United States Department of Agriculture

Apache-Sitgreaves National Forests Land Management Plan

Programmatic Final Environmental Impact Statement

Apache, Coconino, Greenlee, and Navajo Counties, Arizona

Volume II. Chapter 4, Glossary, References, Index, and Appendices A through G

Forest Service Apache-Sitgreaves National Forests MB-R3-01-11 August 2015

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Programmatic
Final Environmental Impact Statement for the Apache-Sitgreaves National Forests Land Management Plan

Volume II. Chapter 4, Glossary, References, Index, and Appendices A through G

Apache, Coconino, Greenlee, and Navajo Counties, Arizona

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Abstract: To comply with the National Forest Management Act and address changes that have occurred over the past 27 years, the Apache-Sitgreaves National Forests propose to revise the current land management plan (1987 plan). This programmatic final environmental impact statement (FEIS) documents analysis of the impacts of four alternatives developed for programmatic management of the 2.1 million acres administered by the Apache-Sitgreaves National Forests.

The FEIS documents the analysis of all alternatives and the associated environmental consequences at a programmatic level. The preferred alternative (alternative B) analyzed in this FEIS and reflected in the accompanying "Apache-Sitgreaves National Forests Land Management Plan," would guide all natural resource management activities on the Apache-Sitgreaves National Forests. This alternative addresses new information and concerns received since the 1987 plan was published, and it meets objectives of Federal laws, regulations, and policies.

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Commonly Used Acronyms

ADA – Arizona Department of Agriculture

ADEQ – Arizona Department of Environmental Quality

ADOT – Arizona Department of Transportation

AMS – Analysis of the Management Situation

AZGFD – Arizona Game and Fish Department

ASQ – Allowable Sale Quantity

BAER – Burned Area Emergency Response

BLM – Bureau of Land Management

BMP – Best Management Practice

CCF – 100 cubic feet

CER – Comprehensive Evaluation Report

CFR – Code of Federal Regulations

CWPP – Community Wildfire Protection Plan

CWRF – Cottonwood-Willow Riparian Forest

DBH – Diameter at Breast Height

DMCF – Dry Mixed Conifer Forest

DRC – Diameter at Root Collar

EI – Ecological Indicator

EIS – Environmental Impact Statement

EPA – Environmental Protection Agency

EO – Executive Order

ESA – Endangered Species Act

FR – Federal Register

FSH – Forest Service Handbook

FSM – Forest Service Manual

GBG – Great Basin Grassland

GIS – Geographical Information System

GTR – General Technical Report

HUC – Hydrologic Unit Code

IC – Interior Chaparral

IRA – Inventoried Roadless Area

MBDRF – Mixed Broadleaf Deciduous Riparian Forest

MIS – Management Indicator Species

MOU – Memorandum of Understanding

MPOW – Madrean Pine-Oak Woodland

MSO – Mexican Spotted Owl

MSG – Montane/Subalpine Grasslands

MVUM – Motor Vehicle Use Map

MWRF – Montane Willow Riparian Forest

NEPA – National Environmental Policy Act

NF – National Forest

NFMA – National Forest Management Act

NFS – National Forest System

NOA – Notice of Availability

NOI – Notice of Intent

NPS – National Park Service

NRCS – Natural Resource Conservation Service

NRHP – National Register of Historic Places

NRT – National Recreation Trail

NVUM – National Visitor Use Monitoring

OHV – Off-highway Vehicle

PAC – Protected Activity Center

PFA – Post-fledging Family Area

PFC – Proper Functioning Condition

PJW – Piñon-Juniper Woodland

PNVT – Potential Natural Vegetation Type

PPF – Ponderosa Pine Forest

RMRS – Rocky Mountain Research Station

RNA – Research Natural Area

ROS – Recreation Opportunity Spectrum

SAD – Sudden Aspen Decline

SDG – Semi-Desert Grassland

SFF – Spruce-Fir Forest

TCP – Traditional Cultural Property

TES – Terrestrial Ecosystem Survey

USC – United States Code

USDA – United States Department of Agriculture

USFS – United States Forest Service

USFWS – United States Fish and Wildlife Service

WCRA – Wetland Cienega Riparian Areas

WMCF – Wet Mixed Conifer Forest

WQA – Wildlife Quiet Area

WUI – Wildland-urban Interface

Chapter 4. Consultation and Coordination

Preparers and Contributors

The following individuals and Forest Service staff groups contributed to the development of this environmental impact statement:

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Table 177. Interdisciplinary team members for plan revision

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Other Forest Service Contributors

Review and input in the development of the proposed plan and FEIS were received from the staffs of the Alpine, Black Mesa, Clifton, Lakeside, and Springerville Ranger Districts, Supervisor's Office, and Southwestern Regional Office. Delilah Jaworski, social scientist with TEAMS Enterprise Unit, prepared the "Socioeconomic Resource Report." Tamara Conner, forest environmental coordinator, provided NEPA review and oversight.

Consultation and Coordination

The Forest Service consulted the following tribes, Federal, State, and local agencies, groups, and individuals during the development of this environmental impact statement:

Tribes

The following nine tribes and one chapter were consulted: White Mountain Apache Tribe, San Carlos Apache Tribe, Hopi Nation, Navajo Nation, Pueblo of Zuni, Yavapai-Apache Tribe, Tonto Apache Tribe, Fort McDowell Yavapai Nation, Yavapai-Prescott Indian Tribe, and the Ramah Chapter of the Navajo Nation.

Federal, State, and Local Agencies

Numerous Federal, State, and local agencies have been consulted in the development of the proposed plan and this FEIS. Complete mailing lists for the scoping periods are available in the "Plan Set of Documents." Some of the agencies consulted include the following:

U.S. Federal Advisory Council on Historic Preservation
U.S. Army Corps of Engineers
U.S. Bureau of Indian Affairs
U.S. Bureau of Reclamation
U.S. Customs and Border Protection
U.S. Department of Energy
U.S. Department of Agriculture
U.S. Environmental Protection Agency
U.S. Federal Energy Regulatory Commission
U.S. Federal Highway Administration
U.S. Fish and Wildlife Service
U.S. National Park Service
U.S.D.A. Animal Damage Control
U.S.D.A. Farm Services Agency
U.S.D.A. Natural Resources Conservation Service
U.S. Congress Members
U.S. Senate Members
Arizona State Representatives
Arizona State Senators
Arizona Department of Environmental Quality
Arizona Department of Mines and Mineral Resources
Arizona Department of Public Safety
Arizona Department of Transportation
Arizona Game and Fish Department
Arizona Governor's Office
Arizona State Forestry Division
Arizona State Historic Preservation Office
Arizona State Land Department
Arizona State Parks
New Mexico Department of Game and Fish
Apache County Natural Resource Conservation District
Apache County Board of Supervisors
Apache County Cooperative Extension Office
Apache County Planning and Zoning
Apache County Sheriff's Office
Catron County Board of Commissioners
Coconino County Board of Supervisors
Coconino County Planning and Zoning
Gila County Board of Supervisors
Graham County Board of Supervisors
Greenlee County Board of Supervisors
Greenlee County Road Department
Navajo County Board of Supervisors
Navajo County Cooperative Extension
Navajo County Sheriff's Office
City of Holbrook
City of Show Low
City of St. Johns
City of Winslow
Clay Springs-Pinedale Fire Department
Eagar Town Council
Eastern Arizona Counties Organization
Forest Lake Fire District
Greer Fire District
Heber-Overgaard Fire Department
Lakeside Fire Department
Show Low Planning and Zoning Commission
Town of Taylor
Town of Clifton
Town of Duncan
Town of Eagar
Town of Pinetop-Lakeside
Town of Snowflake
Town of Springerville
Town of Taylor
Winslow Chamber of Commerce

Others

Numerous groups and individuals participated in the process through written comments and by attending public meetings. Complete mailing lists are available in the “Plan Set of Documents.” Some of the groups consulted include the following:

Apache-Sitgreaves National Forests' Permit Holders
Alpine Action Alliance
Alpine Chamber of Commerce
American Sportfishing Association
Animal Defense League of Arizona
Animal Welfare Institute
Apache County ATV Roughriders
Apache County Historical Society
Archery Trade Association
Arizona Cattle Growers' Association
Arizona Council of Trout Unlimited
Arizona Deer Association
Arizona Desert Bighorn Sheep Society
Arizona Elk Society
Arizona Grazing Lands Conservation Association
Arizona Healthy Grazing Coalition
Arizona Nature Conservancy
Arizona OHV Coalition
Arizona Public Service
Arizona Riparian Council
Arizona Trail Riders
Arizona Trappers Association
Arizona Wilderness Coalition
Arizona Wildlife Federation
Arizona Wool Producers Association
Arizona Zoological Society
Back Country Horsemen of America
Back Country Pilots
Backcountry Horsemen of Arizona
Bear Trust International
Blue Ribbon Coalition
Blue River Cowbelles
Blue River Watershed Association
Campaign for America's Wilderness
Campfire Club of America
Center for Biological Diversity
Center for Desert Archaeology
Central Arizona Grotto
Citizens for Multiple Land Use and Access (CMLUA)
Defenders of Wildlife
Disabled Explorers
Ducks Unlimited
Earth Justice
Eastern Arizona Counties Organization
Ecological Restoration Institute
Economic Development for Apache County
Forest Guardians
ForestERA
Foundation for North American Wild Sheep
Freeport-McMoRan Copper & Gold, Inc.
Friends of Anderson Mesa
Friends of Arizona Rivers
Graham County Republicans
Grand Canyon Trust
Grand Canyon Wildlands Council
Grand Canyon Wolf Recovery Project
Great Old Broads for Wilderness
Greenlee County Cattle Growers Association
Greenlee County Cowbelles
Izaak Walton League of America
Little Colorado River Plateau RC&D
Little Colorado River Watershed Coordinating Council
Local Homeowner's Associations
Maricopa Audubon Society
National Assembly of Sportsmen's Caucuses
National Rifle Association of America
National Shooting Sports Foundation
National Wild Turkey Federation
Natural Heritage New Mexico
Navajo County ATV Roughriders
Navopache Electric Co-op
New Mexico Cattle Growers Association
New Mexico Wilderness Alliance
North American Bear Foundation
North American Grouse Partnership
Northern Arizona University
People of the West

Public Employees for Environmental Responsibility
Public Lands Foundation
Quails Unlimited
Quality Deer Management Association
Ranching Heritage Alliance
Recreational Boating and Fishing Foundation
Rocky Mountain Elk Foundation
Ruffed Grouse Society
Safari Club International
Salt River Project
Sand County Foundation
Save the Peaks Coalition
Sierra Club
Sky Island Alliance
Southwest Center for Biological Diversity
Southwest Environmental Center
Southwest Forest Products
Springerville-Eagar Regional Chamber of Commerce
The Nature Conservancy
The Northern Arizona Wood Products Association
The Rewilding Institute
The Wilderness Society
The Wildlands Project
TRACKS
Trout Unlimited
Tucson Electric Power
University of Arizona
Upper Eagle Creek Watershed Association
Upper Little Colorado River Watershed Partnership
Western Environmental Law Center
Western Lands Exchange Project
Western Watersheds Project
White Mountain Audubon Society
White Mountain Conservation League
White Mountain Open Trails Association
White Mountain Regional Development Corporation
White Mountain Shooters Association
WildEarth Guardians
Wilderness Watch

List of Agencies, Organizations and Persons to Whom Copies of the FEIS Were Sent

Notice of the availability of this FEIS was mailed to the public, forest employees, tribal governments, Federal and State agencies, and local governments These mailing lists can be found in the “Plan Set of Documents” and are available on request. The FEIS is available on the forests’ web site. Printed copies or CDs are available upon request.

