involving off-site road drainage enhancement, surface upgrade, and storm proofing. The intermittent tributaries located adjacent to the Riparian Reserve vegetation that would be affected would likely be dry at the time of construction and would not contribute to the temperature balance of downstream reaches during the critical summer season.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in corridor routing. There would be no stream channels crossed in the watershed; because the route lies on a ridgetop, connections to aquatic systems that would transport sediment are limited. All waterbodies adjacent to affected Riparian Reserves are expected to be dry during construction. Sediment fluxes are expected to be minor, short term, and well within the range of natural variability for the Klamath-Siskiyou Province with implementation of the erosion control measures in ECRP and Best Management Practices as well as the anticipated rapid revegetation that is characteristic of the Province... Erosional impacts are therefore expected to be consistent with those described in section 1.3.1. Road repairs and storm proofing would help reduce sediment impacts in the watershed and move the sediment regime closer to the desired condition.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	It is highly unlikely that the Project would affect flows because of limited connectivity to aquatic systems. The Project routing is on a ridgetop in the watershed and would not cross any stream channels. The watershed is hydrologically recovered (BLM 2001:143) and the corridor would affect less than 0.5 percent of the watershed (table 2.4.6.1-2) so changes in peak flows as a result of construction are highly unlikely.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	Two small forested wetlands would be crossed in or near a ridgetop swale in the Stouts Creek subwatershed at MP 102.1 and 102.2. Trench plugs would be installed on each side of these wetlands to block subsurface flows and maintain water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. By restricting crossings to the dry season (July 1 to Sept. 15), possible impacts on water tables of these wetland areas are expected to be minor and short-term. These features appear to have no surface connectivity with the Stouts Creek drainage network.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Approximately 3.5 acres or approximately 0.03 percent of Riparian Reserves in the watershed would be cleared by the Project. All affected Riparian Reserves are located at or near ridgetops and contribute little to the thermal regulation, nutrient filtering, bank erosion and channel stability of the drainage networks in the watershed. Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Replanting with native species would facilitate recovery of vegetation communities. LWD and boulder placement in and adjacent to 1.2 miles of stream channel as part of offsite mitigation would help to enhance physical complexity of the aquatic habitats. These restoration efforts would contribute to the maintenance and restoration and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation on BLM-managed land in the Days Creek–S. Umpqua River watershed would be minor (4.32 acres cleared) and occur largely in early to mid seral stages forests along ridgetops. Impacts to ridgetop swale wetlands total less than one acre. Existing herbaceous and brush cover would be maintained to the extent practicable. To maintain riparian habitat, construction Best Management Practices would be implemented. LWD and boulders would be placed in channels and adjacent riparian areas and along 1.2 miles of watershed streams to restore and stabilize channel crossings. Revegetation would be encouraged by planting of native riparian species. The persistence of riparian-dependent Survey

TABLE 2.4.6.8-1 **Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Days Creek–South Umpqua River Watershed**	
ACS Objective	**Project Impacts**
	and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.4.6.9 Summary

Given the location of the Project corridor on BLM lands, the relative lack of intersections with waterbodies and the small acreage of Riparian Reserve affected, it is highly unlikely that Project construction and operation would prevent attainment of ACS objectives on BLM land in the Days Creek–South Umpqua River watershed. No Project impacts relevant to the ACS have been identified that are outside of the range of natural variability for disturbance processes in the watershed (section 2.4.6.4). Proposed amendments of the Roseburg District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (section 2.4.6.5). Proposed amendments to allow removal of habitat in two KOACs would not prevent attainment of ACS objectives because project impacts at the KOAC locations are on ridgetops and do not affect aquatic resources. Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.4.6.6).

2.4.7 Elk Creek-South Umpqua River Fifth Field watershed, HUC 1710030204

2.4.7.1 Overview

Originating in the Cascade Mountains, the Elk Creek-South Umpqua River watershed is one of 13 fifth-field watersheds comprising the South Umpqua Sub-basin, which drains about 1,800 square miles of Southern Oregon. Located about 30 miles southeast of Roseburg in the South River Resource Area, most of the watershed lies in Douglas County, but a small portion along the southwest border lies in Jackson County (figure 2.4-5). The watershed was designated a Tier 1 Key watershed in the NWFP.

The Elk Creek-South Umpqua watershed is bordered on the north by the Tier 1 Days Creek-South Umpqua fifth-field watershed, on the northeast by the Middle South Umpqua-Dumont Creek and Jackson Creek fifth-field watersheds, on the southwest by the Upper Cow Creek fifth-field watershed (also in the South Umpqua River system), and on the south and east by the Trail Creek and Elk Creek fifth-field watersheds of the Upper Rogue River drainage system.

Within the Elk Creek-South Umpqua watershed, the drainage network flows northwestward, with Elk Creek crossing the northwest watershed boundary with the Days Creek-S. Umpqua watershed and discharging into the South Umpqua River. At Roseburg Oregon, the South and North Umpqua Rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the PCGP corridor.

The 84.9 sq. mile (54,356 acre) Elk Creek-South Umpqua River watershed includes four subwatersheds, Upper Elk Creek, Middle Elk Creek, Drew Creek and Lower Elk Creek (figure 2.4-5). Land ownership in the watershed is primarily federal (62.9%), most of it in the Umpqua National Forest (table 2.4.7.1-1). BLM administers only 370 acres in the watershed (0.68% of all land). BLM land is found only in the Lower Elk Creek and Upper Elk Creek subwatersheds, while Forest Service land is found in all four subwatersheds, with holdings ranging from 6,334 acres in the Middle Elk Creek subwatershed to 10,584 acres in the Upper Elk Creek subwatershed (table 2.4.7.1-1). Private lands constitute 36.4% of the watershed.

Elevations in the watershed range from about 640 feet where Elk Creek leaves the northwest part of the watershed and flows into the South Umpqua River to about 4,040 feet at the head of Days Creek in the northeast part of the watershed. Over 82 percent of the land in the watershed is in this transient zone (TSZ, 2000 – 5000 feet amsl). Removal of canopy cover in the TSZ can influence peak flows during warm rain-on-snow events.

The Elk Creek-South. Umpqua watershed experiences a Mediterranean type climate, with cool, wet winters and hot, dry summers. Annual precipitation ranges from about 30 inches at Canyonville to more than 60 inches at the highest elevations. About 85% of the precipitation falls from October through April. At the highest elevations, a substantial portion of the precipitation falls as snow. Summer rainfall is typically less than 5 inches. It is during this dry summer season that the threat of fire is greatest.

About 60 acres (15.1%) of the BLM land in the watershed is in the LSR allocation, while 15,093 acres (44.2%) of the Forest Service land is allocated as LSR. Most of the LSR land in the watershed is in the South Umpqua River/Galesville LSR. Land in the LSR allocation is found in all subwatersheds in which there is BLM or Forest Service land (table 2.4.7.1-1). Over all federal lands, 43.9% is LSR, and this LSR land constitutes 27.9% of the total acreage in the watershed (table 2.4.7.1-1). An additional 801 acres on the Umpqua National Forest is in unmapped LSRs created by KOACs. Matrix land is found in all subwatersheds containing LSR land. It constitutes 56.1% of the federal land and 35.7% of all land in the watershed.

Location and Routing

Leaving the Days Creek-South Umpqua River fifth-field watershed on high ground, the PCGP corridor first enters the Elk Creek-South Umpqua watershed at MP 101.8 (figure 2.4-5). The corridor then skirts the southwest divide separating the Lower Elk and Drew Creek subwatersheds from the Days Creek-South Umpqua River and Upper Cow Creek fifth-field watersheds. Along this segment, the corridor runs alternately on both sides of these divides. On leaving the watershed at MP 108.8, the corridor drops down from the highest ridges into the South Fork Cow Creek subwatershed of the Upper Cow Creek fifth-field watershed.

Between MP 101.8 and MP 108.8, approximately 3.43 miles of the PCGP corridor are in the Elk Creek-South Umpqua River watershed, 2.87 miles on Forest Service land and 0.09 miles on BLM land (table 2.4.7.1-2). BLM land is crossed only in the Lower Elk Creek subwatershed, while Forest Service land is crossed in both the Drew Creek and Lower Elk Creek subwatersheds (figure 2.4-5). In addition, 0.47 miles of private land are crossed in the Lower Elk Creek subwatershed. Most of the traversed land is in the TSZ, where clearing could contribute to elevated peak flow conditions during warm rain-on-snow events.

Project effects in the Elk Creek-South Umpqua River watershed total to 34.35 acres, due primarily to clearing (table 2.4.7.1-2). These affected acreages include 2.41 acres of BLM land (2.31 acres cleared and 0.10 acres modified, and constituting 0.66% of the BLM land in the watershed) and 31.92 acres of Forest Service land (30.17 acres cleared and 1.75 acres modified and constituting 0.09% of the Forest Service lands in the watershed). Over all land ownerships, 0.07% of the land in the watershed would be affected by project construction.

Effects to LSR-allocated land in the Elk Creek-South Umpqua River watershed total to 23.88 acres, including 2.43 acres on BLM land and 21.45 acres on Forest Service land. Most of these effects are due to clearing (table 2.4.7.1-3). These effects account for 3.53% of the BLM LSR land in the watershed and 0.15% of the much larger Forest Service LSR acreage. About 10.47 acres of Matrix land would also be affected by corridor construction. Over all allocations, 0.66% of the BLM land and 0.10% of the Forest Service land in the watershed would be affected by PCGP construction (table 2.4.7.1-3).

As a result of the almost exclusive ridge top location no streams channels or Riparian Reserves are affected in the Elk Creek – South Umpqua Watershed (table 2.4.7.1-3).

Draft

Figure 2.4-5 PCGP Routing and Subwatershed Boundaries, Elk Creek-South Umpqua River Watershed

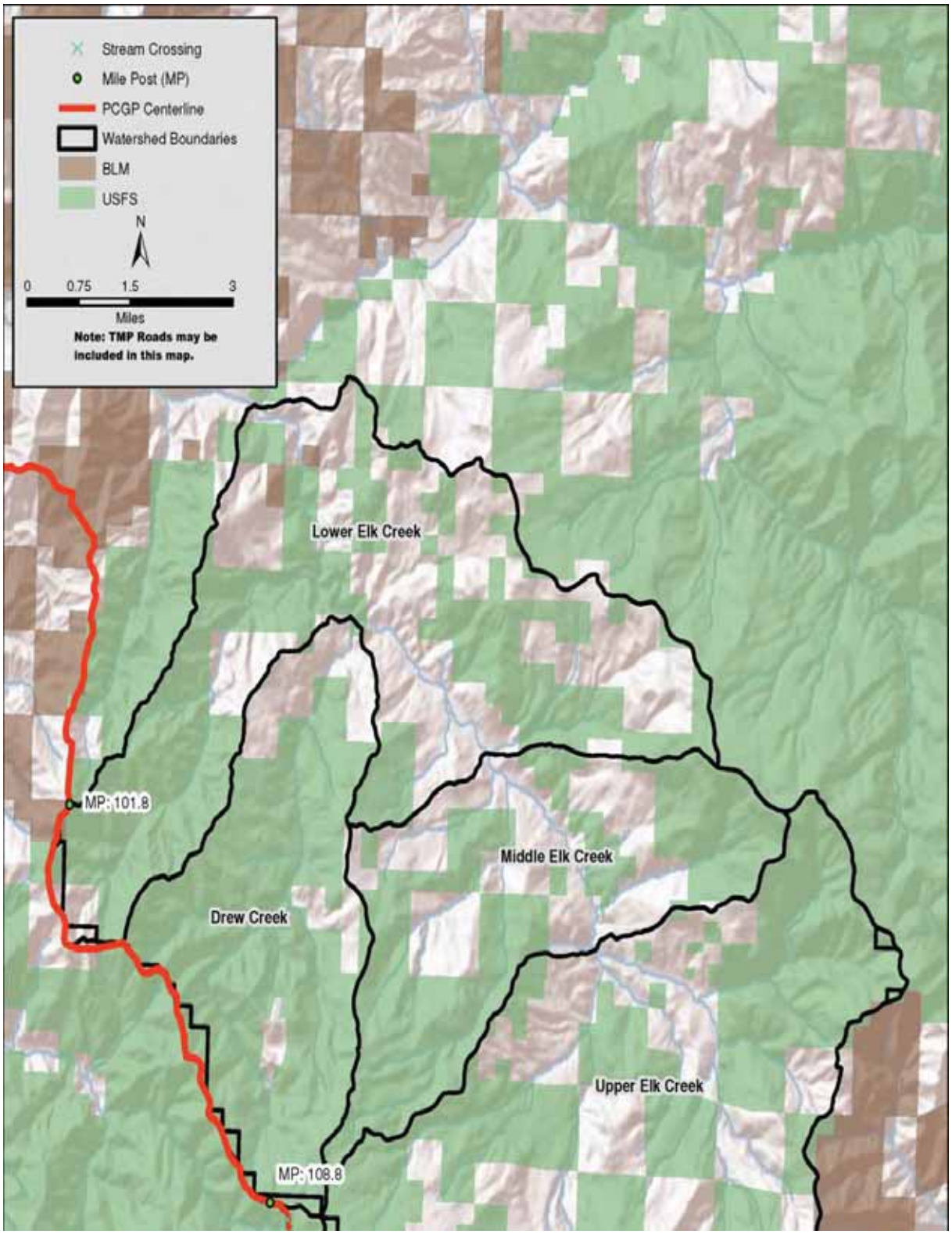


TABLE 2.4.7.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Elk Creek Watershed HUC 1710030204

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Drew Creek	9,621.17		8,050.35	8,050.35	1,570.82		5,293.49		2,756.86		2,976.78	2,976.78
Lower Elk Creek	16,881.51	140.01	9,209.06	9,349.07	7,532.44	17.00	3,021.36	123.01	6,187.70	51.77	3,405.26	3,457.03
Middle Elk Creek	10,271.53		6,337.49	6,337.49	3,934.04		2,425.35		3,912.14		2,343.42	2,343.42
Upper Elk Creek	17,581.71	230.23	10,590.46	10,820.69	6,761.02	50.58	3,530.89	179.65	7,059.57	85.13	3,916.03	4,001.16
Watershed Total	**54,355.92**	**370.24**	**34,187.36**	**34,557.60**	**19,798.32**	**67.58**	**14,271.09**	**302.66**	**19,916.27**	**136.90**	**12,641.49**	**12,778.39**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 810 acres of unmapped LSR are associated with KOACs on the UNF.
c/ Occur within LSR and Matrix Land Allocations. Data Source: MF Coquille WA, page 12 Approximately 40% of the landscape is Riparian Reserve

TABLE 2.3.7.1-2

PCGP Project Corridor (miles) and Project Area (acres) in Elk Creek Watershed HUC 1710030204 by Land Ownership

Unit a/	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Drew Creek					2.48	26.27	0.00	0.33	2.48	26.27	0.00	0.33					2.48	26.27	0.00	0.27
Lower Elk Creek	0.09	1.87	0.56	1.74	0.39	3.90	1.75	0.06	0.48	5.77	2.31	0.09	0.47	4.33	0.00	0.06	0.95	10.10	2.31	0.07
Middle Elk Creek									0.00	0.00	0.00	0.00								
Upper Elk Creek									0.00	0.00	0.00	0.00								
Watershed Total	**0.09**	**1.87**	**0.56**	**0.66**	**2.87**	**30.17**	**1.75**	**0.09**	**2.96**	**32.04**	**2.31**	**0.10**	**0.47**	**4.33**	**0.00**	**0.02**	**3.43**	**36.37**	**2.31**	**0.07**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.7.1 3

PCGP Project Area (acres) on Federal Lands in the Elk Creek Watershed HUC 1710030204 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Drew Creek	BLM																
	NFS	21.16		0.40		5.11		0.19						26.27		0.33	
Lower Elk Creek	BLM	1.87	0.56	11.00	3.29									1.87	0.56	1.34	0.40
	NFS	0.29		0.01		3.61	1.75	0.06	0.03					3.90	1.75	0.04	0.02
Middle Elk Creek	BLM																
	NFS																
Upper Elk Creek	BLM																
	NFS																
Watershed Total	**BLM**	**1.87**	**0.56**	**2.77**	**0.83**									**1.87**	**0.56**	**0.51**	**0.15**
	NFS	**21.45**	**0.00**	**0.15**	**0.00**	**8.72**	**1.75**	**0.04**	**0.01**					**30.17**	**1.75**	**0.09**	**0.01**
	Total BLM & NFS	**23.32**	**0.56**	**0.16**	**0.00**	**8.72**	**1.75**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**32.04**	**2.31**	**0.09**	**0.01**

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

2.4.7.2 Existing Conditions

Original watershed Analysis Findings

- Within the Elk Creek watershed, soils within the PCGP corridor originate on landscapes underlain by granite-schist terrains. The Elk Creek watershed Analysis documents that granitic terrain in the Elk Creek watershed have the lowest rate of natural landslides. Landslides related to management activity are primarily associated with timber sales.
- The transient snow zone in the Tiller Ranger District occurs between 2,000 and 5,000 feet elevation (Forest Service 1990b). In the Elk Creek watershed, 44,924 acres or 82 percent of the watershed is in this transient zone. Since the majority of the watershed is influenced by the transient snow zone, projects that remove canopy cover should consider the effect on peak flows.
- Channel extension from high road densities (and hence effects on peak flows and increased sediment transport) is greatest on paved and aggregate surfaced roads with ditch lines and culverts.
- Road density within each basin ranges from 1.83mi./mi.2 to 5.67mi./mi.2. An estimated 66.2 miles of increased channel extension to the stream network is attributed to the road system. The majority of roads (77 percent) were constructed prior to 1980. Roads constructed prior to the mid-1970's were built by side-casting excavation installing culverts at perennial stream crossings and cross drains at predetermined intervals depending on road grade. The majority of the roads were constructed in soils classified as Moderate Risk for erosion.
- Native surface and non-system roads were found to contribute less to channel extension (and hence to peak flows and sediment routing), because such roads are shorter, steeper, and higher on the hill slope and tend to be narrow and out-sloped. As such, these roads tend not to accumulate water but rather shed it relatively quickly. The low contribution of the native surfaced and non-system roads to the stream network indicate that they may not be as large a factor in increased stream sedimentation as the surfaced roads because the delivery mechanism is not as efficient.
- Modern management has disrupted historic disturbance processes. Thus, many fundamental ecosystem processes have been disrupted, including plant succession, nutrient cycling, and other processes that rely on the ecosystem patterns historically created by fire. Timber harvest has occurred in 37 percent of the lands managed by the Forest Service within the watershed. Approximately 20 percent of the harvest has been by regeneration methods and 17 percent by selection methods. Fire suppression has nearly eliminated disturbance from the rest of the landscape. The result of this changed disturbance regime is a fragmented landscape, low in late-successional vegetation, with unusually high conifer density. Conifer species, specifically pines are being killed directly as a result of high tree density and indirectly by insect attack. The habitat formerly provided by frequent, low-severity fires is completely absent from the landscape. Wildfire hazard has increased with the accumulation of live and dead fuel and landscape homogenization. Pines are dying because of tree density and associated insect attack. These conditions suggest that sustainability, as affected by diversity and health, has declined.
- Terrestrial vegetation has changed dramatically since 1939. The establishment stage increased only four percent, stem exclusion increased 33 percent, and late-successional growth decreased 31 percent in the watershed. Wildlife populations that use late-

Draft

successional habitat for survival have likely decreased in response to loss of habitat. The northern spotted owl, a federally listed threatened species, currently inhabits the watershed and is tied to late-seral habitat for life history requisites. Other sensitive species and species of concern to the Forest Service that rely on a variety of plant communities in the watershed include red-tree vole, great gray owl, red-legged frog, and the Umpqua mariposa lily, a serpentine endemic. Unique habitats that have persisted over time such as Savage Bluffs, Hamlin Prairie, Callahan Meadow, Drew Meadow, and the oak woodlands provide habitat that is key to the survival of several sensitive and rare plants and animals. Some species are the ball-head phacelia, Waldo rock cress, Thompson's mistmaiden, and the California mountain kingsnake. These habitats have decreased in size due to conifer encroachment exclusion of fire, road building, and firewood use. Negative effects that have altered native species composition include grazing and introduction of non-native plants.

Management recommendations that are pertinent to the PCPG from the Elk Creek Watershed Analysis are summarized below. The congruence of the PCGP with each recommendation is noted. Numbering coincides with this document.[9]

Landscape Recommendation 1: Concentrate activities in watersheds that have already had heavy impacts by roads and harvesting to restore the landscape-level vegetation and aquatic conditions. Minimize sediment production and inputs to streams, minimize erosional processes, and reduce road densities throughout the watershed. Use KV funding and road reconstruction packages from proposed activities to pay for restoration projects.

- **PCGP:** The PCGP corridor accomplishes these recommendations primarily by route location, application of the ECRP, and use of Best Management Practices in the construction right-of-way. In the Elk Creek Watershed, the PCGP lies entirely on ridgetops. Where the route leaves the ridgetop in the East Fork of Cow Creek, it does so to avoid high-quality spotted owl habitat in Elk Creek. By leaving the ridgetop and passing into the East Fork of Cow Creek, the PCGP avoids fragmenting high-quality late-successional forest.

Landscape Recommendation 3: Defer harvest in existing interior late-successional patches and their buffers until existing stem exclusion stands have developed into replacement habitat. Currently, late-successional interior habitat occurs sporadically throughout the watershed as patches, embedded in a sea of stem exclusion vegetation. Vegetation manipulation that promotes diversity to the stem exclusion stands and expedites the development of late-successional habitat is encouraged.

- **PCGP:** The PCGP accomplishes this recommendation by route location and proposed mitigations. To minimize impacts in late-successional stands, the route is located on major ridgetops. Where the route leaves the ridgetop and turns into the East Fork of Cow Creek, it does so to in part to avoid high-quality spotted owl habitat. The East Fork of Cow Creek is already heavily roaded, so the PCPG is not fragmenting high-quality late-successional forest.

9 Elk Creek Watershed Analysis, p. 156.

Landscape Recommendation 22: Channel extension occurs across the landscape in the Elk Creek Watershed. Channel extension can be reduced by adding culverts, drain dips, and other drainage structures to existing roads, which help interrupt the direct stream extension by dispersing the water on the hillside at desired locations rather than channeling it into existing streams. Obliterating roads would reduce road densities and decrease channel extension.

- **PCGP**: Consistent with this recommendation, roads used by PCGP to access the project would be upgraded and maintained as needed.

Project Recommendation 10: When aggregating harvest units, consider the effect on peak flows. Canopy removal in snow zones may increase streamflow. The cumulative effects of canopy removal and added road ditches on peak flows and aquatic habitat should be examined at the project level.

- **PCGP:** FERC conducted a project-level peak flow assessment for the PCGP and concluded that the project was highly unlikely to contribute to an increase in peak flows.

Specific Recommendations for Drew Creek and Callahan Creek Sub-Watersheds

Most of these subwatersheds are part of the South Umpqua River/Galesville LSR. Any management activities in these subwatersheds should meet the objectives and follow the guidelines presented in the South Umpqua River/Galesville LSR.

- **PCGP:** Although this LSR is in the Klamath Province where harvest of trees over 80 years old to accomplish fuels objectives is permitted, this LSRA recommends that trees over 80 years old not be cut. It is likely that a small percentage of the trees in the shaded fuel break proposal would be over 80 years old. In this circumstance, trees greater than 80 years old would be removed only where necessary to achieve the fuel break objectives. This is permissible under the Standards and Guidelines applicable to the Klamath Province (Forest Service and BLM 1994b; C-13). The PCGP corridor would also remove an estimated 65 acres of trees older than 80 years from LSR 223 (includes both Elk Creek and Cow Creek watersheds) on the Umpqua (FERC, 2010). Standards and Guidelines for new developments in LSRs make provisions for utility corridors in LSRs.

Most of the Drew and Lower Elk Creek subwatersheds are composed of granite or schist soil types. All management activities in these subwatersheds should follow the guidelines in the 1995 Tiller Ranger District Granite and Schist Policy.

- **PCGP:** The PCGP is consistent with the Tiller Ranger District Granite and Schist policy. Callahan Creek in the Lower Elk Creek subwatershed has been identified as a major contributor of sediment inputs to the South Umpqua River. Debris flows and landslide frequencies related to timber harvest and road construction are very high in this watershed; however, the natural landslide rate is the lowest in the Elk Creek Watershed. Restoration of upland processes should be considered a priority in the Lower Elk Creek subwatershed. Road obliteration and rehabilitation projects would likely reduce sediment inputs.

- **PCGP**: The PCGP lies entirely on ridgetops in these subwatersheds to avoid side-hill areas prone to management-caused landslides. The mitigation plan filed by PCGP includes approximately one mile of road decommissioning in the Lower Elk Creek subwatershed.

Draft

Shaded fuel breaks with underburning, meadow restoration, off-site pine removal, and pre-commercial thinning in LSR all serve to restore upland processes.[10]

Changed watershed Conditions

There have been no large-scale disturbances that would change the conditions described in the watershed analysis. Since the watershed assessment was completed, the following management activities have been completed (table 2.4.7.2-1).

TABLE 2.4.7.2-1

Past Activities in Elk Creek Since Publication of the Elk Creek Watershed Analysis, Oct. 1996

Name	Activity Type	Dates	Total Acres/Miles	Location
Joe Hall Cr. Bridge construction	Replace culver with bridge	2012	1 ac.	Lower Elk (6th)
Elk Cr. Instream Restoration	Add rock & large wood	2012	0.1 mi.	Elk (5th)
Eight County Hazardous Fuels Reduction	Pile burning	2009	341	Elk (5th)
Eight County Hazardous Fuels Reduction	Precommercial thin	2009	393	Elk (5th)
Drew Vegetation	Pile burning	2009-2012	68 ac	Low & Middle Elk (6th)
Drew Vegetation	Commercial thin	2008-2012	340 ac	Low & Middle Elk (6th)
Drew Vegetation	Precommercial thin	2007	53 ac	Low & Middle Elk (6th)
Diamond Cr. Bridge construction	Tree removal, bridge construction	2008	1 ac	Upper Elk (6th)
Joe Hall Instream	Add rock & large wood	2006	2 mi	Lower Elk (6th)
Joe Hall Instream Phase 2	Add large wood	2007	1 mi	Lower Elk (6th)
Joe Hall landslide stabilization	Riparian shrub planting	2008	2 ac	Lower Elk (6th)
Joe Hall logs	Blowdown log removal	2006	80 ac	Lower Elk (6th)
Brownie Instream	Add large wood	2007	2 mi	Upper Elk(6)
Brownie Instream logs	Blowdown log removal	2007	14 ac	Elk headwater (6th)
Devils Knob fuelbreak	Precommercial thin	2012	268 ac	Lower Elk (6th)
Devils Knob fuelbreak	Pile burning	2012	268 ac	Lower Elk (6th)
Cattle Grazing	Cattle Grazing	1996-2006	43,140 ac	Elk (SU -5th)
Cattle Grazing	Cattle Grazing	2007-2012	32,860 ac	Elk (SU -5th)
Drew 1 (Calochortus)	Precommercial thin	2001	15 ac	Lower Elk (6th)
Drew 1 (Calochortus)	Prescribed burn	2001	15 ac	Lower Elk (6th)
Drew 2 (Calochortus)	Precommercial thin	2005	120 ac	Drew (6th)
Drew 2 (Calochortus)	Prescribed burn	2005	120ac	Drew (6th)
Wildfire	Wildfire	1991-2012	41 ac	Lower & Middle Elk (6th)
Summit mdw. restoration	Prescribed burn, snag creation	2001	98 ac	Lower Elk (6th)
Weed treatment	Hand pull/cut	1997-2012	2400 ac	Elk (SU -5th)
Reforestation	Tree planting	1997-2003	467 ac	Elk (SU -5th)
Clearcutting on Private land within District boundary	Clearcut	1996-2006	249 ac	Lower Elk (6th)
Clearcutting on Private land within District boundary	Clearcut	1996-2012	2,934 ac	Upper Elk (6th)
Commercial thinning on private land within district boundary	Commercial thin	2006	6 ac	Lower Elk (6th)

10 Ibid.

TABLE 2.4.7.2-1 **Past Activities in Elk Creek Since Publication of the Elk Creek Watershed Analysis, Oct. 1996**				
Name	**Activity Type**	**Dates**	**Total Acres/Miles**	**Location**
ERFO Road Repair	Road repair	1996-2006	10 ac	Elk (5th)
Road Maintenance	Brushing, grading, resurfacing	2010-2012	53 mi.	Elk (5th)

Current watershed Conditions

Watershed conditions have improved in the Elk Creek South Umpqua watershed with accomplishment of restoration projects and implementation of the NWFP, however most of the issues identified in the watershed assessment remain to varying degrees. NWFP monitoring showed improving watershed condition trends in the Drew Creek, Lower, Middle and Upper Elk Creek subwatersheds. Drew Creek showed a slight negative trend on roads while other subwatersheds were neutral to improving (Attachments: Section 3.3.2). Forest Service Watershed Condition Class evaluation rated the Drew Creek Subwatershed as "functioning at risk" with at risk impacts from water quality issues, fire risk and roads (See Attachments: Section 3.3.1).

2.4.7.3 Natural Disturbance Processes

Disturbance processes for the Elk Creek South Umpqua watershed are consistent with those described for the Klamath Siskiyou and Western Cascade Provinces. Prior to modern management, fire was the dominant process affecting upslope and riparian vegetation above the floodplain. The Elk Creek fire regime is characterized by Agee (1993) as moderate. A diverse combination of fires with variable intensity, frequency and size created an equally diverse pattern of landscape and stand vegetation. With the onset of modern management, that disturbance process has been altered. Fire suppression has excluded all but small gap disturbances outside of areas where timber harvest has occurred. Timber harvest has fragmented the landscape. The combination of fire exclusion and timber harvest has increased homogeneity in mid-seral plant communities while decreasing early and late seral vegetation. Shade and density tolerant white-fir has increased at the expense of intolerant fire-adapted Douglas-fir and yellow pines and most hardwoods. Fire hazard and magnitude of insect and disease activity is likely higher than before modern management (Forest Service 1996: 8).

2.4.7.4 Project Effects and Range of Natural Variability

Table 2.4.7.4-1 addresses relevant ecological processes and the historic range of variability in the Elk Creek - South Umpqua Watershed.

Draft

TABLE 2.4.7.4-1

Project Effects and Relevant Ecological Processes Described in the Elk Creek-South Umpqua Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are a dominant sediment delivery mechanism to stream systems in the watershed under natural conditions. Historically, landslides were associated with high intensity rainfall events that overlapped with infrequent high intensity fires. These events resulted in large depositions of coarse wood and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed has resulted in chronic fine-grained sediment becoming the primary sediment source. Roads, some affected by landslides, can be a chronic source of sediment transport to waterbodies. In some cases, culverts are undersized and plugged. Roads in the watershed have extended the drainage system substantially during storms, resulting in increased sediment transport and peak flows. Many exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in streams.	Landslide prone areas have been avoided in routing of the PCGP. All areas crossed by the PCGP project corridor are classified as low, or very low probability of mass wasting (Geoengineers, 2009). The project within the Elk Creek Watershed-South Umpqua Watershed is located entirely on ridge tops. Erosion control measures and Best Management Practices would be implemented to minimize sediment transport off the corridor. Rapid revegetation of disturbed areas, encouraged by replanting with native species, is anticipated. As a result, sediment effects are expected to be minor, short-term, and well within the range of natural variability for the watershed. Road Decommissioning and storm proofing mitigation projects would likely reduce significant sources of sediments. Fuel hazard reduction off-site mitigation projects in the watershed would help reduce the risk and probability of high-intensity stand replacement fire and associated sediment.
Ecological Succession / Vegetative Condition	The watershed has been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, even age stands with large numbers of snags and fire-maintained natural openings. Logging and fire suppression have greatly modified the seral composition of forests in the watershed, with increases in early and mid seral forests and extensive fragmentation of late seral forest stands.	No Riparian Reserves are affected by the PCGP in the Elk Creek watershed.
Flow Regime	Flow regimes are directly related to the precipitation regime, which in this watershed largely involves rainfall. Under natural conditions, most of the rain falling in the watershed percolates into the soils, where its movement toward aquatic habitats is delayed. Large, high intensity fires may create conditions that significantly increase flows. Roads extend the drainage system, and accelerate the transport of runoff to stream channels. Clearing of the TSZ in past and ongoing logging and road construction operations have likely contributed to increased peak flows during warm rain-on-snow events. Absence of LWD and boulders in streams, also fosters increased peak flows.	Vegetative conditions may contribute to peak flows when more than 25% of a watershed is in the transient snow zone and less than 30 years old, or where there has been extensive vegetation loss after a stand-replacing fire. The PCGP affects 0.08 percent of the watershed. The limited scale of vegetative impact, project location on ridgetops, and limited connectivity to aquatic systems make it unlikely that the PCGP would contribute to an increase in peak flows. Improvements to access roads identified in the TMP along with several off-site road improvement mitigation projects are intended to reduce road-related effects to flow regimes in the watershed and mitigate any project effects. The amount of project-related clearing on TSZ lands is small and should not contribute to elevated peak flows during warm rain-on-snow events. See EIS Chapter 4.4 for additional discussion.
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Stand replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range. Absence of LWD in streams has also likely contributed to higher stream temperatures by reducing pool frequency and size and allowing streams to widen.	There are no stream or Riparian Reserve crossings to expose streams to solar radiation so the PCGP would be unlikely to have any effect on stream temperature.

Draft

TABLE 2.4.7.4-1 **Project Effects and Relevant Ecological Processes Described in the Elk Creek-South Umpqua Fifth Field Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Aquatic Habitat and Stream Channel Complexity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable stream banks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones has substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. Presence of poorly designed and faulty culverts restrict access of anadromous and resident fish populations to upstream habitat.	Since there are no stream crossings in this watershed, LWD or boulders would be removed from streams during construction.

2.4.7.5 Compliance with Land Management Plans

Table 2.4.7.5-1 provides UNF / NWFP standards and guidelines relevant to the ACS, the related BLM management direction as provided in the Roseburg District RMP, and PCGP compliance with this management direction on BLM and NFS lands in the Elk Creek-South Umpqua watershed.

TABLE 2.4.7.5-1 **BLM Roseburg District Management Direction and Umpqua National Forest Standards and Guidelines Applicable to the ACS**		
RMP Management Direction	**UNF / NWFP Standard / Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Lands, pg. 27, last para. & pg. 28, 1st para.	Riparian Reserves - Lands; LH-4	Terms and conditions to assure compliance with ACS objectives in the Elk Creek-S. Umpqua watershed have been incorporated into the BLM Right-of-Way Grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-way Clearing Plan, the Traffic Management Plan (TMP) etc.\.
Specific Land Use Allocations, Riparian Reserves - General Riparian Area Mgmt., pg. 28, para. 4	Riparian Reserves - General Riparian Area Mgmt.; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the Elk Creel-S. Umpqua watershed because all such needs would be provided by municipal sources.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 2	Riparian Reserves - Road Mgmt.; RF-2	No new PCGP project roads intersect Riparian Reserves in the Elk Creek-S. Umpqua watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 4	Riparian Reserves - Road Mgmt.; RF-4	No new project-related road crossings of streams are proposed in the Elk Creek-S. Umpqua watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.

Draft

TABLE 2.4.7.5-1 **BLM Roseburg District Management Direction and Umpqua National Forest Standards and Guidelines Applicable to the ACS**		
RMP Management Direction	**UNF / NWFP Standard / Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 5	Riparian Reserves - Road Mgmt.; RF-5	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction in the Elk Creek-S. Umpqua watershed. In addition, off-site mitigations (culvert replacements) would improve road conditions, further minimizing sediment transport to adjacent aquatic habitats.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 6	Riparian Reserves - Road Mgmt.; RF-6	Fish passage would be maintained at all road crossings where project-related road repairs are implemented in the Elk Creek-S. Umpqua watershed. Some existing crossings would be upgraded. In addition, off-site mitigations (culvert replacement) would be implemented to expand fish migration in the watershed.
Specific Land Use Allocations, Riparian Reserves - Roads Mgmt., pg. 25, para. 7 & pg. 26, 1st para.	Riparian Reserves - Road Mgmt.; RF-7	The project TMP meets all the requirements of RF-7 in the Elk Creek-S. Umpqua watershed.
Specific Land Use Allocations, Riparian Reserves - Watershed & Habitat Restoration, pg. 28, para. 3	Riparian Reserves - watershed & Habitat Restoration; WR-3	Application of Best Management Practices and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation in the Elk Creek-S. Umpqua watershed. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
UNF Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67) Not Applicable		The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20 percent. The PCGP cannot meet this standard. A Forest Plan Amendment (UNF-3) is proposed to waive application of this standard.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project affects Survey and Manage species within the Elk Creek-S. Umpqua watershed. Such effects are inconsistent management recommendations for Survey and Manage Species in the 2001 ROD for Survey and Manage Species. However the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM and FS lands in the Elk Creek-South Umpqua Fifth Field Watershed are currently 45% LSOG.

The Elk Creek – South Umpqua is a Key Watershed where special standards and guidelines apply. These are described in table 2.4.7.5-2

TABLE 2.4.7.5-2 **PCGP Consistency with Standards and Guidelines for Key Watersheds, Elk Creek Watershed**		
Standard and Guideline	**PCPG Consistency**	**Mitigation**

Reduce existing system and nonsystem road mileage with no net increase in road miles.	No new roads would be constructed by PCGP. The construction road in the PCGP corridor would be obliterated after construction.	Decommissioning of 4.65 miles of road would result in a net decrease of road miles.
No new roads would be constructed in inventoried Roadless Areas.	No part of the PCGP is in an inventoried Roadless Area.	None
Watershed Analysis must be completed prior to management activities	Watershed Analysis has been completed for all watersheds crossed by the PCGP on USFS lands.	Off-site mitigations are consistent with Watershed Analysis recommendations.

Relationship of Proposed Forest Plan Amendment UNF-3 to the ACS

Umpqua National Forest LRMP IV-67-1, Forest Wide-Soils Standard and Guideline, states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20 percent.

The PCGP project would likely result in a degraded soil condition in an estimated 30 to 70 percent (10 to 21 acres) of the project right-of-way in the Elk Creek–South Umpqua due to displacement and compaction following completion of corridor construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing Forest Plan Standards and Guidelines allow up to 20 percent of the PCGP corridor or 7 acres of the Elk Creek–South Umpqua Watershed to be in a degraded soil condition on completion of a project. Thus, the proposed amendment allows an estimated 3 to 14 acres or 0.01 percent of the 34,145 acres (USFS lands only) of the Elk Creek–South Umpqua Watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery. Sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Without mitigation, bare soil surfaces in granitic or serpentine soils can persist more than 50 years following a severe disturbance.

Environmental consequences associated with 3 to 5 acres of additional detrimental soil conditions over the right-of-way in Elk Creek include:

- **A potential localized increase in sediment mobilization.** PCGP selected the route of the project to avoid areas with high risk of geologic hazards. No landslides have been identified that pose a threat to the PCGP. The PCGP does not cross earthflow terrains in the Elk Creek. Effective erosion control measures and Best Management Practices are required as shown in the ECRP. Additionally, the PCGP would comply with Forest Plan Standards and Guidelines for maintenance of effective ground cover. As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, the required application of Best Management Practices, ridgetop location, lack of

stream crossings, lack of intersection with Riparian Reserves, and implementation of erosion control methods, it is highly unlikely that amending the Forest Plan to exceed the soil disturbance thresholds by 3 to 5 acres would result in the mobilization of sediment that would change the existing equilibrium described in the Elk Creek Watershed Analysis.

- **A potential localized increase in peak flows.** The Elk Creek Watershed Analysis recommended site-specific evaluation of the potential for peak flows as a result of canopy removal. The PCGP would remove canopy on about 33.9 acres or about 0.9 percent of USFS lands in the Elk Creek-South Umpqua Watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small area affected by the project as a proportion of the watershed (FERC 2009). Additionally, the entire PCGP corridor in Elk Creek lies on ridgetop locations that have minimal, if any interactions with aquatic systems since there no stream intersects with the PCGP corridor. As a result, it is highly improbable that the PCGP would change flow regimes from current conditions or from those described in the Watershed Analysis. See also EIS Chapter 4.4 for a discussion of peak flows.

- **A potential loss of site productivity, which may slow vegetative recovery.** Granitic and schist soils such as those found in the Elk Creek Watershed are typically low in productivity. Without mitigation, these soils can remain barren for 50 years when severely disturbed. Mechanically decompacting the soil to a minimum depth of 20 inches and re-establishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. PCGP would decompact the corridor, fertilize disturbed areas, re-establish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and LWD back across the site to provide for long-term nutrient cycling as required in the ECRP. Additionally, the Forest Service would require soil remediation with biosolids or other organic materials as necessary to restore biotic capacity. Biosolids mixed with wood chips have demonstrated significant increases in vegetative recovery on disturbed sites on the Umpqua NF (Orton 2007).

Off-site mitigations contribute to further reducing these watershed effects. Road decommissioning is planned on 4.65 miles (approximately 32 acres) in the Elk Creek Watershed as part of the mitigation plan for the PCGP. Decommissioning roads reduces sediment by re-establishing effective ground cover and increasing infiltration. This also contributes to reducing peak flow effects by reducing road-stream interactions, increasing infiltration, and re-establishing natural drainage. This reduces compaction and helps offset the estimated 10 to 12 acres of PCGP right-of-way in the Elk Creek Watershed that may be in a degraded soil condition on completion of the project.

2.4.7.6 Off-Site Mitigations

Management recommendations that are pertinent to the PCPG from the Elk Creek Watershed Analysis are summarized below. The congruence of the PCGP with each recommendation is noted. Numbering coincides with this document.

Landscape Recommendation 5. Reduce fragmentation across the landscape.

- **PCGP:** The PCGP proposes to fund mitigations designed by the Forest Service that would reduce fragmentation at a landscape scale. In Elk Creek these include:

  - **Commercial thinning of approximately 95 acres.** This has the effect of moving stands past the stem-exclusion stage by removing excess stems. This reduces fragmentation by effectively aggregating stands, creating more uniform age class distribution, maintaining stands in a healthy condition, and reducing the probability of stand-replacing fire.

  - **Approximately 1,138 acres of shaded fuel breaks.** High-intensity wildfires can result in extensive tree mortality in all age classes, although plantations and younger stands of white fir found in Elk Creek are more much more susceptible to fire mortality than older stands of Douglas-fir and ponderosa pine. Where ladder fuels have developed as a result of fire suppression, the white fir understory may carry fire into the crowns of older trees, increasing mortality. Thus, high-intensity fire can result in larger patch sizes of early seral plant communities where tree mortality can approach 100 percent over large areas. Wildfire may also effectively remove patches of younger trees. Either way, the amount of late-successional forest is reduced by stand-replacement wildfire. Strategically placed shaded fuel breaks can reduce the intensity and spread of wildfire, thus enhancing the effectiveness of fire suppression efforts and reducing tree mortality. Over time, at the landscape scale, this has the effect of reducing fragmentation caused by past timber harvest.

  - **Decommissioning approximately 4.65 miles of roads.** Decommissioning roads reduces fragmentation by returning the road corridor to a forested condition.

Landscape Recommendation 8. Retain higher levels of large woody debris at regeneration harvest than have been left historically to favor long-term site productivity, aquatic resources, wildlife, and vegetation processes. Historically, temporal and spatial variability has been extreme. That variability should be perpetuated.

- **PCGP:** Placement of LWD back on the PCGP corridor according to USFS standards when construction is completed is part of the ECRP filed with FERC.

Landscape Recommendation 22. Channel extension occurs across the landscape in the Elk Creek Watershed. Channel extension can be reduced by adding culverts, drain dips, and other drainage structures to existing roads, which help interrupt the direct stream extension by dispersing the water on the hillside at desired locations rather than channeling it into existing streams. Obliterating roads would reduce road densities and decrease channel extension.

- **PCGP**: Consistent with this recommendation, roads used by PCGP to access the project would be upgraded and maintained as needed. PCGP has also committed to fund decommissioning of 4.65 miles of roads in the Elk Creek Watershed.

Landscape Recommendation 24. Roads that remain open in the watershed should be "storm-proofed" to reduce road failures and the sedimentation produced by them. Drainage structures should be upgraded to pass the 100-year flood events.

- **PCGP:** In response to this recommendation, PCGP has committed to fund 1.59 miles of road storm-proofing in Elk Creek.

Landscape Recommendation 26. Prescribed fire should be used, alone or with tree cutting, to restore nutrient cycles, reduce non-sustainable fuel accumulations, and create conditions that are favorable to establishment and recruitment of non-conifers and conifers. Considering that the native plant community has already been altered, the objective should be to favor development of a new one that replicates the function of the pre-management community. The forests in the Elk Creek Watershed evolved with fire as a fundamental process. With thoughtfully developed and carefully applied prescriptions, and honestly evaluated results, fire can be the best tool for restoring ecosystem functions.

- **PCGP**: Prescribed fire is proposed in the Elk Creek Watershed as part of the shaded fuel break in the mitigation plan adopted by PCGP.

Project Recommendation 2. Silvicultural prescriptions should meet management objectives in the context of site conditions and historic fire processes. However, deviation from this generality is acceptable to retain the stand- and landscape-level complexity. Generally, stands should be restored to species composition and structure that is more sustainable and typical of native forests prior to fire suppression.

Project Recommendation 3. Second-growth stands, plantations, and selectively harvested stands are overrepresented in the landscape. These features have a narrow window of silvicultural treatment and should be treated to meet stand structure and composition objectives and avoid undesirable mortality. However, some dense stands and patches in stands should be retained across the landscape to retain diverse habitats.

Project Recommendation 4. Non-commercial thinning should be accomplished with KV collections whenever possible.

Project Recommendation 5. Stand density management has a much greater benefit to tree growth and stand differentiation, species composition, and forest health than does fertilization. Overly dense stands are abundant and appropriated Timber Stand Improvement money is limited. This money should be spent on thinning rather than fertilization.

Project Recommendation 6. Reforestation prescriptions and stocking objectives should be tailored to meet site-specific objectives. If soil and watershed conditions require rapid recovery of conifer canopy and root-site occupancy, then high initial stocking is appropriate. If large trees, structural diversity, and species diversity throughout the life of the stand are required, then high initial stocking is not appropriate. Pre-commercial thinning can effect changes in stand structure and development, but adequate funding is unlikely.

Project Recommendation 7. Reduce stand density to retain old ponderosa and sugar pines and recruit young ones, ideally at the stand rather than at the individual tree level.

- **PCGP:** Proposed mitigations for the construction of shaded fuel breaks that include periodic underburning (1,183 acres), commercial thinning (95 acres), pre-commercial thinning of young stands in LSR (363 acres), removal of off-site pine (338 acres), and reforestation of the corridor are all responsive to recommendations 3, 4, 5, 6, and 7 above.

Fuel breaks with periodic underburns reduce stand density and help to restore fire-dependent ecosystems while reducing the probability of a landscape-level stand replacement fire. Pre-commercial thinning of LSR regulates stand density and provides a mechanism to partially restore pines through species selection during thinning. Removal of off-site pine (pine plantations that are not adapted to the site where they were planted) provides a mechanism to restore ponderosa and sugar pines that are adapted to the site. Reforestation of the PCGP corridor would follow these recommendations.

Specific Recommendations for Drew Creek and Lower Elk Creek Sub-Watersheds

Most of these subwatersheds are part of the South Umpqua River/Galesville LSR. Any management activities in these subwatersheds should meet the objectives and follow the guidelines presented in the South Umpqua River/Galesville LSR.

- **PCGP:** Proposed mitigations for the PCGP in Elk Creek include shaded fuel breaks, pre-commercial thinning of young stands in LSR, meadow restoration, road decommissioning, and off-site pine removal. These actions are all consistent with the recommendations in the South Umpqua River/Galesville LSR.
    - This LSRA also recommends that trees over 80 years old not be cut. It is likely that a small percentage of the trees in the shaded fuel break proposal would be over 80 years old. In this circumstance, trees greater than 80 years old would be removed only where necessary to achieve the fuel break objectives. The PCGP corridor would also remove an estimated 65 acres of trees older than 80 years from LSR 223 (includes both Elk Creek and Cow Creek watersheds) on the Umpqua. In this case, it is not possible to build the corridor without removing trees older than 80 years. Standards and Guidelines for new developments in LSRs make provisions for utility corridors in LSRs.
    - The natural meadows in these two subwatersheds, in particular Drew Meadows and Callahan Meadows, provide significant habitat for many wildlife and plant species. Impacts on these natural meadows have included harvesting, road construction, grazing, and non-native species. Restoration of these natural meadows can include burning, reseeding with native species, and reducing encroachment by conifers.
- **PCGP:** The mitigation plan filed by PCGP includes approximately 100 acres of meadow restoration in Callahan Meadows and in the Lower Elk Creek sixth-field watershed.
    - The noxious weed eradication program should be continued on a regular basis. St. John's wort is of particular concern in Callahan Meadows.
- **PCGP:** The mitigation plan filed by PCGP includes treatment of St. John's wort and other noxious weeds in Callahan Meadows and on the 3201-200 road system.
    - Callahan Creek has been identified as a major contributor of sediment inputs to the South Umpqua River. Debris flows and landslide frequencies related to timber harvest and road construction are very high in this watershed; however, the natural landslide rate is the lowest in the Elk Creek Watershed. Restoration of upland processes should

Draft

be considered a priority in the Lower Elk Creek subwatershed. Road obliteration and rehabilitation projects would likely reduce sediment inputs.

- **PCGP**: The PCGP lies entirely on ridgetops in these subwatersheds to avoid side-hill areas prone to management-caused landslides. The mitigation plan filed by PCGP includes approximately 1 mile of road decommissioning in the Lower Elk Creek subwatershed. Shaded fuel breaks with underburning, meadow restoration, off-site pine removal, and pre-commercial thinning in LSR all serve to restore upland processes.

Summary of Mitigation Actions: The Applicant-filed mitigation plan includes the following activities in the Elk Creek Watershed that are consistent with recommendations in the Elk Creek Watershed Analysis. (See Section 2.2.3.2 for a more complete description of these mitigation measures.)

- 1,183 acres of shaded fuel breaks primarily along the ridgetop between Elk Creek and Cow Creek. Fuel breaks help reduce the potential for large-scale stand-replacement fire. At the landscape scale, this contributes to the maintenance of canopy.
- 95 acres of commercial thinning. This has the effect of regulating stand density, accelerating the development of larger trees, and reducing the risk of stand-replacing fire by regulating stand density and ladder fuels.
- 290 acres of log placement in upland units. This restores CWD in old harvest units that are currently devoid of this habitat element. CWD also contributes to long-term soil productivity.
- 101 acres of meadow restoration at Callahan Meadows. This has the effect of restoring native plant communities and controlling invasive weeds.
- 363 acres of pre-commercial thinning of young stands in LSR. This has the effect of regulating stand density and accelerating the development of interior stand conditions by accelerating growth.
- 338 acres of off-site pine removal. This removes trees that are not genetically adapted to the site where they are located and provides a mechanism to restore Ponderosa pine and sugar pines that are adapted to the site.

2.4.7.7 Cumulative Effects

Activities on BLM and NFS Lands

The BLM manages less than one percent and the Forest Service 63 percent of the Elk Creek South Umpqua watershed. Projects on federal lands that would contribute to cumulative effects with the PCGP are shown in table 2.4.7.7-1.

Draft

TABLE 2.4.7.7-1

UNF Projects that Contribute to Cumulative Effects with the PCGP in the Elk Creek South Umpqua Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Resource
UNF	Elk Creek South Umpqua	Lower Elk Creek	Proposed Elk Creek Collaborative Watershed Restoration Project. Published in program of work 2012. NEPA analysis on going. Expect implementation to begin in 2015.	900 ac. commercial thin, 500 ac. fuels reduction, 250 ac. prescribed burn, 100 ac. Pre-commercial thin, 50 ac. Weed treatment, 50 ac. Planting, , 4 culvert replacements, 5 miles road decommission	Upland and riparian vegetation, road network, fisheries / aquatic habitat, water quality,
UNF	Elk Creek South Umpqua	Lower Elk Creek	Current Grazing	4963 ac. Cattle grazing	Upland and riparian vegetation, fisheries / aquatic habitat, water quality
UNF	Elk Creek South Umpqua	Lower Elk Creek	Proposed Tiller Aquatic Restoration Project. Published in program of work 2010. NEPA analysis on going. Expect implementation to begin in 2013.	2 culvert replacements, 5 miles instream habitat improvement, 4 sump maintenance sites, 86 ac. Riparian reserve thinning	riparian vegetation, road network, fisheries / aquatic habitat, water quality
UNF	Elk Creek South Umpqua	Lower Elk Creek	Anticipated Clear cutting on private land	150 ac.	Upland and riparian vegetation, road network, fisheries / aquatic habitat, water quality
UNF	Elk Creek South Umpqua	Drew Creek	Current Grazing	5000 ac. Cattle grazing	Upland and riparian vegetation, fisheries / aquatic habitat, water quality
UNF	Elk Creek South Umpqua	Drew Creek	Proposed Elk Creek Collaborative Watershed Restoration Project. Published in program of work 2010. NEPA analysis on going. Expect implementation to begin in 2015.	200 ac. commercial thin, 500 ac. fuels reduction, 250 ac. prescribed burn, 100 ac. Pre-commercial thin, 50 ac. Weed treatment, 50 ac. Planting, , 2 culvert replacements, 5 miles road decommission	Upland and riparian vegetation, road network, fisheries / aquatic habitat, water quality,
UNF	Elk Creek South Umpqua	Drew Creek	Proposed Tiller Aquatic Restoration Project. Published in program of work 2010. NEPA analysis on going. Expect implementation to begin in 2013.	2 miles instream habitat improvement, 1 sump maintenance sites, 58 ac. Riparian reserve thinning, 1 pond habitat improvement	Riparian vegetation, road network, fisheries / aquatic habitat, water quality

These projects are expected to be consistent with standards and guidelines and land allocation objectives of the Umpqua National Forest LRMP. Collectively, these projects are expected to improve watershed conditions on NFS lands by:

- Reducing road-related sediment,
- Improving aquatic habitat conditions,
- Reducing the risk of catastrophic fire and improving stand health by reducing stand density on existing conifer stands.

Activities on Private Lands

Private lands comprise about 36 percent of the Elk Creek South Umpqua watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.78 percent of the BLM lands, 0.10 percent of NFS lands and 0.03 percent of private lands in the Elk Creek South Umpqua watershed (table 2.4.7.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Elk Creek South Umpqua watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14 for a discussion of cumulative effects.

2.4.7.8 Project Effects Compared by ACS Objective

Table 2.4.7.8-1 shows project effects compared to each of the nine ACS objectives.

TABLE 2.4.7.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Elk Creek–South Umpqua Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape-scale features that are affected by the Project. The Project corridor affects (cleared and modified) 0.78% of the BLM-managed land and 0.10% of the NFS land in the Elk Creek–S. Umpqua watershed (table 2.4.7.1-3). No Riparian Reserves are intersected in the Elk Cr. - South Umpqua watershed. The application of Best Management Practices and erosion control measures, use of native vegetation, and the anticipated rapid revegetation of disturbed areas would likely further reduce Project effects. The level of impact is well within the natural range of variability for disturbance processes described by Everest and Reeves (2007), Agee (1993) and as documented in the South Umpqua watershed assessment (Forest Service 1996).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to impact spatial or temporal connectivity in the Elk Creek–S. Umpqua watershed. No streams are crossed, and no Riparian Reserve are impacted. Aquatic system connectivity would be enhanced by replacement of three culverts within the watershed. Any residual levels of disturbance are anticipated to be well within the range of natural variability (section 2.4.7.4).
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Project would have no discernible impact on stream banks or bottoms in the Elk Creek–S. Umpqua watershed because no stream channels are crossed. Off-site mitigations involving LWD within riparian reserves would help restore this physical integrity and complexity (section 2.4.7.6).
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment would be mobilized during construction, but these effects are expected to be short-term and limited to the immediate project area. Connectivity to aquatic systems is limited since no stream channels are crossed. With application of the ECRP and Best Management Practices, there should be no long-term effects associated with sediment transport. No impacts to water temperature are expected because no channels are crossed and no effective shade is removed. Any sediment transport to aquatic systems that may occur would be offset by off-site road drainage enhancement, surface upgrade, and storm proofing mitigation projects.

TABLE 2.4.7.8-1 **Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Elk Creek–South Umpqua Watershed**	
ACS Objective	**Project Impacts**
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in corridor routing. There are no stream channels crossed in the watershed and the route lies on a ridge top so connections to aquatic systems that would transport sediment are limited. All waterbodies adjacent to affected Riparian Reserves are expected to be dry during construction. As a result, sediment fluxes are expected to be minor and short-term and well within the range of variability for the Klamath–Siskiyou Province due to implementation of the erosion control measures in ECRP, Best Management Practices and the anticipated rapid revegetation that is characteristic of the Province. As a result, erosional effects are expected to consistent with those described in section 1.3.1. Road repairs and storm proofing would help reduce sediment effects in the watershed and move the sediment regime closer to the desired condition (section 2.4.7.6).
Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	It is highly unlikely that the Project would impact flows because of limited connectivity to aquatic systems. The Project routing is on a ridge top in the watershed and does not cross any stream channels. The watershed is hydrologically recovered, and the corridor affects 0.08% of the watershed (table 2.4.7.1-2) so changes in peak flows as a result of construction are highly unlikely.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not affect floodplains and water table elevations in meadows because these features are not crossed by the Project in the Elk Creek Watershed.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project effects to Riparian Reserves in the Elk Creek–S. Umpqua Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Replanting with native species would facilitate recovery of vegetation communities. LWD placement within 17 acres of riparian reserves and would help to enhance physical complexity of the aquatic habitats (section 2.4.7.6). These restoration efforts, along with the limited effects to which they are directed, would maintain and restore biological and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Existing herbaceous and brush cover would be maintained to the extent practicable. To maintain riparian habitat, construction Best Management Practices would be implemented. LWD placement within 17 acres of riparian reserves would help to enhance physical complexity of the aquatic habitats (section 2.4.7. Revegetation would be encouraged by planting of native riparian species. . The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.4.7.9 Summary

Given the ridgetop location of the pipeline corridor on BLM and NFS lands, the lack of intersects with waterbodies or Riparian Reserves it is highly unlikely that Project construction and operation would prevent attainment of ACS objectives on BLM and NFS land in the Elk Creek–South Umpqua watershed. Amendments of the Roseburg District BLM and Umpqua National Forest LMPs to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives (section 2.4.7.5). No Project effects relevant to the ACS have been identified that are outside of the range of variability for disturbance processes in the watershed (section 2.4.7.4).

2.4.8 Upper Cow Creek Fifth Field Watershed, HUC 1710030206

2.4.8.1 Overview

The Upper Cow Creek fifth-field watershed is located in Douglas County, Oregon, and is approximately 47,500 acres. The most common land use in the Upper Cow Creek watershed is forestry, with 98.7% of the land base used for public or private forestry. Agriculture constitutes 1.2% of the land use, and mostly occurs along lower Cow Creek. Land ownership is primarily federal (67.0%) and is mostly administered by the Forest Service and BLM. Private landholdings constitute 24.9% of the watershed (Geyer 2003). Below Galesville Dam, Cow Creek meanders through the Lower Cow Creek watershed, joining the South Umpqua River at Riddle, OR.

The Upper Cow Creek watershed lies within the Klamath Mountain Province, though at its easternmost reach, it has some geologic units typical of the Western Cascades. The lowest point in the watershed is 1,780 feet, which is elevation at the top of the Galesville Dam spillway. The highest point is 5,095 feet at Cedar Springs Mountain. In the Upper Cow Creek watershed, 95.9% of the land base is above 2,000 feet. Areas between 2,000 and 5,000 feet in elevation are known as the transient snow zone (TSZ). Rain-on-snow events, in which rain falls on accumulated snow causing it to melt and increase the intensity of peak-flow amounts, may occur in these areas.

Figure 2.4-6 and table 2.4.8.1-1 shows the subwatersheds and ownerships of the Upper Cow Creek watershed. On NFS lands, the Pacific Connector project traverses 1.59 miles of the Dismal Creek subwatershed and 2.77 miles of the South Fork Cow Creek subwatershed. No BLM lands are traversed by the project in the Upper Cow Creek watershed.

The portion of Upper Cow Creek addressed by the Forest Service in a watershed analysis is located in the southwest corner of the Tiller Ranger District on the Umpqua National Forest. The watershed encompasses approximately 47,499 acres, with 24,151 acres (51 percent) within the Forest Service boundary. BLM lands, which are not affected by the project in this watershed are located in the Galesville subwatershed and comprise 9,866 acres or 21 percent of the watershed. On BLM and NFS lands within the watershed there are 11,111 acres of Late-Successional Reserves, 22,995 acres of Matrix lands and an estimated 16,675 acres of Riparian Reserves. An additional 696 acres are in unmapped LSRs associated with KOACs on the Umpqua NF. There are approximately 4,500 acres of non-federal lands within the Forest Service boundary of the Cow Creek watershed. Approximately 13,482 acres (28 percent) are private lands that are managed primarily for grazing and commercial timber production (table 2.4.8.1-1).

The Cow Creek watershed is primarily within the Klamath Mountain geologic province, with a small area on the southeastern edge that lies within the Western Cascade geologic province. Eighty-nine percent of the watershed is either granite or schist. These soil types are susceptible to higher erosion and landslide potential (Forest Service 1995a).

There are estimated to be 222 miles of streams within the Forest Service boundary. The upper Cow Creek watershed no longer supports an anadromous fisheries due to the construction of the Galesville Dam in 1985. Approximately 38 miles are Class II streams (resident fish) with a resident cutthroat and rainbow trout. On NFS lands, there are an estimated 11,826 acres of riparian reserves (49 percent of the NFS land base). Canopy coverage in the smaller streams and tributaries to Cow Creek is high which indicates adequate shade (75 to 100 percent). In the mainstem of Cow Creek

Draft

the canopy opens up and Cow Creek widens downstream as the channel becomes less constricted. Stream temperatures are cool throughout most of the watershed; they begin to rise in the wide, shallow part of the mainstem of Cow Creek. The maximum recorded stream temperature is 75°F in lower Cow Creek (Forest Service 1995a).

Location and Routing

To the maximum extent possible, the project is located on ridgetops to avoid impacting Riparian Reserves. The PCGP alignment originally proposed in the East Fork of Cow Creek was located on a large upland feature known as Long Prairie and had no intersections with stream crossings or other Riparian Reserves. After consultation with the Forest Service and The Cow Creek Band of Umpqua Tribe of Indians, the routing was moved off of Long Prairie to avoid sensitive traditional cultural sites. Pacific Connector's proposed alignment to avoid Long Prairie was filed in the September 2007 FERC Certificate application. However, after completion of the 2008 northern spotted owl surveys, it was determined that the proposed 2007 route crossed a northern spotted owl nest area. In consultation with the U.S. Fish and Wildlife Service and the Forest Service, Pacific Connector developed a re-route to avoid the nest area and to minimize effects on suitable northern spotted owl habitat. This re-route developed in cooperation with the Forest Service has been incorporated into the proposed route, as recommended by FERC (FERC 2009). In 2010, at the request of the Forest Service, a minor realignment was also completed between mileposts 109.71 and MP 109.78 to avoid areas of potential instability. The current project alignment, developed by Pacific Connector and the Forest Service in the Upper Cow Creek watershed avoids areas of unstable soils, areas that had potential conflicts under the National Historic Preservation Act and various agreements with The Cow Creek Band of the Umpqua Indians, and also avoids a northern spotted owl nest grove.

The proposed PCGP corridor enters the Upper Cow Creek watershed at MP 102.6 and travels approximately 8.5 miles in a south-southeasterly direction exiting the watershed at MP 111.1 (figure 2.4-6). From approximately MP 102.6 to approximately MP 109, the PCGP corridor would be located on the ridgetop between the Elk Creek and the Upper Cow Creek fifth field watershed. Approximately 4.36 miles (75.62 acres) of the PCGP right-of-way are in the Upper Cow Creek fifth-field watershed (table 2.4.8.1-2); 1.55 miles are in the Dismal Creek subwatershed and 2.82 miles are in the South Fork Cow Creek subwatershed. Between MP 109 and 110, one small forested wetland, two intermittent and four perennial stream crossings occur. Riparian Reserves in one perennial stream and six forested wetlands are clipped by construction clearing of the corridor and TEWAs but the wetlands are not crossed by the PCGP trench. The Cow Creek watershed assessment estimated that 49%, or approximately 4,559 acres of the South Fork Cow Creek subwatershed are Riparian Reserves, of which approximately 35% or 1,595 acres are LSOG (Forest Service 1995a: 94-95). Approximately 10.83 acres of 4,812 acres or 0.23% of the Riparian Reserves in the S. Fork Cow Creek 6th field subwatershed and 0.07% of Riparian Reserves in the Upper Cow Creek 5th field Watershed would be cleared. Of the cleared Riparian Reserves, approximately 2.81 acres are LSOG. This represents approximately 0.18% of LSOG in Riparian Reserves in the South Fork Cow Creek. Early and mid-seral forest vegetation constitutes the remainder of the affected Riparian Reserve vegetation (tables 2.4.8.1-1 through 4).

Portions of the routing between MP 109 and MP 110 in the South Fork Cow Creek subwatershed cross areas mapped as earthflow terrains. Field investigation by licensed geologists from the Forest Service and PCGP have shown that these areas are dormant and unlikely to reactivated by

the PCGP construction (GeoEngineers 2009; Hanek 2011; NSR 2014, in preparation). Since these earthflow features are not unstable, they are not mapped as additional riparian reserves.

Draft

Figure 2.4-6 PCGP Routing and Subwatershed Boundaries, Upper Cow Creek Watershed

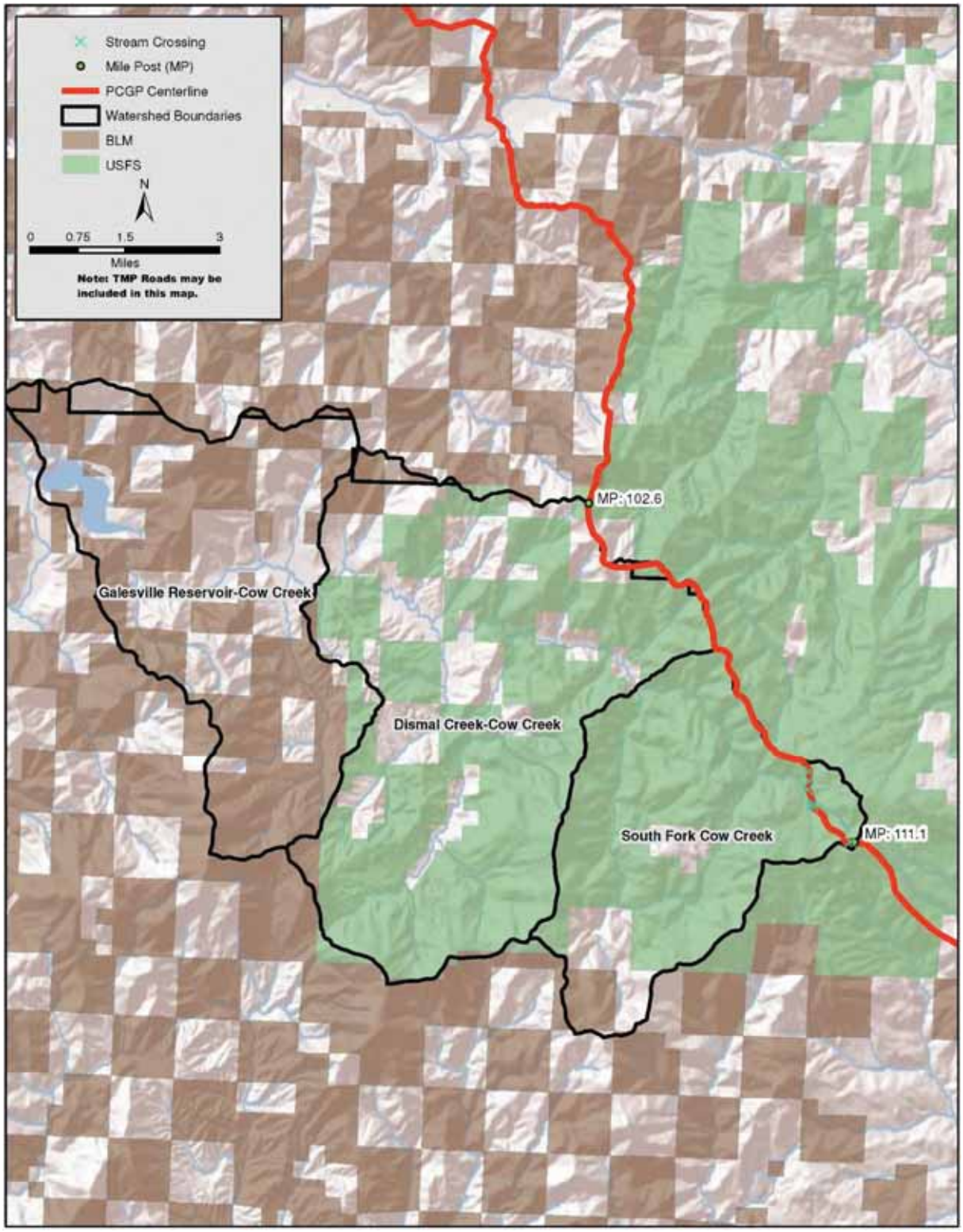


TABLE 2.4.8.1-1.

Land Ownership (acres) and Federal Land Allocations (acres) in Upper Cow Creek Watershed HUC 1710030206

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						Designated LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Dismal Creek-Cow Creek	21,230.73	887.54	14,529.21	15,416.75	5,813.98	214.76	1,078.98	672.78	13,450.23	434.63	7,114.81	7,549.44
Galesville Reservoir-Cow Creek	15,134.85	8,461.92	311.16	8,773.08	6,361.77	8,456.80		5.12	311.16	4143.75	152.38	4,296.13
South Fork Cow Creek	11,133.85	516.57	9,310.97	9,827.54	1,306.31		1,271.42	516.57	8,039.55	252.96	4,559.47	4,812.43
Watershed Total	47,499.43	9,866.03	24,151.34	34,017.37	13,482.06	8,671.56	2,350.40	1,194.47	21,800.94	4831.34	11,826.66	16,658.00

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 696 acres is unmapped LSR associated with KOACs on the Umpqua NF.
c/ Occur within LSR and Matrix Land Allocations. Data Source: MF Coquille WA, page 12 Approximately 40% of the landscape is Riparian Reserve

TABLE 2.4.8.1-2

PCGP project Corridor (miles) and project Area (acres) in Upper Cow Creek Watershed HUC 1710030206 by Land Ownership

Unit a/	Land Ownership															
	BLM				NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Dismal Creek-Cow Creek					1.59	26.71		0.18	0.79	15.08		0.26	2.38	41.79	0.00	0.20
Galesville Reservoir-Cow Creek																
South Fork Cow Creek					2.77	48.91		0.53					2.77	48.91	0.00	0.44
Watershed Total	**0.00**	**0.00**	**0.00**	**0.00**	**4.36**	**75.62**	**0.00**	**0.31**	**0.79**	**15.08**	**0.00**	**0.11**	**5.15**	**90.70**	**0.00**	**0.19**

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.7.1 3

PCGP Project Area (acres) on Federal in Upper Cow Creek Watershed HUC 1710030206 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Desingated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Dismal Creek-Cow Creek	BLM																
	NFS	23.88		2.21		2.83		0.02						26.71		0.18	
Galesville Reservoir-Cow Creek	BLM																
	NFS																
South Fork Cow Creek	BLM																
	NFS	14.75		1.16		34.15		0.42		10.83		0.24		48.90		0.53	
Watershed Total	**BLM**	**0.00**		**0.00**		**0.00**		**0.00**		**0.00**							
	NFS	**38.63**		**1.64**		**36.98**		**0.17**		**10.83**		**0.09**		**75.61**		**0.31**	
	Total BLM & NFS	**36.83**		**1.64**		**36.98**		**0.17**		**10.83**		**0.07**		**75.61**		**0.22**	

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.4.8.1-4

Riparian Reserve Effects Upper Cow Creek Fifth Field Watershed HUC 1710030206

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	fish bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80 years +)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80 years)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40 years)	Stream Channel or Wetland Area c/	Net Riparian Reserve Cleared						
Dismal Creek Subwatershed HUC 171003020602																												
UNF	105.39	CDX050	1-4' wide roadside ditch, 20% gradient; extends off-site	D	Yes	10.34		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
South Fork Cow Creek HUC 171003020601																												
UNF	106.77	CDX049	1-2' wide ditch, 2-5' bankfull, 5-10% Gradient	D	Yes	10.34		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	108.08	CDX047	2' wide roadside ditch,5-10% gradient; dissipates in forest	D	Yes	3.19		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	108.40	CDX048	2' wide roadside ditch;10% gradient	D	Yes	7.12		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	109.15	GDX 015	Connects to GW014.	W	Yes	8.27	0.09	No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	109.17	GW014/FS-HF-C Trib to East Fork Cow Creek	Seep wetland with shrubs, crosses road and continues. USFS considers this wetland as a perennial stream.	P	Yes	12.02		No				0.00	1.54			1.54	0.29	0.09		0.38	0.03	1.95		1.95	0.04	1.99	Yes	No
UNF	109.24	FS-HF-D	Small wetland adjacent to R/W	W	No	0.00		Yes				0.00	0.85			0.85				0.00		0.85		0.85		0.85	No	No
UNF	109.29	FS-HF-E	Skunk cabbage seep wetland on FS land adjacent to RW	W	No	0.00		Yes				0.00	0.08			0.08				0.00		0.08		0.08		0.08	No	No
UNF	109.32	GW017	Forested wetland seep	W	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	109.33	GSI016/FS-HF-F Trib. to East Fork Cow Creek	3' wide intermittent	I	Yes	7.54		No				0.00	0.80			0.80	0.13			0.13		0.93		0.93	0.22	1.15	No	No

TABLE 2.4.8.1-4

Riparian Reserve Effects Upper Cow Creek Fifth Field Watershed HUC 1710030206

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	fish bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80 years +)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80 years)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40 years)	Stream Channel or Wetland Area c/	Net Riparian Reserve Cleared						
UNF	109.43	GW018	Wetland Seep	W	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	109.47	GW021	Emergent wetland seep, connects to GSP019	W	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	109.47	GSP019/FS-HF-G East Fork Cow Creek	Cow Creek – 28' wide, broad, cobbles, boulders, 2' wide	P	Yes	26.44		No				0.00				0.00	1.87			1.87	0.06	1.93		1.93		1.93	Yes	No
UNF	109.49	GW020	Emergent wetland seep	W	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	109.58	East Fork Cow Creek	Riparian Reserve associated with EF of Cow Creek, clipped.	P	No	0.00		Yes			0.38	0.38				0.00	0.69			0.69		1.07		1.07	0.19	1.26	Yes	No
UNF	109.69	AW298/ FS-HF-J Trib. to East Fork Cow Creek	Perennial stream on FS land, extension of AW298 - Willow dominated wetland	P	Yes	10.20		No	1.16			1.16				0.00				0.00	0.03	1.19		1.19	0.27	1.46	Yes	No
UNF	109.78	GSP019/ FS-HF-K Trib. to East Fork Cow Creek	Intermittent stream on FS land, extension of AW299 - Willow dominated wetland (INCORRECTLY ID AS INT)	P	Yes	5.16		No	1.27			1.27				0.00	0.43			0.43		1.70		1.70		1.70	No	No
UNF	110.98	ESI068/FS-HF-N East Fork Cow Creek	EF Cow Creek Ephemeral drainage, U-shaped, cobble 1-2' wide.	I	Yes	16.41		No				0.00	1.10			1.10				0.00	0.03	1.13		1.13		1.13	No	No
Subtotal South Fork Cow Creek		Crossed: 3 Ditches f/ 4 Perennial Streams 2 Int. Streams 1 Wetland	Clipped: 6 Wetland RR 1 Perennial RR		7		0.09	7	2.43	0.00	0.38	2.81	4.37	0.00	0.00	4.37	3.41	0.09	0.00	3.50	0.15	10.83	0.00	10.83	0.72	11.55	4	0

TABLE 2.4.8.1-4

Riparian Reserve Effects Upper Cow Creek Fifth Field Watershed HUC 1710030206

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	fish bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80 years +)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80 years)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40 years)	Stream Channel or Wetland Area c/	Net Riparian Reserve Cleared						
Total Upper Cow Creek		Crossed: 4 Ditches 4 Perennial Streams 2 Int. Streams 1 Wetland	Clipped: 6 Wetland RR 1 Perennial RR		7		0.09	7	2.43	0.00	0.38	2.81	4.37	0.00	0.00	4.37	3.41	0.09	0.00	3.50	0.15	10.83	0.00	10.83	0.72	11.55	4	0

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

TABLE 2.4.8.1-5

Stream Crossing Turbidity and Risk Rating, Upper Cow Creek Fifth Field Watershed

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Upper Cow Creek	SF Cow Cr.	109.17	P	HF-C Perennial stream with associated seep wetland with shrubs	5	12.02	18.6		Erodible	Sand	M	M	M	YELLOW
Upper Cow Creek	SF Cow Cr.	109.33	I	HF-F 3' wide intermittent		7.54					M	M	M	YELLOW
Upper Cow Creek	SF Cow Cr.	109.47	P	HF G Cow Creek – 28' wide, broad, cobbles, boulders, 2' wide	12	26.44	3.32	3.5	Erosion resistant	Cobble / boulders	M	M	H	GREEN
Upper Cow Creek	SF Cow Cr.	109.69	P	HF J Perennial extension of AW298 - Willow dominated wetland	12	10.2	13.15		Erosion resistant	Large cobble	M	L	M	BLUE
Upper Cow Creek	SF Cow Cr.	109.78	P	HF-K Perennial, extension of AW299 - Willow dominated wetland	8	5.16	9.61	3	Highly erodible	Cobble	M	M	H	GREEN
Upper Cow Creek	SF Cow Cr.	111.01	P (I)	Perennial stream with summer flow diversion. In summer the stream is dry and is considered here as an intermittent stream. drainage, U-shaped, cobble 1-2' wide		16.41					I	I	I	BLUE

Sources:
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified

Draft

2.4.8.2 Existing Conditions Original watershed Analysis Findings

The Forest Service completed a watershed assessment for the Upper Cow Creek watershed in 1995 (Forest Service 1995a). The Umpqua basin watershed Council completed a second analysis that covered all ownerships in 2003 (Geyer 2003) Watershed conditions are summarized as follows:

- The Cow Creek fifth-field watershed is primarily composed of granitic and schistose soils that are highly erosive and susceptible to sliding and scouring. Localized ancient dormant earthflow terrains are also represented on the pipeline route in the East Fork of Cow Creek.

- Timber harvest and Roads in steep terrain have significantly increased the rate of landslides in the watershed. The floods in 1964, 1974, 1980's, and the large storm event January 9, 1995 caused many harvest and road related slides.

- The erosive nature of the soils in this watershed influences sediment transport, storage and delivery to various waterbodies, particularly in those subwatersheds prone to landslides and debris torrents. Historically, sediment delivery has probably always been relatively high; however, human activities such as road construction, timber harvest, mining, and grazing have increased landslide and general sedimentation rates over natural levels (Forest Service 1995a: 8).

- Timber harvest and fire suppression have altered the frequent low-intensity fire disturbance regime that dominated Sierran-Steppe mixed forests of the Klamath Mountain eco-region represented in the Cow Creek watershed. The result of this changed disturbance regime is a fragmented landscape, low in both early- and late-seral vegetation. The density and dominance of tolerant conifers is high, commonly at the expense of intolerant conifers and most hardwoods. Fire hazard and the magnitude of insect and disease activity may be higher than before modern management (Forest Service 1995: 8, Forest Service et al. 1998)

- The East Fork of Cow Creek appears to have been in equilibrium (neither degrading nor aggrading) at the time the watershed Analysis was completed with respect to sediment transport, delivery and storage (figure 2.4-7). Dismal Creek is aggrading and appears to be out of equilibrium with respect to sediment transport and storage (Forest Service 1995a: 49). The lower parts of Cow Creek, the Applegate drainage, and Dismal Creek are primarily storage systems; fine sediments are stored in pools and behind large woody material, reducing spawning substrate and pool habitat (Forest Service 1995a).

- The watershed Analysis documented that shade cover on streams was above 80 percent for the lower-order reaches (first, second, and third), averaging 88 percent for fourth-order reaches and 52 percent for fifth-order reaches of Cow Creek. Water temperatures and canopy suggest good stream shading in the watershed (Forest Service 1995: 51). For the watershed analysis, twelve water temperature monitoring stations were established in the streams in Cow Creek during summer 1995. Providing one summer's data was not meant to represent a baseline; however, this monitoring data indicated that the maximum water temperature on the East Fork Cow Creek above the confluence with the South Fork Cow Creek was 55-60 degrees F or below. The Umpqua basin watershed Council (Geyer 2003) collected temperature data from 89 continuously sampling data loggers from sites throughout the Cow Creek watershed during the summer of 2000. Data from the East Fork

Draft

Mouth, downstream of the PCGP project crossing, indicated that the maximum temperature was 61.6 degrees F. There were 74 days where the temperature exceeded 55 degrees F, but there were no days where the temperature exceeded 64 degrees F.

- A portion of the PCGP crosses the East Fork of Cow Creek drainage area in the South Fork Cow Creek subwatershed. The Cow Creek Watershed Analysis provides the following characterization of the drainage:
    - The watershed is highly roaded with a density of 4.7 road miles/mile. Road densities are likely generating sediment that contributes to winter scour. Sediment storage is relatively high, but may be in the range of equilibrium for granite-schist landscapes (See Figure 3.4-7). Water temperatures in this drainage were low. Continuous temperature monitoring results identified 60 degrees Fahrenheit as the high recorded for the summer. Coarse woody debris is limited, possibly as a result of flood flows in 1964 and 1974 (Forest Service 1995a: 63).

Figure 2.4-7 Natural Turbidity and Stored Sediment in the East Fork of Cow Creek

Changes in watershed Condition

Since the watershed assessment was written in 1995, peak flow events in 1997 and again in 2003 caused several road crossing failures. There have been no large fires or other large scale events that would change watershed conditions. Several small road improvement and decommissioning projects have been accomplished that improved watershed conditions at the site or subwatershed-scale (table 2.4.8.2-1).

TABLE 2.4.8.2-1

Activities in Cow Creek since publication of the Cow Creek Watershed Analysis, Sept. 1995

Name	Activity Type	Dates	Total Acres/Miles	Location
Eight County Hazardous Fuels Reduction	Pile burning	2010	68	Upper Cow (5th)
Eight County Hazardous Fuels Reduction	Precommercial thin	2009-2010	68	Upper Cow(5th)
Devils flat Fuelbreak	Precommercial thin	2007	180 ac	Dismal (6th)
Cattle Grazing	Cattle Grazing	1995-2012	8,250 ac	South Fk. Cow (6th)
Off-site pine	Precommercial thin	?	40 ac	Dismal (6th)
Wildfire	Wildfire	1992-2012	27 ac	Dismal (6th)
Weed treatment	Hand pull/cut	1997-2012	685 ac	Upper Cow (5th)
Kirby Road	Road construction.	2001	<1 ac	South Fk. Cow (6th)
Apple Jack salvage	Commercial thin	1997	60 ac	Dismal (6th)
Reforestation	Tree planting	1996-2003	450 ac	Upper Cow (5th)
Skeleton Salvage	Commercial thin	1997	20 ac	Dismal (6th)
ERFO Road Repair	Road repair	1995-2006	3 ac	Upper Cow (5th)
Clearcutting on Private land within district boundary	Clearcut	1995-2012	889 ac	Dismal (6th)
Commercial thinning on private land within district boundary	Commercial thin	1999-2006	258 ac	Dismal (6th)
Road Maintenance	Brushing, grading, resurfacing	2010-2012	70 mi.	Upper Cow (5th)

Current watershed Conditions

Generally, conditions described in the 1995 Cow Creek watershed Analysis are still applicable. In 2010, the Forest Service rated the watershed Condition Class of Upper Cow Creek as "Functioning at Risk" noting positive attributes for water quality and quantity and riparian vegetation, with "Functioning at Risk" or "Not Properly Functioning" ratings for aquatic habitat, aquatic biota and road density (See Attachments: Section 3.3.1). Road-related sediments and culvert blockages have negatively affected aquatic habitats in the Upper Cow Creek watershed. Vegetation remains as described in the Cow Creek watershed assessment Northwest Forest Plan monitoring showed positive trends for overall watershed condition (See Attachments: Section 3.3.2). Figure 2.4-7a shows current (2013 water year) seven day averages of maximum water temperatures (NSR 2014, in preparation, Provisional Data, subject to change).