Glossary

Adjudication – The legal process by which an arbiter or judge reviews evidence and argumentation, including legal reasoning, set forth by opposing parties or litigants to come to a decision which determines water rights and obligations between the parties involved.

Administrative use – Use by the Forest Service.

Age class – Trees or plants that originated within a relatively distinct range of years. Typically the range of years is considered to fall within 20 percent of the average natural maturity of a particular species (e.g., if 100 years is required to reach maturity, then there would be five 20-year age classes).

Allelopathy – The suppression of neighboring plants or the release into the environment by one plant of a substance that inhibits the germination or growth of other potential competitor plants of the same or another species

Allowable sale quantity (ASQ) – The quantity of timber that may be sold from the area of suitable land covered by the land management plan for a time period specified by the plan. This allowable sale quantity (ASQ) is usually expressed on an annual basis as the "average annual allowable sale quantity." For timber resource planning purposes, the allowable sale quantity applies to each decade over the planning horizon and includes only chargeable volume. Consistent with the definition of timber production, do not include firewood or other nonindustrial wood in the allowable sale quantity.

Aquatic management zones – An area of vegetation or forest litter located adjacent to stream courses and/or riparian areas for the purpose of filtering sediment, providing bank stability, and providing shade for fisheries habitat in tree/shrub ecosystems.

Aspen clone – A genetically identical set of aspen trees all connected by the same root system, such that they can be vegetatively propagated. A clone may be a distinct aspen stand, or it may be a smaller inclusion within a conifer stand, or it may cover an entire mountainside as a large stand or patch.

Available forage – That amount of growth of a vigorous and healthy plant that can be utilized as feed (regardless of what animal is using it) without impairing the plant's long-term health and productivity or other uses such as riparian filtering. The amount of available forage may be less where there is a need to restore health and vigor of forage plants. That amount may also depend on time of year and plant physiological stage or other conditions such as drought.

Basal area – The cross-sectional area of the stem or the stems of the plant or all plants in a stand. Herbaceous and small woody plants are measured at diameter at root collar (DRC) or near ground level; larger woody plants are measured at diameter at breast height (DBH) or other appropriate height. Basal area is a way to measure how much of a site is occupied by plants; it is expressed in square feet per acre for woody species.

Beneficial use – Beneficial use of water from rivers and streams is allocated by prior appropriation, meaning the first user to divert water and put it to a "beneficial use" obtains a priority right, and that right is to be satisfied before any other user has access to the water. The definition of what constitutes a "beneficial use" has evolved. Although the Arizona Legislature added habitat for wildlife and fish as one of the beneficial uses in 1941, it wasn't until 1976 that the court ruled this included a right for instream flow, and the first instream flow permit was not

issued until 1990. Obtaining a permit for instream flow allows users to leave their allocation of water in the river rather than diverting, consuming, or losing it for nonuse.

Best management practices (BMPs) – Methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 CFR § 130.2(m)).

Biological diversity – The variety of the Apache-Sitgreaves NFs' organisms, the ecological complexes in which they occur, and the processes and life support services they facilitate.

Biomass – see woody biomass.

Bolt – Short piece of pulpwood, pole, or log.

Candidate species - Plant and animal taxa considered for possible addition to the list of endangered and threatened species. These are taxa for which the U.S. Fish and Wildlife Service has sufficient information on biological vulnerability and threat(s) on file to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions.

CCF – hundred cubic feet.

Chargeable volume – All volume included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity, based on regional utilization standards. Consistent with the definition of timber production, planned production of firewood is not included in the allowable sale quantity and therefore is non-chargeable.

Class I airshed – An airshed classification where areas require the highest level of protection under the Clean Air Act.

Class II airshed – An airshed classification representing National Forest System land that is not classified as a Class I airshed. These areas may receive a greater amount of human-caused pollution than Class I areas.

Clearcutting regeneration method – The cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class. This includes coppice cutting.

Climate change – Refers to long-term (decades or longer) trends in climate averages such as the global warming that has been observed over the past century and long-term changes in variability (e.g., frequency, severity, and duration of extreme events).

Climate variability – Refers to shorter term (daily, seasonal, annual, interannual, several years) variations in climate, including the fluctuations associated with El Niño (wet) or La Niña (dry) events.

Clump – A tight cluster of two to five trees of similar age and size originating from a common rooting zone that typically lean away from each other when mature. A clump is relatively isolated from other clumps or trees within a group of trees, but a stand-alone clump of trees can function as a tree group.

Critical habitat – When a species is listed as endangered or threatened under the Endangered Species Act (ESA), it is protected which includes protection of the habitat it occupies. In addition, specific areas may be designated as particularly necessary for the species' recovery whether the species is present or not; these areas are called "critical habitat." Besides requiring Federal agencies to ensure that their actions will not jeopardize the survival of an endangered or threatened species itself, the ESA also requires that their actions not destroy or adversely modify designated critical habitat. ESA requirements have no implications on non-Federal lands unless activities thereon are undertaken with Federal funding or require a Federal permit.

Coarse woody debris – Woody material, including logs, on the ground greater than 3 inches in diameter—a component of litter. Large coarse woody debris is often considered to be downed logs at least 12 inches in diameter and 8 feet in length.

Common variety minerals – Salable mineral materials/common variety minerals are synonymous terms for the same class of minerals that can be sold under a mineral material contract, and are common. These minerals are relatively low value per volume, for example, sand, gravel, cinders, common building stone, and flagstone. Many of the materials are used for road surfacing, boulders, and engineering construction or may be specialty resources such as soil amendments or decorative stone, including flagstone. These minerals are typically sold unless used internally, by another government agency, or for ceremonial uses. In these cases they may be provided free of charge

Communications site – An area of National Forest System land used for telecommunications services. A communications site may be limited to a single communications facility, but most often encompasses more than one facility. Existing Apache-Sitgreaves NFs communications sites are listed in appendix C of the proposed plan.

Communities-at-risk – As identified in the Federal Register, high risk urban communities within the wildland-urban interface.

Community wildfire protection plans (CWPP) – Plans for at-risk communities that identify and prioritize areas for hazardous fuels treatments. The CWPPs that cover the Apache-Sitgreaves NFs include CWPP for the At-Risk-Communities in Apache County, CWPP for At-Risk-Communities in Greenlee County, and the Sitgreaves CWPP (includes Apache, Coconino, and Navajo Counties).

Connectivity – The arrangement of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of appropriate vegetation; the opposite of fragmentation.

Cultural affiliation – A relationship of shared group identity which can be reasonably traced historically or prehistorically between a present day Indian tribe or Native Hawaiian organization and an identifiable earlier group. (25 USC3001 (2))

Deciview – A measurement of visibility. A low deciview number reflects clearer visibility; while a high deciview number reflects increased haziness.

Departure (departed) – The relative difference between existing and desired conditions or reference conditions.

Desired condition – A description of social, economic, and/or ecological characteristics of the plan area, or portion of the plan area, toward which management of the land and resources should be directed.

Developed recreation site – A distinctly defined area where facilities are provided by the Forest Service for concentrated public use (e.g., campgrounds, picnic areas, swimming areas).

Diameter – The diameter of a tree species, usually measured by two primary methods:

- **Diameter at breast height (DBH)** – The diameter of a forest tree species at the bole (or trunk) typically measured at 4.5 feet above ground level.
- **Diameter at root collar (DRC)** – The diameter of a woodland tree species typically measured at the root collar (the part of a tree where the main roots join the trunk, usually at or near ground level) or at the natural ground line, whichever is higher.

Dispersed recreation – Outdoor recreation in which visitors are spread over relatively large areas. Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the visitors.

Ecological disturbance – An event or force that brings about mortality to organisms and changes in their spatial patterning in the ecosystems they inhabit. Disturbance plays a significant role in shaping the structure of individual populations and the character of whole ecosystems.

Ecological restoration – The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on establishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystem sustainability, resilience, and health under current and future conditions. In the Southwestern Region, achievement of desired conditions means that the ecosystem has been restored. Restoration treatments are those that move ecosystem components toward desired conditions.

Ecoregion – Ecoregion sections and subsections are units in the National Hierarchy of Ecological Units ranging in size from 13 million acres (section) down to 10,000 acres (subsection) that describe areas of similar environmental and biological features. The Apache-Sitgreaves NFs fall completely within the White Mountains-San Francisco Peaks-Mogollon Rim ecoregion section.

Ecosystem – A spatially explicit, relatively homogeneous unit of the earth that includes all interacting organisms and components of the abiotic (nonliving) environment within its boundaries. An ecosystem is commonly described in terms of its (1) composition: major vegetation types, rare communities, aquatic systems, and riparian systems; (2) structure: successional stages, water quality, wetlands, and floodplains; and (3) function: ecological processes such as streamflows and natural disturbance regimes.

Ecosystem diversity – The variety of ecosystems present on the Apache-Sitgreaves NFs, as represented by the 14 potential natural vegetation types and the variety of species (both plant and animal), their habitats, and ecological processes that occur in their different physical settings.

Ecosystem services – Benefits obtained from ecosystems, including (1) provisioning services such as food, fresh water, fuel, and fiber; (2) regulating services such as climate, water, pollination, and disease regulation; (3) supporting services such as soil formation and nutrient

cycling; and (4) cultural services such as educational, aesthetic, and cultural values as well as recreation and tourism opportunities.

Endemic – A population of native insects, diseases, plants, or animals which perform a functional role in the ecosystem when they are present at low levels, or constantly attack just a few hosts throughout an area, but can become potentially injurious when they increase or spread to reach outbreak (epidemic) levels.

Energy corridor – A linear strip of land identified for the present or future location of utility right-of-way (e.g., above or belowground electric transmission line, gas pipeline).

Energy development – Infrastructure associated with the provision or transport of energy (e.g., biomass power generation, wind turbines, solar panels).

Environmental justice – To the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment.

Escaped prescribed fire – A prescribed fire that has exceeded or is expected to exceed prescription parameters or otherwise meets the criteria for conversion to wildfire. Criteria are specified in the Interagency Prescribed Fire Planning and Implementation Procedures Guide (NWCG, 2008).

Even-aged stands – Stands that are composed of one or two distinct age classes of trees.

Even-aged management – The application of a combination of actions that result in the creation of stands in which trees are essentially the same age. Managed even-aged forests are characterized by a distribution of stands of varying ages (and therefore, tree size) throughout the forest area. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

Federal reserved water rights (reserved rights) – When Congress designates Federal lands for a specific purpose it also reserves sufficient water to serve the purposes of that designation. These water rights are known as “Federal reserved water rights” or simply, reserved rights. Reserved rights are implied rights, meaning that Congress need not expressly state in a bill that it intends to reserve Federal water right. The right exists whether or not Congress explicitly mentions it.

Federally listed species (listed species) – Any species of fish, wildlife, or plant which has been determined to be endangered or threatened under section 4 of the Endangered Species Act.

Feral horse – A free-roaming domesticated horse. Feral horses are domestic horses, or their descendants (branded or unbranded), that strayed, escaped, or were deliberately released onto National Forest System lands and continue to survive and reproduce on the forests in the wild. Feral horses are animals that do not meet the definition of a wild free-roaming horse (see wild horse) and are considered unauthorized livestock (see unauthorized livestock)**.**

Fire intensity – The product of the available heat of combustion per unit of ground and the rate of spread of the fire; interpreted as the heat released per unit of time for each unit length of fire edge. The primary unit is British thermal unit per second per foot (Btu/sec/ft.) of fire front. See also fire severity.

Fire management plan – A plan that identifies and integrates all wildland fire management and related activities within the context of approved land management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans, including but not limited to, preparedness plans, preplanned dispatch plans, prescribed fire burn plans, and prevention plans. Fire management plans assure that wildland fire management goals and components are coordinated.

Fire regime – The patterns, frequency, and severity of fire that occur over a long period of time across a landscape and its immediate effects on the ecosystem in which it occurs. There are five fire regimes which are classified based on frequency (average number of years between fires) and severity (amount of replacement of the dominant overstory vegetation) of the fire:

- **Fire regime I** – 0- to 35-year frequency and low (surface fires most common, isolated torching can occur) to mixed severity (less than 75 percent of dominant overstory vegetation replaced)
- **Fire regime II** – 0- to 35-year frequency and high severity (greater than 75 percent of dominant overstory vegetation replaced)
- **Fire regime III** – 35- to 100+-year frequency and mixed severity
- **Fire regime IV** – 35- to 100+-year frequency and high severity
- **Fire regime V** – 200+-year frequency and high severity.

Fire regime condition class (FRCC) – FRCC is a metric that quantifies how departed a system is from historical conditions in relation to fire, the role fire historically played in that system, and the vegetative structure (Hann and Bunnell, 2001; Hardy et al., 2001; Hann et al., 2004).

Fire severity – Degree to which a site has been altered or disrupted by fire; also used to describe the product of fire intensity and residence time; usually defined by the degree of soil heating or mortality of vegetation.

Foliar – Pertaining to foliage (green tree leaves or needles).

Forest highway – A forest road under the jurisdiction of, and maintained by, a public authority and open to public travel. (23 USC101). The Forest Highway Program falls under 23 USC202, 203, and 204.

Forest road or trail – A road or trail wholly or partly within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (23 USC 101, 36 CFR § 212.1, 36 CFR § 251.51, 36 CFR § 261.2, Forest Service Manual 7705).

Free-flowing – Existing or flowing in natural conditions without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.

Firewood – Wood that is round, split, or sawn and/or otherwise generally refuse material cut into short lengths or chipped for burning.

Fugitive dust – Fine particulate matter from windblown soil and dust which becomes airborne.

Geomorphic – Refers to the process of erosion and sediment transport and deposition.

Goshawk post-fledging family areas (PFAs) – Areas that surround nest areas. They represent an area of concentrated use by the northern goshawk family until the time the young are no longer dependent on adults for food. PFAs are approximately 420 acres in size (not including the nest area acres).

Gross growth – Ingrowth plus accretion. A measurable increase in wood volume due to the addition of new trees per acre added or grown into size classes which count toward total stand volume (ingrowth), plus added increases in tree diameter increment and height of trees already existing in those same size classes (accretion).

Group – A cluster of two or more trees with interlocking or nearly interlocking crowns at maturity surrounded by an opening. Size of tree groups is typically variable depending on forested PNVT and site conditions and can range from fractions of an acre (a two-tree group) (i.e., ponderosa pine, dry mixed conifer) too many acres (i.e., wet mixed conifer, spruce-fir). Trees within groups are typically non-uniformly spaced, some of which may be tightly clumped.

Group selection – An uneven-aged management method in which trees are removed and new age classes are established in groups, adjacent to other groups of different age classes. Group cut size is determined by the reproduction requirements of the species desired, and by the number or total acreage of different age classes desired across the stand.

Herbaceous – Grass, grass-like, and/or forb vegetation.

Herbivory – Loss of vegetation due to consumption by another organism.

Highly interactive species – A species that has a disproportionate effect on its ecosystem. The virtual or effective absence of a highly interactive species leads to significant changes in some feature of its ecosystem. Such changes include structural or compositional modifications, alterations in the import or export of nutrients, loss of resilience to disturbance, and decreases in native species diversity. The type of interactions these species have with their surrounding environment is critical to the persistence of certain ecosystem features through time. Examples of strong interactions include mutualisms (e.g., pollinators such as butterflies, spore and seed dispersers such as birds), consumers (e.g., large predators such as mountain lions), and ecosystem engineers (e.g., prairie dogs, beavers).

Historic range of variability (HRV) – Description of the change over time and space in the ecological condition of vegetation types and the ecological processes that shape those types (Schussman and Smith, 2006).

Human health and/or environmental effects – As used in USDA Departmental Regulation 5600-002 includes interrelated social and economic effects.

Hydrologic – Refers to the movement, distribution, and quality of water.

Hydrologic function – The behavioral characteristics of a watershed described in terms of ability to sustain favorable conditions of water flow. Favorable conditions of water flow are defined in terms of water quality, quantity, and timing.

Hydrologic Unit Code (HUC) – The United States is divided and subdivided into successively smaller hydrologic units which are identified by unique hydrologic unit codes (HUCs). The

Apache-Sitgreaves NFs is contained within three 3rd level (basin) HUC watersheds: Little Colorado, Gila, and Salt Rivers. The Apache-Sitgreaves NFs intersect thirteen 4th level (subbasin) HUC watersheds, thirty-two 5th level (watershed) HUC watersheds, and two hundred and fifteen 6th level (subwatershed) HUC watersheds. The average size of a 4th level HUC watershed is 1 million acres, 5th level HUC watersheds are around 165,000 acres, and 6th level HUC watersheds are about 21,000 acres.

Hydrophytic vegetation – The sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

Individual tree selection – An uneven-aged management method where individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration.

Industrial wood – All commercial roundwood products, except firewood.

Instream flow – Seasonal streamflows needed for maintaining aquatic and riparian ecosystems, wildlife, fisheries, and recreation opportunities at an acceptable level.

Invasive species – Species that are not native to the ecosystem being described and that cause, or have the potential to cause, ecological or economic harm.

Irruption – Sudden or drastic increase of an insect population which rises to epidemic levels for a period of time, after which the population returns to endemic levels. Cyclical population explosions and crashes are normal for some insect species, while for others this behavior only occurs in response to conditions tipped abnormally in their favor.

Leasable minerals – Leasable minerals include coal, oil, gas, oil shale, sodium, phosphate, potassium, and geothermal. Leasable minerals also include the hardrock minerals, if they are found on lands that have “acquired” status. Leases are obtained through the Bureau of Land Management to extract these mineral resources.

Litter – Litter consists of dead, unattached organic material on the soil surface that is effective in protecting the soil surface from raindrop splash, sheet, and rill erosion and is at least ½ inch thick. Litter is composed of leaves, needles, cones, and woody vegetative debris including twigs, branches, and trunks.

Livestock grazing – Foraging by permitted livestock (domestic foraging animals of any kind).

Locatable minerals – In general, the hardrock minerals mined and processed for metals (e.g., gold, silver, copper, uranium, some types of nonmetallic minerals such as sandstone). They are called “locatable,” meaning subject to mining claim location under the United States mining laws. Locatable minerals are limited to lands with “reserved public domain” status.

Long-term sustained-yield capacity (LTSYC) – The highest uniform wood yield from lands being managed for timber production that may be sustained, under specified management intensity, consistent with multiple-use objectives.

Low-income population – Any readily identifiable group of low-income persons who live in geographic proximity to, and, if circumstances warrant, migrant farm workers and other

geographically dispersed/transient persons who would be similarly affected by USDA programs or activities. Low-income populations may be identified using data collected, maintained and analyzed by an agency or from analytical tools such as the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty.

Mechanical treatment – For the purposes of this analysis, mechanical treatments include most vegetation treatments except fire. They may include mechanized cutting, hand cutting, and other silvicultural treatments.

Mechanized travel – Movement using any contrivance over land, water, or air, having moving parts, that provides a mechanical advantage to the user and that is powered by a living or nonliving power source. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts.

Mexican spotted owl protected activity center (PAC) – An area established around an occupied Mexican spotted owl site to help ensure successful reproduction and species viability. A PAC is no less than 600 acres in size and includes the best owl nesting and roosting habitat. Management in PACs is focused on forest health and includes retention of key habitat elements such as higher levels of basal area and canopy cover to provide the cool understory conditions owls need, and the down woody debris and forage (cover, fungi, seeds) needed by their prey. Management may involve thinning and/or burning to reduce the risk of high intensity wildfire, often with timing restrictions to prevent disturbance to owls during the breeding season (March 1 through August 31).

Minority – A person who is a member of one or more the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic.

Minority population – Any readily identifiable group of minority persons who live in geographic proximity to, and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who would be similarly affected by USDA programs or activities.

Motorized travel – Movement using machines that use a motor, engine, or other nonliving power sources other than a vehicle operated on rails or a wheelchair or mobility device, including one that is battery powered, designed solely for the use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area.

National Forest System (NFS) – As defined in the Forest and Rangeland Renewable Resources Planning Act of 1974 (Public Law 93-378), the "National Forest System" includes all national forest lands reserved or withdrawn from the public domain of the United States, all national forest lands acquired through purchase, exchange, donation, or other means; the national grasslands and land use projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 USC 1010-1012); and other lands, waters, or interests therein administered by the Forest Service or are designated for administration through the Forest Service as part of the system.

National Forest System road – A road wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its

resources. A forest road other than a road which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority. (36 CFR § 212.1)

National Forest System trail – A trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority. (36 CFR § 212.1)

National Wild and Scenic Rivers System – Created by Congress in 1968 (Public Law 90-542; 16 USC 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

Native species – A species which is a part of the original fauna or flora in the area in question.

Natural disturbance regime – The historic patterns (frequency and extent) of fire, insects, wind, landslides, floods, and other natural processes in an area.

Natural fire regime – The fire regime that existed prior to human-facilitated interruption of frequency, extent, or severity.

Net growth – Gross growth in forest wood volume minus natural (non-cut) mortality volume.

Nonindustrial wood – Includes aspen, junipers, piñons, Chihuahuan pine, oaks, cottonwoods and all riparian obligate broadleaved trees, and any industrial species cut from non-suitable timberlands. Also includes nonindustrial sizes of industrial species. Wood cut as nonindustrial may be used as firewood and/or biomass. Sometimes referred to as non-ASQ species.

Nonmotorized travel – Movement not relying on machines that use a motor, engine, or other nonliving power source (e.g., walking, canoeing, horseback riding).

Nonpoint source pollution (NPS) – NPS refers to water pollution affecting water quality from diffuse sources, such as polluted runoff from agricultural areas draining into lakes, wetlands, rivers, and streams. NPS can be contrasted with point source pollution, where discharges occur to a body of water at a single location, such as discharges from a chemical factory, or urban runoff from a roadway or storm drain. NPS may derive from many different sources with no specific solution to rectify the problem, making it difficult to regulate.

Noxious weed – Any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment. The term typically describes species of plants that have been determined to be undesirable or injurious in some capacity. Federal noxious weeds are regulated by USDA-Animal and Plant Health Inspection Service under the Plant Protection Act of 2000, which superseded the Federal Noxious Weed Act of 1974. When the species are native, they are not considered invasive species by the Federal Government.

Offsite vegetation type – Vegetation type where certain tree or plant species would not survive or successfully reproduce when natural control processes function normally to control their encroachment. Example: exclusion of regular fire intervals permits white fir to encroach where it

does not naturally belong in the ponderosa pine forest. Thus, ponderosa pine forest is an offsite vegetation type for white-fir.

Old growth – In southwestern forested ecosystems, old growth is different than the traditional definition based on northwestern infrequent fire forests. Due to large differences among Southwest forested PNVTs and natural disturbances, old growth forests vary extensively in tree size, age classes, presence, and abundance of structural elements, stability, and presence of understory. Old growth refers to specific habitat components that occur in forests and woodlands – old trees, dead trees (snags), downed wood (coarse woody debris), and structure diversity. These important habitat features may occur in small areas, with only a few components, or over larger areas as stands or forests where old growth is concentrated. In the Southwest, old growth is considered "transitional," given that that the location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality). Some species, notably certain plants, require "old forest" communities that may or may not have old growth components but have escaped significant disturbance for lengths of time necessary to provide the suitable stability and environment. See appendix B in the plan for a more detailed description.