Draft

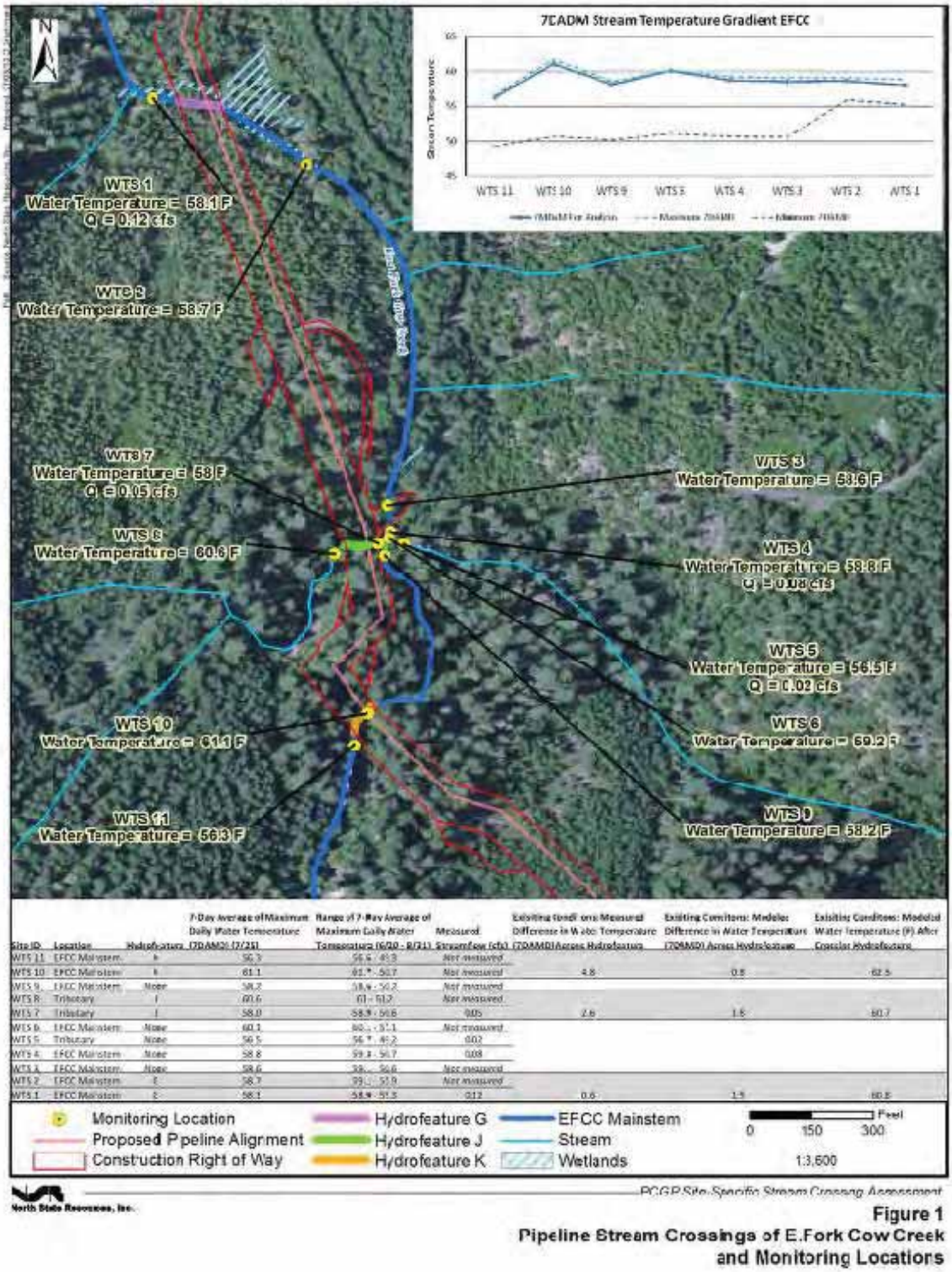


Figure 2.4-7a Current Seven Day Average Maximum Temperatures, EF Cow Creek Perennial Streams

2.4.8.3 Natural Disturbance Processes

Natural disturbance processes for the Upper Cow Creek watershed are consistent with those described for the Klamath and Western Cascade Provinces. Prior to the advent of successful fire suppression, fire was the dominant process affecting upslope and riparian vegetation above the floodplain. Fire visited many sites as often as every 15 years and rarely missed a site for more than 100 years. Cow Creek's complex fire regime created equally complex and diverse landscape and stand-level vegetation (Forest Service 1995a: ES-V). Higher intensity stand replacement fires occurred on average about every 150-200 years in the western Oregon Cascades (Everest and Reeves 2007). Granite and schist soils in the watershed are susceptible to high rates of surface erosion and mass wasting, particularly on earthflow terrains and slopes over 60% and likely demonstrated high erosion rates when stand replacement fires and high intensity rainfall events overlapped.

2.4.8.4 Project Effects and Natural Range of Variability

The Cow Creek watershed is an active landscape with respect to erosional processes. The Cow Creek Watershed Analysis clearly documents a cause for concern with respect to surface erosion and sediment transport to stream systems from management actions that disturb or expose soils. The East Fork of Cow Creek drainage naturally processes a relatively high amount of background sediment, and is roughly in balance for sediment transport and deposition in granite schist systems (Forest Service, 1995a: 63). Given the historic processes that drive the Upper Cow Creek watershed and the nature of the project, aggressive erosion control and streambank / streambed stabilization would be required to maintain the present sediment balance in the East Fork of Cow Creek. Additionally, there is a need to avoid mobilizing naturally occurring mercury that occurs within the watershed. Historically, water temperatures in Upper Cow Creek have been in the range of 55°-60° F. There are five central concerns related to project effects and compliance with the ACS in this watershed.

1. Whether the clearing for the project would cause excessive erosion and sediment deposition and whether that sediment and would aggregate downstream since there are several stream crossings in a short distance in the same stream system.

GeoEngineers completed a crossing risk analysis for turbidity, crossing construction impacts and potential site response (Section 1.3) (GeoEngineers, 2013). Evaluations for stream channel crossings in the East Fork of Cow Creek are shown in table 2.4.8.1-5. Best Management Practices that would be applied at each crossing, grouped by "Blue", "Yellow" and "Green" turbidity and risk ratings are shown in table 2.4.8.4-1.[11]

- Crossings at MP 109.69 – HF-J (Perennial) and 111.01 HF-N (Perennial stream that is intermittent because of upstream diversion) were rated as "Low Risk" where standard stream crossing "Blue" Best Management Practices would be applied.
- Crossings at MP 109.17 – HF-C (Perennial) and 109.33 – HF-F (Intermittent) were rated as Moderate Risk for construction impacts and / site response where "Yellow" Best Management Practices would be applied. The "Yellow" BMP group includes additional

[11] Note that during preconstruction surveys of crossings any additional measures needed to accomplish objectives may be stipulated by Agency representatives.

measures for bank and stream bottom stabilization as needed including grading or terracing over steepened banks, use of geotextile fabrics, fiber rolls, rock and rip-rap placement, in-stream structures, stratified backfill, structural fill placement and LWD etc.(table 2.4.8.4-1).

- Crossings at MP 109.47 – HF-G and 109.78 – HF-K are classed as "Green" crossings which have a high risk for construction impacts to aquatic habitats. These crossings would add placement of rootwads and large wood as needed for stabilization of banks along with standard Best Management Practices and those in the "Yellow" group.

TABLE 2.4.8.4-1

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**109.69 (HF-J), 111.01 (HF-N)**	**109.17 (HF-C), 109.33 (HF-F)**	**109.47 (HF-G), 109.78 (HF-K)**
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.

Draft

TABLE 2.4.8.4-1 **Pacific Connector Proposed BMPS for Use at Waterbody Crossings**			
	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** Rootwad enhancement of bank stabilization
BMP Source	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.		

In all crossing groups,

- Sediment barriers, including silt fencing, would be installed and maintained until effective ground cover is reestablished. Silt fences have been shown to be up to 95% effective in trapping sediment (Robichaud et al, 2003)
- Effective ground cover would be in place prior to the onset of seasonal precipitation (table 1.3.1.2-1)
- Rapid reestablishment of vegetation would be emphasized.

Post construction, the Forest Service, in consultation with the Oregon Department of Environmental Quality (ODEQ), developed the following additional recommendations in this immediate area:

(a) Within Riparian Reserves for all hydrologic features crossed by the pipeline between MP's 109 and 110 provide 100% ground cover on all disturbed areas. Wood fiber is the preferred material. In addition, construct effective water bars at 50-foot intervals. If necessary, biosolids would also be used in concert with wood chips to augment soil productivity to reestablish vegetation.

(b) At hydrologic features G, J, and K assure that all erosion control measures are in place before the onset of seasonal precipitation and monitor for rilling, gullying and other forms of active erosion that may transport sediment into the aquatic environment. If rilling or gullying is occurring that may result in sediment transport into the aquatic environment, immediately take additional erosion control measures to preclude sediment transport.

(c) Until effective ground cover vegetation is established, inspect the construction corridor for sediment transport after each significant storm event (which would be more frequently than a bank-full event) or if there is a visual sediment plume downstream. If the sediment source is originating from the pipeline corridor, add whatever erosion control measures are necessary to preclude sediment transport. This would be done in consultation with the Forest Service. This may include additional silt fencing, aerial placement of ground cover

Draft

and large woody debris, mulch, erosion control fabric or other measures as needed. An authorized Agency representative would provide direction to Pacific Connector regarding these events if necessary.

(d) Based on field reviews by the Forest Service, GeoEngineers and North State Resources, erosion control measures in the ECRP are expected to be successful. There is however potential for incremental and cumulative increases of minor amounts of sediment downstream since all of the crossings in the EF of Cow Creek occur in the same stream system, and occur in close proximity. In order to ensure that sediment during construction and post-construction does not aggregate downstream, the Forest Service would require monitoring of turbidity levels above the crossing at MP 109.78 (the farthest upstream crossing of the project) and at stream junctures downstream at the time of construction and during post-construction wet weather. If turbidity monitoring shows significant cumulative sediment, as defined by the Forest Service, from project crossings, Pacific Connector would need to take additional steps to reduce erosion from sediment sources. These would include adding appropriate methods noted above or specified by the Forest Service to further reduce the mobilization and transport of sediment.

2. Whether construction activity would intercept groundwater causing "piping" or otherwise concentrating subsurface flows.

Complex subsurface routing of water is common on earthflow terrains. Stream temperatures in the East Fork of Cow Creek suggest a groundwater influence in the streams. GeoEngineers also ranked the crossing at MP 109.47 as "High Sensitivity" for hyporheic flows, suggesting groundwater influence (GeoEngineers, 2013g). There is some possibility that during construction, the project may encounter subsurface flows. Because of the crossing proximity and the infiltration rates of the granitic and schist soils, pumping water out of the crossing site may simply be moving it to the next crossing. If significant groundwater flows are intercepted, the Forest Service and Pacific Connector would agree on a site plan during construction to pump hyporheic flows from the channel to a stable location away from the channel. If post construction review shows excessive piping (subsurface erosion) as a result of pipeline construction that is causing resource damage as defined by the Forest Service, Pacific Connector would be required to take additional measures approved by the Forest Service to reduce piping and subsurface erosion. Additional trench blockers may also be necessary in the trench in this area to avoid channeling subsurface flows along the pipeline trench.

3. Whether the earthflow terrains between MP 109 and 111 would remain stable.

At the request of the Forest Service, both GeoEngineers and North State Resources have conducted additional field reviews in the East Fork of Cow Creek to ensure that the project routing would not destabilize earthflow terrains. Licensed geologists from the Forest Service (Hanek 2010), GeoEngineers (2013) and North State Resources (NSR 2014, in preparation) have concluded that the earthflow terrains are stable and that construction is not likely to destabilize them.

4. Whether the loss of effective shade at stream crossings would cause adverse and significant increases in stream temperature at the site of maximum impact or that accumulate downstream.

Stream temperatures are potentially affected by the removal of effective shade. Effects of shade removal depend on aspect, stream volume, aspect and stream orientation and position in the watershed. Loss of effective shade on intermittent streams is not expected to impact water temperature late summer months when stream temperatures are an issue. With four perennial stream crossings of the East Fork of Cow Creek or its tributaries in less than a mile below MP 109.76, the possible cumulative impacts of increased stream temperatures are of concern.

Oregon State water quality standards (Oregon Administrative Rules 340-041-0028) state that all nonpoint sources taken together at the point of maximum impact may not exceed 0.3 degrees Celsius (0.5 degrees Fahrenheit). The Umpqua Basin TMDL (2006) is more restrictive and allocates the human use allowance to be 0.1 degrees Celsius increase at the point of maximum impact (i.e.: downstream of multiple tributaries impacted by pipeline construction). In addition, all of the stream crossings in the Upper Cow Creek watershed are designated as core cold water habitat (OAR 340-041 figure 320A). The OAR (340-041-0028) states that streams designated with a fish use of core cold water habitat may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit) as measured by the seven-day-average maximum stream temperature.

(See www.deq.state.or.us/wq/rules/div041/fufigures/figure320a.pdf).

To address temperature issues, North State Resources (2009) conducted a water temperature assessment of the perennial waterbodies crossed within the East Fork Cow Creek drainage to assess the potential effects that the project would have on downstream temperatures. These crossings are shown in figures 2.4-7a and 2.4-8.This solar loading assessment used the valley, stream channel, and riparian zone characteristics of hydrofeatures; measured water temperature trends of East Fork Cow Creek; and used water temperature modeling results to predict the existing and future stream temperature regimes. The evaluation showed that with mitigation measures, any temperature increases would be less than 0.2 °C and limited to the point of maximum impact. No impacts were predicted at the stream network scale because of the small volume of affected streams, likely groundwater inputs and the assimilative capacity of the stream network. The results of this evaluation are shown in table 2.4.8.5-2. An implementation and effectiveness monitoring plan is in place to ensure that these objectives are achieved. If temperatures do increase, Pacific Connector would be required to take additional measures such as planting additional trees or adding large woody debris to provide additional shade. GeoEngineers 2013f: 26 and EIS Section 4.3.1.5.)On-the-ground conditions and water temperature model results suggest that it is unlikely that the stream temperature downstream of any of the perennial crossings would be increased above the ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F) (NSR 2009:41-42, Table 6.1.1; see also table 2.4.8.5-2).

TABLE 2.4.8.5-2

SSTEMP Model Results for Perennial Stream Crossings in Upper Cow Creek by Hydro-Feature and Reach

Site Data a/	Hydro-K	Reach J-1	Hydro J	Reach JK-1	Hydro G	Reach G-1	Reach G-2
Base Flow Discharge (CFS)	0.18	0.18	0.09	0.26	0.45	0.50	0.55
Existing Temperature (Deg. C)	15	15.1	15.3	14.6	14.6	14.8	14.5
Existing Temperature (Deg. F)	59	59	59	58	58	59	58

Post-project Temperature (Deg. C.)	15.6	15.6	16.5	14.9	15.3	15.0	14.6
Post project Temperature (Deg. F.)	60	60	62	59	60	59	58
Post project With Mitigation (Deg. C)	15.2	15.2	15.3	14.7	14.8	14.8	14.5
Post project with Mitigation (Deg. F)	59	59	60	59	59	59	59

a/ Hydrofeature N at MP 111.01 is a perennial stream that becomes intermittent in the summer because of an upstream diversion. It would be dry during summer months when water temperature is an issue and is not considered here because its current condition is an intermittent stream.

Stream temperatures at perennial crossings on BLM lands at Middle Creek Deep Creek, Big Creek, and on NFS lands in the East Fork of Cow Creek were reanalyzed in 2013 to reflect minor changes in alignment and to provide updated temperature and flow data (NSR 2014, in preparation). The Stream Segment Temperature Model (SSTEMP; Bartholow 2002) model was selected for this analysis because it is the modeling tool most often used by the federal agencies and could provide outputs for single stream segments using available data. This is also the model used in the NSR 2009 analysis. Data recorders were placed at selected locations and seven day average high temperatures were recorded for each crossing during the warmest part of the summer when lowest flows occurred. Flows in the 2013 data year were about 33% of those modeled in 2009 and bordered on intermittent at a perennial stream crossing at MP 109.69 (HF-J) in the East Fork of Cow Creek. This provided a drought condition assessment of potential project impacts on perennial stream temperatures. To validate the model, existing conditions were entered, and predicted temperatures were compared to measured temperatures. When compared to measured existing conditions, the SSTEMP model overstated actual stream temperature increases by as much as 2.0°F (Table 2.4.8.4-2). If the SSTEMP model overstated the existing condition, then it would also be expected to overstate the post-construction impacts by comparable amounts. This highlights the inherent uncertainty and high variability in measuring stream temperatures in low volume channels.

Preliminary results based on provisional data available just prior to publication of the DEIS showed almost no temperature impacts on the BLM channel crossings in Middle Creek, Deep Creek and Big Creek because of higher channel volumes, cooler air temperatures and relative position of the channels in the watershed. Modeling of stream temperatures in the perennial crossings in the East Fork of Cow Creek on the Umpqua National Forest using SSTEMP showed potential temperature increases without mitigation of 1.2°F to 4.2°F at the point of maximum impact in the corridor clearing.[12] Measured stream volumes ranged from 0.045 CFS to 0.115 CFS with modeled post-construction shade levels of 1.2% to 3.7%. As noted above, this is a drought condition assessment and may not be typical of most years or of post-construction shade levels. While there is a great deal of inherent variation in the stream conditions, and a measure of uncertainty in the SSTEMP model results, preliminary results of the NSR 2014 analysis suggest that in a low-flow scenario without mitigation, there could be potential for temperature increases above the TMDL thresholds (0.1°C or 0.18°F at the point of maximum impact) or ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F) in small perennial channels in the East Fork of Cow Creek. The 2014 analysis showed larger temperature impacts than those reported in

NSR 2009. Model differences between NSR 2009 and the NSR 2014 analysis are explained by the much lower flows measured in the 2013 water year and the sensitivity of the SSTEMP model to low flows. Table 2.4.8.4-2 shows preliminary estimates of temperature impacts at Hdyrofeatures G (MP 109.47), J (MP 109.69) and K (MP 109.76). **This is provisional data based on drought-condition flows and near total removal of shading vegetation and is subject to change based on model parameters.**

TABLE 2.4.8.4-2

Preliminary Assessment of Stream Temperature Impacts at Perennial Stream Crossings in the East Fork of Cow Creek

Hydrofeature	Measured Flow (CFS)	Measured Existing Condition 7 Day Max. Temperature Below Crossing 2013 data (Degrees F)	Modeled Predicted 7Average Max. Temperature SSTEMP 2013 Data (Degrees F)	Existing Condition Model Overestimate Compared to Actual Conditions (Degrees F)	Modeled Post Construction Average Max. Temperature (Degrees F)	Modeled Post Construction Max. Increase in Average Max. Temperature (Degrees F)	Predicted Max 7 day Average (Modeled Increase Added to Measured Existing Condition) (Degrees F)
HF K MP 109.76	0.045	61.7°	62.5°	+0.8°	64.8°	2.3°	64.0°
HF J MP 109.69	0.05	58.9°	60.7°	+1.8°	64.9°	4.2°	63.1
HF-G MP 109.47	0.115	58.9°	60.9°	+2.0°	62.1	1.2°	60.1

Data Source: NSR 2014 in preparation at time of publication. Provisional data subject to change. Table values reflect drought condition flows and near total removal of shading vegetation. Values are not adjusted for likely overstatement of impacts by SSTEMP model onsite mitigation measures to retain or replace existing shade.

Crossing-Specific Preliminary Interpretation Based on NSR 2013 Data

Hydrofeature K at MP 104.76 is the uppermost perennial crossing in the East Fork Cow Creek System. This crossing is oriented north-south and is in a small clearing that receives several hours of sunlight each day. Figure 2.4-7a shows that in the existing condition, measured temperature increase by 4.8°F to 61.1°F between WTS 11 and WTS 10 because of solar exposure, then immediately cools to 58.2°F at WTS 9 because of dense shade and possible hyporheic exchange with gravels in the stream bed. Post construction reestablishment of effective shade at Hydrofeature K would likely prevent further temperature increases, and may actually reduce temperatures since there is little shade at this crossing now. Any temperature increase that may be occur with this crossing is expected to follow the measured cooling trend between WTS 10 and WTS 9.

Hydrofeature J at MP 106.69 is the lowest volume crossing in the East Fork Cow Creek system at 0.05CFS. This very small channel is oriented east-west and is shaded most of the day. In the existing condition, water temperatures actually decline by 2.6°F at this location between WTS 8 and WTS 7. Because of the very low stream volume, there is a potential temperature increase of approximately 4.2°F at this location if all of the shading vegetation is removed. This is a narrow channel that would be easily shaded by the placement of large woody debris and willow plantings. NSR 2009 also predicted temperature increases at this location and recommended planning larger conifers to provide shade. If preconstruction levels of shade are reestablished, the predicted temperature increases would likely not occur. Given the very small volume of the stream, the assimilative capacity of the large mainstem East Fork Cow Creek and cold water inputs from

Draft

adjacent tributaries any temperature increase that did occur would likely be unmeasurable in the the mainstem of the East Fork of Cow Creek. Given the inputs of cold water from upstream tribs and the temperature gradients in the East Fork Cow Creek, temperatures at WTS 3 are expected to remain at or near the existing condition.

Hydrofeature G at MP 109.46 is an east-west oriented crossing and is the lowest of the perennial crossings in the East Fork Cow Creek system. In the existing condition, water temperatures decrease from 58.7° at WTS 2 to 58.1° at WTS 1. This is likely the result of groundwater influences from adjacent wetland complexes. Hydrofeature G is at the toe of an ancient but stable earthflow terrain. GeoEngineers identified this site as having possible hyporheic influence (GeoEngineers 2013g). This supported by the measured decrease in temperature at this location. This site is partially shaded by dense willows. A modeled temperature increase of 1.2°F is indicated at this site if all of the shading vegetation is removed. This site could be easily shaded by the placement of large wood and maintenance or replacement of the willows. If the existing shade condition is restored post construction, no temperature increase would be expected. If shade is not restored and the modeled temperature increase of 1.2°F is realized, it would increase the seven day average maximum temperature to 60.1°F. With this increase, water temperature would remain below the ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F).

Discussion

Although exposure to solar radiation may cause temperature increases, temperatures downstream from limited stream-side forested clearings have often been found to cool rapidly once the stream re-enters forested regions (Zwienieck and Newton 1999). Other studies have noted downstream cooling below timber harvest areas as well, but the extent of this cooling is not entirely clear and varies by stream (Moore et al. 2005; Poole et al. 2001). Although there is some debate on the magnitude of cooling provided by riparian vegetation and the extent to which stream temperatures return to non-cleared temperature levels after exiting a cleared area, studies emphasize that riparian buffers assist in maintaining water temperatures (Correll 1997; Gomi et al. 2006). Generally, changes in temperature, especially in small streams, may recover quickly from cooler surrounding conditions downstream (e.g., streambed cooling, evaporation, hyporheic inflows, shade). This was validated by stream temperature data recorded on the Umpqua National Forest in 2013. Preliminary results from field measurements of existing conditions on the Umpqua National Forest showed decreasing stream temperatures of as much as -7.6°F / 100 feet with an overall average over 2,040 feet of the East Fork of Cow Creek of - 0.1°F / 100 feet. (NSR 2014, in preparation). The presence of number of small wetlands adjacent to the stream channel provide evidence of likely groundwater interactions. Most of this 2,040 foot reach also has substantial shade. This suggests the retention of shading structures, or at least partial shade, may greatly reduce increases in stream temperature. This data also supports the NSR 2009 finding that potential temperature increases are partially offset by cooling from groundwater interactions in the stream channel.

Observations as part of both NSR 2009 and NSR 2014 show that large woody debris and low-growing willows, huckleberries and other brush species can provide effective shade for small, narrow channels. For example Hydrofeature G at MP 109.47 has dense overhanging willows and other brush species that shade much of the channel. In many cases, low growing brush outside of the immediate crossing construction area can be maintained thus minimizing shade loss. In the

mainstem of the East Fork of Cow Creek, large woody debris provides significant shade and creates a complex channel structure with high retention of sand and gravel that helps maintain cooler water temperatures. As described in the ECRP and waterbody crossing requirements for the project, all LWD and boulders removed from the crossing area would be replaced during site restoration and low growing brush will be retained where it is possible to do so. Many of the channels crossed by the PCGP are very small, and could easily be shaded by the placement of large woody debris, larger logs and willow plantings. Where site-specific modeling suggests temperature increases may be possible, a restoration plan to reestablish pre-crossing shade conditions using willows, logs, boulders and large woody debris will be prepared for each of the perennial stream crossings NFS lands. With the maintenance of existing shading brush on small channels, the placement of large woody debris and the replanting of willows and other brush species, downstream temperatures are expected to be very close to the existing condition and to remain below ODEQ thresholds on the East Fork of Cow Creek because these measures would provide immediate and effective shade. In small first and second order streams any temperature increase that does occur would likely be masked by the assimilative capacity of larger streams at the stream network scale (NSR 2009).

In all cases in the South Fork of Cow Creek, groundwater influences, downstream shade and comingling with other tributaries is expected to limit any temperature increase to the site scale, with no accumulation of temperature increases downstream. However, since there are four perennial stream crossings in the same stream system in less than a mile and there is a TMDL threshold, it is appropriate to require project implementation and effectiveness monitoring. As a final measure to ensure that temperature standards are maintained, the Forest Service would require Pacific Connector to monitor temperatures above and below crossings of perennial streams during and post construction using Forest Service temperature protocols until effective shade is reestablished at perennial stream crossings or until it is evident that stream temperatures remain unaffected. If temperatures or temperature changes exceed thresholds established by Oregon DEQ, Pacific Connector would be required to develop additional mitigations by agreement with the Forest Service to reduce project impacts on stream temperature. These measures may include placement of large logs so as to provide effective shade and reduce wetted stream width, use of limbs and small logs bridging the channel to provide effective shade or other methods as directed by the Forest Service.

Pacific Connector also assessed potential impacts to stream temperature. Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on BLM and NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75 foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right of way width of 75 feet. Given that mitigation for loss of effective shade would occur, and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field (GeoEngineers 2013f: 26).

5. Whether ground disturbance associated with the PCGP construction could mobilize naturally occurring mercury found in the soils at or near crossings in the East Fork Cow Creek.

The Forest Service contracted with a geologist consultant to collect soil and stream sediment samples for analytical testing and reporting of mercury and other naturally-occurring minerals along a 2,000-foot section of the proposed pipeline route between MP 109 and the East Fork Cow Creek (Broeker 2010b; GeoEngineers 2013e). Geochemical analysis of the soil and stream sediment samples have been determined to have very low to nominal concentrations of naturally occurring mercury mineralization. The mercury level at one of the stream sediment sites was 0.29 part per million, which was above the Level II screening level value of 0.1 part per million for invertebrates (ODEQ 1998, cited in GeoEngineers 2013d). In order to prevent this naturally-occurring mercury from mobilizing during and after construction, additional erosion control measures developed with ODEQ and monitoring would be conducted at these sites. Additional erosion control measures include establishment and The proposed pipeline construction activities by Pacific Connector within the upper East Fork Cow Creek watershed are not anticipated to disturb and expose soils and bedrock strata that contains more than low amounts of natural occurring mercury mineralization; and any sediment that is generated is not likely to reach the aquatic environment due to implementation of short-term and permanent mitigation measures outlined in Pacific Connector's ECRP and as listed in (GeoEngineers 2013e). Pacific Connector would conduct periodic water quality monitoring during and post construction to ensure that mercury is not mobilized.

Table 2.4.8.4-2 compares the project effects to the historic range of variability for relevant ecological processes in the Upper Cow Creek watershed. These processes have been substantially altered by fire suppression, timber harvest, and road construction.

Draft

TABLE 2.4.8.4-2

Project Effects and Relevant Ecological Processes Described in the Upper Cow Creek Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	The Upper Cow Creek watershed has a high frequency of landslides in granite and schist soil. When high intensity rainfall events or rain-on-snow events overlapped with areas burned in high intensity fires, surface erosion and mass wasting likely increased substantially, resulting in pulses of coarse sediments and large woody debris to stream channels. Ancient earthflow features exist in the East Fork of Cow Creek, but they are currently stable (NSR 2014, in preparation)	All but 1 mile of the 4.78 miles of PCGP corridor in Upper Cow Creek is on a ridgetop. The 1 mile stretch from MP 109 to 110 in the South Fork of Cow Creek subwatershed crosses ancient but stable earthflow terrains. Application of measures described in the ECRP and Best Management Practices including maintenance of effective ground cover in accordance with UNF land management plan standards (table 1.3.1.2-1) during construction are expected to minimize potential for sediment transport to streams. Dry dam-and-pump stream crossing methods described in Section 1.3.1 are expected to limit sediment during construction (Section 1.3.1.2). Transport and deposition are currently roughly in balance in the EF of Cow Creek (Forest Service 1995a: 49). Sediment produced by the PCPG is expected to be short-term during the period of construction and minor (see Section 1.3.1.2). The project is not expected to reactivate earthflow terrains or produce sediment amounts that would alter the current balance in the East Fork Cow Creek (Hanek 2011; NSR 2014, in preparation). Project impacts area expected to remain within the range of natural variability for the Klamath Province and the erosionally active Cow Creek Watershed, however potential exists for aggradation of sediment from multiple stream crossings. Therefore, additional post construction sediment monitoring that may require actions by Pacific Connector would be incorporated into the terms of the Right of Way grant.
Ecological Succession / Vegetative Condition	Frequent, low intensity fire with infrequent high intensity stand replacement fires in dry years created a mosaic of open forest dominated by Douglas-fir and pines that ranged from 45% to 75% late successional forest (Forest Service 1995). Landslides associated with unstable granite and schist soils occasionally intersected stream channels creating openings in stream-side vegetation. Fire Suppression and timber management have reduced and fragmented late successional stands reducing patch size, shifting species dominance to white fir and increasing early and mid-seral proportions of the drainage. LSOG acres in both upland and riparian areas are below historic averages. Vegetative condition throughout the Upper Cow Creek watershed has been significantly altered by timber management activities.	No Riparian Vegetation would be affected by the PCGP in the Dismal Creek Subwatershed. The PCGP corridor would affect 10.83 acres or 0.11% of Riparian Reserves of riparian vegetation in the South Fork Cow Creek Subwatershed. A total of approximately 2.8 acres (0.14%) of 1,595 acres of LSOG in Riparian Reserves in the South Fork Cow Creek subwatershed would be cleared at two perennial stream crossings in the construction corridor. The remaining acres of affected Riparian Reserves are early and mid-seral forest (table 2.4.1.8-4). Loss of LSOG vegetation in the corridor is a long term impact, but minor in scale, and well within the historic range of vegetative change given the fire and landslide history of the Upper Cow Creek watershed (see WA discussion of fire and landslides). The federal lands on the Upper Cow Creek watershed remain well above the 20% LSOG threshold stipulated by the NWFP.

Draft

TABLE 2.4.8.4-2

Project Effects and Relevant Ecological Processes Described in the Upper Cow Creek Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Peak Flow Processes	Most of Upper Cow Creek lies in the Transient Snow Zone where rain-on-snow events can increase frequency and intensity of peak flows. Harvest units and roads have likely increased the frequency and intensity of peak flow events.	The Upper Cow Creek watershed Analysis recommended site-specific evaluation of the potential for peak flows as a result of canopy removal. The PCGP would remove canopy on about 75.6 acres or about 0.3 percent of USFS lands in the watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small proportion of the watershed affected by the project (See EIS Chapter 4.4, also FERC, 2009). Additionally, all but approximately one mile of the PCGP corridor lies on ridgetop locations that have minimal interactions with Riparian Reserves. The portion of the project in the South Fork of Cow Creek that is not on ridgetops is unlikely to contribute to peak flows because hydrologic connectivity is minimized by recontouring slopes, decompacting soils, maintaining effective ground cover, and other measures in the ECRP. Peak flows may increase in the transient snow zone where less than 75 percent of drainage is hydrologically recovered because of interactions of roads with stream crossings. Although the project area is in the transient snow zone, more than 85 percent of the USFS lands in the watershed are hydrologically recovered (Forest Service 1995a: 95, table 14), and the PCGP affects substantially less than 1 percent of the drainage. It is highly improbable that the PCGP could affect peak flows in the Upper Cow Creek watershed. (See also EIS Section 4.4)
Stream Temperature	Maximum water temperature on the East Fork Cow Creek above the confluence with the South Fork Cow Creek was 55-60 degrees F or below. The Umpqua basin watershed Council (2000) collected temperature data from 89 continuously sampling data loggers from sites throughout the Cow Creek watershed during the summer of 2000. Data from the East Fork Mouth, downstream of the PCGP project crossing, indicated that the maximum temperature was 61.6 degrees F. There were 74 days where the temperature exceeded 55 degrees F, but there were no days where the temperature exceeded 64 degrees F.	See Section 2.4.8.5, table 2.4.8.5-2 and previous discussion in this section. A site-specific evaluation of effects of the PCGP on stream temperature showed that with mitigations, stream temperatures at the site scale would be minor or not detectable with no impact at the network scale, and would not cross thresholds established by the State of Oregon in a TMDL for temperature in the Umpqua basin (NSR 2009). Temperatures are expected to remain within the range of natural variability although there may be minor increases at the point of maximum impact. See also GeoEngineers 2013f: 26.
Aquatic Habitat and Stream Channel Complexity	Stream channels had 40-60 pieces of LWD / mile with >30% pool habitat by area. Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the stream banks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and stream bank vegetation was indicative of relatively stable stream banks and channels that were relatively resilient during floods. Past management practices have simplified channel conditions, removing LWD from channels, and eliminated future sources of LWD.	During construction, the PCGP project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale, and are minor and short-term (typically 1 to 5 days per crossing).

2.4.8.5 Compliance with Land Management Plans

Project compliance with Standards and Guidelines contribute to compliance with the ACS. Where a project does not comply with a Standard and Guideline the evaluation must show that non-compliance does not prevent attainment of the ACS.

TABLE 2.4.8.5-1

Compliance with Standards and Guidelines

UNF /NWFP Standards and Guidelines	PCGP Compliance
LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, etc. Specifically, in the East Fork of Cow Creek, PCGP has agreed to maintain 100% effective ground cover to prevent surface erosion and minimize risk of mobilizing naturally occurring mercury.
RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Upper Cow Creek watershed, therefore the biological, physical, and chemical integrity of these systems would remain unaffected from hydrostatic withdrawal activities.
RF-2: Road construction standards and guidelines.	The existing transportation system in the East Fork of Cow Creek would be adequate for construction of the project. No new temporary or permanent access roads are planned in the East Fork of Cow Creek watershed.
RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction.
RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented. Additionally, PCGP would install four "fish friendly" crossings which meet the current biological opinions of the USFWS and/or NMFS to replace culverts that currently block fish access and limit connectivity of aquatic habitats.
RF-7: Transportation Management Plan development.	The TMP meets all the requirements of RF-7.
WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	The PCGP project affects Survey and Manage species within the Cow Creek watershed. Such effects would be inconsistent with management recommendations in the 2001 ROD to protect known sites of Survey and Manage species. However, the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective

TABLE 2.4.8.5-1 **Compliance with Standards and Guidelines**	
UNF /NWFP Standards and Guidelines	**PCGP Compliance**
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.	NFS and BLM lands in the Cow Creek Watershed are currently 36% LSOG and exceed this threshold.
New Developments in LSRs	Standards and Guidelines for New Developments in LSR (NWFP C-17) require effects of developments be minimized and mitigated. Reallocation of matrix lands to LSR (UNF-4) is a mitigation to partially meet this Standard and Guideline. See Appendix M.
UNF Standards and Guidelines for Effective Ground Cover (UNF Forest Plan IV-67)	Standards and Guidelines for Effect Ground Cover (UNF Forest Plan IV-67) have been incorporated into the ECRP and are a requirement for the project (table 1.3.1.2-1 and ECRP table 10.15-1). The PCGP would maintain 100% effective ground cover in affected Riparian Reserves in the East Fork of Cow Creek, which exceeds the requirements of this Standard.
UNF Standards and Guidelines Forest Wide Fisheries #1 (LRMP IV-33)	Standards and Guidelines for maintenance of effective shade cannot be met. A Forest Plan amendment (UNF-1) is proposed to waive application of this Standard and Guideline.
UNF Prescriptions C2–II (LRMP IV–173) and C2–IV (LRMP IV–177)	Aquatic prescriptions prohibit utility corridors from running parallel to stream corridors. The PCGP runs parallel to the East Fork of Cow Creek at MP 109.5 to 109.6. A Forest Plan Amendment (UNF-2) is proposed to waive application of this Standard and Guideline.
UNF Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67)	The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20 percent. The PCGP cannot meet this standard. A Forest Plan Amendment (UNF-3) is proposed to waive application of this standard.

Relationship of Proposed Forest Plan Amendments to the ACS

In the Upper Cow Creek fifth-field watershed, four amendments to the UNF Forest Plan have a nexus with the ACS. The section addresses whether implementation of these Forest Plan amendments would prevent attainment of the ACS.

UNF-1. Amends Standards and Guidelines for Fisheries and Water Quality to allow the removal of 3 acres of effective shading vegetation where perennial streams are crossed by the PCGP.

Forest-Wide Fisheries Standard and Guideline #1 (UNF Forest Plan IV-33) states:

> Maintain all effective shading vegetation on perennial streams. Utilize silvicultural practices to establish shade on perennial streams where currently lacking.

The purpose of this Standard and Guideline is to prevent stream temperature increases caused by the removal of effective shade. The UNF Forest Plan clearly allows utility corridors to cross riparian areas; however, the PCGP corridor cannot be constructed without removal of effective

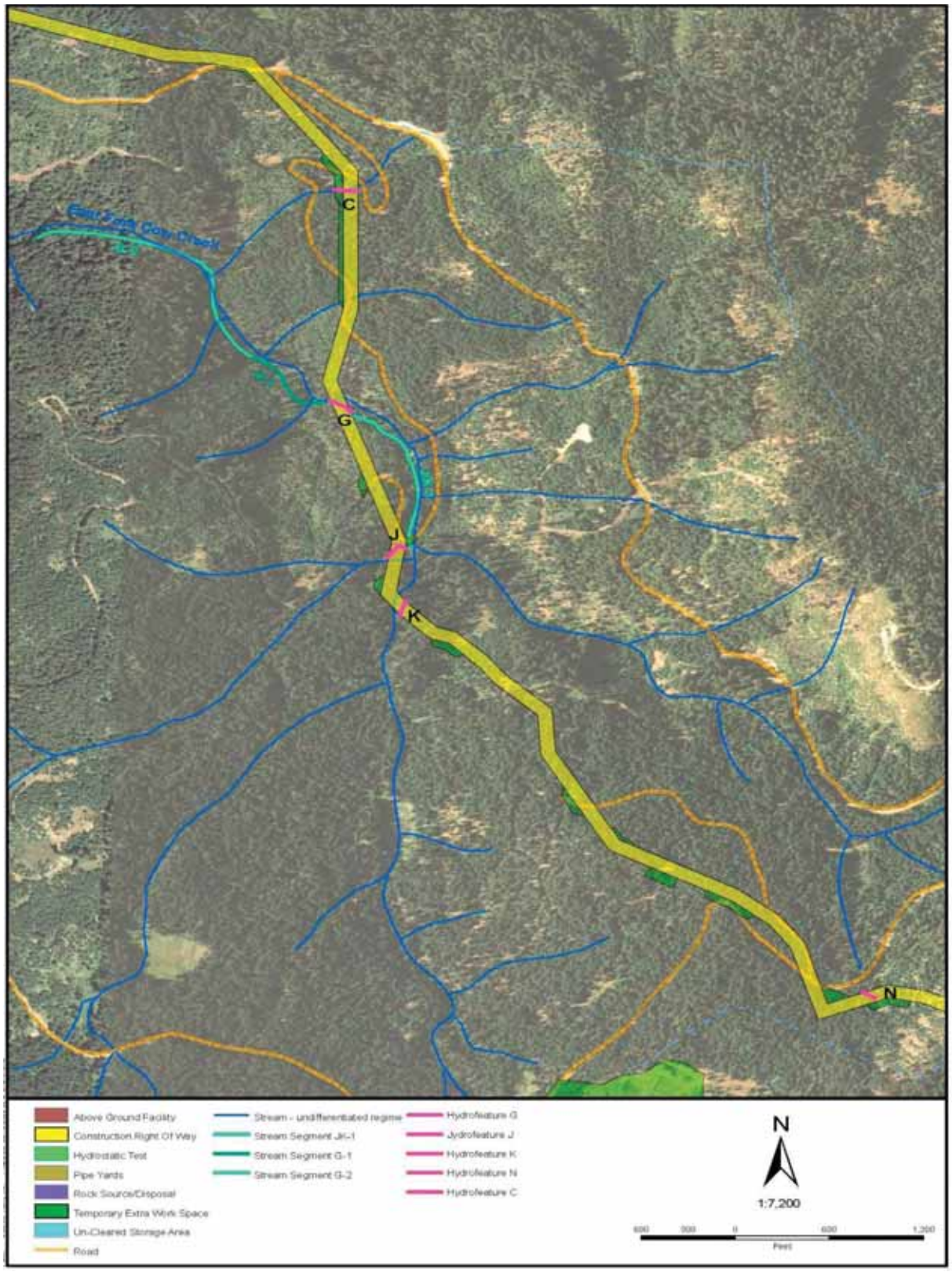
shade. Amendment UNF 1 allows the removal of effective shade where the PCGP corridor crosses perennial streams on the UNF.

See discussion of effects of shade removal related to stream temperature in Section 2.4.8.4.

Based on the limited impact on stream temperature, conditions created by this amendment are not are not likely to prevent attainment of ACS objectives in the Upper Cow Creek waterhed.

Draft

Figure 2.4.-8 Perennial Stream Channel Crossings in the East Fork Cow Creek Drainage



UNF-2. Amends Prescriptions C2–II (LRMP IV–173) and C2–IV (LRMP IV–177) to allow the PCGP to run parallel to a Class II stream for approximately 0.1 miles (approximately 500 feet).

From approximately MP 109.66 to MP 109.76, the PCGP runs parallel to the East Fork of Cow Creek. The UNF Forest Plan Management Prescriptions for riparian areas state:

> Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores in the riparian unit.

The purpose of this Standard and Guideline is to minimize the loss of riparian habitat from utility corridors. Removal of Riparian Reserves can damage aquatic habitats by removing coarse wood that may contribute to aquatic habitats in the future, removing shade and causing increases in temperature and increases in sediment by exposing soil or removing filtering vegetation. To minimize the total number of stream crossings, utilize optimum crossing locations, and minimize overall disturbance, the PCGP route cannot avoid running parallel to the East Fork of Cow Creek from MP 109.66 to 109.76. The PCGP would require removal of approximately 0.8 acre of Riparian Reserve on the southwest side of the East Fork of Cow Creek. In this circumstance, there is little likelihood stream temperatures or sediment deposition would occur or that this action would prevent attainment of ACS objectives because:

- Approximately 300 feet or 94 percent of the reach between MP 109.66 (Hydrofeature J) and 109.76 (Hydrofeature K) of effective shade remains on the southwest side of the East Fork of Cow Creek so it is highly unlikely temperatures would increase from the action of paralleling the stream.
- The ECRP requires that 100% effective ground cover be established and maintained. In addition, water bars would be installed as needed.

Based on this evaluation, it is unlikely that this amendment would prevent attainment of ACS objectives in the Upper Cow Creek watershed.

UNF-3. Allows the PCGP to exceed restrictions on detrimental soil conditions in the project right-of-way.

Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67), states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20 percent.

The PCGP would likely result in a degraded soil condition in an estimated 30 to 70 percent or 22 to 53 acres of the project right-of-way in the Upper Cow Creek fifth-field watershed due to displacement and compaction following completion of corridor construction and rehabilitation (Orton 2010). Approximately three of those acres would likely be in Riparian Reserves. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing Forest Plan Standards and Guidelines allow up to 20 percent of the PCGP corridor (about 15 acres of the corridor in the watershed) to be in a degraded

Draft

soil condition on completion of a project. Thus, the proposed amendment allows an estimated additional 7 to 38 acres or 0.03 to 0.16 percent of the 24,151 acres (NFS lands only) of the watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions may have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery.

Environmental consequences associated with 7 to 38 acres of additional detrimental soil conditions over the right-of-way in the Upper Cow Creek fifth-field watershed include:

- A potential localized increase in sediment mobilization. PCGP selected the route to avoid areas with high risk of geologic hazards. No unstable or potentially unstable terrain has been identified that pose a threat to the PCGP (GeoEngineers 2009). The PCGP does cross earthflow terrains in the East Fork of Cow Creek, but routing avoided areas of instability on the affected earthflow terrains (Hanek 2011; NSR 2014, in preparation). To ensure that the PCGP project does not trigger instability or mobilize sediment, a site-specific supplement to the ECRP has also been prepared for this area. Erosion control measures associated with this plan include:
    - (1) Within Riparian Reserves for all hydrologic features crossed by the pipeline between MP's 109 and 110 provide 100% post-construction ground cover on all disturbed areas. Wood fiber is the preferred material. In addition, construct effective waterbars at 50-foot intervals. These measures are have two purposes: 1) preventing soil erosion and 2) preventing the mobilization of naturally occurring mercury found this watershed.
    - (2) At hydrologic features G, J, and K assure that erosion control measures are in place before the fall rains and monitor for rilling, gullying and other forms of active erosion that may transport sediment into the aquatic environment. If rilling or gullying is occurring that may result in sediment transport into the aquatic environment, improve erosion control measures to preclude sedimentation.
    - (3) Inspect the construction corridor for sedimentation after each significant storm event (which would be more frequently than a bank-full event) or whenever there is a visual sediment plume downstream. If the sediment source is originating from the pipeline corridor, improve erosion control measures to preclude sedimentation. An authorized Agency representative would provide information to Pacific Connector regarding these events.
- As noted in the Upper Cow Creek watershed Analysis, the East Fork of Cow Creek already has a high background sediment load. As a result of the dispersal of effects due to the linear nature of the project, maintenance of effective ground cover, the required application of Best Management Practices, and implementation of site-specific erosion control methods, it is highly unlikely that amending the Forest Plan to exceed the soil disturbance thresholds would result in the mobilization of sediment that would change the existing balance of

Draft

sediment mobilization and transfer or would exceed the natural range of variability in this watershed (NSR 2014, in preparation). (See Section 1.3.1.1 for a general discussion of erosion control measures.)

- A potential localized increase in peak flows. The Upper Cow Creek watershed Analysis recommended site-specific evaluation of the potential for peak flows as a result of canopy removal. The PCGP would remove canopy on about 75 acres or about 0.3 percent of USFS lands in the watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small proportion of the watershed affected by the project (See EIS Section 4.4). Additionally, all but approximately one mile of the PCGP corridor lies on ridgetop locations that have minimal interactions with Riparian Reserves. The portion of the project in the East Fork of Cow Creek that is not on ridgetops is unlikely to contribute to peak flows because hydrologic connectivity is minimized by recontouring slopes, decompacting soils, establishing effective ground cover, and other measures in the ECRP. Peak flows may increase in the transient snow zone where less than 75 percent of drainage is hydrologically recovered because of interactions of roads with stream crossings. Although the project area is in the transient snow zone, more than 85 percent of the USFS lands in the watershed are hydrologically recovered (Forest Service 1995a: 94 table 14), and the PCGP affects less than 1 percent of the drainage. As a result, it is highly improbable that the PCGP would change flow regimes from current conditions or from those described in the Upper Cow Creek watershed Analysis.

- A potential loss of site productivity, which may slow vegetative recovery. Granitic and serpentine soils such as those found in the Upper Cow Creek watershed are typically low in productivity. Earthflow terrains such as those found in the East Fork of Cow Creek (UNF Soil Type 25) are widely variable, depending on parent materials, but tend to have higher clay content and are generally more productive than granite and schist soils. Mechanically decompacting the soil to a minimum depth of 20 inches and re-establishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. The PCGP project would decompact the corridor, fertilize disturbed areas, re-establish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and coarse woody debris back across the site to provide for long-term nutrient cycling as required in the ECRP. Additionally, the Forest Service may require soil remediation with biosolids or other organic material to augment soil productivity.

Off-site mitigations contribute to further reducing these watershed effects. Road decommissioning is planned on 4.44 miles (approximately 31 acres) in the South Fork of Cow Creek sixth-field watershed as part of the mitigation plan for the PCGP project. Decommissioning roads reduces sediment by re-establishing effective ground cover and increasing infiltration. This also contributes to reducing peak flow effects by reducing road-stream interactions, increasing infiltration, and re-establishing natural drainage. This reduces compaction and helps offset the estimated 22 acres of PCGP right-of-way in the Upper Cow Creek watershed that may be in a degraded soil condition on completion of the project.

Based on this evaluation, it is unlikely that this amendment would prevent attainment of ACS objectives in the Upper Cow Creek watershed.

UNF-4. Re-allocates approximately 585 acres from matrix to LSR.

Amendment UNF-1 transfers approximately 585 acres of matrix land in the South Fork of Cow Creek to LSR. The purpose of this amendment is to offset effects of the PCGP on the LSR land allocation; however, this re-allocation also benefits aquatic ecosystems.

Under this amendment, the matrix lands re-allocated to the LSR land allocation would be managed for late successional and old-growth stand characteristics. Late-Successional Reserves are also an important component of the Aquatic Conservation Strategy. The standards and guidelines under which Late-Successional Reserves are managed provide increased protection for all stream types. Because the area selected for re-allocation to LSR has late-successional characteristics, it may offer core areas of high-quality stream habitat that act as refugia and centers from which degraded areas can be recolonized as they recover. This amendment contributes to meeting multiple ACS objectives in the Upper Cow Creek watershed.

2.4.8.6 Off-Site Mitigations

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management objectives are achieved. These projects also contribute to the "Maintain and Restore" objectives of the ACS. The Forest Service and PCGP have entered into an Agreement in Principle to accomplish off-site mitigation work in Upper Cow Creek as shown in table 2.4.8.6-1. Mitigation measures were developed from the recommendations of watershed assessments, late successional reserve assessments and the 2008 Northern Spotted Owl Recovery Plan. Mitigation measures in Upper Cow Creek are focused on integrated projects that are intended to:

- Restore natural sediment regimes by reducing sediment contributions from roads and potential high-intensity fire,
- Restore historic stand and fuel density levels to selected stands
- Restore elements of aquatic and terrestrial habitats and
- Restore access to aquatic habitats that are currently blocked by culverts.

TABLE 2.4.8.6-1

Off Site Mitigations in the Upper Cow Creek Watershed

Project	Amount	Rationale
Fish Friendly Culvert Replacement at Applegate Creek, Beaver Creek, Beaver Creek Trib., and EF Cow Creek	4 culverts	Poor culvert design, erosion at outlets and lack of maintenance of resulted in several road - stream crossings that block access to upstream aquatic habitats. Culvert replacements with fish-friendly designs would benefit fish and other aquatic biota by reconnecting habitats and reducing sediment contributions from these locations. This is responsive to ACS objectives 1, 2, 3 and 5 (figure 2.4-9).
Road Barricades and Stormproofing Road Decommissioning	2.61 miles 4.34 miles	Road density and lack of road maintenance were identified as major sources of sediment in the Cow Creek watershed assessment. Decommissioning, barricading and storm-proofing roads reduce road related sediment contributions. This is responsive to ACS objectives 4 and 5.

TABLE 2.4.8.6-1 **Off Site Mitigations in the Upper Cow Creek Watershed**		
Project	**Amount**	**Rationale**
Density Fuels Reduction - Underburning	1,586 Acres 410 Acres	Forest stands in Upper Cow Creek are often overstocked with unnaturally high fuel loads that make them susceptible to high intensity fire. Stand density and underburn fuel reduction projects were designed to reduce fuel loading and stand density in overstocked, fire-prone stands to historic ranges to reduce the risk of high intensity stand replacement fire. Since these types of fires can be a major cause of surface erosion and mass wasting in granite and schist soils, this contributes to reestablishing a natural sediment regime over time by reducing the probability of a large, high intensity fire in this area. This is responsive to ACS objectives 1, 2, and 5,
Terrestrial LWD LSR Snag Creation Matrix Snag Creation	61 Acres 91 Acres 13 Acres	Logging, fire suppression and fuels treatments have reduced the numbers of snags and pieces of LWD in Upper Cow Creek. Portions of snag creation and terrestrial LWD projects in matrix and LSR would occur within Riparian Reserves. This would contribute to ACS objectives for restoring snag levels down wood to historic ranges in treated areas and is responsive to ACS objectives 1 and 8.
Matrix to LSR Land Reallocation	585 Acres	The Pacific Connector project crosses LSR acres in Upper Cow Creek and adjacent watersheds. Matrix to LSR Reallocation provides aquatic protections by managing upland areas for LSOG conditions. This is responsive to all 9 ACS objectives.

Figure 2.4-9 East Fork of Cow Creek Culvert. This culvert currently blocks migration of fish and other aquatic biota. It would be replaced by a "fish-friendly" design as part of the mitigation plan proposed by Pacific Connector.

2.4.8.7 Cumulative Effects

Activities on NFS Lands

The Forest Service manages about 51 percent of the Upper Cow Creek watershed. Projects on federal lands that would contribute to cumulative effects with the PCGP are shown in table 2.4.8.7-1

TABLE 2.4.8.7-1

UNF Projects That Contribute to Cumulative Effects with the PCGP in the Elk Creek South Umpqua Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Resource
UNF	Upper Cow Creek	South Fork Cow Creek	Proposed Tiller Aquatic Restoration Project. Published in program of work 2010. NEPA analysis on going. Expect implementation to begin in 2013.	1 culvert replacement	riparian vegetation, road network, fisheries / aquatic habitat, water quality
UNF	Upper Cow Creek	South Fork Cow Creek	Current Grazing	7757 ac. Cattle grazing	Upland and riparian vegetation, fisheries / aquatic habitat, water quality

These activities are expected to be consistent with the Standards and Guidelines and objectives of the Umpqua National Forest Land and Resource management plan.

Activities on Private Lands

Private lands comprise about 28 percent of the Upper Cow Creek watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Approximately 270 acres of clearcut timber harvest are currently anticipated in the Dismal Creek subwatershed of Upper Cow Creek. The Pacific Connector route is on a ridgetop in the Dismal Creek subwatershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.3 percent of the NFS lands and 0.11 percent of private lands in the Upper Cow Creek watershed (table 2.4.8.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Elk Creek South Umpqua watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14

2.4.8.8 Project Effects Compared by ACS Objectives

Table 2.4.8.8-1 evaluates project effects against each of the ACS objectives. NFS lands where the ACS applies comprise about 51% of the Upper Cow Creek watershed (table 2.4.8.8-1). Timber harvest and removal of LWD from creek channels has reduced structural complexity of the aquatic

Draft

habitat and its ability to retain sediments. Chronic, fine-grained sediment, primarily related to roads have negatively affected aquatic habitats. The presence of roads has segregated some stream reaches from upslope habitats that are needed for replenishment of LWD.

Through application of Best Management Practices and the FERC Wetland and Waterbody Plan, sediment transport would be minimized, the physical integrity of riparian and instream areas would not be compromised, and instream flow regimes would be maintained. No riparian-related Survey and Manage species would be affected by project construction and operation.

TABLE 2.4.8.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Upper Cow Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed-scale features that would be affected by the Project. There would be four perennial and two intermittent stream crossings in the South Fork Cow Creek subwatershed. (Note that Hydrofeature N at MP 111.01 is a perennial stream but because of an upstream diversion, it is dry in the summer. It is counted here has an intermittent stream since that it is its current condition). One small shrub dominated wetland is also crossed. Riparian Reserves associated with1 perennial stream and 6 forested wetlands are clipped. The Project corridor is located primarily in early or mid-seral forests (table 2.4.8.1-4) and largely on or near ridgetops to minimize impacts on aquatic habitats. The Project corridor would affect 75.61 acres or about 0.22 percent of BLM and NFS lands in the Upper Cow Creek watershed and about 10.83 acres or 0.07 percent of the Riparian Reserves within the watershed. Impacts to aquatic systems are expected to be short-term and minor and limited to the project scale because of application of Best Management Practices and erosion control measures. LWD cleared in construction of the corridor would be used to stabilize and restore stream crossings. Off-site mitigation measures including road stormproofing and decommissioning and installation of fish-friendly culverts are expected to improve watershed conditions in the Upper Cow Creek watershed (section 2.4.8.6). While there are long-term changes in vegetation in Riparian Reserves from construction clearing of the corridor, these would be minor in scale and well within the range of natural variation given the fire history of Upper Cow Creek (section 2.4.8.4).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Upper Cow Creek watershed other than during the construction period because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the Wetland and Waterbody Crossing Plan. In the short-term during construction connectivity would be disrupted. At each crossing, the corridor would be necked down to 75 feet wide. Bed and bank disturbances associated with equipment and trenching are small (<15 feet wide). After construction all disturbed areas would be returned to their approximate original contours to restore preconstruction contours and drainage patterns. The temporary construction right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Connectivity would be improved by installation of fish-friendly culverts at 4 sites currently preclude passage of aquatic organisms (section 2.4.8.6). The residual levels of disturbance are anticipated to be well within the range of natural variability in the Klamath–Siskiyou Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried, and the actual area of bank and stream bottom disturbance associated with equipment crossing and trenching is small at each crossing (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and

TABLE 2.4.8.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Upper Cow Creek Watershed

ACS Objective	Project Impacts
	banks would be returned to pre-construction conditions, consistent with the POD requirements. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained, although in the short-term (during construction) elements of the aquatic system could be disturbed. This level of disturbance is well within the range of natural variability that for watersheds of the Klamath-Siskiyou Province.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Mercury from abandoned mercury mines in the EF Cow Creek is a known issue. Broeker (2010b) and Geoengineers (2013) assessed potential risk of release of mercury from disturbance of affected sediments. Mercury concentration of 0.29 PPM, which is in exceedance of ODEQ threshold of 0.1 PPM, was detected in soil and stream sediment samples at one site. Special measures including maintenance of 100% effective ground cover have been adopted as recommended by Oregon Department of Environmental Quality. As a result, the presence of inorganic mercury is not anticipated to cause any health risk. Minor amounts of sediment would be mobilized during construction, particularly during the dry open-cut crossing dam and pump crossing of the East Fork of Cow Creek and its perennial tributaries (GeoEngineers 2013). Water quality impacts from sediment are expected to be short-term and limited to the general area of construction (section 1.3.1). No long-term impacts on water quality are expected because of application of the ECRP including maintenance of effective ground cover (section 1.3.1 and previous discussion) and Best Management Practices during construction. Approximately 3.1 total acres of effective shading vegetation would be removed at 4 perennial stream crossings. A site-specific shade analysis conducted by Pacific Connector (NSR 2009) showed minor temperature increases were possible at the project scale but no impacts would occur beyond the immediate area of construction, and there were no temperature impacts at the stream network scale. Water quality is expected to remain within the range that supports aquatic biota.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Upper Cow Creek watershed sediment regime was historically characterized by pulse-type disturbances (Forest Service 1995; Everest and Reeves 2007). The East Fork of Cow Creek, a drainage in the South Fork Cow Creek Subwatershed is characterized by the Cow Creek watershed Assessment as being “in balance” for sediment transport and deposition. The Project is not likely to alter these conditions. Eighty percent (3.73 of 4.73 miles) of the Project in the Upper Cow Creek watershed is on ridgetops with little or no aquatic connectivity. Site-specific field reviews by geologists show the project is unlikely to cause landslides or activate currently stable earth-flow terrains because unstable areas have been avoided (GeoEngineers 2009; Hanek 2011; Koler 2013). Surface erosion and sediment transport to streams would be minimized because Project would maintain 100 percent effective ground cover, effective sediment barriers and other erosion control measures as needed (See the sediment discussion at the beginning of this section). Sediment generated during construction is expected be minor, and limited to the general area of construction by the use of dry, dam-and-pump measures that isolate the crossing from flowing water during construction (section 1.3.1). The Project is not expected to alter the balance of sediment transport and storage in the East Fork of Cow Creek. The Project is not expected to alter either the pulse-type disturbance or surface erosion sediment regimes of the Cow Creek drainage (section 2.4.8.4). A pulse of sediment could be observed following the first seasonal rain, but this is likely to dissipate within a few hundred feet and would be indistinguishable from background levels.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	Instream flows would be interrupted for a short period of time during installation of dams during dam and pump crossings. The area of construction that is between upstream and downstream dams would be dewatered for during the actual crossing construction. During construction, water would be pumped around the construction site to maintain downstream flows. It is possible that there may be local increases in runoff from canopy removal but at the watershed scale flow regimes would not be altered by the Project because of the small scale of the Project relative to the watershed, the relatively high proportion (85 percent) of the watershed that is hydrologically recovered and the lack of connectivity of most of the route to any

TABLE 2.4.8.8-1 **Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Upper Cow Creek Watershed**	
ACS Objective	**Project Impacts**
	stream network. See the discussion of peak flow processes in section 2.4.8.4 for additional information.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project corridor clips the Riparian Reserve of six forested wetlands and crosses one delineated wetland. Trench plugs would be installed on each side of these wetlands as needed to block subsurface flows and maintain water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. Regardless, Project construction may have short-term impacts on water tables in these isolated forest wetlands. These site-specific impacts would be minor (i.e. Limited to the general area of construction) and are not connected to larger wetland areas, and may also regulated under Section 404 of the Clean Water Act. By restricting crossings to the dry season (July 1 to Sept. 15), possible impacts on water tables of these wetland areas are expected to be minor and short-term.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Upper Cow Creek watershed would be minor. In the short term, all vegetation would be removed from the Project corridor. About 8.02 of the 10.83 acres of vegetation within the Riparian Reserve to be cleared in the Project corridor is early or mid-seral vegetation (table 2.4.8.1-4). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Overall, Project construction would affect ~ 0.07 percent of the Riparian Reserves in the watershed (table 2.4.8.1-3). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. These restoration efforts, along with the limited impacts on which they are directed, would maintain and restore biological and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Upper Cow Creek watershed would be minor (10.83 acres or 0.07 percent of the Riparian Reserves in the watershed) (table 2.4.8.1-3). Most of the cleared Riparian Reserve vegetation is upland second-growth forest (table 2.4.8.1-4). Existing herbaceous and brush cover within the Project clearing limits would be maintained to the extent practicable. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. . The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.4.8.9 Summary

The South Fork Cow Creek subwatershed has 4 perennial stream crossings within one mile. This is the highest number of perennial stream crossings in one subwatershed on BLM and NFS lands. Construction of the Project in the Upper Cow Creek watershed has high potential for impacts that could prevent attainment of ACS objectives particularly as related to sediment, water temperature and mobilization of naturally occurring mercury (sections 2.4.8.4 and 2.4.8.5). The Project has addressed these issues as follows:

- **Project Routing**—Approximately 80 percent of the route in the Upper Cow Creek watershed is on a ridgetop with little or no connectivity to aquatic habitats or Riparian Reserves. Between MPs 109 and 110 in the South Fork Cow Creek subwatershed, the route has been selected and modified to avoid potentially unstable areas. The Forest Service has participated extensively in routing of the Project and concurs that the location is unlikely to trigger mass wasting or excessive surface erosion (sections 2.4.8.4 and 2.4.8.5).

- **Implementation of Water Quality Best Management Practices**—A site-specific Best Management Practice implementation plan based on construction impact and site-response risk has been prepared that is expected to maintain water quality (GeoEngineers 2013c). Within Riparian Reserves for all hydrologic features crossed by the pipeline between MPs 109 and 110, the Project would provide 100 percent post-construction ground cover on all disturbed areas. Wood fiber is the preferred material supplemented as needed by biosolids. In addition, the Project would construct water bars at 50-foot intervals. Other erosion control measures would be used as needed to prevent surface erosion associated with stream crossings or to prevent sediment transport that may affect riparian systems (section 2.4.8.4).
- **Mitigation of Potential Impacts on Stream Temperature**—A temperature analysis on perennial stream crossings showed the Project may have minor temperature impacts (~ 0.1°C) at the project scale (NSR 2009). Although the analysis showed there would be no impact at the next downstream reach below the crossings because of groundwater infiltration, flow volumes and existing shade, the Project would transplant larger conifers to riparian areas and use logs and slash to provide shade at perennial crossings in the East Fork Cow Creek to mitigate for temperature impacts at the project scale. Temperatures are expected to remain below those specified by the State of Oregon for streams in the Umpqua basin (section 2.4.6.4).
- **Mercury--** The Forest Service contracted with a geologist consultant to collect soil and stream sediment samples for analytical testing and reporting of mercury and other naturally-occurring minerals along a 2,000-foot section of the proposed pipeline route between MP 109 and the East Fork Cow Creek (Broeker 2010b; GeoEngineers 2013e). Geochemical analysis of the soil and stream sediment samples have been determined to have very low to nominal concentrations of naturally occurring mercury mineralization. The mercury level at one of the stream sediment sites was 0.29 part per million, which was above the Level II screening level value of 0.1 part per million for invertebrates (ODEQ 1998, cited in GeoEngineers 2013d). In order to prevent this naturally-occurring mercury from mobilizing during and after construction, additional erosion control measures and monitoring would be conducted at these sites. The proposed pipeline construction activities by Pacific Connector within the upper East Fork Cow Creek watershed are not anticipated to disturb and expose soils and bedrock strata that contains more than low amounts of natural occurring mercury mineralization; and any sediment that is generated is not likely to reach the aquatic environment due to implementation of short-term and permanent mitigation measures outlined in Pacific Connector's ECRP and as listed in GeoEngineers 2013e.

There are approximately 4,559 acres of Riparian Reserves (NFS lands only) in the Upper Cow Creek Watershed of which approximately 1,595 acres are LSOG (Forest Service 1995: 94, 95). Approximately 10.83 acres of Riparian Reserves or 0.07 percent of the Riparian Reserves on NFS lands in the watershed would be cleared (table 2.4.8.1-3). Of this, approximately 2.8 acres are LSOG (table 2.4.8.1-4). This is about 0.18 percent of the LSOG in Riparian Reserves on NFS lands in the Upper Cow Creek watershed. Early and mid-seral forest vegetation constitutes the remaining 8.02 acres of the affected Riparian Reserve vegetation. LSOG and mid-seral vegetation (approximately 5 acres) cleared in the right-of-way would be a long-term, but minor in scale, change in vegetation that is within the range of natural variability for the Upper Cow Creek watershed considering its history of disturbance from stand replacement fire and subsequent

landslides (section 2.4.8.4.). NFS and BLM lands are currently 36% LSOG and exceed minimum watershed thresholds for LSOG forest after consideration of PCGP impacts (section 2.4.8.5).

Several site-specific proposed amendments of the Umpqua National Forest LRMP are required to make provision for the Pacific Connector Pipeline Project. These proposed amendments are not expected to prevent attainment of the ACS in the Upper Cow Creek watershed (section 2.4.8.5):

- Proposed amendment UNF-1 would allow removal of effective shade on perennial streams. This amendment would not prevent attainment of ACS objectives because a site-specific temperature assessment (NSR 2009) showed that any temperature increase resulting from removal of effective shade would be minor, and limited to the point of maximum impact at the site of construction.

- Proposed amendment UNF-2 would allow the Pacific Connector corridor to run parallel to an existing stream within the riparian zone. The amendment would not prevent attainment of ACS objectives because an uncut buffer 30-60 feet wide remains between the corridor and the East Fork of Cow Creek. An estimated 94% of the effective shade is maintained adjacent to the East Fork of Cow Creek, erosion control measures specified in the ECRP are expected to be effective at controlling surface erosion and LWD would not be removed from the stream. Sources of LWD would remain on both sides of the channel.

- Proposed amendment UNF-3 would allow the Project to exceed detrimental soil conditions within the construction corridor. This would not prevent attainment of ACS objectives because soil decompaction and remediation required in Riparian Reserves is expected to effectively moderate detrimental soil conditions. Implementation of measures in the ECRP is expected to effectively control surface erosion and restore native vegetation (See section 4.3.4).

- Proposed amendment UNF-4 would reallocate approximately 588 acres from the matrix land allocation to the LSR allocation. This would benefit aquatic habitats because this area would be managed for late-successional stand conditions that provide additional aquatic protections.

- Proposed amendment of the Umpqua National Forest land management plan to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (Section 2.4.8.5).

The routing of the Project through NFS lands, coupled with the relatively small area of BLM and NFS land affected by Project construction (75.62 acres or 0.22 percent of the BLM and FS lands in the fifth-field watershed – table 2.4.8.1-3), makes it highly improbable that Project impacts could affect watershed conditions. Although there are project-level impacts (e.g., short-term sediment and a long-term change in vegetative condition at stream crossings), these would be minor in scale and largely limited to the boundaries of the project area (section 2.4.8.4).

No project-related impacts that would prevent attainment of ACS objectives have been identified (section 2.4.8.8). All relevant Project impacts are within the range of natural variability for watersheds in the Oregon Cascades and Klamath Provinces, although some of these processes have been altered from their natural condition (section 2.4.8.4).

2.5 ROGUE RIVER BASIN

The Rogue River drains 13,390 km2 of southwestern Oregon before flowing into the Pacific Ocean near the town of Gold Beach (fig. 1). Over 8,500 km of mapped stream channel make up the Rogue River network (StreamStats, http://water.usgs.gov/osw/streamstats). The Rogue River begins in the Cascade Range and traverses the Klamath Mountains, where it gains its largest tributaries, the Applegate (1,994 km2) and Illinois (2,564 km2) Rivers, on its way to the coast. The Rogue River basin is flanked to the north by the Umpqua, Coquille, and Elk River basins and the Euchre Creek basin, to the east by the Williamson River basin, and to the south by the Klamath, Smith, Chetco, and Pistol River basins and the Hunter Creek basin. The Rogue River basin is located in Klamath, Jackson, Josephine, and Curry Counties in Oregon and Siskiyou and Del Norte Counties in California.

2.5.1 Geographic Setting

The Rogue River basin encompasses parts of four geologic provinces: the High Cascades (14 percent), Western Cascades (16 percent), Klamath Mountains (56 percent), and Coast Range (1 percent). The Rogue River's largest tributaries, the Applegate and Illinois Rivers, are predominantly within the Klamath Mountains geologic province. The four geologic provinces reflect unique geologic histories and conditions, resulting in distinct characteristics such as basin relief, drainage density, erosion processes, and water permeability that are relevant to sediment yield and transport.

The Rogue River basin is divided into the Upper, Middle, and Lower Rogue River, Illinois River and Applegate Subbasins. The Pacific Connector corridor crosses only the Upper Rogue River Subbasin which contains the Trail Creek, Shady Cove- Rogue River, Big Butte Creek and Little Butte Creek fifth field watersheds.

The headwaters of the Rogue River basin (including most of the basin east of the confluences of the South Fork, Middle Fork, and mainstem Rogue River) are primarily within the High Cascades geologic province. The typically low-relief High Cascades geologic province is underlain by highly permeable Pliocene and Quaternary lava flows that have low rates of surface water runoff and sediment trans-port. The parts of the Rogue River basin within this province include the western slopes of Crater Lake, which is the remnant of a large Quaternary-age stratovolcano that erupted cataclysmically about 7,700 years ago and blanketed parts of the Rogue River's headwaters with thick tephra and pyroclastic flow deposits (USGS 2012). The Dead Indian Plateau in eastern portion of the Little Butte Creek fifth-field watershed is typical of this landscape.

An area of the Rogue River's headwaters also spans the Western Cascades geologic province (fig. 1). This portion is chiefly a 20-km-wide band running north-south between the upstream confluence of the mainstem and the South Fork Rogue River and the downstream confluence of the mainstem and Trail Creek. This geologic province is underlain by Tertiary volcanic and

volcanoclastic rocks that are typically weathered and highly dissected and, thus, are susceptible to high rates of runoff and mass wasting processes. The remainder of Trail Creek, Shady Cove-Rogue River, Big Butte Creek and the western portion of Little Butte Creek fifth-field watersheds lie within the Klamath – Siskiyou Province.

2.5.2 Climate and Hydrology

Within the Rogue River Basin, only the Upper Rogue Subbasin is crossed by the PCGP. Streamflow in the Upper Rogue River subbasin basin is driven by seasonal precipitation that typically falls in winter as snow in the upper basin near Crater Lake and as rainfall and occasional snow below 4,000 feet. Peak flows on the mainstem Rogue River typically derive from winter frontal systems, with the largest flows resulting from regional rain-on-snow events. From July to October, base flows are sustained by groundwater contributions from the upper Rogue River basin and occasional precipitation events. Pumice soils in the High Cascades Province tend to have high infiltration rates and are easily eroded when saturated. Low gradient pumice plateaus tend to have large storage capacity. More developed soils in the Klamath and Western Oregon Cascades have lower infiltration rates, but tend to be thin with little water holding capacity. As a result, streams tend to be "flashy" and respond rapidly to storm events.

Total Maximum Daily Load (TMDL) thresholds and a Water Quality Restoration Plan (WQRP) were established for temperature and other pollutants for the Rogue River Basin in 2008 (http://www.deq.state.or.us/wq/tmdls/docs/roguebasin/Rogue/Chapter1andExecutiveSummary.pdf).

2.5.3 Trail Creek Fifth-Field Watershed HUC 1710030706

2.5.3.1 Overview

The Trail Creek fifth-field watershed is located in southwestern Oregon between Medford and Crater Lake National Park. It is one of eight fifth-field watersheds in the 2,618 square mile Upper Rogue River Subbasin. The watershed lies north and west of the Rogue River and extends upslope to the divide with the South Umpqua River basin to the north. Below the confluence of Trail Creek with the Rogue River (at the town of Trail), the Rogue River turns south and traverses the Shady Cove-Rogue River fifth-field watershed. Upon leaving the Shady Cove-Rogue River watershed, the Rogue River turns westward and flows through the Rogue River – Siskiyou National Forest and the Klamath Mountains to the Pacific Ocean at Gold Beach, Oregon, about 32 miles from the border with California. The entire Rogue River drainage basin is about 132 miles wide (east to west). See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

Most of the watershed lies within Jackson County, although the northernmost portion lies within Douglas County. The towns of Trail and Shady Cove (population approximately 2,379) are within or adjacent to the watershed. Oregon State highway 227 passes through the center of the Trail Creek basin. Approximately 41.6% of the land in the watershed is managed by the BLM Medford District, and another 12.3% is in the Rogue River – Siskiyou National Forest. The rest (46.1%) is in non-federal ownership. Logging and agriculture dominate human land use in the watershed.

The Trail Creek watershed lies predominantly within the Western Cascade physiographic province although some lands in the southern portion of the watershed are more representative of the

Klamath Mountains province. The entire Trail Creek basin is formed from Tertiary (1.6 to 66 million years before present) Western Cascade volcanoclastic rocks originally deposited predominantly as flows and ash deposits on a nearly flat to gently sloping landscape. Weathering processes have resulted in rugged topography, with irregular ridges and deep narrow valleys. Gentle to moderate slopes predominate in the southern and lower elevations of the watershed, with slope steepness generally increasing with increasing elevation to the north.

Elevations on the Trail Creek watershed range from a low of 1,436 feet at the town of Trail where Trail Creek empties into the Rogue River, to 4,698 feet at Threehorn Mountain, located on the northern margin of the watershed along the divide that separates the Rogue and Umpqua river basins. Much of the northern divide and adjoining western and eastern margins of the watershed exceed 4,000 feet elevation.

The 55.2 sq. mile (35,338 acre) Trail Creek watershed includes three subwatersheds (figure 2.5-1, table 2.5.3.1-1). West Fork and Upper Trail Creek subwatersheds occupy most of the watershed, with the Lower Trail Creek occupying the southernmost portion of the watershed. The watershed is bounded on the north by the Elk Creek-South Umpqua and Cow Creek fifth-field watersheds of the South Umpqua subbasin, by the Elk Creek-Rogue River fifth-field watershed on the east, the Shady Cove-Rogue River fifth-field watershed on the southeast and south, and the Evans Creek fifth-field watershed of the Middle Rogue River subbasin to the west. Headwater areas are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising the majority of the stream miles.

The watershed experiences a Mediterranean type climate characterized by wet, mild winters, hot, dry summers and a long frost-free period. Mean annual precipitation is about 40 inches, and is lowest near the confluence of Trail Creek and the Rogue River, and generally increases to the north and with increasing elevation. Approximately 70 percent of the annual precipitation in the watershed falls in the five months of November through March. Lightning storms are common and contribute to extreme fire dangers.

Streamflow patterns reflect the distribution of precipitation, with lows in the summer and high flows beginning in late fall and peaking in winter. Most of the watershed is in the transient snow zone, where total to partial snow melt during warm mid-winter rain-on-snow events are associated with nearly all major peak flows.

Figure 2.5-1 shows the checkerboard pattern of BLM-managed lands in the watershed, the more contiguous nature of Forest Service lands (found largely in the northwest corner of the watershed), and the allocation status of these lands. BLM lands are found in all three subwatersheds, ranging in sizes from 2,373 acres in the Lower Trail Creek subwatershed to 7,547 acres in the Upper Trail Creek subwatershed (table 2.5.3.1-1). Together, they constitute 41.6% of the land in the watershed. Forest Service lands are found only in Upper Trail Creek and West Fork Trail Creek subwatersheds, where they are similarly represented (2,224 acres and 2,126 acres, respectively). Together, they constitute 12.3% of the land in the watershed. Approximately 46.1% of the land in the watershed is privately owned (table 2.5.3.1-1).

Location and Routing

At MP 111.1, the PCGP corridor crosses over the divide separating the Umpqua River drainage from the Rogue River drainage and moves into the Trail Creek fifth-field watershed (figure 2.5-1). Once in the Trail Creek watershed, the corridor runs in a south-southeast direction along the ridge tops that form the divide between the West Fork Trail Creek and Upper Trail Creek subwatersheds. Along this segment, the corridor runs alternately on both sides of the divide. At MP 118.36, the corridor leaves the subwatershed divide and runs south across the southeast corner of the West Fork Trail Creek subwatershed, over the divide separating the West Fork Trail Creek and Lower Trail Creek subwatersheds, and across the Lower Trail Creek subwatershed (mainly on private land). The corridor exits the Trail Creek watershed at MP 121.7, passing into the Shady Cove-Rogue River fifth-field watershed to the south.

Within the Trail Creek watershed, the project traverses 5.96 miles of federal land, which includes 3.33 miles in Upper Trail Creek, 1.83 miles in West Fork Trail Creek, and 0.80 miles in Lower Trail Creek. Over the entire watershed, the corridor crosses 3.87 miles of BLM land and 2.09 miles of Forest Service land (table 2.5.3.1-2). Most of the traversed land is in the transient snow zone, where land clearing may contribute to elevated peak flow conditions during warm rain-on-snow events. Over all land ownership, the corridor crosses 10.59 miles of Trail Creek watershed.

The project is on the Umpqua NF from the milepost 111.1 where it enters the watershed to milepost 112.7. This segment of the project lies on a ridgetop between the West Fork of Trail Creek and the Upper Trail Creek subwatersheds. The right-of-way corridor on the Umpqua National Forest occupies approximately 50.24 acres of which approximately 22.83 acres are in the Upper Trail Creek subwatershed and 27.41 acres are in the West Fork of Trail Creek subwatershed. The PCPG corridor intersects no streams or Riparian Reserves in the Trail Creek watershed on the Umpqua National Forest. From MP 112.7 to 121.7 the PCGP crosses interspersed private lands and BLM checkerboard. The Right of Way corridor on the BLM occupies 74.22 acres of which 32.85 acres are in West Fork of Trail Creek, 27.93 acres are in Upper Trail Creek and 13.44 acres are in Lower Trail Creek (table 2.5.1.3-3). There are no designated LSRs on BLM or NFS lands in the Trail Creek watershed. Approximately 1,515 acres of unmapped LSRs are associated with KOACs however none of these are affected by the project.

Project effects in the Trail Creek watershed on all ownerships totals 220.17 acres (table 2.5.3.1-2). These affected acreages include 74.22 acres of BLM land (57.38 acres cleared and 16.84 acres modified, and constituting 0.50% of the BLM land in the watershed) and 50.24 acres of Forest Service land (41.28 acres cleared and 8.96 acres modified and constituting 1.15% of the Forest Service lands in the watershed). Total federal land affected is 124.46 acres.

All federal lands within the project right of way are in the matrix or Riparian Reserve land allocation. At milepost 119.7, the filed application corridor crosses and then largely occupies the Riparian Reserve of a small intermittent stream. The BLM has requested a realignment at this location. This evaluation reflects the filed alignment. This evaluation would be modified when a modified realignment is filed. There are no other crossings on BLM lands in the Trail Creek watershed although there are crossings on private lands close to the property boundary. Three Riparian Reserves are clipped of which two are on intermittent streams and one is on a perennial stream (2.5.3.1-4). , Approximately 3.12 acres of Riparian Reserves would be impacted of which

2.92 acres would be cleared and 0.20 acres would be modified. This constitutes 0.07% of the Riparian Reserves in the watershed (2.5.3.1-3).

Draft

Figure 2.5-1 PCGP Routing and Subwatershed Boundaries, Trail Creek Fifth Field Watershed

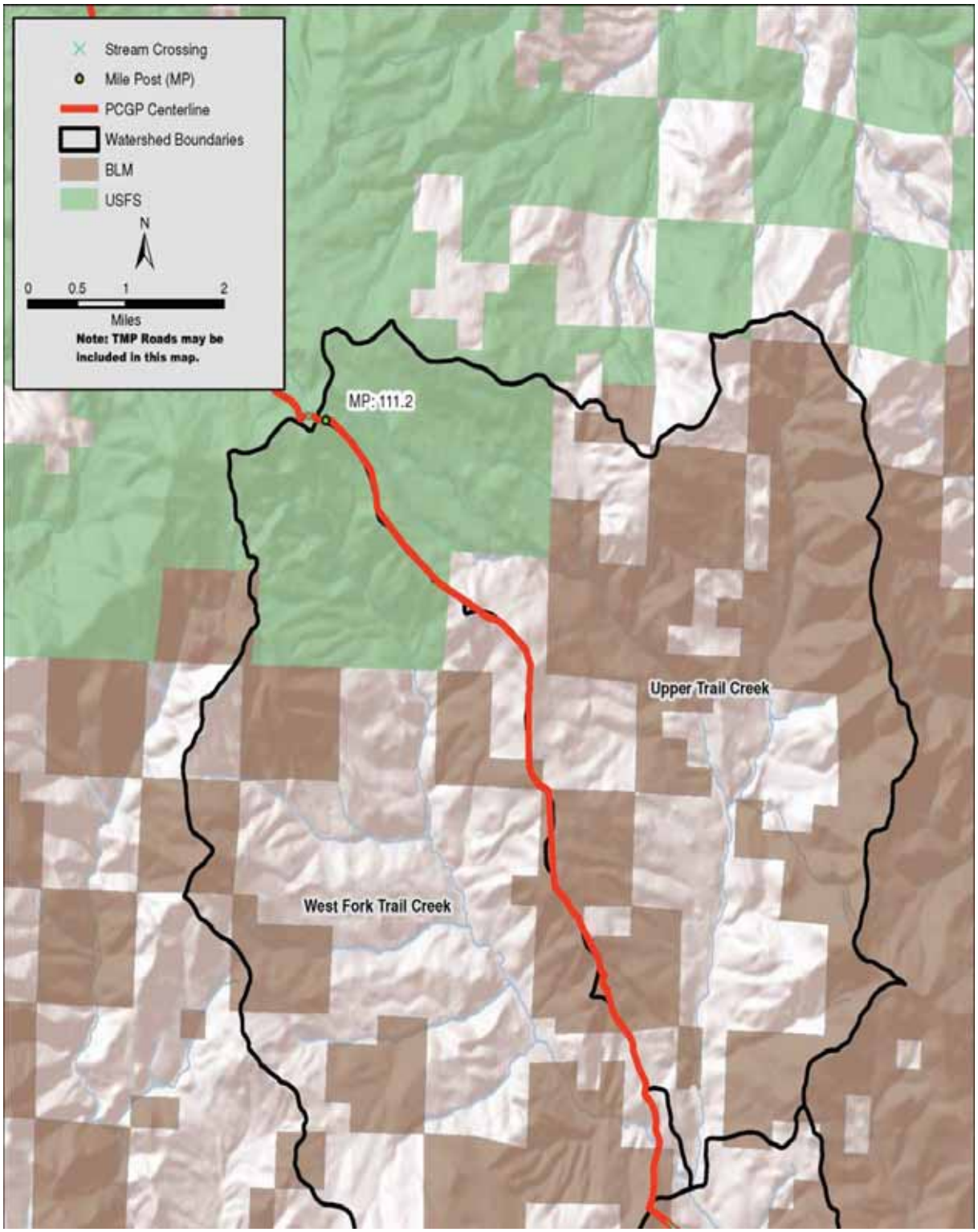


TABLE 2.5.3.1-1.

Land Ownership (acres) and Federal Land Allocations (acres) in Trail Creek Watershed HUC 1710030706 by Land Ownership

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Lower Trail Creek	5,534.07	2,374.75	0.00	2,374.75	3,159.32			2,374.75	0.00	522.1		522.1
Upper Trail Creek	15,493.67	7,551.61	2,225.61	9,777.22	5,716.45	0.00		7,548.92	2,225.61	1660.29	489.32	2,149.61
West Fork Trail Creek	14,309.95	4,774.99	2,127.64	6,902.63	7,407.32			4,774.99	2,127.64	1049.81	467.78	1,517.59
Watershed Total	35,337.69	14,701.35	4,353.25	19,054.60	16,283.09	0.00	0.00	14,698.66	4,353.25	3,232.20	957.10	4,189.30

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. There are an additional 1,515 acres associated with KOAC unmapped LSRs in the watershed.
c/ Occur within LSR and Matrix Land Allocations. Data Source: MF Coquille WA, page 12 Approximately 40% of the landscape is Riparian Reserve

TABLE 2.5.3.1-2

PCGP Project Corridor (miles) and Project Area (acres) in the Trail Creek Watershed HUC 1710030706 by Land Ownership

Unit a/	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Lower Trail Creek	0.80	10.80	2.64	0.57					0.80	10.80	2.64	0.57	1.51	20.58	3.72	0.77	2.31	31.38	6.36	0.68
Upper Trail Creek	1.77	21.70	6.23	0.37	1.56	18.51	4.32	1.03	3.33	40.21	10.55	0.52	1.28	18.05	11.38	0.51	4.61	58.26	21.93	0.52
West Fork Trail Creek	1.30	24.88	7.97	0.69	0.53	22.77	4.64	1.29	1.83	47.65	12.61	0.87	1.84	26.90	15.08	0.57	3.67	74.55	27.69	0.71
Watershed Total	3.87	57.38	16.84	0.50	2.09	41.28	8.96	1.15	5.96	98.66	25.80	0.65	4.63	65.53	30.18	0.59	10.59	164.19	55.98	0.62

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.5.3.1-3

PCGP Project Corridor (miles) and Project Area (acres) in the Trail Creek Watershed HUC 1710030706 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Lower Trail Creek	BLM					10.80	2.64	0.45	0.11	2.22	0.20	0.43	0.01	10.80	2.64	0.45	0.11
	NFS																
Upper Trail Creek	BLM					21.70	6.23	0.29	0.08					21.70	6.23	0.29	0.08
	NFS					18.51	4.32	0.83	0.19					18.51	4.32	0.83	0.19
West Fork Trail Creek	BLM					24.88	7.97	0.52	0.17	0.70		0.07		24.88	7.97	0.52	0.17
	NFS					22.77	4.64	1.07	0.22					22.77	4.64	1.07	0.22
Watershed Total	**BLM**					**57.38**	**16.84**	**0.39**	**0.11**	**2.92**	**0.20**	**0.09**	**0.01**	**57.38**	**16.84**	**0.39**	**0.11**
	NFS					**41.28**	**8.96**	**0.95**	**0.21**	**0.00**	**0.00**			**41.28**	**8.96**	**0.95**	**0.21**
	Total BLM & NFS	**0.00**	**0.00**			**98.66**	**25.80**	**0.52**	**0.14**	**2.92**	**0.20**	**0.07**	**0.00**	**98.66**	**25.80**	**0.52**	**0.14**

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.5.3.1-4

Riparian Reserve Effects Trail Creek Watershed HUC 1710030706

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	fish bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
West Fork Trail Creek Subwatershed HUC 171003070602																												
UNF	110.76	EW069Trib to W. Fork Trail Creek	1-2' deep pond in borrow pit.	Pit	No	0.00		Yes				0.00				0.00				0.00		0.00		0.00		0.00	No	No
UNF	110.76	ESI068Trib. to W. Fork Trail Creek	Ditch associated with rock pit.	D	Yes	0.00		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
MD BLM	118.93	Trib to WF Trail Creek	RR Clipped. Stream Crossing on private lands	I	No			Yes	0.38			0.38			0.32	0.32				0.00		0.70		0.70	0.07	0.77	No	No
(	119.7	Trib to WF Trail Creek	Intermittent stream crossed and paralleled by corridor. (Realignment Requested)																									
Subtotal WF Trail Creek Subwatershed		Crossed: 1 Int. Channel (MP 119.7) 1 ditch f/	Clipped: 1 Int. Channel RR	1	0			1	0.38	0.00	0.00	0.38	0.00	0.00	0.32	0.32	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.70	0.07	0.77	0	0
Lower Trail Creek Subwatershed HUC 171003070603																												
MD BLM	120.43	Trib to lower Trail Creek	RR Clipped. Stream Crossing on private lands	P	No			Yes		0.92	0.22	1.14				0.00				0.00		1.14	0.20	1.34		1.34	No	No
MD BLM	121.47	Trib to lower Trail Creek	RR Clipped. Stream Crossing on private lands	I	No			Yes		1.08		1.08				0.00				0.00		1.08		1.08		1.08	No	No
Subtotal Lower Trail Creek Subwatershed		Crossed: None	Clipped: 1 Int. Channel RR 1 Per. Channel RR	2	0			2	0.00	2.00	0.22	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.20	2.42	0.00	2.42	0	0

Draft

TABLE 2.5.3.1-4

Riparian Reserve Effects Trail Creek Watershed HUC 1710030706

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	fish bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Total Trail Creek Watershed		Crossed: 1 ditch f/ 1 int. channel (MP 119.7)	Clipped: 2 Int. Channel RR 1 Per. Channel RR	3	0			3	0.38	2.00	0.22	2.60	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	2.92	0.20	3.12	0.07	3.19	0	0

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland. At MP 119.7 a realignment has been requested that would eliminate this crossing. Acres are shown as "0" for this crossing.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches and rock pits do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

2.5.3.2 Existing Conditions

Original watershed Analysis Findings

- Road density in the watershed (all ownerships) is about 3.4 miles of road per square mile. Road density for NFS lands only is not specified.
- Soils in the Trail Creek watershed are subject to erosion where exposed and compacted or puddled with associated destruction of internal macro-porosity leading to surface runoff. Delivery of sediment to streams is a concern, particularly on steep slopes. Again due to their high clay content, road surfaces have poor bearing strength when wet, and unsurfaced roads are subject to rutting, concentration of surface flows, and delivery of sediment to streams. Debris torrents, however, were not observed on aerial photos dating from 1966, suggesting that Trail Creek and its tributaries are not as susceptible to this type of disturbance as other channels in the Cascades.
- Deep-seated slumps and earthflows are common in the Trail Creek watershed and are associated with the clay-rich soils formed from volcanoclastic parent materials that underlie the entire watershed.
- A defining characteristic of the Trail Creek watershed is that response reaches contain very little wood and coarse sediment, which are critical for formation of quality fisheries rearing and spawning habitat.
- All subwatersheds in the Trail Creek watershed, as well as the entire watershed as a whole, have predicted increases in peak flows of less than 10 percent for both the average and unusual storm simulations. Therefore, all subwatersheds have been assigned a low sensitivity to peak flow increases.
- Roads are the single greatest source of management-related delivered sediment in the watershed

Changes in watershed Condition

Since the Trail Creek watershed assessment was written, the following events have occurred.