Outstanding Arizona Waters – Surface water designated by Arizona Department of Environmental Quality as an outstanding State water resource. These are waters with exceptional quality where water quality should not be degraded.

Outstandingly remarkable value – A value that a river or river segment possesses that reflects its unique, rare, or exemplary qualities. In the Wild and Scenic River Act, river values identified include scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Examples of other similar values include botanical, hydrological, paleontological, scientific, or heritage. A river must have at least one outstandingly remarkable value to be eligible for wild and scenic river designation.

Patches – Areas larger than tree groups in which the vegetation composition and structure are relatively homogeneous. Patches compose the mid-scale, thus they range in size from 100 to 1,000 acres.

Plan Set of Documents – The complete set of documentation supporting the land management plan; it may include but is not limited to evaluation reports, documentation of public involvement, the plan including applicable maps, applicable plan improvement documents, applicable NEPA documents, and the monitoring program for the plan area.

Planning horizon – The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions.

Planned ignition – The intentional initiation of a wildland fire by hand-held, mechanical, or aerial device where the distance and timing between ignition lines or points and the sequence of igniting them is determined by environmental conditions (e.g., weather, fuel, topography), firing technique, and other factors which influence fire behavior and fire effects. See prescribed fire.

Planning period – The life of the plan, generally 10 to 15 years from plan approval. As a general rule, this analysis uses 15 years to define the planning period.

Potential natural vegetation type (PNVT) – Coarse-scale groupings of noncontiguous land that share similar aspect, elevation, vegetation, soil parent material, and natural disturbances such as fire or drought cycles. Identification of PNVTs is based on the terrestrial ecosystem survey (TES).

Prescribed fire – A wildland fire originating from a planned ignition to meet specific objectives identified in a written and approved prescribed fire plan for which NEPA requirements (where applicable) have been met prior to ignition. See also planned ignition.

Primitive recreation – Reliance on personal skills and nonmotorized and non-mechanized means to travel and camp in an area, rather than reliance on facilities or outside help.

Priority 6th level HUC watershed – The designated watersheds where restoration activities concentrate on the explicit goal of improving watershed condition.

Proper functioning condition (PFC) – Proper functioning condition (PFC) is a qualitative method for assessing the condition of riparian-wetland areas. The term PFC is used to describe both (1) the assessment process or tool, and (2) a defined, on the-ground condition of a riparian-wetland area.

- (1) The PFC tool is designed to assess if the physical elements (abiotic and biotic) are in working order relative to an area's capability and potential. When these physical elements are in working order, then channel characteristics develop that provide habitat for wildlife and other uses. Functionality comes first; then desired conditions are achieved.

- (2) A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to
  - dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality;
  - filter sediment, capture bedload, and aid floodplain development;
  - improve floodwater retention and groundwater recharge;
  - develop root masses that stabilize stream banks against cutting action;
  - develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and
  - support greater biological diversity (BLM, 1998).

Proposed species – Any species of fish, wildlife, or plant that is proposed in the Federal Register to be listed under section 4 of the Endangered Species Act.

Recreation opportunity spectrum (ROS) – A framework for defining the types of outdoor recreation opportunities the public might desire, and identifies that portion of the spectrum a given national forest area might be able to provide. The ROS map can be found in the "Plan Set of Documents." The broad classes are

- **Primitive (P)** – Characterized by essentially unmodified natural environment. Interaction between users is very low and evidence of other users is minimal. Essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is

generally not permitted. Very high probability of experiencing solitude, closeness to nature, tranquility, self-reliance, and risk.

- **Semi-primitive Nonmotorized (SPNM)** – Characterized by a predominantly natural or natural-appearing environment. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on site controls and restrictions may be present, but are subtle. Motorized use is generally not permitted. High probability of experiencing solitude, closeness to nature, tranquility, self-reliance, and risk.
- **Semi-primitive Motorized (SPM)** – Characterized by a predominantly natural or natural-appearing environment. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on site controls and restrictions may be present, but are subtle. Motorized use is generally permitted. Moderate probability of experiencing solitude, closeness to nature, tranquility, self-reliance, and risk.
- **Roaded Natural (RN)** – Characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of other humans. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate but with evidence of other users prevalent. Resource modification and utilization practices are evident but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities. Opportunity to affiliate with other users in developed sites but with some chance for privacy.
- **Roaded Modified (RM)** – Characterized by substantially modified natural environment except for campsites. Roads and management activities may be strongly dominant. There is moderate evidence of other users on roads. Conventional motorized use is provided for in construction standards and design of facilities. Opportunity to get away from others, but with easy access.
- **Rural (R)** – Characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available. Opportunity to observe and affiliate with other users is important, as is convenience of facilities.
- **Urban (U)** – Characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans onsite are predominant. Large numbers of users can be expected, both onsite and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site. Opportunity to observe and affiliate with other users is very important, as is convenience of facilities.

Reference conditions – Environmental conditions that infer ecological sustainability. Reference conditions are often represented by the historic range of variation (i.e., the characteristic range of variation, not the total range of variation) for a particular attribute, prior to Euro-American settlement and under the current climatic period. For some ecosystems, the historic range of

variation reflects American Indian burning. Reference conditions may not necessarily represent desired conditions.

Reference landscape – For inventoried roadless areas, reference landscapes of relatively undisturbed areas can serve as a barometer to measure the effects of development on other parts of the landscape.

Reforestation – The natural or artificial reestablishment (restocking) of an area with forest tree cover.

Regulated – The technical (rather than legal or administrative) aspect of controlling forest stocking, periodic harvests, growth, and yields to meet management objectives including sustained yield. This control can be done either by area, or volume of growing stock, or basal area, or stand density index measures. An uneven-aged, regulated forest is one which has a balanced progression of three or more age/size classes, such that each younger/smaller class is advancing to replace the class above it on approximately the same acreage, until it is mature for harvest or other resource objectives. A regulated forest reaches sustained yield when the volume cut periodically equals the amount of net volume growth for that same period.

Research natural area – A physical or biological unit in which current natural conditions are maintained insofar as possible. These conditions are ordinarily achieved by allowing natural physical and biological processes to prevail without human intervention. Research natural areas are principally for non-manipulative research, observation, and study. They are designated to maintain a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and natural situations that have scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.

Resiliency – The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Restoration – see ecological restoration.

Riparian area – Terrestrial ecosystems characterized by wet soils and plant species that are water loving and dependent on the water table or its capillary fringe zone (a zone in the soil just above the water table that remains saturated or almost saturated). Riparian areas make up the most biologically productive component of forest ecosystems providing unique wildlife habitat in the Southwest. Riparian areas also function to transport and filter water, soil and organic material from upslope to stream.). Examples of riparian areas on the forests include areas along streams, around wetlands, lakes, ponds, springs and seeps, and include wet meadows, fens, bogs and floodplains.

Road decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR § 212.1). It includes a range of activities from ripping and seeding to full reclamation by restoring the original topography. Road decommissioning results in the removal of a National Forest System road from the forest transportation atlas.

Road maintenance – The upkeep of the entire transportation facility including surface and shoulders, parking and side areas, structures, and such traffic control devices as are necessary for

its safe and efficient utilization (36 CFR § 212.1). This work includes brushing of roadside vegetation, falling danger trees, road blading, cleaning ditches, cleaning culvert inlets and outlets, etc.

Road maintenance level – Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria. (Forest Service Handbook 7709.59, 62.32)

- **Maintenance level 1** – These are roads that have been placed in storage between intermittent uses. The period or storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources to an acceptable level and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate" all traffic. Roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular/ motorized traffic but may be available and suitable for nonmotorized uses.
- **Maintenance level 2** – Assigned to roads open for use by high-clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are not provided with the exception that some signing, such as "Warning No Traffic" signs may be posted at intersections. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either to (a) discourage or prohibit passenger cars or (b) accept or discourage high-clearance vehicles.
- **Maintenance level 3** – Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. The Manual on Uniform Traffic Control Devices (MUTCD) is applicable. Warming signs and traffic control devices are provided to alert motorists of situations that may violate expectations. Roads in this maintenance level are typically low speed, with single lanes and turnouts. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users.
- **Maintenance level 4** – Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. Manual on Uniform Traffic Control Devices (MUTCD) is applicable. The most appropriate traffic management strategy is "encourage." However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times.
- **Maintenance level 5** – Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. Manual on Uniform Traffic Control Devices (MUTCD) is applicable. The appropriate traffic management strategy is "encourage."

Road removal – The elimination of unauthorized routes. It includes a range of activities from ripping and seeding to full reclamation by restoring the original topography.

Roundwood products – Logs, bolts, or other round sections cut from trees, excluding firewood.

Sacred sites – Defined in Executive Order 13007 as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Scenic integrity – The state of naturalness or a measure of the degree to which a landscape is visually perceived to be "complete." The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the landscape character valued by constituents for its aesthetic quality. Scenic integrity is the state of naturalness or, conversely, the state of disturbance created by human activities or alteration. Scenic integrity is measured in five levels:

- **Very high (unaltered)** – A scenic integrity level that generally provides for ecological change only.
- **High (appears unaltered)** – Human activities are not visually evident. In high scenic integrity areas, activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.
- **Moderate (slightly altered)** – Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
- **Low (moderately altered)** – Human activities must remain visually subordinate to the attributes of the existing landscape character. Activities may repeat form, line, color, or texture common to these landscape characters, but changes in quality of size, number, intensity, direction, pattern, and so on, must remain visually subordinate to these landscape characters.
- **Very Low (heavily altered)** – Human activities of vegetative and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at background distances.

Seed cut – One step of an even-aged regeneration cutting method in which the healthiest, most desirable trees are left, and stand conditions are created for them to become good cone producers. The intention is to promote natural tree regeneration where needed.

Seral state – A particular plant and animal community developmental stage which is transitional between other stages along the continuum of succession or change. Changes in seral states can take place over time or very quickly and movement between states can be in either direction. Aspen is an example of a seral state that, without disturbance over time, will eventually be replaced by a subsequent seral state dominated by conifers.

Silviculture – The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands using species silvics to meet the diverse needs and values of landowners and society on a sustainable basis. Under this definition, silvicultural treatments include all management activities that control the establishment, growth, composition, health, and quality of forested lands to achieve stated land management objectives. The use of prescribed fire on forested lands qualifies as a silvicultural treatment in the context of this definition.

Slash – The residue (e.g., branches, bark) left on the ground after a management activity, such as logging, or natural ecological disturbance such as a storm or fire.

Snags – Standing dead or partially dead trees (snag topped), often missing many or all limbs and/or bark. Snags (generally 12 inches or larger) provide essential wildlife habitat for many species and are important for forest ecosystem function.

Soil burn severity – Burn severity indicators are classified and defined as follows (Parsons et al., 2010):

- **Low soil burn severity** – Surface organic layers are not completely consumed and are still recognizable. Structural aggregate stability is not changed from its unburned condition, and roots are generally unchanged because the heat pulse below the soil surface was not great enough to consume or char any underlying organics. The ground surface, including any exposed mineral soil, may appear brown or black (lightly charred), and the canopy and understory vegetation will likely appear "green."
- **Moderate soil burn severity** – Up to 80 percent of the pre-fire ground cover (litter and ground fuels) may be consumed but generally not all of it. Fine roots (~3/32 inch diameter) may be scorched but are rarely completely consumed over much of the area. The color of the ash on the surface is generally blackened with possible gray patches. There may be potential for recruitment of effective ground cover from scorched needles or leaves remaining in the canopy that will soon fall to the ground. The prevailing color of the site is often "brown" due to canopy needle and other vegetation scorch. Soil structure is generally unchanged.
- **High soil burn severity** – All or nearly all of the pre-fire ground cover and surface organic matter (litter, duff, and fine roots) is generally consumed and charring may be visible on larger roots. The prevailing color of the site is often "black" due to extensive charring. Bare soil or ash is exposed and susceptible to erosion, and aggregate structure may be less stable. White or gray ash (up to several centimeters in depth) indicates that considerable ground cover or fuels were consumed. Sometimes very large tree roots (> 3 inches in diameter) are entirely burned extending from a charred stump hole. Soil is often gray, orange, or reddish at the ground surface where large fuels were concentrated and consumed.

Soil productivity – The inherent capacity of the soil to support appropriate site-specific biological resource management objectives, which includes the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses.

Special use authorization – A permit, term permit, temporary permit, lease, easement, or other written instrument that grants rights or privileges of occupancy and use subject to specified terms and conditions on National Forest System land.

Species diversity – The number of different species, both plant and animal, within a region (i.e., the Apache-Sitgreaves NFs). NFMA requires that land management plans provide for diversity of plant and animal communities.

Springs and seeps - Springs and seeps are groundwater-dependent ecosystems where groundwater discharges at the ground surface, often through complex subsurface flow paths (Stevens and Meretsky, 2008).

Stand – A contiguous group of trees generally uniform in age class distribution, composition, condition, and structure, and growing on a site of generally uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the fundamental unit of silviculture reporting and record-keeping.

Structure – Structure includes both the vertical and horizontal dimensions of a vegetation type or plant community. The horizontal structure refers to spatial patterns of individual and groups of plants and openings, as well as plant size and species composition. The vertical component refers to the layers of vegetation between the forest floor and the top of the canopy. Each vegetation type has its own structure. For example, forests have greater vertical structure than a grassland or woodland based on the height of the dominant species.

Suitable timberlands – Land to be managed for timber production on a regulated basis. Such lands are those which have been determined to meet the following criteria: (a) are available for timber production (i.e., not withdrawn for wilderness or other official designation by Congress, the Secretary of Agriculture, or Chief of the Forest Service); (b) are physically capable of producing crops of industrial wood without irreversible resource damage to soils productivity or watershed conditions; (c) adequate tree restocking within 5 years of final harvest is reasonably assured; (d) adequate information exists about responses to timber management activities; (e) timber management is cost efficient over the planning horizon in meeting forest objectives that include timber production; (f) timber production is consistent with meeting the management requirements and multiple-use objectives specified in the forest plan or plan alternative; and (g) other management objectives do not limit timber production activities to the point where it is impossible to meet management requirements set forth in 36 CFR § 129.27 (per Forest Service Handbook 2409.13, WO Amendment 2409.13-92-1, O Code and Chapter 20).

Sustainability – Meeting the needs of the present generation without compromising the ability of future generations to meet their needs. Sustainability is composed of desirable social, economic, and ecological conditions or trends interacting at varying spatial and temporal scales embodying the principles of multiple use and sustained yield.

Temporary road or trail – A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road, or trail and that is not included in the transportation atlas. (36 CFR § 212.1).

Terrestrial ecosystem survey (TES) – Also called the terrestrial ecological unit inventory, the TES identifies ecological units for the Apache-Sitgreaves NFs that are distinct from each other in terms of their soil, vegetation, and climate components.

Thinning – An intermediate treatment made to reduce the stand density of trees primarily to improve growth, enhance forest health, recover potential mortality, emphasize desired tree species, and/or emphasize desired forest structure. It includes crown thinning (thinning from above, high thinning), free thinning, low thinning (thinning from below), selection thinning (dominant thinning), mechanical thinning (leaves trees in equally spaced rows), and mechanized thinning (any spacing arrangement). Mechanized thinning should not be confused with mechanical thinning. Mechanized thinning, as used in the plan, includes prescribed cuts made by both hand and/or mechanized equipment, as a distinction from prescribed thinning by use of wildland fire only. Traditional (cutting) prescribed thinning can be used with both even- and uneven-aged management systems. Thinning with prescribed fire can qualify as an intermediate

treatment but may not provide enough controlled tree selection to clearly fit in either management system.

Timber production – Purposefully growing, tending, harvesting, and regenerating regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. In addition, managing land to provide commercial timber products on a regulated basis with planned, scheduled entries. It does not include firewood or harvest from unsuitable lands. (Forest Service Manual 1900)

Total maximum daily load (TMDL) – A TMDL is a written analysis that determines the maximum amount of a pollutant that a surface water can assimilate (the "load"), and still attain water quality standards during all conditions. The TMDL allocates the loading capacity of the surface water to point sources and nonpoint sources identified in the watershed, accounting for natural background levels and seasonal variation, with an allocation set aside as a margin of safety.

Traditional cultural properties (TCP) – Defined in National Register Bulletin 38 as properties associated "with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community." TCPs can range from structures, mountains, and other landforms to plant gathering locations to communities. These areas are considered historic properties that may be eligible to the National Register of Historic Places

Travel Management Rule (November 29, 2005, 36 CFR § 212.51) – Requires that each national forest designate a system of roads, trails, and areas for motor vehicle use by vehicle class and, if appropriate, by time of year. Once the system is designated, the rule will prohibit motor vehicle use off the designated system.

Tree cutting – The cutting or removal of trees for wood fiber use and other multiple-use purposes. Sometimes referred to as "timber harvest" or "thinning."

Unauthorized livestock – Any cattle, sheep, goat, hog, or equine not defined as a wild free-roaming horse or burro by 36 CFR § 222.20(b)(13), which is not authorized by permit (or Bill for Collection) to be upon the land on which the livestock is located and which is not related to use authorized by a grazing permit (livestock owned by other than a national forest grazing permit holder). Noncommercial pack and saddle stock used by recreationists, travelers, other forest visitors for occasional trips, as well as livestock to be trailed over an established driveway when there is no overnight stop on Forest Service administered land, do not fall under this definition.

Unauthorized road or trail – A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas (36 CFR § 212.1). Sometimes referred to as a "user-created" road or trail.

Uncharacteristic wildfire – An increase in wildfire size, severity, and resistance to control compared to reference conditions which occurred historically. These fires result as a consequence of more continuous canopy cover, ladder fuels, and accumulated live and dead woody material. Uncharacteristic wildfires burn with more intensity; cause higher tree mortality; degrade watersheds; sterilize soils; and threaten adjacent communities, forest infrastructure, and wildlife habitat. See reference conditions.

Uneven-aged forests – Forests that comprise three or more distinct age classes of trees, either intermixed or in small groups.

Uneven-aged management – The application of combined actions needed to simultaneously maintain continuous forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

Unplanned ignition – A wildfire, not including planned ignitions.

Use of wildland fire – Management of either wildfire or prescribed fire to meet resource objectives specified in land management plans.

Vigor – Relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant (i.e., height, weight) and its parts in relation to its age and the environment in which it is growing.

Wild and scenic rivers – These rivers are free flowing and have at least one outstandingly remarkable value. Eligible and suitable rivers are given a tentative classification of wild, scenic, or recreational. These rivers may be included in the National Wild and Scenic Rivers System.

- **Wild** – Those rivers or segments of rivers free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic** – Those rivers or segments of rivers free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- **Recreational** – Those rivers or segments of rivers readily accessible by road or railroad that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Wildfire – Unplanned ignition of a wildland fire (e.g., fires caused by lightning, unauthorized and accidental human-caused fires) and escaped prescribed fires. See also unplanned ignition.

Wild horse (wild free-roaming horse) – All unbranded and unclaimed horses and their progeny using National Forest System lands on or after December 15, 1971. This definition does not include any horse introduced onto National Forest System lands on or after December 15, 1971, by accident, negligence, or willful disregard of private ownership. Animals that stray from other lands onto National Forest System lands are not considered wild free-roaming horses and are not under Forest Service protection. No known records or documentation exists that the Apache NF had any unbranded and unclaimed horses prior to December 15, 1971. See 36 CFR § 220 and Forest Service Manual 2260 for more information.

Wildland – An area in which development is essentially nonexistent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.

Wildland fire – A general term describing any nonstructural fire that occurs in the vegetation and/or natural fuels. The two types of wildland fire are wildfires and prescribed fires. Other terms such as “fire-use fires,” “resource benefit fires,” or “suppression fires” are not used in this document.

Wildland-urban interface (WUI) – The WUI includes those areas of resident populations at imminent risk from wildfire, and human developments having special significance. These areas may include critical communications sites, municipal watersheds, high voltage transmission lines, church camps, scout camps, research facilities, and other structures that if destroyed by fire, would result in hardship to communities. These areas encompass not only the sites themselves, but also the continuous slopes and fuels that lead directly to the sites, regardless of the distance involved. (Forest Service Manual 5140.5, Southwestern Region supplement).

Windthrow – Trees susceptible to wind damage (e.g., bole breakage, uprooting, toppling).

Woody biomass – The trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or grassland environment, that are the byproducts of forest management used to produce bioenergy and the full range of bio-based products.

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Appendix A. Public Comments and Responses

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Introduction

This appendix documents the Apache-Sitgreaves NFs' responses to substantive comments received during the 90-day comment period for the Proposed Land Management Plan (proposed plan) and Programmatic Draft Environmental Impact Statement (DEIS). The proposed plan and DEIS, along with supporting documents were made available on the Apache-Sitgreaves NFs' Web site in late January 2013. A notice of availability was posted in the Federal Register on February 15, 2013, by the Environmental Protection Agency under the title "EIS No. 20130028, Draft EIS, AFS, AZ, Programmatic—Apache-Sitgreaves National Forests Land Management Plan." This notice initiated the comment period which ended May 17, 2013. The Forest Service received comment letters or emails from individuals, organizations, and agencies; these comments were received by email, in person, and via the U.S. Post Office. Letters from government agencies and tribes are included in appendix H. A total of 41,288 comment letters, of which 145 contained unique and substantially different comments. In addition, there were 7 different form letters received. The original comments are included in the plan set of documents and are available at the Apache-Sitgreaves NFs Forest Supervisor's Office, 30 S. Chiricahua Drive, Springerville, Arizona. Many of the electronic documents from the plan set of documents can be found on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning.

Content Analysis Process

The comment content analysis followed a systematic process of reading, coding, and summarizing the comments that were submitted. This process ensured that every comment was read, analyzed, and considered.

Each unique letter was assigned a commenter code (see list of commenter codes at the end of this appendix). Each comment within a letter or email was assigned a unique comment tracking number and coded by subject and category. Comments were then sorted by topic in a spreadsheet. Similar or identical comments were summarized into a single concern statement. The concern statements are found in this appendix beginning in the next section. The unique commenter code followed by the comment tracking number can be found in parenthesis at the end of the concern statement (commenter code → 127.9 ← comment tracking number). For example, 127.9 would be comment number 9 of letter number 127. The comments and tracking spreadsheet are available in the plan set of documents.

The interdisciplinary planning team prepared responses for each concern statement based on its merits, regardless of the source or whether expressed by many people or by one person. This appendix documents the Apache-Sitgreaves NFs responses to substantive comments, which are addressed as prescribed in 40 CFR § 1503.4 in the following ways:

- Modifying the proposed plan (alternative B) and alternatives;
- Developing or analyzing alternatives not given detailed consideration in the DEIS;
- Supplementing, improving, or modifying the analysis that the DEIS documented;
- Making factual corrections; and/or
- Explaining why the comments need no further agency response.