West Fork Trail Creek (BLM)

- Decommissioned 3.4 miles of road.
- Replaced undersized culvert with fish passage bottomless pipe arch on tributary to West Fork Trail Creek.
- Placed boulders in approximately 0.5 miles of stream and large woody debris (LWD) in approximately 1 mile of stream.
- Stabilized 1.5 acres of slide area using subsurface drainage and rock buttress.
- Improved drainage over 13 miles of road by adding/replacing cross drain culverts.

Upper Trail Creek (BLM)

- Decommissioned/closed 4.9 miles of road.

- In 2002, the Wall Fire burned 314 acres.

Lower Trail Creek (BLM)

- Decommissioned 0.3 miles of road.

TABLE 2.5.3.2-1

Past Activities on NFS Lands in Trail Creek since Publication of the Trail Creek Watershed Analysis, June 1999

Name	Activity Type	Dates	Total Acres/Miles	Location
Cattle Grazing	Cattle Grazing	1999 - 2012	4,230 ac	Upper & West Fk. Trail (6th)
Reforestation	Tree planting	1998 - 2000	54 ac	Upper & West Fk. Trail (6th)
Road Maintenance	Brushing, grading, resurfacing	2010-2012	3 mi.	Upper & West Fk. Trail (6th)

Current Watershed Conditions

Overall watershed conditions remain similar to those described in the watershed assessment. Watershed conditions have improved somewhat on BLM and Forest Service lands since the watershed assessment was written. Collectively, watershed restoration efforts have improved watershed condition in the subwatersheds and stream reaches where the projects occurred, however ongoing timber management, grazing and development continue to affect watershed conditions on private lands, which in turn, affect overall watershed conditions. Small scale disturbances have had local effects. No large-scale disturbance events have occurred that would affect overall watershed conditions on BLM or Forest Service lands. Forest Service Watershed Condition Class rating for the West Fork of Cow Creek was "functioning, at risk" with "at risk" scores for fire, roads and water quality (Attachments: Section 3.3.1). NWFP aquatic monitoring showed a slightly declining trend in overall watershed condition in the Upper Trail Creek subwatershed with negative trends for vegetation. The West Fork and Lower Trail Creek showed slightly improving watershed conditions and positive trends in vegetation (Attachments: Section 3.3.2)

2.5.3.3 Natural Disturbance Processes

Surface erosion of well-forested areas rarely occurred in the watershed, with the possible exception of erosion that occurred immediately following severe wildfire. Thin and stony soils, which are often sparsely vegetated with hardwoods and grasses, may also have been subject to surface erosion. However, most natural erosion within the watershed likely occurred as mass wasting, soil creep, and related streambank and channel erosion, most of which is likely to have occurred during major flood events. Channel-scouring debris flows (debris torrents) undoubtedly occurred in steep first, second, and some third order channels, depositing coarse sediment and LWD into transport/response transitional areas. However, no debris torrents were observed to have occurred in the Trail Creek watershed during the photo record made available for the watershed analysis (1966, 1969, 1975, 1985, and 1996). This suggests that debris torrents may not have been as frequent as is common for steeper and more failure-prone areas of the Oregon and Washington Cascades, Coast Ranges, and Siskiyou Mountains (BLM 1999: 3-10)

Draft

2.5.3.4 Project Effects and Range of Natural Variability

Watershed Analysis is intended to describe the historic range of variability and provide recommendations for management activities that contribute to restoring watershed health and achieving the objectives of the ACS (table 2.5.3.4-1). The Trail Creek watershed Analysis described reference and current conditions and general ecological trends, but it did not establish metrics that reflect the natural variability at the watershed scale. Management recommendations to improve watershed health were provided that are responsive to the conditions and trends in the watershed. Those that are pertinent to the PCPG from the Trail Creek watershed Analysis are summarized below. The congruence of the PCGP with each recommendation is noted.

Recommendation—Vegetation: Decrease ladder fuels in forest stands by cutting dense patches of suppressed tree regeneration and shrub species.

Recommendation—Hydrologic Change: Fire hazard reduction should directly reduce risk to areas with high percentages of drainage area in the rain-on-snow zone (elevation 3,600 to 4,800 feet). These are areas where hydrologic change is most responsive to changes in canopy cover that would result from catastrophic wildfire.

- **PCGP:** The Applicant-filed mitigation plan includes 566 acres of shaded fuel breaks on NFS lands and 687 acres on BLM lands in the Trail Creek watershed that are responsive to these recommendations. These fuel breaks are part of an integrated shaded fuel break on BLM and Forest Service lands that runs from Milo to Shady Cove.

Recommendation—Vegetation: Consider the use of sterile and/or competitive grasses on disturbed sites to prevent encroachment of noxious weeds. Use of native grass seeds should also be considered in instances where noxious weeds have not yet become established. Active and non-active roads should be considered in this recommendation, as should early-seral-stage vegetation conditions, both extensive in the watershed. Prevention activities should be emphasized, including minimization of ground disturbance, where possible; use of native, non-invasive, or non-persistent species in reclamation; and equipment decontamination, applied in all activities. This recommendation should be implemented through standard operating procedures.

Consider aggressive post-harvest prescriptions to control noxious weed infestation of harvested lands and adjoining lands and roads. Any of the prescriptions outlined above would be considered under such a strategy.

- **PCGP:** The PCGP Noxious Weed Management Plan filed as part of FERC application is consistent with these recommendations.

Recommendation—Hydrologic Processes: If future management alternatives or projects are extensive and therefore have potential for increasing peak flows above acceptable limits, consider additional analysis consistent with the procedures used in this watershed Analysis to define acceptable subwatershed canopy removal and stand treatment limits.

- **PCGP:** FERC conducted a site-specific evaluation of peak flow potential in Trail Creek. FERC's evaluation concluded that, although increased snow accumulation may occur (which can lead to peak flow increases in rain-on-snow events), the probability of any measurable increase in peak flows was unlikely because of the relatively small areas

affected in any single watershed and the design measures incorporated by PCGP to minimize effects on forest hydrology. These findings are consistent with the Trail Creek watershed Analysis conclusions that amount, timing, and delivery of water, sediment, and wood from the forested parts of this watershed are not changed appreciably from the reference conditions. Changes in sensitivity to peak flow increases would remain inconsequential unless large areas of forest are harvested or burned in the near future. Results of simulation of watershed conditions during mid-winter rain-on-snow runoff events presented in the Trail Creek watershed Analysis suggest that the magnitude of current rain-on-snow flood events are not substantially different from the reference condition.

Recommendation—Hydrologic Processes: Allow for 100-year runoff events, including associated bed-load and debris, when installing new stream crossing structures and for existing stream crossing structures that pose substantial risk to Riparian Reserves.

Recommendation—Erosional Processes: Maintain and enhance the sediment regime under which the aquatic ecosystem evolved and improve, maintain, or restore federal road systems with an emphasis on adequate drainage and surfacing. Reconstruct, stabilize, reroute, close, obliterate, or decommission roads and landings that pose substantial risk to Riparian Reserves.

Recommendation—Erosional Processes: Reconstruct, stabilize, reroute, close, obliterate or decommission roads and landings that pose substantial risk to Riparian Reserves.

- **PCGP:** Roads used by PCGP for access and construction would be maintained or improved as needed to minimize erosion. In addition, the Applicant-filed mitigation plan provides for storm-proofing 0.6 miles and decommissioning 1 mile of roads in the Trail Creek watershed on USFS lands. On BLM lands, PCPG would decommission 2.7 miles of roads, storm proof 4.3 miles and surface 16.3 miles. Combined these projects would reduce road sediments from over 30 miles of roads. This represents a substantial decrease in road-related sediment sources in the watershed.

Recommendation—Riparian and Stream Processes: Consider carefully engineered placement of LWD in select reaches of the West and East Forks of Trail Creek and major tributaries where existing LWD quantity and function are low.

- **PCGP:** The Applicant-filed mitigation plan includes 2.6 miles of instream LWD placement in the West Fork of Trail Creek.

Table 2.5.3.4-1 compares historic range of variability and Pacific Connector Effects for selected ecological processes relevant to the Project.

Draft

•

TABLE 2.5.3.4-1 **Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth Field Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Erosional Processes	Mass wasting during forested periods was generally associated with major storms and floods. Channel-scouring debris flows (debris torrents) undoubtedly occurred in steep first, second, and some third order channels, depositing coarse sediment and LWD into transport/response transitional areas. However, no debris torrents were observed to have occurred in the Trail Creek watershed during the photo record made available for this analysis (1966, 1969, 1975, 1985, and 1996). This suggests that debris torrents may never have been as frequent as is common for steeper and more failure-prone areas of the Oregon and Washington Cascades, Coast ranges, and Siskiyou Mountains. Prior to disturbance of soils by road construction, logging, and forest conversion to non-forest land uses, surface erosion of well-forested areas rarely occurred in the watershed, with the possible exception of erosion that occurred immediately following severe wildfire. Thin and stony soils, which are often sparsely vegetated with hardwoods and grasses, may also have been subject to surface erosion. However, most natural erosion within the watershed likely occurred as mass wasting, soil creep, and related streambank and channel erosion, most of which is likely to have occurred during major flood events.	Pacific Connector has been routed to avoid unstable or potentially unstable areas. There are approximately 5.96 miles of corridor on BLM and NFS lands within the watershed. From MP 111 to MP 113, the project is on a ridgetop with no stream or Riparian Reserve intersects. On NFS lands from MP 113 to MP 121.79 where the PCGP crosses the watershed boundary, there are 3.87 miles of corridor on BLM checkerboard lands. Soils on most of the BLM lands are thin and gravelly. Nearly the entire length of the project in the Trail Creek watershed is on ridgetops with no hydrologic connection. Within the entire watershed, approximately 2.9 acres of Riparian Reserves would be cleared. Three Riparian Reserves would be clipped, and one intermittent stream would be crossed. There is one intermittent stream crossing at MP 119.7. At this location, the PCGP corridor would clear most of the vegetation and parallel the stream channel rather than cross at a right angle. The BLM has determined that this site is likely to become a chronic source of fine sediments and requested the PCGP be realigned at this location. With the exception of the channel at MP 119.7, the measures in the ECRP are expected to minimize and control soil erosion.
Ecological Succession / Vegetative Condition	Fire was the major disturbance factor affecting vegetation patterns in the watershed. Wildfires in the mixed evergreen forests of southern Oregon and northern California occurred at frequencies of 5 to 25 years. Naturally occurring fires were ignited primarily by lightning sources, which can strike more or less randomly, regardless of elevation. Hot, dry climatic conditions are common in the region, further increasing the chances of ignition and spread. During pre-settlement, Native Americans also used fire on a much more frequent basis to maintain grasslands and oak woodlands in the major river valleys. These fires were generally of relatively low to moderate intensity and limited extent, burning in mosaic patterns. Because of this fire cycle, fuel loads were maintained at relatively low levels. Understory and ground fuels were typically consumed, reducing the probability of crown fires. Because of these frequent, minor reductions in fuel profiles, the potential for large scale catastrophic events was greatly reduced. Overall, this process maintained a more or less stable ecosystem dominated by fire tolerant species such as Douglas-fir, ponderosa pine, and Oregon white oak. Fire Suppression and timber management have reduced and fragmented late successional stands reducing patch size, shifting species dominance to white fir and increasing early and mid-seral proportions of the drainage. LSOG acres in both upland and riparian areas are below historic averages. Vegetative condition throughout the Upper Cow Creek watershed has been significantly altered by timber management activities.	No Riparian Reserves are affected by the project on NFS lands in the Trail Creek Watershed. No riparian vegetation would be affected by the project on BLM lands in the Upper Trail Creek subwatershed. Less than 1 acre or early to mid seral or hardwoods are affected on BLM in the West Fork Trail Creek Subwatershed. On BLM lands in Lower Trail Creek, approximately 2.42 acres of Riparian Reserves would be affected, of which approximately 2.22 acres are classed as LSOG. The remainder of the affected vegetation is early or mid seral or hardwoods. Loss of LSOG vegetation in the PCGP corridor is a long-term impact, but minor in scale and well within the historic range of vegetative disturbance in the Trail Creek watershed. Standards and Guidelines for the NWFP (C-44) require retention of all LSOG where less than 15% of federal lands in a watershed are in LSOG condition. NFS and BLM lands in the Trail Creek Watershed are currently 28% LSOG and exceed this threshold.

Draft

TABLE 2.5.3.4-1

Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Flow Regime processes	Most of the watershed is subject to periodic snowfall and subsequent total to partial snow melt during warm mid-winter rain-on-snow events, which are associated with nearly all major peak flows. The reference condition for this watershed is fully forested, interrupted by widespread severe wildfire at intervals of several decades to centuries. Wildfires may have caused partial water repellency of soils in severely burned areas in the watershed may have then occurred, causing elevated peak flows for one to five years following fire.	In the total PCGP project, the greatest disturbance within the transient snow zone on a percentage basis would occur within the Trail Creek Watershed. The pipeline would disturb a total of 127.64 acres within the transient snow zone in this 28,867-acre watershed, which represents 0.44 percent of the total watershed area (GeoEngineers 2012, Resource Report 2, p 46). Whether this increases peak flows depends on watershed conditions. The Trail Creek WA determined that all sub-watersheds in the Trail Creek watershed, as well as the entire watershed as a whole, have predicted increases in peak flows of less than 10% for both the average and unusual storm simulations. Therefore, all sub-watersheds have been assigned a low sensitivity to peak flow increases. The WA analysis indicates that current rain-on-snow flood magnitudes are not substantially different than the reference condition (BLM 1999b: 4-8). Given the small surface area affected by the corridor it is highly unlikely that the project would increase peak flows in the watershed. See also EIS Chapter 4.4)
Stream Temperature	There are no reports or data that define the reference condition for streams within the Trail Creek watershed (BLM 1999, p. 3-31). WA analysis indicates that summer maximum water temperatures naturally exceed the Oregon 64 degrees F standard in many streams. Furthermore, the regression model predicts that the 64 degrees F standard cannot be achieved at elevations below 2,000 feet even with 100% shade, a level of shading which is seldom, if ever, achievable at the lower elevations in the Trail Creek watershed. Conversely, the model indicates that the 64 degrees F standard is likely to be met at elevations above 3,400 feet regardless of stream shade levels. In the Trail Creek watershed, all fish-bearing streams lie below 3,400 feet, and most are below 2,600 feet. (BLM 1999, p. 3-64). Notwithstanding the ability of the watershed to reach desired conditions, it is likely that timber harvest and road construction have reduced shade in the upper portions of the watershed. Seven-day maximum temperature (ºF) exceeded the Oregon standard of 64 ºF at five monitoring stations located within the Trail Creek watershed. Seven-day maximum daily temperatures near the mouth of the West Fork and Trail Creek reach 80.3 and 83.5 ºF, respectively.	The project does not cross any perennial streams on BLM lands in the Trail Creek Watershed, therefore it is unlikely that stream temperatures would be impacted by the project on lands where the ACS applies. A project-wide thermal recovery analysis by GeoEngineers (2012) concluded that temperatures at stream crossings may increase by a maximum of 0.160C but return to ambient levels within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared ROW width of 75 feet (GeoEngineers, 2013f, Thermal Impacts Assessment p. 26). .
Aquatic Habitat and Stream Channel Complexity	There are no reports or data that define the reference condition for streams within the Trail Creek watershed. Conditions representative of western Oregon Cascade streams are presumed to have existed in the Trail Creek watershed. Many streams within forested west coast watersheds had higher density of large woody debris (LWD) than is found under current conditions (BLM, 1999, 3-31). Typically, these streams channels had 40-60 pieces of LWD / mile with >30% pool habitat by area. Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as	During construction, the PCGP project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale, and are minor and short-term (typically 1 to 5 days per crossing).

DRAFT

TABLE 2.5.3.4-1 Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth Field Watershed Assessment		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
	ground water in the stream banks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and stream bank vegetation was indicative of relatively stable stream banks and channels that were relatively resilient during floods. Well-developed mid-channel and channel margin gravel bars may have been common. The large mainstem channels of Trail Creek 1964 (Lower Trail, East Fork and West Fork) appear to have been scoured by large flood events, such as occurred in 1964, and gravel and cobble substrate are uncommon. Streambanks are typically stable along Trail Creek and the lower reaches of the main tributaries due to the dominance of rock or well vegetated streambanks (BLM 1999: 3-33).	

2.5.3.5 Compliance with Land Management Plans

Table 2.5.3.5-1 provides UNF / NWFP standards and guidelines relevant to the ACS, the related BLM management direction as provided in the Medford District RMP, and PCGP compliance with this management direction on BLM and NFS land in the Trail Creek watershed.

Draft

TABLE 2.5.3.5-1 **Compliance with Standards and Guidelines**		
Medford BLM RMP Management Direction	**UNF / NWFP Standard and Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Lands Mgmt., pg. 30, para. 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan etc.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - General Riparian Area Mgmt., pg. 30, para. 4	RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Trail Creek watershed, therefore the biological, physical, and chemical integrity of these systems would remain unaffected from hydrostatic withdrawal activities.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 27, para. 2	RF-2: Road Construction Standards and Guidelines	The existing transportation system in the Trail Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Trail Creek watershed.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 1	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction. Several road improvement projects and road decommissioning are proposed in the Trail Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 4	RF-7: Transportation Management Plan development.	The TMP meets all of the requirements of RF-7.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Watershed & Habitat Restoration, pg. 31, para. 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Not Applicable	UNF Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67)	The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20 percent. The PCGP cannot meet this standard. A Forest Plan Amendment (UNF-3) is proposed to waive application of this standard.

Draft

TABLE 2.5.3.5-1 **Compliance with Standards and Guidelines**		
Medford BLM RMP Management Direction	**UNF / NWFP Standard and Guideline**	**PCGP Compliance**
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project affects Survey and Manage species within the Trail Creek watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		NFS and BLM lands in the Trail Creek Watershed are currently 28% LSOG and exceed this threshold.

Relationship of Proposed Forest Plan Amendments to the ACS

UNF-3. Allows the PCGP to exceed restrictions on detrimental soil conditions in the project right-of-way.

Approximately 41 acres of the UNF would be cleared by the PCGP in the Trail Creek Watershed (table 2.5.3.1-2). The only Forest Plan amendment with an ACS nexus in this watershed is UNF-3, which allows the PCGP to exceed restrictions on detrimental soil conditions resulting from displacement and compaction in the project right-of-way.

Umpqua National Forest LRMP IV-67-1, Forest-Wide Soils Standard and Guideline, states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20 percent.

The PCGP would likely result in a degraded soil condition in an estimated 30 to 70 percent (13 to 30 acres) of the project right-of-way on USFS lands in the Trail Creek Watershed due to displacement and compaction following completion of corridor construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing Forest Plan Standards and Guidelines allow up to 20 percent of the PCGP corridor or approximately 9 acres of the project area in the Trail Creek Watershed to be in a degraded soil condition upon completion of a project. Thus, the proposed amendment allows an estimated 3 to 21 acres or 0.14 – 0.48 percent of the 4,350-acre (USFS lands only) Trail Creek Watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils

Draft

may increase runoff and sediment transport and have lower rates of vegetative recovery. Sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Without mitigation, bare soil surfaces in granitic or serpentine soils can persist more than 50 years following a severe disturbance.

Environmental consequences associated with 3 to 30 acres of additional detrimental soil conditions within the PCGP corridor within the Trail Creek Watershed include:

- A potential localized increase in sediment mobilization. The PCGP route was located to avoid areas with high risk of geologic hazards. No landslides have been identified that pose a threat to the PCGP. The PCGP route does not cross earthflow terrains in the Trail Creek Watershed. Effective erosion control measures and Best Management Practices are required as shown in the ECRP. : (see Section 2.1.2 for a general discussion of erosion control measures.) Additionally, the PCGP would comply with Forest Plan Standards and Guidelines for maintenance of effective ground cover. As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, the required application of Best Management Practices, ridgetop location, lack of stream crossings, lack of intersection with Riparian Reserves, and implementation of the ECRP, it is highly unlikely that amending the Forest Plan to exceed the soil disturbance thresholds by 3 to 6 acres would result in the mobilization of sediment that would change the existing equilibrium described in the Trail Creek Watershed Analysis. (I need a resource report that draws this conclusion)

- A potential localized increase in peak flows. The PCGP would remove canopy on about 43 acres or about 1.0 percent of USFS lands in the Trail Creek Watershed. FERC noted that this watershed was the most impacted of all of the fifth-field watersheds crossed by the PCGP with respect to canopy removal as a proportion of watershed size. The Trail Creek Watershed Analysis determined that all subwatersheds in the Trail Creek Watershed had low sensitivity to peak flow increases because of the small proportion of the watershed that is in a hydrologically immature condition and the small area that is potentially affected by rain-on-snow events. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small area affected by the project as a proportion of the watershed. Additionally, the entire PCGP corridor within the watershed lies on ridgetop locations that have minimal interactions with aquatic systems. No stream channels or Riparian Reserves are intersected by the PCGP corridor within the in Trail Creek watershed. The Trail Creek watershed analysis concluded that:

  - *Amount, timing, and delivery of water, sediment, and wood from the forested parts of this watershed are not changed appreciably from the reference conditions due to forest harvest effects on peak flows. Effects would remain inconsequential unless large areas of forest are harvested or burned in the near future.*

Because the PCGP corridor does not intersect any streams on NFS lands in Trail Creek, there is no direct routing of water to stream channels. Given the ridgetop location, lack of stream or Riparian Reserve intersection, low watershed sensitivity to peak flows, and application of Best Management Practices in construction and rehabilitation of the corridor, it is highly improbable that the amendment of Forest Plans to exceed soil compaction limitations in the PCGP corridor

would change flow regimes from current conditions or from those described in the Trail Creek Watershed Analysis.

- A potential loss of site productivity, which may slow vegetative recovery. Volcanoclastic soils such as those found in the Trail Creek Watershed may be low in productivity. Mechanically decompacting the soil to a minimum depth of 20 inches and re-establishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. PCGP would decompact the corridor, fertilize disturbed areas, re-establish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and coarse woody debris back across the site to provide for long-term nutrient cycling as required in the ECRP. The Forest Service may also require soil remediation with biosolids. Biosolids provide a proven method to increase soil biotic capacity and revegetation success in SW Oregon (Orton 2007).

Off-site mitigations contribute to further reducing these watershed effects. Approximately 1.05 miles of existing roads (about 2.56 acres) would be decommissioned; storm-proofing is planned on 0.58 miles in the Trail Creek Watershed as part of the mitigation plan for the PCGP on NFS lands. Decommissioning roads reduces sediment by allowing re-establishment of effective ground cover and reducing soil compaction, thus increasing infiltration. Decommissioning roads - contributes to reducing peak flow effects by reducing road-stream interactions, increasing infiltration and reestablishing natural drainage. Reducing sediment and potential peak flow effects helps offset the impact of the estimated 12 to 15 acres of PCGP right-of-way in the watershed that may be in a degraded soil condition on completion of the project.

2.5.3.6 Off-Site Mitigations

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management objectives are achieved. These projects also contribute to the "Maintain and Restore" objectives of the ACS. The BLM, Forest Service and PCGP have entered into Agreements in Principle to accomplish off-site mitigation work in Trail Creek as shown in table 2.5.3.6-1. Figure 2.5-2 compares selected mitigation measures and project impacts. Mitigation measures were developed from the recommendations of watershed assessments, late successional reserve assessments and the 2011 Northern Spotted Owl Recovery Plan. Mitigation measures in Upper Cow Creek are focused on integrated projects that are intended to:

- Restore natural sediment regimes by reducing sediment contributions from roads and potential high-intensity fire,
- Restore historic stand and fuel density levels to selected stands, and
- Restore elements of aquatic and terrestrial habitat

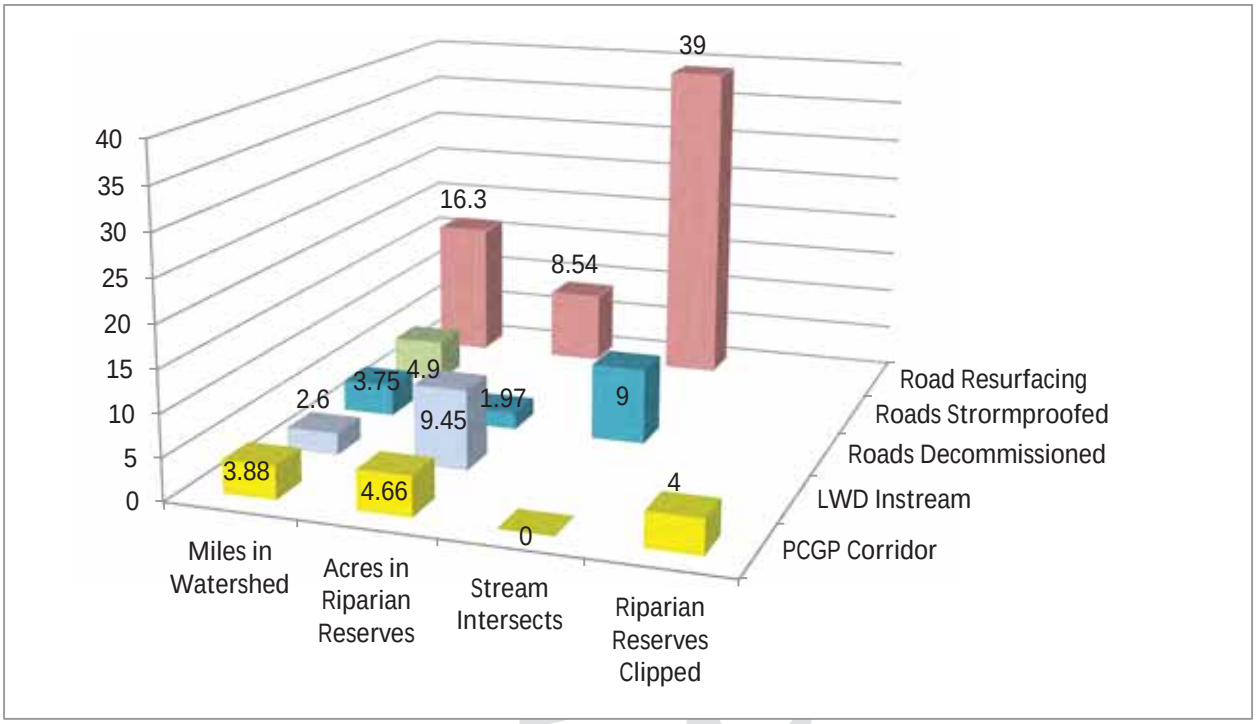
TABLE 2.5.3.6-1

Offsite Mitigations on BLM and NFS Lands in the Trail Creek Watershed

Agency	Project Type	Mitigation Group	Project Name	Project Rationale
Forest Service	Fuels Reduction	Stand Density Fuel Break	Upper Trail Creek Shaded Fuel Break (566 Acres)	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity; however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. These segments tie together as part of the Milo to Shady Cove fuel break on both BLM and Forest Service lands.
BLM	Fuels Reduction	Stand Density Fuel Break	Trail Creek Fuel Hazard Reduction (687 Acres)	
BLM	Fire Suppression	Fire suppression	Trail Creek Pump Chance (8 Sites)	Construction of the pipeline and associated activities would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.
Forest Service	Road Decommissioning	Road Sediment Reduction	Upper Trail Creek Road Decommissioning (1.05 Miles)	Sediment has been identified by the Upper Rogue watershed Council as a limiting factor for aquatic habitat in Trail Creek. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity and by reducing road density.
BLM	Road Decommissioning	Road Sediment Reduction	Trail Creek Road Decommissioning (2.7 Miles)	
Forest Service	Road storm-proofing	Road Sediment Reduction	Trail Creek Road Stormproofing (0.60 Miles)	Sediment has been identified by the Upper Rogue watershed Council as a limiting factor for aquatic habitat in Trail Creek. Stormproofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.
BLM	Road Storm Proofing	Road Sediment Reduction	Trail Creek Road Stormproofing (4.3 Miles)	
BLM	Road Surfacing	Road Sediment Reduction	Trail Creek Road Resurface (16.3 Miles)	Sediment has been identified by the Upper Rogue watershed Council as a limiting factor for aquatic habitat in Trail Creek. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.
Forest Service	Snag Creation in Matrix Lands	Upland Terrestrial	Snag Creation (109 Acres)	The PCGP would remove current and future sources of snags, which provide a key wildlife habitat element. Snag creation replaces the existing and potential snags lost in the corridor.
BLM	LWD instream	Aquatic Habitat	Trail Creek LWD (2.6 Miles)	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term effects from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.

Draft

Figure 2.5-2. Comparison of PCGP Project Impacts and Benefits of Off-site Mitigation Measures in the Trail Creek Watershed



2.5.3.7 Cumulative Effects

Activities on BLM and NFS Lands

The BLM manages about 42 percent of the Trail Creek watershed; the Forest Service manages about 12 percent. Projects on federal lands that would contribute to cumulative effects with the PCGP are shown in table 2.5.3.7-1

TABLE 2.5.3.7-1

Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Trail Creek Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Resource
UNF	Trail Creek	West Fork Trail Creek	Current Grazing	2133 ac. Cattle grazing	Upland and riparian vegetation, fisheries / aquatic habitat, water quality
UNF	Trail Creek	Upper Trail Creek	Current Grazing	2270 ac. Cattle grazing	Upland and riparian vegetation, fisheries / aquatic habitat, water quality

TABLE 2.5.3.7-1

Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Trail Creek Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Resource
MD_BLM	Trail Creek	West Fork Trail Creek	Proposed Trail Creek Forest Management. Published in 2012 Medford Messenger. NEPA analysis on going. Expect implementation FY2014 & 2015.	336 acres restoration thinning, 13 acres riparian thinning, 414 acres of hazardous fuels treatment, 263 acres of precommercial thinning, 8 pump chances restored, block 4 roads, replace 1 culvert, decommission 0.48 miles of road, stream restoration on 0.45	Owls, NRF habitat, CHU, WUI, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils
MD_BLM	Trail Creek	Upper Trail Creek	Proposed Trail Creek Forest Management. Published in 2012 Medford Messenger. NEPA analysis on going. Expect implementation FY2014 & 2015.	714 acres restoration thinning, 75 acres riparian thinning, 1075 acres hazardous fuels treatment, 282 acres meadow restoration, 50 acres of small diameter thinning, 6 pump chances restored, 259 acres of roadside firewood cutting, 0.78 miles of temporary roads.	Owls, NRF habitat, CHU, WUI, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils
MD_BLM	Trail Creek	Lower Trail Creek	Proposed Trail Creek Forest Management. Published in 2012 Medford Messenger. NEPA analysis on going. Expect implementation FY2014 & 2015.	20 acres of restoration thinning, 1,044 acres of hazardous fuels treatment, and 2 pump chances restored.	Owls, NRF habitat, CHU, WUI, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils

These activities are expected to be consistent with the standards and guidelines (or management direction on the BLM) and objectives of the Umpqua National Forest and Medford District BLM land management plans. Restoration thinning and hazardous fuels reductions are expected to contribute to improvements in watershed conditions by reducing stand density and reducing the probability of stand replacement fire. Road improvements and decommissioning are expected to reduce road-related sediment transport to aquatic systems.

Activities on Private Lands

Private lands comprise about 46 percent of the Trail Creek watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Most of the private lands in the watershed are small ranches where the dominant use of the land is grazing.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.50 percent of BLM lands, 1.15 percent of the NFS lands and 0.65 percent of private lands in the Trail Creek watershed (table 2.5.3.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when

considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Trail Creek South Umpqua watershed in any significant, discernible or measureable way. See also Chapter 4.14, Cumulative Effects.

2.5.3.8 Project Effects Compared by ACS Objective

Table 2.5.3.8-1 compares the Project impacts to the objectives of the ACS for the Trail Creek watershed. BLM and NFS lands where the ACS applies comprise about 50 percent of the Trail Creek watershed (table 2.5.3.1-1). Watershed conditions and recommendations are found in the Trail Creek Watershed Analysis (BLM 199b) and described in detail in Appendix J. In the Trail Creek Watershed, timber harvest and removal of LWD from creek channels has reduced structural complexity of the aquatic habitat and its ability to retain sediments. Chronic, fine-grained sediment, primarily related to roads, has negatively affected aquatic habitats. The presence of roads has segregated some stream reaches from upslope habitats that are needed for replenishment of LWD. The Project crosses one intermittent stream and clips 5 Riparian Reserves BLM lands (tables 2.5.3.1-1 through 4).

In their 2013 filing, Pacific Connector proposed a route that would have paralleled, and largely encompassed the Riparian Reserve of a small intermittent channel at MP 119.7. Field review by the BLM indicated that this area was moderately to severely erosive and may be difficult to revegetate if disturbed. This area was also flashy (runoff comes up rapidly with storms) because of relatively shallow soils. If constructed as proposed, this location would likely become a long-term chronic source of sediment that would be outside the range of historic variation and may retard attainment of ACS objectives at that location. At the request of the BLM, Pacific Connector has identified an alternative alignment to avoid this channel. This would reduce the acres of affected Riparian Reserve and placed the corridor in an area that would not have the revegetation issues associated with the filed route however it moved one stream channel crossing from private lands to BLM lands. BLM resource specialists reviewed this location in the field and concur with this routing. Once final engineering of this route realignment is completed and filed with FERC, this assessment would be modified to recognize that change.

Although Pacific Connector has modified the Project to respond to the ACS objectives and has incorporated measures consistent with the Riparian Reserve standards and guidelines, the assessment demonstrates that short-term impacts associated with the Project would occur at the site scale related to the removal of riparian vegetation, and impacts on streambanks, and substrates. When considering the design measures and BMPs that have been incorporated into the Project, the impacts on Riparian Reserves would be minor and short-term at the watershed or landscape scale except at noted at MP 119.7.

TABLE 2.5.3.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Trail Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed landscape scale features that would be affected by the Project. There are five Riparian Reserves that are clipped by the Project corridor on BLM-managed lands in the Trail Creek watershed (table 2.5.3.1-4). No Riparian Reserves are affected on NFS lands. One intermittent stream channel is crossed on BLM-managed lands at MP 119.7. There are also stream crossings on adjacent private lands. On BLM-managed and NFS lands subject to the ACS, the Project corridor is located primarily in early or mid-seral forests (table 2.5.3.1-4) and largely on or near ridgetops to minimize impacts on aquatic habitats. Approximately 4.66 acres or 0.14 percent of the Riparian Reserves in the Trail Creek Watershed are potentially affected by the Project (table 2.5.3.1-3). Approximately 0.81 acre of LSOG would be removed by the Project from a clipped Riparian Reserve in Lower Trail Creek (table 2.5.3.1-4. Impacts to aquatic systems are consistent with those described in section 1.3.1. LWD cleared in construction of the corridor would be used to stabilize and restore stream crossings. Off-site mitigation measures including road stormproofing and decommissioning and instream LWD projects are expected to improve watershed conditions in the Trail Creek watershed (section 2.5.3.6). At MP 119.7, the project has been rerouted to avoid a small intermittent stream that would have run parallel to the pipeline trench. While there are long-term effects on vegetation in Riparian Reserves, from construction clearing of the corridor, these would be minor in scale and well within the range of natural variability for the watershed.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Trail Creek watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the POD (i.e., Wetland and Waterbody Crossing Plan). Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried, and the actual area of bank and stream bottom disturbance associated with equipment crossing and trenching is small at each crossing (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions, consistent with the POD requirements. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. The residual levels of disturbance are anticipated to be well within the range of natural variability in the Western Oregon Cascade Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	No stream channels are crossed on BLM-managed or NFS lands where the ACS applies so physical integrity of banks and stream bottoms would not be affected. There are crossings on private lands immediately adjacent to BLM property boundaries. The impacts of crossing construction would be the same as if those crossings were on BLM-managed lands and are disclosed here because of the close proximity. Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried, and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored on-site and the bed and banks would be returned to pre-construction conditions, consistent with the POD requirements (i.e., Wetland and Waterbody Crossing Plan). By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained, although in the short term (during construction) elements of the aquatic system could be disturbed. This level of disturbance is well within the range of natural variability that for watersheds of the Western Oregon Cascade Province

TABLE 2.5.3.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Trail Creek Watershed

ACS Objective	Project Impacts
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	There would be one intermittent stream crossed on BLM-managed lands at MP 119.7. No long-term impacts on water quality are expected because of application of the ECRP including maintenance of effective ground cover and Best Management Practices during construction (see section 1.3.1 and previous discussion).
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Trail Creek watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from landslides and surface erosion following major disturbances such as fires and high-intensity winter storms (BLM 1999b; Everest and Reeves 2007). More chronic erosion and deposition of fine sediments primarily from roads, and to a lesser degree from land use has replaced these pulse-type disturbances in the current sediment regime in the watershed. In their 2013 filing, Pacific Connector proposed a route that would have paralleled, and largely encompassed the Riparian Reserve of a small intermittent channel at MP 119.7. Field review by the BLM indicated that this area was moderately to severely erosive and may be difficult to revegetate if disturbed. This area was also flashy (runoff comes up rapidly with storms) because of relatively shallow soils. If constructed as proposed, this location would likely become a long-term chronic source of sediment that would be outside the range of historic variation and may retard attainment of ACS objectives at that location. With the exception of MP 119.7, the Project construction and operation is not likely to alter sediment patterns in the watershed, nor is it likely to exacerbate these conditions. Proposed mitigation projects would contribute significantly to reduction of sediments and restoration of aquatic functions (section 2.5.3.6).
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project is not likely to affect peak flows in the Trail Creek watershed because of it's predominately ridgetop location, the relatively small area of the watershed affected (less than 1 percent) and relative lack of connectivity to aquatic systems. The Trail Creek Watershed Assessment noted that increases in peak flows were a low risk in all of the subwatersheds and in the watershed as a whole.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not cross any meadows or wetlands in the Trail Creek watershed on BLM-managed or NFS lands, so there would be no impact from the Project on water tables or seasonal inundation of these areas
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Trail Creek watershed would be minor. The Project would affect approximately 4.66 acres of vegetation in Riparian Reserves or 0.14 percent of the Riparian Reserves on BLM-managed and NFS lands in the Trail Creek watershed (table 2.5.3.1-3). About 3.85 of the 4.66 acres affected are early or mid-seral plant communities; the remaining 0.81 acres is LSOG (table 2.5.3.1-4). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Planned mitigation measures include 2.6 miles of instream LWD which would contribute to restoration of aquatic function (section 2.5.3.6)

Draft

TABLE 2.5.3.8-1 **Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Trail Creek Watershed**	
ACS Objective	**Project Impacts**
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Trail Creek watershed would be minor. The project would affect approximately 4.66 acres of vegetation in Riparian Reserves or 0.14 percent of the Riparian Reserves on BLM-managed and NFS lands in the Trail Creek watershed. About 3.85 of the 4.66 acres affected are early or mid-seral plant communities; the remaining 0.81 acre is LSOG. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. . The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.5.3.9 Summary

There would be no intersections with Riparian Reserves or stream crossings on NFS lands in the Trail Creek watershed. The pipeline route clips five Riparian Reserves on BLM lands. Two of these are associated with stream crossings that occur on adjacent private lands. At MP 119.7, the filed route would cross and run parallel to an intermittent stream and would largely overlay its associated Riparian Reserve. This site is likely to become a chronic source of sediment that may retard attainment of ACS objectives. The BLM has requested the applicant to realign this segment away from the affected Riparian Reserve. The applicant has agreed to do so and has developed a proposed realignment as requested. Once engineering is final, the applicant would file this realignment with FERC. At that time, this assessment would be modified to reflect that change. As a result of this proposed realignment, one intermittent channel would be crossed on BLM lands.

Clearing associated with the Project corridor would remove about 2.2 acres of LSOG vegetation in Riparian Reserves (table 2.5.3.1-4). Most of this is mature hardwoods. While this is a long-term change in vegetative condition, it is minor in scale and is well within the range of natural variability for changes in vegetative condition given the fire history of the watershed (section 2.5.3.4).

The high clay-content soils in the watershed (BLM 1999:1-4) presents a potential issue with respect to possible compaction, sediment produced at stream crossings and sediment that could be mobilized by overland flow. Subsoil ripping (including the use of hydraulic excavators) is a proven method to reduce soil compaction. Measures in the ECRP including soil remediation with biosolids or other organic materials, rapid revegetation and maintenance of effective ground cover are likely to control surface erosion. Erosion control measures described in section 1.3 for stream crossings are likely to be successful at minimizing sediment associated with clearing in Riparian Reserves in the Trail Creek watershed. The BLM and Forest Service may require additional erosion control measures if needed.

Off-site mitigation measures, identified by the BLM and Forest Service, would supplement onsite minimization, mitigation, and restoration actions. These proposed offsite mitigation measures are responsive to recommendations in the Trail Creek watershed assessment and would contribute to improving terrestrial and aquatic conditions within the watershed (section 2.5.3.6).

A site-specific amendment of the Umpqua National Forest LRMP to waive limitation on detrimental soil compaction is proposed to make provision for the Project. This proposed amendment is minor in scope and is not expected to prevent attainment of ACS objectives because

of implementation of the ECRP and the fact that there are no stream intersects on NFS lands in the Trail Creek watershed (section 2.5.3.5). Proposed amendment of the Umpqua National Forest LRMP and the Medford District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian dependent species (section 2.5.3.5).

The routing of the pipeline through BLM and NFS lands, coupled with the relatively small area of BLM and NFS land affected by Project construction (124.46 acres or 0.65 percent of federal lands), makes it highly improbable that Project impacts could affect watershed conditions beyond the site scale. Although there are project-level impacts such as short-term sediment and a change in vegetative condition on approximately 2.92 acres or 0.07% of Riparian Reserves in the watershed, these would be minor and limited to the boundaries of the project area (section 2.5.3.4).

With the exception of possible chronic sediment caused by locating the corridor in a Riparian Reserve at MP 119.7, no project-related impacts that would retard or prevent attainment of ACS objectives have been identified (section 2.5.3.8). Impacts, as they relate to relevant ecological processes, are within the range of natural variability for watersheds in the Cascades and Klamath-Siskiyou Provinces, although some of these processes have been altered from their natural condition (section 2.5.3.4).

2.5.4 Shady Cove-Rogue River Fifth Field Watershed HUC 1710030707

2.5.4.1 Overview

The Shady Cove-Rogue River fifth-field watershed (figure 2.5-3) is located in southwestern Oregon between Medford and Crater Lake National Park. It is one of eight fifth-field watersheds in the 2,618 square mile Upper Rogue River Subbasin. The watershed lies entirely within Jackson County. The towns of Trail and Shady Cove (population approximately 2,379) are within or adjacent to the watershed. Logging and agriculture dominate human land use in the watershed.

The Shady Cove-Rogue River watershed is located at the lower (downstream) end of the Upper Rogue subbasin. The watershed lies just downstream of Lost Creek Lake, a reservoir formed on the Rogue River by Lost Creek Dam (on the Lost Creek-Rogue River fifth-field watershed). The Rogue River flows generally southward through the watershed for a total distance of about 23 miles. Upon leaving the watershed at its southwest corner, the Rogue River turns westward and flows through the Rogue River – Siskiyou National Forest and the Klamath Mountains to the Pacific Ocean at Gold Beach, Oregon, about 32 miles from the border with California. The entire Rogue River drainage basin is about 132 miles wide (east to west). See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the proposed PCGP corridor.

The Shady Cove-Rogue River watershed lies within the Western Cascade and Klamath Mountain physiographic provinces. The Western Cascades, generally located east of the Rogue River, are characterized by rocks that have formed from predominantly older lava flows (between 42 and 25 million years ago). As the Cascades rose, the Rogue River maintained its flow to the ocean by down-cutting, which created steep narrow gorges and rapids in many places. In contrast to the predominantly volcanic rocks of the Western Cascades, the Klamath Mountains physiographic province is characterized by ancient undifferentiated igneous, metamorphic, and sedimentary

rocks. Quaternary (1.6 million years ago to present) alluvial floodplain deposits also occur as dominant geologic materials along the lower reaches of the Rogue valley.

The upper portions of the Shady Cove-Rogue River Watershed are characterized by soils having a high erosion hazard potential. Approximately 26,734 acres or 36 percent of the watershed is dominated by highly erodible soils. This includes about 40 percent of the Indian Creek subwatershed and 76 percent of the Brush Creek subwatershed.

The watershed contains various land forms including ridges, buttes, undulating hills, valleys, and relatively broad bottomlands. Approximately 35 percent of the watershed is above 2,000 feet amsl and is, therefore, in the TSZ, where total to partial snow melt during warm mid-winter rain-on-snow events is associated with nearly all major peak flows. Lower elevation lands are mostly privately owned and contain most of the area's population. The town of Shady Cove is located at 1,400 feet amsl. The watershed's lowest elevation is at about 1,200 feet amsl at the southern boundary at the confluence of Little Butte Creek and the Rogue River. The highest elevation is approximately 3,900 feet amsl, which occurs near Willy Rock, in the far northeast corner of the watershed (Brush Creek-Rogue River subwatershed). Higher elevation areas, which include the majority of BLM lands, are comprised mainly of the forested Cascade foothills.

The PCGP project corridor traverses portions of the two more upland subwatersheds (i.e., Brush Creek and Indian Creek subwatersheds, figure 2.5-3). The watershed is bounded on the north by the Trail Creek and Elk Creek-Rogue River fifth-field watersheds, on the east by the Lost Creek-Rogue River and Big Butte Creek fifth-field watersheds, and on the south by the Little Butte Creek fifth-field watershed. All these watersheds are part of the Upper Rogue River subbasin. On the west, the 116.0 sq. mile (74,268 acre) Shady Cove-Rogue River watershed includes three subwatersheds (figure 2.5-3, table 2.5.4.1-1). Moving down the Rogue River drainage system (from northeast to southwest), the Brush Creek, Indian Creek and Reese Creek subwatersheds are encountered. Of the three, the PCGP Shady Cove-Rogue River watershed is bordered by the Rogue River-Gold Hill and Evans Creek fifth-field watersheds of the Middle Rogue River subbasin.

The watershed is characterized by a Mediterranean type climate, tempered by winds from the Pacific Ocean. The area is characterized by cool, wet winters, warm, dry summers, and a long frost-free period. Summer temperatures range from the 70's to the high 90's (°F). Winter lows range from 10 to 20°F in the higher elevations, but the average daily winter temperature is 39°F for Shady Cove. The watershed has the lowest annual precipitation of all watersheds in the Upper Rogue River subbasin, with a mean annual precipitation of 22 inches in the lower elevations and 42 inches in the higher elevations. Most precipitation (about 80%) occurs from October through March, and is predominantly rainfall. However, on the highest ridges, winter snow can accumulate.

Based on the National Hydrography Dataset, there are approximately 645 miles of streams in the Shady Cove-Rogue River watershed, including approximately 85 miles of perennial streams, 200 miles of intermittent streams and 318 miles of ephemeral streams. Streamflow patterns reflect the distribution of precipitation, with low flows in the summer and high flows beginning in late fall and peaking in winter. Lost Creek Dam has modified the high and low flow regime in the Upper Rogue River. Water withdrawals contribute to decreased stream flows in summer.

Draft

Figure 2.5-3 shows the checkerboard pattern of lands in the watershed managed by the BLM Medford District. BLM lands are found in all three subwatersheds, ranging from 5,745 acres in the Reese Creek subwatershed to 9,799 acres in the Indian Creek subwatershed (table 2.5.4.1-1). Together, they constitute approximately 30 percent of the land in the watershed. The rest (70 percent) is in non-federal ownership. There are no NFS lands in the watershed.

There are no designated LSRs in the Shady Cover – Rogue River watershed. Approximately 420 acres of unmapped LSRs are associated with KOACs. No LSR land would be affected by project construction (table 2.5.4.1-3). Matrix lands, which are found in all three subwatersheds (table 2.5.4.1-1), constitute 100 percent of the federal land and 29.6 percent of all land in the watershed. Riparian Reserves total approximately 6,941 acres or approximately 30 percent of the BLM lands in the Watershed (table 2.5.4.1-1).

Location and Routing

At MP 121.7, the PCGP corridor crosses over the divide separating the Trail Creek fifth-field watershed from the Shady Cove-Rogue River watershed (figure 2.5-3). Once in the Shady Cove-Rogue River watershed, the corridor runs on high ground, soon moving to the divide separating the Indian Creek subwatershed from the Trail Creek watershed, and then proceeding along the divide separating the Brush Creek subwatershed from the Indian Creek subwatershed. Along this segment, the corridor runs alternately on both sides of the ridgetop. The corridor leaves the divide and proceeds south-southeastward across the eastern portion of the Indian Creek subwatershed to the divide separating the Indian Creek subwatershed from the Big Butte Creek fifth-field watershed. The corridor remains on this divide until it leaves the Shady Cove-Rogue River watershed at MP 130.1. Along this segment, the corridor runs alternately on both sides of the divide.

By generally following ridge lines and subwatershed boundaries, corridor routing minimizes effects to waterbodies, associated riparian areas, and riparian reserves. The alignment also avoids areas of potential rapidly moving landslides. Because of its predominant ridge top routing, the PCGP corridor traverses a substantial amount (4.42 miles) of BLM land, including 0.98 miles in Brush Creek subwatershed and 3.40 miles in the Indian Creek subwatershed (table 2.5.4.1-2). Most of the traversed land is in the TSZ, where vegetation clearing is known to contribute to elevated peak flow conditions during warm rain-on-snow events. Over all land ownership, the corridor crosses 8.14 miles of the Shady Cove-Rogue River Watershed.

Project effects in the watershed total approximately 142.4 acres (all ownerships), due largely to clearing (table 2.5.4.1-2). Approximately 75.53 acres of BLM land (69.3 acres cleared and 6.23 acres modified), constituting 0.34 percent of the BLM land in the watershed would be within the Right of Way. Over all land ownerships, 0.20 percent of the land in the watershed would be affected by project construction. All affected federal land (75.53 acres) is matrix land or Riparian Reserves (4.4acres)[13]. No NFS lands are affected in the Shady-Cove Rogue River watershed.

Four small intermittent tributaries of Indian Creek (and associated riparian zones) are crossed (MP 126.50, 126.52, 126.59, and 128.89, table 2.5.4.1-4). Five other riparian reserves, one in the Brush

[13] This estimate of affected Riparian Reserves is based on the filed application. The proponent has agreed to route realignments between MP 126.5 and 126.59 that will eliminate one stream crossing and reduce the affected area slightly.

Creek subwatershed and the other four in the Indian Creek subwatershed, are clipped, but none of the associated streams are crossed. The BLM has requested realignment of the crossings at MP 126.5, 126.52 and 126.59 to avoid erosive soils that would be difficult to revegetate. The assessment reflects the filed alignment. When a modified alignment is filed, this evaluation would be modified to reflect those changes. One of the four riparian zones affected in the Indian Creek subwatershed is associated with a perennial tributary to Deer Creek (MP 128.08). Over the entire watershed, approximately 4.4 acres of riparian reserves would be cleared. This constitutes approximately 0.06 percent of the riparian reserves in the watershed. Approximately 2.59 acres of LSOG forest habitat within riparian reserves would be cleared by the PCGP project. Tables 2.5.4.1-4 and 2.5.4.1-5 describe affected riparian reserves and stream channel intersects in the Shady Cove-Rogue River Watershed.

Draft

Figure 2.5-3 PCGP Routing and Subwatershed Boundaries, Shady Cove – Rogue River Watershed

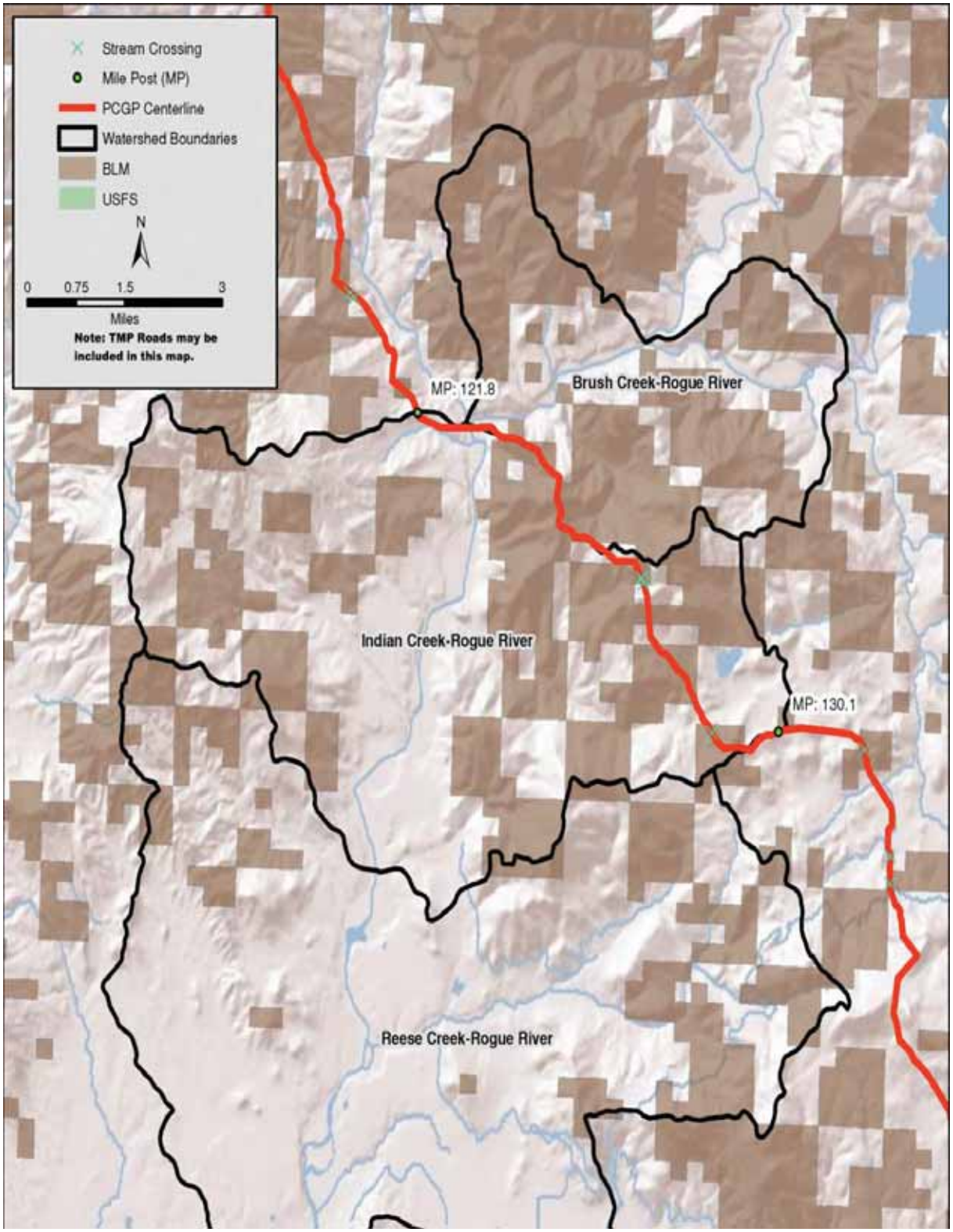


TABLE 2.5.4.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Shady Cove-Rogue River Watershed HUC 1710030707

Unit a/	Unit Total (acres)	Land Ownership (acres)			Federal Land Allocation (acres)					
		BLM	NFS	Other	LSR b/		Matrix		Riparian Reserves c/	
					BLM	NFS	BLM	NFS	BLM	NFS
Brush Creek-Rogue River	11,569.01	6,884.47		4,684.54			6,879.26		2595.2	
Indian Creek-Rogue River	25,234.45	9,805.67		15,428.78			9,805.67		2782.8	
Reese Creek-Rogue River	37,464.39	5,749.29		31,715.10			5,749.29		1563.4	
Watershed Total	74,267.85	22,439.43	0.00	51,828.42	0.00	0.00	22,434.22	0.00	6,941.40	

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. Approximately 420 acres of unmapped LSRs are associated with KOACs.
c/ Occur within LSR and Matrix Land Allocations

TABLE 2.5.4.1-2

PCGP Project Corridor (miles) and Project Area (acres) in the Shady Cove-Rogue River Watershed (HUC 1710030707) by Land Ownership

Unit a/	Land Ownership															
	BLM				Forest Service				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Forest Service Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Brush Creek-Rogue River	0.98	10.84	1.63	0.18					0.55	8.84	1.07	0.21	1.53	19.68	2.70	0.19
Indian Creek-Rogue River	3.40	58.47	4.60	0.64					3.21	53.17	3.74	0.37	6.61	111.64	8.34	0.48
Reese Creek-Rogue River																
Watershed Total	4.38	69.31	6.23	0.34					3.76	62.01	4.81	0.13	8.14	131.32	11.04	0.19

a/ All data derived from NSR-based GIS files

Draft

TABLE 2.5.4.1-3

PCGP Project Area (acres) on Federal Lands in the Shady Cove-Rogue River Watershed (HUC 1710030707) by Agency and Land Allocations

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves				All Allocations			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modifie d
Brush Creek-Rogue River	BLM					10.84	1.63	0.16	0.02	0.28		0.01		10.84	1.63	0.16	0.02
	NFS																
Indian Creek-Rogue River	BLM					58.47	4.60	0.60	0.05	4.32	0.20	0.16	0.01	58.47	4.60	0.60	0.05
	NFSe																
Reese Creek-Rogue River	BLM																
	NFS																
Watershed Total	**BLM**					69.31	6.23	0.31	0.03	4.60	0.20	0.07	0.00	69.31	6.23	0.31	0.03
	NFS																

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only. Source: BLM 2012: Table 1-2, page 1-6

Draft

TABLE 2.5.4-1-4

Riparian Reserve Effects Shady Cove Rogue River Fifth Field Watershed HUC 1710030707

									Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/																	
Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed	Width of Crossing (feet)	Wetland Acres Crossed	Clipped	RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats	Gross Riparian Reserves	Fish Bearing	Anadromy
Brush Creek Subwatershed HUC 171003070701																												
MD BLM	123.57	Trib to Brush Cr.	RR of lateral stream clipped	I	No			Yes		0.28		0.28				0.00				0.00		0.28		0.28		0.28	No	No
Indian Creek Subwatershed171003070702																												
MD BLM	125.44	Trib to Indian Cr.	RR of lateral stream clipped	I	No			Yes	0.02		0.65	0.67				0.00				0.00		0.67		0.67	0.05	0.72	No	No
MD BLM	126.5	Trib to Indian Cr.	small 1' wide intermittent headwater tributary) (Realignment Requested)	I	Yes	4	0	No				0.00			0.25	0.25		0.25		0.25		0.50		0.50	0.08	0.58		
MD BLM	125.52	Trib to Indian Cr.	small 1-2' wide intermittent headwater tributary) (Realignment Requested)	I	Yes	4		No				0.00			0.01	0.01		0.41		0.41		0.42		0.42	0.02	0.44	No	No
MD BLM	126.59	ASI221Trib. to Indian Creek (possible minor reroute)	Seasonal Creek, U- shaped channel, 4'wide, 6-10% gradient (Realignment Requested)	I	Yes	5.65		No				0.00				0.00		0.23		0.23	0.02	0.23		0.23	0.45	0.68	No	No
MD BLM	127.39	RS005	RR clipped by hydrostatic test site	I	No	0.00		Yes				0.00			0.06	0.06		0.05		0.05		0.11		0.11		0.11	No	No
MD BLM	127.61	RS005	1' wide intermittent drainage – BLM designated	I	Yes	0.00		No			0 59	0.59			0. 41	0.41				0.00		1.0		0.63		0.51	No	No
MD BLM	128.89	AW309Trib. to Indian Creek	Forested wetland/stream	W	Yes	30.00	0.07	No	0.52		0.02	0.54			0.43	0.43				0.00	0.07	1.04		1.24		1.04	No	No
MD BLM	129.30	Trib to Indian Cr.	RR of lateral stream clipped	I	No			Yes	0.26	0.09		0.35				0.00				0.00		0.35	0.20	0.55		0.55	No	No
Subtotal Indian Creek Subwatershed		Crossed: 3 Int. Channels 1 Wetland	Clipped: 4 Int. Channel RR	8	4		0.07	4	0.8	0.09	1.26	2.15	0.00	0.00	0.79	0.79	0.00	0.94	0.00	0.94	0.09	4.32	0.2	4.52	0.6	5.21		

Draft

TABLE 2.5.4-1-4

Riparian Reserve Effects Shady Cove Rogue River Fifth Field Watershed HUC 1710030707

									Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/																	
Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed	Width of Crossing (feet)	Wetland Acres Crossed	Clipped	RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats	Gross Riparian Reserves	Fish Bearing	Anadromy
Total Shady Cove – Rogue River Watershed		Crossed: 3 Int. Channels 1 Wetland	Clipped: 5 Int. Channel RR	9	4		0.07	5	0.8	0.37	1.26	2.43	0	0	0.79	0.79	0.00	0.94	0	0.94	0.09	4.60	0.20	4.8	0.6	5.21		

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland. Proposed Realignments at 126.5, 126.52 and 126.59 would result in modifications of acres.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

TABLE 2.5.4.1-5

Turbidity and Stream Crossing Risk, Shady Cove –Rogue River Watershed

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Stream-bed Material b/	Turbidity Rating c/	Site Response Rating d/	Constru c-tion Impact Rating d/	Overall Rating e/
Shady Cove-Rogue River	Indian Cr.	126.5	I	1-2' wide intermittent drainage – BLM designated	1	1.18	20.11		BLM classified as erosive, realignment requested	Cobble/ Gravel	M	H (BLM)	M	Realign
Shady Cove-Rogue River	Indian Cr	126.52	I	Seasonal Creek, U-shaped channel, 1-2' wide; 15% gradient		4.08			BLM classified as erosive, realignment requested	Cobble/ Gravel	M	H (BLM)	M	Realign
Shady Cove-Rogue River	Indian Cr	126.59	I	Seasonal Creek, U-shaped channel, 4'wide, 6-10% gradient	4	5.65	13.62		BLM classified as erosive, realignment requested	Cobble/ Gravel	M	H (BLM)	L	Realign
Shady Cove-Rogue River	Indian Cr	128.89	I	Forested wetland/stream	5	30	10.42		Erosion resistant	Cobble/ Gravel	L	L	L	BLUE
Shady Cove-Rogue River	Indian Cr	129.13	I	Intermittent Stream		1.42					/	/	/	BLUE

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011, modified by BLM based on 2007 field review.
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011, modified by BLM based on 2007 field review.
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Draft

2.5.4.2 Existing Conditions Shady Cove-Rogue River, HUC 1710030707

As part of the analysis for the PCGP project the applicant prepared a project specific watershed analysis for the Shady Cove-Rogue River Watershed in March of 2012 (BLM 2012). The analysis was reviewed and accepted by the BLM. The Shady Cove-Rogue River Watershed encompasses three sub-watersheds: Indian Creek-Rogue River, Brush Creek-Rogue River and Reese Creek-Rogue River. The analysis was conducted on the entire watershed including each of the three sub-watersheds; however, the PCGP project does not cross the Reese Creek-Rogue River sub-watershed. The information in the rest of this section is summarized from the watershed analysis.

Watershed Analysis Findings

Geology and Soils

Generally soil erosion hazards within the watershed increase with slope gradients, and soils that have slopes greater than 35 percent typically have a severe soil erosion hazard. The Brush Creek and Indian Creek subwatersheds have the highest acreage of highly erodible soils in the watershed with 8,641 and 10,011 acres, respectively. Further, approximately 76 percent of the entire Brush Creek-Rogue River subwatershed is composed of highly erodible soils. However, potential erosion hazards increase on all disturbed soils, and appropriate Best Management Practices should be employed to minimize the potential loss of the soil resource as well as potential effects of sedimentation. When soil limitations are understood appropriate project designs and Best Management Practices can be developed to minimize potential effects to soils, including increased soil erosion and potential sedimentation.

The potential area of landslide hazards, as estimated by potential areas of Rapidly Moving Landslide (RMLs) with slopes greater than 50 percent slope, within both the Indian Creek and Brush Creek subwatersheds are fairly similar, with approximately 641 acres and 708 acres, respectively. High risk (RMLs) areas, as estimated by ODF, include areas with slopes greater than 70 percent. Slope analysis of the Watershed indicated that the Brush Creek subwatershed has the most area of steep slopes greater than 70 percent (196 acres) compared to the other subwatersheds. The Indian Creek-Rogue River subwatershed has about 70 acres of slopes greater than 70 percent

Hydrology

Development within the watershed included the city of Shady Cove, along with significant rural residential development on private lands throughout the watershed, as well as diversions to support irrigated croplands (hayfields) and pastures. These factors are the main contributors to the alteration of the hydrology within the Watershed. Diversions and flow alterations and the construction of Lost Creek Dam and other reservoir storage facilities have permanently changed the natural stream flow of the Rogue River and its tributaries. Approximately two-thirds of the watershed is privately owned. Ongoing growth and development would further impact water availability within the watershed.

Vegetation

Vegetation within this watershed has been altered or degraded by fire suppression, agriculture practices (grazing and cultivated fields), urban and rural development, logging, invasive species, and changes in hydrology (i.e., dams, irrigation). Generally, areas that are currently considered

agriculture and urban development had historically been oak woodlands or grasslands. Approximately 77 percent of historic forest and woodland vegetation remains within the Shady Cove-Rogue River Watershed; however, stand composition has changed. Fire was an ecological process that was active within the watershed and responsible for forest composition and structure. Since 1920, fire suppression efforts have limited lightning-ignited fires to an average of about only 15 acres within Jackson County. In the last 40 years, both natural and human-ignited fires within the Shady Cove-Rogue River Watershed have averaged approximately 3 acres. Fire suppression is most likely responsible for changes in vegetation composition within the Watershed from historic open, park-like stands with large-diameter trees to denser, often conifer-dominated stands, or from historic grasslands to more scrubby oak-dominated habitat and/or shrub-dominated landscapes. Lower elevations have been developed for residential and agricultural uses. No specific information on historic wetlands is available, although it can be assumed that most historic wetlands have been lost or degraded to habitat conversion from agricultural, urban, and rural residential uses, similar to impacts experienced to vernal pool complexes.

Brush Creek-Rogue River Subwatershed

BLM lands dominate land ownership in the upland areas of this subwatershed, while private lands are primarily concentrated along the Rogue River corridor. This subwatershed is dominated by high gradient channel habitat types and confined headwater streams. Within this subwatershed, numerous small residential lots (< 2 acres) are developed adjacent to the river corridor along State Highway 62. Stream channel modifications on private lands on the narrow terraces along the Rogue River have generally been channelized to optimize residential development and the crossing of State Highway 62. This modification (1.79 miles) primarily is associated with moderate gradient moderately confined channels (MM) that are intermittent or ephemeral streams. BLM and private lands in the upland areas of the watershed away from the river corridor are dominated by forest lands and land uses. While road development is generally limited, the main access roads typically parallel named creeks (i.e., Brush Creek, Lewis Creek).

Indian Creek-Rogue River Subwatershed

Private lands dominate this subwatershed with residential development concentrated in and around the communities of Shady Cove and the community of Trail. Residential river front property land uses dominate the character of the river corridor in this subwatershed with many small developed lots. BLM and private lands in the upper areas of the subwatershed are characterized by forest lands; however, rural residential development occurs on larger parcels in the upper watershed areas. Similar to the Brush Creek subwatershed, this subwatershed is also dominated by high gradient channel habitat types (VH and SV). Stream channel modifications (a total of 16.7 miles) are primarily evident along the Rogue River associated with development in and around Shady Cove, as well as with irrigated agricultural lands in the southern area of the subwatershed along the Rogue River; however, channel modifications are also present in the gentle valley in the upper reaches of Indian Creek and Mucky Flats. Channel modifications are primarily (9.0 miles) associated with moderate gradient moderately confined channels (MM) intermittent and ephemeral drainages. Approximately 2.6 miles of perennial stream channels appear to have been modified.

Reese Creek-Rogue River Subwatershed

This subwatershed is dominated by private land ownership. BLM lands are principally located in the upper reaches of the subwatershed. While this subwatershed, which is in the lowest part of the Shady Cove-Rogue River Watershed, is dominated by very steep and steep gradient channel habitat types (VH and SV), moderate gradient confined channel types (MV, MH and MC) are also common. This subwatershed also has the greatest number of miles of low gradient unconfined to moderately confined channel habitat types (FP3 and LM) when compared to the other subwatersheds. The PCGP does not cross this subwatershed.

Residential development is scattered throughout the subwatershed; however, scattered development on 5-acre, non-irrigated grassland lots dominates the character of the subwatershed west of the river along State Highway 234 and north of County Road 815 in the Constance Creek area. While residential development along the Rogue River corridor has occurred, development is generally on larger parcels with less density than in the Brush Creek or Indian Creek subwatersheds. East of the Rogue River, rural residential development is generally characterized by lots 5 acres or larger that are irrigated and non-irrigated pasture and hay lands. Channel modification is prevalent on the private lands in the low gradient areas within the Constance Creek drainage, west of the Rogue River on the non-irrigated rural residential lands. West of the Rogue River, channel modification is predominantly associated with irrigated agricultural activities. The Reese Creek-Rogue River sub-watershed has the highest mileage of channel modification in the Watershed, with a total of 57.6 miles. Channel modifications have occurred primarily to moderate gradient headwater channels (MH) and low gradient small floodplain channels (FP3) that are mostly intermittent or ephemeral streams. Approximately 7.8 miles of perennial stream channels appear to have been modified.

Water Quality

Human-caused changes within the watershed have affected water quality. Construction, development, agriculture, and roads affect stream temperature, increase sedimentation, and contribute to elevated levels of monitored water quality parameters. However, water quality in the upper basin of the Rogue River and the Shady Cove-Rogue River Watershed measured at Dodge Bridge is good, especially when compared downstream at Merlin.

The completion of Lost Creek Dam in 1977, upstream of the watershed, has improved water quality by minimizing algae by trapping phosphorus, a critical nutrient. Furthermore, the Dam has had a cooling effect on the river, which would not have occurred without the reservoir. The design of the Dam allows water to exist at three different elevations; it is mixed to create an optimum temperature for trout, salmon, and steelhead rearing in the summer.

Aquatic

There has been an apparent decline in coho salmon returning to Gold Ray Dam during the past 10 years. Numbers of fall and spring Chinook salmon returning to the Shady Cove-Rogue River Watershed have also been declining during that period. Numbers of winter and summer steelhead suggest some declines during the past 10 years, but there are no apparent significant trends as there are for coho and Chinook salmon. Populations of other native anadromous and resident fish species are unknown.

Draft

Coho salmon in the Rogue River have been the focus of more studies than other fish species. Logging, agricultural practices, urbanization, stream channelization, dams, wetland loss, have led to soil erosion and stream sedimentation (logging and road networks), degradation of riparian zones and increased water temperatures, decreased recruitment of large woody debris in streams and decreased habitat complexity, damage to riparian vegetation by livestock grazing, and pollution by agriculture and urbanization throughout the SO/NCC coho ESU.

In the Rogue River, wild coho salmon were heavily affected by hatchery production with little natural production in the mainstem. The declining trend of coho salmon was indicative that natural populations in the Rogue River and others within the ESU were not self-sustaining. Declines in Rogue River coho populations prior to 2004 were recognized, due to a number of factors including loss of rearing and spawning habitat, reduction of summer stream flows, obstruction at culverts and other structures, decrease in ocean habitat productivity, and impacts caused by hatchery programs.

Removal of dams would allow Rogue River to flow freely for 153 miles from Lost Creek Dam to the Pacific Ocean. Recent removal of Gold Ray Dam (completed summer 2010) provides fish better access high quality salmon and steelhead spawning habitat upstream of the dam (much of it within the Shady Cove-Rogue River Watershed) and reclaim approximately 1.5 miles of spawning habitat under the dam reservoir.

Most water quality factors in the Watershed are functioning at adequate levels although fines are somewhat elevated in sediment loads. Likewise, instream habitat factors are adequate except for instream large wood which is less than under reference conditions, and instream gravel which is somewhat embedded and does not cover enough of the area. Conditions in upland habitats have been most affected by human development and past land uses so that the potential for large wood recruitment into streams is a limiting factor as well as the relatively small sizes of trees associated with younger seral stages and the accumulation of biomass fuels which increase risk due to forest fires.

Human Uses

The Shady Cove-Rogue River Watershed has been an area of intense human use since pre-historic times, especially along the mainstem of the Rogue River. This trend continues today and is commensurate with population growth. American Indian and early Euro-American hunter-gatherer-fisher uses have given way to agriculture, grazing, and industrial forestry over the last 150 years. More recently, recreational uses have become an important part of the human element within the watershed. Both public and private lands within the watershed are managed to support a variety of human uses, including the traditional forestry/agriculture paradigm and the newer recreational and light industrial uses. While hosting excellent recreation opportunities in its own right, the watershed also continues to serve as a major gateway to recreational use in adjacent watersheds and the Cascade Mountains.

Changes in Watershed Condition and Current Condition

There have been no significant changes in watershed conditions since the preparation of the March 2012 watershed analysis. The NWFP 15 year aquatic monitoring program noted a slight

downward trend in watershed condition based on changes in vegetation (Attachments: Section 3.3.2).

2.5.4.3 Natural Disturbance Processes

The Shady Cover Rogue River watershed lies entirely within the Klamath Province. As in other parts of the Klamath Province, disturbance processes were driven by frequent, low intensity fire with occasional stand replacing high intensity events. Where high intensity rain storms or rain-on-snow events overlapped with high intensity fires, landslides delivered large pulses of coarse material to aquatic systems. In the long intervals between these events, surface erosion and landslide rates were likely relatively low. Historically, surface erosion processes would have been associated with the steeper portions of the watershed, where erosion potential is higher. Erosion processes in the lower areas of the watershed where slope gradients are less would have likely been dominant near river channels and streams during high flow periods and would have been associated with bank erosion processes. Development and in particular, high road densities have replaced this cycle of pulse disturbances of coarse sediments with chronic fine sediment transport and deposition.

2.5.4.4 Project Effects and Range of Natural Variability

Watershed Analysis is intended to describe the historic range of variability and provide recommendations for management activities that contribute to restoring watershed health and achieving the objectives of the ACS. The Shady Cove-Rogue River Watershed Analysis described reference and current conditions and general ecological trends, but it did not establish metrics that reflect the natural variability at the watershed scale. Management recommendations to improve watershed health were provided that are responsive to the conditions and trends in the watershed. Those that are pertinent to the PCPG project on federal lands from the Shady Cove-Rogue River Watershed Analysis are summarized below. The congruence of the PCGP project with each recommendation is noted.

Recommendation-Noxious weeds: Treat noxious weeds which have degraded native plant communities, and displaced native plants.

- PCGP: The PCGP Noxious Weed Management Plan filed as part of FERC application is consistent with this recommendation.

Recommendation-Roads: Reduce road densities.

- PCGP: Although reducing road densities in this watershed was not identified as part of the applicant filed off-site mitigation plan, road improvement and road resurfacing were identified for 2.5 miles of road to reduce road related sedimentation in the watershed.

Recommendation-Stream Habitat: Restore stream habitat complexity through wood placement or other actions.

- PCGP: The off-site mitigation plan filed by the applicant includes placing large woody debris along 2.5 miles of streams within key locations in the watershed.

Draft

Table 2.5.4.4-1 provides the range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) on the Shady Cove-Rogue River Watershed. All processes have been affected to some degree by human activity. Also included in this table are evaluations of PCGP project effects on these ecological processes relative to the ranges of variability, considered in the context of past and ongoing natural and human disturbances in the watershed.

Table 2.5.4.1-5 summarizes the risk of increased turbidity and the overall crossing risk associated with each stream crossing in the watershed (adapted from GeoEngineers, 2011). All of the waterbody crossings in this watershed are intermittent streams and are rated as "blue" in the matrix of crossing risk and site response risk developed by GeoEngineers (see section 1.3). Sites in the blue management category represent low risk to stream channel stability based on this risk assessment scoring.

More robust Best Management Practices, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of Best Management Practices on "yellow" crossings. "Green" crossings have a high potential for impacts to aquatic habitat and typically involve sites with wider floodplains or varied aquatic habitats. Emphasis at these locations is more on bank and floodplain restoration. Table 2.5.4.4-2 describes the applicable Best Management Practices.

TABLE 2.5.4.4-1

Project Effects and Relevant Ecological Processes Described in the Shady Cove-Rogue River Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Prior to modern settlement and development of the Watershed, disturbances that would have increased erosion rates would have been associated with natural wildfires Surface erosion was limited to steeper upland slopes during storm events. Forested areas rarely experienced significant surface erosion except during seasonal precipitation after wildfires. Similar to current conditions, periods of abnormal weather such as heavy rains, rapid snowmelt, and flooding would have also influenced erosion processes prior to development. Historically, erosion processes in the lower areas of the Watershed where slope gradients are less would have likely been associated with storm events and bank erosion processes. The upper portions of the Shady Cove-Rogue River Watershed are characterized by soils having a high erosion hazard potential. Approximately 26,734 acres or 36 percent of the watershed is dominated by highly erodible soils. This includes about 40 percent of the Indian Creek subwatershed and 76 percent of the Brush Creek subwatershed.	The PCGP Project would cross approximately 8 miles of the Shady Cove-Rogue River Watershed between approximate MPs 122 and 130 and would clear a total of approximately 131 acres across all ownerships. The pipeline alignment was routed to follow ridgelines, where feasible, and to be aligned perpendicular to slope contours to minimize side hill construction, grading requirements, and overall disturbance. These routing objectives reduced the number of stream crossings as well as the potential for erosion and sedimentation. Measures in the ECRP are expected to minimize erosion and sediment transport. The filed application proposed to cross three areas in the vicinity of MP 126.5 that the BLM had identified as potential chronic sources of sediment if disturbed. At the request of the BLM, stream crossings at 126.5, 126.52 and 126.59 would be realigned to a more stable location that can be revegetated.
Ecological Succession / Vegetative Condition	The Shady Cove-Rogue River Watershed lies within the Oak Savanna Foothills sub-ecoregion of the Klamath Mountains ecoregion, which supports a high rate of species diversity, including many species found only locally. This sub-ecoregion has two distinct	The proposed Pacific Connector pipeline route through the Shady Cove-Rogue River Watershed is generally along a ridgeline between the Brush Creek-Rogue River and Indian Creek-Rogue River subwatersheds; therefore, vegetation would only be

TABLE 2.5.4.4-1

Project Effects and Relevant Ecological Processes Described in the Shady Cove-Rogue River Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
	components, one of which occurs within the Watershed: a dry area that is dominated by oak woodlands, grassland-savanna, ponderosa pine, and Douglas-fir. Franklin and Dyrness (1973) define the plant communities in the area of this Watershed as the Mixed-Conifer Zone. This type can generally be found within the northern two-thirds of the Watershed and can be extremely varied due to the complex geological history and topography. Most of the vegetation present within the Shady Cove-Rogue River Watershed has been altered through fire exclusion, agriculture practices/livestock production, rural and urban development, and logging. Fire exclusion has affected the overall landscape pattern. Within the past 40 years, approximately 18 percent of the 443 fires have been initiated naturally (lightning) and have averaged 0.3 acre in size, with the largest lightning-ignited fire affecting 3 acres. Historically this Watershed with its relatively dry climate was dominated by fire-adapted vegetation that experienced widely variable fire regimes, ranging from areas with relatively short fire return intervals (every few years) to areas with 50 to 100 year return intervals. As a result of fire suppression, stand structure has changed through increases in small tree density and heavy fuels. Today, the most prevalent stand replacement process in the Watershed is timber harvest and subsequent reforestation; however, this land use is minimal compared with surrounding watersheds because of forest composition. Flood (peak flows) and debris flows have been major influences on riparian vegetation.	affected within the Brush Creek-Rogue River and Indian Creek-Rogue River subwatersheds. Short-term and long-term impacts to vegetation due to construction and operation of the PCGP Project would result from clearing and grading 131 acres within the construction right-of-way and TEWAs. Vegetation within UCSAs may be modified (approximately 10 acres) over the short-term, if damage to understory vegetation and/or minor damage to trees occurs during temporary use to store forest slash, stumps, and dead and downed log materials during construction of the pipeline. Short-term impact would occur where vegetation types (i.e., herbaceous vegetation, some shrublands, and urban landscapes) would return to or approximate its pre-construction state within two years after revegetation and reclamation. Short-term impact could apply to the 25 acres of Shrublands, 20 acres of Grasslands, and 4 acres of Urban and Mixed Environs affected by the project. Long-term effects would occur where trees and shrubs are removed in upland coniferous, deciduous and mixed forests along the construction right-of-way and at TEWAs. Removal of trees within riparian zones would also be a long-term effect, although riparian shrubs removed during construction would be expected to be readily replaced by cuttings and sprigs of locally available shrub species. Long-term effects would result from clearing approximately 90 acres of forest land. This represents approximately 0.2 percent of forested vegetation types present within the Watershed. Since the Pacific Connector pipeline is expected to last for 50 years, effects to mid-seral forests and older stages would extend beyond the life of the project.
Flow Regime	Prior to settlement, dams, diversions, and barriers were non-existent and the flow regime followed a natural pattern which included seasonal flooding and larger flood events. The reference flow conditions would have been unaffected by dam storage, consumptive use, and diversions as they are today; instead floodplains, riparian areas, and soils would have stored, used, and recharged stream flow. The shape of the discharge graph would have been based solely on a pattern of precipitation in the Upper Rogue Subbasin and would likely be highly variable due to the relationship between precipitation and average monthly discharge rates. During July, August, and September, streamflow entering the Watershed from surrounding watersheds is greater than the amount of water exiting. The reduction in flow is due to irrigation use and withdrawals for domestic use, especially by the city of Shady Cove. Lost Creek Dam has modified the Rogue River's high and low flow regime. Naturally low flows and water withdrawals contribute to decreased stream summer stream flows. Water temperatures are known to exceed the criteria of the Oregon State Water Quality Standards for extended periods during the	The project would disturb approximately 76 acres of vegetation on BLM lands in the Watershed within the transient snow zone which ranges between about 2,000 and 5,000 feet in elevation, On all ownerships, the project clears approx. 131 acres or 0.19% of the watershed (table 2.5.4.1-2). These effects are dispersed throughout the watershed because of the linear nature of the project. Although forest harvesting and increased road networks/road densities within watersheds are known to increase peak-flows and rain-on-snow events, the limited aquatic connectivity and the limited area of forest clearing associated with the PCGP Project within the Watershed it is unlikely that measurable or consequential change to peak flows could occur. See also EIS Chapter 4.4. Water for dust abatement and hydrostatic testing would be drawn from sources other than those on BLM lands.