General Comments

Concern Statement: The DEIS fails to establish a need for change based on existing conditions and is not clear regarding "revision topics." Recommend the purpose and need chapter be revised in accordance with NEPA. (108.7)

Response: The purpose and need for change are discussed in the “Purpose and Need” section in chapter 1 of the DEIS. As noted in the DEIS, the need for change is based on public and employee collaboration and the Analysis of the Management Situation. The revision topics (three primary focus areas where there are priority needs for change in program direction) and need for change are also described under the “Summary of the Analysis of the Management Situation” section in chapter 1 of the plan.

Concern Statement: Explain how the Forest Service Handbook and the travel management plan relate to the plan and projects. (109.1, 132.6)

Response: The introduction to appendix D (“Relevant Laws, Regulations, and Policies”) in the plan describes the relationship between national and regional management direction (e.g., Forest Service Handbook), forestwide management direction (e.g., plan), and project-level management direction (e.g., travel management decisions).

The Forest Service Directive System consists of the Forest Service Manual (FSM) and Handbook (FSH), which codify the agency's policy, practice, and procedure. The system is the primary basis for the internal management and control of all programs and the primary source of administrative direction to Forest Service employees. The plan’s programmatic guidance was developed to be consistent with both FSM and FSH direction. Although the plan is in alignment with FSM and FSH direction, it does not repeat that direction as plan decisions.

As forest managers carry out the mission of the Forest Service through the implementation of projects and activities, they follow direction as described in the FSM, FSH, and plan. As stated in chapter 1, the “plan provides broad guidance and information for project and activity decisionmaking.”

The implementation of the Travel Management Rule (36 CFR §212) is a future project that will be implemented following FSM, FSH, and plan guidance. The purpose of the project is to identify a designated system for motorized vehicle use. The plan provides the framework (e.g., desired conditions, standards, guidelines) for implementing the Travel Management Rule. In particular, the “Motorized Opportunities” section in chapter 2 contains standards that would limit motorized vehicle travel to a designated system of NFS roads and motorized trails, and designated motorized areas. In addition, the “Motorized Uses Suitability” in chapter 4 describes the suitability of areas for motorized uses.

Concern Statement: Any roads in the state of Arizona should fall under the jurisdiction of the county and sheriff where they are located. (129.2)

Response: Jurisdiction of roads is beyond the scope of the plan and plan revision process. However the Forest Service refers the commenter to applicable laws providing for Federal jurisdiction over NFS lands including the Property Clause of the U.S. Constitution (Article IV, section 3, clause 2), the Supremacy Clause of the U.S. Constitution (Article VI, clause 2) the Organic Act of 1987 (codified at 16 USC 551, et. seq.). The National Forest Roads and Trails Act

of October 13, 1964, as amended (16 U.S.C. 532-538), authorizes road and trails systems for the national forests. Forest Service Manual 7703.3 describes the types of roads under Forest Service jurisdiction and those roads that may be under jurisdiction of other parties.

The plan provides direction for managing motorized roads and trails in the "Motorized Opportunities" section in chapter 2 and the "Motorized Uses Suitability" section in chapter 4 of the plan.

Concern Statement: The Forest Service has limited jurisdiction in Greenlee County as proved by affidavit, supporting court cases and references including: (1) Jurisdiction Affidavit Pertaining to Federal Jurisdiction over Areas Acquired by the United States in the county of Greenlee, state of Arizona, (2) 16 U.S.C 480 Civil and criminal jurisdiction, (3) U.S. Supreme Court, United States v. County of Fresno, 429 U.S. 452 (1977), (4) The Doctrine of Retroactivity and Prospectivity is being violated by the DOJ in attempting to enforce the Organic Act of 1897, Taylor Grazing and FLPMA upon the pre existing right of property., (5) Union Pacific R. Co. v. Laramie Stock Yards Co., 231 U.S. 190 (1913), (6) 16 USC 472 - Laws affecting forest lands, (7) U.S. Supreme Court Wilcox v. Jackson, 38 U.S. 13 Pet. 498498 (1839)], (8) U.S. Constitution - Amendment 10, (9) 16 USC 534 - Termination and cancellation of easements; notice; hearing, (10) 40 USC 1314 – Easements. (119.1, 116.1, 117.1, 118.1)

Response: Forest Service jurisdiction over federally owned lands within the National Forest System in Greenlee County is beyond the scope of the plan and plan revision process. However the Forest Service refers the commenter to applicable laws providing for Federal jurisdiction over NFS lands including the Property Clause of the U.S. Constitution (article IV, section 3, clause 2), the Supremacy Clause of the U.S. Constitution (article VI, clause 2) the Organic Act of 1897 (codified at 16 USC 551, et. seq.), the National Forest Roads and Trails Act of October 13, 1964, as amended (16 U.S.C. 532-538), and the legal principles of concurrent jurisdiction.

Concern Statement: National forest lands should be State forest lands. (24.7)

Response: The jurisdiction of National Forest System land is beyond the scope of the plan and plan revision process. Only Congress may decide what entity will manage federally owned lands within the National Forest System.

Concern Statement: Our national forests need to be protected. The Forest should be managed to emphasize ecological sustainability. The Forest Service should emphasize protection of biodiversity, endangered species and other animals, habitat, and old growth. (106.1, 15.1, 53.1, 49.1, 13.1, 85.2, 21.1, 21.2, 33.1, 60.4, 83.1, 80.1, 8.5)

Response: As noted in chapter 1, the plan provides broad guidance and information for project and activity decisionmaking. These protections provide a framework to sustain native ecological systems by managing toward desired conditions that support native plant and animal diversity. One of the primary focus areas, or revision topics, for the plan is "Maintenance and Improvement of Ecosystem Health." As a whole, the plan provides direction that contributes to ecological, social, and economic sustainability. The plan provides specific direction (see the "Overall Ecosystem Health," "Aquatic Habitat and Species," "All PNVTs," and "Wildlife and Rare Plants" sections) to provide for biodiversity (i.e., biological diversity) and protect endangered species and other animals, habitat, and old growth.

<u>Concern Statement:</u> The Forest Service should make special effort regarding the restoration of watersheds and ecosystem health. (146.1)

<u>Response</u>: See response above. In addition, as part of the focus on ecosystem health, there is a concerted effort to restore priority 6th level HUC watersheds (see the "Overall Ecosystem Health" section), and the plan contains an objective,

"During the planning period, improve the condition class on at least 10 priority 6th level HUC watersheds by removing or mitigating degrading factors."

<u>Concern Statement:</u> There is a need to protect our forests from deforestation and pollution. (60.5)

<u>Response</u>: The plan provides protections (see standards for the "Forests: All Forested PNVTs" section) to regulate timber harvests and restock trees to prevent deforestation. The plan also provides protections to minimize or prevent air pollution (see "Air" section) and is consistent with the Clean Air Act of 1972 and State of Arizona air quality standards for visibility and public health.

<u>Concern Statement:</u> The Forest Service should protect the forests and wildlife by forbidding uses including: (1) logging, (2) mining, (3) drilling, and (4) road construction. (91.1, 8.1, 89.1)

<u>Response</u>: Alternatives that would prohibit logging, mining, drilling, and road construction were considered during the development of the plan and EIS. It was determined that an alternative to eliminate timber harvesting would be inconsistent with legal mandates, including the Multiple Use-Sustained Yield Act of 1960. Each of the action alternatives contains desired conditions, standards, guidelines, and suitability determinations to protect forest resources when designing logging activities.

It was determined that an alternative to eliminate mining and drilling would be inconsistent with legal mandates, including the Mining and Minerals Policy Act of 1970. In addition, the Forest Service does not have the discretionary authority to prevent mining of locatable minerals on public domain lands as prescribed by the 1872 Mining Law (as amended). Each of the action alternatives contain desired conditions, guidelines, and suitability determinations for minerals and geology related projects and activities, including surface occupancy stipulations.

An alternative to forbid road construction was also considered, however it was considered not to be feasible. For example, new road construction may be required when access to a particular resource or private inholding is needed. All of the action alternatives contain desired conditions, standards, guidelines, and suitability determinations that address the impacts of road construction.

For more detail, see the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS.

<u>Concern Statement:</u> Forest uses that reduce water quality and quantity or degrade aquatic ecosystems should not be allowed. (9.9)

<u>Response</u>: The plan provides direction to projects and activities to eliminate or minimize impacts to water quality, water quantity, and aquatic ecosystems (see "Water Resources," "Aquatic Habitat and Species," and "Water Uses" sections). In addition, one of the primary focus areas, or

revision topics, for the plan is “Maintenance and Improvement of Ecosystem Health,” and the plan contains specific objectives to improve aquatic resources (see “Overall Ecosystem Health,” “Aquatic Habitat and Species,” and “Riparian Areas” sections).

Concern Statement: There should be no more national monuments or national parks. (22.3)

Response: The addition of national monuments or national parks is beyond the scope of the plan and the plan revision process. It is not within the authority of the Forest Service to designate these types of areas; the authority resides with the Congress and the President.

Concern Statement: The forest should be managed for the benefit of humans including: (1) current and future generations, (2) provision of goods and services, (3) balance ecological sustainability with economic uses and social sustainability, (4) multiple use. (108.40, 138.3, 151.8, 93.1, 93.2)

Response: The plan contributes to ecological, social, and economic sustainability focused on meeting the needs of the present generation without compromising the ability of future generations to meet their needs. The plan gives direction to manage the forest consistent with the Multiple Use-Sustained Yield Act of 1960 and provides goods and services including outdoor recreation, timber, range, watershed, wildlife, and fish.

Concern Statement: Why does the Forest Service close areas for administrative use during hunting and horn hunting season but Forest Service employees are allowed behind the locked gates at those times? (157.2)

Response: Site specific area closures are outside the scope of the plan. Site closure orders may have specific exemptions pursuant to 36 CFR § 261.50(e) that allow entry by Federal, State, or local officer, or member of any organized rescue or fire fighting force in the performance of official duty.

Concern Statement: We don't know enough about how forests work and what all they do for us to be damaging them in the ways we are. Let them be. (72.2)

Response: A minimum management (no or minimal human intervention) alternative was considered but eliminated from detailed study (see chapter 2 of the EIS). If the Forest Service provided no management, it would not meet the legal direction of the National Forest Management Act or Multiple Use–Sustained Yield Act which direct that forests will be managed using multiple use, sustained yield principles. Active management is also needed to maintain or move toward desired conditions, including restoring forest ecosystems, maintaining recreation opportunities, reducing the threat of uncharacteristic wildfires to communities, and maintaining the availability of forest products.

Plan Process

Concern Statement: The DEIS considers an inadequate range of alternatives because: (1) the alternatives are too similar, (2) there are not enough alternatives, or (3) the alternatives do not address the purpose and need or issues. (127.45, 108.13, 108.12, 125.16, 108.14)

Response: The DEIS evaluates a range of reasonable alternatives that were developed to address the significant issues raised. The alternatives differ in the way they address the issues that were

raised during scoping. The "Issues that Served as the Basis for Alternative Development" section of the DEIS describes these issues. Chapter 2 describes the alternatives developed in response to these issues. Forest Service National Environmental Policy Act (NEPA) regulations at 36 CFR §220.5(e) states,

"no specific number of alternatives is required or prescribed."

It is noted in chapter 2 of the DEIS, the proposed plan (alternative B) was developed iteratively in a collaborative manner to address the needs for change. This is consistent with the Forest Service NEPA regulations at 36 CFR §220.5(e)(1) stating,

> "*The responsible official may modify the proposed action and alternative(s) under consideration prior to issuing a draft EIS. In such cases, the responsible official may consider the incremental changes as alternatives considered."*

As a result of public comments on the DEIS, an additional 8 alternatives (to the original 10 alternatives eliminated from detailed study that were addressed in the DEIS) were considered but eliminated from detailed study. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS for rationale for how these alternatives were considered and addressed.