TABLE 2.5.4.4-1

Project Effects and Relevant Ecological Processes Described in the Shady Cove-Rogue River Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
	summer months due to low flow conditions and solar radiation in areas with sparse riparian vegetation. Development within the Watershed included the city of Shady Cove, along with significant rural residential development on private lands throughout the watershed, as well as diversions to support irrigated croplands (hayfields) and pastures. These factors are the main contributors to the alteration of the hydrology within the Watershed. Diversions and flow alterations and the construction of Lost Creek Dam and other reservoir storage facilities have permanently changed the natural stream flow of the Rogue River and its tributaries. Approximately two-thirds of the Watershed is privately owned. Ongoing growth and development would further impact water availability within the Watershed.	
Stream Temperature	Reference conditions for water quality are not available for pre-human settlement in the Watershed. Human settlement and development activities within the Watershed have removed vegetation and riparian shade, increased nutrient loading, and affected flow regimes through diversion/irrigation activities. Stream temperature is affected by many factors including air temperature, site elevation, riparian shade, forest structure, groundwater influence, upstream inputs, stream azimuth, stream depth, and stream gradient. According to the 2006 Upper Rogue Watershed Assessment, approximately 6 percent of the riparian areas along the Rogue River and tributaries have less than 20 percent shade. Most water temperature and flow concerns are focused on the tributaries. Water temperature has been measured in the Rogue River at Gauge 14339000 since 1980, though not continuously. Warmest temperatures are observed during July and August (56.30°F and 57.06°F, respectively) and minimum temperature occurs in January and February (41.37°F and 41.82°F, respectively). During the 30-year period from Water Year 1980 to 2009, the maximum temperature of 70°F occurred during several days in July 1992. Freezing temperatures (32°F) were only recorded for two days in October 1999. No streams with exceptionally high temperatures were identified within the Shady Cove-Rogue River Watershed; nor were any tributaries in the Watershed listed on Oregon's Water Quality Limited Streams for Temperature (the 303(d) list for 2004).	The PCGP Project would clear approximately 4.6 acres of riparian vegetation on BLM lands within the Shady Cove-Rogue River Watershed, primarily within the Indian Creek-Rogue River subwatershed (table 2.5.4.1-1). Because the PCGP Project is linear, it cannot avoid all stream and riparian crossings. The removal of riparian vegetation would have the potential to affect water quality by increasing solar radiation and temperature. Although shading vegetation would be removed at waterbody crossings, all of the stream channel crossings on BLM lands are intermittent streams that expected to be dry or discontinuous by the time that water temperatures become an issue in late summer. No adverse impacts to water temperature are expected to occur. See also EIS Chapter 4.4.
Aquatic Habitat and Stream Channel Complexity	The Rogue Basin Coordinating Council (2006) completed a Watershed Health Factors Assessment for the Rogue Basin. The 2006 report identified aquatic and terrestrial factors that limit watershed health in the Upper Rogue WCA. The lower reaches of Indian Creek provide some of the most coho important spawning habitat in the Rogue Basin. Instream habitats were generally characterized as adequate however fine sediments in spawning areas have negative impacts.	The Pacific Connector project does not cross any perennial streams so there would be no direct impacts on fish habitat. Crossings of intermittent streams would be restored to pre-crossing conditions.

Draft

Table 2.5.4.4-2 describes summarizes the risk of increased turbidity and the overall crossing risk associated with each stream crossing in the watershed (adapted from GeoEngineers, 2011). Crossings at MP 126.50, 126.52 and 126.59 all have a high risk of becoming chronic sources of fine sediments and would be realigned and are not included in table 2.5.4.4-2. This table would be updated with the new alignment when it is filed.

TABLE 2.5.4.4-2

Pacific Connector Proposed Best Management Practices for use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**128.89**	None	None
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization

Draft

TABLE 2.5.4.4-2 **Pacific Connector Proposed Best Management Practices for use at Waterbody Crossings**			
	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
BMP Source	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.		

At all crossings, silt fencing would be installed and maintained until effective ground cover is reestablished, effective ground cover would be in place prior to the onset of seasonal precipitation (table 1.3.1.2-1), and rapid re-establishment of vegetation would be emphasized.

Field review by the BLM of crossings at MP 126.50, 126.52, and 126.59 in the headwaters of Indian Creek show that these intermittent stream channels have fairly steep gradients with very steep sideslope angles (Lindell, e-mail, 2007). The streams, although intermittent, are prone to rapid runoff resulting in incision and downstream sediment transport. Slump potential in these channels is rated high by the BLM. Additionally, these stream banks and slopes are in many places completely barren of vegetation. The exposed soils erode easily with disturbance, and are likely exposed because surface erosion limits the reestablishment of vegetation. Because of the steepness, and lack of vegetation, the area experiences "flashy" storm runoff which is evident where the streambeds have scoured down to bedrock in several locations resulting in incised stream channels. The BLM has concerns about the ability to reestablish vegetation in this area and the high potential for mobilized sediment to be transported downstream. Excavating across the stream channels in these locations would only exacerbate these conditions. The BLM has requested a realignment at this location to avoid these issues. .

For the stream crossings at MP 126.50, 126.52, and 126.59, there is also potential for aggradation of sediment since all of these crossings are in close proximity and combine into one channel shortly downstream from the crossings. Once a new alignment is filed for this location, the potential for cumulative effects from crossing these channels would be reevaluated.

With the exception of crossings at MP 126.5, 126.52 and 126.59 application of project Best Management Practices described above, downstream sediment generated during construction should be consistent with effects described in Section 1.3.1 for dry, isolated crossings.

Erosion control measures and bank stability Best Management Practices are expected to be effective for longer term stability of the site. Post-operations sediment related to the PCGP corridor would be expected to be minor and within the range of natural variability for the Western Cascade and Klamath Mountain Provinces once the area is revegetated.

2.5.4.5 Compliance with Land Management Plans

Table 2.5.4.5-1 provides NWFP standards and guidelines relevant to the ACS, the related BLM management direction as provided in the Medford District RMP, and PCGP compliance with this management direction on BLM land in the Shady Cove – Rogue River watershed.

TABLE 2.5.4.5-1 **Compliance with Standards and Guidelines**		
Medford BLM RMP Management Direction	**NWFP Standard and Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Lands Mgmt., pg. 30, para. 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives would be incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, and others
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - General Riparian Area Mgmt., pg. 30, para. 4	RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. Pacific Connector has identified the Rogue River as a potential source for hydrostatic test water and dust suppression and has estimated the need for approximately 27 acre feet (AF) of water for these purposes. Hydrostatic test water withdrawal would occur during the late summer or fall after construction of the pipeline is completed and would only be needed for this one time use. Other than water appropriations for hydrostatic testing and dust control purposes, no other water appropriations or potential effects to the Watershed's hydrological conditions would be expected with the project's design measures and Best Management Practices. .
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 27, para. 2	RF-2: Road Construction Standards and Guidelines	The existing transportation system in the Shady Cove-Rogue River Watershed would be adequate for construction of the project. No permanent access roads are planned in the Shady Cove-Rogue River Watershed.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 1	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be rigorously implemented during project construction. Several road improvement projects are proposed in the Shady Cove-Rogue River Watershed. These would be expected to reduce sediment delivery from road.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 4	RF-7: Transportation Management Plan development.	The TMP meets all of the requirements of RF-7.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Watershed & Habitat Restoration, pg. 31, para. 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project affects Survey and Manage species within the Shady Cove – Rogue River watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective

TABLE 2.5.4.5-1 **Compliance with Standards and Guidelines**		
Medford BLM RMP Management Direction	**NWFP Standard and Guideline**	**PCGP Compliance**
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLM lands in the Shady Cove-Rogue River Watershed are currently 26% LSOG and exceed this threshold.

2.5.4.6 Off-Site Mitigations

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management objectives are achieved. These projects also contribute to the "Maintain and Restore" objectives of the ACS. The BLM, Forest Service and PCGP have entered into Agreements in Principle to accomplish off-site mitigation work in the Shady Cove-Rogue River Watershed as shown in table 2.5.4.6-1. Mitigation measures were developed from the recommendations of watershed assessments, late successional reserve assessments and the 2008 Northern Spotted Owl Recovery Plan.

The Rogue Basin Coordinating Council assessment of Indian Creek identified barriers, water temperature, and water quantity as the most significant aquatic limiting factors (Priority One) in the Upper Rogue WCA. Channel modification, large wood, pool-to-riffle ratio, sediment, stream habitat complexity (Priority Two), and gravel substrate (Priority Three) were also identified as limiting aquatic habitat quality in the Upper Rogue WCA. Similarly, fire risk, roads, and seral stage deficiencies were the most significant terrestrial limiting factors (Priority One), while riparian shade and wood sources (Priority Two) needed for large woody debris recruitment were limiting terrestrial components for salmonid habitats in the WCA (BLM 2012).

Draft

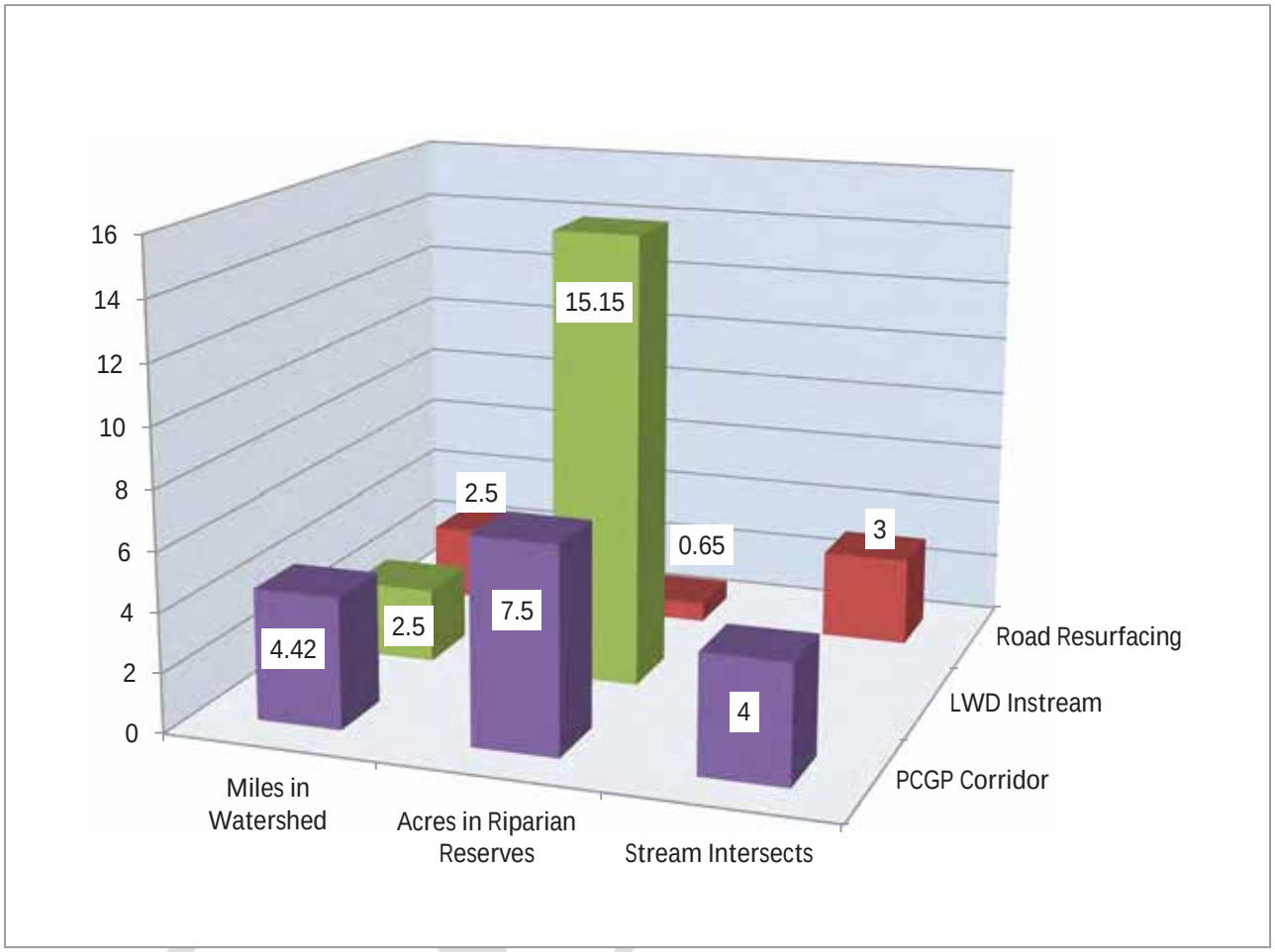
TABLE 2.5.4.6-1

Proposed Off-site Mitigations on BLM Lands in the Shady Cove-Rogue River Watershed

Project Type	Mitigation Group	Project Name	Project Rationale
Fuels Reduction	Stand Density Fuel Break	Shady Cove Fuel Hazard Reduction 866 acres	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities would remove both mature and developing stands and would increase fire suppression complexity; however, the corridor would also provide a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and would tie in with similar projects on the Umpqua NF.
Fuels Reduction	Stand Density Fuel Break	Shady Cove Fuel Hazard Maintenance 866 acres	This would provide a mechanism for maintenance of fuel breaks over time for the life of the project.
LWD instream	Aquatic Habitat	Shady Cove LWD 2.5 miles (Estimated 15 acres of aquatic habitat	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and would contribute to the accomplishment of ACS objectives.
Road Drainage and Surface Enhancement	Road Sediment Reduction	Shady Cove Road Improvement 1 mile	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Upper Rogue. The effects of the PCGP would be similar to a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Improvement of existing roads would restore hydrologic connectivity and reduce sediment by managing drainage and restoring surfacing where needed.
Road Surfacing	Road Sediment Reduction	Shady Cove Road Resurface 1.5 miles	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in the Upper Rogue. The effects of the PCGP would be similar to a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) would help restore hydrologic conditions and reduce road-related sediment that could be delivered to stream channels.

Off-site mitigation actions in the Brush Creek and Indian Creek Subwatersheds are focused on restoring natural sediment regimes by reducing sediment contributions from roads and potential high-intensity fire, restoring historic stand and fuel density levels to selected stands, and restoring elements of aquatic habitat. Figure 2.5-4 provides a comparison of the PCGP project impacts and the benefits of the off-site mitigation actions.

Figure 2.5-4 Comparison of PCGP Impacts and Beneficial Effects of Off-site Mitigation Actions in the Shady Cove-Rogue River Watershed



2.5.4.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 30 percent of the Shady Cove - Rogue River watershed. There are currently no projects proposed on BLM or NFS lands in the watershed that would contribute to cumulative effects.

Activities on Private Lands

Private lands comprise about 70 percent of the Shady Cove - Rogue River watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.32 percent of the BLM lands, two percent of NFS lands and 0.57 percent of private lands in the Shady Cove - Rogue River watershed (table 2.5.4.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.5.4.8 Project Effects Compared by ACS Objective

Table 2.5.4.8-1 compares the Project impacts to the objectives of the ACS for the Shady Cove–Rogue River watershed. The Project would include 4.38 miles of corridor and three intermittent stream channel crossings and one small forested wetland on BLM lands within the Shady Cove-Rogue River Watershed (table 2.5.4.1-1-4). BLM lands where the ACS applies comprise approximately 22,448 acres, or approximately 30 percent of the 74,284-acre watershed. Watershed conditions and recommendations are found in the Shady-Cove Rogue River Watershed Analysis (BLM 2012) and described in detail in Appendix J.

In their 2013 filing, Pacific Connector proposed a route that crossed three intermittent streams at MP 126.5, 126.52, and 126.59. Field review by the BLM indicated that these areas are moderately to severely erosive and may be difficult to revegetate if disturbed. These areas are flashy (runoff comes up rapidly with storms) because of relatively shallow soils. If constructed at the filed alignment, it is likely this area would become a source of chronic sediment that may adversely affect downstream aquatic habitat and retard attainment of ACS objectives. At the request of the BLM, Pacific Connector has developed a proposed realignment at this location that would avoid one channel crossing and the areas of erosive soils and revegetation difficulty. This proposed realignment would reduce the acres of affected Riparian Reserves, eliminate one stream crossing and placed the corridor in an area that would not have the erosion and revegetation issues associated with the filed route. BLM resource specialists reviewed this location in the field and concur with this routing. Once engineering of this realignment is completed and filed with FERC, this assessment would be modified to reflect the new alignment.

Although Pacific Connector has modified the Project to respond to the ACS objectives and has incorporated measures consistent with the Riparian Reserve standards and guidelines, the assessment demonstrates that short-term impacts associated with the Project would occur at the site scale related to the removal of riparian vegetation, and impacts on streambanks, and substrates. With the possible exception of the stream channel crossings at MP 126.5, 126.52, and 126.59, when considering the design measures and BMPs that have been incorporated into the Project, the impacts on aquatic habitat would be minor and short-term at the watershed or landscape scale. This is apparent when considering the total amount of Riparian Reserves that are located within the Shady Cove–Rogue River watershed (10,930 acres) and the amount of clearing (4.13 acres) in Riparian Reserves within the watershed (0.04 percent) (table 2.5.4.1-3). Further, because of the linear characteristic of the pipeline, the Riparian Reserve crossings would be spread out across the landscape and would be discontinuous. In addition, the Project's Riparian Reserve crossings are associated with small intermittent streams that are not fish bearing (BLM 2012).

Draft

TABLE 2.5.4.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Shady Cove–Rogue River Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed landscape scale features that would be affected by the Project. There are 9 Riparian Reserves that are affected by the Project corridor on BLM-managed lands in the Shady Cove–Rogue River watershed. No riparian reserves are affected on NFS lands. Four intermittent stream channels and one small forested wetland are crossed on BLM-managed lands. On BLM-managed lands subject to the ACS, the Project corridor is located primarily on or near ridgetops to minimize impacts on aquatic habitats. Approximately 4.6 acres or 0.07 percent of the Riparian Reserves in the Shady Cove–Rogue River watershed are potentially affected by the Project (table 2.5.4.1-3). Approximately 2 acres of LSOG would be removed by the Project (table 2.5.4.1-4). Impacts to aquatic systems are consistent with those described in section 1.3.1. LWD cleared in construction of the corridor or otherwise provided by Pacific Connector would be used to stabilize and restore stream crossings. Off-site mitigation measures including road improvements and resurfacing and instream LWD projects are expected to improve watershed conditions in the watershed (section 2.5.4.6). While there are long-term impacts on riparian Reserves from construction clearing of the corridor, these would be minor in scale and well within the range of natural variability given the disturbance history of the watershed (section 2.5).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Shady Cove–Rogue River watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the POD. In the short-term during construction connectivity would be disrupted. At each crossing, bed and bank disturbances are small (<15 feet wide). After construction all disturbed areas would be returned to their approximate original contours to restore preconstruction contours and drainage patterns. The temporary construction right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored on-site and the bed and bank would be returned to pre-construction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. The residual levels of disturbance are anticipated to be well within the range of natural variability in the Western Oregon Cascade Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	There are four intermittent stream channel crossings on BLM lands in the Shady Cove – Rogue River watershed. Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried, and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored on-site and the bed and banks would be returned to pre-construction conditions, consistent with the Wetland and Waterbody Crossing Plan. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained, although in the short term (during construction) elements of the aquatic system could be disturbed. This level of disturbance is well within the range of natural variability that for watersheds of the Western Oregon Cascade Province
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Four intermittent stream channels are crossed on BLM-managed lands. Approximately 4.6 acres or 0.07 percent of the riparian reserves on BLM-managed lands in the Shady Cove–Rogue River watershed are potentially affected by the Project (table 2.5.4.1-3) No long-term impacts on water quality are expected because of application of the ECRP including maintenance of effective ground cover (section 1.3.1) and Best Management Practices during construction.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing,	The Shady Cove–Rogue River Watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from landslides and surface erosion following major disturbances such as fires and high-intensity winter storms (BLM 2012). More chronic erosion and deposition of fine sediments primarily from roads, and to a lesser degree from

TABLE 2.5.4.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Shady Cove–Rogue River Watershed

ACS Objective	Project Impacts
volume, rate, and character of sediment input, storage, and transport.	land use has replaced these pulse-type disturbances in the current sediment regime in the watershed. Riparian Reserve intersects occur at right angles to the Reserve, or minimally clip the boundary. With the exception of possible stream crossings at MP 126. 5, 126.52 and 126.59, the Project construction and operation is not likely to alter this sediment pattern nor is it likely to exacerbate these conditions. If constructed as filed, crossings at MP 126.5, 126.52 and 126.59 would likely retard attainment of ACS objectives by causing chronic depositions of sediment. The BLM and the applicant have agreed to a realignment that would eliminate one channel crossing and significantly reduce potential sediment. When engineering is completed, and this realignment is filed with FERC, this assessment would be modified to reflect that change. Proposed mitigation projects would contribute to reduction of sediments and restoration of aquatic functions (section 2.5.4.6.)
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project is not likely to affect peak flows in the Shady Cove–Rogue River Watershed because of it's predominate ridgetop location, the relatively small area of the watershed affected (less than 0.4 percent) and relative lack of connectivity to aquatic systems. The Shady Cove–Rogue River Watershed Assessment noted there would be no measurable effect to peak flows in the watershed as a result of the Project (BLM 2012).
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would only affect 0.01 acre of one wetland in the Shady Cove–Rogue River watershed on BLM-managed lands, so there would be no measurable impact from the Project on water tables or seasonal inundation of these areas (table 2.5.4.1-4)
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Shady Cove–Rogue River Watershed would be minor. The Project would potentially affect approximately 4.6 acres of vegetation in Riparian Reserves or 0.07 percent of the riparian reserves on BLM-managed lands in the Shady Cove–Rogue River watershed (table 2.5.4.1-3. Approximately 2 acres of LSOG forest would be removed (table 2.5.4.1-4) Riparian Reserve intersects occur at right angles to the Reserve, or minimally clip the boundary. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Planned mitigation measures include 2.5 miles of instream LWD which would contribute to restoration of aquatic function (section 2.5.4.6).
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Shady Cove–Rogue River watershed would be minor. The Project would potentially affect approximately 4.6 acres of vegetation in Riparian Reserves or 0.07 percent of the riparian reserves on BLM-managed lands in the Shady Cove–Rogue River Watershed (table 2.5.4.1-3). Approximately 2 acres of LSOG forest would be removed (table 2.5.4.1-4. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.5.4.9 Summary

The pipeline route would cross four intermittent streams and one small wetland on BLM lands. The Project would also clip Riparian Reserves associated with five intermittent streams and one perennial stream but would not cross the streams. The Project would remove approximately 4.6 acres of vegetation within Riparian Reserves, or approximately 0.07 percent of vegetation within Riparian Reserves on BLM lands within the watershed (section 2.5.4.1-3). Approximately 2 acres of the riparian vegetation removed would be LSOG forest habitat (section 2.5.4.1-4).

Stream crossings proposed in the filed application at MP 126.5, 126.52 and 126.59 would likely become chronic sources of fine sediment that would retard attainment of ACS objectives. With

the exception of this these crossings, measures in the ECRP including revegetation and maintenance of effective ground cover are likely to control surface erosion. Erosion control measures described in section 1.3.1 for stream crossings would likely be successful at minimizing sediment associated with stream channel crossings in the watershed. The BLM may require additional erosion control measures if needed. Since all of the streams crossed are intermittent, they are likely to be dry by late summer when water temperatures are an issue, it is unlikely there would be any impact on water temperature.

Off-site mitigation measures, identified by the BLM, would supplement onsite minimization, mitigation, and restoration actions (section 2.5.4.6). These proposed offsite mitigation actions are responsive to recommendations in the Shady Cove–Rogue River Watershed Analysis (BLM 2012) and would contribute to improving terrestrial and aquatic conditions within the watershed. Offsite mitigations, identified by the BLM, would supplement onsite minimization, mitigation, and restoration actions. These proposed offsite mitigation actions are responsive to recommendations in the Shady Cove-Rogue River Watershed Analysis (BLM 2012) and the Rogue Basin Coordinating Council (2006) assessment and would contribute to improving terrestrial and aquatic conditions within the watershed.

The routing of the pipeline through the relatively small area of BLM land that would be affected by Project construction (69.31 acres or 0.34 percent of BLM lands and 0.19 percent of the all ownerships in the watershed), makes it highly improbable that Project impacts would affect watershed conditions beyond the site scale with the exception of possible chronic sediment from stream crossings at MP 126.5, 126.52 and 126.59. The BLM and the applicant have agreed to a realignment at that location that would address sediment concerns. Once the applicant has filed the realignment with FERC, this assessment would be modified to reflect that change. Although there are project-level impacts (e.g., short-term sediment and a change in vegetative condition at stream crossings), these would be minor and would be largely limited to the boundaries of the project area (section 2.5.4.4).

With the exception of stream crossings at MP 126.5, 126.52 and 126.59, no project-related impacts that would retard or prevent attainment of ACS objectives have been identified (section 2.5.4.8). Impacts, except as noted, would be within the range of natural variability for watersheds in the Western Cascades and Klamath Mountain Provinces although some of these processes have been altered from their natural condition (section 2.5.4.4). Proposed amendment of the Medford District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (section 2.5.4.5).

2.5.5 Big Butte Creek Fifth Field Watershed, HUC 1710030704

2.5.5.1 Overview

The Big Butte Creek fifth field watershed (figure 2.5-5) is located in southwestern Oregon between Medford and Crater Lake National Park. It is one of eight fifth-field watersheds in the 2,618 square mile Upper Rogue River Subbasin. The watershed lies south of the Rogue River and drains in a northwest direction. The confluence of Big Butte Creek and the Rogue River occurs at the northwest tip of the watershed, at the junction of the Big Butte Creek, Rogue River-Lost Creek and Shady Cove-Rogue River fifth-field watersheds. The Rogue River then runs westward to its

confluence with Trail Creek, and then south through the Shady Cove-Rogue River watershed. Upon leaving the Shady Cove-Rogue River watershed, the Rogue River turns westward and flows through the Rogue River – Siskiyou National Forest and the Klamath Mountains to the Pacific Ocean at Gold Beach, Oregon, about 32 miles from the border with California. The entire Rogue River drainage basin is about 132 miles wide (east to west). See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

The watershed lies completely within Jackson County. The town of Butte Falls lies within the watershed near the confluence of the North and South Forks of Big Butte Creek. Logging and agriculture dominate human land use in the watershed. Cattle operations are the largest non-forestry agricultural use. The BLM manages nine grazing allotments, of which eight were in use as of January 2008 (BLM, 2008). Elevations on the Big Butte Creek watershed range from about 1,530 feet amsl at the mouth of Big Butte Creek to 9,495 feet at the top of Mount McLoughlin in the far eastern portion of the watershed.

The Big Butte Creek watershed lies in the Klamath-Siskiyou and the High Cascades Province aquatic provinces. Relatively old, soft volcanic materials dominate the geology in this portion of the watershed. As a result, the landscape is deeply dissected, with a well-developed dendritic drainage pattern that has developed in response to landslides and surface erosion. The clay content of the soils is high (particularly in the subsoil), resulting in relatively low infiltration rates. In the eastern portion of the watershed, High Cascade geology, consisting of much younger and harder lava flows, prevails. The landscape is much less dissected, as the geological substrate is less erodible and more stable than in the Western Cascades. High Cascade soils contain more silt, sand, and gravel than those in the Western Cascades. They are generally shallower and less weathered, and have relatively high infiltration rates.

The 247.3 sq. mile (158,243 acre) Big Butte Creek watershed includes eight subwatersheds (figure 2.5-5 and table 2.5.5.1-1). Moving southeast to northwest, these subwatersheds are Willow Creek, Middle South Fork Big Butte Creek, Upper South Fork Big Butte Creek, Lower South Fork Big Butte Creek, North Fork Big Butte Creek, McNeil Creek, Upper Big Butte Creek and Lower Big Butte Creek. Of these eight, only the McNeil Creek subwatershed is crossed by the PCGP corridor. The watershed is bounded on the north by the Lost Creek-Rogue River and South Fork Rogue River fifth-field watersheds, on the east by the South Fork Rogue River and Fourmile Creek fifth-field watersheds, on the south and southwest by Little Butte Creek fifth-field watershed, and on the west by the Shady Cove-Rogue River fifth-field watershed. Of these, only the Fourmile Creek watershed lies outside the Upper Rogue River subbasin. The Fourmile Creek watershed lies within the Upper Klamath Lake basin, which is part of the Klamath River system.

The watershed experiences a Mediterranean type climate characterized by mild, wet winters and hot, dry summers. Prevalent flows of moist air from the Pacific Ocean in winter result in frequent storms of varied intensities. Mean annual precipitation ranges from about 35 inches at the mouth of Big Butte Creek to around 80 inches on the upper slopes of Mount McLoughlin. Winter precipitation at elevations above 5000 feet amsl typically occurs as snow, with spring melting and runoff occurring from April through June. Rainfall dominates precipitation patterns below 3,500 feet amsl.

Streamflow patterns reflect the distribution of precipitation, with low flows in the summer and high flows from mid-November to May. In the watershed, the TSZ is defined as land between 3,500 and 5,000 feet amsl. About 35 percent of the watershed is in the TSZ, which is characterized by a mixture of rain and snow. Partial to total snow melt typically occurs in the TSZ during warm mid-winter rain-on-snow events, and is associated with nearly all major peak flows.

Three native anadromous salmonids (coho salmon, spring run Chinook salmon, and summer and winter run steelhead trout spawn and rear in the Big Butte Creek watershed. Both coho salmon and steelhead trout utilize the lower and middle reaches of McNeil Creek. The Northern California/Southern Oregon coho salmon is listed as threatened under the Endangered Species Act. Coho salmon utilize several creeks in the watershed, including McNeil Creek.

Figure 2.5-5 shows the checkerboard pattern of BLM-managed lands in the watershed and the more contiguous nature of Forest Service lands found largely in the eastern uplands. Approximately 18.6 percent of the land in the watershed is managed by the BLM Medford District, and another 36.8 percent is in the Rogue River National Forest. The rest (44.6 percent) is in non-federal ownership. BLM lands are found in all eight subwatersheds, while Forest Service lands are found in five of the eight subwatersheds. By far, the largest acreages of Forest Service lands are in the three subwatersheds found in the far eastern portion of the watershed (i.e., Upper South Fork Big Butte Creek, Middle South Fork of Big Butte Creek, and Willow Creek, figure 2.5-5 and table 2.5.5.1-1). Approximately 46.1 percent of the land in the watershed is privately owned.

In the McNeil Creek subwatershed, the only subwatershed traversed by the PCGP corridor, there are 3,426 acres of BLM land (table 2.5.5.1-1) that comprise 11.6 percent of the BLM land in the watershed and 2.2 percent of all land in the watershed. There are no Forest Service lands in McNeil Creek subwatershed.

There are 1,636 acres of designated LSR on NFS lands; there is no designated LSR on BLM lands in Big Butte Creek Watershed. Approximately 1,428 acres of BLM lands and 1,815 acres of NFS lands are unmapped LSRs associated with KOACs. The PCGP project does not cross any designated or unmapped LSRs in the McNeil Cr. Sub watershed.

Location and Routing

The PCGP corridor enters the Big Butte Creek watershed at MP 129.6 from the Shady Cove-Rogue River watershed (figure 2.5-5). The corridor first runs along the divide between the Shady Cove-Rogue River and Big Butte Creek watersheds and then along the divide between the Lower Big Butte Creek and McNeil Creek subwatersheds. At MP 131.4, the corridor turns sharply south and traverses the McNeil Creek subwatershed, exiting the watershed at MP 135.0 where it enters the Little Butte Creek fifth-field watershed. Within the Big Butte Creek watershed, only the McNeil Creek subwatershed is traversed. The PCGP corridor traverses 5.00 miles of the McNeil Creek subwatershed (table 2.5.5.1-2). The majority of the traversed land (4.56 miles) is privately owned. Approximately 0.68 miles of BLM land is traversed; no NFS land is affected.

PCGP project impacts in the Big Butte Creek watershed (all ownerships) total 80.29 acres of which 77.18 acres would be cleared (table 2.5.5.1-2). The majority of this acreage (68.6 acres) is non-federal. Approximately 11.66 acres of BLM land in the McNeil Creek subwatershed would be cleared by corridor construction. This constitutes 0.04 percent of the BLM land in the watershed

and 0.01 percent of all land in the watershed. None of the traversed federal land is in the TSZ, where land clearing is known to contribute to elevated peak flow conditions during warm rain-on-snow events. All affected federal land (11.69 acres acres) is Matrix land.

Within the Big Butte Creek watershed, two intermittent streams would be crossed. In the filed alignment, the PCGP corridor parallels and largely occupies the Riparian Reserve of an intermittent stream between MP 131.4 and 131.78.[14] In total, approximately 6.91 acres of riparian reserves would be impacted. This constitutes approximately 0.05 percent of the 13,293 acres of federal riparian reserves in the watershed. Approximately 4.9 of the 6.91 acres of affected Riparian Reserves would be in LSOG forest.

Draft

[14] The BLM has requested a realignment at this location that would eliminate these impacts. When the realignment is filed, this assessment will be modified to reflect that.

Figure 2.5-5 PCGP Routing and Subwatershed Boundaries, Big Butte Creek Watershed

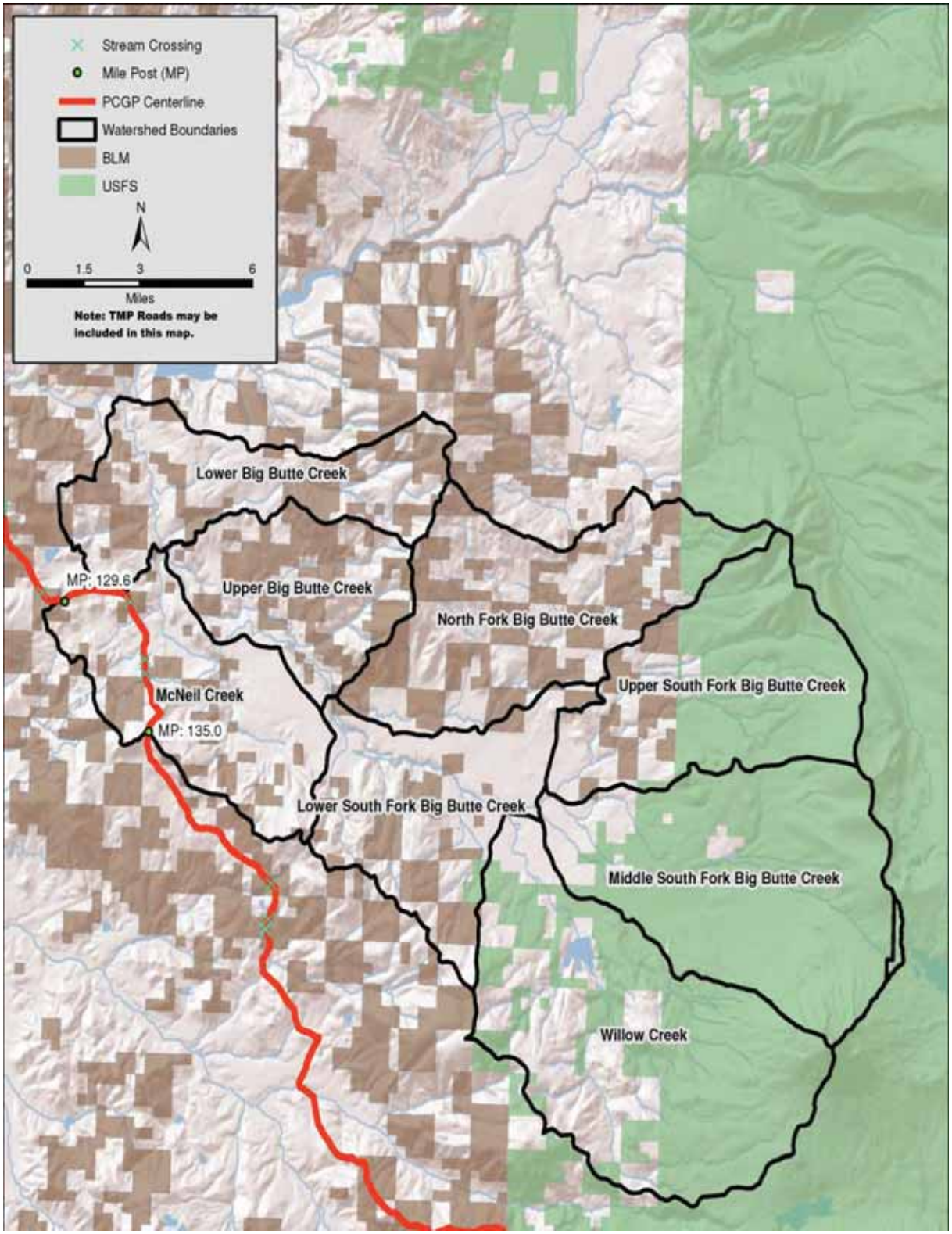


TABLE 2.5.5.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Big Butte Creek Watershed HUC 1710030704

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	FS	Total BLM and FS	Other	BLM	FS	BLM	FS	BLM	FS	Total BLM and FS
Lower Big Butte Creek	15,155	5,313	0	5,313	9,843	0	0	5,313	0	881		881
Lower South Fork Big Butte Creek	15,798	4,062	326	4,388	11,410	0	0	4,062	326	691	55	746
McNeil Creek	16,292	3,428	0	3,428	12,864	0	0	3,428	0	569		569
Middle South Fork Big Butte Creek	26,477	21	23,553	23,574	2,903	0	0	21	23,553	3	3,149	3,152
North Fork Big Butte Creek	21,988	8,950	1,764	10,714	11,274	0	0	8,950	1,764	1,522	300	1,821
Upper Big Butte Creek	12,363	5,351	0	5,351	7,012	0	0	5,351	0	888		888
Upper South Fork Big Butte Creek	19,760	2,363	13,205	15,568	4,192	0	1,328	2,363	11,877	402	2,245	2,647
Willow Creek	30,409	32	19,333	19,365	11,044	0	308	32	19,025	4	2,585	2,589
Watershed Total	**158,243**	**29,520**	**58,181**	**87,701**	**70,541**	**0**	**1,636**	**29,520**	**56,545**	**4,959**	**8,334**	**13,293**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. There are approximately 3,243 acres of unmapped LSRs associated with KOACs.
c/ Occur within LSR and Matrix Land Allocations. Sources: Lower Big Butte Cr. WA, p. 33, Upper Big Butte Cr. WA, p. 3-1 prorated for MSF BBC and Willow Cr; Estimated at 17% for LSF BBC, USF BBC and NF BBC

Draft

TABLE 2.5.5.1- 2.

PCGP Project Corridor (miles) and Project Area (acres) in the Big Butte Creek Watershed (HUC 1710030704) by Land Ownership

Unit a/	Land Ownership															
	BLM				FS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of FS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Lower Big Butte Creek																
Lower South Fork Big Butte Creek										0.08						
McNeil Creek	0.68	11.66	0.03	0.34					4.32	65.52	3.08	0.53	5.00	77.18	3.11	0.49
Middle South Fork Big Butte Creek																
North Fork Big Butte Creek																
Upper Big Butte Creek																
Upper South Fork Big Butte Creek																
Willow Creek																
Watershed Total	0.68	11.66	0.03	0.04	0.00	0.00	0.00	0.00	4.32	65.60	3.08	0.10	5.00	77.18	3.11	0.05

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.5.5.1-3

PCGP Project Area (acres) on Federal Lands in the in the Big Butte Creek Watershed HUC 1710030704

		Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
Unit a/	**Agency**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Lower Big Butte	BLM																
	FS																
Lower South Fork Big Butte Creek	BLM																
	FS																
McNeil Creek	BLM					11.66	0.03	0.34	0.00					11.66	0.03	0.34	0.00
	FS																
Middle South Fork Big Butte Creek	BLM																
	FS																
North Fork Big Butte Creek	BLM																
	FS																
Upper South Fork Big Butte Creek	BLM																
	FS																
Middle Creek Sub watershed	BLM																
	FS																
Willow Creek	BLM																
	FS																
Watershed Total	**BLM**					**11.66**	**0.03**	**0.04**	**0.00**	**6.91**		**0.05**		**11.66**	**0.03**	**0.04**	**0.00**
	FS																

a/ All data derived from NSR-based GIS layers.
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.5.5.1-4

Riparian Reserve Effects in the Big Butte Creek Fifth Field Watershed HUC 1710030704

Jurisdiction	Mile Post	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
McNeil Creek Subwatershed HUC 171003070407																													
MD BLM	131.55	ASI250Trib. to Neil Creek	1-3' wide, U-shaped channel; >10% gradient, tributary to ASI249	I	Yes	4.79		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
MD BLM	131.72	ASI251Trib. to Neil Creek	1-3' wide, U-shaped channel; >10% gradient, tributary to ASI249	I	Yes	3.95		No			4.08	4.08			0.64	0.64		0.96	1.02	1.98	0.21	6.91		6.91		6.91	No	No
MD BLM	133.35	ASP241Trib. to Quartz Creek	Braided channels; at edge of corridor (This is a leak from the aqueduct and does not create a riparian reserve)	D	Yes	44.80		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
MD BLM	133.38	ASP240Medford Aqueduct(Ditch 3)	Medford Aqueduct. (This is a ditch that does not create an Riparian Reserve)	D	Yes	29.36		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
Subtotal McNeil Creek Subwatershed and Big Butte Creek Watershed			Crossed: 2 Int. Channels 2 ditches / Clipped: None		2			0	0.00	0.00	4.08	4.08	0.00	0.00	0.64	0.64	0.00	0.96	1.02	1.98	0.21	6.91	0.00	6.91	0.00	6.91		

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves, and are NOT included in inventory tallies of channel crossings.

TABLE 2.5.5.1-5

Turbidity and Stream Crossing Risk, Big Butte Creek Watershed

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construc-tion Impact Rating d/	Overall Rating e/
Big Butte Creek	McNeil Cr.	131.55	I	1-3' wide, U-shaped channel; >10% gradient, tributary to ASI249 **(Realignment Requested)**	3	4.79	21.83		Erosion resistant	cobble/ gravel	M	L	M	BLUE
Big Butte Creek	McNeil Cr.	131.72	I	1-3' wide, U-shaped channel; >10% gradient, tributary to ASI249 **(Realignment Requested)**	1	3.95	13.45		Erosion resistant	cobble/ gravel	L	L	L	BLUE

Sources:
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified

Draft

2.5.5.2 Existing Conditions

Watershed analysis was conducted on the Big Butte Creek Watershed in three separate assessments between 1995 and 1999. The assessments were divided into the Lower Big Butte Watershed Analysis (BLM 1999d), the Central Big Butte Creek Watershed Analysis (BLM 1995a), and the Upper Big Butte Watershed Analysis (FS 1995b). In addition, a Water Quality Restoration Plan (WQRP) for the Big Butte Creek Watershed was prepared by the Medford District of the BLM in January of 2008 (BLM 2008a). This WQRP describes how the BLM would meet Oregon water quality standards for 303(d) listed streams on BLM-managed lands.

The WQRP utilized information in the Lower and Central Big Butte WAs (where BLM lands are located) and also prepared additional analysis and recommendations that updated the Lower and Central Big Butte WAs. Since the proposed PCGP corridor would only traverse the lower watershed and the WQRP contains the most recent information on lower watershed conditions, information from the WQRP is summarized below to describe the current watershed conditions.

Watershed Analysis Findings

Temperature

Stream temperature is influenced by riparian vegetation, channel morphology, hydrology, climate, and geographic location. While climate and geographic location are outside of human control, the condition of the riparian area, channel morphology and hydrology can be altered by land use. Human activities that contribute to degraded thermal water quality conditions in the Big Butte Watershed include: agricultural activity; rural residential developments; water withdrawals; timber harvests; local and forest access roads; and state highways. Timber harvest, roads, and livestock grazing are the primary impacts specific to federally managed lands that have the potential to affect water quality conditions in the plan area.

Within the WQRP area, there are a total of 54.2 stream miles on the 2004/2006 303(d) list, of which 17.2 miles cross BLM-managed lands. The water quality limited stream reaches on BLM-managed lands are:

- Big Butte Creek - 2.0 miles for summer temperature, dissolved oxygen, and E. coli;
- Clark Creek - 3.0 miles for year-round (non-spawning season) temperature;
- Dog Creek - 1.3 miles for year-round (non-spawning season) temperature;
- Doubleday Creek - 1.5 miles for year-round (non-spawning season) temperature;
- Hukill Creek - 0.5 miles for year around (non-spawning season) temperature;
- Jackass Creek - 2.4 miles for year-round (non-spawning season) temperature; and
- North Fork Big Butte Creek - 6.5 miles for year-round (non-spawning season) temperature.

Note that the proposed PCGP route does not cross any of these streams. Subsequently, in 2008, a TMDL was established for Big Butte Creek removing these streams from the 303(d) list.

Riparian Vegetation

Removal of riparian vegetation, and the shade it provides, contributes to elevated stream temperatures. Activities in riparian areas such as timber harvest, road construction, residential and agricultural clearing, and livestock grazing, have reduced the amount of riparian vegetation in the

Big Butte Watershed. Riparian areas in the plan area cover less area and contain fewer species than under historic conditions. They tend to be younger in age and dominated by hardwoods. Conifers, such as Douglas-fir, ponderosa pine, and white fir are a bigger component of the riparian vegetation as the elevation increases, however the average diameter is smaller than what existed historically. Riparian vegetation appears patchy: areas with many layers of riparian vegetation, including large-diameter trees, are scattered in between clumps of even-aged alder and cottonwood and shrub-dominated areas. Woodland stands are fragmented, creating a patchy, poorly connected landscape of simpler and less biologically productive habitat. These changes have resulted in less shade on stream surfaces and an increase in stream water temperatures. Such altered riparian areas are not sources of large wood and they lack the cool, moist microclimate that is characteristic of healthy riparian zones.

The primary reason for elevated stream temperatures on BLM-managed lands is an increase in solar radiation reaching the stream surface following timber harvest or road construction that removed stream shading vegetation. Pre-NWFP management activities along streams on federal lands in the plan area have left a mosaic of vegetation age classes in the riparian areas. The amount of riparian area with late successional forest characteristics has declined on federal lands primarily due to timber harvest and road construction within or adjacent to riparian areas. In some cases the large conifers have been replaced by young, small diameter conifer stands and in other cases, hardwoods have replaced conifers as the dominant species in riparian areas. In riparian areas where the trees are no longer tall enough to adequately shade the adjacent streams, the water flowing through these exposed areas is subject to increased solar radiation and subsequent elevated temperatures.

Stream Morphology

Large wood plays an important role in creating stream channel habitat. Obstructions created by large wood help to settle out gravel. The deposition of gravel helps to decrease thermal loading by reducing the amount of water exposed to direct solar input, as a portion of the water would travel sub-gravel and not be exposed to sun. The loss of large wood in the Big Butte Watershed has had a direct impact on stream channel morphology. Once the large wood was removed, the alluvial material held behind it washed out, causing channels to down-cut and eventually widen, allowing for increased thermal loading and stream heating.

Changes in sediment input can lead to a change in channel morphology. When sediment input increases over the transport capability of the stream, sediment deposition can result in channel filling, thereby increasing the width-depth ratio. During storm events, management-related sources can increase sediment inputs over natural levels and contribute to channel widening and stream temperature increases. Natural erosion processes occurring in the plan area such as landslides, surface erosion, and flood events contribute to increased sedimentation. Sediment sources resulting from human activities include roads; logging (tractor skid trails, yarding corridors, and landings); off-highway vehicle (OHV) trails; concentrated livestock grazing in riparian zones; residential and agricultural clearing of riparian zones; maintenance of irrigation diversions; irrigation return flows; and irrigation ditch blowouts. Roads appear to be the primary human-caused sediment source from BLM-administered lands in the plan area.

Draft

Streamflow

The Big Butte Creek Watershed experiences extreme flow conditions typical of southwest Oregon streams. Historical flows are a function of seasonal weather patterns: rain and snow in the winter months contribute to high flow volumes, while the summer dry season reduces flow. Big Butte Springs provides a steady supply of high quality water on a year-round basis to the City of Medford. Average daily flows are about 26 million gallons per day (about 40 CFS). The Town of Butte Falls gets its water from Ginger Springs, located about one mile south of town. Water diversion by the Eagle Point Irrigation district from South Fork of Big Butte Creek removes 100 cubic feet per second (cfs) used to generate electricity at a small hydroelectric plant. The water is then returned to Nichols Creek, a tributary to Little Butte Creek. Water is diverted from South Fork Big Butte Creek to provide water to the fish hatchery just east of the town of Butte Falls at 15.5 cfs. This water is returned to the system via Ginger Creek. Water withdrawals and irrigation return flows likely result in increased thermal loads within the Big Butte Creek Watershed. The management of water withdrawals is within the jurisdiction of the Oregon Water Resources Department.

2.5.5.3 Natural Disturbance Processes

Historically, disturbance processes in the Big Butte watershed were associated with fires and high intensity winter rain on snow events. When high-intensity winter storms overlapped with recently burned areas, very high surface erosion and landslide rates likely occurred delivering large pulses of coarse grained sediment and gravel to stream systems.

In the Rogue River basin, it has been estimated that prior to logging, approximately 71 percent of the land contained large-sized timber. This estimate is based upon detailed forest surveys completed during the 1930s. The pre-logging time frame includes the period prior to late 19th century and early 20th century. Large-size class timber is defined as Douglas-fir greater than 20 inch dbh, ponderosa pine greater than 22 inch dbh and white fir greater than 16 inch dbh. Furthermore, approximately 89 percent of this large size timber was in one large connected patch extending throughout most of western Oregon. The average size for burned timber patches in the Rogue River basin was approximately 9,500 acres.

The western portion of the watershed was typically grass and hardwood woodlands with scattered rocky meadows and patches of conifer stands. Frequent fire occurrence in this portion of the watershed was probably the most influential factor on erosion rate from hill-slopes. Several years after wildfires the bare soil areas exposed by fire are subject to detachment and transport during rainstorms. High flows in burned over areas had the most influence on stream channel stability and subsequent streambank erosion. Historically, these events contributed to the majority of erosion and sedimentation in this portion of the watershed.

Fire suppression has changed the vegetation patterns. Fire resistant trees such as large diameter ponderosa pine and large white oaks are no longer found in the stands to the degree that they once were. The large trees, particularly the oaks, are one of the fastest vanishing ecosystems in the west. These trees provided wildlife habitat such as roosting sites for bats and other cavity nesters. Frequent fires not only provided a low thinning effect on conifers, they also reduced large continuous brush fields and provided a more diverse vegetative pattern. These changes have

increased the risk of large destructive fires. Ladder fuels have significantly increased over the past decades. The potential for these fires puts residences and ecosystems at high risk of fire.

2.5.5.4 Project Effects and Range of Natural Variability

Table 2.5.5.1-4 and table 2.5.5.1-5 describe affected riparian reserves and stream channel intersects in the Big Butte Creek Watershed. Table 2.5.5.1-5 summarizes the risk of increased turbidity and the overall crossing risk associated with each stream crossing in the watershed (adapted from GeoEngineers, 2011). All of the waterbody crossings in this watershed are rated as "blue" in the matrix of crossing risk and site response risk developed by GeoEngineers (see section 1.3). Sites in the blue management category represent low risk to stream channel stability based on this risk assessment scoring.

More robust Best Management Practices, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of Best Management Practices on "yellow" crossings. "Green" crossings have a high potential for impacts to aquatic habitat and typically involve sites with wider floodplains or varied aquatic habitats. Emphasis at these locations is more on bank and floodplain restoration. Table 2.5.5.4-1 describes the applicable Best Management Practices.

At all crossing, silt fencing would be installed and maintained until effective ground cover is reestablished, effective ground cover would be in place prior to the onset of seasonal precipitation (table 2.5.5.4-1), and rapid re-establishment of vegetation would be emphasized. These are all proven and effective erosion prevention Best Management Practices. These are proven measures that are expected to be effective (see section 1.4.4.1).

TABLE 2.5.5.4-1

Pacific Connector Proposed Best Management Practices for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**131.55, 131.72 (Note that a realignment has been requested at both of these locations which would eliminate any stream crossings in Big Butte Creek.)**	None	None
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)

Draft

TABLE 2.5.5.4-1

Pacific Connector Proposed Best Management Practices for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Source	FERC Guidelines FEIS, JPA, Appendix C, Project Description JPA Appendix 1B, ECRP JPA Appendix F, Affected Waters, Section 2.1.8.3 JPA Appendices 2C, 2D JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.		

Table 2.5.5.4-2 provides the range of variability of five key ecological processes (erosional processes, ecological succession/vegetation conditions, flow regimes, stream temperature, and aquatic habitat and stream channel complexity) on the Shady Cove-Rogue River Watershed. All processes have been affected to some degree by human activity. Also included in this table are evaluations of PCGP project effects on these ecological processes relative to the ranges of

Draft

variability, considered in the context of past and ongoing natural and human disturbances in the watershed.

TABLE 2.5.4.4-2

Project Effects and Relevant Ecological Processes in the Big Butte Creek Fifth Field Watershed

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Historically, disturbance processes in the Big Butte watershed were associated with fires and high intensity winter rain on snow events. When high-intensity winter storms overlapped with recently burned areas, very high surface erosion and landslide rates likely occurred delivering huge pulses of coarse grained sediment and gravel to stream systems.	The PCGP Project would cross approximately 5.2 miles of the Big Butte Creek Watershed and would clear a total of approximately 92 acres across all ownerships of which 11.66 acres would be on BLM lands. The pipeline alignment was routed to follow ridgelines, where feasible, and to be aligned perpendicular to slope contours to minimize side hill construction, grading requirements, and overall disturbance. These routing objectives reduced the number of stream crossings as well as the potential for erosion and sedimentation. To ensure that the potential for erosion and sedimentation would be minimized during project construction, Pacific Connector prepared an Erosion Control and Revegetation Plan (ECRP). The ECRP was developed in consultation with the FERC, NRCS, BLM, Forest Service, and the Oregon Department of Agriculture (ODA). The revegetation measures outlined in the ECRP have been prescribed to stabilize disturbed areas and to revegetate the right-of-way to a condition which supports the preconstruction land use (i.e., forest lands, rangelands, croplands, hayfields, and pasturelands) as quickly as possible following construction. Although implementation of the PCGP Project would disturb approximately 11.6 acres of BLM lands within the Watershed, all disturbed areas would be restored (excluding reforestation of the 30-foot, maintained area centered over the pipeline) and returned to preconstruction conditions and land uses after construction. With the project's proposed design measures and Best Management Practices, the potential project effects on erosional processes would be expected to be short-term.
Ecological Succession / Vegetative Condition	In the Rogue River basin, it has been estimated that prior to logging, approximately 71 percent of the land contained large-sized timber. This estimate is based upon detailed forest surveys completed during the 1930s. The pre-logging time frame includes the period prior to late 19th century and early 20th century. Large-size class timber is defined as Douglas-fir greater than 20 inch dbh, ponderosa pine greater than 22 inch dbh and white fir greater than 16 inch dbh. Furthermore, approximately 89 percent of this large size timber was in one large connected patch extending throughout most of western Oregon. The average size for burned timber patches in the Rogue River basin was approximately 9,500 acres. The western portion of the watershed was typically grass and hardwood woodlands with scattered rocky meadows and patches of conifer stands. Frequent fire occurrence in this portion of the watershed was probably the most influential factor on erosion rate from hill-slopes. Several years after wildfires the bare soil areas exposed by fire are subject to detachment and transport during rainstorms. High flows in burned over areas had the most influence on stream channel stability and subsequent streambank erosion. Historically, these events	The proposed Pacific Connector pipeline route through the Big Butte Creek Watershed is generally along ridgelines in the McNeil Creek subwatershed; therefore, vegetation would only be affected within this subwatershed. Short-term and long-term impacts to vegetation due to construction and operation of the PCGP Project would result from clearing and grading 11.6 acres of BLM lands within the construction right-of-way and TEWAs. Short-term impact would occur where vegetation types (i.e., herbaceous vegetation, some shrublands, and urban landscapes) would return to or approximate its pre-construction state within two years after revegetation and reclamation. Short-term impact could apply to Shrublands, Grasslands, and acres of Urban and Mixed Environs affected by the project. Long-term effects to vegetation would last longer than two years and much longer along portions of the right-of-way that would not resemble adjacent undisturbed lands for the life of the project (i.e., mature forests). Long-term effects would occur where trees and shrubs are removed in upland coniferous, deciduous and mixed forests along the construction right-of-way and at TEWAs. Removal of trees within riparian zones would also be a long-term

TABLE 2.5.4.4-2 **Project Effects and Relevant Ecological Processes in the Big Butte Creek Fifth Field Watershed**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
	contributed to the majority of erosion and sedimentation in this portion of the watershed.	effect, although riparian shrubs removed during construction would be expected to be readily replaced by cuttings and sprigs of locally available shrub species. Since the Pacific Connector pipeline is expected to last for 50 years, effects to mid-seral forests and older stages would extend beyond the life of the project. Forests on BLM-administered lands within the Medford District would be affected over the long-term by construction and operation of the PCGP Project. Approximately 6.9 acres of vegetation in Riparian Reserves would be removed on BLM lands within the Watershed.[15] .
Flow Regime	The western portion of the watershed was typically grass and hardwood woodlands with scattered rocky meadows and patches of conifer stands. Frequent fire occurrence in this portion of the watershed was probably the most influential factor on erosion rate from hill-slopes. Several years after wildfires the bare soil areas exposed by fire are subject to detachment and transport during rainstorms. High flows in burned over areas had the most influence on stream channel stability and subsequent streambank erosion. Historically, these events contributed to the majority of erosion and sedimentation in this portion of the watershed. Fire suppression has changed the vegetation patterns. Fire resistant trees such as large diameter ponderosa pine and large white oaks are no longer found in the stands to the degree that they once were. The large trees, particularly the oaks, are one of the fastest vanishing ecosystems in the west. Frequent fires not only provided a low thinning effect on conifers, they also reduced large continuous brush fields and provided a more diverse vegetative pattern. These changes have increased the risk of large destructive fires. Ladder fuels have significantly increased over the past decades. The potential for these fires puts residences and ecosystems at high risk of fire.	The project would disturb a total of approximately 77 acres of vegetation (all ownerships) of which approximately 11.7 acres are BLM lands. All of this area is outside of the transient snow zone. This disturbance is equivalent to approximately 0.49 percent of the entire Watershed area. Increases in peak flows would not be expected with construction of the pipeline from this scale of disturbance. See also EIS Chapter 4.4.
Stream Temperature	Historically, stream temperatures in the Big Butte Creek Watershed were undoubtedly lower than contemporary conditions however no metrics are available for McNeil Creek, the subwatershed where the PCGP is located. McNeil Creek as rated as “poor” with respect to water temperature in 1972 (BLM 1999d: 22). Within the lower and central portion of the watershed, there are a total of 54.2 stream miles on the 2004/2006 303(d) list, of which 17.2 miles cross BLM-managed lands. The water quality limited stream reaches on BLM-managed lands are: • Big Butte Creek - 2.0 miles for summer temperature, dissolved oxygen, and E. coli; • Clark Creek - 3.0 miles for year-round (non-spawning season) temperature; • Dog Creek - 1.3 miles for year-round (non-spawning season) temperature;	The PCGP Project would remove approximately 6.91 acres of riparian vegetation within the Big Butte Creek Watershed, all within the McNeil Creek subwatershed where the project parallels an intermittent stream between MP 131.4 and 131.79. Although the stream is intermittent, it is likely this amount of canopy loss could affect water temperatures early in the summer and possibly retard attainment of ACS objectives. The BLM has requested a realignment at this location to move the corridor completely out of the Riparian Reserve. This would completely eliminate any possible impact on water temperatures. When Pacific Connector files final engineering on this realignment this evaluation would be modified to reflect that change.

[15] The BLM has requested realignment of the section of the PCGP corridor between MP 131.4 to 131.79 from the Riparian Reserve to an adjacent ridgetop. This alignment would eliminate any impact to Riparian Reserves in the Big Butte Creek watershed.

TABLE 2.5.4.4-2 **Project Effects and Relevant Ecological Processes in the Big Butte Creek Fifth Field Watershed**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
	• Doubleday Creek - 1.5 miles for year-round (non-spawning season) temperature; • Hukill Creek - 0.5 miles for year around (non-spawning season) temperature; • Jackass Creek - 2.4 miles for year-round (non-spawning season) temperature; and • North Fork Big Butte Creek - 6.5 miles for year-round (non-spawning season) temperature.	
Aquatic Habitat and Stream Channel Complexity	Large wood plays an important role in creating stream channel habitat. Obstructions created by large wood help to settle out gravel. The deposition of gravel helps to decrease thermal loading by reducing the amount of water exposed to direct solar input, as a portion of the water would travel sub-gravel and not be exposed to sun. The loss of large wood in the Big Butte Watershed has had a direct impact on stream channel morphology. Once the large wood was removed, the alluvial material held behind it washed out, causing channels to down-cut and eventually widen, allowing for increased thermal loading and stream heating. Changes in sediment input can lead to a change in channel morphology. When sediment input increases over the transport capability of the stream, sediment deposition can result in channel filling, thereby increasing the width-depth ratio. During storm events, management-related sources can increase sediment inputs over natural levels and contribute to channel widening and stream temperature increases. Natural erosion processes occurring in the area such as landslides, surface erosion, and flood events contribute to increased sedimentation. Sediment sources resulting from human activities include roads; logging (tractor skid trails, yarding corridors, and landings); off-highway vehicle (OHV) trails; concentrated livestock grazing in riparian zones; residential and agricultural clearing of riparian zones; maintenance of irrigation diversions; irrigation return flows; and irrigation ditch blowouts. Roads appear to be the primary human-caused sediment source from BLM-administered lands.	The PCGP Project would remove approximately 6.91 acres of riparian vegetation within the Big Butte Creek Watershed, all within the McNeil Creek subwatershed where the project parallels an intermittent stream between MP 131.4 and 131.79. Although the stream is intermittent, it is likely this amount of canopy loss would affect stream channel complexity by removing sources of large wood adjacent to the stream channel and creating chronic sources of fine sediments immediately adjacent to the stream channel. This impacts would likely retard attainment of ACS objectives. The BLM has requested a realignment at this location to move the corridor completely out of the Riparian Reserve. This would completely eliminate any possible impact on aquatic habitat and channel complexity. When Pacific Connector files final engineering on this realignment this evaluation would be modified to reflect that change.

2.5.5.5 Compliance with Land Management Plans

Project compliance with LMP management direction contributes to compliance with the ACS. Where a project does not comply with management direction the evaluation must show that non-compliance does not prevent attainment of the ACS. Table 2.5.5.5-1 discloses compliance with applicable management direction.

TABLE 2.5.5.5-1

Compliance with BLM Management Direction

Medford BLM RMP Management Direction	NWFP Standard and Guideline	PCGP Compliance
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Lands Mgmt., pg. 30, para. 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, and others.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - General Riparian Area Mgmt., pg. 30, para. 4	RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Big Butte Creek watershed, therefore the biological, physical, and chemical integrity of these systems would remain unaffected from hydrostatic withdrawal activities.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 27, para. 2	RF-2: Road Construction Standards and Guidelines	The existing transportation system in the Big Butte Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Big Butte Creek watershed
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 1	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction. Several road improvement projects and road decommissioning are proposed in the Trail Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 4	RF-7: Transportation Management Plan development.	The TMP meets all of the requirements of RF-7.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Watershed & Habitat Restoration, pg. 31, para. 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.

Draft

TABLE 2.5.5.5-1 **Compliance with BLM Management Direction**		
Medford BLM RMP Management Direction	**NWFP Standard and Guideline**	**PCGP Compliance**
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project affects Survey and Manage species within the Big Butte Creek watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD, however the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		BLLM lands in the Big Butte Creek Watershed exceed this threshold.

2.5.5.6 Offsite Mitigations

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management objectives are achieved. These projects also contribute to the "Maintain and Restore" objectives of the ACS. The BLM, and PCGP have entered into Agreements in Principle to accomplish off-site mitigation work in the Big Butte Creek Watershed as shown in table 2.5.5.6-1. Mitigation measures were developed from the recommendations of watershed assessments, late successional reserve assessments and the 2008 Northern Spotted Owl Recovery Plan.

TABLE 2.5.5.6-1

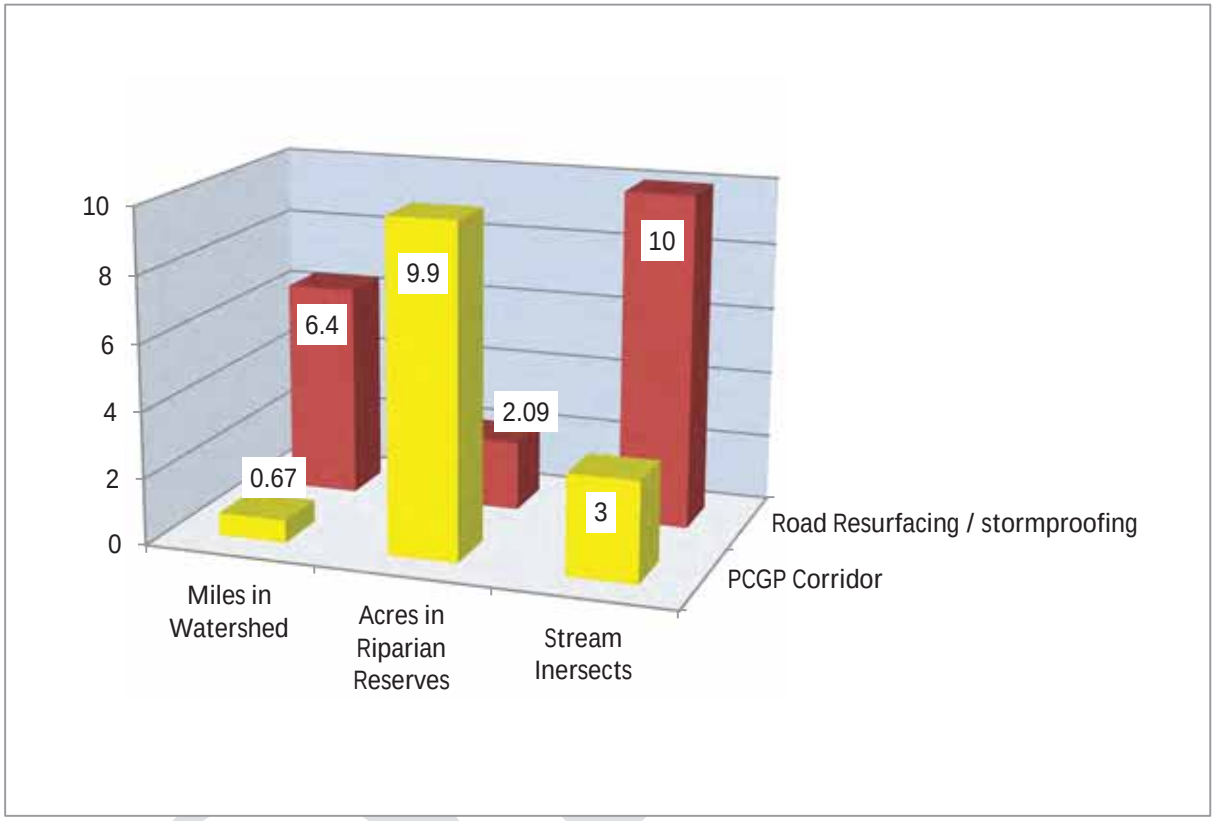
Proposed Off-site Mitigations on BLM Lands in the Big Butte Creek Watershed

Project Type	Mitigation Group	Project Name	Project Rationale
Fire Suppression	Fire suppression	Big Butte Creek Pump Chance 1 site	Construction of the pipeline and associated activities would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.
Road Surfacing	Road Sediment Reduction	Big Butte Creek Road storm-proofing 6.4 miles	Sediment was identified by the Upper Rogue Watershed Council as a factor that limited aquatic habitat in Big Butte Creek. The effects of the PCGP include possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.

Sediment was identified by the Upper Rogue Watershed Council as a factor that limited aquatic habitat in Big Butte Creek. The Big Butte Creek WQRP (BLM 2008) identified roads as the primary human-caused sediment source from BLM-administered lands in the plan area. Similarly, fire risk, was identified as significant terrestrial limiting factor. Off-site mitigation actions in the Big Butte Creek Watershed are focused on restoring natural sediment regimes by reducing

sediment contributions from roads and potential high-intensity fire. Figure 2.5-6 provides a comparison of the PCGP project impacts and the benefits of the off-site mitigation actions.

Figure 2.5-6 Comparison of PCGP Impacts and Beneficial Effects of Off-site Mitigation Measures on BLM Lands in the Big Butte Creek Watershed



2.5.5.7 Cumulative Effects

Activities on BLM Lands

The BLM manages approximately 18 percent of the Big Butte Creek watershed. There are currently no projects proposed on BLM or NFS lands in the watershed that would contribute to cumulative effects.

Activities on Private Lands

Private lands comprise about 45 percent of the Big Butte Creek watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.03 percent of the BLM lands and 0.12 percent of private lands in the Big Butte Creek watershed (table 2.5.5.1-2). The small proportion

of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the watershed in any significant, discernible or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.5.5.8 Project Effects Compared by ACS Objective

Table 2.5.5.8-1 compares the Project impacts to the objectives of the ACS for the Big Butte Creek watershed. The Project would include 0.68 miles of corridor and two intermittent stream crossings on BLM lands within the Big Butte Creek watershed where the ACS applies. Approximately 6.91 acres, or 0.05 percent of the Riparian Reserves on BLM and NFS lands in the watershed are affected. BLM lands in the McNeil Creek subwatershed, where all of the proposed Project would occur, comprise approximately 3,426 acres (21 percent) of the 16,292 acre subwatershed. From MP 131.4 to 131.78, the filed Project alignment lies parallel to an adjacent intermittent stream and largely overlays the associated Riparian Reserve. Because of the close proximity to the adjacent stream, construction of the project in this location would cause substantial impacts on riparian vegetation on the east side of the channel, likely cause this reach to become a chronic source of sediment and could affect channel complexity by removing sources of large wood. These impacts would likely retard attainment of ACS objectives at this location. The BLM has requested Pacific Connector realign this section to reduce potential sediment and impacts on Riparian Reserves. The applicant has developed a proposed realignment that would move the corridor to an adjacent ridgetop that is entirely outside of the Riparian Reserve. This proposed realignment would eliminate Riparian Reserve and sediment impacts at this location. When engineering has been completed, and the applicant has filed this realignment with FERC, this assessment would be modified to reflect that change. Watershed conditions and recommendations are found in the Upper Big Butte Watershed Analysis (BLM 1995b), Central Big Butte Creek, Big Butte Watershed Analysis (BLM 1995a) and the Big Butte Creek Water Quality Restoration Plan (BLM 2008).

Draft

TABLE 2.5.5.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Big Butte Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed landscape scale features that would be affected by the Project. There are three riparian reserves that are affected by the Project corridor on BLM-managed lands in the watershed. No riparian reserves are affected on NFS lands. Two intermittent stream channels are crossed on BLM-managed lands. On BLM-managed lands subject to the ACS, the Project corridor is located primarily on or near ridgetops to minimize impacts on aquatic habitats. From MP 131.4 to 131.78, the project would closely parallel an intermittent stream and would clear most of the riparian vegetation on the east side of the stream. This is a disproportionate impact when compared to crossings at right angles to streams that are typical of the project. At the request of the BLM, the applicant has developed an alternative alignment that would move the corridor to an adjacent ridge and completely avoid impacts to the Riparian Reserve. When engineering is completed on this realignment and it has been filed with FERC, this assessment would be modified to reflect that change. Approximately 6.91 acres or 0.05 percent of the riparian reserves in the watershed would be affected by the Project. Most of those acres are affected by the reach described above. The proposed realignment would eliminate most impacts on Riparian Reserves in the Big Butte Cr. watershed. Off-site mitigation measures including resurfacing would improve conditions in the watershed (see section 2.5.5.5). Except as noted above, while there are long-term impacts on Riparian Reserves from construction clearing of the corridor, these would be minor in scale and well within the range of natural variability given the disturbance history of the watershed.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The PCGP Project would remove approximately 6.91 acres of riparian vegetation within the Big Butte Creek Watershed, all within the McNeil Creek subwatershed where the project parallels an intermittent stream between MP 131.4 and 131.79. Although the stream is intermittent, it is likely this amount of canopy loss would affect stream channel complexity and connectivity by removing sources of large wood adjacent to the stream channel and creating chronic sources of fine sediments immediately adjacent to the stream channel. This impacts would likely retard attainment of ACS objectives. The BLM has requested a realignment at this location to move the corridor completely out of the Riparian Reserve. This would completely eliminate any possible impact on aquatic habitat connectivity. When Pacific Connector files final engineering on this realignment this evaluation would be modified to reflect that change
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	From MP 131.4 to 131.78, the project would closely parallel an intermittent stream and would clear most of the riparian vegetation on the east side of the stream. This is a disproportionate impact when compared to crossings at right angles to streams that are typical of the project. Construction at this location would likely not maintain the integrity of the aquatic system. At the request of the BLM, the applicant has developed an alternative alignment that would move the corridor to an adjacent ridge and completely avoid impacts to the Riparian Reserve. When engineering is completed on this realignment and it has been filed with FERC, this assessment would be modified to reflect that change. Although the stream is intermittent, it is likely this amount of canopy loss would affect stream channel complexity by removing sources of large wood adjacent to the stream channel and creating chronic sources of fine sediments immediately adjacent to the stream channel. This impacts would likely retard attainment of ACS objectives. The BLM has requested a realignment at this location to move the corridor completely out of the Riparian Reserve. This would completely eliminate any possible impact on aquatic habitat and channel complexity. When Pacific Connector files final engineering on this realignment this evaluation would be modified to reflect that change
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Two intermittent stream channels are crossed on BLM-managed lands. Approximately 6.91 acres or 0.05 percent of the riparian reserves in the Big Butte Creek Watershed are potentially affected by the Project all within the McNeil Creek subwatershed where the project parallels an intermittent stream between MP 131.4 and 131.79. Although the stream is intermittent, it is likely this amount of canopy loss would affect water temperature early in the summer. This impacts would likely retard attainment of ACS objectives. The BLM has requested a realignment at this location to move the corridor completely out of the Riparian Reserve. This would completely eliminate any possible impact on aquatic habitat and channel complexity. When Pacific Connector files final engineering on this realignment this evaluation would be modified to reflect that change

Draft

TABLE 2.5.5.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Big Butte Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	From MP 131.4 to 131.78, the project would closely parallel an intermittent stream and would clear most of the riparian vegetation on the east side of the stream channel. If constructed as proposed, this site would likely become a chronic source of sediment because of the adjacency of the stream channel to the project corridor. It is likely these impacts would retard attainment of ACS objectives. At the request of the BLM, the applicant has developed an alternative alignment that would move the corridor to an adjacent ridge completely out of the Riparian Reserve. When engineering is complete and the realignment has been filed with FERC, this assessment would be modified to address the change. The Big Butte Creek watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from landslides and surface erosion following major disturbances such as fires and high-intensity winter storms (BLM 1999d). More chronic erosion and deposition of fine sediments primarily from roads, and to a lesser degree from land use has replaced these pulse-type disturbances in the current sediment regime in the watershed. With the exception noted above, the Project construction and operation is not likely to alter this sediment pattern nor is it likely to exacerbate these conditions. Proposed mitigation projects including road resurfacing would contribute to reduction of sediments and restoration of aquatic functions (section 2.5.5.6).
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project is unlikely to affect peak flows in the Big Butte Creek watershed because of it's predominately ridgetop location, the relatively small area of the watershed affected (less than 0.05 percent of the total acres in Riparian Reserves on BLM and NFS lands), and relative lack of connectivity to aquatic systems.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project would not affect wetlands in the Big Butte Creek watershed on BLM-managed lands, so there would be no measurable impact from the Project on water tables or seasonal inundation of these areas
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The PCGP Project would remove approximately 6.91 acres of riparian vegetation within the Big Butte Creek Watershed, all within the McNeil Creek subwatershed where the project parallels an intermittent stream between MP 131.4 and 131.79. Although the stream is intermittent, it is likely this amount of canopy loss would affect stream channel complexity by removing sources of large wood adjacent to the stream channel and creating chronic sources of fine sediments immediately adjacent to the stream channel. This impacts would likely retard attainment of ACS objectives. The BLM has requested a realignment at this location to move the corridor completely out of the Riparian Reserve. This would completely eliminate any possible impact on aquatic habitat and channel complexity. When Pacific Connector files final engineering on this realignment this evaluation would be modified to reflect that change
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	From MP 131.4 to 131.78, the project would closely parallel an intermittent stream and would clear most of the riparian vegetation on the east side of the stream. This is a disproportionate impact when compared to crossings at right angles to streams that are typical of the project. Construction at this location would likely not maintain the integrity of the aquatic system. At the request of the BLM, the applicant has developed an alternative alignment that would move the corridor to an adjacent ridge and completely avoid impacts to the Riparian Reserve. When engineering is completed on this realignment and it has been filed with FERC, this assessment would be modified to reflect that change. Project impacts on riparian vegetation in the Big Butte Creek watershed would be minor. Two intermittent stream channels are crossed on BLM-managed lands. Approximately 6.96 acres or 0.05 percent of the riparian reserves in the Watershed are potentially affected by the Project. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings, revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

Draft

2.5.5.9 Summary, Big Butte Creek Watershed

Forests on BLM lands within the Medford District in the Big Butte Creek watershed would be affected over the long term by construction and operation of the Project. The Project would not affect any NFS lands in the watershed. Approximately 11.66 acres of vegetation would be cleared on BLM lands within the watershed. This represents approximately 0.03 percent of BLM lands within the watershed (table 2.5.5.1-3). While this is a long-term change in vegetative condition, it is limited to the site scale and is within the range of natural variability for changes in vegetative condition given the fire history of the watershed.

From MP 131.4 to 131.78, the project would closely parallel an intermittent stream and would clear most of the riparian vegetation on the east side of the stream. This is a disproportionate impact when compared to crossings at right angles to streams that are typical of the project. Construction at this location would likely become a chronic source of sediment and would not maintain the integrity of the aquatic system. These impacts would likely retard attainment of ACS objectives at this location. At the request of the BLM, the applicant has developed an alternative alignment that would move the corridor to an adjacent ridge and completely avoid impacts to the Riparian Reserve. Preliminary evaluation indicates this alignment would avoid any Riparian Reserve impacts in McNeil Creek Subwatershed or the Big Butte Creek Watershed. When engineering is completed on this realignment and it has been filed with FERC, this assessment would be modified to reflect that change.

The pipeline would cross two intermittent streams within the Big Butte Creek Watershed on BLM land on the filed alignment. The proposed realignment discussed above would eliminate these crossings. Except as noted above, measures in the ECRP including re-vegetation and maintenance of effective ground cover are likely to control surface erosion. Erosion control measures described in section 1.3.1 for stream crossings would likely be successful at minimizing sediment associated with stream channel crossings in the watershed. The BLM may require additional erosion control measures if needed Impacts on stream temperature are unlikely because the affected channels are intermittent streams.

Off-site mitigation measures, identified by the BLM, would supplement onsite minimization, mitigation, and restoration actions. These proposed off-site mitigation actions are responsive to recommendations in the Big Butte Creek WQRP (BLM 2008) and would contribute to improving terrestrial and aquatic conditions within the watershed (section 2.5.5.6).

Except as noted above, the routing of the pipeline through the relatively small area of BLM land that would be affected by Project construction (approximately 11.66 acres) makes it highly improbable that Project impacts would affect watershed conditions beyond minor, short-term impacts at the site scale. Impacts on Riparian Reserves could be further reduced by realignment to get the corridor out of the Riparian Reserves at MP 131.4 to 131.78. Although there are project-level impacts (e.g., short-term sediment and a change in vegetative condition at stream crossings), these would be minor and would be largely limited to the boundaries of the project area except as noted above. Proposed amendment of the Medford District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (section 2.5.5.5).

Except as noted above, no project-related impacts that would prevent attainment of ACS objectives have been identified (section 2.5.5.8). Impacts, as they relate to relevant ecological processes, would be within the range of natural variability for watersheds in the Western Oregon and High Cascade Provinces although some of these processes have been altered from their natural condition (section 2.5.5.4).

.

2.5.6 Little Butte Creek Fifth Field Watershed, HUC 1710030708

2.5.6.1 Overview

The Little Butte Creek fifth-field watershed (figure2.5-7) is located in the southern Cascade Range in southwestern Oregon about 10 miles southeast of Medford. Little Butte Creek is a Tier One Key Watershed in the NWFP above the confluence of the North and South Forks. It is one of eight fifth-field watersheds in the 2,618 square mile Upper Rogue River Subbasin. The Upper Rogue River Subbasin is one of five subbasins within the Rogue River basin. The entire Rogue River drainage basin is about 132 miles wide (east to west). See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth field watersheds traversed by the PCGP corridor.

The watershed lies south of the Rogue River, with Little Butte Creek draining in a northwest direction. Major tributaries include Antelope Creek and the North and South Forks of Little Butte Creek. The North Fork begins at Fish Lake (northeast corner of the watershed), while the South Fork begins near the eastern boundary with the Fourmile Creek watershed. The North Fork headwaters are considerably lower in elevation than those of the South Fork. The two forks meet to form the main stem of Little Butte Creek near Lake Creek (elevation of 1,647 feet amsl). Little Butte Creek then continues in a northwest direction for 17 miles through the communities of Eagle Point and White City before emptying into the Rogue River about 3 miles west of Eagle Point at the junction of the Little Butte Creek and Shady Cove-Rogue River fifth-field watersheds. The Rogue River then turns westward and flows through the Rogue River – Siskiyou National Forest and the Klamath Mountains, discharging to the Pacific Ocean at Gold Beach, Oregon, about 32 miles from the California border.

The Little Butte Creek watershed lies mainly in Jackson County (354 square miles), but the eastern extremity is in Klamath County (19 square miles). Elevations range from 1,204 feet amsl at the confluence of Little Butte Creek and the Rogue River to 9,495 feet amsl at the top of Mount McLaughlin on the northeastern divide with Big Butte Creek fifth-field watershed. Average land elevation over the entire watershed is 3,496 feet. About 31% of the watershed is in the TSZ zone (3.500 feet amsl to 5000 feet amsl), where warm rain-on-snow events contribute to peak flow events.

The City of Eagle Point is the only municipality within the watershed boundary, but unincorporated White City borders along the same lower reach, and the unincorporated settlements of Waynsboro and Lake Creek are also found along the valley portions of the watershed. The eastern portion of the City of Medford approaches the western edge of the watershed. In this vicinity, the I-5 corridor lies about 5 miles from the watershed. State Hwy. 140, which connects Medford and Klamath Falls, is a major transportation corridor through the watershed. Other major

roads include State Hwy. 62, Hwy. 722 (Dead Indian Memorial), County Road 1000, South Fork Little Butte Creek, Lake Creek, and Antelope Creek roads.

Farming (especially orchards), forestry, and cattle grazing dominate human land use in the watershed. The BLM maintains 28 grazing allotments and the Forest Service maintains an additional four grazing allotments in the watershed. Water withdrawals from Little Butte Creek associated with agricultural and domestic uses constitute a major concern for aquatic water and habitat quality.

Much of the terrain in Little Butte Creek is transitional between the Klamath-Siskiyou Province and the High Cascades Province. The western and central portions where most federal land is BLM-administered are generally in the Klamath-Siskiyou Province. The eastern, higher elevation portion where most federal land is NFS is generally in the High Cascades Province.

Relatively old, soft volcanic materials dominate the geology of the Western Cascade portion of the watershed. Lava flows of basaltic andesite, basalt, and andesite predominated. These lavas are interlayered with softer pyroclastic flows of andesitic tuff, basaltic breccia, ash flow tuff, dacite tuff, and andesitic breccia. These pyroclastic materials often interfinger with the lavas making the area subject to landsliding during rain-on-snow or intense storm events. As a result of landslides and surface erosion processes, the landscape is deeply dissected, with a well-developed dendritic drainage pattern. The clay content of the soils is high (particularly in the subsoil), resulting in relatively low infiltration rates.

In the eastern portion of the watershed and a small part of the central portion along the north central watershed divide with Big Butte Creek fifth-field watershed, High Cascade geology prevails. These deposits consist of much younger and harder lava flows that have developed from large composite and shield volcanos. Volcanism from these local vents produced the more prominent peaks that form the High Cascades including Brown Mountain and Mount McLoughlin which appear in sharp contrast to the Western Cascades topography. Rock types include basaltic andesite, andesite, and basalt lavas. Most of these lava flows were from the north and east, overlapping the eastern margin of the Western Cascades. As a result, a high plateau developed above the older topography. Since the geological substrate is less erodible and more stable than in the Western Cascades, the landscape is much less dissected. Soils are generally shallower and less weathered, and have relatively high infiltration rates.

Most of the large alluvial stream terraces, located above the floodplains in the western third of the watershed, developed during the formation of the High Cascades. These terraces consist of unconsolidated deposits of gravel, cobbles, and boulders intermixed and interlayered with clay, silt, and sand. The alluvium and valley bottom are much wider in the western part of the watershed. Large portions of the western and central portions of the watershed are moderately stable to unstable soils due to steep slopes, moderate precipitation rates, and the natural weakness of many of the volcanic soil/rock types of the Western Cascades.

The 373.0 sq. mile (238,879 acre) Little Butte Creek watershed includes twelve subwatersheds, nine of which (moving from northwest to southeast, Lick Creek, Salt Creek, Lake Creek, Lower North Fork Little Butte Creek, Lower South Fork Little Butte Creek, Upper North Fork Little Butte Creek, Upper South Fork Little Butte Creek, Middle South Fork Little Butte Creek, and Beaver Dam Creek) are crossed by the PCGP corridor (figure 2.5-7 and table 2.5.6.1-1). The watershed

is bounded on the northwest to the northeast by the Shady Cove-Rogue River and Big Butte Creek fifth-field watersheds, on the east by the Fourmile Creek fifth-field watershed, on the south by several fifth-field watersheds of the Upper Klamath 4th field watershed, and on the west by the Rogue River-Gold Hill and Bear Creek subwatersheds of the Middle Rogue River subbasin.

The region experiences a Mediterranean type climate, with mild, wet winters and hot, dry summers. The general area has the highest summer temperatures and lowest annual precipitation in western Oregon. Summer weather is dominated by the Pacific high pressure system. Annual precipitation ranges from 22 inches at the lower elevations to 66 inches in the upper reaches of the watershed. July through October is the driest period, while December through April is the wettest. Winter precipitation at elevations above 5000 feet amsl typically occurs as snow, with spring melting and runoff occurring from April through June. Rainfall predominates below 3,500 amsl feet. Between the two (i.e., in the TSZ) there is a mix of rain and snow in winter. Locally intense thunderstorm precipitation events may occur during summer months.

The Little Butte Creek watershed contains approximately 784 miles of streams based on BLM and Forest Service GIS layers. This includes about 167 miles of fish bearing (and perennial) streams, 69.9 miles of perennial nonfish-bearing streams, and 547.4 miles of intermittent streams (BLM and Forest Service, 1997: 36). The watershed also contains 1,383.0 acres of palustrine wetlands and 393.0 acres of lacustrine wetlands. Headwater areas are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising 80% of the stream miles. Sediment and loss of LWD and large wood recruitment along streams from logging activity has negatively impacted many of the streams in the watershed.

Streamflow patterns reflect the distribution of precipitation. The range of elevations across the watershed results in a variety of runoff events, including rain, rain-on-snow, and snowmelt. Partial to total snow melt typically occurs in the TSZ during warm mid-winter rain-on-snow events, and is associated with nearly all major peak flows. Thirty-four percent (34%) of the surface runoff from the watershed is collected from rain, 31% from rain-on-snow events, and 35% from snowmelt.

Agricultural production (farms, orchards and cattle grazing) requires annual withdrawal of many thousands of acre feet of water from Little Butte Creek for irrigation. The Medford Water Commission services customers throughout the Rogue Valley with Little Butte Creek water during the months of April to September. An extensive canal system facilitates these withdrawals. The resulting low flows in summer are accompanied by elevated temperatures, hearty bacterial growth, and other water quality problems.

The vegetation in the watershed is very diverse. Approximately 65 percent of the total area, mainly in the higher elevations consists of temperate coniferous forest. Low elevations are characterized by dry pine/oak woodland savannahs (chaparral). Virtual elimination of fire due to fire suppression efforts has resulted in high stocking levels, which in turn have caused poor tree growth and success of many non-preferable species. Grass/oak savannahs have become choked with brush and open ponderosa pine stands have developed dense understories of Douglas-fir and white fir. Fire suppression has also resulted in accumulation of dead fuels. Under drought conditions, these fuel loads may cause large, high intensity fires.

Figure 2.5-7 shows the checkerboard pattern of BLM lands on the western and central portions of the watershed and the more contiguous Forest Service lands in the eastern uplands. Approximately 22.9% of the land in the watershed is managed by the BLM Medford District, and another 25.1% is in the Rogue River – Siskiyou National Forest. BLM lands are found in all watersheds except the easternmost two (Upper North Fork and Upper South Fork of Little Butte Creek subwatersheds). Substantial acreages of Forest Service lands are found in only the four easternmost subwatersheds (i.e., Upper North Fork, Upper South Fork, Middle South Fork, and Beaver Dam Creek subwatersheds). Approximately 52.0% of the land in the watershed is privately owned.

No lands in the LSR allocation are crossed on the BLM. Conversely, all of the NFS lands crossed in the Little Butte Creek watershed are in the LSR land allocation. All mapped LSR lands are in LSR RO 227. Matrix lands account for about 54% of the federal land in the watershed. Late Successional Reserves account for 46%. Riparian Reserves which occur in both the matrix and LSR lands allocations account for an estimated 10,791 acres or 9.4% of the federal lands in Little Butte Creek (BLM and Forest Service 1997: 17). There is an additional 2,549 acres (2,294 acres BLM, 255 acres NFS) of unmapped LSR associated with KOACs in the watershed.

Location and Routing

The PCGP corridor enters the Little Butte Creek fifth-field watershed from the Big Butte Creek fifth-field watershed at MP 135.0 (figure 2.5-7). As it traverses Lick Creek, Salt Creek and (northern portion of) Lake Creek subwatersheds, the corridor runs across country. After entering Lower North Fork subwatershed, the corridor runs along subwatershed divides most of the rest of the way through the watershed. The major exception is the segment running from Middle South Fork into Upper South Fork subwatersheds (figure 2.5-7). The corridor exits the watershed at MP 167.9, moving into the Spencer Creek fifth-field watershed of the Upper Klamath basin. Total length of the corridor in the Little Butte Creek watershed is 32.82 miles.

The PCGP corridor traverses 5.99 miles of BLM land in the four subwatersheds occupying the north central portion of the watershed (i.e., Lick Creek, Salt Creek, Lower North Fork and Lower South Fork). Corridor lengths range from 1.08 miles to 2.66 miles. Approximately 13.65 miles of Forest Service land are traversed by the corridor in the six easternmost subwatersheds. In total, 19.64 miles of the project corridor are on BLM and NFS lands. This is the largest number of project miles on federal lands in any watershed crossed by the project (figure 2.2-2). Private ownership accounts for 13.2 miles of the land traversed by the corridor.

A total of 641.1 acres of land would be affected by PCGP corridor construction in the Little Butte Creek watershed of which 536.3 acres would be cleared and 104.8 acres would be modified. Over 70 percent of this acreage (449.4 acres) is on federal land. BLM cleared and modified acre (table 2.5.6.1-2). s (168.74 acres) constitute 26.3% of the total, while Forest Service cleared and modified acres (280.65 acres) constitute 43.8% of the total. Largest BLM effects occur in the four watersheds occupying the north central portion of the watershed, while largest Forest Service effects occur in the five eastern subwatersheds. BLM effects constitute 0.31% of the BLM land in the watershed, while Forest Service effects constitute 0.47% of the Forest Service land. Over the entire watershed, all ownerships, 0.27% of the land in the Little Butte Creek watershed would be within the project right-of-way.

No LSR acreage would be affected on BLM land (table 2.5.6.1-3). All BLM land within the Right of Way (107.86 acres) is Matrix land. By contrast, all of the NFS acreage (279.86 acres) in the Right of Way is LSR (table 2.5.6.1-2). The LSR land within the Right of Way accounted for 0.53% of the Forest Service LSR land allocation in the watershed. No unmapped LSRs are affected by the Project in the Little Butte Creek Watershed.

One perennial stream (South Fork of Little Butte Creek, MP 162.45, on Forest Service land), seven intermittent streams (six on BLM land and one on NFS land) and one forested wetland would be crossed and associated riparian zones impacted (table 2.5.6.1-4). Riparian Reserves on one intermittent BLM stream, one intermittent Forest Service stream and on forested wetland would be clipped by the PCGP corridor, but the associated waterbodies would not be crossed. In total, 15.2 acres of Riparian Reserves would be cleared, 10.79 acres of which are on BLM land and 4.41 acres are on NFS land (table 2.5.6.1-4). This constitutes 0.14% of the Riparian Reserves in the watershed (table 2.5.6.-3). Approximately 5.6 acres of LSOG in Riparian Reserves would be cleared in the project corridor (table 2.5.6.1-4). The remaining 9.6 acres cleared are early or mid seral forest communities.

Draft

Figure 2.5-7 PCGP Routing and Subwatershed Boundaries, Little Butte Creek Watershed

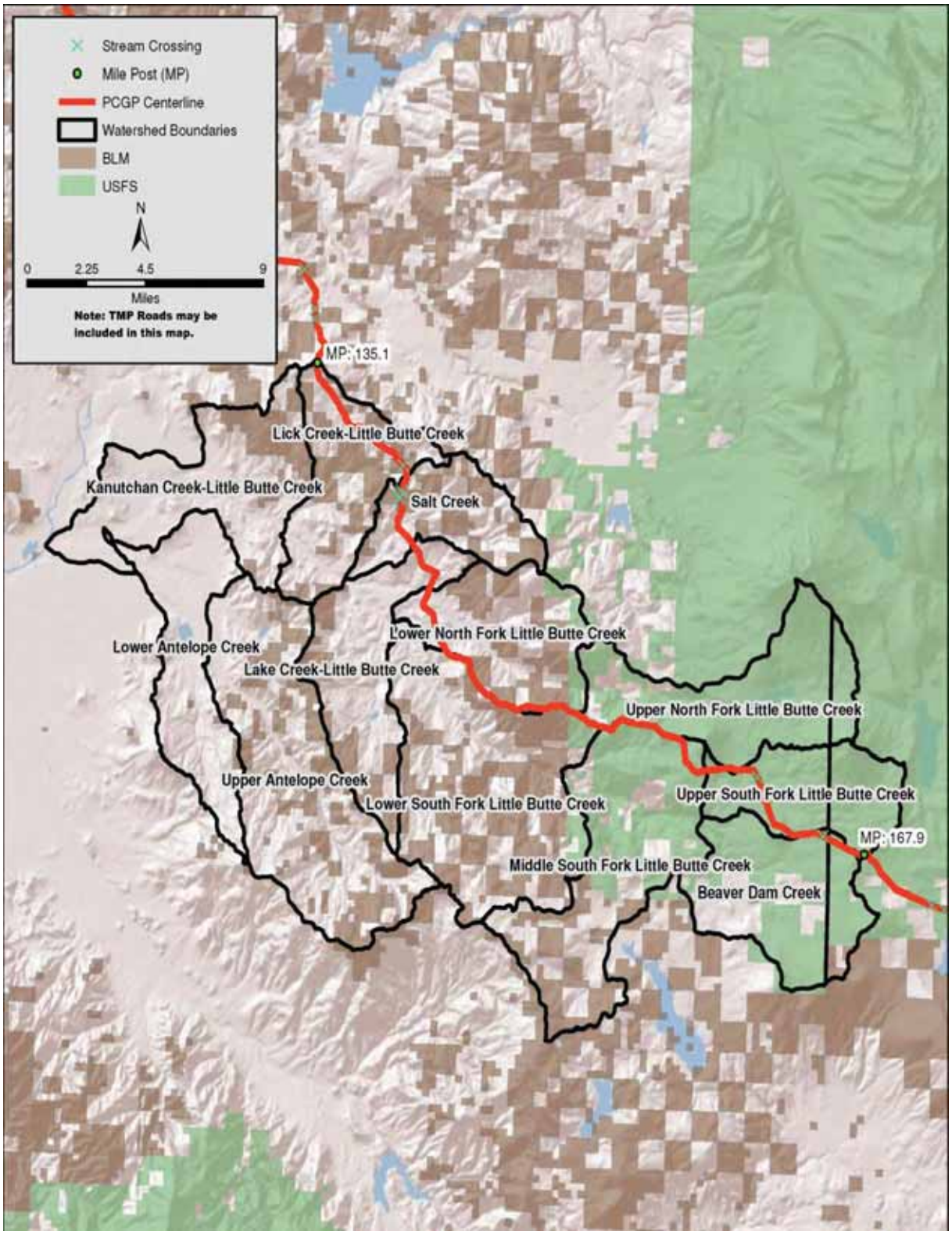


TABLE 2.5.6.1-1.

Land Ownership (acres) and Federal Land Allocations (acres) in Little Butte Creek Watershed HUC 1710030708

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	NFS	Total BLM and NFS	Other	BLM	NFS	BLM	NFS	BLM	NFS	Total BLM and NFS
Beaver Dam Creek	17,862.75	599.03	12,989.80	13,588.83	4,273.92		12,512.25	599.03	477.55	56.31	1,221.04	1,277.35
Kanutchan Creek-	21,959.17	3,732.43		3,732.43	18,226.74			3,732.43		350.85	0.00	350.85
Lake Creek	16,974.66	4,023.36		4,023.36	12,951.30			4,023.36		378.20	0.00	378.20
Lick Creek	14,838.25	5,619.05		5,619.05	9,219.20			5,619.05		528.19	0.00	528.19
Lower Antelope Creek	16,096.61	294.91		294.91	15,801.70			294.91		27.72	0.00	27.72
Lower North Fork Little Butte Creek	15,714.05	5,948.61	1,344.23	7,292.84	8,421.21		320.10	5,948.61	1,024.13	559.17	126.36	685.53
Lower South Fork Little Butte Creek	33,078.77	14,950.78	1,572.84	16,523.62	16,555.15		1,557.48	14,950.78	15.36	1,405.37	147.85	1,553.22
Middle South Fork Little Butte Creek	26,193.88	5,495.86	12,427.33	17,923.19	8,270.69		12,315.57	5,495.86	111.76	516.61	1,168.17	1,684.78
Salt Creek	11,029.22	4,698.08	0.47	4,698.55	6,330.67			4,698.08	0.47	441.62	0.04	441.66
Upper Antelope Creek	32,108.75	9,480.66		9,480.66	22,628.09			9,480.66		891.18	0.00	891.18
Upper North Fork Little Butte Creek	20,358.40		18,901.65	18,901.65	1,456.75		13,447.78		5,453.87	0.00	1,776.76	1,776.76
Upper South Fork Little Butte Creek	12,664.06		12,664.06	12,664.06	0.00		12,659.47		4.59	0.00	1,190.42	1,190.42
Watershed Total	**238,878.57**	**54,842.77**	**59,900.38**	**114,743.15**	**124,135.42**	**0.00**	**52,812.65**	**54,842.77**	**7,087.73**	**5,155.22**	**5,630.64**	**10,785.86**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap. An additional 2,549 acres are in unmapped LSR associated with KOACs.
c/ Occur within LSR and Matrix Land Allocations. Data Source: Riparian Reserves are estimated at 10,791 acres, an average of 9.4% of the landscape: Little Butte Creek WA, page 17. Columns of number may not add up exactly because of accumulated small rounding discrepancies.

Draft

TABLE 2.5.6.1-2

PCGP Project Corridor (miles) and Project Area (acres) in Little Butte Creek Watershed HUC 1710030708 by Land Ownership

Unit a/	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Beaver Dam Creek					1.68	21.42	10.64	0.25	1.68	21.42	10.64	5.35					1.68	21.42	10.64	0.18
Kanutchan Creek-									0.00	0.00	0.00			16.76						
Lake Creek									0.00	0.00	0.00		2.09	30.56	0.45	0.24	2.09	30.56	0.45	0.18
Lick Creek	1.00	14.64	1.73	0.29					1.00	14.64	1.73		4.64	67.77	12.67	0.87	5.64	82.41	14.40	0.65
Lower Antelope Crk									0.00	0.00	0.00									
Lower North Fork Little Butte Creek	2.54	34.06	5.90	0.67	0.11	1.31	0.82	0.16	2.65	35.37	6.72	0.58	3.50	49.02	1.82	0.60	6.15	84.39	8.54	0.59
Lower South Fork Little Butte Creek	1.35	33.64	1.63	0.24	0.86	12.42	4.44	1.07	2.21	46.06	6.07	0.32	0.91	20.45	1.12	0.13	3.12	66.51	7.19	0.22
Middle South Fork Little Butte Creek					3.54	51.01	21.06	0.58	3.54	51.01	21.06	0.40		1.58		0.02	3.54	52.59	21.06	0.28
Salt Creek	1.08	14.42	1.84	0.35					1.08	14.42	1.84		1.57	28.47	0.81	0.46	2.65	42.89	2.65	0.41
Upper Antelope Creek									0.00	0.00	0.00									
Upper North Fork Little Butte Creek					1.95	26.93	8.88	0.19	1.95	26.93	8.88	0.19	0.53	6.87	0.90	0.53	2.48	33.80	9.78	0.21
Upper South Fork Little Butte Creek					5.55	96.32	24.61	0.95	5.55	96.32	24.61	0.95					5.55	96.32	24.61	0.95
Watershed Total	5.97	96.76	11.10	0.20	13.69	209.41	70.45	0.47	19.66	306.17	81.55	0.71	13.24	221.48	17.77	0.19	32.90	510.89	99.32	0.26

a/ All data derived from NSR-based GIS layers

Draft

TABLE 2.3.7.1 3

PCGP Project Area (acres) on Federal Lands in the Middle Fork Coquille River Watershed HUC 1710030501 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Beaver Dam Creek	BLM																
	NFS	21.42	10.64	0.17	0.09					1.03	0.63	0.08	0.05	21.42	10.64	0.16	0.08
Kanutchan Creek	BLM																
	NFS																
Lake Creek	BLM																
	NFS																
Lick Creek	BLM					14.64	1.73	0.26	0.03	2.20		0.42		14.64	1.73	0.26	0.03
	NFS																
Lower Antelope Creek	BLM																
	NFS																
Lower North Fork Little Butte Creek	BLM					34.06	5.90	0.57	0.10	3.82		0.11		34.06	5.90	0.57	0.10
	NFS	1.31	0.82	0.41	0.26									1.31	0.82	0.10	0.06
Lower South Fork Little Butte Creek	BLM					33.64	1.63	0.23	0.01					33.64	1.63	0.23	0.01
	NFS	12.42	4.44	0.80	0.29							2.18		12.42	4.44	0.79	0.28
Middle South Fork Little Butte Creek	BLM																
	NFS	50.91	21.06	0.41	0.17			0.00						50.91	21.06	0.41	0.17
Salt Creek	BLM					14.42	1.84	0.31	0.04	4.77	0.81	1.08	0.18	14.42	1.84	0.31	0.04
	NFS																
Upper Antelope Creek	BLM																
	NFS																
Upper North Fork Little Butte Creek	BLM																
	NFS	26.70	8.88	0.20	0.07			0.00						26.70	8.88	0.14	0.05
Upper South Fork Little Butte Creek	BLM																
	NFS	96.31	24.60	0.76	0.19		0.01	0.00	0.22	3.38	0.46	0.28	0.04	96.31	24.61	0.76	0.19

Draft

TABLE 2.3.7.1 3

PCGP Project Area (acres) on Federal Lands in the Middle Fork Coquille River Watershed HUC 1710030501 by Agency and Land Allocation

Unit a/	Agency	Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
		Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Watershed Total	**BLM**					**96.76**	**11.10**	**0.18**	**0.02**	**10.79**	**0.81**	**0.15**	**0.02**	**96.76**	**11.10**	**0.18**	**0.02**
	NFS	**209.07**	**70.44**	**0.40**	**0.13**			**0.00**	**0.00**	**4.41**	**1.09**	**0.14**	**0.02**	**209.07**	**70.45**	**0.35**	**0.12**
	Total BLM & NFS	**209.07**	**70.44**	**0.40**	**0.13**	**96.76**	**11.10**	**0.18**	**0.02**	**15.20**	**1.90**	**0.14**	**0.02**	**305.83**	**81.55**	**0.27**	**0.06**

a/ All data derived from NSR-based GIS layers
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.5.6.1-4

Riparian Reserve Effects Little Butte Creek HUC 1710030708

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area c/	Net Riparian Reserve Cleared						
Lick Creek Subwatershed HUC 171003070809																													
MD BLM	140.26	ASI233Lick Creek	Lick Creek, 10-20'wide, U-shaped channel	I	Yes	12.33		No	0.20		1.22	1.42				0.00		0.75		0.75	0.03	2.20		2.20	0.02	2.22	No	No
MD BLM	140.31	ADX234	3' wide at OHW M, V-shaped channel	D	Yes	3.66		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
MD BLM	140.91	ADX186	Rocky Ditch	D	Yes	3.34		No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
Subtotal Lick Creek Subwatershed		Crossed: 2 Ditches 1 Int. Channel	Clipped: none	1					0.20		1.22	1.42				0.00		0.75		0.75	0.03	2.20		2.20	0.02	2.22		
Salt Creek Subwatershed HUC 171003070808																													
MD BLM	141.17	ASI187Trib. to Salt Creek	1-2' wide intermittent stream with little vegetation	I	Yes	2.51		No				0.00				0.00		1.29		1.29		1.29		1.29		1.29	No	No
MD BLM	141.44	ASI188Trib. to Salt Creek	3-4' average width, U-shaped channel, 8%gradient	I	Yes	43.20		No		1.04	0.44	1.48				0.00		0.72		0.72	0.05	2.25	0.41	2.66	0.09	2.75	No	No
MD BLM	141.49	RS017Trib. to Salt Creek	1-2' wide intermittent drainage	I	Yes	4.45		No	0.44	0.32		0.76				0.00				0.00	0.01	0.77	0.40	1.17	0.08	1.25	No	No
MD BLM	141.85	Trib of Salt Cr.	RR of lateral stream clipped. Stream crossing on private land.	I	No			Yes		0.43		0.43				0.00		0.03		0.03		0.46		0.46	0.06	0.52	No	No
Subtotal Salt Creek Subwatershed		Crossed: 3 Int. Channels	Clipped: 1 Int. Channel		2			1	0.44	1.79	0.44	2.67				0.0		2.04		2.04	0.06	4.77	0.81	5.58	0.23	5.81		
Lower North Fork Little Butte Creek HUC 171003070802 (Tier One Key Watershed)																													
MD BLM	152.19	AW185	Forested stream bank with wetland characteristics	W	Yes		0.01	No				0.00	0.56			0.56	0.03			0.03		0.59		0.59	0.01	0.60	No	No

Draft

TABLE 2.5.6.1-4

Riparian Reserve Effects Little Butte Creek HUC 1710030708

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/															Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area c/	Net Riparian Reserve Cleared						
MD BLM	152.33	AL169 Stock Pond	Intermittent Channel adjacent to l 3' deep stock pond w/wetland species; 6'max depth	I	Yes	0.00		No				0.00				0.00	3.23			3.23		3.23		3.23	0.34	3.57	No	No
MD BLM	152.35	Intermittent stream trib to stock pond	Stream not in inventory: acres combined with 152.33	I	Y		0.01					0.00																
Subtotal Lower NF Little Butte Creek Subwatershed		Crossed: 2 Int. Channels 1 wetland	Clipped: none		3				0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.56	3.26	0.00	0.00	3.26	0.01	3.82	0.00	3.82	0.00	3.82		
Upper South Fork of Little Butte Creek HUC 171003070803 (Tier One Key Watershed)																												
RRNF	162.45	ASP165South Fork Little Butte Creek	2-30' wide, U-shaped,1% gradient, braided channels	P	Yes	19.62		No	1.38			1.38				0.00	1.16			1.16	0.04	2.58	0.08	2.66		2.66	Yes	No
RRNF	164.11	EW075	RR of adjacent emergent wetland in forest clearing.	W	No	0.00	0.00	Yes	0.13			0.13				0.00	0.39			0.39		0.52	0.26	0.78		0.78	No	No
RRNF	164.96	ASI164	RR of lateral stream clipped	I	No	0.00		Yes				0.00	0.28			0.28				0.00		0.28	0.12	0.40		0.40	No	No
Subtotal Upper South Fork Little Butte Creek		Crossed: 1 Per. Channel	Clipped: 1 wetland RR 1 Int. Stream RR		1			2	1.51	0.00	0.00	1.51	0.28	0.00	0.00	0.28	1.55	0.00	0.00	1.55	0.04	3.38	0.46	3.84	0.00	3.84	1	0
Beaver Dam Creek HUC 171003070804 (Tier One Key Watershed)																												
RRNF	166.21	ESI076 (ESI084) Daley Creek	30-40' wide braided channel, coble/gravel substrate, trib. to Daley Creek.	I	Yes	26.51		No				0.00				0.00		0.73	0.20	0.93	0.10	1.03	0.63	1.66		1.66	No	No
Total, Key Watershed Portion of Little Butte Creek (North and South Forks above Pipeline MP 145.38)																												

Draft

TABLE 2.5.6.1-4

Riparian Reserve Effects Little Butte Creek HUC 1710030708

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy e/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area c/	Net Riparian Reserve Cleared						
Total Key Watershed		Crossed: 3 Int. Channels 1 Per. Channel 1 Wetland	Clipped: 1 Int. Stream RR 1 Wetland RR		5		0.01	2	1.51	0.00	0.00	1.51	0.84	0.00	0.00	0.84	4.81	0.73	0.20	5.74	0.14	8.23	1.09	9.32	0.35	9.67		
Totals, Little Butte Creek Watershed																												
Total BLM		Crossed: 2 Ditches f/ 6 Int. Channels 1 Wetland	Clipped: 1 Int. Stream RR		7		0.01	1	0.64	1.79	1.66	4.09	0.56	0.00	0.00	0.56	3.26	2.79	0.00	6.05	0.09	10.79	0.81	11.60	0.60	12.20	0	
Total Forest Service		Crossed: 1 Int. Channel 1 Per. Channel	Clipped: 1 Int. Channel RR 1 Wetland RR		2			2	1.51	0.00	0.00	1.51	0.28	0.00	0.00	0.28	1.55	0.73	0.20	2.48	0.14	4.41	1.09	5.50	0.00	5.50	1	
Total		Crossed: 2 Ditches 7 Int. Channels 1 Per. Channel 1 Wetland	Clipped: 2 Int. Channel RR 1 Wetland RR		9		0.01	3	2.15	1.79	1.66	5.60	0.84	0.00	0.00	0.84	4.81	3.52	0.20	8.53	0.23	15.20	1.90	17.10	0.60	17.70		

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor or TEWA clearing crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

TABLE 2.5.6.1-5

Stream Crossing Turbidity and Risk Assessment

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bank full Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construc-tion Impact Rating d/	Overall Rating e/
Little Butte Creek	Lick Cr.	140.26	I	Lick Creek, 10-20'wide, U-shaped channel		12.33					M	M	M	YELLOW
Little Butte Creek	Salt Cr.	141.17	I	1-2' wide intermittent stream with little vegetation		2.51					L	L	L	BLUE
Little Butte Creek	Salt Cr.	141.44	I	3-4' average width, U-shaped channel, 8%gradient	4	43.2	13.89		Highly erosion resistant	Bedrock	L	L	L	BLUE
Little Butte Creek	Salt Cr.	141.49	I	1-2' wide intermittent drainage		4.45					L	L	L	BLUE
Little Butte Creek	Upper SF Little Butte Cr.	162.45	P	U-shaped,1% gradient,	22	19.62	0.87		Erosion resistant	Gravel/ cobble	M	M	M	YELLOW
Little Butte Creek	Beaver Dam Cr.	166.21	I	30-40' wide braided channel, cobble/gravel substrate, Daley Creek.		26.51				Cobble gravel	L	L	L	BLUE

Sources
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified

Draft

2.5.6.2 Existing Conditions Little Butte Creek, HUC 1710030708

In 1997 The BLM and Forest Service prepared an interagency watershed assessment for federal lands in Little Butte Creek (BLM and Forest Service 1997). The Little Butte Creek watershed Council completed an assessment that addressed issues throughout all ownerships in the watershed in 2003.

Original watershed Analysis Findings

- Soils on the young volcanic landforms associated with the High Cascades (e.g., plateaus) where the PCGP is routed have higher infiltration rates than the older landforms of the Western Cascades in the Little Butte Creek watershed. Erosion potential is characterized as slight to moderate on these plateaus and valley floors and moderate to high in the associated stream channels.

- The key aquatic issue in the watershed is water quality. High-priority issues that affect water quality and limit factors for long-term sustainability of native fish and other aquatic species in this watershed are temperature, habitat modification, and sedimentation.

- Water withdrawals and trans-basin diversions have had the greatest impact on summer stream flows in the Little Butte Creek watershed. Except for the smallest tributaries, all of the streams in the LBCW have been over-allocated for water rights during the summer season. This means that there are more legal rights to water than there is water in the system(Little Butte Creek watershed Council 2003). The majority of water diverted from streams in the watershed is used for irrigation. Trans-basin diversions out of the Little Butte Creek watershed dramatically decrease stream flows in the diverted tributaries and downstream reaches during the irrigation and reservoir storage seasons.

- The South Fork of Little Butte Creek is 303(d) listed for flow modification, habitat modification, sediment, and temperature from the mouth to the confluence of Beaver Creek. The PCGP route crosses South Fork of Little Butte Creek, a perennial stream, and Daley Creek (intermittent) several miles above the confluence of Beaver Creek. The reach of the South Fork of Little Butte Creek and Daley Creek crossed by the PCGP is not 303(d) listed.

- Removal of coarse woody material (CWM) in past fuel treatments has affected site productivity. Maintaining the maximum levels of CWM consistent with reasonable fuel loadings appears to have considerable potential for enhancing site quality. Mid-seral stands with no CWM may have yields 12 percent lower than stands with sufficient CWM (BLM and Forest Service 1997: 75).

- The Little Butte Creek watershed Analysis suggests that roads contribute the greatest amount of sediment to streams in the watershed. Roads located in unstable areas and adjacent to streams, as well as those with inadequate drainage control and maintenance and no surfacing are most likely to cause sedimentation of stream habitats. Stream-adjacent roads confine the channel and restrict the natural tendency of streams to move laterally. Roads crossing through riparian areas have fragmented riparian habitat connectivity. Some culverts impede or prevent fish passage. Road density (all ownerships) described in the watershed analysis is 3.3 miles per square mile. Two sections (T37, R3E, Section 12; T37

S, R4E, Section 14) have road densities of 4.4 miles per square mile and 6.0 miles per square mile, respectively.

- Peak flows associated with past rain-on-snow events have altered the South Fork of Little Butte Creek by eroding stream banks, scouring channels, and removing coarse wood. Peak flows effects on n the primary channels within subwatershed are not expected to change noticeably in the future. Peak flows in the headwater streams are expected to decrease slightly as the areas recover hydrologically. Reduced harvest and restoration efforts under the existing land allocations within the Land and Resource Management Plan would accelerate the recovery process. Roads would continue to affect peak flows. At the time it was prepared, the Little Butte Creek watershed Analysis estimated conservatively that vegetation in the South Fork of Little Butte Creek subwatershed was 72 percent hydrologically recovered. This is at or above the threshold of 70 percent for increasing peak flows by removing vegetation in the timber types on the Dead Indian Plateau.

- High stream temperatures (approximately >70°F) are lethal to fish and limit summer rearing habitat in Little Butte Creek watershed. Summer stream temperatures vary throughout the watershed, with cooler temperatures generally found in most headwater streams. Elevated summer water temperatures are a limiting factor in Little Butte; North Fork Little Butte (below the National Forest boundary); South Fork Little Butte (below Beaver Dam Creek); and Antelope, Conde, and Dead Indian creeks.

- Stream temperatures for the mainstems of Little Butte, North Fork Little Butte, and South Fork Little Butte creeks tend to show a correlation with elevation: cooler stream temperatures are found in the stream reaches at higher elevations. Federal lands (located at higher elevations) account for 75 to 85 percent of the viable salmonid production during summer months. Stream temperature on the lower reaches of these streams warm to near lethal (physiologically stressful) or lethal conditions for salmonids and other native fishes (sculpins, suckers, lamprey, etc.) during summer months due to habitat alteration. Warm stream temperatures limit fish production (growth) and occupation of habitat.

Changes in watershed Condition

The following projects or natural disturbance events have occurred on BLM and NFS lands since the WA was written in 1997 (table 2.5.6.2-1).

TABLE 2.5.6.2-1

Changes in Watershed Condition since publication of the Little Butte Creek Watershed Analysis

Subwatershed	Fires or Other Terrestrial Disturbance Events	Flood or Channel Forming Events	Recommended Watershed Assessment Restoration Projects Completed
Kanutchan Creek-LBC	Major blowdown-83 ac.,2008		Decommissioned 2.2 miles of road. Rehabbed approximately 3 acres of meadows damaged by OHV's.

TABLE 2.5.6.2-1 **Changes in Watershed Condition since publication of the Little Butte Creek Watershed Analysis**			
Subwatershed	**Fires or Other Terrestrial Disturbance Events**	**Flood or Channel Forming Events**	**Recommended Watershed Assessment Restoration Projects Completed**
Lick Creek	Major blowdown-886 ac.,2008; Doubleday Fire-316 ac.,2008		Decommissioned 1.3 miles of road. Replaced 2 undersized culverts on Lick Creek with one properly sized bottomless structure for fish passage. Rehabbed approximately 7.3 acres of meadow damaged by OHV's.
Salt Creek	2008 blowdown event		Decommissioned/closed 2.8 miles of road.
Lower South Fork LBC	2002 Lost Lake Fire - 230 acres; 2008 blowdown event	1997: Flood event in 5+ steep headwater tributaries; blew out lots of large wood, scoured riparian areas, sluiced out several miles of channels, deposited uprooted trees and tons of sediment on flat benches, road crossings, etc., changed channels, wiped out bridges and culverts, extensive erosion of roads 2005 & 2011: floods/debris torrents	• 2 large wood projects (Soda & Lost Creek) • 4 road obliteration projects - 1.5 miles; • riparian planting
Lower North Fork LBC	2005 Wasson Canyon Fire - 1507 acres; some salvage; 2008 blowdown event		Decommissioned/closed 2.8 miles of road.
Middle South Fork LBC	2011 Little Butte Fire - 276 acres; 2008 blowdown event		
Upper North Fork LBC	2005 Jack Springs Fire - 17 acres; 2008 blowdown event		
Upper South Fork LBC	2008 blowdown event		
Beaver Dam Creek	2008 blowdown event		

Additionally, the BLM has had approximately 500 acres of timber harvest projects in the Heppsie project Area. On private lands interspersed throughout the watershed but particularly in lower reaches, development, ongoing timber harvest and grazing have affected water quality.

Draft

Current Watershed Conditions

Although watershed restoration projects have improved local and subwatershed conditions where the projects have been completed, at the watershed scale, the issues described in the watershed assessment remain. Large amounts of water are diverted from Little Butte Creek to aid in irrigation and water storage. Canal systems deliver the water to nearby Howard Prairie Lake and the Klamath River watershed, Agate Lake, and the Rogue Valley. Rural development has exacerbated sediment and waters quality issues.

Despite being moderately polluted, Little Butte Creek is one of the best salmon-producing tributaries of the Rogue River. Coho and Chinook salmon migrate upstream each year; however, several dams hinder their progress. A fish ladder was built in 2005 to help fish swim past a dam constructed in Eagle Point in the 1880s, but was destroyed by flooding just three months later. It was rebuilt in 2008. Restoration of a 1.3-mile (2.1 km) artificially straightened section of the creek in the Denman Wildlife Area was completed in 2011. The most severe barriers to anadromous fish passage are located on private lands either on the Mainstem of Little Butte Creek or South Fork Little Butte Creek. Steelhead and coho are the species most impacted by the barriers that have been surveyed so far (table 2.5.6.2-2). Summer steelhead in particular are impacted as they have the most extensive distribution in the LBW. Coho are only affected by those barriers lower in the tributaries (LBWC 2003) The South Fork Little Butte Creek is one of the primary rearing areas and contains one of the largest populations of rearing coho salmon in the upper Rogue River basin. Resident fish include cutthroat, rainbow, and brook trout.

TABLE 2.5.6.2-2

Anadromous Fish Distribution in Subwatersheds Crossed by the PCGP (Miles)

	Little Butte Cr.	South Fork Little Butte Cr.	North Fork Little Butte Cr.	Antelope Cr.	Lake Cr.	Lick Cr.	Dead Indian Cr.	Soda Cr.	Total
Fall Chinook	17								
Spring Chinook	17	1							18
Coho	17	16.4	7.5	6.3	2.5	2.25	0.5	0.25	52.7
Winter Steelhead	17	16.4	10						43.4
Summer Steelhead	17	16.4	10	13	3.1	3	0.9	2.6	66

Source: Little Butte Creek Watershed Assessment, Little Butte Creek Watershed Council, 2003, p. 67

NWFP aquatic and riparian monitoring data is shown in table 2.5.6.2-3. Only the Lower North Fork and Lick Creek subwatersheds showed declining trends; both were caused by declining trends in vegetation (See Attachments: Section 3.3.2 of this appendix.)

TABLE 2.5.6.2-3

NWFP Aquatic and Riparian Monitoring Trends, Subwatersheds in Little Butte Creek

Subwatershed a/	WS Condition 1994	WS Condition 2009	WS Condition Trend b/
UPPER NORTH FORK LITTLE BUTTE CREEK	0.0870	0.1400	0.0530
LOWER NORTH FORK LITTLE BUTTE CREEK	-0.3360	-0.3460	-0.0100
UPPER SOUTH FORK LITTLE BUTTE CREEK	0.1000	0.2310	0.1310

Draft

TABLE 2.5.6.2-3 NWFP Aquatic and Riparian Monitoring Trends, Subwatersheds in Little Butte Creek			
Subwatershed a/	**WS Condition 1994**	**WS Condition 2009**	**WS Condition Trend** b/
BEAVER DAM CREEK	0.0690	0.0970	0.0280
SOUTH FORK LITTLE BUTTE CREEK/DEAD INDIA	-0.0480	-0.0130	0.0350
LOWER SOUTH FORK LITTLE BUTTE CREEK	-0.3410	-0.3320	0.0090
SALT CREEK/LONG BRANCH	-0.4980	-0.4810	0.0170
LITTLE BUTTE/LICK	0.0130	-0.0080	-0.0210

a/ Data Source: NWFP AREMP monitoring program. See Attachments: Section 3.3.2 of this Appendix
b/ Positive numbers indicate improving watershed conditions. Negative numbers indicate declining conditions.

2.5.6.3 Natural Disturbance Processes

Disturbance processes for the Little Butte Creek Watershed are consistent with those described for the Klamath Province on the west half of the watershed (Generally BLM lands), and the High Cascades on the east half of the watershed (generally NFS lands). Fires were (and are) the dominant disturbing force on the landscape (table 2.5.6.2-1). Fire effects were highly variable because of the diversity of the landscape.

Currently much of the lower elevation areas have dense shrubs, hardwoods and conifer forests due to decades of fire exclusion where previously open grass/oak/pine savannas or Douglas-fir and other conifers historically dominated the landscape. Before effective fire suppression, the fire return interval was to 25 years). Fires burned with lower intensity, and were widespread.

Moderate severity regimes dominated transition zones between lower valleys and the cool, moist uplands of the Dead Indian Plateau. Fires were more infrequent (25 to 100 years) and burned with varying degrees of intensity. High intensity stand replacement fires occasionally occurred in this zone. The overall effect of fire on the landscape was a complicated mosaic of vegetation.

The high-severity regime found at upper elevations is characterized by moist and cool conditions so fires are infrequent. When fires occur within these areas it is due to unusual conditions such as drought or low precipitation periods associated with high winds, and fires historically resulted in stand replacement. Fire return intervals for the Mixed Conifer and drier portions of the White Fir zone areas of the Dead Indian Plateau range from 8 to 125 years with an average of about 35 years. Because of the gentle slopes of the plateau, fire ignitions that occurred did not spread to the same degree as ignitions with similar vegetation on steep slopes (BLM and Forest Service: 34).

Within the Shasta Fir and Mountain Hemlock vegetation zones in the High Cascades Province, fire return intervals are much longer than within similar zones in the Klamath Mountain Range (Atzet et al. 1982, cited in BLM and Forest Service 1997). Fire return intervals of 100 to 300 years were not uncommon. This can be partially explained by the higher precipitation amounts in the Cascades as compared with the extreme eastern Siskiyou Mountains. In the lava fields, fires historically occurred from lightning and burned islands of trees. The Brown Mountain area has exposed lava fields with little or no ground fuels. Field observations in the lava fields have shown that many of the large Douglas-fir and ponderosa pine have old fire scars.

When a significant rainfall event occurs within a year or two after a high intensity fire that consumes duff layers, there is often substantial erosion from a fire-disturbed site (Robichaud et al,

Draft

2000). When duff layers are not removed, or where vegetative cover or litterfall is reestablished within a year after a disturbance, soils are protected from further rainfall impact. When intense rainstorm events occur shortly after fire disturbance, there can be a significant amount of surface erosion and mass wasting on exposed soils. Topsoil loss has probably been reduced over the past 70 years since fire suppression has resulted in fewer natural fires exposing soils. However, this situation increases the risk that a hot-burning wildfire would occur and may cause increased soil erosion and landslide events. During the late nineteenth and early twentieth centuries, large lightning caused wildfires periodically swept across the Little Butte Creek Watershed, mainly in the lava plateau and canyon sideslopes. The middle elevations of the watershed contain the highest fire occurrence and intensity in the watershed and are considered to be high risk wildfire areas. The canyon sideslope landscape is located in unstable and highly erodible terrain of South Fork and Dead Indian canyons (BLM and Forest Service 1997).

The primary natural event that affects water quality and fisheries is thick snow packs in the transient snow zone that are rapidly melted by warm rain storms. During the 1955, 1964, 1974, and 1997 rain-on-snow events, several earthflows and debris flows reactivated mainly in the canyon sideslopes landform. Several new slides also occurred in the steep canyon sideslopes terrain. These storms, especially the 1964 and 1997 events, caused both natural and management related slides to transport sediment to nearby streams (BLM and Forest Service 1997: 58). Where rain-on-snow events occur within a few years after a high-intensity fire, there can be a synergistic effect from the lack of vegetation on the forest floor, increased snowpack in the opening created by the fire, lack of interception from the canopy and rapid melting of snowpack. When this overlap of disturbance events occurs significant landslide and erosion activity may occur.

2.5.6.4 Project Effects and Natural Range of Variability

The Little Butte Creek Watershed is an active landscape with respect to erosional processes. Conditions in the Little Butte Creek watershed are highly variable and have been substantially altered by past management practices such as timber harvest and fire exclusion, private land development and irrigation withdrawals. The Little Butte Creek watershed Analysis described current and reference conditions for aquatic processes and functions and discussed ecological trends but it did not establish metrics that reflect the natural variability at the watershed scale.

Based on the WA there are two central concerns in the Little Butte Creek watershed:

1: Whether the clearing for the project would cause excessive erosion and sediment deposition that would adversely impact any of the affected streams. Sediment levels throughout the Little Butte Creek system are limiting and excess or chronic sediment deposition to streams is a significant cause for concern.

GeoEngineers completed a stream crossing turbidity, construction risk and site response analysis (Section 1.3). Evaluations for stream channel crossings in the Little Butte Creek are summarized in table 2.5.6.1-5. BMPs that would be applied at each crossing, grouped by “Blue” (low risk) and “Yellow” (moderate risk) turbidity and risk ratings are shown in table 2.5.6.4-1.

- Crossings at MP 141.17, 141.44, 141.49 (tributaries of Salt Creek) and 166.21 (Daley Creek) are all intermittent streams with a “Low” crossing risk. Best Management Practices from the “Blue” category in table 2.5.6.4-1 would be applied at these crossings.

- Crossings at MP 140.26 (Lick Creek) and 162.45 (Upper South Fork Little Butte Creek) were rated as Moderate Risk for construction impacts and / site response where "Yellow" Best Management Practices would be applied. The "Yellow" BMP group includes additional measures for bank and stream bottom stabilization as needed including grading or terracing over steepened banks, use of geotextile fabrics, fiber rolls, rock and rip-rap placement, in-stream structures, stratified backfill, structural fill placement and LWD placement (table 2.5.6.4-1).

In all crossing groups,

- Silt fencing would be installed and maintained until effective ground cover is reestablished
- Effective ground cover would be in place prior to the onset of seasonal precipitation (table 1.3.1.2-1)
- Rapid reestablishment of vegetation would be emphasized.

These are all proven and effective erosion control and water quality Best Management Practices. Based on site-specific evaluations and field reviews (GeoEngineers, 2011; Koler 2013), there is no reason to believe these are expected to be effective. If constructed, sediment impacts are expected to be minor, short term and consistent with the evaluation in Section 1.3.1. Long term adverse consequences on water quality from soil erosion are not expected to occur because of establishment of effective ground cover (table 2.5.6.4-1), implementation of the ECRP which includes revegetation of disturbed areas, installation of waterbars to disperse water, regrading over-steepened slopes and the relative lack of corridor intersects with aquatic systems.

2: Whether removal of effective shade may increase water temperatures in streams.

There are six stream crossings in Little Butte Creek where Riparian Reserve vegetation would be cleared. Five crossings are intermittent channels and one crossing is on a perennial stream. Channel crossings of intermittent streams are not expected to affect water temperatures because these streams would likely be dry or become discontinuous by the time that warmer water temperatures become an issue in late summer. A site specific temperature evaluation of the perennial crossing at the South Fork of Little Butte Creek at MP 162.45 showed no change in water temperature (North State Resources, 2009; see Section 1.3.1.3).

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on BLM and NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75 foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right of way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right of way clearing on stream temperatures. Given that mitigation for loss of effective shade would occur, and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field (GeoEngineers 2013f: 26).Based on these evaluations, No discernable effect on stream temperatures would be expected.

TABLE 2.5.6.4-1

Pacific Connector Proposed BMPs for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**141.17, 141.44, 141.49, 166.21**	**140.26, 162.48**	None
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization

Draft

TABLE 2.5.6.4-1 **Pacific Connector Proposed BMPs for Use at Waterbody Crossings**			
	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
BMP Source	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.		

Table 2.5.6.4-2 compares project effects to the historic range of variability for erosional processes, ecological succession and vegetative condition, flow regimes, stream temperature and aquatic habitat complexity.

TABLE 2.5.6.4-2 **Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth Field Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Erosional Processes	The primary natural event that affects water quality and fisheries is thick snow packs in the transient snow zone that are rapidly melted by warm rain storms. During the 1955, 1964, 1974, and 1997 rain-on-snow events, several earthflows and debris flows reactivated mainly in the canyon sideslopes landform. Several new slides also occurred in the steep canyon sideslopes terrain. These storms, especially the 1964 and 1997 events, caused both natural and management related slides to transport sediment to nearby streams (BLM and Forest Service 1997, p. 58) The lower elevation Klamath Province portion of the watershed (BLM) is driven more by winter rainfall, streambank erosion and occasional rain-on-snow events at mid elevations. Where high-intensity rainfall events overlapped recent fire events, surface erosion and landslide activity could increase dramatically. Infiltration rates are relatively lower, and hence, surface erosion rates are relatively higher when compared to the pumice dominated High Cascades Province. Surface erosion potential for disturbed soils is high. Reestablishment of effective ground cover significantly reduces surface erosion rates (BLM and Forest Service 1997, p 59). Fire return intervals range from 1 to 25 years in the lower elevation interior valleys and lower elevation forests to 25 to 100 years in lower elevation the mixed conifer forests (BLM and Forest Service 1997, p. 34) Erosional processes in the upper elevation High Cascades portion of the Watershed (Forest Service) are driven by snowmelt and occasional rain-on-snow events. Pumice soils have high infiltration rates, but steeper slopes can be prone to landslides when saturated from snow melt. Summer thunderstorms are not unusual in Little Butte Creek and can deliver intense but localized rain	On BLM lands (generally Klamath-Siskiyou Province), there are 5.99 miles of corridor of which 4.6 miles are on ridgetops. On NFS lands (generally High Cascades Province) the project is located on ridgetops or on the relatively flat pumice-dominated Dead Indian Plateau. The project does not cross steep canyon sideslope landforms that are prone to landslides. No unstable earthflow terrains are crossed (GeoEngineers, 2009). Application of Best Management Practices described in the Stream Crossing Risk Assessment (GeoEngineers 2013) maintenance of effective ground cover and revegetation according to the ECRP are expected to minimize sediment transport to streams. Stream channel crossings are widely separated and unlikely to aggregate sediment downstream. Sediment produced by the PCGP during construction using dam-and-pump construction methods is expected to be minor and short-term (Section 1.3.2). Given the fire history of the area, and erosional processes, these effects are well within the range of natural variability for the Little Butte Creek watershed.

Draft

TABLE 2.5.6.4-2

Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
	events. These events can result in pulses of sediment particularly if associated with recent fires.	
Ecological Succession / Vegetative Condition	Little Butte Creek is very diverse, ranging from interior valley plant communities dominated by agriculture, grassland and oak woodlands to high elevation alpine forests. In the lower elevation Klamath Province, higher frequency, low to moderate intensity fires created a mosaic of vegetation types with occasional stand replacement fires during droughts. At higher elevations, fire frequency decreased and intensity increased resulting in more stand-replacement type events. On the Dead Indian Plateau gentler slopes limited the spread of stand replacement fires when compared to steeper slopes. Fire Suppression and timber management have reduced and fragmented late successional stands reducing patch size, shifting species dominance to white fir and increasing early and mid-seral proportions of the drainage. LSOG acres in both upland and riparian areas are below historic averages. Vegetative condition throughout the Upper Cow Creek watershed has been significantly altered by timber management activities.	The PCGP clears 96.76 acres (0.20%) of BLM lands and 209.41 acres (0.47%) of NFS lands in the Little Butte Creek watershed. Approximately 10.79 and 4.41 acres of Riparian Reserve vegetation would be cleared respectively on BLM and NFS lands. Combined, this is 0.14% of the Riparian Reserves on federal lands in the watershed. Of this, approximately 5.6 acres is LSOG forest. The remainder is early and mid seral forest (5.57 acres) and shrub or grasslands (3.8 acres). The clearing of LSOG and mid-seral vegetation are long-term changes in vegetative condition. Given the fire history (see Section 2.4.5.2, Changes in Watershed Condition) of Little Butte Creek, this is well within the range of natural variability for the watershed.
Flow Regime	Prior to the introduction of irrigation in the Little Butte Creek Watershed, summer stream flows were directly related to the amount and timing of precipitation events. Years of high rainfall and large spring snow packs resulted in summer flows that provided adequate water supplies for aquatic dependent species. Drought years produced low flows and likely there were some dry stream channels by the end of the summer. Irrigation withdrawals that began in the late 1800s and became more extensive in the early 1900s greatly reduced summer stream flow throughout the watershed. Historically, major flood events were generally the result of rain-on-snow events (BLM and Forest Service 1997, p. 147). The completion of Fish Lake dam in 1915 modified the winter streamflow regime in North Fork Little Butte Creek. Fish Lake stored the winter runoff and moderated the peak flows occurring downstream in North Fork Little Butte Creek. Irrigation withdrawals have significantly reduced summer flows, particularly in the lower watershed where BLM lands are located. Extensive road building, timber harvest, and land clearing in Little Butte Creek Watershed have raised the potential for increasing the magnitude and frequency of peak flows in the tributaries and main stem. Openings in the transient snow zone are of particular concern as they tend to produce higher stream flows during rain-on-snow events (BLM and Forest Service, 1997) .	Large areas of vegetation removal in the transient snow zone and increased road networks/road densities within watersheds are known to increase peak-flows during rain-on-snow events. Most of the Pacific Connector route in Little Butte Creek is in the transient snow zone where rain on snow events occur. Analysis of vegetation patterns in the WA (p. 88) showed that the subwatersheds of Little Butte Creek were all above thresholds and were considered hydrologically recovered. This means that an increase in peak flows from vegetation change would have to be large enough to drop the subwatershed below recovery thresholds before a significant increase in peak flows is likely. The Pacific Connector project crosses six different subwatersheds. The largest impact in any single watershed is the Upper South Fork of Little Butte Creek where less than 1% of the subwatershed is affected by the project. There is only one stream crossing in the Upper South Fork, so hydrologic connectivity with the project is very limited. In Salt Creek, subwatershed, where there are 3 channel crossings, less than 0.5% of the watershed (all ownerships) is affected by the project. Given the limited extent of the project in any single subwatershed, the relative lack of hydrologic connectivity and the hydrologically recovered vegetative condition of the watershed, it is highly improbable that the Pacific Connector project would alter flow conditions or have an effect on flows. See also EIS Chapter 4.4.
Stream Temperature	Historically, stream temperatures were likely lower than today. Water quality in the Little Butte Creek Watershed was probably very good prior to EuroAmerican settlement: low summer water temperatures, acceptable chemical and biological parameters, and low sediment/turbidity levels. This was	There are eight stream crossings in Little Butte Creek where Riparian Reserve vegetation would be cleared. Seven crossings are intermittent channels and one crossing is on a perennial stream. Channel crossings of intermittent streams are not expected to affect water temperatures because these streams would likely be dry

Draft

TABLE 2.5.6.4-2 **Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth Field Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
	due to the wide, diverse riparian zones, low width/depth ratios, greater summer flows, and low sediment input. Land clearing activities in the late 1800s and early 1900s resulted in a reduction of riparian vegetation allowing more solar radiation to reach the streams. Increased water temperatures were likely a result of this activity. Irrigation withdrawals during this same time period lowered stream flows and contributed to increased stream temperatures.	or become discontinuous by the time that warmer water temperatures become an issue in late summer. A site specific temperature evaluation of the perennial crossing at the South Fork of Little Butte Creek at MP 162.45 showed no change in water temperature (North State Resources, 2009). (See Section 1.3.1.3 and EIS Chapter 4.4). Based on this evaluation, No discernable effect on stream temperatures would be expected.
Aquatic Habitat and Stream Channel Complexity	Beaver dams and natural geomorphic processes created complex, sinuous channels with low width to depth ratios and high pool frequencies. Sediment inputs were dominated by pulses of landslide deposits associated with floods from peak flow events (Everest and Reeves, 2007). The loss of beaver clams due to fur trapping in the 1830s to 1840s resulted in scouring of channel beds and banks, reduction in the number of stream reaches with multiple channels, increased width/depth ratios, and increased fine sediment deposition in pools. Channelization resulted in entrenched channels with greater width/depth ratios. Decreases in sinuosity accompanied by increased stream gradients and reduced bedload transport capability were a consequence of the larger width/depth ratios (BLM and Forest Service 1997).	During construction, the project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale, and are minor and short-term (typically 1 to 5 days per crossing). Additionally, 1.5 miles of LWD in-stream projects are a part of the mitigation plan (See Section 2.5.6.6)

2.5.6.5 Compliance with Land Management Plans

Table 2.5.6.5-1 describes RRNF / NWFP standards and guidelines relevant to the ACS, the related BLM management direction as provided in the Medford District RMP, and PCGP compliance with this management direction in the Little Butte Creek Watershed.

Draft

TABLE 2.5.6.5-1 **Compliance with Applicable Land Management Plan Direction**		
Medford BLM RMP Management Direction	**RRNF / NWFP Standard and Guideline**	**PCGP Compliance**
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Lands Mgmt., pg. 30, para. 2	LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan, and others
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - General Riparian Area Mgmt., pg. 30, para. 4	RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources under BLM or NFS jurisdiction occur within the Little Butte Creek watershed, therefore the biological, physical, and chemical integrity of these systems would remain unaffected from hydrostatic withdrawal activities.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 27, para. 2	RF-2: Road Construction Standards and Guidelines	The existing transportation system in the Little Butte Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Little Butte Creek watershed.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 1	RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 2	RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction. Several road improvement projects and road decommissioning are proposed in the Little Butte Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 3	RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Roads Mgmt., pg. 28, para. 4	RF-7: Transportation Management Plan development.	The TMP meets all of the requirements of RF-7.
Specific Land Use Allocations, Riparian Reserves - Mgmt. Actions/Direction - Watershed & Habitat Restoration, pg. 31, para. 3	WR-3: Proper use of planned mitigation and restoration.	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in BLM RMPs and the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)		The PCGP project affects Survey and Manage species within the Little Butte Creek watershed. Such effects are inconsistent with land management plan direction for both the Forest Service and BLM. Regardless, the project does not threaten the persistence of any Survey and Manage species (see Appendix M). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.

TABLE 2.5.6.5-1 **Compliance with Applicable Land Management Plan Direction**		
Medford BLM RMP Management Direction	**RRNF / NWFP Standard and Guideline**	**PCGP Compliance**
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		NFS and BLM lands in the Little Butte Creek Watershed are currently 24% LSOG and exceed this threshold.
New Developments in LSRs (Only 21 acres of this reallocation is in this watershed and has almost no aquatic effect. We probably should not include this as part of our ACS mitigation)		Standards and Guidelines for New Developments in LSR (NWFP C-17) require effects of developments be minimized and mitigated. Reallocation of matrix lands to LSR is a mitigation to partially meet this Standard and Guideline (RRNF-7). See Appendix M.
Standards and Guidelines for Facilities in Restricted Riparian (MA 26) areas: Helispots and transmission corridors should be located outside this management area. (RRNF LRMP 4-308)		MA 26, Restricted Riparian does not allow utility corridors to cross this land allocation. The PCGP corridor crosses a part of the Restricted Riparian Land Allocation at the South Fork of Little Butte Creek. A forest plan amendment is necessary. Amendment RRNF-5 Allows the PCGP to cross approximately 2.5 acres of the Restricted Riparian Land Allocation.
Standards and Guidelines in the RRNF Lands and Resource Management Plan (RRNF LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307).		No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices including roads and landings. Permanent recreation facilities or other permanent facilities are exempt. The project cannot meet this standard, and a project specific amendment of the RRNF LRMP is necessary. RRNF-6 Allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction within the project right-of-way on an estimated 60 acres.

Compliance with Standards and Guidelines for Key Watersheds

The Little Butte Creek above the confluence of the North and South Forks was delineated as a Tier 1 Key Watershed in the NWFP. Applicable Standards and Guidelines for Key Watersheds and PCGP consistency is shown in table 2.5.6.5-2.

Draft

TABLE 2.5.6.5-2 **Standards and Guidelines for Key Watersheds**		
Standard and Guideline	**PCPG Consistency**	**Mitigation Plan**
Reduce existing system and nonsystem road mileage, with no net increase in road miles	No new roads would be constructed by PCGP. The construction corridor would be obliterated after construction.	Decommissioning of 53.2 miles of road would on NFS lands and 13 miles of roads on BLM lands would result in a net decrease of road miles and reduce road density in the Tier One Key Watershed.
No new roads would be constructed in inventoried Roadless Areas.	No part of the PCGP is in an inventoried Roadless Area.	None
Watershed Analysis must be completed prior to management activities.	Watershed Analysis has been completed for all watersheds crossed by the PCGP on BLM and NFS lands.	Off-site mitigations are consistent with watershed Analysis recommendations

Relationship of Proposed Forest Service Land Management Plan Amendments to the ACS

The Rogue River National Forest Land and Resource Management Plan contains standards and guidelines that cannot be met by the Pacific Connector project. Two of these standards and guidelines have a nexus with the ACS in that they provide protection for aquatic resources that are more restrictive than the NWFP. Site-specific amendments of these standards and guidelines are proposed to make provision for the Pacific Connector project. This discussion addresses whether those plan amendments would prevent attainment of the ACS.

RRNF-5. Amends Management Area 26 (Restricted Riparian)

This Standard and Guideline in the Rogue River National Forest Land and Resource Management Plan prohibits development of energy transmission facilities in the Restricted Riparian land allocation. The purpose of this Standard and Guideline is to protect unique riparian habitats associated with perennial streams for wildlife, fishery, and other beneficial uses and to protect perennial streams from detrimental changes in water temperature, blockages of water courses, and deposits of sediment. The restricted riparian land allocation occurs on all lakes, perennial streams, and wetlands within 100 feet of the riparian feature or to the extent of associated riparian vegetation. The PCGP crosses one perennial stream, the South Fork of Little Butte Creek, and one wetland associated with Daley Creek, an intermittent stream. The crossing of the South Fork of Butte Creek occurs at MP 162.45 in the Upper South Fork Little Butte Creek subwatershed and affects approximately 1.25 acres of riparian habitat. The crossing of the wetland associated with intermittent Daley Creek occurs at MP 166 in the Beaver Dam Creek subwatershed and affects approximately 0.9 acres of riparian habitat.

Possible Environmental consequences associated with a Forest Plan amendment of MA 26 to allow crossing of Restricted Riparian zones include the following.

Stream Temperature: One perennial stream, the South Fork of Little Butte Creek at MP 162.45 is crossed by the project corridor. Oregon State water quality standards (Oregon Administrative Rules 340-041-0028) state that all nonpoint sources taken together at the point of maximum impact may not exceed 0.3 degrees Celsius (0.5 degrees Fahrenheit). The Rogue Basin TMDL (2006) allocates the human use allowance to be 0.3 degrees Celsius increase at the point of maximum impact (i.e.: downstream of tributaries impacted by pipeline construction). In addition, all of the stream crossings in the Little Butte Creek watershed are designated as core cold water habitat

(OAR 340-041 figure 271A). The OAR (340-041-0028) states that streams designated with a fish use of core cold water habitat may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit) as measured by the seven-day-average maximum stream temperature.

At the request of the Forest Service, North State Resources conducted a site-specific evaluation of impacts of shade removal on water temperature at the proposed crossing of the PCGP right-of-way at the South Fork of Little Butte Creek (NSR, 2009). This analysis concluded the PCGP crossing on the South Fork of Little Butte Creek was not likely to increase water temperature. Daley Creek is an intermittent stream and is dry during warm summer months most years, so water temperature at the Daley Creek crossing is not likely to be affected by the PCGP.

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on BLM and NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75 foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right of way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right of way clearing on stream temperatures. Given that mitigation for loss of effective shade would occur, and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field (GeoEngineers 2013f: 26).

Sediment: There are two stream crossings on the RRNF where sediment deposition is a potential issue. See table 2.5.6.4-1 for a description of crossing risk and associated Best Management Practices for water quality. Pacific Connector's ECRP is consistent with Best Management Practices designed to ensure that beneficial uses of water are protected from excessive sediment deposition. Erosion control measures include:

- Potential compaction on the right-of-way is mitigated (scarification, subsoiling, ripping, Paraplow/wing-tipped ripper, etc.) and a roughened seedbed is created to minimize runoff and promote infiltration.

- Waterbars are installed at appropriate intervals based on slope gradient to divert runoff to stable areas and to minimize concentrated flows and potential erosion hazards.

- The construction right-of-way is replanted with native grasses, trees, and shrubs (with the exception no trees within the 30-foot operational easement).

- Slash is redistributed across the right-of-way to provide cover and long-term nutrient cycling.

- No maintenance roads would be established along the right-of-way. Additionally, with the measures in the TMP, the project's use of the existing road system would improve the existing conditions, because the applicant would be required to improve/maintain the existing road system.

Additional Best Management Practices (table 2.5.6.4-1) that may be used on-site as needed include

- Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc.
- Bank graded/terraced to 3:1
- Geotextile reinforced slope
- Fiber rolls
- Stream barbs/flow deflectors
- Toe rock placement
- Riprap placement
- Biotechnical "vegetation" riprap
- Tree revetments

With dam-and-pump construction and application of Best Management Practices described above, any sediment effects are expected to minor and short-term as described in Section 1.3.1.2 and would not prevent attainment of ACS objectives.

Blockages of Water: The only perennial stream crossed in Little Butte Creek is the South Fork Little Butte Creek at MP 162.45. The PCGP would not create any blockage of water (other than those short-term blockages that occur during construction with dam-and-pump) because the pipeline would be buried and constructed in a manner that the bed and banks of channels would be restored to original contours.

Protection of Riparian Habitat for Fish and Wildlife: Assuming that the extent of MA-26 matches the extent of the Riparian Reserve on SF Little Butte Creek, PCGP would remove a total of 2.58 acres of vegetation within MA 26 of which 1.38 acres is LSOG. The Applicant-filed mitigation plan includes the following on NFS lands in Little Butte Creek:

- 4.3 miles of road decommissioning in riparian habitats. This would allow restoration of approximately 10.4 acres of riparian vegetation that is currently occupied by roads.
- Replanting of native riparian vegetation within 100 feet of waterbodies or the extent of Riparian vegetation crossed on federal lands. This re-establishes riparian vegetation in the PCGP corridor.
- Creation of 1,200 snags on 600 acres of NFS lands of which approximately 126 acres are in Riparian Reserves. This replaces snags cut in association with the PCGP corridor.
- Placement of coarse woody material on 600 acres, of which an estimated 126 acres are in Riparian Reserves. This replaces coarse wood removed during construction of the PCGP and contributes to riparian habitats where placed in Riparian Reserves.
- Placement of large wood in stream channels associated with stream crossings and on 1.5 miles of the South Fork, Little Butte Creek.
- Replacement of large woody debris in the corridor right-of-way.

These measures restore components of riparian habitat on far more acres of MA 26 than are affected by the project. The loss of 1.38 acres of LSOG vegetation in MA 26 at MP 162.45 is a long term change in vegetative condition, however given the fire history of Little Butte Creek (table 2.5.4.2-1) this degree of change is well within the range of natural variability for the watershed.

Draft

Conclusion: Based on this evaluation, it is unlikely that waiving the prohibition of utility corridors crossing MA-26, Restricted Riparian would prevent attainment of ACS objectives in the Little Butte Creek watershed.

RRNF 6. Site-Specific Amendment to Waive Limitations on Detrimental Soil Conditions within the Pacific Connector Right-of-Way in All Management Areas:

Standards and Guidelines in the RRNF Lands and Resource Management Plan (RRNF LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307) states:

> No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices including roads and landings. Permanent recreation facilities or other permanent facilities are exempt.

This Standard and Guideline was developed to limit adverse impact to soils from timber sales and other developments so that the basic productivity of the land was maintained. The PCGP would likely result in a degraded soil condition in an estimated 30 to 70 percent (60 to 147 acres) of the project right-of-way on NFS lands in the Little Butte Creek Watershed due to displacement and compaction following completion of corridor construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing Forest Plan Standards and Guidelines allow up to 10 percent of the PCGP corridor or 20 acres in the PCGP corridor of the Little Butte Creek Watershed to be in a degraded soil condition on completion of a project. Thus, PCGP would likely exceed this threshold by 40 to 127 additional acres or 0.08 to 0.2% of the 59,900-acre (USFS lands only) within the Little Butte Creek Watershed on completion of the project. About an acre of degraded soil conditions above LRMP thresholds may be in Riparian Reserves (15% of 4.4 acres – see table 2.5.4.1-4).

Without mitigation, severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions may have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery.

Environmental consequences associated with 40 to 127 acres of additional detrimental soil conditions above Forest Plan thresholds include:

- **A potential increase in sediment mobilization**. The following measures have been incorporated into the project design or mitigation plans to limit sediment mobilization and transport.
    - The PCGP route was selected to avoid areas with high risk of geologic hazards. No landslides have been identified that pose a threat to the project. The PCGP does not cross unstable earthflow terrains in Little Butte Creek.

- Effective erosion control measures and Best Management Practices are required as shown in the ECRP. (See Section 1.3 for a discussion of erosion control measures.) Additionally, the PCGP would comply with Forest Plan Standards and Guidelines for maintenance of effective ground cover (Section 1.3.1.2).

- Offsite mitigation measures that would help to offset these effects on NFS lands in the Little Butte Creek watershed include 53.2 miles of road decommissioning. Assuming a 14 foot average road width, 53.2 miles of proposed road decommissioning would reduce compaction and revegetate approximately 90 acres (53.2*5280*14/43560=90.3 Acres) that are currently native road surfaces in the Little Butte Creek Watershed. This substantially compensates for areas that may in a detrimental soil condition (see Section 2.5.4.7).

- The Forest Service and BLM would require soil remediation as needed with biosolids or other organic materials in areas with potential revegetation difficulty within the project corridor. The use of biosolids used in concert with wood chips has been shown to be an effective mitigation for impacts to soil productivity from mixing and displacement (Orton 2007).

As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, the required application of Best Management Practices, ridgetop location, minimal stream crossings, and application of offsite mitigations any sediment impacts from detrimental soil conditions are expected to be minor and short term. It is highly unlikely that amending the Forest Plan to exceed the soil disturbance thresholds on 40 to 127 acres would result in the mobilization of sediment that would prevent attainment of ACS objectives in Little Butte Creek.

- **A potential localized increase in peak flows:** Changes in peak flows may occur where there are large changes in vegetative condition in the transient snow zone within a watershed. At the time the Little Butte Creek Watershed Analysis was prepared, the Forest Service concluded that peak flows in the headwater streams would decrease slightly as the area continue to recover hydrologically. Reduced harvest and restoration efforts under current land allocations would accelerate the recovery process. Roads would continue to affect peak flows. At the time of publication, the watershed analysis estimated conservatively that 72 percent of the vegetation in the South Fork of Little Butte Creek in the transient snow zone was hydrologically recovered and that 75 percent of the vegetation in transient snow zone throughout the basin was hydrologically recovered. This is above the threshold of 70 percent for increasing peak flows by removing vegetation in the timber types on the Dead Indian Plateau (BLM and Forest Service 1997: 88). The PCGP affects 0.95% of the South Fork of Little Butte Creek and 0.26 percent of the watershed when all ownerships are considered (table 2.5.6.1-2), thus clearing associated with the PCGP would not move either the South Fork Little Butte Creek or the Little Butte Creek Watershed above the threshold where changes in peak flows are likely. The FERC also concluded that the probability of project-caused increases in peak flows was minimal because of the small proportion of any single watershed that is affected by the PCGP corridor. Additionally, there are two widely separated stream-corridor intersects that are miles apart. This limited hydrologic connectivity makes it highly improbable that the PCGP could affect peak flows even in the most severe conditions. See also EIS Section 4.4.

Draft

It is highly unlikely that amending the forest plan to allow detrimental soil conditions on 40-127 acres would result in any change in flows that would prevent attainment of ACS objectives because of limited hydrologic connectivity, the dispersed nature of impacts, the hydrologically recovered condition of the watershed and limited project impacts.

- **A potential loss of site productivity, which may slow vegetative recovery**: Soils derived from High Cascade volcanics on the Dead Indian Plateau may be low in productivity. Mechanically decompacting the soil to a minimum depth of 20 inches and re-establishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. PCGP mitigation measures would be used to decompact the corridor, fertilize disturbed areas, re-establish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and coarse woody debris back across the site to provide for long-term nutrient cycling as required in the ECRP. Additionally, the Forest Service would require soil remediation with biosolids in any areas that are likely to have revegetation issues because of soil productivity. Soil remediation with biosolids is a proven method of restoring soil productivity (Orton 2007). Any loss of soil productivity would be widely dispersed. Additionally, decommissioning 53.2 miles of roads (estimated to be 90 acres) on NFS lands would contribute to offsetting any loss of soil productivity.

  When the dispersed nature of this potential impact, the very limited area of detrimental soil conditions that may persist in Riparian Reserves, soil remediation measures using woodchips and biosolids and on-site and off-site mitigation measures are considered, it is highly unlikely that reduced soil productivity would prevent attainment of ACS objectives.

Conclusions: Amendments RRNF 5 (MA-26 Restricted Riparian) and RRNF 6 (detrimental soil conditions) have minor effects at the site scale. It is highly unlikely that those effects would prevent attainment of ACS objectives.

2.5.6.6 Offsite Mitigations on BLM and NFS Lands

Environmental Effects of Proposed Mitigation Actions

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management plan objectives are achieved. These projects also contribute to the "Maintain and Restore" objectives of the ACS. The BLM, Forest Service, and PCGP have entered into Agreements in Principle to accomplish off-site mitigation work in the Little Butte Creek Watershed as shown in tables 2.5.6.6-1 and 2.5.6.6-2. Mitigation measures were developed from the recommendations of watershed assessments, late successional reserve assessments and the 2011 Northern Spotted Owl Recovery Plan. Proposed mitigation measures in the Little Butte Creek watershed with a nexus to the ACS include:

LWD Instream

Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream

temperatures over time (Tippery, Jones et al. 2010) This is responsive to Aquatic Conservation Strategy objectives 2, 3, 4 and 5.

Road Surfacing and Drainage Repair

Road surfacing reduces sediment by capping existing fine textured sediments in the running surface of a gravel road with coarser rock or by paving. Paving all but eliminates traffic-generated sediments. Drainage repair reestablishes out-sloping, cross-drains and in some cases ditchlines to ditch-relief culverts. These actions have the effect of getting water off the road before it can enter streamcourses. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b: B-11, C-7)

Road Decommissioning

Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the PCGP occur. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b: B-11, C-7).

Fish Passage / Culvert Replacement

Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS Objectives 1, 2, 3 and 9 (Forest Service and BLM 1999b, Lanigan et al. 2012)

Fire Protection

High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP (Moeur 2012). Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity. However the corridor also provides a fuel break. Quick response time is imperative for successful control in wildfire situations during initial attack during periods of severe fire weather. Additionally, accessible waters sources help support controlled burning activities. Pump chance developments contribute to these objectives. This is responsive to ACS objectives 8 and 9.

Fuels Reduction

Late Successional Reserve Assessments in SW Oregon have noted shifts from forests dominated by fire-resistant LSOG stands to fire-prone early and mid-seral forests (Forest Service et al. 1998, BLM and Forest Service 1999). Use of fuels reduction and stand density management are appropriate tools to reduce the risk of high intensity stand replacement fires in Klamath Province forests (Forest Serivce and BLM 1994b).

Draft

Management activities that reduce the risk of natural disturbance adjacent to Known Owl Activity Centers is also appropriate (Forest Service and BLM 1994b: C-11). The Little Butte Creek Watershed Analysis also recommended fuels reduction projects on most landscapes (BLM and Forest Service 1997: 192 and multiple other references). Stand density reductions in riparian zones have the dual benefit of reducing the risk of stand-replacing fire, while also accelerating the development of late successional stand conditions by accelerating growth of remaining trees. This is responsive to ACS objective 8 and 9.

Specialized Habitats

Little Butte Creek provides habitat for species that are narrowly specialized. Restoration of these habitats is responsive to ACS objective 9.

- **Fritillaria.** Outplanting bulbs is consistent with the Recovery Plan for this species and would offset any possible losses from impacts to habitat.
- **Mardon skipper butterflies.** The Dead Indian Plateau is one of the few places in the world where Mardon skipper butterflies are found. The PCGP permanent corridor that would be maintained in low-growing vegetation provides an opportunity to establish desired habitat for this species
- **Short Horned Grasshoppers.** The project is adjacent to a known site for short-horned Grasshoppers. This species is on the RRNF Sensitive Species list. The pipeline requirement of a permanent open corridor provides a unique opportunity to develop habitat.

Watershed Conditions and Related Mitigations on BLM Lands

The PCGP crosses portions of the Lick Creek, Salt Creek, Lower North Fork and Lower South Fork Little Butte Creek subwatersheds on BLM Lands in the Little Butte Creek watershed.

Aquatic Conditions and Issues

- Road-related sediment has degraded aquatic habitats in Little Butte Creek. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.
- Northern California/Southern Oregon Coho salmon (*Oncorhynchus kisutch*), a species listed as threatened under the Endangered Species Act (May 1997) are present in Little Butte Creek.
- Chinook salmon, steelhead, cutthroat trout and Pacific lamprey are also found in Little Butte Creek
- High temperatures, habitat modification and sediment are key aquatic issues.

Terrestrial Conditions and Issues

- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Little Butte Creek watershed.
- Fragmentation from past logging has substantially impacted terrestrial habitats.

- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

Table 2.5.6.6-1 describes mitigation measures that would be responsive to these conditions and issues. Figure 2.5-8 shows a comparison of selected project impacts and related mitigation measures.

Draft

TABLE 2.5.6.6-1

Proposed Mitigation Measures on BLM Lands in Little Butte Creek

Agency	Project Type	Mitigation Group	Project Name	Qty.	Unit	Project Rationale	Land Allocation
BLM	Fire suppression	Fire suppression	Little Butte Cr. Pump Chance	8	sites	Construction of the pipeline and associated activities would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	All
BLM	Fish passage	Aquatic habitat	Little Butte Creek Fish Screen	1	site	Irrigation diversions have negatively affected fisheries in Little Butte Cr. by causing entrapment. There is a private irrigation ditch with an unscreened diversion and associated push up dam on BLM land in the lower 1.5 miles of Lost Creek. The unscreened ditch is currently accessible to juvenile and adult fish, creating a stranding hazard with limited return access to the main channel. Creating a permanent diversion structure, possibly in the form of a boulder weir, would divert water without yearly maintenance and would provide for both upstream and downstream fish passage.	All
BLM	LWD instream	Aquatic Habitat	BLM Little Butte Cr. Instream LWD	8.6	miles	Lost Cr. provides habitat for Coho Salmon. The SF Little Butte Creek provides habitat for resident fish and is a significant source of high quality water. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	Riparian Reserves
BLM	Road decommissioning	Road sediment reduction	BLM Little Butte Cr. Road Decommissioning Butte Falls RA	2.4	miles	Sediment has been identified by the Upper Rogue watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity and by reducing road density.	Matrix / Riparian Reserve
BLM	Road decommissioning	Road sediment reduction	BLN Little Butte Cr. Road Decommissioning Ashland RA	10.6	miles		

Draft

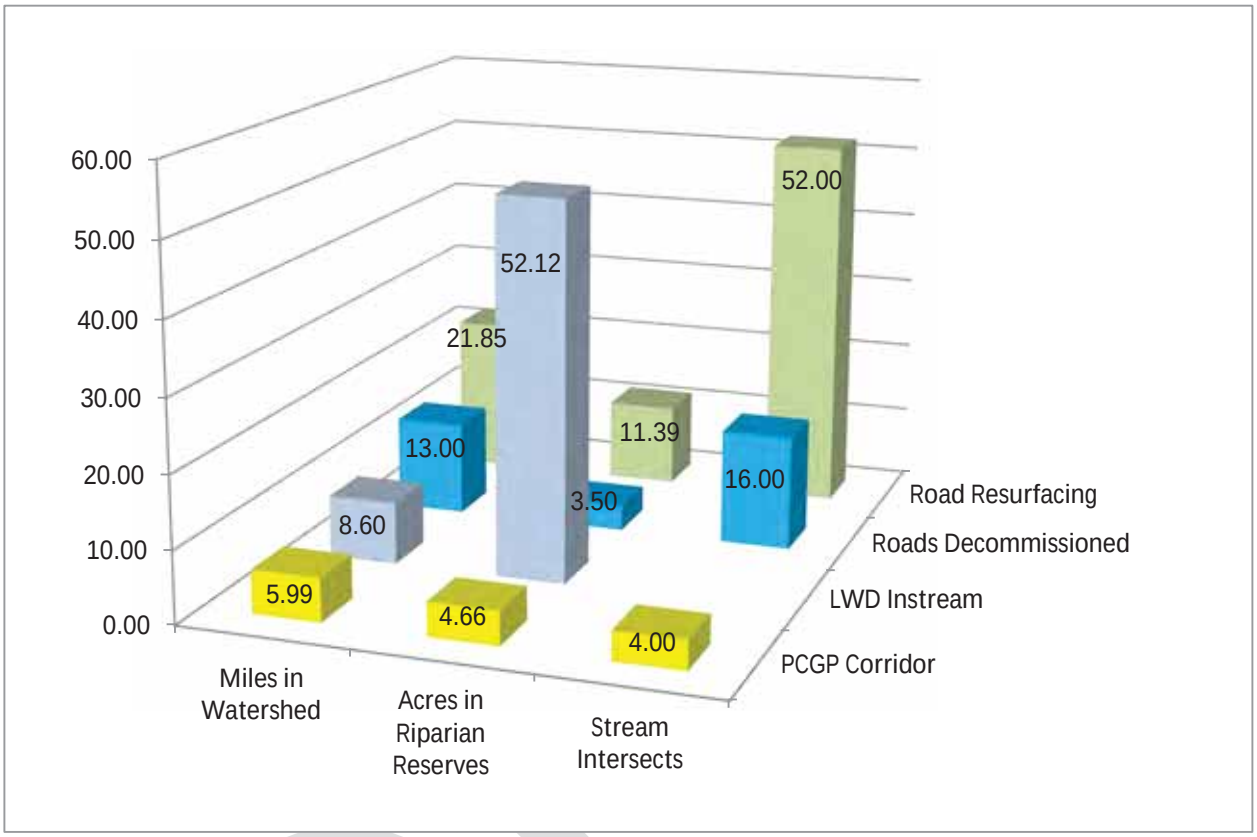
TABLE 2.5.6.6-1

Proposed Mitigation Measures on BLM Lands in Little Butte Creek

Agency	Project Type	Mitigation Group	Project Name	Qty.	Unit	Project Rationale	Land Allocation
BLM	Road drainage and surface enhancement	Road Sediment Reduction	BLM Little Butte Cr. Road Improvement	3.5	miles	Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	Riparian Reserve
BLM	Road surfacing	Road sediment reduction	BLM Little Butte Cr. Road Resurfacing	9.35	miles		
BLM	Road surfacing	Road sediment reduction	BLM Little Butte Cr. Road Resurface	9	miles		

Draft

Figure 2.5-8 Comparison of PCGP Effects with Selected Mitigation Measures on BLM lands.



Watershed Conditions and Related Mitigations on NFS Lands

The PCGP crosses portions of the Lower North Fork, Upper North Fork, Lower South Fork, Middle South Fork, Upper South Fork and Beaver Dam Creek subwatersheds on NFS Lands in the Little Butte Creek watershed. All of the NFS lands in the Little Butte Creek watershed are in the LSR lands allocation and classified as a Tier One Key Watershed. Standards and Guidelines for Tier One Key Watersheds overlay all other land allocations.

Mitigations in LSRs are included in this ACS assessment because the LSR network is also an important component of the Aquatic Conservation Strategy. The standards and guidelines under which Late-Successional Reserves are managed provide increased protection for all stream types. Because these reserves possess late-successional characteristics, they offer core areas of high quality stream habitat that would act as refugia and centers from which degraded areas can be recolonized as they recover. Streams in these reserves may be particularly important for endemic or locally distributed fish species and stocks (Forest Service and BLM 1994b: B-12). Standards and Guidelines for new developments in LSRs allow those developments provided the impact is minimized and mitigated such that the impact is neutral to beneficial for the LSR in question.

Aquatic Conditions and Issues

Portions of the Little Butte Creek watershed have high road densities that have negatively affected watershed condition and wildlife habitat (BLM and Forest Service 1997). Key issues identified in the WA for aquatic habitats include temperature, habitat modification and sedimentation. Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). Additional restoration recommendations to address these conditions include road decommissioning, riparian planting and thinning (BLM and Forest Service 1997: Executive Summary, p. 10)

Terrestrial Conditions and Issues

The South Cascades Late Successional Reserve Assessment (1998) estimated that LSR 227 was approximately 16% LSOG habitat at the time of the assessment, but had the capacity to be 75% late seral (Forest Service et al.: 51, 113). In order to achieve that objective, the assessment recommended a number of stand-level activities to accelerate the development of late-successional stand conditions including young stand thinning, creation of snags and recruitment of large woody debris (Forest Service 1998: 189-194). Opportunities also exist for management of unique habitats.

Table 2.5.6.6-2 describes mitigation measures for the RRNF that are intended to be responsive to these issues. Figure 2.5-9 shows a comparison of selected project impacts and related mitigation measures.

Draft

TABLE 2.5.6.6-2

Proposed Mitigation Measures on NFS Lands in Little Butte Creek

Agency	Project Type	Mitigation Group	Project Name	Qty.	Unit	Project Rationale	Land Allocation
FS	Elderberry Planting	Specialized Habitats	FS SF LBC Special Habitat Planting	20	acres	The Dead Indian Plateau region is one of three known sites for Mardon Skipper butterflies in the world. It is also adjacent to a known site for Short-horned Grasshoppers. Both species are on the Forest's Sensitive Species list. The pipeline requirement of a permanent open corridor provides a unique opportunity to develop habitat for these skippers and grasshoppers. Planting the corridor with plants preferred by these Sensitive Species has the potential to increase the habitat and local range for these two species. Rehabilitation of disturbed sites is required under various BMP guidelines. Use of specific plant species has no additional problems. Results would be immediate in stabilizing the local habitat and location would be in the pipeline.	LSR
FS	LWD instream	Aquatic Habitat	FS South Fork Little Butte Creek LWD	1.5	miles	Little Butte Cr. is a Tier One, Key Watershed. Lost Cr. provides habitat for Coho Salmon. The SF Little Butte Creek provides habitat for resident fish and is a significant source of high quality water. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves, associated aquatic and riparian habitat, and contributes to the accomplishment of ACS objectives.	Riparian Reserve
FS	Precommercial Thin	Terrestrial Habitat	FS Little Butte Creek Precommercial Thin	600	acres	Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to pipeline construction. Thinning of young stands is a recognized treatment within LRSs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD C-12). ROD Pages B-11 ACS Objectives, C-11 and C-17.	LSR / Riparian Reserve
FS	Upland Snag Creation	Terrestrial Habitat	FS Little Butte Creek Snag Patch	600.	acres	Snag management is required in the RRNF LRMP (4-20), with levels set under the various management directions. Snag Management is discussed in the NWFP for LSRs on C-14 and 15 of the ROD (items 4 and 7). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSR Assessment (Chap. 3).	LSR / Riparian Reserve
FS	Road Decommissioning	Terrestrial / Aquatic Habitat	FS Little Butte Creek Road Decommissioning	53.2	miles	Little Butte Cr. is a Tier One, Key Watershed. Sediment has been identified by the Upper Rogue watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity and by reducing road density.	LSR / Riparian Reserve

Draft

TABLE 2.5.6.6-2

Proposed Mitigation Measures on NFS Lands in Little Butte Creek

Agency	Project Type	Mitigation Group	Project Name	Qty.	Unit	Project Rationale	Land Allocation
FS	Upland Snag Creation	Terrestrial Habitat	FS Little Butte Creek Snag Patch	600	acres	Snag management is required in the RRNF LRMP (4-20), with levels set under the various management directions. Snag Management is discussed in the NWFP for LSRs on C-14 and 15 of the ROD (items 4 and 7). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSR Assessment (Chap. 3).	LSR / Riparian Reserve
FS	Upland Coarse Woody Debris Placement	Terrestrial Habitat	FS LSR Coarse Wood Replacement	200-400	acres	The project would forgo the development of large down wood for the life of the project and for decades after. Downed wood is a critical component of Mature Forest ecosystems. Large wood replacement would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID). ROD C-11. Acres that can be treated are necessarily limited by material available from the corridor.	LSR

Draft

Relationship of Offsite Mitigations Related to the ACS and Watershed Analysis or Late Successional Reserve Assessment Recommendations

This section describes the relationship between the recommendations of the SW Oregon LSR Assessment (Forest Service et al. 1998), the Little Butte Creek Watershed Assessment (BLM and Forest Service 1997) and LRMP of the Rogue River National Forest as amended by the NWFP and mitigation measures in LSR 227 and the Tier One Key Watershed portion of Little Butte Creek located on the Rogue River NF.

Recommendation - Road Decommissioning. Reduction in road density was identified as a method to improve watershed conditions (Forest Servcie and BLM 1997 p. 182, 191, 205, Appendix F, K). High priority areas identified in the WA and proximity to the effects of the PCGP corridor were used to develop road decommissioning proposals.

- **PCGP Mitigation – Road Decommissioning.** The purpose of road decommissioning as mitigation for the PCGP is to offset potential watershed effects from construction and to reduce impacts on wildlife habitat from edge effects and fragmentation associated with the PCGP corridor. In 2010, the RRNF completed a Forest-wide transportation planning project to identify roads that are necessary for the Forest's designated transportation system. As a result of that decision and other access considerations, 53.2 miles of roads on NFS lands in Little Butte Creek were identified that are no longer needed for access and can be decommissioned. There are 6.7 miles of roads and 32 stream crossings in Riparian Reserves (tables 2.5.6.6-3 and 2.5.6.6-4). Current road density in LSR 227 is 3.3 miles per square mile. With the proposed road decommissioning, that would be reduced to 2.5 miles per square mile, a 24% reduction in road density measured in miles of road per square mile of LSR. Reduction in road density within 1/4, 1/2, and 1 mile of the pipeline corridor are shown in the table 2.5.6.6-5. Figure 2.5-9 provides a comparison of PCGP effects and proposed road decommissioning in the Little Butte Creek Tier 1 Key Watershed Roads proposed for decommissioning are shown in figure 2.5-9 and 2.5-10, below.

  - **Road Decommissioning Effects on Watershed Function.** Impacts of roads on watershed values are well documented (Trombulak and Frissell 2000; Switalski, Bissonette et al. 2004). Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). The proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the effects from the PCGP occur. Assuming a 20 foot average road width, 53.2 miles of proposed road decommissioning would revegetate approximately 90 acres (53.2*5280*14/43560=90 Acres) that are currently native road surfaces in the Little Butte Creek Watershed.

  - **Riparian Restoration.** The PCGP crosses 1 intermittent and 1 perennial stream on the Rogue River National Forest affecting approximately 0.25 miles and 3 acres of riparian vegetation (table 2.5.4.1-4). Decommissioning roads in Riparian Reserves and at stream intersections has the effect of restoring connectivity within aquatic ecosystems and allowing riparian vegetation to become reestablished in riparian areas now occupied by road beds (Switalski, Bissonette et al. 2004). Approximately 6.72 miles with of proposed road decommissioning on NFS lands in Little Butte Creek watershed

Draft

would occur in Riparian Reserves. A total of 32 stream crossings as shown in tables 2.5.6.6-3 and 2.5.6.6-4 below would be restored by proposed road decommissioning. As vegetation becomes reestablished at these crossings, it is expected that road-related sediment transport to aquatic ecosystems would be reduced (Madej 2000;Keppeler, Cafferata et al. 2007). This also supports ACS objectives 2, 3, 4, and 5, in the Little Butte Creek Key Watershed by reducing compaction and by revegetating approximately 14.3 acres of decommissioned roadbeds within Riparian Reserves.