The purpose of the DEIS was achieved by evaluating different programmatic strategies (or alternatives) for revising the 1987 plan and disclosing the potential environmental consequences of those alternatives. The need for the DEIS was accomplished by providing alternatives that:
(1) guide natural resource management activities on the forests for the next 10 to 15 years,
(2) address public issues and the need for change as summarized in the three revision topics, and
(3) meet the legal direction of the National Forest Management Act of 1976 and the provisions of the 1982 Planning Rule to revise the plan every 10 to 15 years.

Concern Statement: Remove the reference to or inclusion of lands outside the Apache-Sitgreaves NFs from the scope, analysis, justification, and recommendations or change the name of the DEIS to demonstrate the inclusion of lands outside the Apache-Sitgreaves NFs. (108.4)

Response: The plan does not apply to lands outside the Apache-Sitgreaves NFs. As described at the beginning of chapter 1 of the plan, the "Land Management Plan for the Apache-Sitgreaves National Forests" covers the National Forest System (NFS) lands within the boundary of the Apache-Sitgreaves NFs. Plan direction only applies to the 2.1 million acres of NFS land administered by the Apache-Sitgreaves NFs.

The EIS does consider activities on non-NFS ownerships to describe the potential cumulative environmental consequences on a particular resource. This is consistent with CEQ National Environmental Policy Act (NEPA) regulations 1508.7,

"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."

Concern Statement: Explain why the decision on the land management plan is left up to one supervisor. (157.3)

Response: The decisionmaker for plans revised under the 1982 Planning Rule is not the forest supervisor, but rather the regional forester. The provisions of the 1982 Planning Rule identify one position as the decisionmaker for the plan, it states the,

"Regional Forester shall review the proposed plan and the final environmental impact statement and either approve or disapprove the plan."

Concern Statement: Explain how the Forest Service can implement rules. (157.1)

Response: Congress grants agencies the authority to issue and implement rules and regulations through law. For example, the National Forest Management Act of 1976 (Sec. 6(g)) states,

"as soon as practicable, but not later than two years after enactment of this subsection, the Secretary shall in accordance with the procedures set forth in section 553 of title 5, United States Code, promulgate regulations, under the principles of the Multiple-Use, Sustained-Yield Act of 1960, that set out the process for the development and revision of the land management plans, and the guidelines and standards prescribed by this subsection."

Regulations are issued by federal agencies, boards, or commissions to explain how an agency intends to carry out a law. Regulations have the force and effect of law.

When an agency decides that a regulation needs to created, changed, or deleted, it goes through a rulemaking process which is governed by the Administrative Procedure Act (5 U.S.C. Chapter 5). The agency proposes a proposed rule in the Federal Register to ask the public for comments. After the agency considers public feedback and makes applicable changes, it then publishes a final rule in the Federal Register that states when the regulations will become effective and enforceable. For more information, see the "Office of the Federal Register's A Guide to the Rulemaking Process" at http://www.federalregister.gov/uploads/2011/01/the_rulemaking_process.pdf.

Concern Statement: Include a commitment to implement the mitigation strategies identified in the plan's Appendix A (Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning) into the final EIS and record of decision (ROD). (159.5)

Response: The mitigation strategies identified in the plan's appendix A are not plan decisions, and therefore, they are not analyzed in the EIS and are not referenced in the record of decision. The appendix is intended to be used as a reference for land managers and contains options that managers may use to respond to change. The Apache-Sitgreaves NFs is committed to taking steps to incorporate climate change considerations in its management and planning. For example, the plan does address climate change by incorporating adaptive management strategies and describing ecological conditions that are resilient to change, and the EIS analyzed the environmental consequences of climate change on forest resources.

Concern Statement: The proposed plan should be revised because it is not consistent with law, policy, or regulation because the Forest Service did not: (1) discuss costs or net public benefits, (2) prepare a variety of alternative management strategies that address alternative objectives and discuss associated benefits or costs, (3) establish standards and guidelines to meet minimum management requirements, and (4) consider an alternative and disclose how

"decisions based on it will or will not achieve the requirements of … environmental laws and policies." (127.52, 127.6, 162.150)

Response:

(1) Costs and net public benefits were discussed and considered within the plan, EIS, and plan process to provide for multiple use and sustained yield of goods and services in a way that maximizes long term net public benefits in an environmentally sound manner (1982 Planning Rule section 219.1(a)). The plan is designed to contribute to ecological, social, and economic sustainability. The environmental consequences, including long term net public benefits, are described in the resource and topic sections in chapter 3 of the EIS. The plan, EIS, and plan revision process meet the requirements of the provisions of the 1982 Planning Rule. For example:

- A summary of the Analysis of the Management Situation (AMS) is discussed in chapter 1 of the plan. The AMS, including the "Comprehensive Evaluation Report" (Forest Service, 2008a) and "CER Supplement" (Forest Service, 2010b), describes benchmark analysis and the demand and supply conditions for resources and potential management opportunities. In addition, the "Background" sections in the plan and the "Affected Environment" sections of the EIS for each resource area provide information about resource conditions. (1982 Planning Rule sections 219.11(a) and 219.12(e)(1))

- A broad range of reasonable alternatives was developed by the interdisciplinary team to provide an opportunity to maximize net public benefits. Four of those alternatives were analyzed in detail in the EIS. See chapter 2 in the EIS for more information about alternatives. (1982 Planning Rule sections 219.4(a)(1) and 219.12(f))

- The EIS estimates effects of alternatives, including benefits and costs, in the "Environmental Consequences" sections of chapter 3. In particular, the EIS discusses the expenditures, revenues, and present net values by alternative and program area in the "Socioeconomic Resources" section of chapter 3. (1982 Planning Rule section 219.12(g)(3))

(2) The EIS (chapter 3) analyzed the effects (both positive and negative) of a range of reasonable alternatives (or management strategies) that contain varying objectives. The associated benefits and costs are discussed in the "Environmental Consequences" sections of chapter 3 of the EIS.

(3) The plan provides plan decisions (desired conditions, objectives, standards, guidelines, suitability determinations, and a monitoring strategy) that integrate minimum management requirements (1982 Planning Rule section 219.27). Forestwide desired conditions, objectives, standards, and guidelines are located in chapter 2. Management area specific desired conditions, objectives, standards, and guidelines are found in chapter 3. Suitability determinations are located in chapter 4 and the monitoring strategy is in chapter 5. For example, the requirement to maintain air quality (1982 Planning Rule section 219.27(a)(12)) is addressed in the "Air" section of the plan with desired conditions to maintain air quality related values and meet state air quality standards, a guideline that requires smoke to be monitored during extended periods of burning, and the monitoring strategy question that asks,

"are management activities contributing to desired conditions or improving air quality across the forests…?"

(4) Chapter 2 of the DEIS states that all four alternatives comply with applicable laws, regulations, and policies that meets National Environmental Policy Act (NEPA) regulations (40 CFR §1502.2(d)). The EIS has been corrected to explain that alternative C does not comply with the 2001 Roadless Area Conservation Rule. The National Environmental Policy Act (NEPA) allows for the consideration of alternatives that an agency may not legally implement but which address public concerns (40 CFR §1502.14(c)). The Forest Service included consideration of no IRAs and no IRA management in alternative C in response to public comments that requested full multiple use of IRAs.

Concern Statement: The plan should be aligned with Forest Service Manual guidance and direction, the Forest Service mission, and congressional expectations. (152.4, 152.1, 152.9)

Response: The plan is aligned with Forest Service Manual guidance and direction but does not repeat the guidance in the plan. The Forest Service mission is listed in chapter 1 of the plan and the plan decisions collectively contribute to sustaining the health, diversity, and productivity of the Nation's forests to meet the needs of present and future generations. The plan is aligned with congressional expectations because it complies with applicable laws enacted by Congress.

Concern Statement: The plan should not repeat the appropriate acts, laws, regulations, or policies as desired conditions, standards, and/or guidelines. (152.8)

Response: During the development of the plan, the intent was not to repeat law, regulation, or policy. Those relevant laws, regulations, or policies are listed in appendix D ("Relevant Laws, Regulations, Policies, and Other Sources of Information") of the plan.

Concern Statement: The Forest Service should not conduct site specific NEPA analysis to classify areas (e.g., wilderness, wild and scenic rivers) as part of the plan. (152.10)

Response: The EIS is a programmatic analysis of plan alternatives and does not conduct site specific National Environmental Policy Act (NEPA) analysis. The plan only makes preliminary administrative recommendations (e.g., recommended wilderness). Congress has reserved the authority to make final decisions on wilderness designation and the inclusion of rivers into the National Wild and Scenic Rivers System. When Congress indicates a desire to act further on the recommendations identified in the plan, the Forest Service would initiate the site specific NEPA analysis for these areas following Forest Service Handbook 1909.12, chapters 70 and 80.

The plan contains plan decisions (e.g., desired conditions, standards, guidelines) that will maintain the character of the recommended areas until such time as Congress chooses to act on those recommendations.

Concern Statement: The plan should meet the intent of NFMA to be an integrated document addressing all the various functions that make up a forest and its operation, which includes range, timber, water, minerals, wildlife, and recreation. (132.5)

Response: Although the plan and EIS are organized by individual resources or uses, the development of the plan and EIS used an interdisciplinary process (see "List of Preparers" chapter in the plan and the "Preparers and Contributors" section in chapter 4 of the EIS) considering input from a wide range of stakeholders and resource specialists with the intent of

providing direction for all forest natural resource management activities. Where appropriate, the plan contains crosswalks ("Related Plan Content" sections) to other relevant resource or use sections. The result is a plan and EIS that are better integrated and easier to navigate than the 1987 plan.

Concern Statement: There is a need for a discussion of the funding necessary to implement the alternatives (desired conditions will not happen without adequate funding). (132.3)

Response: The "Socioeconomic Resources" section in chapter 3 of the EIS describes the program costs (expenditures) by alternative. The action alternatives were developed to be realistic and able to be implemented within anticipated future budgets (expected to be similar to current budgets). Chapter 1 of the plan acknowledges that objectives to achieve desired conditions are strongly influenced by recent trends, past experiences, and anticipated staffing levels and short term budgets.

Concern Statement: The Forest Service should not have formulated a preferred alternative. (155.1)

Response: The CEQ National Environmental Policy Act (NEPA) regulations at 40 CFR §1502.14(e) requires the EIS to,

"identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement unless another law prohibits the expression of such a preference."

The preferred alternative, alternative B, was identified in the DEIS in chapter 2, "Alternatives Analyzed in Detail" section.

The preferred alternative was developed iteratively in a collaborative manner to address the needs for change identified in chapter 1. It is designed to address the demand for wildlife habitat, community protection, commodity outputs, and recreation opportunities with an emphasis on ecological restoration.

Concern Statement: There are concerns that only alternative B was mentioned in handouts, flyers, and during February 2013 public meetings - violating CEQ regulations at section 1502.2€. (104.5, 147.2)

Response: Handouts and flyers announcing the release of the proposed plan and DEIS referenced information about all alternatives evaluated in the DEIS. Information, including maps, of all four alternatives was made available at the 2013 public meetings held in Show Low (February 26), Springerville (February 27), and Duncan (February 28).