TABLE 2.5.6.6-3

Comparison of PCGP Effects and Proposed Road Decommissioning on NFS Lands, Little Butte Creek Tier 1 Key Watershed

Rogue River NF	Miles in Watershed	Miles in Riparian Reserves	Acres in Riparian Reserves	Acres in Degraded Soil Condition / Acres Restored a/	Stream Crossing
PCGP Corridor	13.58	0.25	4.4	60-137 degraded	1 Class II3 1 Class IV
Proposed Decommissioned Roads	53.2	6.72	14.3	90 Restored	1 Class II, 1 Class III 29 Class IV

a/ Based on 14 foot road width. Figure 2.5-9 uses a midpoint of 104 acres for potentially degraded soils.

TABLE 2.5.6.6-4

Stream Crossings in Decommissioned Roads by Subwatershed and Stream Class on NFS Lands, Little Butte Creek

6th Field Subwatershed	Class II	Class III	Class IV
Beaver Dam Subwatershed		1	7
Middle South Fork Subwatershed			6
Upper North Fork Subwatershed			8
Upper South Fork Subwatershed	1		9
Total	1	1	30

TABLE 2.5.4.6-5

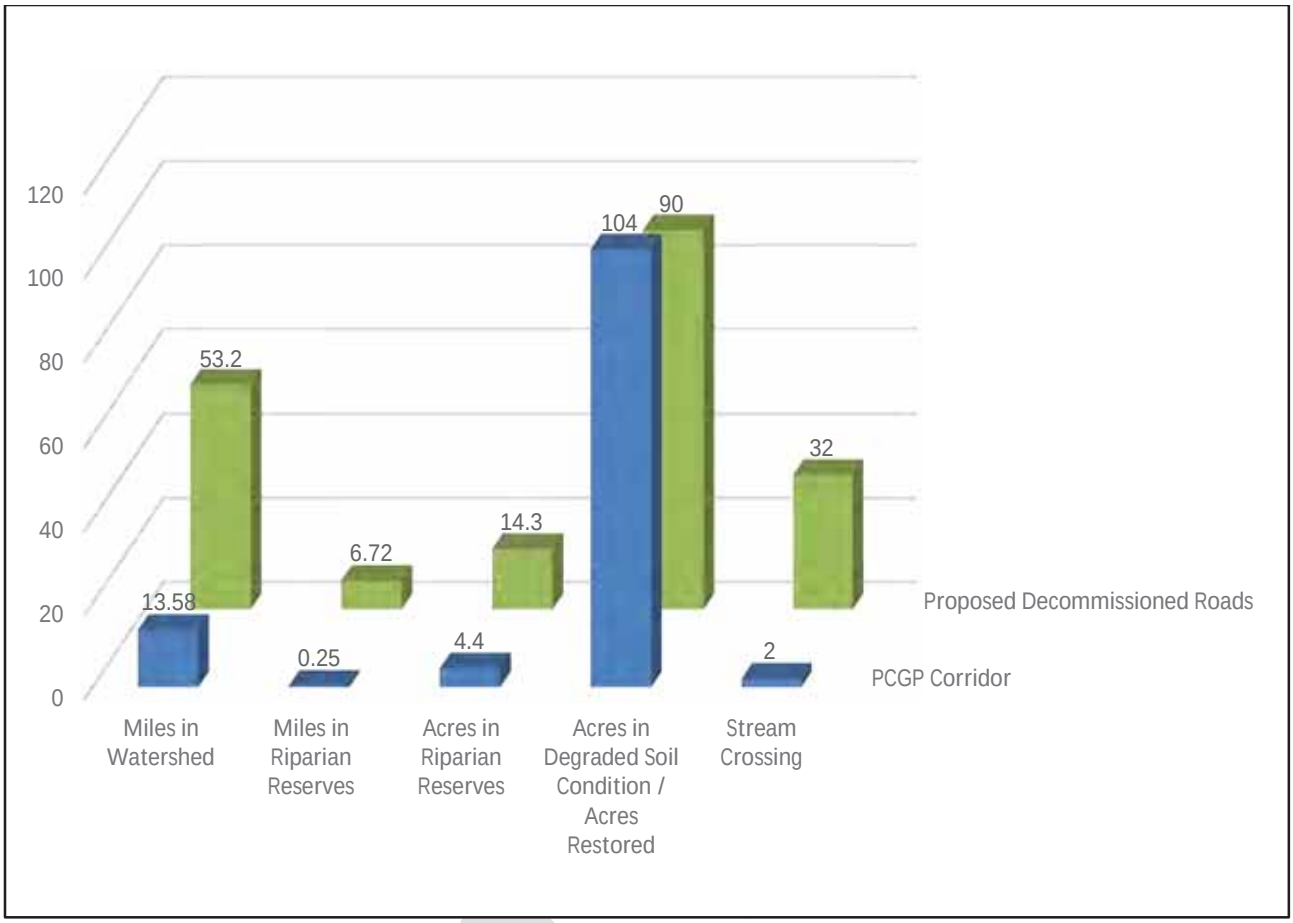
Changes in Road Density with Implementation of Mitigation Plan, Little Butte Creek Tier 1 Key Watershed

Rogue River NF	Current Condition (miles/square mile)	With Road Decommissioning (miles/square mile)	Change in Road Density with Decommissioning (miles/square mile)
NFS Lands in LBC KWS	3.27	2.67	-0.6
LSR 227 in LBC KWS	3.87	3.09	-0.78
Within 1 mile of pipeline	4.18	2.77	-1.41
Within 1/2 mile of pipeline	4.12	2.71	-1.41
Within 1/4 mile of pipeline	3.91	2.56	-1.35

Source: USFS GIS Analysis, (see Chapter 3))

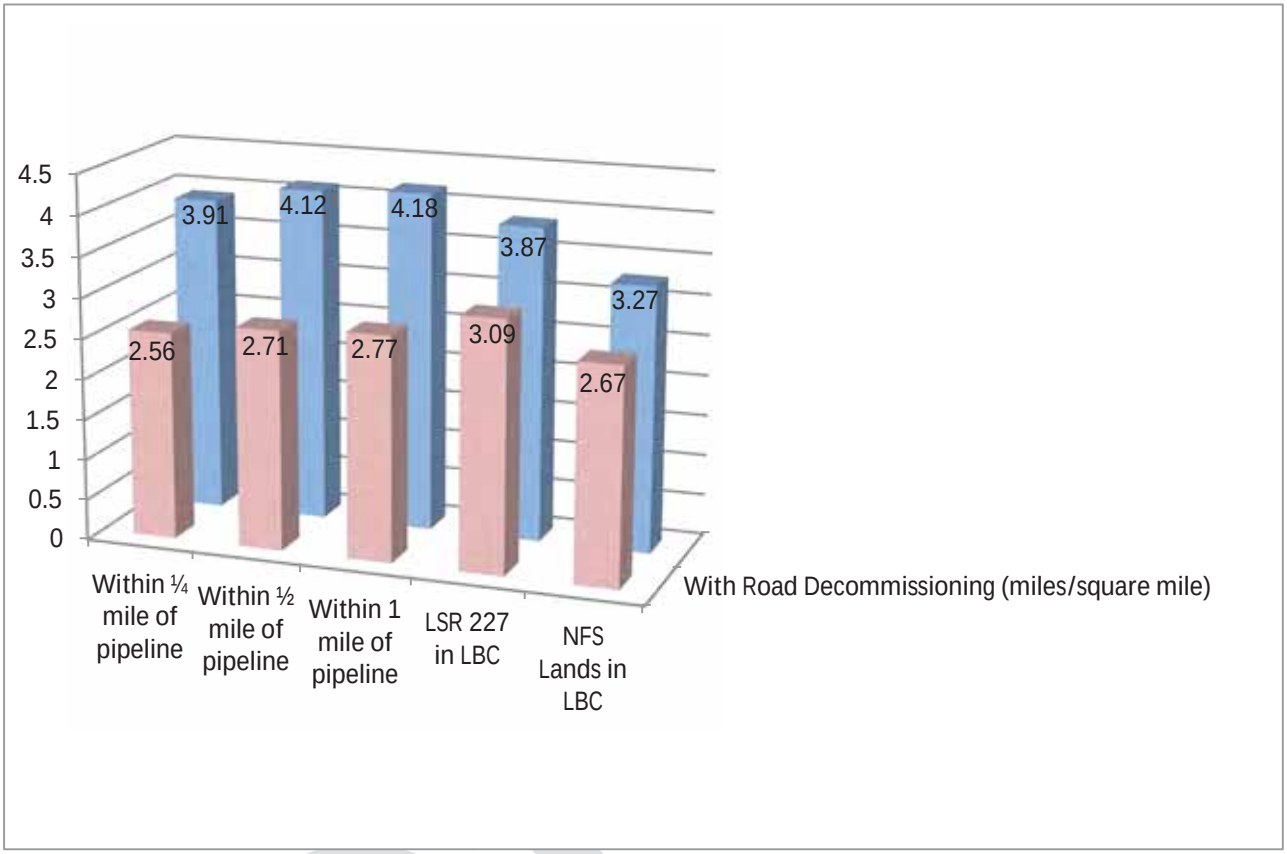
Figure 2.5-9 Comparison of PCGP Effects and Proposed Road Decommissioning: Little Butte Creek Tier 1 Key Watershed

Draft



(Note: Acres in degraded soil conditions could range from 60 to 147 acres. A midpoint of 104 acres was used for the purposes of graphic display)

Figure2.5-10 Change in Road Density with Implementation of Mitigation Plan: RRNF, LSR 227 in Little Butte Creek Tier 1 Key Watershed



Recommendation—Soil Productivity. Manage for an abundance of coarse woody material in various decaying conditions in forested areas across the landscape (BLM and Forest Service 1997: 182).

Recommendation—Vegetation. Provide for well-distributed coarse woody material (CWM) across the landscape for maintaining the ecological functions of the species dependent on coarse wood (BLM and Forest Service 1997: 187). Maintaining the maximum levels of CWM consistent with reasonable fuel loadings appears to have considerable potential for enhancing site quality. Mid-seral stands with no CWM may have yields 12 percent lower than stands with sufficient CWM (BLM and Forest Service 1997: 75).

Recommendation—Terrestrial Wildlife Species and Habitat. Maintain adequate numbers of snags and amounts of coarse wood material (see Vegetation Section) for those species that require these special habitats for breeding, feeding, or sheltering (BLM and Forest Service 1997: 190).

- **PCGP Mitigation – Upland Placement of Large Woody Debris**

  Large wood placement in plantations is proposed to accelerate the development of late-successional and old-growth characteristics by restoring this habitat component to plantations where large woody debris is lacking. Large wood would be placed in approximately 600 acres of plantations that are also receiving stand density

management treatment. Approximately 126 of those acres are in Riparian Reserves. The large wood would be from trees cut from the pipeline corridor. Sites selected for fallen woody material placement would be within 1/2 mile of the pipeline right-of-way. As with the other off-site mitigations, placement of the mitigation activities close to the pipeline corridor can benefit species that are affected by the vegetation changes within the corridor and would make these mitigations more effective. Sites would be in early-successional stands that are currently deficient in fallen wood (as defined by Plant Association Group for Cascade White Fir forests). The large wood placement is expected to vary to account for some of the range in variability found across the landscape. For logs 11 to 20 inches in diameter, densities would vary from 8 to 33 logs per acre. For logs over 20 inches in diameter, densities would vary from 3 to 12 logs per acre. Logs would be approximately 40 feet in length, and the specified diameter (11 to 20 inches and over 20 inches) refers to the stem diameter at the midpoint of the 40-foot log.

- **PCGP Mitigation – Snag Creation**
  - Snag creation is proposed as a mitigation to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags would be lost from the pipeline corridor to facilitate pipeline construction or to mitigate safety hazards for construction workers. Approximately 1,200 snags would be created by blasting tops from live trees (preferably trees with existing decay that makes them more suitable for cavity-nesting birds and/or as denning sites) or by inoculating living trees with heart rot decay fungi. Sites selected for snag creation would be within 1/2 mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the pipeline corridor. Sites would be in mid-successional stands or around the edges of early-successional stands that are currently deficient in snags as defined by Plant Association Group for Cascade White Fir forests. Stand data for these plant associations (which is an indication of undisturbed forest snag levels) shows that these stands have an average of about four snags per acre in the range of 11 to 20 inches in diameter and an additional four snags per acre greater than 20 inches in diameter. If the tree diameters in the stands prevent snag creation in the greater than 20-inch-diameter size class, additional snags in the smaller size class (11 to 20 inches in diameter) would be created to make up for the deficit. For sites bordering early-successional stands, snags would be created within 100 yards of the stand boundary at the same trees per acre levels described above.

Recommendation—Vegetation. Enhance the structural diversity of vegetation classes by pre-commercial thinning treatments at staggered intervals and favoring trees of different heights and species at the time of treatment (BLM and Forest Service 1997: 188).

- **PCGP Mitigation- Stand Density Management:** Stand density management is proposed for overstocked plantations to accelerate the development of late-successional and old-growth forest characteristics in LSR 227. This accelerated development would also reduce fragmentation and reduce edge effects and would help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused

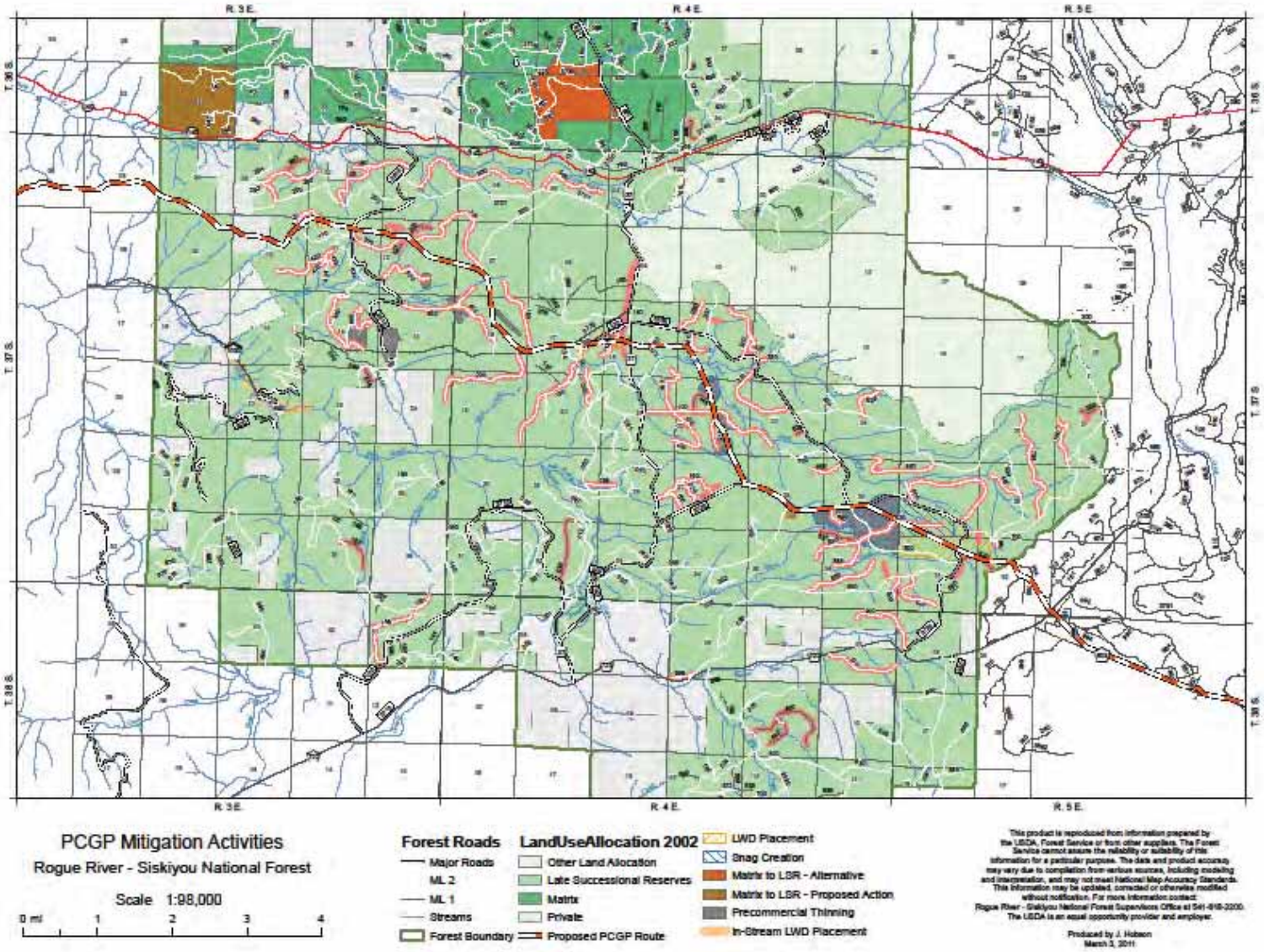
disturbances. Fuels treatments for the slash generated by stand density management are decided on a case-by-case basis and rely on slash loading information as well as proximity to roads and other factors. Slash treatments may be as simple as lop and scatter to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling and burning or removal of slash from the site. All 600 acres are within 0.5 miles of the pipeline right-of-way and 126 acres are within Riparian Reserves. Placing the off-site mitigation activities close to the actual pipeline corridor increases their effectiveness by impacting lands within, or near, the home ranges of individual animals being affected by the pipeline habitat changes. .

Recommendation - Stream Structure. Large wood in streams contributes to the form and structure of a stream's channel and largely controls the distribution of aquatic habitats, stability of streambeds and streambanks, and routing of sediments and water through the system. Large wood traps and slows the movement of sediment and organic matter through the stream system . Large wood is particularly critical for the steep tributaries because it creates a stepped stream profile, with stream energy dissipated in relatively short, steep sections of the channel (BLM and Forest Service 1997: 92).

- **PCGP Mitigation – In-Stream Placement of LWD:** In addition to restoration of LWD in Riparian Reserves and at channel crossings, large woody debris would be placed in 1.5 miles of the South Fork Little Butte Creek below the project. This would contribute significantly to reducing sediment in the affected reach and downstream, and would add pool and riffle structure to the stream by narrowing the channel and trapping gravels.

Draft

Figure 2.5-11 Proposed Mitigation Projects, Rogue River National Forest Little Butte Creek



Summary. The Applicant-filed off-site mitigation plan includes a number of actions that substantively contribute to the "maintain and restore" criteria of the ACS objectives at the site, subwatershed and watershed scale.

- Decommissioning 53.2 miles of roads, of which 4.3 miles (14.3 acres) lie in riparian reserves on NFS lands and 13.0 miles of roads, of which approximately 3.5 acres lie in Riparian Reserves on BLM lands. This significantly reduces sediment sources and would allow restoration of vegetation in Riparian Reserves on approximately 14.3 acres on NFS lands and 3.5 acres on BLM lands that are currently occupied by roads. This is responsive to ACS objectives 1, 2, 3, 4, and 5 and road density objectives in Key Watersheds.

- Road improvements including resurfacing on 21.85 miles of roads on BLM lands. This reduces sediment contributions from gravel roads and increases resilience to damage from winter rains. This is responsive to ACS objective 5.

- Creation of 1,200 snags on approximately 600 acres of NFS lands, of which an estimated 126 acres are within Riparian Reserves. This replaces snags cut in association with the PCGP corridor. This is responsive to ACS objectives 1, 8 and 9.

- Placement of coarse woody material on 600 acres, of which 126 acres are within Riparian Reserves. This replaces coarse wood removed during construction of the PCGP and contributes to riparian habitats where placed in Riparian Reserves. This is responsive to ACS objectives 1, 8 and 9.

- Stand Density Management (Precommercial Thinning) on approximately 600 acres of NFS lands, of which a portion estimated to be 126 acres occurs in Riparian Reserves. This has the effect of accelerating the development of larger trees and increasing stand diversity. [16] This is responsive to ACS objectives 1, 8 and 9.

- Placement of LWD on 1.5 miles perennial fish-bearing streams on NFS lands and 8.6 miles on perennial fish-bearing streams on BLM lands. This replaces LWD that is removed from the project right-of-way. This is responsive to ACS objectives 1, 2, 3, 4, 5, 7 and 8.

- Installation of a screened diversion at an irrigation ditch in Lost Creek. This is responsive to ACS objective 2.

2.5.6.7 Cumulative Effects

Activities on BLM and NFS Lands

The BLM manages about 23 percent of the Little Butte Creek watershed; the Forest Service manages about 25 percent. Projects on federal lands that would contribute to cumulative effects with the PCGP are shown in table 2.5.6.7-1

[16] Prorated by average percent of area occupied by Riparian Reserves in Little Butte Creek.

TABLE 2.5.6.7-1

Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Little Butte Creek Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Affected Resource
RRNF	Little Butte Creek	Lower NF Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	400 acres of grazing on the South Butte Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Lower NF Little Butte Creek	2009 Fish Lake and Rancheria Allotment Management Plan Update	1,000 acres of grazing on the Fish Lake Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Lower South Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	2,000 acres of grazing (900 acres on the South Butte Allotment, and 1,100 acres on the Conde Allotment)	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Upper North Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	5,300 acres of grazing on the South Butte Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Upper North Fork Little Butte Creek	2009 Fish Lake and Rancheria Allotment Management Plan Update	6,500 acres of grazing on the Fish Lake Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Little South Fork Little Butte Creek	2013 Big Elk Cinder Pit CE (DM would be published within next 6 months)	Excavation of cinders from 5 acres of land in an existing cinder quarry	Quarry
RRNF	Little Butte Creek	Middle South Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	14,100 acres of grazing (7,000 acres on the South Butte Allotment, 4,900 acres on the Deadwood Allotment, and 2,200 acres on the Conde Allotment)	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Upper South Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	8,700 acres of grazing on the South Butte Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Beaver Dam Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	16,800 acres of grazing (3,400 acres on the South Butte Allotment, 13,400 acres on the Deadwood Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
MD_BLM	Little Butte Creek	Lick Creek	Salty Gardner DNA, FY2014-2015	540 acres of hazardous fuels treatment	WUI, upland vegetation, neo-tropical birds
MD_BLM	Little Butte Creek	Salt Creek	Bieber Salt Forest Management FY 2016, Salty Gardner DNA FY 2014-2015	756 acres of upland vegetation treatment, 721 acres of hazardous fuels treatment	Owls, NRF habitat, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils
MD_BLM	Little Butte Creek	Lower NF Little Butte Creek	Bieber Salt Forest Management FY 2016, Salty Gardner DNA FY 2014-2015	763 acres of upland vegetation treatment, 932 acres of hazardous fuels treatment	Owls, NRF habitat, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils

These activities are expected to be consistent with the standards and guidelines (or management direction on the BLM) and objectives of the Rogue River National Forest and Medford District BLM land management plans. Restoration thinning and hazardous fuels reductions are expected to contribute to improvements in watershed conditions by reducing stand density and reducing the

probability of stand replacement fire. Road improvements and decommissioning are expected to reduce road-related sediment transport to aquatic systems.

Activities on Private Lands

Private lands comprise about 52 percent of the Little Butte Creek watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.2 percent of BLM lands, 0.47 percent of the NFS lands and 0.71 percent of private lands in the Little Butte Creek watershed (table 2.5.6.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Little Butte Creek South Umpqua watershed in any significant, discernable or measureable way. See also EIS Chapter 4.14, Cumulative Effects.

2.5.6.8 Project Effects Compared by ACS Objective

Table 2.5.6.8-1 compares the Project impacts to the objectives of the ACS for the Little Butte Creek watershed. BLM- and NFS lands where the ACS applies comprise approximately 114,658 acres or 48 percent of the Little Butte Creek watershed (table 2.5.6.1-1). Riparian Reserves comprise approximately 10,785 acres (about 9.4% of the watershed) on BLM and NFS lands. Watershed conditions and recommendations are found in the Little Butte Creek Watershed Analysis (BLM and Forest Service 1997). The Project would include 5.97 miles on BLM lands, and 13.65 miles on NFS lands. A total of 15.2 acres or 0.14% of the Riparian Reserves in the watershed would be affected on:

- One perennial stream channel crossing,
- Seven intermittent stream channel crossings
- One small forested wetland and
- Two intermittent stream and one wetland where Riparian Reserves are clipped, but the associated waterbodies are not crossed by the Project.

TABLE 2.5.6.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Little Butte Creek

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed-scale features. The Project would affect about 15.2 acres or about 0.14 percent of Riparian Reserves on BLM-managed and NFS lands in Little Butte Creek (table 2.5.4.1-2, 4). There are seven intermittent and one perennial stream channels crossed in the Little Butte Creek watershed. Impacts to aquatic systems are expected to be short-term and minor and limited to the project scale because of application of Best Management Practices and

TABLE 2.5.6.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Little Butte Creek

ACS Objective	Project Impacts
	erosion control measures (sections 2.5.6.4 and 1.3.1). LWD cleared in construction of the corridor would be used to stabilize and restore stream crossings. Off-site mitigation measures including road stormproofing and over 65 miles of road decommissioning, over 9 miles of instream projects, snag creation and coarse woody debris placement are expected to improve watershed conditions in the Little Butte Creek watershed (section 2.5.6.6). While there are long-term changes in vegetation in Riparian Reserves from construction clearing of the corridor, these would be minor in scale and well within the range of natural variability given the disturbance history of the watershed (section 2.5.6.4).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Little Butte Creek watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the Wetland and Waterbody Crossing Plan. At each crossing, bed and bank disturbances from equipment crossing and trenching are small (<15 feet wide). After construction all disturbed areas would be returned to their approximate preconstruction contours and drainage patterns. The temporary construction right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossings, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Road decommissioning that occurs within Riparian Reserves (approximately 18 acres) would contribute to restoration of aquatic connectivity. The residual levels of disturbance are anticipated to be well within the range of natural variability in the Klamath–Siskiyou Province and High Cascades Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried, and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). This level of disturbance is comparable to a bank slough (section 1.3.1.) and well within the range of natural variability that for watersheds of the Klamath–Siskiyou Province and High Cascades Province (section 2.5.6.4). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions, consistent with the POD requirements. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment would be mobilized during construction. These impacts are expected to be short-term and limited to the general area of construction. No long-term impacts on water quality are expected because of application of the ECRP including maintenance of effective ground cover and Best Management Practices during construction (section 1.3.1.1). Effective shade would be removed at the crossing of the South Fork Little Butte Creek at MP 162.45. A site-specific shade analysis (NSR 2009) found no temperature impacts at the site or at the stream network scale at this crossing.

Draft

TABLE 2.5.6.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Little Butte Creek

ACS Objective	Project Impacts
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Little Butte Creek watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from landslides and surface erosion following major disturbances such as fires and high-intensity winter storms (BLM and Forest Service 1997). The current sediment regime in the watershed has replaced these pulse-type disturbances with more chronic erosion and deposition of fine sediments primarily from urban and agricultural land use, timber harvest and roads. The Project construction and operation is not likely to alter this sediment pattern nor is it likely to exacerbate these conditions because of implementation of measures in the ECRP (section 1.3.1) including maintenance of effective ground cover, water bars to dissipate overland flows and maintenance of sediment barriers until revegetation is successful. Sediment impacts from construction are expected to be similar to those described in section 1.3.1.2. Proposed mitigation projects including road resurfacing and decommissioning would contribute to reduction of sediments and restoration of aquatic functions at the watershed scale (Section 2.5.6.6). Any sediment impacts are expected to be well within the range of natural variability given the disturbance history of the Little Butte Creek Watershed (section 2.6.5.4). A pulse of sediment could be observed following the first seasonal rain, but that this is likely to dissipate within a few hundred feet and would be indistinguishable from background levels.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project is unlikely to affect peak flows in the Little Butte Creek watershed because of the dispersed nature of impacts, the current hydrologically recovered conditions in the watershed, the relatively small proportion of the watershed affected and the relative lack of connectivity to aquatic systems (section 2.5.6.4). Decommissioning roads (66.2 miles) as part of the offsite mitigation plan would contribute substantively the restoration of flow patterns by restoring hydrologic connectivity at stream crossings that are decommissioned (section 2.5.6.6).
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Pacific Connector Project crosses one small (0.01 acre) wetland in the Little Butte Creek Watershed. Trench plugs would be used at the edge of the wetland area if any are encountered to minimize drainage by the pipeline trench. Decommissioning 66.3 miles of roads, 18 acres of which are in Riparian Reserves (section 2.5.6.6) would contribute substantially to restoring floodplain functions where these projects occur.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Little Butte Creek watershed would be minor. Approximately 15.2 acres or 0.14 percent of the Riparian Reserves in the watershed are potentially affected by the Project (table 2.5.6.1-4). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Coarse wood placement and snag creation on 126 acres in Riparian Reserves, along with revegetation on 18 acres of Riparian Reserves in roads that would be decommissioned would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves (section 2.5.6.6).
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Little Butte Creek watershed would be minor. Approximately 15.2 acres or 0.14 percent of the Riparian Reserves in the watershed are potentially affected by the Project. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Coarse wood placement and snag creation on 126 acres in Riparian Reserves, along with revegetation on 18 acres of Riparian Reserves in roads that would be decommissioned would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves (Section 2.5.6.4). No riparian-dependent Survey and Manage species have been identified whose persistence would be threatened by the Project (section 2.5.6.5)

Draft

2.5.6.9 Summary

Little Butte Creek is the largest, and in some ways, the most complex watershed crossed by the Project. With 19.6 miles of corridor, and 306 acres of clearing on BLM and NFS lands, this watershed has the most federal land area affected of the 19 watersheds crossed by the Project. Little Butte Creek is geologically complex with both Klamath-Siskiyou Province and High Cascade Province landscapes. It is ecologically diverse and important, providing some of the most productive coho salmon streams in the Upper Rogue Basin. Little Butte Creek is a Tier One Key Watershed above the confluence of the North and South Forks, and all of the NFS lands in the watershed are managed as LSR (section 2.5.6.1). Against this backdrop, compliance with the ACS is an important measure of Project impacts.

Pacific Connector has modified the Project to respond to the ACS objectives and has incorporated measures consistent with the Riparian Reserve standards and guidelines. The assessment demonstrates that short-term impacts associated with the Project would occur to streambanks, and substrates at the site scale. Change in vegetative condition from clearing of forest within the pipeline construction corridor is a long-term impact. These impacts, however, are well within the range of natural variability given the disturbance processes that function in the watershed (section 2.5.4.4; table 2.5.4.2-1). This is especially apparent when considering the total amount of Riparian Reserves that are located within the Little Butte Creek watershed (10,791 acres) and the amount of clearing (15.2 acres) in Riparian Reserves (0.14 percent of the Riparian Reserves in the watershed) (table 2.5.6.1-3). Also, because of the linear characteristic of the pipeline, the Riparian Reserve crossings would be spread out across the landscape and would be discontinuous.

Off-site mitigation measures including over 66 miles of road decommissioning (53 miles are within Key Watershed) 9.6 miles of LWD instream projects, 21.8 miles of road resurfacing, identified by the BLM and Forest Service, would supplement onsite minimization, mitigation, and restoration actions. These proposed offsite mitigation measures are responsive to recommendations in the Little Butte Creek Watershed Assessment (1997) and the South Cascades Late-Successional Reserve Assessment (1998). Mitigations associated with the Project are responsive to watershed analysis recommendations and would improve watershed conditions where they are applied (section 2.5.6.4).

Three site-specific amendments of the Rogue River National Forest LRMP and one amendment of the Medford District RMP related to the ACS are proposed to make provision for the project (section 2.5.6.5):

- Proposed amendment RRNF-5 would allow the Project to cross the MA-26 Restricted Riparian land allocation at one location on the South Fork of Little Butte Creek. This amendment would not prevent attainment of ACS objectives because a site-specific temperature assessment (NSR 2009) showed there would be no temperature increase from shade removal at this location, effective ground cover and sediment barriers would be maintained and implementation of the ECRP is expected to control surface erosion and reestablish native vegetation.

- Proposed amendment RRNF-6 would allow the Project to exceed detrimental soil conditions within the construction corridor. This would not prevent attainment of ACS objectives because soil decompaction and remediation required in Riparian

Reserves is expected to effectively moderate detrimental soil conditions. Implementation of measures in the ECRP is expected to effectively control surface erosion and restore native vegetation (See section 4.3.4).

- Proposed amendment of the Rogue River National Forest LRMP and the Medford District RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (Section 2.4.8.5).

The Project is otherwise consistent with standards and guidelines for activities in Riparian Reserves for the Rogue River National Forest and the Medford District, BLM.

The routing of the pipeline through BLM and NFS lands, coupled with the relatively small area of BLM and NFS land affected by Project construction (0.20 percent of BLM-managed lands and 0.47 percent of NFS lands of the fifth-field watershed), makes it highly improbable that Project impacts could affect watershed conditions. The relative lack of intersections with aquatic systems serves to further minimize possible impacts (section 2.5.6.1). Although there are project-level impacts from short-term sediment and long-term change in vegetative condition at stream crossings), these would be minor in scale (section 2.5.6.4)

No project-related impacts that would prevent attainment of ACS objectives have been identified (section 2.5.6.8). All relevant Project impacts are within the range of natural variability for watersheds in the Klamath-Siskiyou and High Cascades Provinces, although some of these processes have been altered from their natural condition (section 2.5.6.4).

2.6 KLAMATH RIVER BASIN

2.6.1 Geographic Setting

The Klamath River is notable because only the Klamath and Columbia Rivers cross the Cascade Mountains. The Klamath Basin geography, topography, hydrology, and biology are unique from other watersheds in the Pacific Northwest. Water in the Klamath River, unlike other watersheds in the Pacific Northwest, originates in relatively flat, open valleys east of the Cascades before crossing the Trinity and Coast Ranges in a steep river canyon and intercepting cold water inputs from the Scott, Salmon, and Trinity Rivers. Irongate Dam is the dividing line between the Upper and Lower Klamath subbasins. The Klamath River flows through mountainous terrain from the Oregon-California State line to the reaches downstream from Iron Gate Dam. Downstream from Iron Gate Dam, and for most of the river's length to the Pacific Ocean, the river maintains a relatively steep, high-energy channel.

The Klamath River originates just downstream from Upper Klamath Lake in southern Oregon and flows 253 miles southwest through northern California to the Pacific Ocean. The Upper Klamath Basin has five main lakes: Crater Lake, Upper Klamath Lake, Lower Klamath Lake, Clear Lake, and Tule Lake. The Lower Klamath Basin, with its border beginning at Iron Gate Dam, is almost 200 miles long and contains the four major Klamath River tributaries: the Shasta, Scott, Salmon, and Trinity Rivers. The basin is generally rural, with a total population of approximately 120,000. Its largest communities are Klamath Falls, Oregon, and City of Yreka, California.

The Pacific Connector project lies in the Upper Klamath subbasin. The upper Klamath subbasin encompasses approximately 8,000 square miles and is located in south-central Oregon and northeastern California. The Oregon part of the subbasin (more than 5,600 square miles) lies primarily in Klamath County with smaller parts in Jackson and Lake Counties. The California part of the subbasin (more than 2,300 square miles) lies in Modoc and Siskiyou Counties. The upper Klamath subbasin spans parts of the Sierra-Cascade Mountains to the west and the Basin and Range geologic region to the east. Down faulted valleys and fault block mountains of the Basin and Range region terminate against the Cascade Mountains. In the upland areas of the Klamath subbasin to the north, the Wood and Williamson Rivers originate from the eastern flank of Mount Mazama (Crater Lake). To the east, the Sprague and Lost Rivers flow westward from more arid parts of the basin. The California portion of the basin to the south is characterized by closed lake basins that are more typical of the Basin and Range region.

2.6.2 Climate and Hydrology

The Upper Klamath Subbasin climate is characterized by hot, dry summers and wet winters with moderate to low temperatures. At its higher elevations (above 5,000 feet), the Upper Klamath subbasin receives rain and snow during the late fall, winter and spring. Peak stream flows generally occur during snowmelt runoff in late spring/early summer. After the runoff period, flows drop in the late summer/early fall. Annual basin precipitation amounts range from 15 inches at valley floors to more than 40 inches in the Cascade Mountains. Sixty to seventy percent of the precipitation occurs from October through March. An average of about four inches of rain falls during the period from April through September. The portion of the Upper Klamath Subbasin affected by the PCGP is all in the High Cascades Province and is dominated by pumice soils. Infiltration rates and water storage capacity of pumice plateau landscapes are high, although water retention in surface soils is very low in summer. Late summer streamflows are sustained by the slow release of snowmelt from large wetland complexes such as Buck Lake.

The Klamath Basin is home to 19 native fish species. The Klamath Basin once produced large runs of steelhead, Chinook salmon, coho salmon, green sturgeon, eulachon, coastal cutthroat trout, and Pacific lamprey. Runs of these anadromous fish (fish that migrate from salt water to spawn in fresh water) contributed substantially to tribal, commercial, and recreational fisheries. Irongate dam (35 miles below the Pacific Connector project) currently blocks all anadromous fish passage. The Department of Interior has proposed to remove Irongate and other dams that block anadromous fish on the Klamath River in 2020.

Coho salmon, which currently listed as “Threatened” under the Endangered Species Act, are currently widely distributed in the Klamath River downstream from Iron Gate Dam (RM 190). Before the construction of the dams, coho salmon were apparently common and widely distributed throughout the watershed, probably in both mainstem and tributary reaches up to and including Spencer Creek (Reclamation 2013).

Spencer Creek is the only fifth-field watershed crossed by the Pacific Connector project in the Klamath Basin where the ACS applies. Spencer Creek is 35 miles above Irongate dam. It flows into the Klamath River at the upper end of the reservoir created by the JC Boyle dam.

Draft

2.6.3 Spencer Creek Fifth Field Watershed, HUC 180102206

2.6.3.1 Overview

Spencer Creek watershed is part of the Upper Klamath subbasin in the High Cascades Province. The 54,160 acre Spencer Creek watershed is located in Klamath County, approximately 20 miles west of Klamath Falls (figure 1-1) and north of the Klamath River. The watershed originates at the crest of the southern Oregon Cascades, flows southeast, and empties into the Klamath River at the upper end of the JC Boyle Reservoir which is part of PacifiCorps' Klamath River hydroelectric project. Elevations range from approximately 8,200 feet at the top of Aspen Butte to 4,000 feet at the mouth of Spencer Creek at JC Boyle Reservoir. Prior to construction of the Klamath River hydroelectric project coho and Chinook salmon and Pacific lamprey used the lower reaches of Spencer Creek for spawning and rearing. Spencer Creek is a Tier One Key Watershed in the NWFP. If the Klamath Dams, including JC Boyle, are removed as planned, Spencer Creek would once again provide spawning habitat for Chinook and coho salmon (Reclamation, 2013).

Unique features within the watershed include Buck Lake, a large, shallow snowmelt wetland that lies in the upper end of the watershed and is a significant contributor to the ecological systems within the watershed. Buck Lake was drained in the 1940s and no longer fully functions as a perennial wetland but it does have seasonal wetland characteristics. The northeastern part of the watershed lies within the Mountain Lakes Wilderness Area where no significant past management activities, with the exception of fire suppression, have occurred. Private lands in the lower part of the watershed are managed for timber production and open range grazing.

The watershed is bisected by the Dead Indian Memorial highway which runs generally east-west and the Clover Creek county road which runs generally northwest-southeast and parallels Spencer Creek for several miles. A small unincorporated community is located the junction of the Clover Creek Road and the Dead Indian Memorial Highway.

The portion of Spencer Creek traversed by the project is typical of the High Cascades Province. Expansive pumice plateaus associated with the eruption of Mt. Mazama about 5000 years ago with droughty soils characterized by high snowmelt infiltration and low summer water retention dominate the landscape. Streamflows are dominated by spring snowmelt. Streams often develop braided channels where they encounter pumice flats and may become intermittent, surfacing again downstream. . Relatively low gradients, porous soils, and deep glacial till in some areas combine to create a system with low stream densities (0.3 mile of perennial streams per square mile, and 0.9 miles of intermittent streams per square mile) (BLM et al. 1995: 4-4-155).

Vegetation in the watershed is primarily a mixed conifer forest dominated by white fir and large stands of lodgepole pine. Private lands have been managed intensively for timber production and grazing and are dominated by younger aged stands and early seral brush communities. Fire suppression has resulted in overly dense white fir understory vegetation and accumulations of dead fuel. Under drought conditions, these fuels may cause large, high intensity stand replacement fires. At the time of the WA, twenty-five percent of the Federal land within the Spencer Creek watershed is late successional forest and 29 percent is mid-seral stage forest. The percentages of seral stages on Federal land are shown in table 2.6.2.1-4. One percent of private land within the watershed is late-successional forest and nine percent is mid-seral stage (BLM et al.: 4-86.)

Figure 2.6-1 shows the ownership pattern of the watershed. Relatively contiguous NFS lands (40% of all ownerships) dominate the upper watershed. Scattered BLM lands (16% of all ownerships) interspersed private lands (44% of all ownerships) dominate the lower watershed. Increases in conifer populations as well as fire suppression have led to the loss of aspen stands throughout the Inland West. Further losses have occurred because aspen parklands have been converted to meadows for livestock grazing, with others degraded from logging and continual and intense recreational use. Within Spencer Creek, aspen patches reportedly occurred around Buck Lake, along wet areas, and along streams and meadows near Spencer Creek however only remnants of those stands now remain (BLM et al.: 4-27).

Buck Lake, Upper Spencer Creek, Clover Creek and Lower Spencer Creek subwatersheds make up the Spencer Creek watershed (table 2.6.2.1-1). Spencer Creek watershed has approximately 110 miles of fish bearing and intermittent streams which depend on healthy functioning riparian areas for key habitat input factors. One short stretch of lower Clover Creek is fish bearing from its connection to Spencer Creek, but becomes intermittent during late summer in most years. In addition, over 2,000 acres of wetland area in and around Buck Lake and along Spencer Creek have important effects on water quality and hydrologic function. Buck Lake is privately owned, and was drained to provide pasture for cattle, however it remains an important area for aquatic function in Spencer Creek. Riparian Reserves comprise 2.4% of the watershed (BLM et al: 4-97). There are 1,515 acres of designated LSR and an additional 829 acres of unmapped LSR associated with KOACs. No lands in the LSR land allocation are crossed on either BLM or NFS lands. The Pacific Connector project is located entirely on matrix lands in the Spencer Creek watershed.

Location and Routing

The Pacific Connector project crosses a broad ridge from the Little Butte Creek watershed in the Rogue Basin to the Klamath Basin and the Spencer Creek watershed at MP 168.0. The corridor crosses the Dead Indian Memorial Highway at MP 168.84 and continues cross-country to MP 169.54 where it intersects the Clover Creek Road, a two-lane paved Klamath County road. The project runs directly adjacent to the Clover Creek Road for the next 17 miles, crossing portions of the Upper Spencer Creek, Clover Creek and Lower Spencer Creek subwatersheds, exiting the watershed at MP 183.0.

The total length of the corridor in the watershed is approximately 15 miles. Of that, approximately 7.1 miles are on BLM or NFS lands managed in accordance with the ACS. Approximately 6.07 miles of the project would be on NFS lands between MP 168.0 and 175.3. Of those, 3.94 miles would be in the Buck Lake subwatershed and 2.13 miles would be in the Upper Spencer Creek subwatershed (table 2.6.3.1-2). From MP 170.04 to MP 175.36, the project would be on NFS lands adjacent to the Clover Creek Road. The project was originally proposed to run parallel to the Clover Creek Road 400 feet to the west. At the request of the Forest Service, the project was moved adjacent to the Clover Creek Road to avoid creating a second corridor that may adversely affect wildlife values and create an unmanageable strip between the road and the project. Between MP 176.17 and 179.72, the project crosses 1.04 miles of BLM lands interspersed in two separate "checkerboard" blocks, remaining adjacent to the Clover Creek Road. Approximately 0.89 miles are in the Upper Spencer Creek subwatershed and 0.15 miles are in the Clover Creek subwatershed (table 2.6.3.1-2). After MP 179.72, no other federal lands are crossed by the project where the ACS applies. (figure 2.6-1, table 2.6.2.1-2). Of the 15 miles of project corridor in the Spencer Creek watershed, approximately 13 miles are adjacent to the Clover Creek road where stream

crossings and clearing riparian vegetation have already occurred. By utilizing this existing corridor the project avoids creating a second clearing that would further fragment Riparian Reserves and wildlife habitat. This routing also places the Clover Creek road between the project corridor and the Spencer Creek Riparian Reserves.

A total of 200.45 acres of right of way would be cleared, and 13.88 acres modified for a total of 214.33 acres affected in the right-of-way across all ownerships in the watershed. This is about 0.40% of the Spencer Creek watershed. Approximately 107.69 acres, or about 52% of the affected acres in the watershed are on BLM and NFS lands where the ACS applies. About 6.07 miles or 85% of the miles of corridor on federal lands are on NFS lands. The remaining 1.04 miles, or 15% of the miles of corridor on federal lands are on BLM lands. The project affects 0.42% of NFS lands and 0.17% of BLM lands in the watershed (table 2.6.3.1-2).

All project effects on BLM or NFS lands in the Spencer Creek watershed occur on matrix lands. Of the 107.69 acres of right-of-way on BLM and NFS lands, approximately 9.14 acres are in Riparian Reserves; of these, 9.06 acres would be cleared, and 0.08 acres modified. There are four intermittent stream channel and two wetland crossings on NFS lands. Four Riparian Reserves of intermittent streams and two wetlands are clipped, but the associated waterbody is not crossed by the pipeline trench (table 2.6.3.1-4). Approximately 6.95 acres of Riparian Reserves or about 1.3% of the Riparian Reserves on NFS lands in the watershed would be cleared (table 2.6.3.1-3). About 3.5 acres of NFS Riparian Reserves cleared are in LSOG forest; the remaining 5.56 acres are early or mid-seral forests. There is one intermittent stream crossing on BLM lands which affects 2.11 acres of Riparian Reserve or about 1.01% of Riparian Reserves on BLM lands in the watershed. Of the affected acres at the crossing, approximately 1.17 acres are in LSOG forest (table 2.6.3.1-4). All of the crossings in Spencer Creek are rated as “Blue” or low risk of construction impacts (table 2.6.3.1-5.)

Draft

Figure 2.6-1 PCGP Right-of-way and BLM Lands, Spencer Creek Watershed

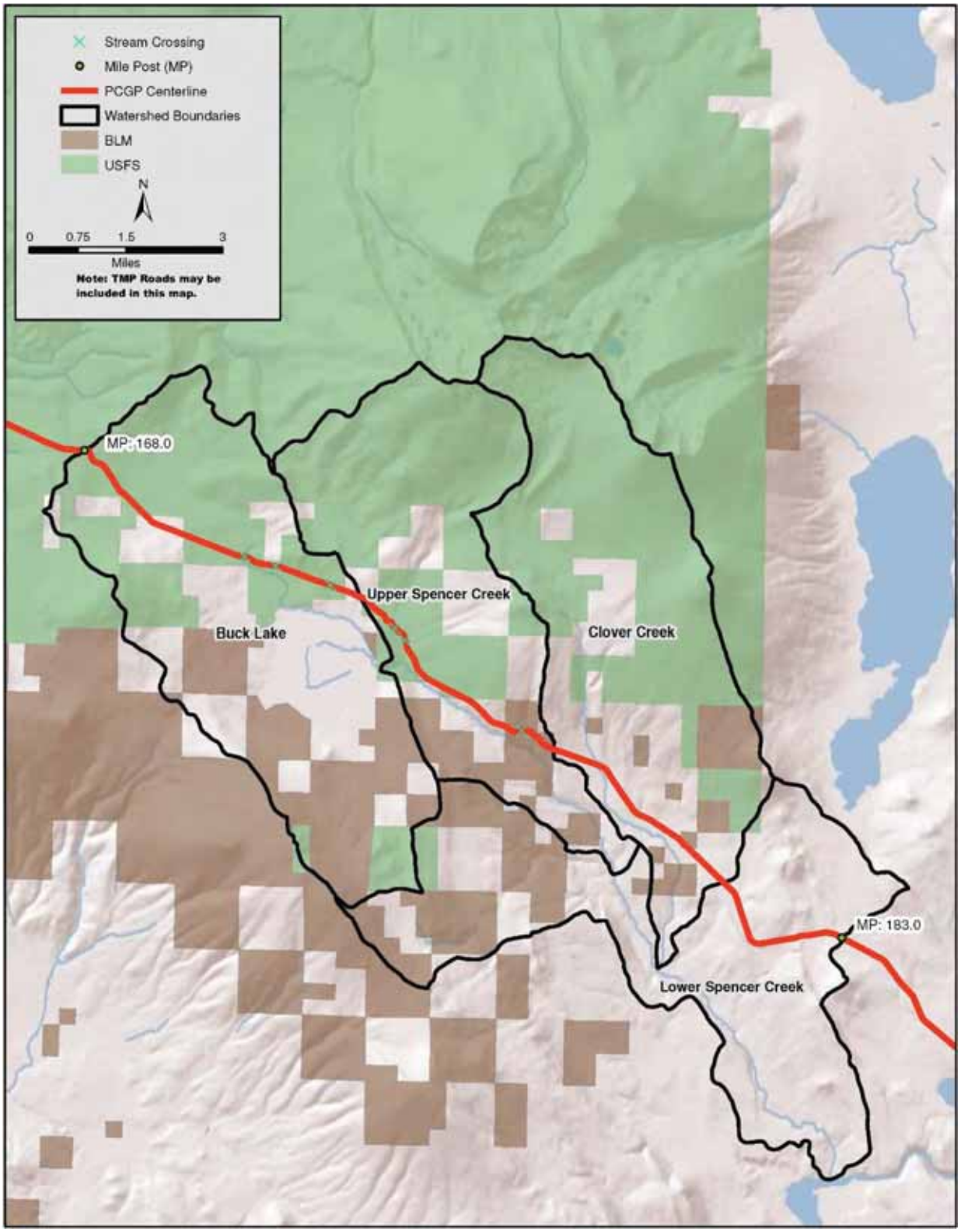


TABLE 2.6.3.1-1

Land Ownership (acres) and Federal Land Allocations (acres) in Spencer Creek watershed HUC 1801020601

Unit a/	Unit Total (acres)	Land Ownership (acres)				Federal Land Allocation (acres)						
						LSR b/		Matrix		Riparian Reserves c/		
		BLM	FS	Total BLM and FS	Other	BLM	FS	BLM	FS	BLM	FS	Total BLM and FS
Buck Lake	15,182.26	3,597.12	6,398.22	9,995.34	5,186.92		1,227.03	3,597.12	5,171.19	86.27	153.45	239.72
Clover Creek	14,094.78	1,182.13	8,461.83	9,643.96	4,450.82		2,169.71	1,182.13	6,292.12	28.35	202.94	231.29
Lower Spencer Creek	13,265.30	2,540.91	264.23	2,805.14	10,460.16			2,540.91	264.23	60.94	6.34	67.28
Upper Spencer Creek	11,704.41	1,431.11	7,198.75	8,629.86	3,074.55		1,922.42	1,431.11	5,276.33	34.32	172.65	206.97
Watershed Total	**54,246.75**	**8,751.27**	**22,323.03**	**31,074.30**	**23,172.45**	**0.00**	**5,319.16**	**8,751.27**	**17,003.87**	**209.88**	**535.38**	**745.26**

a/ All data derived from NSR-based GIS layers
b/ LSR acreage values may reflect small areas where BLM and USFS data overlap.. An additional 829 acres is in unmapped LSR associated with KOACs.
c/ Occur within LSR and Matrix Land Allocations. Riparian Reserves comprise approximately 2.4% of BLM and NFS lands in the watershed (Spencer Creek WA, p. 4-102)

TABLE 2.6.3.1.-2

PCGP Project Corridor (miles) and Project Area (acres) in the Spencer Creek watershed HUC 1801020601 by Land Ownership

Unit	Land Ownership																			
	BLM				NFS				Total BLM and NFS				Other				Entire Unit			
	Corridor Length (miles)	Project Area (acres)		% of BLM Land Impacted	Corridor Length (miles)	Project Area (acres)		% of NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of BLM and NFS Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Other Land Impacted	Corridor Length (miles)	Project Area (acres)		% of Unit Impacted
		Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified			Cleared	Modified	
Buck Lake					3.94	54.46	10.26	1.01	3.94	54.46	0.00	0.54	1.14	15.55	2.45	0.35	5.08	70.01	12.71	0.54
Clover Creek	0.15	1.90		0.16					0.15	1.90	0.00	0.02	3.31	41.56		0.93	3.46	43.46	0.00	0.31
Lower Spencer Creek									0.00	0.00	0.96	0.03	2.51	31.14		0.30	2.51	31.14	0.00	0.23
Upper Spencer Creek	0.89	12.96		0.91	2.13	27.15	0.96	0.39	3.02	40.11	10.26	1.67	1.07	15.73	0.21	0.52	4.09	55.84	1.17	0.49
Watershed Total	1.04	14.86	0.00	0.17	6.07	81.61	11.22	0.42	7.11	96.47	11.22	0.35	8.03	103.98	2.66	0.46	15.14	200.45	13.88	0.40

Draft

TABLE 2.6.3.1-3

PCGP Project Area (acres) on Federal Lands in the Spencer Creek Watershed (HUC 1801020601) by Agency and Land Allocation

		Federal Land Allocation															
		Designated LSR				Matrix				Riparian Reserves b/				All Allocations c/			
		Project Area (acres)		% of Total LSR in Unit		Project Area (acres)		% of Total Matrix in Unit		Project Area (acres)		% of Total Riparian Reserves in Unit		Project Area (acres)		% of Total Allocations in Unit	
Unit a/	**Agency**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Buck Lake	BLM																
	NFS					54.46	10.26	1.05	0.20	3.90		1.63		54.46	10.26	0.85	0.16
Clover Creek	BLM					1.90		0.16	0.00								
	NFS																
Lower Spencer Creek	BLM																
	NFS																
Upper Spencer Creek	BLM					12.96		0.91	0.00	2.11		6.15	0.00	12.96	0.00	0.91	0.00
	NFS					27.15	0.96	0.51	0.02	3.05	0.08	1.77	0.05	27.15	0.96	0.38	0.01
Watershed Total	**BLM**					14.86	0.00	0.17	0.00	2.11	0.00	1.01		12.96	0.00	0.15	0.00
	NFS					81.61	11.22	0.48	0.07	6.95	0.08	1.30	0.01	81.61	11.22	0.37	0.05
Total BLM and FS		**0.00**	**0.00**	**0.00**	**0.00**	**96.47**	**11.22**	**0.65**	**0.07**	**9.06**	**0.08**	**1.22**	**0.01**	**94.57**	**11.22**	**0.51**	**0.05**

a/ All data derived from NSR-based GIS layers.
b/ Occur within LSR and Matrix Land Allocations
c/ LSR and Matrix lands only

Draft

TABLE 2.6.3.1-4

Riparian Reserve Effects Spencer Creek Fifth Field Watershed HUC 1801020601

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/																				
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy d/
Buck Lake Subwatershed HUC 180102060102																													
WNF	168.31	ASI161	RR of lateral stream clipped	I	No	0.00		Yes				0.00				0.00		0.20		0.20		0.20		0.20	0.17	0.37	No	No
WNF	171.06	Spencer CreekEW085	Wetland swale, culverted under road	W	Yes	154.82	0.26	No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
WNF	171.06	Trib. to Spencer Cr and wetland EW085	small intermittent stream with associated wetland culverted under road	I	Yes	4.05		No	0.34			0.34	0.57			0.57			0.17	0.17	0.29	1.37		1.37	0.18	1.55	No	No
WNF	171.35	AW184	Large wetland complex south of Clover Creek Rd.	W	No	0.00	0.00	Yes	0.67			0.67				0.00				0.00		0.67		0.67		0.67	No	No
WNF	171.57	Trib. to Spencer Cr.	2' wide stream that fans out into a wetland/stream complex. (Incorrectly classified as a perennial stream)	I	Yes	4.05		No				0.00				0.00		0.33		0.33		0.33		0.33		0.33	No	No
WNF	172.03	GW008	Spiraea wetland	W	No	0.00	0.00	Yes	0.23			0.23				0.00				0.00		0.23		0.23		0.23	No	No
WNF	172.45	Trib. to Spencer Creek EW107 and wetland EW 105	Wetland/Stream	I	Yes	64.25		No	0.94			0.94				0.00				0.00	0.16	1.10		1.10		1.10	No	No
WNF	172.45	EW105	Adjacent to EW107 (Acres of RR included in EW 107)	W	Yes	0.00	0.16	No				0.00				0.00				0.00		0.00		0.00		0.00	No	No
Subtotal Buck Creek		Crossed: 3 Int. Channel RR	Clipped: 1 Int. Channel RR	8	5		0.42	3	2.18	0.00	0.00	2.18	0.57	0.00	0.00	0.57	0.00	0.53	0.17	0.70	0.45	3.90	0.00	3.90	0.35	4.25		

Draft

TABLE 2.6.3.1-4

Riparian Reserve Effects Spencer Creek Fifth Field Watershed HUC 1801020601

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/																			Anadromy d/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	
Subwatershed		2 Wetland RR	2 Wetland RR																									
Upper Spencer Creek Subwatershed HUC 180102060104																												
WNF	173.35	Trib to Spencer Creek	RR of lateral stream clipped	I	No			Yes	1.32			1.32				0.00				0.00		1.32		1.32		1.32	No	No
WNF	173.68	Trib to Spencer Creek	RR of lateral stream clipped	I	No			Yes				0.00	0.40			0.40				0.00		0.40		0.40		0.40	No	No
WNF	173.74	ESI106aTrib. to Spencer Creek	4' wide, snowmelt intermittent I stream	I	Yes	8.17		No				0.00	0.83			0.83				0.00		0.83	0.08	0.91	0.02	0.93	No	No
WNF	173.84	Trib to Spencer Creek	RR of lateral stream clipped	I	No			Yes				0.00	0.50			0.50				0.00		0.50		0.50	0.35	0.85	No	No
LV BLM	176.55	ESI069/GSI010Trib. to Spencer Creek	1' wide intermittent shrubbed stream Extension of ESI069' - wide, 2' deep.	I	Yes	2.02		No	1.91			1.91				0.00			0.17	0.17	0.03	2.11		2.11	0.10	2.21	Yes	No
Subtotal Upper Spencer Creek Subwatershed		Crossed: 2 Int. Channels	Clipped: 3 Int. Channel RR	5	2			3	3.23	0.00	0.00	3.23	1.73	0.00	0.00	1.73	0.00	0.00	0.17	0.17	0.03	5.16	0.08	5.24	0.47	5.71	1	0
Total Spencer Creek		Crossed: 5 Int. Channels 2 Wetlands	Clipped: 4 Int. Channel RR 2 Wetland RR	13	7		0.42	6	5.41	0.00	0.00	5.41	2.30	0.00	0.00	2.30	0.00	0.53	0.00	0.87	0.48	9.06	0.08	9.14	0.82	9.96	1	0
Total Forest Service		Crossed: 4 Int. Channels 2 Wetlands	Clipped: 4 Int. Channel RR 2 Wetland RR	12	6		0.42	6	3.50	0.00	0.00	3.50	2.30	0.00	0.00	2.30	0.00	0.53	0.17	0.70	0.45	6.95	0.08	7.03	0.72	7.75	0	0

Draft

TABLE 2.6.3.1-4

Riparian Reserve Effects Spencer Creek Fifth Field Watershed HUC 1801020601

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/ f/																			
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats d/	Gross Riparian Reserves	Fish Bearing	Anadromy d/
Total LV BLM		Crossed: 1 Int. Channel (Fish bearing in lower reaches)	Clipped: None	1	1			0	1.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.03	2.11	0.00	2.11	0.10	2.21	1	0

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams Where this occurs, the Riparian Reserve of the wetland is counted with the stream channel's to avoid double counting.
d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features, and are not considered as part of the Riparian Reserve vegetated area.
e/ "Anadromy" means that a stream contains anadromous fish, or that it is a tributary directly influences an anadromous stream.
f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings in the body of the table.

Draft

TABLE 2.6.3.1-5

Stream Crossing Turbidity and Crossing Risk Assessment

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Spencer Creek	Buck Lake	171.06	I	Small, ,10 feet wide stream associated with wetland swale	12	154.82	3.3	0.75	Erodible	silt	M	L	M	BLUE
Spencer Creek	Buck Lake	171.57	I	2' wide stream that fans out into a wetland/stream complex		4.05					L	I	I	BLUE
Spencer Creek	Buck Lake	172.45	I	Wetland/Stream	5	64.25	1.98		Highly erosion resistant	gravel	M	L	M	BLUE
Spencer Creek	Upper Spencer Cr.	173.74	I	4' wide, snowmelt ephemeral stream		8.17					I	I	I	BLUE
Spencer Creek	Upper Spencer Cr.	176.55	I	1' wide intermittent shrubbed stream Extension of ESI069' - wide, 2' deep	4	2.02	57.99		Erodible	gravel/ soil	M	L	M	BLUE

Sources:
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ lower case italic red letters are presumed ratings until field verified

Draft

2.6.3.2 Existing Conditions

Original watershed Analysis Findings

- At the time of the Spencer Creek watershed Analysis, there were 290 miles of roads in the watershed on BLM and NFS lands, which equals approximately 4 miles per square mile. In most areas, this density exceeds the 1.5 miles per square mile recommendation of the Spencer Creek Coordinated Resource Management Plan and both Forest Service and BLM land management plans (BLM et al. 1995: 4-124). The high density of roads is contributing to excess levels of sediment in Spencer Creek. There are 150 stream crossings and 23 miles of road within 100 feet of stream channels in the watershed (BLM et al. 4-150). Roads and areas of compaction decrease soil productivity, prolong the vegetative recovery process, and increase runoff potential. The density of roads also exceeds the recommended level for several wildlife species of concern, including deer and elk.

- Road densities and harvest have reduced near-term large woody debris recruitment and streamside canopy closure in many areas. In addition, there has been an increase in the amount of solar radiation and stream warming due to a reduction in shade and an increase in sediments.

- Spencer Creek and associated tributaries frequently do not meet State of Oregon Water Quality Standards for salmonid-bearing streams of the Klamath Basin. Spencer Creek may continue to exceed maximum summer water temperatures above 68°F (ODEQ Standard for redband trout streams) because the mainstem originates as outflow from a shallow wetland area (Buck Lake). Riparian disturbance and low flows influenced diurnal fluctuations may be a major cause for not meeting State of Oregon Standards for temperature in Spencer Creek. (BLM et al. 1995: ES-4).

- The exceedance of the temperature standard may be related to two major management changes in the watershed; increased disturbance of the riparian zone due to management practices and the draining and water diversion channeling of Buck Lake for livestock grazing (BLM et al. 1995: 4-143).

- The design of the road system in the Spencer Creek watershed has resulted in water being routed into the stream channel, possibly contributing to increases in peak flows (BLM et al. 1995: ES-4).

- Three changes in habitat condition were determined to be chronic and problematic for native fish in Spencer Creek: fine sediment, high temperature, and low flows. The significant causal mechanisms for reduced habitat quality are road crossings, streamside timber harvest, and channelization and grazing at Buck Lake (BLM et al. 1995: ES-4).

- Fire suppression has removed the natural disturbance regimes that would have acted to create openings and increase large woody debris input rates (BLM et al.:1995 4-158).

Changes in watershed Condition

The following projects responsive to the recommendations in the Spencer Creek Watershed Analysis have been completed by the BLM and Forest Service (table 2.6.2.2-1).

TABLE 2.6.2.2-1

Changes in Watershed Condition since publication of the Spencer Creek Watershed Analysis

Project Name	Administrative Unit	Treatments Completed
Lower Spencer Creek Forest Health Treatments	Klamath Falls Resource Area, Lakeview District BLM	3 Timber Sales were implemented in mid seral and mature stands designed to thin overstocked stands, reduce fuel hazards, increase stand resiliency, and promote pine recruitment to address the restoration opportunities identified in the watershed analysis.
Spencer Creek Riparian Treatments	Klamath Falls Resource Area, Lakeview District BLM	70-80 acres of hand cutting, piling, and burning within the Spencer Creek Riparian Reserve to reduce fuel densities and increase tree resiliency, particularly beneath older residual pines.
Upper Spencer Creek Watershed Treatments	Klamath Falls Resource Area, Lakeview District BLM	Placement of large woody debris (cull logs) into about 1.5 miles of a perennial stream channel done to dissipate stream energy, create localized sediment deposition, and increase habitat diversity (as discussed on pages 4 and 7 of the EA).
Upper Spencer Creek Watershed Treatments	Klamath Falls Resource Area, Lakeview District BLM	• 0.5 miles of road decommissioning ("permanent closure"); • 2.4 miles of road obliteration ("ripping" and seeding), including 0.6 miles within Riparian Reserves; • 0.8 miles of road construction (to facilitate obliteration of roads within Riparian Reserves); • 0.8 miles of road improvement (to facilitate obliteration of roads within Riparian Reserves and to restore hydrologic processes); • Installation of 2 gates to implement an administrative use closure on 0.5 miles of road; • Removal of 3 stream crossings (two culverts and one low-water crossing); and, • Placement of large woody debris (cull logs and directionally felled trees) into about 0.25 miles of an ephemeral/intermittent stream channel to dissipate stream energy, cause localized sediment deposition, and reduce channel incision ("headcutting").
Spencer Creek Restoration	Klamath Falls Resource Area, Lakeview District BLM	Placement of large woody debris (cull logs) into about 1.5 miles of a perennial stream channel done to dissipate stream energy, create localized sediment deposition, and increase habitat diversity (as discussed on pages 4 and 7 of the EA).
Spencer Creek Hook-up Road Culvert Replacement	Klamath Falls Resource Area, Lakeview District BLM	The existing nine foot diameter round culvert was replaced with a new, 20-25 foot diameter open bottom arch style culvert with a natural stream gravel and cobble substrate designed to meet fish and aquatic species passage criteria.
Spencer Creek Helicopter Log Placement	Klamath Falls Resource Area, Lakeview District BLM	Placement of approximately 170 logs (LWD) via helicopter into a 3.1-mile section of the Spencer Creek stream channel to: dissipate stream energy, create localized sediment deposition, and increase habitat diversity (as discussed on pages 4 and 7 of EA #OR-014-04-08).
Tunnel Creek Wetland Botanical Area Fence Addition	Klamath Falls Resource Area, Lakeview District BLM	Rebuild existing fence (approx. 1500 ft) to provide additional protection from livestock grazing during early spring and summer.
Spencer Creek Watershed Riparian Fence Reconstruction	Klamath Falls Resource Area, Lakeview District BLM	Construction/rebuilding of 5 livestock exclusion fences to better protect approx. 150 acres of BLM/ US Timberlands (JWTR) intermingled riparian areas within the Watershed.
Tunnel Creek DDR/DDRB Fuel Rx	Klamath Falls Resource Area, Lakeview District BLM	Prescribed burning of approx. 123 acres of mixed conifer and an aspen stand to reducer fuels that threaten the large tree component of the Tunnel Creek DDR and DDRB, and to remove competing conifers in the aspen stand
Clover Creek Rock Quarry Restoration DR	Klamath Falls Resource Area, Lakeview District BLM	The proposed action resulted in the removal of the quarry tailings pile, obliteration of the existing roads, and the restoration of the stream channel and riparian area.

Draft

TABLE 2.6.2.2-1 **Changes in Watershed Condition since publication of the Spencer Creek Watershed Analysis**		
Project Name	**Administrative Unit**	**Treatments Completed**
Miners Creek Culvert Removal and Road Decommissioning	Klamath Falls Resource Area, Lakeview District BLM	Two existing undersized culverts on Miners Creek were removed. The stream channel at the crossings was stabilized so that erosion potential and sedimentation are minimized. Rock and step pools were to be installed where necessary to stabilize sediment accumulated behind the culverts and to provide habitat and fish passage in the stream. A third rock step pool was installed at the mouth Miners Creek at Spencer Creek on private timberlands below BLM project area. The rocks on private timberlands would be installed to improve fish passage and prevent channel head-cutting. Approximately 1.2 miles of BLM road in the inner gorge of Miners Creek was obliterated and/or decommissioned. A total of 3.2 miles of road in Section 33 was obliterated or decommissioned. Roads affected were 38S-6E-33.02 (upper culvert) and #38-6E-33.04 (lower culvert). Approximately 0.3 miles of private commercial forestland road was decommissioned at the mouth of Miners Creek by installing roadblocks.
Buck Lake Pump Chance Fence	Klamath Falls Resource Area, Lakeview District BLM	Fence the spring/wetland area and existing pump chance with approximately .38 miles of fence to exclude livestock. The soil surface at a small livestock accessible water gap to be protected by stones and gravel.
Lakewoods WUI	Klamath RD, Winema NF	**Purpose:** Recreation management, Vegetation management (other than forest products), Fuels management, Special use management **Activities:** Forest vegetation improvements, Fuel treatments (non-activity fuels). Fuels thinning/piling/burning.
Spencer Creek Fences	Klamath RD, Winema NF	**Purpose:** Wildlife, fish, Rare Plants, Grazing Management. **Activities:** Species habitat improvements, grazing structural improvements.
Spencer Creek Fence Project – Part II	Klamath RD, Winema NF	**Purpose:** Wildlife, fish, Rare Plants, Grazing Management. **Activities:** Species habitat improvements, grazing structural improvements.
Clover Creek Fish Passage Culvert	Klamath RD, Winema NF	**Activities:** Replace undersized culvert on through fill with arch fish passage culvert. T38S R5E Sec. 3 SE/SE (Keno Access Road)
Spencer Creek Fish Passage	Klamath RD, Winema NF	**Activities:** Removed two channel spanning rock check dams set by dispersed recreation users to restore fish passage at the Spencer Creek dispersed camping site at outlet of Buck Meadows.
Spencer Creek Dispersed Campground	Klamath RD, Winema NF	**Activities:** Large section of the campground immediately adjacent to Spencer Creek was closed to vehicle access with boulder barriers allowing bar, compacted areas to fully revegetate. Dispersed camping area was fenced to exclude cattle from Buck-Indian Allotment allowing area to revegetate.
Fremont-Winema National Forests Motorized Travel Management Project Environmental Assessment	Klamath RD, Winema NF	The decision applies to all National Forest System lands managed by the Forest, including the Spencer Creek watershed. Result of the decision is to improve water quality by reducing impacts from existing roads.

Current watershed Conditions

Spencer Creek is 303(d) listed by the State of Oregon for biological criteria, sedimentation, and temperature (ODEQ 2010 database). Ongoing restoration efforts in Spencer Creek have improved watershed conditions at the locations where those projects occurred, however the issues of fine sediment and stream temperature described in the watershed assessment remain valid. This is reflected in the Forest Service Condition Class Rating for the Buck Creek Subwatershed is "Functioning, At Risk". Water quality ratings were "Not Properly Functioning" (See Attachments:

Section 3.3.2). Despite the temperature and fine sediment issues, Spencer Creek is a highly productive spawning and rearing habitat for rainbow/redband trout. Spencer Creek temperatures are low during spring (<15°C) and are generally below 18°C, but can exceed 20°C for periods of extended during summer months (BOR, 2013). Aquatic and riparian monitoring as part of the NWFP noted improving watershed condition trends in all of the subwatersheds of Spencer Creek (See Attachment: Section 3.3.3).

2.6.3.3 Natural Disturbance Processes

Disturbance processes for the Spencer Creek watershed are consistent with those described for the High Cascades Province in Section 2.1.4. The disturbance agent that had the most historic influence on ecosystems within the mixed conifer and ponderosa pine zone was fire (Agee 1993, cited in BLM et al. 1995). Studies cited in the Spencer Creek watershed analysis found an average fire-return interval of that probably ranged from 10-60 years. Fires tended to be frequent and of moderate to low intensity that created a mosaic of burned and unburned areas.

Both Native American and lightning ignitions were important sources of fire. Native Americans burned these forests regularly and somewhat altered the successional development of the vegetative communities. Within both the mixed conifer and ponderosa pine zone the intensity of these historic fires was usually low because the frequent fires repeatedly removed understory ladder fuels and consumed the forest floor fuels.

Within the Spencer Creek watershed, historic insect epidemics from bark beetles (Dendroctunus spp., Ips spp., and Scolytus ventralis) moderately influenced the forests within this zone. Root rots and diseases (Heterobasidion annosum, Armillaria ostoyae, and Leptographium wageneri; blackstain) likely caused small-scale disturbances within the watershed in this zone (Scharpf 1993). Indian paint fungus (Echinodontium tinctorium) was also an important small-scale disturbance within this zone. No significant windthrow events are known to have occurred within the watershed except for minor events involving a small number of trees.

Most precipitation falls as snow in the Spencer Creek drainage, and snowmelt dominates the hydrograph. In most years, snow melts slowly and percolates into the soil without generating peak discharge events. Warm spring rains can add to snowmelt peaks and on average do so two or three years out of every ten (BLM et al .1995). Though rare, high intensity rain-on-snow events do occur in Spencer Creek and can generate large peak flows. Historically, Buck Lake buffered these flows to some degree.

During large infrequent peak flow events, the stream spreads out in overflow channels or is directed toward the upper banks, resulting in high erosion rates. Historically, these processes form a pol riffle system. Due to the high gradient the frequency of pool-riffle sequencing was approximately three to seven channel widths; increasing in frequency with higher gradient. Large wood was a major factor in quantity of pools. Large wood also created dam pools upstream and slowed velocity allowing for the deposition of gravels. Beaver dams also helped to create this pool-riffle structure. This structure trapped sediments.

The amount and proportion of fine sediments entering Spencer Creek was historically low, and floodplain areas, the wetland at Buck Lake, large woody debris, beaver dams and pools and floodplain deposition all functioned to capture and store fine sediments. From this it is concluded

that the quantity and quality of productive spawning gravels was relatively high. Clean bedload sediments, and other stream substrate contributed to a diverse and resilient macroinvertebrate community (BLM et al.: 1995: 156). Historically, water quality in the Spencer Creek watershed was likely high. Water quantity was more likely a limiting factor for salmonids and other aquatic biota.

2.6.3.4 Project Effects and Natural Range of Variability

Based on the Spencer Creek Watershed Assessment, there are two areas of concern related to the project effects of the Pacific Connector corridor in Spencer Creek and whether those effects would be outside the range of natural variability for affected resources in the watershed.

1: Whether the clearing for the project would cause excessive erosion and sediment deposition that would adversely impact any of the affected streams. Sediment levels throughout the Spencer Creek system are limiting and excess or chronic fine sediment deposition in streams is a significant cause for concern.

GeoEngineers completed a stream crossing turbidity, construction risk and site response analysis (Section 1.3). Evaluations for stream channel crossings in the Spencer Creek watershed are summarized in table 2.6.2.1-5. BMP's that would be applied at each crossing, grouped by "Blue" (low risk) and "Yellow" (moderate risk) construction impact risk ratings are shown in table 2.6.2.1-1. All of the crossings in Spencer Creek are rated as "Blue" or low risk for construction impacts.

All stream crossings on federal lands in Spencer Creek are intermittent, snow-melt driven streams. Best Management Practices from the "Blue" category in table 2.6.2.1-1 would be applied at these channel crossings. The upper three crossings (MP 171.06, 171.57, 172.48) drain into wetland features directly below the Spencer Creek road, or into the large Buck Lake complex of channels. The remaining two crossings (MP 173.74 and 176.55) are intermittent tributaries of Spencer Creek.

In all crossings,

- Silt fencing would be installed and maintained until effective ground cover is reestablished. Silt fences are greater than 90 percent efficient at trapping silt (Robichaud et al, 2002).
- Effective ground cover would be in place prior to the onset of seasonal precipitation (table 2.6.2.4-1)
- Rapid reestablishment of vegetation would be emphasized.

These are all proven and effective erosion control and water quality Best Management Practices. Based on site-specific evaluations and field reviews (GeoEngineers, 2011), these measures are expected to be effective. If the Pacific Connector project is constructed, sediment impacts are expected to be minor, short term and consistent with the evaluation in Section 1.3.1. Long term adverse consequences on water quality from soil erosion are not expected to occur because of establishment of effective ground cover (table 1.3.1.2-1), implementation of the ECRP which includes revegetation of disturbed areas and installation of waterbars to disperse water.

While on-site erosion control measures are expected to be effective, the presence of wetland features below three of the crossings (MP 171.06, 171.57, 172.48) provide additional backup for filtering of any fine sediment that may enter stream systems from these crossings.

2: Whether removal of effective shade may increase water temperatures in streams.

There are five stream crossings in Spencer Creek where Riparian Reserve vegetation would be cleared. All are intermittent channels. Channel crossings of intermittent streams are not expected to affect water temperatures because these streams would likely be dry or become discontinuous by the time that warmer water temperatures become an issue in late summer. (See Section 1.3.1.3).

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on BLM and NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75 foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right of way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right of way clearing on stream temperatures. Given that mitigation for loss of effective shade would occur, and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field (GeoEngineers 2013f: 26).

TABLE 2.6.2.4-1

Pacific Connector Proposed BMPs for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**171.06, 171.57, 172.45, 173.74, 176.5**	None	None
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3,4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)

Draft

TABLE 2.6.2.4-1

Pacific Connector Proposed BMPs for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for all other crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Streambanks	• Revegetation with native plant materials (3, 4,6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) • Bank graded/terraced to 3:1 (2,3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control Best Management Practices including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2,3,4) Narrowed permanent management corridor (2,3,4) • Revegetation with native plant materials (3, 4,6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (Federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) Widened riparian corridor (Federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Source	1. FERC Guidelines 2. FEIS, JPA, Appendix C, Project Description 3. JPA Appendix 1B, ECRP 4. JPA Appendix F, Affected Waters, Section 2.1.8.3 5. JPA Appendices 2C, 2D 6. JPA Appendix H, Compensatory Mitigation Plan Agency Representatives of the BLM and Forest Service may require additional measures necessary to meet Agency Standards under the terms of the Right of Way Grant.		

Draft

TABLE 2.6.1.4-2

Project Effects and Relevant Ecological Processes Described in the Spencer Creek Fifth Field Watershed Assessment

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Spencer Creek is a High Cascades Province pumice soils landscape with high infiltration rates. Erosional process in Spencer Creek are dominated by spring snowmelt. Landform processes such as landslides, debris flows, and rill and gully erosion are, for the most part, rare and isolated on steep slopes of Aspen Butte, Mt. Carmine and Crater Mt. (BLM et al. 1995, p. 4-157) Warm spring rains may occasionally (2-3 years out of 10) may cause accelerated snowmelt and higher flows, but these rarely result in channel forming events. Infrequent high intensity rain on snow peak flow events caused pulses of sediments, primarily from bank erosion that created complex pool and riffle aquatic environments. Beaver dams / pools and large wetland complexes (e.g. Buck Lake) created sinks that trapped fine sediments. These processes in Spencer Creek have been altered primarily by roads, which serve as a chronic source of fine grained sediment. Also, draining Buck Lake and irrigation / drainage ditch maintenance contribute sediment. Erosion from timber harvest and skid trails have little effect on channel conditions (BLM et al. 1995, p. 4-153)	The Pacific Connector project does not cross any steep slopes that are prone to landslide or gully erosion. The project location in Spencer Creek is all on gentler landscapes where water tends to percolate into the ground. On these terrains, hillslope roughness is sufficient to slow water velocity causing any mobilized sediment to "drop out" before reaching streams (BLM et al. 1995, p. 4-153). Erosion control measures are expected to be effective in minimizing sediment sources and transport. Any effects of the Pacific Connector project are expected to be within the range of natural variation for the Spencer Creek watershed.
Ecological Succession / Vegetative Condition	Historically, Spencer Creek had a high frequency of fire occurrence that created a complex mosaic of stands that had an open stand structure. Large, high intensity fires were rare.	The PCGP affects 14.86 acres (0.17%) of BLM lands and 81.61 acres (0.4%) of NFS lands in the Spencer Creek watershed (table 2.6.2.1-2). Approximately 2.11 and 6.95 acres of Riparian Reserve vegetation would be cleared respectively on BLM and NFS lands (table 2.6.2.1-4). Combined, this is 1.2% of the Riparian Reserves on federal lands. Of this, approximately 5.41 acres is LSOG forest. The remainder (3.65 acres) is early and mid seral forest or non-forested wetlands (< 1 acre). The clearing of LSOG and mid-seral vegetation are long-term changes in vegetative condition. Given the fire history (see Section 2.6.1.3) of Spencer Creek, this is well within the range of natural variability for the watershed.
Flow Regime	Flow regimes in Spencer Creek were largely driven by the snowmelt cycle, and less so by changes in vegetation associated with fires because fires were frequent and of low to moderate intensity. Large wetland features buffered minor changes in flows.	The Pacific Connector project affects 0.4% on NFS lands, 0.17% of BLM lands and 0.40% of all lands in the watershed (table 2.6.2.1-2). Given the vegetation mosaic in the watershed, the high infiltration rates of soils, the large buffering capacity provided by adjacent wetlands and the small proportion of the watershed affected by the project it is highly unlikely that the Pacific Connector project would alter flow regimes in any way. See also EIS Section 4.4.

Draft

TABLE 2.6.1.4-2 **Project Effects and Relevant Ecological Processes Described in the Spencer Creek Fifth Field Watershed Assessment**		
Ecological Processes Relevant to the PCGP	**Historic Range of Variability**	**Pacific Connector Effects**
Stream Temperature	The aspect of the perennial portion of Spencer Creek is primarily southeast. This exposure provides high incidence of solar radiation compared to many drainages in the Cascade province which tend to run east or west. This makes this portion of the stream channel susceptible to increases in water temperatures from loss of shade. Buck Lake likely caused some warming from increased solar radiation. Historic tree composition and valley form indicate that approximately 75 percent of the perennial streams (excluding Buck Lake) probably had 40 to 70 percent canopy closure. The remaining 25 percent, areas with broad flood plains and meadows, is presumed to have had a mixture of cottonwoods, willows, and scattered lodgepole pine patches. Water temperatures in these reaches were probably never in excess of levels considered detrimental to fish populations. Areas susceptible to very low flows were probably subject to short term high temperatures and high diurnal fluctuations in water temperature (BLM et al. 1995:4-155). Stream temperatures have been altered primarily by shade removal associated with roads and timber harvest and by changes in channel morphology that have resulted in high width to depth ratios and a lack of large wood. Spencer Creek is currently 303(d) listed for water temperature.	There are five intermittent stream crossings in Spencer Creek where Riparian Reserve vegetation would be cleared. Channel crossings of intermittent streams are not expected to affect water temperatures because these streams would likely be dry or become discontinuous by the time that warmer water temperatures become an issue in late summer. (See Section 1.3.1.3). Also, the upper three crossings (171.16, 171.57, 172.45) drain into the Buck Lake wetland complex where exposure to solar radiation would mask any temperature increase.
Aquatic Habitat and Stream Channel Complexity	Channel complexity in Spencer Creek was likely high because of large wood present in stream channels and beaver activity. Channel structure was sinuous with high pool to riffle ratios and gravels that were relatively free of fine sediments.	During construction, the project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their pre-construction condition and stabilized as needed by placement of boulders, LWD and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale, and are minor and short-term (typically 1 to 2 days per crossing).

2.6.3.5 Compliance with Standards and Guidelines

Table 2.6.2.5-1 describes RRNF/NWFP standards and guidelines relevant to the ACS, the related BLM management direction as provided in the Klamath Falls Resource Area, Lakeview District RMP, and PCGP compliance with this management direction in the Spencer Creek Watershed.

Draft

TABLE 2.6.2.5-1 **Cross References between ACS-Relevant NWFP Standards and Guidelines and BLM District RMP Management Direction**		
Klamath Falls Resource Area (Lakeview District) RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
Riparian Reserves - Lands, pg. 16, para. 2	LH-4: Riparian Reserves	Terms and conditions to assure compliance with ACS objectives have been incorporated into the BLM Right-of-Way grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan (TMP), the Right-of-way Clearing Plan, the Traffic Management Plan etc.
Riparian Reserves - General Riparian Area Mgmt., pg. 17, para. 4	RA-4: Riparian Reserves - General Riparian Area Mgmt.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Spencer Creek watershed, therefore the biological, physical, and chemical integrity of these systems would remain unaffected from hydrostatic withdrawal activities.
Riparian Reserves - Roads Mgmt., pg. 14, para. 2	RF-2: Riparian Reserves - Road Mgmt.;	The existing transportation system in the Spencer Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Spencer Creek watershed.
Riparian Reserves - Roads Mgmt., pg. 14, para. 4	RF-4: Riparian Reserves - Road Mgmt.;	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications and TMP Section 2.2.3 and TMP Exhibit F, Section F.9.e which require culvert and bridge replacements to meet Agency standards and Agency approval of plans.
Riparian Reserves, Roads Mgmt., pg. 14, para. 5	RF-5: Riparian Reserves - Road Mgmt.;	Road maintenance specifications T-831, T-842, T-811 and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction. Several road improvement projects and road decommissioning are proposed in the Spencer Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
Riparian Reserves - Roads Mgmt., pg. 14, para. 6	RF-6: Riparian Reserves - Road Mgmt.;	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
Riparian Reserves - Roads Mgmt., pg. 14, para. 7	RF-7: Riparian Reserves - Road Mgmt.;	The TMP meets all of the requirements of RF-7.
Riparian Reserves - Watershed & Habitat Restoration, pg. 17, para. 3	WR-3: Riparian Reserves - Watershed & Habitat Restoration;	Application of Best Management Practices and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.		NFS and BLM lands in the Spencer Creek Watershed are currently 26% LSOG and exceed this threshold.

Draft

TABLE 2.6.2.5-1 **Cross References between ACS-Relevant NWFP Standards and Guidelines and BLM District RMP Management Direction**		
Klamath Falls Resource Area (Lakeview District) RMP Management Direction	**NWFP Standard / Guideline**	**PCGP Compliance**
BLM / FS 1. Management Recommendations for Survey and Manage Species		Management direction for Survey and Manage Species in BLM RMPs was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.). The Pacific Connector project cannot meet the Management Recommendations for Survey and Manage species, and an amendment of BLM and Forest Service management plans is required. This amendment waives application of Management Recommendations so long as there is reasonable assuredness that the affected species would persist in the range of the northern spotted owl.
WNF 4 - The forest wide general standard and guideline requires detrimental soil conditions not exceed 20 percent of the total acres within the activity area (Forest Plan page 4-73) a		The Pacific Connector project cannot meet this standard, and an amendment of the Winema land management plan is needed. This amendment allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction on an estimated 30 acres within the project right-of-way. Detrimental soil conditions occur when soil is compacted, puddled, displaced over an area greater than 100 square feet, or are severely burned.
WNF 5 - Management Area 8 – Riparian Areas requires the cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area (Forest Plan page 4-137).		The Pacific Connector project cannot meet this standard. This amendment allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction on an estimated 4 acres within the project right-of-way that lies within Management Area 8 Riparian Area. Detrimental soil conditions occur when soil is compacted, puddled, displaced over an area greater than 100 square feet, or are severely burned.

Compliance with Standards and Guidelines for Key Watersheds

Spencer Creek was delineated as a Tier 1 Key Watershed in the NWFP. Applicable Standards and Guidelines for Key Watershed and PCGP consistency is shown in table 2.6.2.5-2.

TABLE 2.6.2.5-2 **Standards and Guidelines for Key Watersheds**		
Standard and Guideline	**PCPG Consistency**	**Mitigation Plan**
Reduce existing system and nonsystem road mileage, with no net increase in road miles	No new roads would be constructed by PCGP. The construction corridor would be obliterated after construction.	Decommissioning of approximately 21 miles of road would on NFS lands would result in a net decrease of road miles and reduce road density in the Tier One Key Watershed.
No new roads would be constructed in inventoried Roadless Areas.	No part of the PCGP is in an inventoried Roadless Area.	None
Watershed Analysis must be completed prior to management activities.	Watershed Analysis has been completed for all watersheds crossed by the PCGP on BLM and NFS lands.	Off-site mitigations are consistent with watershed Analysis recommendations

Relationship of Proposed Forest Service Land Management Plan Forest Plan Amendment to the ACS

The Winema National Forest Land and Resource Management Plan contains standards and guidelines that cannot be met by the Pacific Connector project. Two of these standards and guidelines have a nexus with the ACS because they provide protection for aquatic resources that are more restrictive than the NWFP. Site-specific amendments of these standards and guidelines are proposed to make provision for the Pacific Connector project. This discussion addresses whether those plan amendments would prevent attainment of the ACS.

WNF-4 and WNF-5: Amendments of Detrimental Soil Standards

These Standards and Guidelines restrict the amount of an area that may be in a degraded soil condition as a result of a management activity. They are considered together here because the assessment is the same for both standards.

> The forest wide general standard and guideline requires detrimental soil conditions not exceed 20 percent of the total acres within the activity area (Forest Plan page 4-73) and Management Area 8 – Riparian Areas requires the cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area (Forest Plan page 4-137). Detrimental soil conditions occur when soil is compacted, puddled, displaced over an area greater than 100 square feet, or are severely burned.

The PCGP would likely result in a degraded soil condition in an estimated 30 to 70 percent (20-57 acres) of the project right-of-way on NFS lands in the Spencer Creek Watershed due to displacement and compaction following completion of corridor construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing Forest Plan Standards and Guidelines allow up to 10 percent of the PCGP corridor in MA-8 Riparian Areas or 20% (15 acres) in the PCGP corridor outside of MA-8 to be in a degraded soil condition on completion of a project. Thus, PCGP would likely exceed this threshold by 5-42 additional acres or 0.04% to 0.18% of the 22,307-acres (USFS lands only) within the Spencer Creek watershed on completion of the project. About 1-2 acres of degraded soil conditions above LRMP thresholds of 10% may be in MA-8 Riparian Areas after construction and site restoration are completed.

Without rehabilitation, severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions may have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery.

Environmental consequences associated with 20-57 acres (about 0.13% of NFS lands in the watershed) of additional detrimental soil conditions include:

- **A potential increase in sediment mobilization**. The following measures have been incorporated into the project design or mitigation plans to limit sediment mobilization and transport.

- The PCGP route was selected to avoid areas with high risk of geologic hazards. No landslides have been identified that pose a threat to the project. The PCGP does not cross unstable earthflow terrains in Spencer Creek.
- Effective erosion control measures and Best Management Practices are required as shown in the ECRP. (See Section 1.3 for a discussion of erosion control measures.) Additionally, the PCGP would comply with Forest Plan Standards and Guidelines for maintenance of effective ground cover (Section 1.3.3.1).
- The Spencer Creek watershed analysis documented that skid trails and harvest units rarely contribute sediment to channels because the roughened soil surface and inherently high infiltration rates limit sediment transport (BLM et al. 1995: 4-153). The Pacific Connector corridor upon completion would have conditions similar to a harvest unit so similar results would be expected.
- Offsite mitigation measures that would help to offset these effects on NFS lands in the Spencer Creek watershed include approximately 21.45 miles of road decommissioning. Assuming a 14 foot average road width, 21.45 miles of proposed road decommissioning would reduce compaction and revegetate approximately 36.4 acres (21.45*5280*14/43560=36.4 Acres) that are currently native road surfaces in the Spencer Creek Watershed. This action substantially offsets any areas that may remain in a detrimental soil condition (an estimated 20-57 acres) in the project corridor.

As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, the required application of Best Management Practices, minimal stream crossings, and application of offsite mitigations any sediment impacts from detrimental soil conditions are expected to be minor and short term. It is highly unlikely that amending the Forest Plan to exceed the soil disturbance thresholds on 20 to 57 acres would result in the mobilization of sediment that would prevent attainment of ACS objectives in Spencer Creek.

- **A potential localized increase in peak flows.** Changes in vegetation from fires, altering wetland functions, clearing vegetation and roads are known to affect peak flows. Loss of wetland functions and roads were identified in the Spencer Creek Watershed Analysis as the primary factors affecting peak flows. Changes in vegetation from timber harvest appear to have little effect on peak flow processes (BLM et al. 1995: 4-147). The Pacific Connector project as a whole affects about 82 acres or 0.42% of the NFS lands in the Spencer Creek watershed. Detrimental soil conditions are likely to exist on 20-57 acres or about 0.13% of NFS lands in Spencer Creek. These effects would be spread over 6 miles of corridor in two separate subwatersheds. Given the snowmelt driven hydrograph and high infiltration rates of soils in Spencer Creek, it is highly unlikely there would be any change in peak flows as a result of construction of the corridor or detrimental soil conditions.

  It is highly unlikely that amending the forest plan to allow detrimental soil conditions on 20-57 acres would result in any change in flows that would prevent attainment of ACS objectives.

- **A potential loss of site productivity, which may slow vegetative recovery.** Soils derived from High Cascade volcanics may be low in productivity. Mechanically decompacting the soil to a minimum depth of 20 inches and re-establishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. PCGP mitigation measures would be used to decompact the corridor, fertilize disturbed areas, re-establish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and coarse woody debris back across the site to provide for long-term nutrient cycling as required in the ECRP. Any loss of soil productivity would be widely dispersed in the corridor. Additionally, decommissioning 21.45 miles of roads (estimated to be 36.4 acres of running surface) on NFS lands would contribute to offsetting any loss of soil productivity by restoring vegetative cover and organic material and reestablishing drainage on currently bare and compacted soils.

  Upon completion of the construction phase, slash and coarse woody debris would be scattered back across the corridor to provide organic material. Additionally, in areas where revegetation may be difficult because of soil conditions, the BLM and Forest Service would require soil remediation with wood chips and biosolids to reestablish soil productivity. This is a proven method of soil remediation in SW Oregon (Orton 2007).

Conclusions:

Amendments WNF-4 (Detrimental Soil Conditions) and WNF-5 (Detrimental Soil Conditions in Riparian Areas) have allow minor effects at the site scale. It is highly unlikely that those effects would prevent attainment of ACS objectives in the Spencer Creek Watershed

2.6.3.6 Off-Site Mitigations on BLM and NFS Lands

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management plan objectives are achieved. These projects also contribute to the "Maintain and Restore" objectives of the ACS. The BLM, Forest Service, and PCGP have entered into Agreements in Principle to accomplish off-site mitigation work in the Spencer Creek Watershed as shown in table 2.6.2.6-1.

Mitigation measures were developed from the recommendations of watershed assessments, late successional reserve assessments and the 2008 Northern Spotted Owl Recovery Plan. Proposed mitigation measures in the Spencer Creek watershed with a nexus to the ACS include:

LWD Instream

Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010) This is responsive to Aquatic Conservation Strategy objectives 2, 3, 4 and 5.

Road Surfacing and Drainage Repair

Road surfacing reduces sediment by capping existing fine textured sediments in the running surface of a gravel road with coarser rock or by paving. Paving all but eliminates traffic-generated sediments. Drainage repair reestablishes out-sloping, cross-drains and in some cases ditchlines to ditch-relief culverts. These actions have the effect of getting water off the road before it can enter streamcourses. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b: B-11, C-7)

Road Decommissioning

Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the PCGP occur. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b: B-11, C-7)

Fish Passage / Culvert Replacement

Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS Objectives 1, 2, 3 and 9.

Fuels Reduction

Use of fuels reduction and stand density management are appropriate tools to reduce the risk of high intensity stand replacement fires in these forests. Management activities that reduce the risk of natural disturbance adjacent to Known Owl Activity Centers is also appropriate (Forest Service and BLM 1994b: C-11). The Spencer Creek Watershed Analysis also recommended fuels reduction projects on most landscapes Stand density reductions in riparian zones have the dual benefit of reducing the risk of stand-replacing fire, while also accelerating the development of late successional stand conditions by accelerating growth of remaining trees. This is responsive to ACS objective 8 and 9.

BLM Lands

The PCGP project crosses portions of the Upper Spencer Creek and Clover Creek subwatersheds on BLM lands in the Spencer Creek watershed. The Upper Spencer Creek subwatershed is in the Tier One Spencer Creek Key Watershed. The Clover Creek Subwatershed lies in the Clover Creek Tier Two Key watershed.

Aquatic Conditions and Issues

- Road-related sediment has degraded aquatic habitats in Spencer Creek. Road decommissioning, stormproofing and surfacing would contribute to reducing road-related sediments in aquatic systems.

- High temperatures, habitat modification and sediment are key aquatic issues.

Terrestrial Conditions and Issues

- Risk of stand – stand replacing fire and attendant impacts on LSOG forest habitats, riparian reserves and aquatic ecosystems is a significant issue in the Spencer Creek watershed.
- Fragmentation from past logging and high road densities have impacted terrestrial habitats.
- Less fire resistant early and mid-seral plant communities have increased and more fire resistant late-successional-old-growth stands have decreased relative to the historic conditions.

NFS Lands

The PCGP crosses portions of the Buck Lake and Upper Spencer Creek subwatershed on NFS Lands in the Spencer Creek watershed. All of the NFS lands in the Spencer Creek watershed are classified as a Tier One Key Watershed. Standards and Guidelines for Tier One Key Watersheds overlay all other land allocations. Figure 2.6-2 shows mitigation proposed on NFS lands.

Aquatic Conditions and Issues

Spencer Creek is 303(d) listed by the State of Oregon for biological criteria, sedimentation, and temperature (ODEQ 2010 database). Roads are the primary source of fine sediments that negatively impact aquatic habitats. There are 150 road crossings and 23 miles of road within 100 feet of stream channels within the watershed. Roads and areas of compaction decrease soil productivity, prolong the vegetative recovery process and increase runoff potential. Road densities and harvest have reduced near term large woody debris recruitment and stream side canopy closure in many areas. Streamside timber harvest and channelization and grazing at Buck Lake (mostly private property) have also affected aquatic resources. Fuel accumulation and dense white fir ladder fuels have increased the risk of high-intensity stand replacement fire in Riparian Reserves.

Terrestrial Conditions and Issues

Road density exceeds the recommended level for several wildlife species of concern, including deer and elk. Due to the distribution of blocks of late successional forest, habitat connections are minimal between large late-successional forest patches occurring within the watershed. This may restrict the movement and dispersal of some late-successional dependent wildlife species through the watershed. Fuel accumulation and dense white fir ladder fuels have increased the risk of high-intensity stand replacement fire.

Table 2.6.2.6-1 describes proposed mitigation measures on BLM and NFS lands that are responsive to these conditions and issues.

Proposed Mitigation Projects

Table 2.6.2.6-1 describes proposed mitigation projects on BLM and NFS lands and provides an analysis of effects. Figure 2.6-2 provides a map of proposed mitigation activities on NFS lands. Figure 2.6-3 provides a comparison of selected project impacts and compensating mitigations on BLM lands. Figures 2.6-4 and 2.6-5 provides a comparison of the project impacts to the effects of compensating road decommissioning on NFS lands.

TABLE 2.6.2.6-1

Proposed Offsite Mitigation Projects on BLM and NFS Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
BLM	Riparian Vegetation Stand Density	Tributary Creek Riparian Thinning	70	acres	Spencer Creek is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. Thinning would restore forest health and diversity in riparian reserves and stands near streams that are currently overstocked. Thinning would be done in a way that emulates the natural "patchiness" of disturbance events.	Riparian Reserves
BLM	Riparian Vegetation Riparian Stand Density	Upper Spencer Creek LSR/ Riparian Treatment	3	miles	Spencer Creek is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. This project would thin, pile and burn dense white fir understory vegetation and fall occasional trees into the stream channel for LWD. This would enhance forest health and diversity with the LSR/Riparian Reserve by restoring stand density to more natural and sustainable levels. This contributes to forest health and sustainability of riparian reserves by increasing resistance to insect and disease losses and reducing the risk of stand replacing fire. LWD in stream channels contributes to meeting water quality and TMDL targets and provides habitat for sensitive fish and invertebrate species.	Riparian Reserves and LSR
BLM	Riparian Vegetation Riparian Stand Density	Miners Creek LSR, Riparian Treatment	3	miles		Riparian Reserves
BLM	Road Closure Road Sediment Reduction	Spencer Creek Repair Existing Road Closure	12	sites	Roads negatively impact wildlife. Implementation of the PCGP project would require use of a large number of permanent and temporary roads and other access routes. Road closures (barricades) were established in the watershed to reduce road density to meet Resource Management Plan objectives for both the aquatic conservation strategy and reduce impacts to wildlife. This project repairs the existing closure structures to ensure that road closures remain effective. Spencer Creek is a Tier One, Key Watershed. Maintaining road closures also reduces sediment by keeping closed roads revegetated.	Riparian Reserves
BLM	Road Sediment Reduction	Spencer Creek Drainage Improvements and Sediment Trap Removal	15	sites	Spencer Creek is a Tier One, Key Watershed. The project uses a number of roads for access and construction. Drainage improvements and removing non-functioning cross drains and sediment traps at selected locations would benefit aquatic habitat/connectivity by restoring drainage and reducing sediment transport.	Riparian Reserves
BLM	Road Sediment Reduction	Keno Access Road Repair and Culvert Replacement	1	site	Spencer Creek is a Tier One, Key Watershed. The existing stream crossing (culvert) is undersized in both length and diameter, therefore it ability to meet ACS objectives is minimized. The culvert underlying the existing road bed periodically causes erosion of the road prism and adjacent upland and riparian areas. Replacement of the culvert would allow stabilization of the road shoulder and reduce sediment input to Miner's creek and its contribution of sediment to Spencer creek. If this work is not completed, the condition would eventually lead to increased sedimentation. Replacement of this drainage structure would decrease road-related erosion, increase the hydrologic capacity of the crossing and enhance aquatic connectivity for fish and other aquatic organisms.	Riparian Reserves

Draft

TABLE 2.6.2.6-1

Proposed Offsite Mitigation Projects on BLM and NFS Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
BLM	Stand Density / Fuels Reduction	Upper Spencer Creek LSR Density Mgt.	270	acres	Implementation of the PCGP project would require removal of late-successional habitat, including critical habitat for northern spotted owls. Stand density management reduces the risk of stand replacing fire and accelerates the development of late-successional stand conditions which may benefit northern spotted owls.	Terrestrial Habitat Improvement
FS	Aquatic	Riparian Planting	0.5	Mile	This is a meadow site along a .0.5 mile reach of Spencer Creek just upstream of Buck Lake (T38S R5E sec 11) that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings would contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation would increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats. This is responsive to Aquatic Conservation Strategy objectives 3, 4, 5, 8 and 9.	Riparian Reserves
FS	Aquatic	Spencer Creek LWD	1	Mile	Over the last century, a 1mile reach of Spencer Creek (T38S R6E sec 18) with high aquatic habitat potential has become simplified, and therefore, has a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). The BLM completed placement last year on 3 miles of Spencer Creek below this reach. Addition of this segment would complete the stream rehabilitation on the reach of Spencer Creek where the project occurs. Logs from the PCGP Right of Way would be used for the project. An estimated 75 pieces are needed. A helicopter would be used to place the logs. This is responsive to Aquatic Conservation Strategy objectives 2, 3, 4 and 5.	Riparian Reserves
FS	Aquatic	Interpretive Sign	1	Project	Continued recreational dam building occurs at this location resulting in negative impacts to stream morphology and riparian habitat impacting fish and the only known Upper Klamath Basin population of Giant Pacific Salamander. There is a need to educate the public as to the detrimental effects of this dam building action and this would best be served by installation of an informational sign to reach those parties utilizing the site.	Riparian Reserves

Draft

TABLE 2.6.2.6-1

Proposed Offsite Mitigation Projects on BLM and NFS Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
FS	Aquatic / Terrestrial	Road Decommissioning	21.45	Miles	Reduction in road density is a central recommendation of the Spencer Creek WA. The objective of road decommissioning for this project is to reduce road density and accelerate the revegetation of the decommissioned roads with trees to reduce negative impacts of roads on wildlife habitat and aquatic environments. Some natural-surface roads have poor drainage that can lead to erosion and increased sediment in nearby streams (Trombulak and Frissell 2000). Road obliteration can improve drainage and to reduce chronic sediment input to the stream systems (Madej 2000; Switalski, Bissonette et al. 2004; Tippery, Jones et al. 2010). This mitigation also offsets the impacts of soil compaction and displacement within the construction right-of-way by reducing compaction in the decommissioned roadbeds. table 2.6.2.6--2 and figure 2.6-4 compares miles of roads decommissioned with impacts of the PCGP corridor on riparian reserves, acres in degraded soil condition and number of stream crossings. Likely benefits of road decommissioning include increased infiltration of precipitation, reduced surface runoff, and reduced sediment production from surface erosion (Switalski, Bissonette et al. 2004). Where roads are decommissioned within riparian areas, riparian vegetation may be reestablished. Approximately 5.2 miles or 12.6 acres of proposed decommissioning occur within riparian reserves (table 2.6.3.6-2, figure 2.6-4) Approximately 21.45 miles of roads are currently open that can be decommissioned. table 2.6.2.6--3 and figure 2.6-5 below shows the reduction in road density associated with implementation of the proposed mitigation plan. Road densities decrease at all scales with this mitigation. The greatest reductions in road density occur within 1/4 mile of the PCGP corridor, showing that mitigations are associated with the impact of the project where the impacts from the PCGP occur. Overall, this accomplishes a reduction in road density of 24% (table 2.6.2.6-3, figure 2.6-5) Assuming a 14 foot average road width, 21.45 miles of proposed road decommissioning would revegetate approximately 30 acres (21.45*5280*14/43560=30 Acres) that are currently native road surfaces in the Spencer Creek Watershed. This mitigation is responsive to ACS objectives 2, 3, 4 and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b p. B-11, C-7).	Riparian Reserves
FS	Aquatic / Terrestrial	Allotment Fencing	6.4	Miles	Construct allotment fencing along the south side of the ROW through Forest Service administered lands (approx. 6.4 miles). This fence would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the Right of Way corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met.	Riparian Reserves

Draft

TABLE 2.6.2.6-1

Proposed Offsite Mitigation Projects on BLM and NFS Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
FS	Aquatic / Terrestrial	Harden Ford	1	Project	Stream crossing improvements would improve aquatic habitat/connectivity and reduce sedimentation. The road accessing this location has been closed on the BLM and USFS. The private landowner and cattle cross the ford to access pasture from private land. The raw, unstable banks at this crossing allow fine sediments to enter the stream. This ford needs to be hardened and the banks re-vegetated and protected from grazing. The USFS side from the upper Spencer Creek dispersed campground needs more boulders or method of blocking 4-wheelers.	Riparian Reserves

Draft

Figure 2.6-2 Mitigation Proposals on the Winema National Forest, Spencer Creek

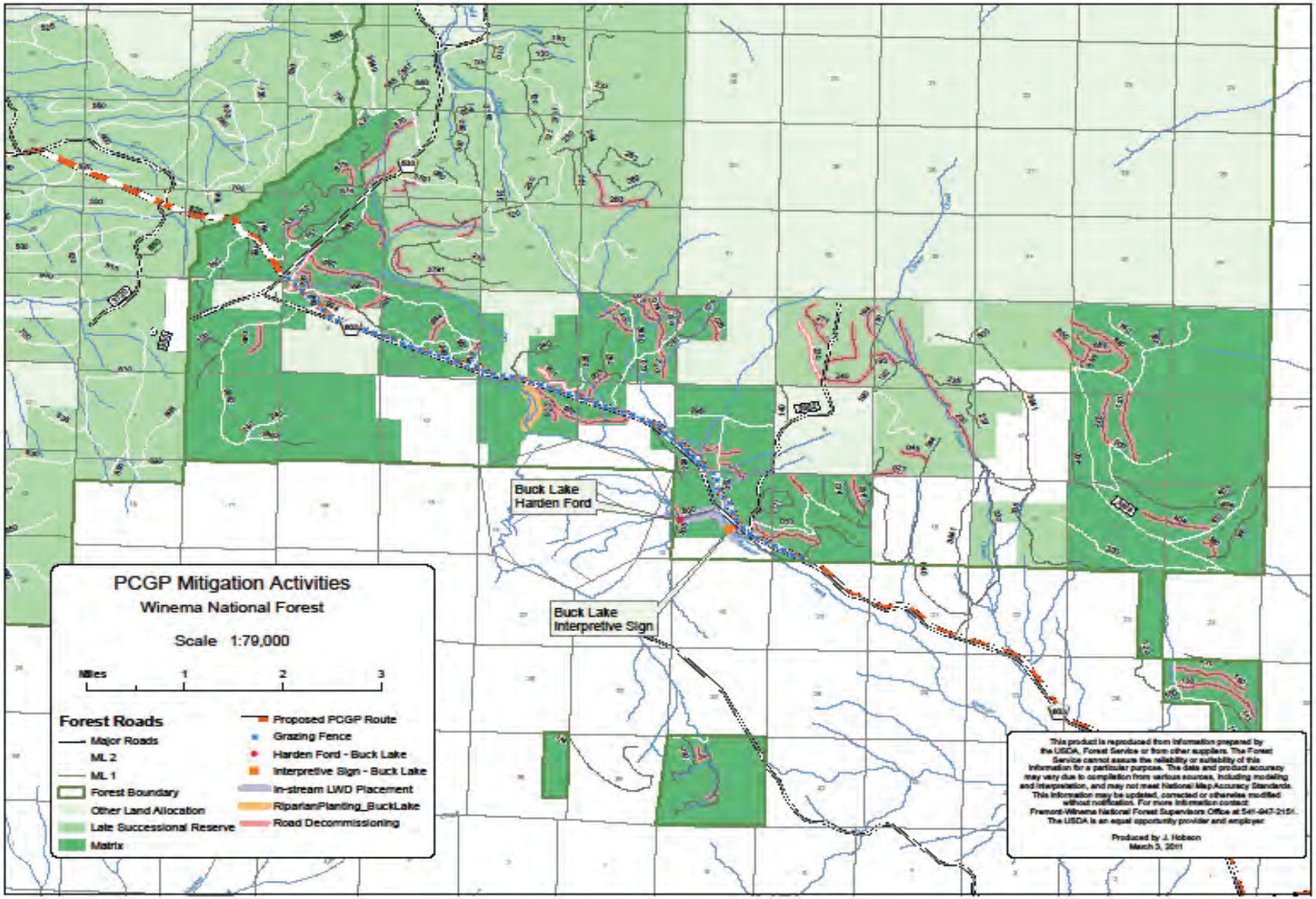


Figure 2.6-3 Comparison of PCGP Effects with Selected Mitigation Measures on BLM Lands

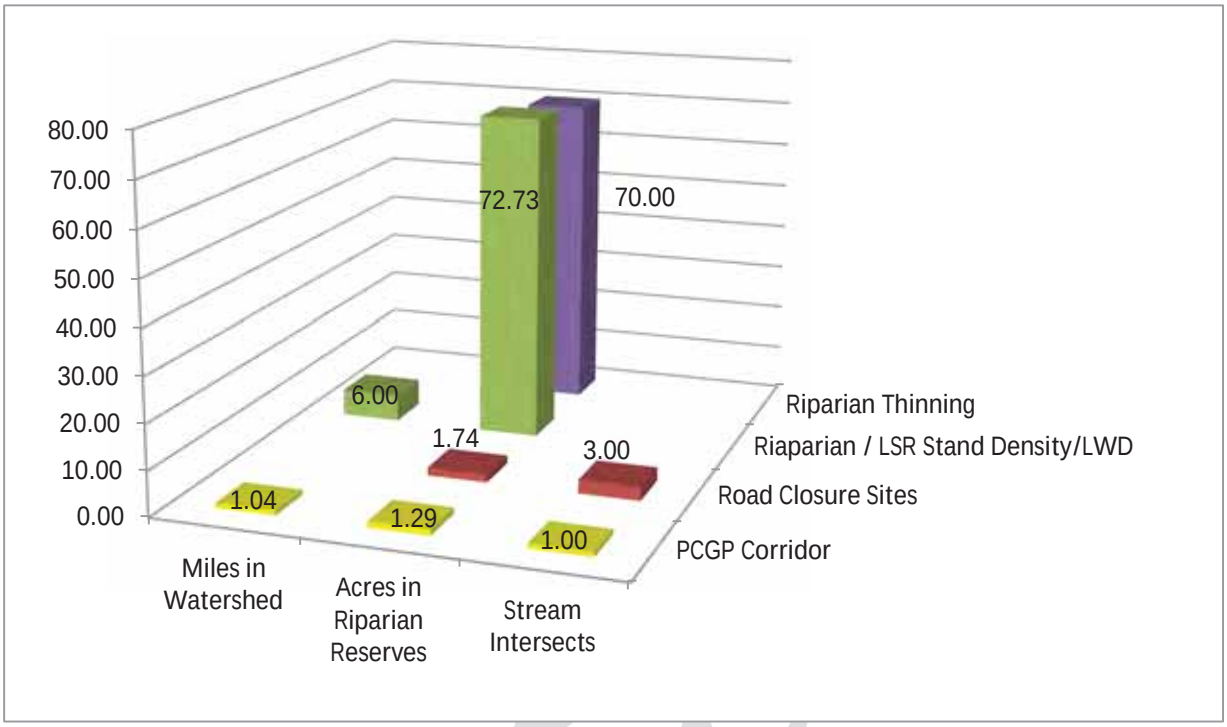


TABLE 2.6.3.6-2

Comparison of PCGP Effects and Proposed Road Decommissioning on NFS Lands, Spencer Creek Tier 1 Key Watershed

	Miles in Watershed a/	Acres in Riparian Reserves b/	Acres in Degraded Soil Condition / Acres Restored c/	# Stream Crossings d/
PCGP Corridor	6.06	6.95	39	3
Roads Decommissioned	21.45	12.6	36	25

Source:
a/ Table 2.6.2.1-2
b/ Table 2.6.2.1-4
c/ See Road Decommissioning Data Tables in Section 3.4. Acres in degraded soil condition are estimated at midpoint of range from 20-57 acres.
d/ Table 2.6.2.1-5

TABLE 2.6.3.6-3

Changes in Road Density with Implementation of Mitigation Plan, WNF Spencer Creek Tier 1 Key Watershed

Winema NF	Current Condition (miles/square mile)	With Road Decommissioning (miles/square mile)	Change in Road Density with Decommissioning (miles/square mile)
All Roads, Spencer Cr. KWS (NFS only)	2.64	2.02	-0.62
Within 1 Mile of Corridor	3.9	2.79	-1.11
Within 1/2 mile of Corridor	4.33	2.87	-1.46
Within 1/4 mile of Corridor	4.67	2.75	-1.92

Source: FS GIS Analysis, Road Density Analysis,

Figure 2.6-4 Comparison of PCGP Effects and Proposed Road Decommissioning: Spencer Creek Tier 1 Key Watershed NFS lands.

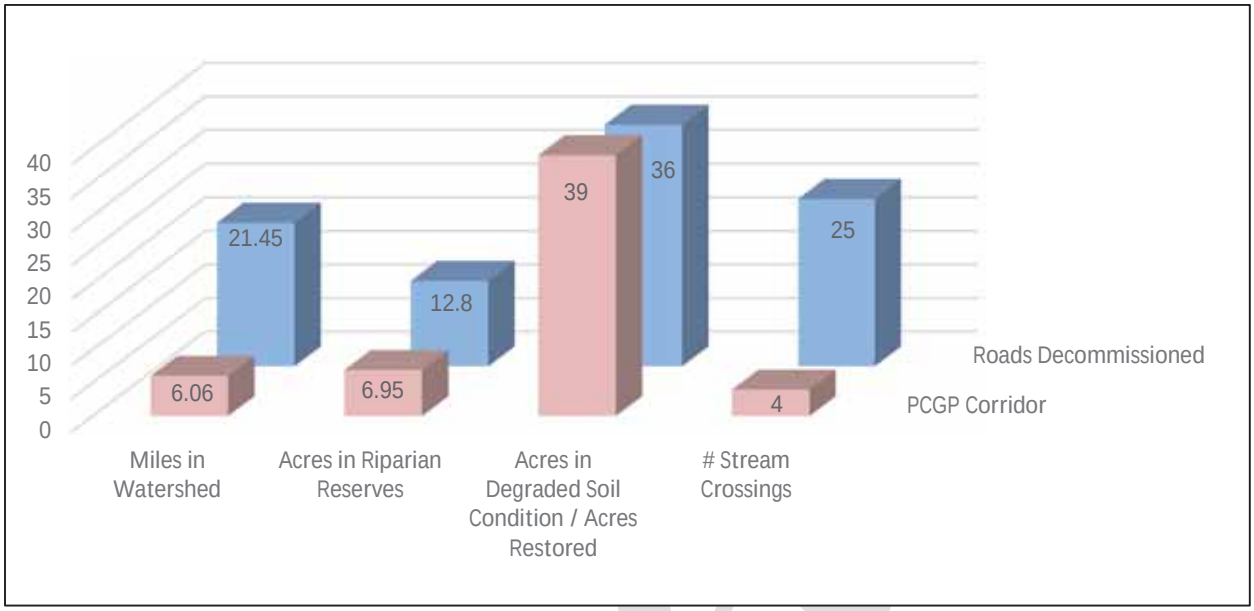
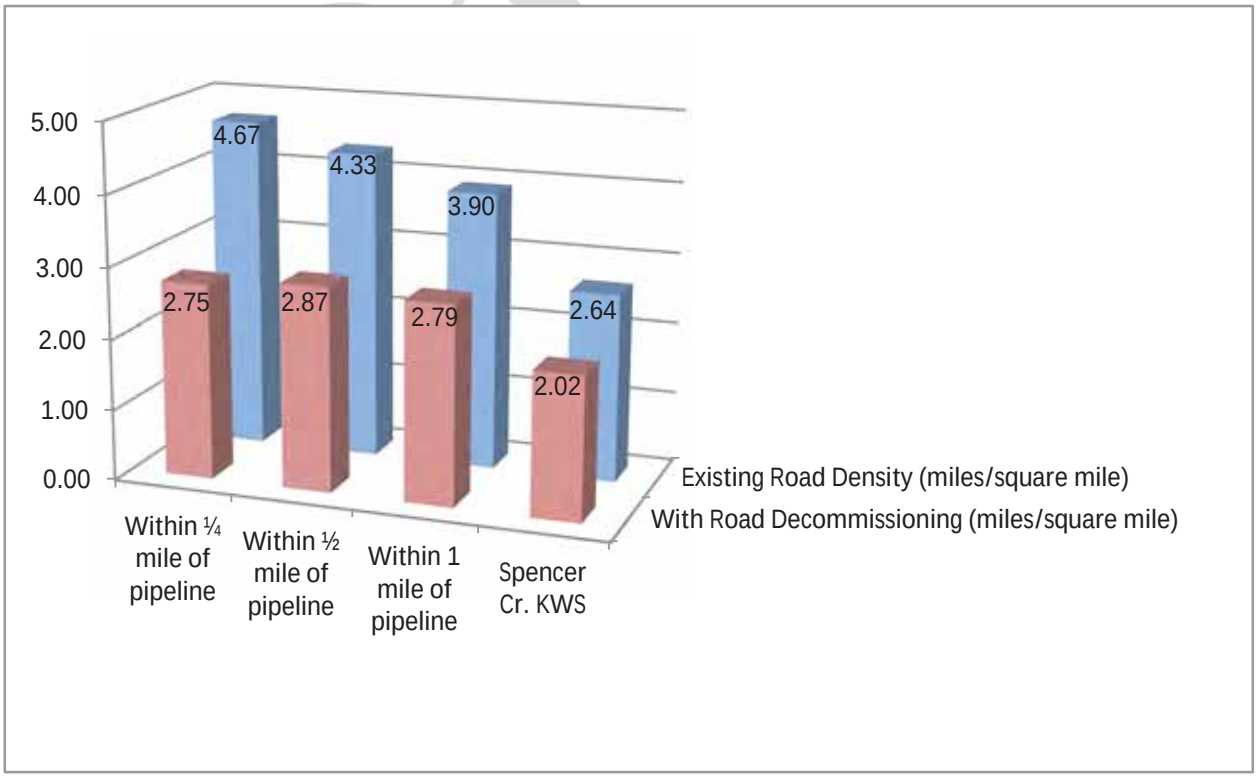


Figure 2.6-5 Change in Road Density with Implementation of Mitigation Plan: WNF Spencer Creek Tier 1 Key Watershed



2.6.3.7 Cumulative Effects

Activities on BLM and NFS Lands

The BLM manages about 23 percent of the Spencer Creek watershed; the Forest Service manages about 25 percent. Projects on federal lands that would contribute to cumulative effects with the PCGP are shown in table 2.6.2.7-1

TABLE 2.6.2.7-1

Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Spencer Creek Watershed

Unit	5th Field Watershed	6th Field Watershed	Project Name	Project Description	Affected Resource
WNF	Spencer Creek	Buck Lake	Lakewoods WUI Harvest Project	Variety of fuels treatments surrounding the Lakewoods private land subdivision. Commercial harvest approximately 70 acres.	Vegetation; soil compaction; road system
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek	Indian Grazing Allotment	Cattle grazing	Vegetation; water quality; fisheries
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	Buck Cattle and Horse Allotment	Livestock grazing	Vegetation; water quality; fisheries
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	Road Maintenance	Variety of routine road maintenance activities	Road system
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Lower Spencer Creek; Clover Creek	Road Decommissioning as part of PCGP mitigation	Decommission approximately 21.45 miles as “offsite” PCGP mitigation	Water quality; fisheries; soil compaction; road system
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	Fremont-Winema Invasive Plant Treatment EIS 2009	Ongoing invasive plant treatment project currently prescribes treatment of known infestations of invasive plants and would reduce the potential for invasive plant introduction and spread by allowing for timely treatment sites in or near the project area as	Vegetation
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	PCGP reclamation activities	All activities associated with reclamation of construction right of way; access roads; etc.	Vegetation; soil compaction; road system; water quality; fisheries

These activities are expected to be consistent with the standards and guidelines (or management direction on the BLM) and objectives of the Rogue River National Forest and Medford District BLM land management plans. Restoration thinning and hazardous fuels reductions are expected to contribute to improvements in watershed conditions by reducing stand density and reducing the probability of stand replacement fire. Road improvements and decommissioning are expected to reduce road-related sediment transport to aquatic systems.

Draft

Activities on Private Lands

Private lands comprise about 52 percent of the Spencer Creek watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The Pacific Connector Right of Way comprises about 0.52 percent of BLM lands, 1.2 percent of the NFS lands and 0.64 percent of private lands in the Spencer Creek watershed (table 2.6.2.1-2). The small proportion of the landscape affected by the project, ongoing land management on private lands, the regulatory framework between the BLM, Oregon Department of Environmental Quality and the Army Corps of Engineers applicable to the project and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present and reasonably foreseeable future actions would change watershed conditions in the Spencer Creek South Umpqua watershed in any significant, discernible or measureable way.

2.6.3.8 Project Effects Compared by ACS Objective

Table 2.6.3.8-1 compares the Project impacts to the objectives of the ACS for the Spencer Creek watershed. BLM-managed and NFS lands where the ACS applies comprise approximately 57 percent of the Spencer Creek watershed (table 2.6.3.1-1). Watershed conditions and recommendations are found in the Spencer Creek Watershed Analysis (BLM et al. 1997). The Project would include 1.04 miles of right-of-way on BLM-managed lands, and 6.06 miles on NFS lands. A total of 9.06 acres of Riparian Reserves or 1.22% of the Riparian Reserves in the watershed (table 2.6.3.1-4) would be affected on:

- Five intermittent stream channels and two wetlands crossed by the Project.
- Four intermittent streams and two wetlands where Riparian Reserves are clipped but the associated stream channel or wetland is not crossed.

Draft

TABLE 2.6.3.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Spencer Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed-scale features. The Project would clear about 9.06 acres or about 1.22 percent of Riparian Reserves on BLM-managed and NFS lands in the Spencer Creek watershed (table 2.6.3.1-3). There are five intermittent stream channels crossed in the Spencer Creek Watershed. No perennial streams are crossed. Riparian Reserves associated with two forested wetlands and four intermittent streams are clipped. Impacts to aquatic systems are expected to be short-term or minor and limited to the project scale because of application of Best Management Practices and erosion control measures (sections 2.6.3.4 and 1.3.1.). Clearing of 5.41 acres of LSOG vegetation in Riparian Reserves is a long-term change in condition, but is minor in scale, and within the range of natural variability given the disturbance processes in Spencer Creek (section 2.6.3.4). Spencer Creek watershed remains above the 15 percent threshold for LSOG vegetation established in the NWFP (section 2.6.3.5). LWD cleared in construction of the corridor would be used to stabilize and restore stream crossings. Off-site mitigation measures including road stormproofing and over 21 miles of road decommissioning, 1.5 miles of instream projects, fencing and riparian planting projects are expected to improve watershed conditions in the Spencer Creek watershed. While there are long-term changes in vegetation in Riparian Reserves from construction clearing of the corridor, these would be minor in scale and well within the range of natural variability given the disturbance history of the watershed (section 2.6.2.6).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The Project is not expected to affect spatial or temporal connectivity in the Spencer Creek watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the POD (i.e., Wetland and Waterbody Crossing Plan). Additionally, all of the channel crossed in Spencer Creek are intermittent and are likely to be dry at the time of crossing. In the short-term during construction connectivity could be disrupted for 1-5 days. At each crossing, bed and bank disturbances are small (<15 feet wide). After construction all disturbed areas would be returned to their approximate preconstruction contours and drainage patterns. The temporary construction right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic and riparian dependent species would not be obstructed. By restricting stream crossing operations to the ODFW in-stream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Road decommissioning that occurs within Riparian Reserves (approximately 12.6 acres) would contribute to restoration of aquatic connectivity. (section 2.6.3.6). The residual levels of disturbance are anticipated to be well within the range of natural variability in the High Cascades Province (section 2.6.3.4).
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried, and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). This level of disturbance is comparable to a bank slough (section 1.3.1.2) and well within the range of natural variability for watersheds of the High Cascades Province (section 2.6.3.4). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to pre-construction conditions, consistent with the Wetland and Waterbody Crossing Plan. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained. Offsite mitigation measures (section 2.6.3.6) would substantively improve watershed conditions by decommissioning 21.5 miles of roads (36.4 acres total of which 12.6 acres are in riparian reserves), replanting willows along 0.5 miles of perennial streams and restoring LWD in 1.5 miles of Spencer Creek.

TABLE 2.6.3.8-1

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Spencer Creek Watershed

ACS Objective	Project Impacts
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Pipeline stream crossings in Spencer Creek are expected to occur when intermittent stream channels are dry. Minor amounts of sediment would be generated during construction that may be mobilized during the onset of seasonal precipitation in the fall. These impacts are expected to be short term and limited to the general area of construction (section 1.3.1). No long-term impacts on water quality are expected because of application of the ECRP including maintenance of effective ground cover (section 1.3.1) and Best Management Practices during construction (sections 1.3.1.1 and 2.6..3.4) Offsite mitigation measures (section 2.6.3.6) address key issues identified in the watershed assessment and are expected to substantially improve watershed conditions.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Spencer Creek Watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from streambank erosion following major disturbances such as fires and high-intensity winter storms. More chronic erosion and deposition of fine sediments primarily from roads, and to a lesser degree from land use has replaced these pulse-type disturbances in the current sediment regime in the watershed. The Project construction and operation is not likely to alter this sediment pattern nor is it likely to exacerbate these conditions. Sediment impacts from construction are expected to be similar to those described in section 1.3.1.2. Proposed mitigation projects including 21.5 miles of road decommissioning would contribute to reduction of sediments and restoration of aquatic functions at the watershed scale. Any sediment impacts are expected to be well within the range of natural variability given the disturbance history of the Spencer Creek Watershed (section 2.6.3.4).
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The Project is unlikely to affect flow patterns in the Spencer Creek watershed because of the dispersed nature of impacts, high infiltration rates and the relatively small proportion of the watershed affected (section 2.6.3.4). Decommissioning roads (21.45 miles) as part of the offsite mitigation plan would contribute substantively the restoration of flow patterns by restoring hydrologic connectivity at stream crossings that are decommissioned (section 2.6.3.6)
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Project corridor crosses two small wetland areas and clips the Riparian Reserve of another two forested wetlands. Trench plugs would be installed on each side of these wetlands as needed to block subsurface flows and maintain water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. Regardless, Project construction may have short-term impacts on water tables in these isolated forest wetlands. These crossings may also regulated under Section 404 of the Clean Water Act. By restricting crossings to the dry season (July 1 to Sept. 15), possible impacts on water tables of these wetland areas are expected to be minor and short-term.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Spencer Creek Watershed would be minor. Approximately 9.06 acres or 1.22 percent of the Riparian Reserves in the watershed are potentially affected by the Project (table 2.6.3.1-3). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Revegetation of 12.6 acres of Riparian Reserves in roads that would be decommissioned would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves (section 2.6.3.6).
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Spencer Creek Watershed would be minor. Approximately 9.06 acres or 1.22 percent of the Riparian Reserves in the watershed are potentially affected by the Project. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. Revegetation on 12.6 acres of Riparian Reserves in roads that would be decommissioned would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves. The persistence of riparian-dependent Survey and Manage species would not be threatened by Project construction and operation in the watershed (see appendix M).

2.6.3.9 Summary and Conclusions

Spencer Creek is the easternmost and driest watershed that is crossed by the Project in the High Cascades Province where the ACS applies[17]. It is also a Tier One Key Watershed in the NWFP. Stream densities are much lower than watersheds west of the Cascade crest. Spencer Creek has the highest percentage of riparian reserves affected (9.06 acres or 1.22% of Riparian Reserves in the watershed) of the watersheds crossed by the project. Precipitation patterns show a strong declining gradient from 40 inches a year on the crest of the Cascades to less than 12 inches where Spencer Creek flows into the Klamath River. The pumice soils in the watershed have high infiltration rates and rarely exhibit overland flows and mass wasting seen in other watersheds crossed by the Project. By locating the Project adjacent to the Clover Creek Road for much of its length, Project impacts on wetlands and stream channels have been minimized when compared to the impacts of creating a new corridor with the Project.

Pacific Connector has modified the Project to respond to the ACS objectives and has incorporated measures consistent with the Riparian Reserve standards and guidelines. The assessment demonstrates that short-term impacts associated with the Project would occur to streambanks, and substrates at the site scale. Change in vegetative condition from clearing the corridor is a long-term impact that would occur on 9.06 acres of Riparian Reserves. These impacts, however, are well within the range of natural variability given the disturbance processes that function in the watershed (section 2.6.3.4). Also, because of the linear characteristic of the Project, the Riparian Reserve crossings would be spread out across the landscape and would be discontinuous.

Off-site mitigation measures, identified by the BLM and Forest Service, would supplement on-site minimization, mitigation, and restoration actions. These proposed off-site mitigation measures are responsive to recommendations in the Spencer Creek Watershed Assessment (BLM et al. 1995) and would improve watershed conditions where they are applied. (section 2.6.3.6).

Three site-specific amendments of the Winema National Forest LRMP and one amendment of the Lakeview Resource Area RMP that have a nexus with the ACS are proposed to make provision for the Project (section 2.6.3.5):

Proposed amendments WNF-4 and WNF-5 would allow the Project to exceed detrimental soil conditions within the construction corridor. This would not prevent attainment of ACS objectives because soil decompaction and remediation required in Riparian Reserves is expected to effectively moderate detrimental soil conditions. Implementation of measures in the ECRP is expected to effectively control surface erosion and restore native vegetation (See section 4.3.4 of this EIS).

Proposed amendment of the Winema National Forest LRMP and the Lakeview Resource Area RMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the Project does not threaten the persistence of any riparian-dependent species (Section 2.4.8.5).

[17] Mill Creek, Lake Ewauna and JC Boyle watersheds are also crossed by the project, but they are outside the area of the NWFP. Of these, only Lake Ewauna watershed has a small piece of BLM lands that are crossed. The ACS does not apply in that location.

The Project is otherwise consistent with standards and guidelines for activities in Riparian Reserves for the Winema National Forest and the Klamath Falls Resource Area of the Lakeview District, BLM.

The routing of the pipeline through BLM- and NFS lands, coupled with the relatively small area of BLM and NFS land affected by Project construction (0.17 percent of BLM lands and 0.42 percent of NFS in the fifth-field watershed), makes it highly improbable that Project impacts could affect watershed conditions. Although there are project-level impacts (e.g., short-term sediment and long-term a change in vegetative condition at stream crossings), these would be minor in scale (section 2.6.3.4).

No project-related impacts that would prevent attainment of ACS objectives have been identified. All relevant Project impacts are within the range of natural variability given the disturbance patterns and fire history of watersheds in the High Cascades Province (section 2.6.3.4).

Draft

3.0 ATTACHMENTS: DATA TABLES AND REFERENCES

3.1 RESERVED: NSR 2014 STREAM CROSSING ASSESSMENT (IN PREPARATION)

3.2 SUSPENDED SEDIMENT

Draft

An evaluation of suspended sediment and turbidity in Cow Creek, Oregon

By David A. Curtiss

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations 82-364
Open-File Report

Torrance, Oregon
1982

3.3 AQUATIC INVENTORY AND EVALUATION

3.3.1 Watershed Data Tables

Draft

TABLE 3.3.1-1

Watershed Condition Class Corn Creek Subwatershed

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0615
FS_UNIT_NAME	Umpqua National Forest
HUC12_CODE	171003020502
HUC12_NAME	Corn Creek-South Umpqua River
WATERSHED_CLASS_FS_LAND	1
WATERSHED_SCORE_FS_LAND	1.5
WATERSHED_OVERRIDE_CLASS	
CONTACT	Debra Gray
TOTAL_WATERSHED_AREA_ACRES	12017
FS_LAND_ACRES	2636
NONFS_LAND_ACRES	9381
FS_LAND_PERCENT	22
NONFS_LAND_PERCENT	78
PROCESS_CAT_AQ_PHYS_CLASS	1
PROCESS_CAT_AQ_PHYS_SCORE	1.6
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	1
IND_AQ_PHYS_WATER_QNTY_SCORE	1
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	1.7
PROCESS_CAT_AQ_BIO_CLASS	1
PROCESS_CAT_AQ_BIO_SCORE	1.4
IND_AQ_BIO_BIOTA_CLASS	2
IND_AQ_BIO_BIOTA_SCORE	1.7
IND_AQ_BIO_RIP_VEG_CLASS	1
IND_AQ_BIO_RIP_VEG_SCORE	1
PROCESS_CAT_TERR_PHYS_CLASS	1
PROCESS_CAT_TERR_PHYS_SCORE	1.6
IND_TERR_PHYS_ROAD_TRAIL_CLASS	2
IND_TERR_PHYS_ROAD_TRAIL_SCORE	1.8
IND_TERR_PHYS_SOILS_CLASS	1
IND_TERR_PHYS_SOILS_SCORE	1.3
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.4
IND_TERR_BIO_FIRE_CLASS	3
IND_TERR_BIO_FIRE_SCORE	3
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	8EC8016FCDDB41DAAE40C8361E225BB8
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.450379015079065
SHAPE_Area	0.00536232161377724

TABLE 3.3.1-2

Watershed Condition Class Lower Elk Creek Subwatershed

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0615
FS_UNIT_NAME	Umpqua National Forest
HUC12_CODE	171003020404
HUC12_NAME	Lower Elk Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.9
WATERSHED_OVERRIDE_CLASS	
CONTACT	Debra Gray
TOTAL_WATERSHED_AREA_ACRES	16885
FS_LAND_ACRES	9208
NONFS_LAND_ACRES	7677
FS_LAND_PERCENT	55
NONFS_LAND_PERCENT	46
PROCESS_CAT_AQ_PHYS_CLASS	2
PROCESS_CAT_AQ_PHYS_SCORE	2
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	2
IND_AQ_PHYS_WATER_QNTY_SCORE	2
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	2
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	1.7
IND_AQ_BIO_BIOTA_CLASS	1
IND_AQ_BIO_BIOTA_SCORE	1.3
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2
PROCESS_CAT_TERR_PHYS_CLASS	3
PROCESS_CAT_TERR_PHYS_SCORE	2.3
IND_TERR_PHYS_ROAD_TRAIL_CLASS	3
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2.8
IND_TERR_PHYS_SOILS_CLASS	2
IND_TERR_PHYS_SOILS_SCORE	1.7
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.2
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	2A478438AE67449D8C797A41F1E34C78
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.588488957122515
SHAPE_Area	0.00752919920341603

TABLE 3.3.1-3

Watershed Condition Class Drew Creek Subwatershed

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0615
FS_UNIT_NAME	Umpqua National Forest
HUC12_CODE	171003020403
HUC12_NAME	Drew Creek
WATERSHED_CLASS_FS_LAND	1
WATERSHED_SCORE_FS_LAND	1.6
WATERSHED_OVERRIDE_CLASS	
CONTACT	Debra Gray
TOTAL_WATERSHED_AREA_ACRES	9623
FS_LAND_ACRES	8050
NONFS_LAND_ACRES	1573
FS_LAND_PERCENT	84
NONFS_LAND_PERCENT	16
PROCESS_CAT_AQ_PHYS_CLASS	1
PROCESS_CAT_AQ_PHYS_SCORE	1.6
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	1
IND_AQ_PHYS_WATER_QNTY_SCORE	1
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	1.7
PROCESS_CAT_AQ_BIO_CLASS	1
PROCESS_CAT_AQ_BIO_SCORE	1.5
IND_AQ_BIO_BIOTA_CLASS	1
IND_AQ_BIO_BIOTA_SCORE	1.3
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	1.7
PROCESS_CAT_TERR_PHYS_CLASS	2
PROCESS_CAT_TERR_PHYS_SCORE	1.9
IND_TERR_PHYS_ROAD_TRAIL_CLASS	2
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2.1
IND_TERR_PHYS_SOILS_CLASS	2
IND_TERR_PHYS_SOILS_SCORE	1.7
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.2
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	5550AE6F52114D238686236A321110A4
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.311258896366514
SHAPE_Area	0.00428774060233233

TABLE 3.3.1-4

Watershed Condition Class South Fork Cow Creek Subwatershed

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0615
FS_UNIT_NAME	Umpqua National Forest
HUC12_CODE	171003020601
HUC12_NAME	South Fork Cow Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.8
WATERSHED_OVERRIDE_CLASS	
CONTACT	Debra Gray
TOTAL_WATERSHED_AREA_ACRES	11136
FS_LAND_ACRES	9339
NONFS_LAND_ACRES	1797
FS_LAND_PERCENT	84
NONFS_LAND_PERCENT	16
PROCESS_CAT_AQ_PHYS_CLASS	1
PROCESS_CAT_AQ_PHYS_SCORE	1.6
IND_AQ_PHYS_WATER_QUAL_CLASS	1
IND_AQ_PHYS_WATER_QUAL_SCORE	1.5
IND_AQ_PHYS_WATER_QNTY_CLASS	1
IND_AQ_PHYS_WATER_QNTY_SCORE	1
IND_AQ_PHYS_HABITAT_CLASS	3
IND_AQ_PHYS_HABITAT_SCORE	2.3
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	1.7
IND_AQ_BIO_BIOTA_CLASS	3
IND_AQ_BIO_BIOTA_SCORE	2.3
IND_AQ_BIO_RIP_VEG_CLASS	1
IND_AQ_BIO_RIP_VEG_SCORE	1
PROCESS_CAT_TERR_PHYS_CLASS	2
PROCESS_CAT_TERR_PHYS_SCORE	2.2
IND_TERR_PHYS_ROAD_TRAIL_CLASS	3
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2.6
IND_TERR_PHYS_SOILS_CLASS	2
IND_TERR_PHYS_SOILS_SCORE	1.7
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.2
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	088DD917CFF442118016DE2938C1DF6B
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.330290340562584
SHAPE_Area	0.0049564566682067

TABLE 3.3.1-5

Watershed Condition Class Upper Trail Creek

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0615
FS_UNIT_NAME	Umpqua National Forest
HUC12_CODE	171003070601
HUC12_NAME	Upper Trail Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.7
WATERSHED_OVERRIDE_CLASS	
CONTACT	Debra Gray
TOTAL_WATERSHED_AREA_ACRES	15496
FS_LAND_ACRES	2220
NONFS_LAND_ACRES	13276
FS_LAND_PERCENT	14
NONFS_LAND_PERCENT	86
PROCESS_CAT_AQ_PHYS_CLASS	1
PROCESS_CAT_AQ_PHYS_SCORE	1.3
IND_AQ_PHYS_WATER_QUAL_CLASS	1
IND_AQ_PHYS_WATER_QUAL_SCORE	1
IND_AQ_PHYS_WATER_QNTY_CLASS	1
IND_AQ_PHYS_WATER_QNTY_SCORE	1
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	2
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	1.7
IND_AQ_BIO_BIOTA_CLASS	1
IND_AQ_BIO_BIOTA_SCORE	1.3
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2.1
PROCESS_CAT_TERR_PHYS_CLASS	3
PROCESS_CAT_TERR_PHYS_SCORE	2.3
IND_TERR_PHYS_ROAD_TRAIL_CLASS	3
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2.8
IND_TERR_PHYS_SOILS_CLASS	2
IND_TERR_PHYS_SOILS_SCORE	1.7
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.2
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	A3909A957FF845808365A9CC302FCB9F
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.441421198357761
SHAPE_Area	0.00689375389901229

TABLE 3.3.1-6

Watershed Condition Class West Fork Trail Creek

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0615
FS_UNIT_NAME	Umpqua National Forest
HUC12_CODE	171003070602
HUC12_NAME	West Fork Trail Creek
WATERSHED_CLASS_FS_LAND	1
WATERSHED_SCORE_FS_LAND	1.5
WATERSHED_OVERRIDE_CLASS	
CONTACT	Debra Gray
TOTAL_WATERSHED_AREA_ACRES	14312
FS_LAND_ACRES	2135
NONFS_LAND_ACRES	12177
FS_LAND_PERCENT	15
NONFS_LAND_PERCENT	85
PROCESS_CAT_AQ_PHYS_CLASS	2
PROCESS_CAT_AQ_PHYS_SCORE	1.7
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	1
IND_AQ_PHYS_WATER_QNTY_SCORE	1
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	2
PROCESS_CAT_AQ_BIO_CLASS	1
PROCESS_CAT_AQ_BIO_SCORE	1.2
IND_AQ_BIO_BIOTA_CLASS	1
IND_AQ_BIO_BIOTA_SCORE	1.3
IND_AQ_BIO_RIP_VEG_CLASS	1
IND_AQ_BIO_RIP_VEG_SCORE	1
PROCESS_CAT_TERR_PHYS_CLASS	2
PROCESS_CAT_TERR_PHYS_SCORE	1.7
IND_TERR_PHYS_ROAD_TRAIL_CLASS	2
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2.1
IND_TERR_PHYS_SOILS_CLASS	1
IND_TERR_PHYS_SOILS_SCORE	1.3
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.2
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	7E383D00A73D4173AA285EA689DCF9F4
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.377781901603849
SHAPE_Area	0.00636416104090432

TABLE 3.3.1-7

Watershed Condition Class Upper SF Little Butte Creek

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0610
FS_UNIT_NAME	Rogue River-Siskiyou National Forests
HUC12_CODE	171003070803
HUC12_NAME	Upper South Fork Little Butte Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.7
WATERSHED_OVERRIDE_CLASS	
CONTACT	Steve Brazier
TOTAL_WATERSHED_AREA_ACRES	12664
FS_LAND_ACRES	12663
NONFS_LAND_ACRES	1
FS_LAND_PERCENT	100
NONFS_LAND_PERCENT	0
PROCESS_CAT_AQ_PHYS_CLASS	2
PROCESS_CAT_AQ_PHYS_SCORE	2.1
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	2
IND_AQ_PHYS_WATER_QNTY_SCORE	2
IND_AQ_PHYS_HABITAT_CLASS	3
IND_AQ_PHYS_HABITAT_SCORE	2.3
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	1.9
IND_AQ_BIO_BIOTA_CLASS	2
IND_AQ_BIO_BIOTA_SCORE	1.7
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2
PROCESS_CAT_TERR_PHYS_CLASS	1
PROCESS_CAT_TERR_PHYS_SCORE	1.3
IND_TERR_PHYS_ROAD_TRAIL_CLASS	1
IND_TERR_PHYS_ROAD_TRAIL_SCORE	1.5
IND_TERR_PHYS_SOILS_CLASS	1
IND_TERR_PHYS_SOILS_SCORE	1
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.2
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	9FAC518D9EE545AF86E448FF1D4B4E87
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.409891071751336
SHAPE_Area	0.00559878941007791

TABLE 3.3.1-8

Watershed Condition Class Middle SF Little Butte Creek

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0610
FS_UNIT_NAME	Rogue River-Siskiyou National Forests
HUC12_CODE	171003070805
HUC12_NAME	Middle South Fork Little Butte Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.8
WATERSHED_OVERRIDE_CLASS	
CONTACT	Steve Brazier
TOTAL_WATERSHED_AREA_ACRES	26193
FS_LAND_ACRES	12542
NONFS_LAND_ACRES	13652
FS_LAND_PERCENT	48
NONFS_LAND_PERCENT	52
PROCESS_CAT_AQ_PHYS_CLASS	2
PROCESS_CAT_AQ_PHYS_SCORE	2.2
IND_AQ_PHYS_WATER_QUAL_CLASS	3
IND_AQ_PHYS_WATER_QUAL_SCORE	3
IND_AQ_PHYS_WATER_QNTY_CLASS	2
IND_AQ_PHYS_WATER_QNTY_SCORE	2
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	1.7
PROCESS_CAT_AQ_BIO_CLASS	1
PROCESS_CAT_AQ_BIO_SCORE	1.5
IND_AQ_BIO_BIOTA_CLASS	1
IND_AQ_BIO_BIOTA_SCORE	1
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2
PROCESS_CAT_TERR_PHYS_CLASS	2
PROCESS_CAT_TERR_PHYS_SCORE	1.7
IND_TERR_PHYS_ROAD_TRAIL_CLASS	2
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2
IND_TERR_PHYS_SOILS_CLASS	1
IND_TERR_PHYS_SOILS_SCORE	1.3
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.5
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	
IND_TERR_BIO_RANGE_SCORE	
IND_TERR_BIO_INVASIVE_CLASS	2
IND_TERR_BIO_INVASIVE_SCORE	2
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	8E3F907F831949709451CC12FDC138CF
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.661710864253619
SHAPE_Area	0.0115731457641415

TABLE 3.3.1-8

Watershed Condition Class Lower NF Little Butte Creek

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0610
FS_UNIT_NAME	Rogue River-Siskiyou National Forests
HUC12_CODE	171003070802
HUC12_NAME	Lower North Fork Little Butte Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.8
WATERSHED_OVERRIDE_CLASS	
CONTACT	Steve Brazier
TOTAL_WATERSHED_AREA_ACRES	15715
FS_LAND_ACRES	1348
NONFS_LAND_ACRES	14367
FS_LAND_PERCENT	9
NONFS_LAND_PERCENT	91
PROCESS_CAT_AQ_PHYS_CLASS	2
PROCESS_CAT_AQ_PHYS_SCORE	2.2
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	3
IND_AQ_PHYS_WATER_QNTY_SCORE	3
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	1.7
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	1.9
IND_AQ_BIO_BIOTA_CLASS	2
IND_AQ_BIO_BIOTA_SCORE	1.7
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2
PROCESS_CAT_TERR_PHYS_CLASS	1
PROCESS_CAT_TERR_PHYS_SCORE	1.5
IND_TERR_PHYS_ROAD_TRAIL_CLASS	1
IND_TERR_PHYS_ROAD_TRAIL_SCORE	1.3
IND_TERR_PHYS_SOILS_CLASS	2
IND_TERR_PHYS_SOILS_SCORE	1.7
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.3
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	
IND_TERR_BIO_RANGE_SCORE	
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	8ABC2531F8DE423DAB63FCE1C0ED136D
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.411273396658079
SHAPE_Area	0.00695542392367426

TABLE 3.3.1-9

Watershed Condition Class Beaver Dam Creek Subwatershed

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0610
FS_UNIT_NAME	Rogue River-Siskiyou National Forests
HUC12_CODE	171003070804
HUC12_NAME	Beaver Dam Creek
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.8
WATERSHED_OVERRIDE_CLASS	
CONTACT	Steve Brazier
TOTAL_WATERSHED_AREA_ACRES	17862
FS_LAND_ACRES	13002
NONFS_LAND_ACRES	4861
FS_LAND_PERCENT	73
NONFS_LAND_PERCENT	27
PROCESS_CAT_AQ_PHYS_CLASS	2
PROCESS_CAT_AQ_PHYS_SCORE	2
IND_AQ_PHYS_WATER_QUAL_CLASS	2
IND_AQ_PHYS_WATER_QUAL_SCORE	2
IND_AQ_PHYS_WATER_QNTY_CLASS	2
IND_AQ_PHYS_WATER_QNTY_SCORE	2
IND_AQ_PHYS_HABITAT_CLASS	2
IND_AQ_PHYS_HABITAT_SCORE	2
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	1.9
IND_AQ_BIO_BIOTA_CLASS	2
IND_AQ_BIO_BIOTA_SCORE	1.7
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2
PROCESS_CAT_TERR_PHYS_CLASS	1
PROCESS_CAT_TERR_PHYS_SCORE	1.6
IND_TERR_PHYS_ROAD_TRAIL_CLASS	2
IND_TERR_PHYS_ROAD_TRAIL_SCORE	1.8
IND_TERR_PHYS_SOILS_CLASS	1
IND_TERR_PHYS_SOILS_SCORE	1.3
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.4
IND_TERR_BIO_FIRE_CLASS	3
IND_TERR_BIO_FIRE_SCORE	3
IND_TERR_BIO_FORCOVER_CLASS	1
IND_TERR_BIO_FORCOVER_SCORE	1
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	1
IND_TERR_BIO_FORHEALTH_SCORE	1
WATERSHED_CN	7DD0AB77A92F4313862C050F0408E1B5
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.44532592420224
SHAPE_Area	0.00789066367742833

TABLE 3.3.1-10

Watershed Condition Class Buck Lake Subwatershed

ASSESSMENT_YEAR	2010
FS_UNIT_ID	0602
FS_UNIT_NAME	Fremont-Winema National Forests
HUC12_CODE	180102060101
HUC12_NAME	Buck Lake
WATERSHED_CLASS_FS_LAND	2
WATERSHED_SCORE_FS_LAND	1.9
WATERSHED_OVERRIDE_CLASS	
CONTACT	S. Ruda
TOTAL_WATERSHED_AREA_ACRES	15182
FS_LAND_ACRES	6398
NONFS_LAND_ACRES	8784
FS_LAND_PERCENT	42
NONFS_LAND_PERCENT	58
PROCESS_CAT_AQ_PHYS_CLASS	1
PROCESS_CAT_AQ_PHYS_SCORE	1.5
IND_AQ_PHYS_WATER_QUAL_CLASS	3
IND_AQ_PHYS_WATER_QUAL_SCORE	2.5
IND_AQ_PHYS_WATER_QNTY_CLASS	1
IND_AQ_PHYS_WATER_QNTY_SCORE	1
IND_AQ_PHYS_HABITAT_CLASS	1
IND_AQ_PHYS_HABITAT_SCORE	1
PROCESS_CAT_AQ_BIO_CLASS	2
PROCESS_CAT_AQ_BIO_SCORE	2.2
IND_AQ_BIO_BIOTA_CLASS	3
IND_AQ_BIO_BIOTA_SCORE	2.3
IND_AQ_BIO_RIP_VEG_CLASS	2
IND_AQ_BIO_RIP_VEG_SCORE	2
PROCESS_CAT_TERR_PHYS_CLASS	2
PROCESS_CAT_TERR_PHYS_SCORE	2
IND_TERR_PHYS_ROAD_TRAIL_CLASS	3
IND_TERR_PHYS_ROAD_TRAIL_SCORE	2.7
IND_TERR_PHYS_SOILS_CLASS	1
IND_TERR_PHYS_SOILS_SCORE	1.3
PROCESS_CAT_TERR_BIO_CLASS	1
PROCESS_CAT_TERR_BIO_SCORE	1.6
IND_TERR_BIO_FIRE_CLASS	2
IND_TERR_BIO_FIRE_SCORE	2
IND_TERR_BIO_FORCOVER_CLASS	2
IND_TERR_BIO_FORCOVER_SCORE	2
IND_TERR_BIO_RANGE_CLASS	1
IND_TERR_BIO_RANGE_SCORE	1
IND_TERR_BIO_INVASIVE_CLASS	1
IND_TERR_BIO_INVASIVE_SCORE	1
IND_TERR_BIO_FORHEALTH_CLASS	2
IND_TERR_BIO_FORHEALTH_SCORE	2
WATERSHED_CN	4FABCF837E7346EB9DD6F051AD9A382A
REQUESTED_AS_OF_YEAR	2010
SHAPE_Length	0.405040955950949
SHAPE_Area	0.00670452825014269

Draft

3.3.2 Aquatic and Riparian Evaluation and Monitoring Program (AREMP)

Table 3.3.2-1

AREMP Summary for Subwatersheds Crossed by the PCGP

ACRES	PCGP	SUBWAT	PROV_LG	WatershedN	WsCond1994	WsCond2009	WsCondTren	Roads1994	Roads2009	RoadsTrend	Veg1994	Veg2009	VegTrend	LsRisk1994	LsRisk2009	LsRiskTren	LUA_CLASS	TOT_ACRES	KWS_CLASS	KWS_AR	Huc2003	Huc2011
14341	PCGP	171003020503	Klamath/Siskiyou	STOUTS CREEK	-0.3150	-0.3010	0.0140	-0.7670	-0.7690	-0.0020	0.5880	0.6350	0.0470	-0.9090	-0.8200	0.0890	lsr	14341	KEY	9,267.46	171003020503	171003020602
13806	PCGP	171003020504	Klamath/Siskiyou	ST JOHNS	-0.1700	-0.1420	0.0280	-0.5830	-0.4790	0.1040	0.6570	0.5320	-0.1250	-0.8570	-0.8790	-0.0220	matrix	13806	KEY	11,122.98		
22007	PCGP	171003020505	Klamath/Siskiyou	DAYS CREEK	-0.3820	-0.3220	0.0600	-0.9830	-0.9360	0.0470	0.8180	0.9070	0.0890	-1.0000	-1.0000	0.0000	matrix	22007	KEY	17,734.21		
19743	PCGP	171003070401	High Cascades	UPPER SOUTH FORK BIG BUTTE CREEK	0.0870	0.0930	0.0060	-1.0000	-0.9970	0.0030	0.6710	0.6870	0.0160	1.0000	1.0000	0.0000	matrix	19743	NONKEY	0.00	171003070401	171003070401
17627	PCGP	171003020401	Western Cascades	ELK HEADWATER	0.1160	0.1390	0.0230	-0.8310	-0.8000	0.0310	0.7030	0.7400	0.0370	1.0000	1.0000	0.0000	matrix	17628	KEY	10,819.02	171003020401	171003020401
10196	PCGP	171003020402	Western Cascades	UPPER ELK FACIAL	0.1840	0.1930	0.0090	-0.6780	-0.6780	0.0000	0.7360	0.7670	0.0310	1.0000	1.0000	0.0000	matrix	10196	KEY	6,306.81	171003020402	171003020402
9592	PCGP	171003020403	Western Cascades	DREW CREEK	0.1820	0.2140	0.0320	-0.4470	-0.4480	-0.0010	0.2030	0.3110	0.1080	1.0000	1.0000	0.0000	lsr	9592	KEY	8,017.55	171003020403	171003020403
16913	PCGP	171003020404	Western Cascades	LOWER ELK FACIAL	-0.1900	-0.1540	0.0360	-0.9060	-0.9060	0.0000	-0.0680	0.0110	0.0790	0.7200	0.8200	0.1000	matrix	16913	KEY	10,842.07	171003020404	171003020404
11346	PCGP	171003020501	Klamath/Siskiyou	UPPER COFFEE CREEK	0.3380	0.3540	0.0160	0.0420	0.0320	-0.0100	0.9280	0.9990	0.0710	0.4120	0.3680	-0.0440	matrix	11346	KEY	7,648.92		
12063	PCGP	171003020502	Klamath/Siskiyou	LOWER COFFEE CREEK	0.0400	0.0840	0.0440	-0.3730	-0.3610	0.0120	0.8660	0.9730	0.1070	-0.0850	-0.0530	0.0320	lsr	12063	KEY	10,951.84	171003020502	171003020502
17298	PCGP	171003020506	Klamath/Siskiyou	UPPER SHIVELY OSHEA	-0.4430	-0.3990	0.0440	-1.0000	-1.0000	0.0000	0.6700	0.8030	0.1330	-1.0000	-1.0000	0.0000	lsr	17299	KEY	12,366.14		
24106	PCGP	171003020507	Klamath/Siskiyou	CANYON CREEK	-0.3840	-0.3350	0.0490	-0.8490	-0.8490	0.0000	0.5460	0.6920	0.1460	-0.7030	-0.6080	0.0950	matrix	24106	NONKEY	0.00		
11099	PCGP	171003020601	Klamath/Siskiyou	SOUTH FORK COW CREEK	-0.2030	-0.1360	0.0670	-0.6670	-0.6670	0.0000	0.7260	0.9240	0.1980	-0.6190	-0.5390	0.0800	matrix	11099	NONKEY	0.00	171003020601	171003020601
21222	PCGP	171003020602	Klamath/Siskiyou	DISMAL CREEK	-0.3420	-0.3150	0.0270	-0.9450	-0.9450	0.0000	0.8650	0.9450	0.0800	-0.7370	-0.7370	0.0000	matrix	21222	NONKEY	0.00	171003020602	171003020602
15114	PCGP	171003020603	Klamath/Siskiyou	UPPER COW CREE/GALESVILLE	-0.4810	-0.4170	0.0640	-1.0000	-1.0000	0.0000	0.5560	0.7500	0.1940	-1.0000	-1.0000	0.0000	lsr	15114	NONKEY	0.00	171003020603	171003020602
26905	PCGP	171003020901	Klamath/Siskiyou	MIDDLE CREEK	-0.4350	-0.3670	0.0680	-1.0000	-1.0000	0.0000	0.6940	0.8990	0.2050	-0.7990	-0.7300	0.0690	lsr	26906	KEY	20,952.69		
17705	PCGP	171003020902	Klamath/Siskiyou	UPPER COW CREEK	-0.4100	-0.3720	0.0380	-1.0000	-1.0000	0.0000	0.7690	0.8840	0.1150	-1.0000	-1.0000	0.0000	lsr	17705	NONKEY	0.00		
11534	PCGP	171003020903	Klamath/Siskiyou	MIDDLE COW CREEK	-0.1260	-0.1280	-0.0020	-0.5800	-0.6290	-0.0490	0.7820	0.8750	0.0930	0.0820	-0.0110	-0.0930	lsr	11534	NONKEY	0.00		
20844	PCGP	171003020904	Klamath/Siskiyou	LOWER COW CREEK	-0.1870	-0.1670	0.0200	-0.6140	-0.6560	-0.0420	0.6670	0.8100	0.1430	-0.0050	-0.1110	-0.1060	lsr	20844	NONKEY	0.00		
26624	PCGP	171003021101	Klamath/Siskiyou	UPPER SOUTH MYRTLE	-0.2380	-0.1940	0.0440	-0.8090	-0.7730	0.0360	0.9050	0.9630	0.0580	-0.8020	-0.8050	-0.0030	matrix	26624	NONKEY	0.00	171003021101	171003011006
18514	PCGP	171003021102	Klamath/Siskiyou	UPPER NORTH MYRTLE	-0.4220	-0.3660	0.0560	-0.9590	-0.9490	0.0100	0.6520	0.8000	0.1480	-1.0000	-1.0000	0.0000	matrix	18514	NONKEY	0.00		
32456	PCGP	171003050502	Oregon Coast	MIDDLE CR	0.0790	0.1770	0.0980	-1.0000	-1.0000	0.0000	0.9583	1.0000	0.0417	0.3800	0.7100	0.3300	lsr	32456	NONKEY	7476.7704		
23002	PCGP	171003050503	Oregon Coast	FAIRVIEW	0.3110	0.3360	0.0250	-0.7225	-0.7260	-0.0035	0.7927	0.8633	0.0707	1.0000	1.0000	0.0000	matrix	23002	NONKEY	0.00		
26430	PCGP	171003070402	High Cascades	CLARKS FORK CREEK/FOURBIT CREEK	0.1790	0.1850	0.0060	-0.8580	-0.8440	0.0140	0.7420	0.7420	0.0000	1.0000	1.0000	0.0000	matrix	26430	NONKEY	0.00	171003070402	171003070402
29966	PCGP	171003070403	High Cascades	WILLOW CREEK	0.0250	0.0290	0.0040	-0.9890	-0.9810	0.0080	0.6800	0.6820	0.0020	1.0000	1.0000	0.0000	matrix	29966	NONKEY	0.00	171003070403	171003070403
22060	PCGP	171003070405	High Cascades	NORTH FORK BIG BUTTE CREEK	-0.1140	0.0150	0.1290	-1.0000	-1.0000	0.0000	0.0800	0.4230	0.3430	1.0000	1.0000	0.0000	matrix	22060	NONKEY	0.00	171003070405	171003070405
12491	PCGP	171003070406	High Cascades	MIDDLE BIG BUTTE CREEK	-0.3270	-0.3170	0.0100	-0.8720	-0.8640	0.0080	0.2660	0.2900	0.0240	1.0000	1.0000	0.0000	matrix	12492	NONKEY	0.00		
15034	PCGP	171003070408	High Cascades	LOWER BIG BUTTE CREEK	-0.2310	-0.1960	0.0350	-1.0000	-1.0000	0.0000	-0.1360	-0.0200	0.1160	1.0000	1.0000	0.0000	matrix	15035	NONKEY	0.00		
15512	PCGP	171003070601	Western Cascades	UPPER TRAIL CREEK	-0.7730	-0.8240	-0.0510	-1.0000	-1.0000	0.0000	-0.2420	-0.4140	-0.1720	1.0000	1.0000	0.0000	matrix	15512	NONKEY	0.00	171003070601	171003070601
14293	PCGP	171003070602	Western Cascades	WEST FORK TRAIL CREEK	-0.7850	-0.6910	0.0940	-1.0000	-1.0000	0.0000	-0.7330	-0.5640	0.1690	1.0000	1.0000	0.0000	matrix	14293	NONKEY	0.00	171003070602	171003070602
5504	PCGP	171003070603	Klamath/Siskiyou	LOWER TRAIL CREEK	-0.5310	-0.4350	0.0960	-0.9560	-0.8930	0.0630	0.3190	0.4790	0.1600	-1.0000	-1.0000	0.0000	matrix	5504	NONKEY	0.00		
25199	PCGP	171003070702	Klamath/Siskiyou	ROGUE RIVER/INDIAN CREEK	-0.0030	-0.0070	-0.0040	-0.0100	-0.0100	0.0000	0.0110	0.0010	-0.0100	0.2380	0.2100	-0.0280	matrix	25200	NONKEY	0.00		
20455	PCGP	171003070801	High Cascades	UPPER NORTH FORK LITTLE BUTTE CRE	0.0870	0.1400	0.0530	-0.9060	-0.8650	0.0410	0.6950	0.6920	-0.0030	1.0000	1.0000	0.0000	lsr	20455	KEY	19,085.63	171003070801	171003070801
15585	PCGP	171003070802	Klamath/Siskiyou	LOWER NORTH FORK LITTLE BUTTE CRI	-0.3360	-0.3460	-0.0100	-0.8690	-0.8670	0.0020	0.7290	0.6970	-0.0320	0.5140	0.1290	-0.3850	matrix	15585	KEY	14,530.17	171003070802	171003070802
12643	PCGP	171003070803	High Cascades	UPPER SOUTH FORK LITTLE BUTTE CRE	0.1000	0.2310	0.1310	-0.9360	-0.6190	0.3170	0.5800	0.5950	0.0150	1.0000	1.0000	0.0000	lsr	12643	KEY	12,642.76	171003070803	171003070803
17836	PCGP	171003070804	High Cascades	BEAVER DAM CREEK	0.0690	0.0970	0.0280	-1.0000	-0.9570	0.0430	0.5630	0.6000	0.0370	1.0000	1.0000	0.0000	lsr	17836	KEY	13,601.19	171003070804	171003070804
26184	PCGP	171003070805	High Cascades	SOUTH FORK LITTLE BUTTE CREEK/DEA	-0.0480	-0.0130	0.0350	-1.0000	-0.9720	0.0280	0.2980	0.3770	0.0790	1.0000	1.0000	0.0000	lsr	26184	KEY	19,702.59	171003070805	171003070805
33072	PCGP	171003070806	Klamath/Siskiyou	LOWER SOUTH FORK LITTLE BUTTE CRE	-0.3410	-0.3320	0.0090	-0.8450	-0.8500	-0.0050	0.6670	0.7040	0.0370	0.0100	0.0200	0.0100	matrix	33072	KEY	26,154.45	171003070806	171003070805
14270	PCGP	171003070808	Klamath/Siskiyou	SALT CREEK/LONG BRANCH	-0.4980	-0.4810	0.0170	-1.0000	-0.9960	0.0040	0.5070	0.5490	0.0420	0.2420	0.2420	0.0000	matrix	14270	NONKEY	0.00	171003070808	171003070403
14773	PCGP	171003070809	Klamath/Siskiyou	LITTLE BUTTE/LICK	0.0130	-0.0080	-0.0210	-0.0470	-0.0470	0.0000	0.1320	0.0710	-0.0610	0.4000	0.3810	-0.0190	matrix	14773	NONKEY	0.00		
15076	PCGP	180102060101	High Cascades	BUCK LAKE	0.1090	0.1450	0.0360	-1.0000	-0.9860	0.0140	0.6970	0.7980	0.1010	1.0000	1.0000	0.0000	matrix	15076	KEY	12,487.94	180102060101	180102060101
14079	PCGP	180102060102	High Cascades	CLOVER CREEK	0.2410	0.2530	0.0120	-0.8730	-0.8680	0.0050	0.9660	1.0000	0.0340	1.0000	1.0000	0.0000	matrix	14079	KEY	13,906.65	180102060102	180102060103
11696	PCGP	180102060103	High Cascades	MINERS CREEK	0.2150	0.2320	0.0170	-0.9280	-0.8850	0.0430	0.9540	0.9530	-0.0010	1.0000	1.0000	0.0000	matrix	11696	KEY	10,392.18	180102060103	180102060102
13305	PCGP	180102060104	High Cascades	LOWER SPENCER CREEK	0.1330	0.2000	0.0670	-1.0000	-1.0000	0.0000	0.7770	1.0000	0.2230	1.0000	1.0000	0.0000	matrix	13305	KEY	12,901.89	180102060104	180102060101

3.4 ROAD DECOMMISSIONING DATA TABLES

3.4.1 Data Synopsis

Changes in road density resulting from implementation of road decommissioning mitigations

- Spencer Creek Tier 1 Key Watershed, Winema National Forest
- Little Butte Creek Tier 1 Key Watershed, Rogue River National Forest

Data Abstract: Data is derived from a GIS analysis by the FS using shape files from the updated mitigation plan dated 3/09/11 and FS transportation layer data. Table 3.3.1-1 shows changes in road density in Spencer Creek and Little Butte Creek Tier 1 Key Watersheds (KWS) that would result from implementation of the proposed road decommissioning that is part of the mitigation plan for the PCGP. Road densities are calculated for NFS roads on NFS lands. Spencer Cr. KWS all roads density is for all land allocations in the Spencer Cr. watershed. Little Butte Cr. KWS all roads density is shown for both the LSR portion of Little Butte Cr. KWS and as a summary for all land allocations in Little Butte Creek. Distances of 1/4, 1/2, and 1 mile from the PCGP corridor are included to show relative comparisons of the effect of proposed road decommissioning in proximity to the effect of the PCGP corridor.

Comparison of effects of road decommissioning and impacts of the PCGP corridor

Data Abstract: Data is derived from the FERC FEIS and Biological Assessment and Forest Service GIS data in shape files dated 3/09/11 as noted in the tables. Data comparisons are as follows:

- **Miles in Watershed** compares the miles of the PCGP corridor in the watershed to the miles of roads that are proposed to be decommissioned. This information is important because decommissioning roads help offset the unavoidable watershed effects of the PCGP corridor. This provides a relative comparison of impact of the project to benefits of proposed road decommissioning.

- **Miles in Riparian Reserves** compares the miles of the PCGP corridor that occur in Riparian Reserves to miles of roads proposed to be decommissioned in Riparian Reserves. This information is important because it allows a comparison of riparian vegetation and habitat that would be impacted by the PCGP to the riparian vegetation and habitat where restoration can occur as part of road decommissioning.

- **Acres in Degraded Soil Condition** compares estimated acres that would be displaced or compacted within the PCGP corridor to the estimated acres of existing roads where degraded soil conditions would be restored by decommissioning existing roads. This information is important because degraded soil conditions can adversely affect watershed functions such as sediment routing and infiltration. This provides a relative comparison of the estimated adversely impacted soil conditions to the potential restoration accomplished in proposed road decommissioning.

- **Stream Crossings** compares the number of stream crossed by the PCGP to the number of stream crossings in decommissioned roads. This is important because most watershed – road interactions occur at or near stream crossings. This provides a relative comparison of

Draft

the potential watershed effects associated with stream crossings in the PCPG corridor and the potential watershed benefits associated with decommissioning roads where they intersect streams.

Spencer Creek and Little Butte Creek are both Tier 1 Key Watersheds in the NWFP.

TABLE 3.4.1-1 **Road Density Worksheet**				
RRS NF – Little Butte Creek Road Decommissioning Analysis 030911 Final				
Riparian Reserves				
Watershed	Miles	GIS Acres		
Little Butte Creek	6.73	14.3155		
Stream Crossings	Class	Frequency		
	II	1		
	III	1		
	IV	30		
PCGP Buffers	**Total Acres**	**Total miles NFS Roads**	**Road Density — all roads**	**Road Density — less proposed Decommissioned roads**
Rogue River NF LBC 5th field watershed 030911 Final				
1/4 mile buffer	4,335.20			
All roads		26.50	3.91	
Road_Decom_052810.xlsx (Calibrated)		9.16		
37207XX-A (0.06812)				
37207XX-B (0.088)				
Roads less decommissioned		17.34		2.56
1/2 mile buffer	8,695.90			
All roads		56.00	4.12	
Road_Decom_052810.xlsx (Calibrated)		19.24		
37207XX-A (0.1546)				
37207XX-B (0.1546)				
Roads less decommissioned		36.76		2.71
1 mile buffer	16,709.20			
All roads		109.10	4.18	
Road_Decom_052810.xlsx (Calibrated)		36.86		
37207XX-A (0.1545)				
37207XX-B (0.1545)				
Roads less decommissioned		72.24		2.77
All NFS Roads, LSR 227 in LBC	44,028.21	266.05	3.87	
Mile decommissioned LSR 227 in LBC		53.50		3.09
All NFS Roads, NFS Lands LBC	57,234.02	292.19	3.27	

Draft

TABLE 3.4.1-1 **Road Density Worksheet**				
Miles decommissioned LBC		53.50		2.67
Winema NF, Spencer Creek WS- Road Decom analysis 030911 Final				
Stream Crossings				
Stream Class	**Frequency**			
Intermittent	25			
Riparian Reserves				
Miles	GIS Acres			
5.276	12.7868			
Spencer Creek WS Road Density, 030911 update				
PCGP Buffers	**Total Acres**	**Total NFSR Miles**		**Road Density**
1/4 mile buffer	1854.20			
NFSR roads		13.53		4.67
Decom Roads		5.56		
Roads less decom		7.97		2.75
1/2 mile buffer	3448.21			
NFSR roads		23.34		4.33
Decom Roads		7.86		
Roads less decom		15.48		2.87
1 mile buffer	6317.58			
NFSR roads		38.52		3.90
Decom Roads		10.95		
Roads less decom		27.57		2.79
All NFS Lands, Spencer Cr. KWS	22284.1	91.85		2.64
Decom Roads		21.45		
Roads less Decom		70.40		2.02

Draft

TABLE 3.4.1-2

Proposed Road Decommissioning Projects, Rogue River National Forest

ROAD #	MILES	LSR	FIELD VERIFIED	CURRENT STATUS	OBJ MAINT LEVEL	REC CONFLICT	RANGE CONFLICT	FIRE CONFLICT	ROW STATUS	TIMBER SALE	RIPARIAN	TMP OVERLAP	TSI_need	suitable to close	# CULVERTS	PROPOSED CLOSURE DATE	Comments
LEVEL 1 OR DECOMMISSIONED ROADS																	
2500183	0.5	227	Partial	Closed	1	N	N	N	No ROW	N	N	N		suitable	unknown	2011	Wide roadbed and N closed canopy. Did Not walk entire length.
2500510	0.9	227	9/25/09	Open	1	N	N	N	No ROW		N	Overlap	Y	suitable	1	2015	Close after TSI treatment
2500520	0.5	227	9/25/09	Open	1	N	N	N	No ROW		N	Overlap	Y	suitable	0	2015	Close after TSI treatment
2500550	0.5	227	9/25/09	Open	1	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	Close after TSI treatment. Range access to range improvement (Spring). Can close after spring which is where the number section 36 is written on fire map.
2500598	0.4	227	9/25/09	Open/closed	1	N	N	N	No ROW		N	N	N	suitable	0	2011	1st 100 yds open, then blocked by a log and trees growing in roadbed
2520400	1.4	227	Informal		1	N		N	No ROW		Y	N	Y	suitable	1	2015	This is know from birding walks. Open road beds with N trees growing in them.
2520440	0.5	227	Informal		1	N		N	No ROW		N	N	Y	suitable	0	2015	This is known from birding walks. Open road beds with no trees growing in them. Some logs across the road.
2815260	0.1	227	9/16/09	Open/closed	1	N	Trail	N	No ROW		N	Overlap	Y	Partial	0	2011	.33 mi. in GIS but treed in after .1 miles and Not drivable.
2815320	0.8	227	9/18/09	Decommissioned	D-1993	N	N	N	No ROW		N	N	Y	suitable	0	2015	Estimated distance as not drivable and Not in GIS

Draft

2815325	0.3	227	9/19/09	Decommissioned	D-1993	N	N	N	No ROW		N	N	N	suitable	0	2011	
2815327	0.3	227	9/18/09	Blocked	1	N	N	N	No ROW		N	N		suitable	0	2011	
2815330	0.4	227	9/18/09	Blocked	1	N	N	N	No ROW			N	Y	suitable	0	2015	Close after TSI treatment
2815415	0.1	227	9/18/09	Open/closed	1	N	N	N	No ROW		N	Overlap		Partial	0	2011	1st 100 yds open, then blocked by dense brush growing in roadbed
2815422	0.3	227	9/22/09	Open	1	N	N	N	No ROW		N	Overlap	Y	suitable	0	2015	
2815423	0.2	227	9/22/09	Open	1	N	N	N	No ROW		N	Overlap	Y	suitable	0	2015	
3640380	0.6	227	9/23/09	Open/closed	1	N	N	N	No ROW		N	N		suitable	0	2011	Blocked at .1 mile and revegetated behind the log. A 385 spur comes off the road and needs closing. Not surveyed.
3640385	0.2	227	Not	Decommissioned	D-1992	N	N	N	No ROW		N	N		suitable	0	2011	
3700088	0.6	227	9/22/09	Open	1	N	N	N	No ROW		N	Overlap	N	suitable	1	2011	Hydrological issues.
3700103	1.0	227	9/25/09	Open	1	N	N	N	No ROW		N	Overlap		suitable	0	2011	Road forks Not shown on map provide additional mileage.
3700109	0.6	227	9/25/09	Open	1	N	Trail	N	No ROW		N	Overlap	Y	suitable	0	2015	Range access needed to the plantation? Trail 6 foot wide min.
3700113	0.6	227	9/25/09	Blocked	1	N	N	N	No ROW		N	Overlap		suitable	0	2015	
3700115	0.6	227	9/25/09	Open	1	N	N	N	No ROW		N	Overlap		suitable	0	2015	Access blocked by a log across the 100 road.
3700130	0.4	227	9/22/09	Open	see comment	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	Open gate. Log barrier bypassed by vehicles, OBJ ML: MP 0.0-MP 0.66 is '3', MP 0.66-MP 2.1 is '2'. Permittee needs access as far as Short Creek Prairie turnoff. Can close after gate or short creek turn off. (0.4 miles can be decommissioned)
3700165	1.6	227	9/18/09	Open/closed	N record	Y	N	N	No ROW		N	N	N	suitable	0	2011	Dispersed sites.

Draft

3705100	0.4	227	9/23/09	Open	1	N	N	N	No ROW	Big Elk	N	Overlap	Y	suitable	0	2015	
3705300	0.9	227	9/23/09	Open	1	N	N	N	No ROW	Big Elk	N	Overlap	Y	suitable	0	2015	
3705320	0.3	227	9/23/09	Open	1	N	N	N	No ROW		N	Overlap	Y	suitable	0	2015	
3705350	0.4	227	9/23/09	Open	1	Y	N	N	No ROW		Y	N	N	suitable	0	2011	Crosses Brown Mtn Trail
3705525	0.5	227	9/23/09	Open	1	N	N	N	No ROW		N	Overlap		suitable	0	2015	
3705580	0.5	227	Partial	Open	1	N	N	N	No ROW		N	Overlap	N	suitable	0	2011	Blocked after 100 yds by log. Some timber encroachment.
3705620	0.1	227	Partial	Open/closed	1	Y	N	N	No ROW		N	N	N	suitable	1	2011	Large dispersed campsite. Appears closed after 200 yds.
3710016	0.9	227	Partial	Open/closed	1	N	N	N	No ROW	N	N	N		suitable	0	2011	North end at canal is in mature forest with closed canopy. N treatment needed. South end in Lodgepole plantation needs rip and plant.
3720070	1.0	227	9/23/09	Open	1	N	N	N	No ROW	Big Elk	N	Overlap	Y	suitable	0	2015	
3720150	0.6	227	9/23/09	Open	1	N	N	N	No ROW	Big Elk	N	Overlap	Y	suitable	0	2015	
3720151	0.4	227	9/23/09	Decommissioned	D-1992	N	N	N	No ROW	Big Elk	N	N	Y	suitable	0	2015	
3720537	0.8	227	9/23/09	Open	1	N	Trail	N	No ROW		N	Overlap	Y	Partial	0	2015	This road accesses a permittee's gathering corral so access to that point needs to be maintained. After corral turn off road can be turned into trail 6 foot wide.
3720820	0.5	227	9/23/09	Open/bermed	1	Illegal OHV use	N	N	No ROW		N	N	N	suitable	0	2011	OHVs are going over the berm
3720900	1.1	227	Partial	Blocked	1	N	N	N	No ROW		N	Overlap	N	suitable	0	2011	Closed but N trees in portion of roadbed observed.
3730180	1.3	227	9/18/09	Open	1	N	Trail	N	No ROW		N	Overlap		suitable	0	2011	Range trail
3730200	1.3	227	9/18/09	Open	1	Cabin	Y	N	No ROW		N	Overlap	Y	Partial	0	2015	Accesses Short Creek Prairie range allotment and cabin, Closure beyond this point possible. (1.3 miles can be closed)

Draft

3730515	0.2	227	9/18/09	Revegetated	1	N	N	N	No ROW		N	N	N		0	2011	
3740940	0.4	227	5/27/10	Closed	1	N	N	N	No ROW	N	N	N	Y	suitable	0	2015	Native surface road through mix age /mix conifer forest.
250052X	0.2	227	9/25/09	Blocked	Non system?	N	N	N	No ROW		N	N	Y	suitable	0	2015	
281525X	0.1	227	9/16/09	Open	Non system?	Y	N	N	No ROW		N	N	Y	suitable	0	2015	Social road that accesses a dispersed camp
28154XX	0.0	227	9/22/09	Open	Non system?	N	N	N	No ROW			N	N	suitable	0	2011	Not in GIS
37052XX	0.2	227	9/23/09	Open	Non system?	N	N	N	No ROW	Big Elk	N	N	Y	suitable	0	2015	
37053XX	0.0	227	9/23/09	Open	Non system	N	N	N	No ROW	Big Elk	N	N	N	suitable	0	2011	
372015x	0.1	227	9/23/09	Non system?	Non system?	N	N	N	No ROW		N	N	Y	suitable	0	2015	
37207XX	0.2	227	9/23/09	Gated	Non system?	Illegal OHV use	N	N	No ROW		N	N	Y	suitable	0	2015	OHVs have bypassed the gate and cut through a log to access. This road is not in the system but is still getting used.
37208XX	0.1	227	9/25/09	Bermed	Non system?	N	N	N	No ROW		N	N	N	suitable	0	2011	Leads to log deck area. Landing needs ripping and planting
Total	25.4																
LEVEL 2 ROADs																	
2500145	0.9	227	5/27/10	Open/closed	2	N	N	N	No ROW	N			N	suitable	unknown	2011	Drove .3 mi. to logs across road. Mature timber. North end is closed, fenced, and vegetated.
2500150	0.2	227	5/27/10	Open	2	N	N	N	No ROW	N	Y		Y	suitable	0	2011	High priority, inside riparian zone. Goes Nowhere.
2500700	2.2	227	9/25/09	Open	2	Y	N	N	No ROW		N	Overlap		suitable	1	2015	Only shows as 1 mile in GIS, Large dispersed camp at end.
2815100	1.5	227	9/16/09	Open	2	Y	Y	N	No ROW		Y	Overlap	Y	suitable	4	2015	Dispersed camp at end. There is Permittee access need for this road. The access it to FS fence line and pvt lands.

Draft

2815180	0.3	227	9/16/09	Open	2	N	Trail	Pumper	No ROW		Y	Overlap	Y	suitable	2	2015	Close after TSI treatment. Range needs as trail access at min 6'Foot wide minimum.
2815250	1.9	227	9/16/09	Open	2	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	Only .87 miles show in GIS. Open for fence maintenance.
2815300	1.0	227	Partial	Gated	2		Trail		No ROW		N	Overlap	Y	suitable	5	2015	Only first mile surveyed. Range- still need access for management. Prefer to keep open, but can make trail.
2815420	1.0	227	9/22/09	Open	2	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	Range access pond. Can make trail 6 foot wide.
2815460	1.3	227	9/22/09	Gated (both ends)	2	Illegal OHV use	Trail	N	No ROW		N	Overlap	Y	suitable	0	2015	trail 6 foot wide access
2815500	0.8	227	9/18/09	Open	2	N	Trail	N	No ROW		Y	Overlap	Y	suitable	0	2015	Plantation at end needs fence removal. Can make trail 6 foot wide
2815800	0.3	227	9/19/09	Open	2	N	Y	N	No ROW		Y	Overlap	Y	suitable	0	2015	2815-800 goes through 2815-870 to 3730-500 and needs for alternative route due to snow drifts and moving cattle. Leave open. Can close 0.3 miles beyond the 870 spur
2815870	0.8	227	9/18/09	Open	2	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	2815-800 goes through 2815-870 to 3730-500 and needs for alternative route due to snow drifts and moving cattle. Leave open.
2815900	0.7	227	9/19/09	Gated	2	N	N	N	No ROW			Overlap	Y	suitable	3	2015	
3700095	0.1	227	9/22/09	Open/closed	2	N	N	N	No ROW		N	Overlap	N	suitable	0	2011	Road blocked by a log at 100 yds. Ripping this section is the only action needed
3700100	2.0	227	Partial	Open	2	OHV use	Y	N	No ROW			Overlap		suitable	0	2011	All spurs off this are proposed for closure. Road has a log over it that was not opened in 2009, indicating little need for the road. OHVs are going cross country to get around the log. Range: Road connects with the 3705-700 and permittee uses it for moving cattle. Using the other roads put them into allot traffic. Can close all spurs off of this road (103, 109, 106, 113, 115)

Draft

3700106	0.6	227	9/25/09	Open	2	N	N	N	No ROW		N	Overlap	Y	suitable	0	2015	
3700131	0.5	227	9/22/09	Open	2	OHV use	N	N	No ROW		N	Overlap	Y	suitable	0	2015	Log bypassed by OHVs
3705090	0.5	227	9/23/09	Open	2	N	N	N	No ROW		N	N	N	suitable	0	2011	
3705375	1.5	227	9/23/09	Open	2	Y	Y	N	No ROW		N	Overlap	N	suitable	0	2011	Crosses Brown Mtn Trail. Longer than shown in GIS. Not completely driven due to road condition. Permittee needs access (appx 1/4 mi) to fence and trailhead. From that point make trail 6 foot wide to hiking trail. (can close 1.5 miles)
3705550	1.2	227	9/23/09	Open	2	N	N	N	No ROW		N	Overlap	N	suitable	0	2011	
3705800	0.5	227	Partial	Bermed	2	Y	N	N	No ROW		N	Overlap	Y	suitable	0	2015	Large dispersed campsite at 50 yds can be left open.
3707590	1.0	227	9/16/09	Open/closed	2	Illegal OHV use	N	N	No ROW		N	Overlap	Y	suitable	0	2015	Log across road at 100 yds. OHVs accessing road by going cross country from several points.
3707850	1.0	227	9/16/09	Open/closed	2	N	Y	N	No ROW		N	Overlap		suitable	0		Log across road at MP 1.7 has been there for several years. Permittee needs access to fence. Can make trail last half of road after fence. Trail 6 foot wide. (can close 1 mile)
3720050	0.4	227	9/23/09	Open	2	N	N	N	No ROW	Big Elk	N	Overlap	Y	suitable	0	2015	
3720480	0.3	227	9/23/09	Open	2	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	This provides permittee access to back side of Daley Prairie for cattle distribution.
3720520	1.1	227	9/23/09	Open	2	N	Trail	N	No ROW		N	Overlap	Y	suitable	0	2015	TSI done in Klamath County. Needed in Jackson. Range: Make trail 6 foot wide.
3720530	0.6	227	9/23/09	Open	2	N	N	N	No ROW		N	Overlap	Y	suitable	0	2015	This road accesses a permittee's gathering corral so access to that point needs to be maintained (can close 0.6)
3720535	0.4	227	9/23/09	Open	2	N	Y	N	No ROW		N	Overlap	Y	suitable	0	2015	Range access needed for 1st 1/2. Trail after that. (can close 0.4)

Draft

3720600	0.7	227	9/23/09	Open	2	N	Trail	N	No ROW		N	Overlap	N	suitable	0	2011	Gravel pit. Range: trail 6 foot wide (can close 0.7 miles) Allow access to gravel pit.
3720706	0.1	227	9/23/09	Open	2	Illegal OHV use	N	N	No ROW		N	Overlap	Y	suitable	0	2011	Gravel Storage Area. Close trail beyond.
3720730	1.7	227	9/23/09	Gated	2	Illegal OHV use	Y	N	No ROW		Y	Overlap	Y	suitable	0	2015	OHVs have bypassed the gate. Culverts in wet area have perennial pools but no surface flow. This is a permittee water source, prefer to leave open, but willing to make trail (6 foot wide)
3720780	0.8	227	9/23/09	Open	2	N	Y	N	No ROW		N	Overlap	N	suitable	0	2011	Gating would work for permittee but does not meet the needs for mitigation. Prefer road open but can make trail.
Total	27.8																

Draft

TABLE 3.4.1-3

Proposed Road Decommissioning Spencer Creek Watershed

RECOMMENDATIONS WITH DATABASE ROUTE STATUS AS "EXISTING"

ROAD #	BMP	EMP	LENGTH	OPERATIONAL MAINTENANCE LEVEL	SURFACE TYPE	ROAD MANAGEMENT RECOMMENDATION		RECOMMENDED BY	COMMENTS
						CLOSE	DECOMM		
3640570	0.00	0.50	0.50	1	NATIVE		0.50	AQ/WL	CREEK CROSSING/SPOTTED OWLS
3700675	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3700753	0.00	0.30	0.30	1	NATIVE		0.30	WL	REDUCE ROAD DENSITY/NEAR SPOTTED OWL SITE
3787260	0.00	0.80	0.80	1	NATIVE		0.80	AQ/WL	CROSSES CREEK
3800800	0.00	0.50	0.50	1	NATIVE		0.50	AQ/WL	CHECK PRIVATE ACCESS TO BUCK LAKE
3800901	0.00	0.40	0.40	2	NATIVE		0.40	WL	REDUCE ROAD DENSITY/PREVENT MEADOW ACCESS
3800903	0.00	0.60	0.60	1	NATIVE		0.60	AQ/WL	CROSSES CREEK
3800930	0.00	0.75	0.75	1	NATIVE		0.75	AQ/WL/RA	ACCESSES BUCK LAKE/CROSSES CREEK/REDUCE ROAD DENSITY
3800930	0.85	1.10	0.25	1	NATIVE		0.25	WL/RA	ACCESSES BUCK LAKE/REDUCE ROAD DENSITY
3800930	1.10	1.20	0.10	2	NATIVE	0.10		WL/RA	BERMED AT CLOVER CREEK ROAD/CHANGE TO ML 1
3800933	0.00	0.20	0.20	1	NATIVE		0.20	WL/RA	REDUCE ROAD DENSITY
3800962	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3800964	0.00	0.30	0.30	1	NATIVE		0.30	WL	REDUCE ROAD DENSITY
3800991	0.00	0.60	0.60	2	NATIVE		0.60	AQ/WL	REDUCE ROAD DENSITY
3800992	0.00	0.95	0.95	1	NATIVE		0.95	AQ/WL	CROSSES CREEK
3800993	0.00	0.30	0.30	1	NATIVE		0.30	AQ/WL	CROSSES CREEK
3800994	0.00	0.30	0.30	1	NATIVE		0.30	WL	REDUCE ROAD DENSITY
3800995	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3800996	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3828130	0.00	1.00	1.00	1	NATIVE		1.00	WL	REDUCE ROAD DENSITY
3828150	0.00	0.90	0.90	1	NATIVE		0.90	WL	REDUCE ROAD DENSITY
3828361	0.00	0.30	0.30	1	NATIVE		0.30	WL	REDUCE ROAD DENSITY
3828404	0.00	0.70	0.70	1	NATIVE		0.70	WL	REDUCE ROAD DENSITY
3828503	0.00	0.60	0.60	1	NATIVE		0.60	WL	GOES THROUGH SPOTTED OWL SITE
3828650	0.00	0.50	0.50	1	NATIVE		0.50	WL	GOES TO SPOTTED OWL CORE AREA
3828655	0.00	0.40	0.40	1	NATIVE		0.40	WL	GOES TO SPOTTED OWL CORE AREA
3828657	0.00	0.30	0.30	1	NATIVE		0.30	WL	GOES TO SPOTTED OWL CORE AREA

Draft

TABLE 3.4.1-3

Proposed Road Decommissioning Spencer Creek Watershed

3828680	0.00	1.10	1.10	1	NATIVE		1.10	WL	GOES TO SPOTTED OWL CORE AREA
3828710	0.00	0.90	0.90	1	NATIVE		0.90	WL	GOES THROUGH SPOTTED OWL SITE
3841045	0.00	0.30	0.30	1	NATIVE		0.30	WL	REDUCE ROAD DENSITY
3841230	0.10	2.00	1.90	1	NATIVE		1.90	AQ/WL	FOLLOWS CLOVER CREEK
3850072	0.00	0.30	0.30	1	NATIVE		0.30	AQ/WL	CROSSES 2 CREEKS
3850073	0.00	0.60	0.60	1	NATIVE		0.60	AQ/WL	CROSSES 2 CREEKS; KEEP OPEN TO PLANTATION
3850074	0.00	0.30	0.30	1	NATIVE		0.30	AQ/WL	CROSSES CREEK
3850076	0.00	0.30	0.30	1	NATIVE		0.30	WL	CHECK FOR PRIVATE ACCESS
3850077	0.00	0.50	0.50	1	NATIVE		0.50	AQ/WL	CREEK + 2 SPOTTED OWL SITES
3850100	0.00	0.30	0.30	1	NATIVE		0.30	AQ/WL	CREEK + 2 SPOTTED OWL SITES
3852016	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3852021	0.00	0.40	0.40	1	NATIVE		0.40	WL	NEAR SPOTTED OWL CORE AREA
3852193	0.00	0.40	0.40	1	NATIVE		0.40	WL	REDUCE ROAD DENSITY
3852194	0.00	0.40	0.40	1	NATIVE		0.40	WL	REDUCE ROAD DENSITY
3852230	0.00	0.60	0.60	2	IMPROVED		0.60	WL	REDUCE ROAD DENSITY
3852240	0.00	0.60	0.60	1	NATIVE		0.60	WL	REDUCE ROAD DENSITY
3852271	0.00	0.10	0.10	1	NATIVE		0.10	WL	REDUCE ROAD DENSITY
TOTALS						0.10	21.45		
RECOMMENDATIONS WITH DATABASE ROUTE STATUS AS "DECOMMISSIONED" (NEED TO GROUND TRUTH)									
3700662	0.00	0.50	0.50	1	NATIVE		0.50	AQ/WL	2 CREEK CROSSINGS
3700670	0.25	0.50	0.25	1	NATIVE		0.50	AQ/WL	CREEK + SPOTTED OWL SITE NEARBY
3700673	0.00	0.40	0.40	1	NATIVE		0.40	AQ/WL	CREEK + SPOTTED OWL SITE NEARBY
3791010	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3791014	0.00	0.50	0.50	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3791111	0.00	0.20	0.20	1	NATIVE		0.20	AQ/WL	CHECK FOR WATER SOURCE ACCESS
3791113	0.00	0.70	0.70	1	NATIVE		0.70	AQ/WL	FOLLOWS CREEK
3791250	0.00	0.30	0.30	1	NATIVE		0.30	WL	REDUCE ROAD DENSITY

Draft

TABLE 3.4.1-3

Proposed Road Decommissioning Spencer Creek Watershed

3791320	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3800792	0.00	0.30	0.30	1	NATIVE		0.30	AQ/WL	CROSSES & GOES TO CREEK
3800793	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3800794	0.00	0.20	0.20	1	NATIVE		0.20	AQ/WL	GOES TO CREEK
3800820	0.00	0.50	0.50	1	NATIVE		0.50	AQ/WL	CROSSES CREEKS
3850130	0.00	0.20	0.20	1	NATIVE		0.20	AQ/WL	CHECK FOR WATER SOURCE ACCESS
3852012	0.00	0.70	0.70	1	NATIVE		0.70	WL	REDUCE ROAD DENSITY
3852017	0.00	0.20	0.20	1	NATIVE		0.20	WL	REDUCE ROAD DENSITY
3852260	0.00	0.70	0.70	1	NATIVE		0.70	WL	REDUCE ROAD DENSITY
3852270	0.00	0.60	0.60	1	NATIVE		0.60	WL	REDUCE ROAD DENSITY
3862040	0.00	0.40	0.40	1	NATIVE		0.40	WL	REDUCE ROAD DENSITY
3954070	0.00	0.10	0.10	1	NATIVE		0.10	AQ/WL	CREEK
3954072	0.00	0.20	0.20	1	NATIVE		0.20	AQ/WL	CREEK
3954073	0.00	0.10	0.10	1	NATIVE		0.10	AQ/WL	CREEK
TOTALS						0	7.60		

Draft

4.0 FILED MITIGATION PLANS

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
Roads	Key Watersheds: Reduce existing system and nonsystem road mileage. There would be no net increase in the amount of roads in Key Watersheds. (ROD C-7) Soil Productivity: maintain and enhance soil productivity and soil stability. (UNF IV-67; RR 4-1)) Wildlife: To provide for present and future habitat needs of wildlife species Contribute to the recovery of all threatened or endangered species (UNF IV-39, RR 4-2) Water Quality: maintain or enhance water quantity, quality, and timing of streamflow (UNF IV-59, RR 4-1) Fisheries: protect, maintain and, where appropriate, enhance the productivity of fish habitat (UNF IV-33, RR 4-2).	Decommission/ obliterate roads, barricade road entrance w/permanent landscape structures (berms, boulders, etc.), remove culverts, restore drainage, recontour roadbed to original slope, large wood placement, and seed/plant.	Umpqua National Forest, LSR 222, 223	7.6 Miles	1	LSR, Northern Spotted Owl, Pacific fisher, other late-successional habitat dependent species, riparian habitat, aquatics, SONC Coho, Steelhead, soil productivity	Some natural-surface roads have poor drainage that can lead to erosion and increased sediment in nearby streams. Road maintenance or obliteration is needed to improve drainage and to reduce chronic sediment input to the stream systems. The objective of road decommissioning for this project is to accelerate the revegetation of the decommissioned road with trees. This mitigation also offsets the impacts of soil compaction and displacement within the construction right-of-way by reducing compaction in the decommissioned roadbeds. This would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from surface erosion. A 30-50 foot wide route along the pipeline route would be maintained in early successional habitat. In addition a construction zone of 100 foot width or wider would be cut through mature forest, setting back development of mature forest habitat by one or more centuries. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Planting selected roads in conjunction with precommercial thinning treatments (see other mitigations) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in riparian reduces sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 & 9. Little Butte Creek and Spencer Creek are Key Watersheds and road reduction is a major objective (NWFP ROD C-7). Note that this would be most effective if done in conjunction with the thinning proposed. This mitigation also offsets the impacts of soil compaction and displacement within the construction R/W.
			Little Butte Creek Key Watershed, Rogue River-Siskiyou LSR 227 (road closures proposed intersect 32 streams and include 1 fish bearing stream, 1 perennial non-fish bearing stream and 30 intermittent streams. Proposal decommissions 6.7 miles of roads in riparian reserves and would allow restoration of riparian vegetation on approximately 14.3 acres of riparian vegetation.)	53.2 Miles (Reduced from 54.5 miles)	1		
			Spencer Creek Key Watershed, Winema National Forest (Proposed road closures intersect 25 intermittent streams. Proposal	21.4 miles (new mitigation)	1		

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
			decommissions 5.3 miles of roads in riparian reserves and would allow restoration of approximately 12.8 acres of riparian vegetation)				
		Close roads with barricades and remove culverts; revegetate, outslope road prism but do not obliterate.	Umpqua NF	5.4 Miles	1	Wildlife sensitive to disturbance, improves aquatic and terrestrial connectivity.	Close roads and remove culverts and treat weeds Mowing and maintenance of pipeline corridor, temporary road construction, and road use are direct disturbance impacts to wildlife. Road closure would mitigate some of those impacts, improve interior stand connectivity and benefit aquatic habitats over time.
		Road stormproofing	Umpqua NF	2.17 miles	1		Replacing culverts with hardened low water crossing (drain dips), fill removal, outsloping and erosion control on disturbed areas

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
Stand Density and Fuels Management	Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem. (ROD, C-11) Matrix Lands: Most timber harvest and other silvicultural activities would be conducted in that portion of the matrix with suitable forest lands, according to standards and guidelines. (ROD, C-39) Efficient production of wood fiber to satisfy National needs and benefit local economies (UNF IV-42, RR 4-2) ACS Objectives 1, 2, 5, 8.	Integrated Stand Density and Fuels Treatments: Commercial Thin, Precommercial Thin, Fuels Treatments adjacent to Pipeline corridor Removal of offsite pine in old plantations.	Umpqua LSR 223	2081 Acres Vegeta-tion Rx with 1128 acres of under-burns (Includes 350 acres of offsite pine removal)	1 Vegetation treatment, 3 Under-burns	Late successional and old growth dependent species and forest ecosystems. Timber production on Matrix Lands.	Both mature stands and developing stands would be removed during pipeline construction. Impacts to mature and developing stands would exceed the life of this project by many decades. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Density management in younger stands would accelerate development of LSOG. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated by land allocation change. Removal of LSOG is essentially a permanent loss that cannot be replaced. Young stands would take 70 years to develop into LSOG so this is not a 1-1 replacement. LSR Assessments have identified the importance of density management to control losses to stand replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so habitat over time becomes contiguous and is in proximity of the project. The proposed mitigation is centered on the ecological values associated with late-successional habitat. The values to associated species, many other ecosystem goods and services components such as microorganisms, soils and vegetative cover inter act to purify air and water, regulate the climate and recycle nutrients and wastes is very complex to establish appropriate level of mitigation for the loss of irreplaceable habitat late-seral forest. The proposed ridge line pipeline route intersects and area that has had reoccurring lighting strikes and has potential for stand replacement fires. This mitigation would assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, Forest, adjacent private landowners and public.
			Umpqua NF Matrix	1341 Acres Vegetation Rx with 1000 Acres of under-burns (increased from 907 Acres)			
		Precommercial thin young harvest	Rogue River-Siskiyou NF LSR 227.	600 Acres	1 (staggered over a period of 3 years)	LSR, Northern Spotted Owl, Pacific fisher,	There would be direct impacts to existing interior, developing interior habitat. The project would result in additional fragmentation and preclude the recovery of

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
		plantations in a single entry to create a pattern and spacing that would accelerate development of mature forest characteristics. These stands are in LSR but are not adjacent to the pipeline and are in addition to acres above.	Umpqua NF LSR 223	425 Acres (in addition to Fuel Break Project Above)		other late-successional habitat dependent species	fragmented habitat for those stands adjacent to the pipeline corridor. Maintenance of pipeline corridor would provide a continued vector for predators, early-seral species and non-native species. Also the project would result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands would be removed during pipeline construction. Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to pipeline construction. Thinning of young stands is a recognized treatment within LRSs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD C-12). ROD Pages B-11 ACS Objectives, C-11 and C-17.

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
Upland Terrestrial	Late Successional Reserves: managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. (ROD C-11) Long Term Soil Productivity: Maintain or improve soil site productivity in all resource management activities Rehabilitate degraded land to a productive state. (RR 4-1, UNF IV-67) Wildlife: To provide for present and future habitat needs of wildlife species Contribute to the recovery of all threatened or endangered species (UNF IV-39, RR 4-2) Biological Diversity: Maintain viable representation of native plant and animal species, and biological communities. (UNF IV-36, RR 4-2)	Within LSR manage snags densities at 16/acre > 10.0 in, of which 8/acre > 20 in dbh. Within the Matrix manage snag densities at 4/acre >20 in dbh. to mitigate loss of current and future sang habitat from removal large trees and snags within the construction clearing zone and the removal of adjacent hazard trees for the life of this project. Managing for this level of snag habitat provide for a greater assurance of associated species abundances within the LSR and Matrix (DecAID). ROD C-C11 and C-40	Umpqua NF LSR 223	175 Acres	1	LSR, Northern Spotted Owl, Pacific fisher, other late-successional habitat dependent species. Matrix benefits all snag dependent species.	Mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades after. Corridor construction would result in loss of snag habitat on approximately 775 acres of corridor construction (includes safety zone buffer). Data relies on the Cow Creek Watershed Analysis which suggests the watershed is far below historic levels of snag habitat due of past management actions. This project would add to those cumulative impacts. As snags are a critical component of LSR spotted owl habitat, replacement is needed. Snag requirements are specifically outlined in the Forests' LRMPs and NWFP. Forests require analysis and mitigation under most management activities. Replacement would be immediate though there would be a 10 year delay as snag decay develops. Snag management is required in the RRNF LRMP (4-20), with levels set under the various management directions. Snag Management is discussed in the NWFP for LSRs on C-14 and 15 of the ROD (items 4 and 7). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSR Assessment (Chap. 3).
			Rogue River-Siskiyou NF LSR 227	600 Acres	1		
			Umpqua NF Matrix	175 Acres	1		
		Manage Logs (Coarse woody material) within the pipeline corridor and in	Umpqua NF LSR 223	100-200 Acres (Reduced from 350 Acres)	1	LSR, Northern Spotted Owl, Pacific fisher, other late-successional	Mitigate for the loss of recruitment of large down wood to adjacent stands and within the construction clearing zone. The project would forgo the development of large down wood for the life of the project and for decades after. Downed wood is a

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
		adjacent stands that have a deficiency in down wood due to past management.	Rogue River-Siskiyou NF LSR 227	200-400 Acres (Reduced from 600 Acres)	1	habitat dependent species	critical component of Mature Forest ecosystems. Large wood replacement would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance (DecAID). ROD C-11. Acres that can be treated are necessarily limited by material available from the corridor.
		Treatment of noxious weeds, planting of native species, treatment of encroaching conifers and burning,	Umpqua NF Unique and Mosaic Habitats and Roadside Nox Weeds	120 Acres meadow restoration 6.7 miles of roadside weeds.	1	Native plant and wildlife communities.	Mitigate impacts to Unique habitats impacted by the project, There would be loss of forest habitat buffering the unique habitats and disruption to soil horizons enhancing the opportunities for non-native plant species.
		Planting at specific sites to grasses that benefit Mardon Skippers and Elderberry to benefit Short-horned Grasshopper.	Rogue River-Siskiyou NF LSR 227	20 Acres	1	Mardon Skipper Butterflies and short horned grasshoppers	The Dead Indian Plateau region is one of three known sites for Mardon Skipper butterflies in the world. It is also adjacent to a known site for Short-horned Grasshoppers. Both species are on the Forest's Sensitive Species list. The pipeline requirement of a permanent open corridor provides a unique opportunity to develop habitat for these skippers and grasshoppers. Planting the corridor with plants preferred by these Sensitive Species has the potential to increase the habitat and local range for these two species. Rehabilitation of disturbed sites is required under various BMP guidelines. Use of specific plant species has no additional problems. Results would be immediate in stabilizing the local habitat and location would be in the pipeline.

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
Wetlands Aquatic	Riparian Areas: Maintain or enhance the Characteristics of riparian areas, wildlife habitat, and fish habitat near or within riparian ecosystems (WIN 4-6). Riparian area management is designed to protect soil, water, wetland, floodplain, wildlife, and fish and resource values associated with riparian vegetative communities; maintain or improve water quality, wildlife habitat and fish habitat near or within riparian ecosystems (WIN 4-136, 139; RR 4-2; UNF IV-59) Fisheries: protect, maintain and, where appropriate, enhance the productivity of fish habitat to provide for populations of resident and anadromous fish (UNF IV-43; RR 4-2). High standards of water quality in terms of temperature, turbidity, and bank stability for fisheries (WIN 4-6, 4-139). Aquatic ecosystems: restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands, maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. (NWFP ROD B-9)	Repair Stream Crossing	Winema NF, Spencer Creek	1 project	1	Fisheries and aquatic habitats	Mitigation-Indirect: The proposed pipeline would cross Spencer Creek upstream of Buck Lake. This ford is at the uppermost reach of the perennial portion of Spencer Creek which is occupied by redband trout. Spencer Creek has been identified by NMFS through the FERC re-licensing process for the Klamath River hydro facilities, as habitat for Federally listed Southern Oregon/Northern California Coast Coho salmon. Additionally, once fish passage is provided through the Klamath River hydro facilities, steelhead would re-colonize Spencer Creek. The pipeline crosses SONC Coho habitats at other locations in other watersheds along the proposed pipeline route, possibly impairing habitat quality or reducing available habitat. Improving habitat quality at Spencer Creek provides the opportunity to be pro-active in providing quality habitat for SONC Coho, mitigating for any detrimental effects to other SONC Coho habitats, while improving habitat for redband trout and other aquatic species. Spencer Creek appears on the Oregon DEQ 303(d) list as water quality impaired from increased sedimentation. Improvements at this location would immediately benefit all downstream aquatic habitats and the species associated with those habitats.
			Rogue River NF, Little Butte Creek	32 Stream crossings (see notes in road decommis sioning)	1		Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which would help offset the impact of shade removal at pipeline R/W crossings.
		Stream Simulator Culverts Placement; Remove existing culverts and replace with	Umpqua National Forest	5 crossings	1	Fisheries, aquatic biota and connectivity	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which would help offset the impact of shade removal at pipeline R/W crossings.

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
	ACS objectives 1, 2, 3, 4, 5, 8	stream simulator culverts					
		In-Stream Large Woody Debris Placement	Winema NF, Spencer Creek (new project)	1 mile	1	Fisheries and aquatic habitats	Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time. The BLM completed placement last year on 3 miles of Spencer Creek below this reach. Addition of this segment would complete the stream rehabilitation on the reach of Spencer Creek where the project occurs. Logs from the PCGP Right of Way would be used for the project. An estimated 75 pieces are needed. A helicopter would be used to place the logs.
			Rogue River NF, SF Little Butte Creek (new project)	1 mile	1		
		Riparian Planting	Winema NF, Spencer Creek (new project)	0.5 miles	1	Riparian vegetation and habitats	Spencer Creek just upstream of Buck Lake. This is a meadow site that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings would contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation would increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats.
Grazing	Riparian Areas: Maintain or enhance the Characteristics of riparian areas, wildlife habitat, and fish habitat near or within riparian ecosystems. (WIN 4-6). Water bodies, stream courses, and wetlands, their riparian vegetation, and the immediately adjacent	Fence construction and cattle guards	Fremont-Winema NF, Clover Creek Road. Buck-Indian Allotment	6.4 Miles	1	Wetland and aquatic habitats. Visual resources, public safety.	This fence would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the Right of Way corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met. It would also serve to separate anticipated increased cattle grazing of the ROW from the highway; greatly

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
	upland areas would be managed to stabilize stream channels: prevent soil erosion: and maintain or improve water quality, fish habitat, recreation opportunities, and riparian/ wetland habitat for dependent fish and wildlife species and dependent aquatic species. (WIN 4-16) Riparian area management is designed to protect soil, water, wetland, floodplain, wildlife, and fish resource values associated with riparian vegetative communities (WIN 4-136); maintain or improve riparian areas associated with Class I, II and III streams and with lakes (WIN 4-139) ACS Objectives: 3, 4, 5, 8, 9						reducing a safety hazard for vehicles traveling the Clover Creek road. This fence would require 7-9 cattle guard crossings for Forest Roads intersecting the fence

Draft

TABLE 4.0-1

FS Filed Mitigation Plan Submitted to FERC

Miti-gation Group	Related Forest Plan Goals and Objectives	Mitigation Activity	Location	Amt	Treatments in 50 year Period	Resource Benefit	Rationale
Visuals	Winema NF: Provide attractive. visually pleasing settings, emphasizing appearance of areas seen from major travel .routes,-use areas, and bodies of water (LRMP 4-13) Foreground Retention: The primary emphasis for this intensity is to retain the natural-appearing condition of the foreground areas. The retention visual quality objective means that activities may only repeat whatever form, line, color, and texture are frequently found in the characteristic landscape. Changes in their qualities—such as size, amount, intensity, direction, and pattern-may not be evident (WIN MA 3A, LRMP 4-103, RR MA 6A, and LRMP 4-72). Foreground Partial Retention: The goal is to provide attractive scenery that is slightly altered from a natural condition as viewed in the foreground. Activities may repeat or introduce form, line, color, or texture common or uncommon to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, and pattern must remain visually subordinate to the visual strength of the characteristic landscape (MA 3B; LRMP 4-107, RR MA 6B, LRMP 4-86).	Stand density and fuels treatments for visual purposes on 50-500 foot wide area (Avg. 300) feet wide for length of corridor along Clover Creek Road (estimated 110 Acres).	Winema National Forest, Clover Creek Road	Estimated 110 acres-50-500 foot wide zone along the timbered edge of the PCGP corridor on the Clover Creek Rd.	1	Soften the visual effect of the hard edge created along the timbered boundary of the PCGP along the Clover Creek Road.	The PCGP would create a hard line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway. Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with landscape. Thinning of commercial sized material would be accomplished with a commercial timber sale. The mitigation is intended to supplement funding for the non-commercial part of that work for visual purposes that could not otherwise be accomplished.
		Note that extensive mitigations are proposed within the PCGP Corridor for visual purposes at the PCGP crossing of the Big Elk Road and the Pacific Crest Trail on the Rogue River NF, and at the Dead Indian Memorial Highway crossing and along the Clover Creek Road on the Winema NF. These mitigations occur within the PCGP corridor and part of the Aesthetic Management Plan for the project, so they are not included as part of the Mitigation Plan or funding for activities that occur outside of the PCGP Corridor.					

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
MD	Big Butte Cr.	Fire Suppression	Fire suppression	Big Butte Cr. Pump Chance	Construction of the pipeline and associated activities would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	1	sites
CB	EF Coquille	Fire Suppression	Fire suppression	Heli-Pond construction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity, however the corridor also provides a fuel break. Within the East/Middle Fork watersheds, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heliponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur.	2	ea.
MD	Little Butte Cr.	Fire Suppression	Fire suppression	Little Butte Cr. Pump Chance	Construction of the pipeline and associated activities would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	8	sites
CB	MF Coquille	Fire Suppression	Fire suppression	Heli-Pond construction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity, however the corridor also provides a fuel break. Within the East/Middle Fork watersheds, there is an 18+ mile gap between helicopter accessible waterholes. Quick response time is imperative for successful control in wildfire situations during initial attack. Most water sources in this area are low in the drainage and accessible only by truck. Heliponds at these locations would enable a 2-3 mile radius for aerial application. Fire control is necessary to protect Late Successional Reserves and endangered species habitat should a wildfire occur.	1	ea.
RD	South Umpqua River (1710030205), Myrtle Creek (1710030211), and Middle South Umpqua River (1710030210)	Fire Suppression	Fire suppression	Dry Hydrants	By installing dry hydrants, the water source is disturbed the one time but there are several advantages. Fire vehicles would not need to be really close to the water to fill, decreasing risk of contamination, and they can fill out of some water sources that would otherwise need to be modified for use. Areas that have had restoration work for fish populations could still be safely accessed for fire suppression. Over all, better water sources would improve suppression success and therefore help protect natural resources.	6	sites

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
MD	Trail Cr.	Fire Suppression	Fire suppression	Trail Creek Pump Chance	Construction of the pipeline and associated activities would increase fire suppression complexity. Pump chances increase capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.	8	sites
MD	Little Butte Cr.	Fish Passage	Fish Passage	Little Butte Creek Fish Screen	Irrigation diversions have negatively impacted fisheries in Little Butte Cr. by causing entrapment. There is a private irrigation ditch with an unscreened diversion and associated push up dam on BLM land in the lower 1.5 miles of Lost Creek. The unscreened ditch is currently accessible to juvenile and adult fish, creating a stranding hazard with limited return access to the main channel. The push up dam is constructed at the beginning of the irrigation season and removed at the end of the season. This stream is considered coho critical habitat and building a push up dam in the creek each season disturbs gravels, generates sediment and creates an unnecessary disturbance during steelhead spawning season. Creating a permanent diversion structure, possibly in the form of a boulder weir, would divert water without yearly maintenance and would provide for both upstream and downstream fish passage.	1	site
RD	MF Coquille	Fish Passage	Fish Passage	Loveseat Creek culvert removal	Man-made barriers to fish passage have negatively affected access to habitat in the MF Coquille. The stream crossing is a fish barrier to resident fish. Removing the culvert and associated road fill would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. Sediment introductions to the stream network would also cease.	1	project
RD	MS Umpqua	Fish Passage	Fish Passage	Rice Creek culvert replacements	Man-made barriers to fish passage have negatively affected access to habitat in the MS Umpqua. Replacing fish barrier culverts with crossings that pass adult and juvenile salmonids at a range of flows would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter the stream network. Replacing fish barrier culverts with crossings that pass adult and juvenile salmonids at a range of flows would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter the stream network.	2	sites
RD	Myrtle Creek	Fish Passage	Fish Passage	Slide Creek culvert replacement	Man-made barriers to fish passage have negatively affected access to habitat in Myrtle Cr. Culvert is perched, undersized, and a fish barrier for anadromous and resident fish. Replacing a fish barrier culvert with one that would pass adult and juvenile salmonids at a range of flows would extend the availability of upstream habitat, mitigating for reductions in habitat quality on stream reaches crossed by the pipeline corridor. In addition, undersized culverts are at risk of failure due to small size and age. This could result in the culvert plugging which could cause road fill to enter into the stream network.	1	project

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
RD	South Umpqua River	Fish Passage	Fish Passage	Beal Creek culvert replacement	Man-made barriers to fish passage have negatively affected access to habitat in the South Umpqua. Both culverts are undersized and obstruct anadromous and resident fish passage. Replacing the culverts with ones properly sized for the stream would allow for proper fish passage along with reducing the risk for culverts plugging and causing road fill failures.	2	sites
MD	Shady Cove RR	Fuels Reduction	Stand Density Fuel Break	Shady Cove Fuel Hazard Reduction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity, however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	866	acres
MD	Shady Cove RR	Fuels Reduction	Stand Density Fuel Break	Shady Cove Fuel Hazard Maintenance	This provides a mechanism for maintenance of fuel breaks over time for the life of the project.	866	acres
RD	South Umpqua River	Fuels Reduction	Stand Density Fuel Break	Hazardous Fuel Reduction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity; however, the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Days Creek to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	1000	acres
MD	Trail Cr.	Fuels Reduction	Stand Density Fuel Break	Trail Creek Fuel Hazard Reduction	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity, however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.	687	acres
MD	Trail Cr.	fuels Reduction	Stand Density Fuel Break	Trail Cr. Fuels Hazard Maintenance	This provides a mechanism for maintenance of fuel breaks over time for the life of the project.	687	acres

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
MD	Big Butte Cr.	Habitat Improvement	Terrestrial Habitat Imp.	Big Butte Cr. Fritillaria Habitat	The PCGP may impact habitat of Fritillaria gentneri. Outplanting to suitable habitat locations is recommended in the recovery plan.	600	acres
CB	EF Coquille	Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation& Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the PCGP. The action also compensates for the removal of occupied marbled murrelet habitat and suitable RNF spotted owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of Matrix lands adjacent to occupied murrelet sites by reallocating the entire parcel to LSR.	120	acres
CB	MF Coquille	Land Re-Allocation from Matrix to LSRNon-Federal Land Acquisition	Acquisition	LSR Reallocation& Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in mapped and unmapped LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the PCGP. The action also compensates for the removal of occupied marbled murrelet habitat and suitable RNF spotted owl habitat. In addition, the selected parcel reduces the potential edge effects caused by management of Matrix lands adjacent to occupied murrelet sites by reallocating the entire parcel to LSR.	330	acres
RD	Olalla-Lookingglass	Land Re-Allocation from Matrix to LSR Non-Federal Land Acquisition	Acquisition	LSR Reallocation and Land Acquisition	This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres of acres and habitat from the construction and operation of the PCGP. In addition to impacts to Mapped LSR, this action compensates for impacts to 3 unmapped LSRs (NSO habitat). The 409 acres of re-allocation would be a factor of 5.0 x to the 81 acres of habitat affected by the construction.	409	acres
CB	EF Coquille	LWD instream	Aquatic Habitat	Yankee Run In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.75	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
MD	Little Butte Cr.	LWD instream	Aquatic Habitat	Little Butte Cr. LWD	Little Butte Cr. is a Tier One, Key Watershed. Lost Cr. provides habitat for Coho Salmon. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	8.6	miles
RD	MF Coquille	LWD instream	Aquatic Habitat	Twelvemile Creek Large Wood and Boulder Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2	miles
CB	MF Coquille	LWD instream	Aquatic Habitat	Upper Rock Creek In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.1	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
RD	MF Coquille	LWD instream	Aquatic Habitat	Middle Fork Coquille LWD Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat.	0.6	miles
CB	NF Coquille	LWD instream	Aquatic Habitat	Steinnon Creek In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishments of ACS objectives.	1.5	miles
CB	NF Coquille	LWD instream	Aquatic Habitat	Upper North Fork Coquille In-stream Large Wood Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishments of ACS objectives.	2.2	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
RD	Olalla-Lookingglass	LWD instream	Aquatic Habitat	Olalla Creek Large Wood and Boulder Placement	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	1.2	miles
MD	Shady Cove RR	LWD instream	Aquatic Habitat	Shady Cove LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.5	miles
RD	South Umpqua River	LWD instream	Aquatic Habitat	West Fork Canyon Creek Large Wood and Boulder Placement	The South Umpqua River is a Tier 1 Key Watershed. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 6.23 miles of corridor and 3 stream crossings in the South Umpqua. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	0.8	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
RD	South Umpqua River	LWD instream	Aquatic Habitat	Days Creek Large Wood and Boulder Placement	The South Umpqua River is a Tier 1 Key Watershed. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. There are approximately 6.23 miles of corridor and 3 stream crossings in the South Umpqua. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	0.4	miles
MD	Trail Cr.	LWD instream	Aquatic Habitat	Trail Creek LWD	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of large woody debris from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of large woody debris into the channel and associated Riparian Reserves. Placing large woody debris at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	2.6	miles
LV	Spencer Cr.	Riparian Vegetation	Riparian Stand Density	Tributary Creek Riparian Thinning	Spencer Cr. is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. Thinning would restore forest health and diversity in riparian reserves and stands near streams that are currently overstocked. Thinning would be done in a way that emulates the natural “patchiness” of disturbance events.	70	acres
LV	Spencer Cr.	Riparian Vegetation	Riparian Stand Density	Upper Spencer Cr. LSR/Riparian treatment	Spencer Cr. is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. This project would thin, pile and burn dense white fir understory vegetation and fall occasional trees into the stream channel for LWD. This would enhance forest health and diversity with the LSR/Riparian Reserve by restoring stand density to more natural and sustainable levels. This contributes to forest health and sustainability of riparian reserves by increasing resistance to insect and disease losses and reducing the risk of stand replacing fire. LWD in stream channels contributes to meeting water quality and TMDL targets and provides habitat for sensitive fish and invertebrate species.	3	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
LV	Spencer Cr.	Riparian Vegetation	Riparian Stand Density	Miners Creek LSR, Riparian Treatment	Spencer Cr. is a Tier One, Key Watershed. Implementation of the PCGP project would require removal of riparian vegetation, thereby influencing the form and function of Riparian Reserves. This project would thin, pile and burn dense white fir understory vegetation and fall occasional trees into the stream channel for LWD. This would enhance forest health and diversity with the LSR/Riparian Reserve by restoring stand density to more natural and sustainable levels. This contributes to forest health and sustainability of riparian reserves by increasing resistance to insect and disease losses and reducing the risk of stand replacing fire. LWD in stream channels contributes to meeting water quality and TMDL targets and provides habitat for sensitive fish and invertebrate species.	3	miles
LV	Spencer Cr.	Road Closure	Road Sediment Reduction	Spencer Cr. Repair Existing Road Closure	Roads negatively impact wildlife. Implementation of the PCGP project would have road-like impacts on wildlife and require use of a large number of permanent and temporary roads and other access routes. Road closures (barricades) were established in the watershed to reduce road density to meet Resource Management Plan objectives for both the aquatic conservation strategy and reduce impacts to wildlife. This project repairs the existing closure structures to ensure that road closures remain effective. Spencer Cr. is a Tier One, Key Watershed. Maintaining road closures also reduces sediment by keeping closed roads revegetated.	12	sites
MD	Little Butte Cr.	Road Decommissioning	Road Sediment Reduction	Little Butte Cr. Road Decommissioning Butte Falls RA	Little Butte Cr. is a Tier One, Key Watershed. Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. There are approximately 6 miles of the PCGP corridor and 7 stream crossings on BLM lands in LBC. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity by reducing road density.	2.4	miles
MD	Little Butte Cr.	Road Decommissioning	Road Sediment Reduction	Little Butte Cr. Road Decommissioning Ashland RA	Little Butte Cr. is a Tier One, Key Watershed. Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. There are approximately 6 miles of the PCGP corridor and 7 stream crossings on BLM lands in LBC. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity by reducing road density.	10.6	miles
MD	Trail Cr.	Road Decommissioning	Road Sediment Reduction	Trail Creek Road Decommissioning	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity and by reducing road density.	2.7	miles

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
RD	MS Umpqua	Road Drainage	Road Sediment Reduction	East Fork Willis Creek tributary culvert replacement	Sediment is one of the primary water quality problems in the MS Umpqua. Watershed analyses clearly indicate that the sediment turbidity habitat indicator is at risk or more likely not functioning properly. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Culvert is plugged, old, undersized, shot-gunned, and eroding road fill. Culvert has poor alignment with the stream at the outlet. Replacing the culvert with a properly sized one would reduce the risk of road fill failure.	1	project
RD	MS Umpqua	Road Drainage	Road Sediment Reduction	Judd Creek culvert removal	Sediment is one of the primary water quality problems in the MS Umpqua. Watershed analyses clearly indicate that the sediment turbidity habitat indicator is at risk or more likely not functioning properly. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. This culvert is undersized and has a large amount of road fill associated with it. Pulling the culvert and fill material and stormproofing the road would prevent a plugged culvert. A plugged culvert could cause the road fill to fail which could deliver sediment downstream to fish bearing reaches. The road is blocked by a landslide just beyond so access would not be lost. Access to the stream crossing is gradually being lost due to soil slumping and vegetation growth.	1	project
LV	Spencer Cr.	Road Drainage	Road Sediment Reduction	Spencer Cr. Drainage Improvements and Sediment Trap Removal	Spencer Cr. is a Tier One, Key Watershed. Although BMP's and other project measures would be implemented, the PCGP would have road-like watershed impacts if constructed, including mobilization of sediment and possible alteration of hydrologic regimes. The project also uses a number of roads for access and construction. Drainage improvements and removing non-functioning cross drains and sediment traps at selected locations would benefit aquatic habitat/connectivity by restoring drainage and reducing sediment transport.	15	sites
LV	Spencer Cr.	Road Drainage	Road Sediment Reduction	Keno Access Road Repair and Culvert Replacement	Spencer Cr. is a Tier One, Key Watershed. Although BMP's and other project measures would be implemented, the PCGP would have road-like watershed impacts if constructed, including mobilization of sediment and possible alteration of hydrologic regimes. The existing stream crossing (culvert) is undersized in both length and diameter, therefore it ability to meet ACS objectives is minimized. The culvert underlying the existing road bed periodically causes erosion of the road prism and adjacent upland and riparian areas. Replacement of the culvert would allow stabilization of the road shoulder and reduce sediment input to Miner's creek and its contribution of sediment to Spencer creek. If this work is not completed, the condition would eventually lead to increased sedimentation. Replacement of this drainage structure would decrease road-related erosion, increase the hydrologic capacity of the crossing and enhance aquatic connectivity for fish and other aquatic organisms.	1	site

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
MD	Little Butte Cr.	Road Drainage and Surface Enhancement	Road Sediment Reduction	Little Butte Cr. Road Improvement	Little Butte Creek is a Tier 1 Key Watershed. Sediment has been identified by the LBC Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. The PCGP has approximately 6 miles of corridor and 7 stream crossings on BLM lands in the LBC 5th field watershed. The effects of the PCGP include possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	3.5	miles
RD	MF Coquille	Road Drainage and Surface Enhancement	Road Sediment Reduction	Camas Mountain Road Drainage and Surface Enhancement	Road-related sediment and stream network extension from ditchlines have negatively impacted the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Roads do not meet current Best Management Practices and are a source of chronic sediment delivery to fish bearing streams. The 9.1 and 9.2 roads currently shows signs of water rutting and stream network extension. Stormproofing and blocking the road would reduce the potential for sediment-laden water to be carried off the road surface and into the ditch where it could be transmitted to the stream network.	3.5	miles
RD	Myrtle Creek	Road Drainage and Surface Enhancement	Road Sediment Reduction	Ben Branch Road Drainage and Surface Enhancement	Sediment in streams is a limiting factor in Myrtle Creek. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Roads do not meet current Best Management Practices and are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair would reduce sediment delivery to fish bearing streams.	1	miles
MD	Shady Cove RR	Road Drainage and Surface Enhancement	Road Sediment Reduction	Shady Cove Road Improvement	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Upper Rogue. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	1	mile
RD	South Umpqua River	Road Drainage and Surface Enhancement	Road Sediment Reduction	South Umpqua Road Drainage and Surface Enhancement	The South Umpqua River is a Tier 1 Key Watershed. There are approximately 6.23 miles of corridor and 3 stream crossings in the South Umpqua. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Sediment is likely the most limiting factor to aquatic function in the S. Umpqua Basin. Roads do not meet current Best Management Practices and are a source of chronic sediment delivery to fish bearing streams. Surfacing and drainage repair would reduce sediment delivery to fish bearing streams.	10	miles
RD	Myrtle Creek	Road Stabilization	Road Sediment Reduction	South Myrtle Hill Slide Repair	Sediment in streams is a limiting factor in Myrtle Creek. There are approximately 3.4 miles of corridor in Myrtle Creek. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Stabilizing the failure would prevent future sediment delivery and catastrophic slope failure.	1	project

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
RD	Olalla-Lookingglass	Road Stabilization	Road Sediment Reduction	Olalla Tie Road Renovation	Sediment from roads is a primary concern in Olalla-Lookingglass Cr. Roads do not meet current Best Management Practices and are a source of chronic sediment delivery to fish bearing streams. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Additionally, there are several landslides crossing the road which need to be stabilized. Stabilizing these conditions would reduce the delivery of road-related sediments to channels.	1	project
RD	South Umpqua River	Road storm-proofing	Road Sediment Reduction	31-4-3.2 Road storm proofing	The South Umpqua River is a Tier 1 Key Watershed. Sediment is likely the most limiting factor to aquatic function in the South Umpqua Basin. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. If culverts fail, substantial sediment could be transported to Shively Creek. Removing culverts would prevent crossing failures that deposit fine road sediments in stream channels. Project should occur before road becomes too overgrown for heavy equipment access.	1	project
MD	Trail Cr.	Road storm-proofing	Road Sediment Reduction	Trail Creek Road Stormproofing	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP include possible impacts to flow and sediment regimes. Stormproofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	4.3	miles
MD	Big Butte Cr.	Road Surfacing	Road Sediment Reduction	Big Butte Cr. Road stormproofing	Sediment was identified by the Upper Rogue Watershed Council as a factor that limited aquatic habitat in Big Butte Creek. The effects of the PCGP include possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	6.4	miles
CB	EF Coquille	Road Surfacing	Road Sediment Reduction	Road Surfacing - South Fork Elk Creek	Road-related sediment has negatively impacted the EF Coquille. The effects of the PCGP include possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to the South Fork Elk Creek would reduce if not eliminate sediment input to adjacent Chinook, coho, steelhead, and cutthroat habitat.	2.6	miles
CB	EF Coquille	Road Surfacing	Road Sediment Reduction	Road Surfacing - Yankee Run Mainline	Road-related sediment has negatively impacted the EF Coquille. The effects of the PCGP include possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to Yankee Run Creek would reduce if not eliminate road-related sediment input to coho, steelhead, and cutthroat habitat.	2	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
CB	EF Coquille	Road Surfacing	Road Sediment Reduction	Road Surfacing - Yankee Run Spurs	Road-related sediment has negatively impacted the EF Coquille. The effects of the PCGP include possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed. Surfacing the BLM road which is parallel to Yankee Run Creek would reduce if not eliminate road - related sediment input to coho, steelhead, and cutthroat habitat.	0.9	miles
MD	Little Butte Cr.	Road Surfacing	Road Sediment Reduction	Little Butte Cr. Road Resurfacing	Little Butte Cr. is a Tier One, Key Watershed. The PCGP has approximately 6 miles of corridor and 7 stream crossings on BLM lands in the LBC 5th field watershed. The effects of the PCGP include the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	9.35	miles
MD	Little Butte Cr.	Road Surfacing	Road Sediment Reduction	Little Butte Cr. Road Resurface	Little Butte Cr. is a Tier One, Key Watershed. The PCGP has approximately 6 miles of corridor and 7 stream crossings on BLM lands in the LBC 5th field watershed. The effects of the PCGP include the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	9	miles
CB	MF Coquille	Road Surfacing	Road Sediment Reduction	Road Surfacing - Fall Creek System	Road-related sediment has negatively impacted the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Surfacing the BLM road which is parallel to Fall Creek would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat.	0.9	miles
CB	MF Coquille	Road Surfacing	Road Sediment Reduction	Bridge Approach paving -Sandy & Jones Creek Roads	Road-related sediment has negatively impacted the MF Coquille. There are approximately 7.3 miles of corridor and 9 stream crossings in the MF Coquille. The effects of the PCGP include habitat fragmentation and potential impacts to flow and sediment regimes. Surfacing the bridge approach would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat from this location.	2	ea.
CB	NF Coquille	Road Surfacing	Road Sediment Reduction	Bridge Approach paving - Woodward & Alder Creek Roads	Road-related sediment has negatively impacted the NF Coquille. While Best Management Practices would be implemented, construction of the PCPG would likely cause sediment to enter stream channels and may affect aquatic habitat. Surfacing the bridge approach would reduce if not eliminate sediment input to coho, steelhead, and cutthroat habitat.	2	ea.
MD	Shady Cove RR	Road Surfacing	Road Sediment Reduction	Shady Cove Road Resurface	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in the Upper Rogue. The effects of the PCGP include the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	1.5	miles

Draft

TABLE 4.0-2

BLM High Priority Mitigation Projects Submitted for Consideration by Pacific Connector

Admin Unit	Watershed	Project Type	Mitigation Group	Project Name	Project Rationale	Qty.	Unit
MD	Trail Cr.	Road Surfacing	Road Sediment Reduction	Trail Creek Road Resurface	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP include the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic and reduce road-related sediment that could be delivered to stream channels.	16.3	miles
LV	Spencer Cr.	Stand Density Habitat	Terrestrial Habitat Imp.	Upper Spencer Creek LSR Density Mgt.	Implementation of the PCGP project would require removal of late-successional habitat, including critical habitat for northern spotted owls. Stand density management reduces the risk of stand replacing fire and accelerates the development of late-successional stand conditions which may benefit northern spotted owls.	270	acres

Draft

5.0 BIBLIOGRAPHY

Agee, J.K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press, Covelo, CA.

Anderson, P.G., B.R. Taylor, and G.C. Balch. 1996. Quantifying the effects of sediment release on fish and their habitats. Can. Manuscript. Report of Fisheries and Aquatic Sciences. 2346: 110 p. + 3 Append.

Bartholow, J. 2002. Stream Segment Temperature Model (SSTEMP) Version 2.0. Revised 34 August 2002. U.S. Geological Survey, Fort Collins, CO.

Bauer, S., E. Salminen, P. Hoobyar and J. Runyon. Summary of the Watershed Health Indicators for the Oregon Coast Coho Evolutionarily Significant Unit. Oregon Watershed Enhancement Board, Salem, OR. January, 2008

Benda, L.E.; Miller, D.J.; Dunne, T. [et al.]. 1998. Dynamic Landscape Systems. In Naiman, R.J. and Bilby, R.E., eds. River Ecology and Management: Lessons from the Pacific Coastal Ecoregion. Springer-Verlag, New York, NY. pp 261-288. Cited in Everest and Reeves, 2007.

Broeker, L. 2010a. Potential for Natural-Occurring Mercury Mineralization to Enter the Aquatic Environment between M.P. 109 and East Fork Cow Creek, Williams' Pacific Connector Gas Pipeline Project. Resource report prepared for USDA Forest Service, Umpqua National Forest, Roseburg, OR. November 18, 2009; revised February 3, 2010.

Broeker, L. 2010b. Riparian Reserves and Unstable and Potentially Unstable Ground: "Finalized" Pipeline Alignment, East Fork Cow Creek Watershed, Pacific Connector, LP Gas Pipeline Project. Resource Report prepared for USDA Forest Service, Umpqua National Forest, Roseburg, OR. September 9, 2010.

Brown, G.W. 1970. Predicting the effect of clearcutting on stream temperature. J. Soil Water Conservation. 25(1):11-13. (Cited in North Fork Coquille Watershed Analysis)

Bureau of Land Management. 1995a. Central Big Butte Creek, Big Butte Watershed, Watershed Assessment. Bureau of Land Management, Medford District Butte Falls Resource Area. Medford, OR. 1995.

Bureau of Land Management. 1995b. Record of Decision and Resource Management Plan, Coos Bay District. U.S. Department of the Interior, Bureau of Land Management, Coos Bay District. North Bend, OR. May 1995.

Bureau of Land Management. 1995c. Klamath Falls Resource Area Record of Decision and Resource Management Plan and Rangeland Program Summary. U.S. Department of the Interior, Bureau of Land Management, Klamath Falls Resource Area. Klamath Falls, OR. June, 1995

Bureau of Land Management. 1995d. Record of Decision and Resource Management Plan, Roseburg District. U.S. Department of the Interior, Bureau of Land Management, Roseburg District. Roseburg, OR. June 1995.

Draft

Bureau of Land Management. 1995e. Record of Decision for the Medford District Resource Management Plan, U.S. Department of the Interior, Bureau of Land Management Medford District, Medford, OR. 1995

Bureau of Land Management. 1997a. Big Creek Watershed Analysis. [First iteration.] Bureau of Land Management, Coos Bay District, Myrtlewood Resource Area, North Bend, OR. May 1997

Bureau of Land Management. 1997b. Watershed Analysis: Middle Main Coquille, North Coquille Mouth, [and] Catching Creek. [Ver. 1.1.] Bureau of Land Management, Coos Bay District, Umpqua Resource Area, North Bend, OR. September 30, 1997.

Bureau of Land Management. 1998. Olalla-Lookingglass Watershed Analysis, Revised April 2, 1998. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. April 2, 1998

Bureau of Land Management. 1999a. Upper Middle Fork Coquille Watershed Analysis, Revised May 25, 1999. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. May 25, 1999.

Bureau of Land Management. 1999b. Trail Creek Watershed Assessment. Prepared by Western Watershed Analysts. Bureau of Land Management, Medford District. Medford, OR. June 1999.

Bureau of Land Management. 1999c. Middle South Umpqua Watershed Analysis, Revised November 30, 1999. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. November 30, 1999.

Bureau of Land Management. 1999d. Lower Big Butte Watershed Analysis. Bureau of Land Management, Medford District, Butte Falls Resource Area. Medford, OR. September 1999

Bureau of Land Management. 2000a. East Fork Coquille Watershed Analysis. [First iteration.] Bureau of Land Management, Coos bay District, Myrtlewood Resource Area, North Bend, OR. May 2000.

Bureau of Land Management. 2000b. Lower South Umpqua Watershed Analysis, Revised May 30, 2000. Bureau of Land Management, South River Resource Area. Roseburg, OR. May 30, 2000.

Bureau of Land Management. 2001. South Umpqua Watershed Analysis and Water Quality Restoration Plan, Second Iteration March 2, 2001. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. March 2, 2001.

Bureau of Land Management. 2002a. North Fork Coquille Watershed Analysis. [Second iteration July 20, 2001; includes edits through January 9, 2002] Bureau of Land Management, Coos Bay District, Umpqua Resource Area, North Bend, OR.

Bureau of Land Management. 2002b. Myrtle Creek Watershed Analysis and Water Quality Restoration Plan, Second Iteration October 2002. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. October 2002.

Draft

Bureau of Land Management. 2007. Watershed Analysis: Middle Fork Coquille Analytical (sic) Watershed. [Version 1.1.] Bureau of Land Management, Coos Bay District, Myrtlewood Resource Area, North Bend, OR. October 2007.

Bureau of Land Management. 2008. Water Quality Restoration Plan for the Big Butte Creek Fifth-Field Watershed. Bureau of Land Management, Medford District, Butte Falls Resource Area. Medford, OR. February 1, 2008.

Bureau of Land Management. 2008. Umpqua River Subbasin Water Quality Restoration Plan. Bureau of Land Management, Coos Bay District, Umpqua Field Office, North Bend, OR. December 2008

Bureau of Land Management. 2010. Catching-Beaver Watershed Analysis. Bureau of Land Management, Coos Bay District, Umpqua Resource Area, North Bend, OR. June 3, 2010.

Bureau of Land Management. 2011. Shady Cove-Rogue River Water Quality Restoration Plan. Bureau of Land Management, Medford District, Butte Falls Resource Area, Medford, OR. February 2011.

Bureau of Land Management. 2012. Shady Cove-Rogue River Project-Specific Watershed Analysis; Pacific Connector Gas Pipeline Project, Pacific Connector Gas Pipeline, LP. Prepared by Edge Environmental for the Bureau of Land Management, Medford District. Medford, OR. March 2012.

Bureau of Land Management and Forest Service. 1997. Little Butte Creek Watershed Assessment, Version 1.2. Bureau of Land Management, Medford District, Ashland Resource Area, Rogue River National Forest, Ashland Ranger District,. Medford, OR. November 1997.

Bureau of Land Management and Siuslaw National Forest. 1998. South Coast/Northern Klamath Late-Successional Reserve Assessment. Bureau of Land Management, Coos Bay Roseburg, and Medford Districts, and Siuslaw National Forest, Mapleton Ranger District. North Bend, OR. May 1998

Bureau of Land Management and Forest Service 1999. South Umpqua-Galesville Late Successional Reserve Assessment RO 223. Bureau of Land Management, Medford District, Glendale, Field Office, Roseburg District, South River Field Office, Forest Service, Umpqua National Forest, Tiller Ranger District. Medford, OR. July 1999.

Bureau of Land Management and Oregon Department of Environmental Quality 2000. East Fork Coquille River Water Quality Restoration Plan ["Draft"]. Bureau of Land Management, Coos Bay District, Coos Bay, OR, and Oregon Department of Environmental Quality, Coos Bay Office, Coos Bay, OR. February 2000.

Bureau of Land Management and Oregon Department of Environmental Quality. 2001a. Big Creek Water Quality Restoration Plan. Bureau of Land Management, Coos Bay District, and Oregon Department of Environmental Quality, Coos Bay Office. October 2001.

Bureau of Land Management and Oregon Department of Environmental Quality. 2001b. North Fork Coquille Water Quality Restoration Plan. Bureau of Land Management, Coos Bay

Draft

District and Oregon Department of Environmental Quality, Coos Bay Office. November 2001.

Bureau of Land Management. 2008b. Umpqua River Subbasin Water Quality Restoration Plan. , Coos Bay District BLM, Umpqua Field Office. North Bend, OR

Bureau of Land Management, USDA Forest Service, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service. 1995. Spencer Creek Pilot Watershed Analysis. Lakeview District, Bureau of Land Management, Lakeview District and Klamath Falls Resource Area; USDA Forest Service, Winema National Forest; U.S. Environmental Protection Agency; and U.S. Fish and Wildlife Service. August 1995.

Bureau of Reclamation. 2012. Klamath Facilities Removal Final Environmental Impact Statement / Environmental Impact Report, Volume II Appendix C. Sacramento, CA, December 2012

Castro, J. M. 1997. Stream Classification in the Pacific Northwest: Methodologies, Regional Analyses, and Application. PhD. Dissertation for the degree of Doctor of Philosophy in Geography, Oregon State University, Corvallis, OR. January 17, 1997.

Correll, D.L. 1997. Buffer zones and water quality protection: general principles. Pages 7-20. In: Haycock, N.E., T.P. Burt, K.W.T. Goulding, and G. Pinay (editors). Buffer zones: Their Processes and Potential in Water Protection. Proceedings of the International Conference on Buffer Zones. September 1996. Quest Environmental. Harpenden, 26 England. 326 pages

Cristea, Nicoleta and Jack Janisch. 2007. Modeling the Effects of Riparian Buffer Width on Effective Shade and Stream Temperature. Environmental Assessment Program, Washington State Department of Ecology Olympia, Washington 98504-7710

Curtis, D. A., 1982. An evaluation of suspended sediment and turbidity in Cow Creek, Oregon. U. S. Geological Survey, Water Resource Investigations 82-364, Open File Report. Portland, OR 1982

Everest, Fred H., and Gordon H. Reeves. 2007. Riparian and Aquatic Habitats of the Pacific Northwest and Southeast Alaska: Ecology, Management History, and Potential Management Strategies. [General Technical Report PNW-GTR 692.] USDA Forest Service, Pacific Northwest Research Station. February 2007.

Federal Energy Regulatory Commission, Office of Energy Projects. 2009. Jordon Cove Energy and Pacific Connector Gas Pipeline Project, Final Environmental Impact Statement. Jordon Cover Energy Project, L.P. Docket No. CP07-444-000; Pacific Connector Gas Pipeline, L.P. Docket No. CP07-441-000. FERC / EIS 0223 F, Washington DC. May, 2009.

Forest Service 1990a. Land and Resource Management Plan, Rogue River National Forest. Forest Service, Pacific Northwest Region, Rogue River National Forest. Medford, OR. 1990.

Forest Service 1990b. Land and Resource Management Plan, Umpqua National Forest. Forest Service, Pacific Northwest Region, Umpqua National Forest. Roseburg, OR. 1990.

Draft

Forest Service 1990c. Land and Resource Management Plan, Winema National Forest. Forest Service, Pacific Northwest Region, Winema National Forest. Klamath Falls, OR 1990.

Forest Service. 1995a. Cow Creek Watershed Analysis. Forest Service, Umpqua National Forest, Tiller Ranger District, Roseburg OR. September 30, 1995

Forest Service 1995b. Upper Big Butte Creek Watershed Analysis. Rogue River National Forest, Butte Falls Ranger District. Medford, OR. December 1, 1995

Forest Service. 1996. Elk Creek Watershed Analysis. Forest Service, Umpqua National Forest, Tiller Ranger District. Roseburg, OR. October 16, 1996.

Forest Service 2011. Watershed Condition Framework: A Framework for Assessing and Tracking Changes to Watershed Condition. U. S. Department of Agriculture, Forest Service. FS-977, May 2011. Washington D. C.

Forest Service; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service; USDA Bureau of Land Management; USDI Fish and Wildlife Service; USDI National Park Service; and Environmental Protection Agency. 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. A Report of the Forest Ecosystem Management Assessment Team. Portland, Oregon. July 1993.

Forest Service and Bureau of Land Management 1994a. Record of Decision on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl. USDA Forest Service and USDI Bureau of Land Management. Portland, Oregon. 1994

Forest Service and Bureau of Land Management. 1994b. Standards and Guidelines, Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl. USDA Forest Service and USDI Bureau of Land Management. Portland, Oregon. 1994

Forest Service and Bureau of Land Management. 1994c. Final Environmental Impact Statement, Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl. USDA Forest Service and USDI Bureau of Land Management. Portland, Oregon. 1994

Forest Service, Bureau of Land Management and US Fish and Wildlife Service 1998. South Cascades Late Successional Reserve Assessment. Forest Service, Umpqua National Forest; Bureau of Land Management, Roseburg District; US Fish and Wildlife Service, Roseburg Field Office. Roseburg, OR. April 1998

Forest Service 2013. A Soil Bioengineering Guide for Streambank and Lakeshore Stabilization. USDA Forest Service, Technology and Development Program, San Dimas, CA. Published online: http://www.fed.us/publications/soil-bio-guide. San Dimas, CA 2013

Draft

Forest Service and BLM. 2011. Northwest Forest Plan—the first 15 years (1994–2008): status and trends of northern spotted owl populations and habitats; U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, OR

Forest Service and BLM. 2011a. Northwest Forest Plan–the first 15 years (1994–2008): status and trends of late-successional and old-growth forests, U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, OR

Forest Service and BLM. 2012. Northwest Forest Plan - The first 15 years (1994-2008): watershed condition status and trends: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, OR

Fowler, Steve. Personal Communication. Stream temperature concerns from Middle and Big Creek Crossings. April 30, 2013

GeoEngineers. 2009. Addendum to Geologic Hazards Evaluation: Pacific Connector Gas Pipeline. Letter report to Pacific Connector Gas Pipeline, LP. Salt Lake City, UT. January 16, 2009.

GeoEngineers. 2013a. Channel Migration and Scour Analysis: Pacific Connector Gas Pipeline Project, Southern Oregon. GeoEngineers, Salt Lake City, UT. May 29, 2013.

GeoEngineers. 2013b. Geologic Hazards and Mineral Resources Report: Pacific Connector Gas Pipeline, Coos Bay to Malin, Oregon. Salt Lake City, UT. May 29, 2013.

GeoEngineers. 2013c. Stream Crossing Risk Analysis: Pacific Connector Gas Pipeline Project; Coos, Douglas, Jackson and Klamath Counties, Oregon. Salt Lake City, UT. May 29, 2013.

GeoEngineers. 2013d. Resource Report No. 2: Water Use and Quality, Pacific Connector Gas Pipeline Project. Salt Lake City, UT. June 2013.

GeoEngineers. 2013e. Turbidity-Nutrients-Metals Water Quality Impacts Analysis: Pacific Connector Gas Pipeline Project; Coos, Douglas, Jackson and Douglas Counties, Oregon. Salt Lake City, UT. May 29, 2013.

GeoEngineers 2013f. Thermal Impacts Assessment: Pacific Connector Gas Pipeline Project; Coos, Douglas, Jackson and Douglas Counties, Oregon. Salt Lake City, UT. May 29, 2013.

GeoEngineers 2013g. Stream Crossing Hyporheic Analysis, File No. 16724-001-06. Pacific Connector Gas Pipeline Project. Southern Oregon. Salt Lake City, UT. May 29, 2013.

Goodman, Linda, E.W. Shepard, M. Pool, B Weingardt. 2007. FS-Memorandum; BLM Instruction Memorandum No. OR-2007-060 dated 5/22/2007: Compliance with the Aquatic Conservation Strategy. Forest Service, Bureau of Land Management. Portland, OR. May 22, 2007.

Gomi, T., R. Moore, and A. Dhakal. 2006. Headwater Stream Temperature Response to Clearcut Harvesting with Different Riparian Treatments, Coastal British Columbia, Canada. Water Resources Research 42: W08437 [doi:10.1029/2005WR004162].

Draft

Grant, Gordon E.; Lewis, Sarah L.; Swanson, Frederick J.; Cissel, John H.; McDonnell, Jeffrey J. 2008. Effects of forest practices on peak flows and consequent channel response: a state-of-science report for western Oregon and Washington. Gen. Tech. Rep. PNW-GTR-760. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 76 p.

Geyer, Nancy A., 2003. Upper Cow Creek Watershed Assessment and Action Plan. Umpqua Basin Watershed Council, November 2003.

Hanek, G. 2011. Resource Report: Review of February 8, 2011, GeoEngineers Inc. Geologic Hazards Evaluation, EFCC Routing Alternatives Report. Letter report prepared for Umpqua National Forest, Roseburg, OR. March 24, 2011.

Hassan, Marwan A., Michael Church, Thomas E. Lisle, Francesco Brardinoni, Lee Benda, and Gordon E. Grant. 2005. Sediment Transport and Channel Morphology of Small, Forested Streams. Journal of the American Water Resources Association, 41(4):853-876.

Keppeler, E. T., P. H. Cafferata, et al. 2007. State forest road 600: a riparian road decommissioning case study in Jackson Demonstration State Forest. Sacramento, CA, State of California, the Resources Agency, California Dept. of Forestry & Fire Protection.

Koler, Thomas E. 2012. Resource Report: Earthflow Terrains Crossed by the PCGP in East Fork Cow Creek—Review of Previous Assessments. Prepared for North State Resources, Inc., Redding, CA. December 11, 2012.

Lanigan, Steven H.; Gordon, Sean N.; Eldred, Peter; Isley, Mark; Wilcox, Steve; Moyer, Chris; Andersen, Heidi. 2012. Northwest Forest Plan—the first 15 years (1994–2008): watershed condition status and trend. Gen. Tech. Rep. PNW-GTR-856. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 155 p.

Legleiter, C. J., Rick L Lawrence, Mark A. Fonstad, W. Andrew Marcus, and Richard Aspinall. 2003. Fluvial Response a Decade after Wildfire in the Northern Yellowstone Ecosystem: A Spatially Explicit Analysis. Geomorphology 54(119-136).

Levesque, Lucie. M. and Monique. G. Dube. 2007. Review of the effects of in-stream pipeline crossing construction on aquatic ecosystems and examination of Canadian methodologies for impact assessment. Environ Monit Assess. 2007 132:395-409, National Hydrology Research Center, Saskatoon, Canada

Lindell, L. 2007. Pipeline at Approx. MP 126.26–127.2 (T 34 S., R. 1 E., Sec.18). Email from Laurie Lindell, District Hydrologist, Bureau of Land Management, Medford District, to Lori Dalton, Williams, and Dan Duce, Edge Environmental. May 17, 2007.

Madej, M. 2000. Erosion and sediment delivery following removal of forest roads. U.S. Geological Survey Western Ecological Research Center.

Draft

Malmon, Daniel V., Steven L. Reneau, Danny Katzman, Alexis Lavine, and Jared Lyman. 2007. Suspended Sediment Transport in an Ephemeral Stream following Wildfire. .Journal of Geophysical Research 112(FO2006) doi:10.1029/2005JF000459J.

Moeur, M.; Ohmann, J.L; Kennedy, R.E.; Cohen, W.B.; Gregory, M.J.; Yang, Z.; Roberts H.M.; Spies, T.A.; Fiorella, M. 2011. Northwest Forest Plan-the first 15 years (1994-2008): Status and Trends of Sate-Successional and Old-Growth Forests. [General Technical Report PNW-GTR-853.] USDA Forest Service, Pacific Northwest Research Station. Portland, OR. November 2011.

Moore, R.D., D.L. Spittlehouse, and A. Story. 2005. Riparian Microclimate and Stream Temperature Response to Forest Harvesting: A Review. Journal of the American Water Resources Association 41:813-834.

Newcombe, C. P, and J. O. T. Jensen. 1996. Channel Suspended Sediment and Fisheries: A Synthesis for Quantitative Assessment of Risk and Impact. North American Journal of Fisheries Management, 16:693-727. 1996

Newcombe, C. P., and D. D. Macdonald (1991): Effects of Suspended Sediments on Aquatic Ecosystems, North American Journal of Fisheries Management, 11:1, 72-82

North State Resources, Inc. 2009. Pacific Connector Gas Pipeline Project: Technical Memorandum for Water Temperature Effects Assessment. Prepared for Pacific Connector Gas Pipeline by North State Resources, Inc. Redding, California. April 13, 2009.

North State Resources, Inc. 2014 (in preparation). Pacific Connector Gas Pipeline Project: Technical Memorandum for Water Temperature Effects and Restoration Assessment. Prepared for Pacific Connector Gas Pipeline by North State Resources, Inc. Redding, California. August, 2014.

Oregon Department of Environmental Quality, 1998, Guidance for Ecological Risk Assessment - Levels I, II, III, IV: Oregon Department of Environmental Quality Waste Management Cleanup Division (contains updates of November, 1998; December 2001; and March 2000). (Cited in Resource Report 2, GeoEngineers 2013)

Orton, G. P. Kennedy and D. Hutchinson 2007. Biosolids and woodchips as soil organic amendments for promoting soil restoration in decommissioned forest roads. Administrative Study, Umpqua National Forest, Oregon Department of Environmental Quality, Bureau of Land Management. Roseburg Oregon, 2007.

Poole, G. 2001. A comment on "Influence of Streamside Cover and Stream Features on Temperature Trends in Forested Streams in Western Oregon." In: Issue Paper 3 - Spatial and Temporal Patterns of Stream Temperature (Revised), G. Poole, J. Risely, and M. Hicks. EPA-910-D-01-003. USEPA, Seattle, WA.

Draft

Pettigrew, E. L., P. N. Owens and T. R. Giles. 2006. Wildfire Effects on the Quantity and Composition of Suspended and Gravel-Stored Sediments. Water, Air, and Soil Pollution: Focus (2006) 6: 647–656

Reeves, G. L. 1999. Declaration of Gordon Reeves, Ph.D., Civil No. C 99-0067 R, Western District of Washington at Seattle

Reeves, Gordon R., J. E. Williams, K. M. Burnett, and K. Gallo. 2006. The Aquatic Conservation Strategy of the Northwest Forest Plan. Conservation Biology, Volume 20, No. 2, 319-329, Society for Conservation Biology.

Reid, S., and P. G. Anderson. 2002. Evaluation of Isolated Water Course Crossings during Winter Construction along the Alliance Pipeline in Northern Alberta. Environmental Concerns in Rights-of-Way Management: Seventh International Symposium. I.W. Goodridr-Mahoney, D.F. Mutrie and C.A. Guild (editors). Calgary, Alberta, Canada. September 2000.

Reid, S. M., S. Stoklosar, S. Metikosh and J. Evans. 2002. Effectiveness of Isolated Pipeline Crossing Techniques to Mitigate Sediment Impacts on Brook Trout Streams. Water Qual. Res. J. Canada, Vol. 37, No. 2, 473-488. 2002

Reid, S. M., F. Ade and S. Metikosh. 2004. Sediment entrainment during pipeline water construction: predictive models and crossing method comparison. J. Environ. Eng. Sci. 3: 81-88. NRC Canada. January 2004.

Ryan, S. E., M. K. Dixon, K. A. Dwire. 2006. The use of turbidity sensors for monitoring sediment loads following wildfires. Proceedings of the Eighth Federal Interagency Sedimentation Conference. Reno, NV April 2006.

Pacific Connector Gas Pipeline, Resource Report 2. 2013. Water Use and Quality, Pacific Connector Gas Pipeline Project. June 2013. Salt Lake City, UT

Pacific Connector Gas Pipeline Resource Report 3. 2013. Fish Wildlife and Vegetation. Pacific Connector Gas Pipeline Project. June 2013. Salt Lake City, Utah

Pacific Connector Gas Pipeline Resource Report 7. 2013. Soils. Pacific Connector Gas Pipeline Project, June 2013. Salt Lake City, Utah

Pacific Connector Gas Pipeline. 2013. Hydrostatic Test Plan, Pacific Connector Gas Pipeline Project, January 2013. Salt Lake City, UT

Pacific Connector Gas Pipeline. 2013. Wetland Delineation Report (Draft), Pacific Connector Gas Pipeline Project, June 2013. Salt Lake City, UT

Robichaud, Peter R., J. L. Byers, D.G. Neary, 2000. Evaluating the Effectiveness of Postfire Rehabilitation Treatments. [General Technical Report RMRS-GTR-63] USDA Forest Service, Rocky Mountain Research Station. September, 2000.

Shaw, E. A. and J. S. Richardson. 2001. Direct and indirect effects of sediment pulse duration on stream invertebrate assemblages and rainbow trout (Oncorhynchus mykiss) growth and

Draft

survival. Canadian Journal of Fisheries and Aquatic Sciences 58: 2213-2221. NRC Canada, 2001.

Shasta-Trinity National Forest. 2014. Bagley Fire Case Study. USDA Forest Service, Shasta-Trinity National Forest, Shasta McCloud Management Unit. Redding, CA. April, 2014

Switalski, T. A., J. A. Bissonette, T. H. DeLuca, C. H. Luce, and M. A. Madej. 2004. Benefits and Impacts of Road Removal. Frontiers in Ecology and the Environment 2(1):21-28.

Swanson, F.J. 1981. Fire and Geomorphic Process. In: Proceedings, Fire Regimes and Ecosystems Conference, Dec 11-15, 1978. Honolulu, HI. [General Technical Report WO-26.] USDA Forest Service, Washington DC. 1981. (Cited in Catching Beaver WA)

Tippery, S., K. K. Jones, K. J. Anlauf, C. H. Stein., M. J. Strickland. 2010. The Oregon Plan for Salmon and Watersheds: Effectiveness Monitoring Report for the Western Oregon Stream Restoration Program, 1999-2008. OPSW-ODFW-2010-6, Oregon Department of Fish and Wildlife, Salem, OR. July 2010

Trombulak, S. C. and C. A. Frissell (2000). "Review of Ecological Effects of roads on terrestrial and aquatic communities." Conservation Biology 14(1): 18-30.

Overview of Forest Planning and Project Level Decisionmaking. USDA Office of the General Counsel, Natural Resources Division. June, 2002, Washington DC

US Geological Survey. 2013 Gage Data, Coastal HUC 12. USGS Gage data provided by US Geological Survey.

Wagenbrenner, J. W., L. H. Macdonald and D. Rough. 2006. Effectiveness of three post-fire rehabilitation treatments in the Colorado Front Range. Published in Wiley Interscience (www.interscience.wiley.com). DOI: 10.1002/hyp.6146

Wondzell, S. M., and j. G. King. 2003. Postfire Erosional Processes in the Pacific Northwest and Rocky Mountain Regions. Forest Ecology and Management 178: 75-87.

Zwieniecki, M.A., and M. Newton. 1999. Influence of Streamside Cover and Stream Features on Temperature Trends in Forested Streams of Western Oregon. Western Journal of Applied Forestry 14: 106-113.

Draft