Concern Statement: Explain how Forest Service personnel could legally provide input during the wildlife public discussion group held in 2007. (133.1)

Response: At the beginning of the revision process (2006 to 2007), two focus groups were assembled by interested publics to focus on the topics of wildlife and livestock grazing. Consistent with Federal Advisory Council Act (FACA), these groups were not managed or controlled by the Forest Service. However, FACA does allow Forest Service representatives to participate in groups to share and exchange information.

Concern Statement: The Forest Service should conduct an effective conflict resolution and conflict reduction process aimed not at managing potential discrepancies but at resolving potential discrepancies between the plan and county objectives, plans, and policies. (161.122)

Response: The Apache-Sitgreaves NFs has encouraged collaborative input on the development of the plan and is committed to working with counties and other parties as the plan is implemented. It is important to obtain collaborative input in the design and accomplishment of projects and activities.

The development of an effective conflict resolution or conflict reduction is beyond the scope of the plan. The decision on the plan is subject to a post-decision administrative review. The county or other parties may file an appeal if there are unresolved conflicts between the final plan and county objectives, plans, and policies.

Appendix C ("Coordination with Other Public Planning Efforts") in the EIS crosswalks the objectives of the plan with county plans and other state, local, and tribal plans. The appendix highlights consistencies, potential discrepancies, and provides recommendations for resolving inconsistencies. The appendix concludes by acknowledging that other landowners and land policies have the potential to impact the Apache-Sitgreaves NFs and vice-versa. The seven county objectives: (1) rangelands resources management, (2) forest products resources management, (3) mineral and energy resources management, (4) motorized travel and recreation management, (5) forested ecosystems restoration and catastrophic wildfire prevention, (6) watersheds restoration, and (7) management areas designation are similar to the topics identified in the need for change (chapter 1 of the EIS) and are addressed throughout the plan.

Plan and EIS - General

Concern Statement: Update the plan and EIS to make them easier to read and understand by: (1) clarifying terminology and using clear and plain language, (2) adding an index of acronyms, (3) reducing the length, (4) correcting inconsistencies, grammar, and punctuation, (5) providing hyperlinks to downloadable information, and (6) reformatting to streamline presentation. (147.1, 152.15, 152.16, 152.7, 99.22, 99.41, 109.2, 108.44, 108.212, 99.43, 104.3, 102.49, 108.9, 102.9, 108.10, 108.153, 108.173, 108.180, 108.2, 108.3)

Response: The plan and EIS have been updated to make them easier to read and understand. In particular, new definitions have been added to the glossary and some text has been rewritten to clarify information, an index of acronyms has been added to both the plan and EIS, and factual and grammatical errors have been corrected. The length of the document was not reduced; it has actually increased with the addition of this appendix. Additional hyperlinks to downloadable information were not added because those links may change over time. The interdisciplinary team discussed other options for reformatting the plan (streamlining the presentation); however, no preferable options were identified.

Concern Statement: Identify the differences between the printed and electronic (.pdf) version of the proposed plan. (108.91)

Response: The printed and electronic (.pdf available on the forests' Web site) versions of the plan are the same. However, when first posted to the Web site in January 2013, the individual

segments (e.g., chapter 1, chapter 2, etc.) of the electronic versions had incorrect page numbers. Once the issue was identified, the page numbers were corrected and the documents were re-posted to the Web site.

Concern Statement: Within the plan, describe how the standards and guidelines addressed under forest or range management practices are used in meeting desired conditions or objectives (e.g., how livestock grazing standards meet a vegetation type's desired conditions). (112.1)

Response: Standards and guidelines provide the sideboards or constraints for designing projects and activities; those projects and activities help maintain or move towards desired conditions.

To reduce redundancy in the plan, every standard and guideline is not necessarily repeated under every resource or uses section where those standards and guidelines contribute to desired conditions or objectives. Standards and guidelines under one section (i.e., the livestock grazing guideline "to minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source") may contribute to desired conditions of a resource located in another section of the plan (i.e., riparian area, water resources). Each resource or use section of the plan contains a "Related Plan Content" section that points the reader to other pertinent areas of the plan.

Concern Statement: Explain how improvements to the land will actually happen on the ground when the plan does not provide a specific date for achieving desired conditions. (122.6, 122.5, 152.5, 152.3, 132.2, 122.13, 152.2)

Response: Desired conditions set forth the social, economic, and ecological attributes of the Apache-Sitgreaves NFs. Specific dates for achievement are not defined, as noted in chapter 1 of the plan, because some desired conditions may only be achievable over a long timeframe (in some cases, several hundred years). The plan does identify objectives to be completed within the planning period. Objectives are concise, time-specific statements of measurable planned results that make progress toward or maintain desired conditions. In addition, biennial evaluations of monitoring information will identify if improvements to the land actually happen on the ground.

Concern Statement: Concern that standards from the 1987 plan have been removed or replaced with unenforceable guidelines. The plan should contain stronger binding standards and guidelines. There is a concern that the plan relies too heavily on desired conditions (aspirations) and that standards and guidelines are discretionary (meaning the Forest Service may disregard them in project design and implementation). (26.52, 26.5, 26.17, 26.54, 26.136, 26.134, 26.12, 23.8, 5.2, 23.3, 23.2, 26.11, 26.63, 26.9, 26.97, 5.19, 9.1, 9.11, 9.2, 94.1, 94.14, 23.1, 127.16, 3.1, 127.20, 26.22, 26.36, 10.1, 101.22, 102.14, 11.2, 112.12, 127.14, 127.26, 127.15, 20.1, 127.11, 127.12, 127.47, 127.8, 14.1, 14.8, 154.1, 156.1, 16.1, 162.10, 162.11, 162.12, 162.13, 162.37, 26.76, 127.23)

Response: Many of the 1987 plan standards and guidelines not carried forward into the plan duplicated law, regulation, or policy; the intent was not to repeat law, regulation, or policy in the plan. Where appropriate, 1987 plan standards and guidelines were retained, reworded, or reframed in the form of desired conditions, objectives, standards, or guidelines.

Desired conditions are not just aspirations. To be consistent with the plan, projects and activities must be designed to maintain, move towards, or be neutral to desired conditions as described in chapter 1 of the plan.

In addition, chapter 1 of the plan explains that standards and guidelines are not discretionary. Standards are constraints upon project and activity decisionmaking. A project or activity must be consistent with all standards applicable to the type of project or activity and its location in the plan area. A project or activity is consistent with a standard in only one way; it is designed in exact accord with the standard. Variance from a standard is not allowed except by plan amendment. A project or activity must be consistent with all guidelines applicable to the type of project or activity and its location in the plan area. A project or activity is consistent with a guideline in either of two ways: (1) it is designed exactly in accord with the guideline; or (2) it varies from the exact words of the guideline, but it is as effective in meeting the purpose of the guideline to contribute to the maintenance or attainment of the relevant desired conditions and objectives. Guidelines must be followed, but they may be modified for a specific project if the intent of the guideline is followed and the deviation is addressed in a decision document with supporting rationale. However, when deviation from a guideline does not meet the original intent, a plan amendment is required.

Finally, in response to this concern, the Forest Service has prepared a “Crosswalk between Apache-Sitgreaves 1987 Forest Plan (as amended) and the Revised Forest Plan,” which has been appended to the Final EIS as appendix I. This appendix, while not an exhaustive account of all plan direction, tracks plan elements relevant to issues that drove the plan revision process, and/or were highlighted in appendix A (Response to Comments).

Concern Statement: The Forest Service should analyze how the proposed plan's standards and guidelines are different from the 1987 plan's and how those differences may affect forest resources (e.g., Mexican spotted owl, northern goshawk, riparian). (26.7, 26.53, 162.28, 26.77, 26.55, 26.50, 26.108, 162.35, 162.27, 127.9, 127.3, 127.27, 127.21, 127.2, 127.13, 127.10, 26.183, 26.172, 162.24, 26.92)

Response: There are no requirements in the provisions of the 1982 Planning Rule to analyze the effects of differences to specific standards and guidelines. The EIS analyzes the effects of the plan decisions collectively, not each individual plan decision. Alternative A represents the 1987 plan including its standards and guidelines and is analyzed in the EIS along with alternative B (the proposed plan), alternative C, and alternative D. Therefore, the effects of changing the 1987 plan (alternative A) to one of the action alternatives (alternatives B, C, D) have been analyzed in the EIS. The effects to forest resources from the four alternatives are presented throughout chapter 3 of the EIS in the “Environmental Consequences” sections.

Concern Statement: Desired conditions should be achievable and based on science. (139.7, 152.6, 152.19, 102.8, 138.2)

Response: Desired conditions, like the rest of the plan, were developed to be realistic and achievable. Desired conditions are based upon the best available science where applicable. Desired conditions also reflect the desires of people, what they want the forests to look like or the goods and services they want provided.

Concern Statement: Desired conditions should meet the need of the public. (147.9, 152.18)

Response: Desired conditions paint a picture of what we (the public and Forest Service) desire the forests to look like or the goods and services we desire them to provide. The Apache-Sitgreaves NFs used a collaborative process to develop the plan's desired conditions in order to reflect the need and desire of the public. The public involvement process, including the development of plan decisions, is outlined in chapter 1 of the EIS.

Concern Statement: If observable on-the-ground conditions differ from plan guidelines or desired conditions, would this be a violation of the plan? (139.5)

Response: Chapter 1 of the plan describes the criteria that must be met for a project or activity to be consistent with the plan. To be consistent with the plan, projects and activities must be designed to maintain, move towards, or be neutral to desired conditions. Projects and activities must also be designed in accord with the exact wording or intent of a guideline.

The outcome of a desired condition or guideline may or may not be achieved immediately with project or activity implementation. The plan's monitoring strategy is designed to evaluate the effectiveness of plan decisions. If there is no on-the-ground movement towards or attainment of desired conditions, the responsible official may choose to amend or revise the plan.

Concern Statement: Concern that areas may not have the potential to meet desired conditions because of site characteristics or changing climate. (138.39, 138.4, 138.41, 138.42)

Response: It is recognized that plan decisions (including desired conditions) may not apply in every site specific location due to variability in site characteristics. The proposed plan was modified in chapter 1 and the introduction of chapters 2 and 3 to make it clear that,

"plan decisions apply to projects or activities where site conditions provide an inherent capability to meet those decisions."

The plan describes ecological desired conditions that are resilient to a changing climate.

Concern Statement: Consider removing the guideline, "constructed features should be maintained to standard or removed when no longer needed" in the "Wildlife and Rare Plants" and "Overall Recreation" sections. Hundreds of features are not maintained to standard and will not be maintained any time soon. (99.3)

Response: The guideline has not been removed, but it has been modified to clarify the intent of the guidance. It now reads,

"Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed."

Concern Statement: Convert the guideline, "constructed features should be maintained to standard or removed when no longer needed" in the "Special Uses" section to a standard. (99.8)

Response: This guideline has been modified to clarify the intent of the guidance (see response above). Guidelines are non-discretionary, but they would allow the project or activity design to deviate from the exact words of the guideline, as long as it is effective in meeting the purpose of the guideline to contribute to the maintenance and attainment of the relevant desired conditions and objectives.

Concern Statement: The DEIS and proposed plan should be revised and a second DEIS released for public comment prior to a final. (127.51)

Response: A second DEIS was not released. The Apache-Sitgreaves NFs followed the public participation requirements outlined in the National Environmental Policy Act, National Forest Management Act, and provisions of the 1982 Planning Rule to develop the proposed plan and DEIS and make them available for review during a 90-day public comment period. Public comments submitted were analyzed by the Forest Service and adjustments were made to the plan and EIS based on this input. The adjustments were not substantial enough to merit publication of a second DEIS.

Alternatives

Concern Statement: Some commenters supported or rejected all or portions of alternative A (1987 plan). (161.85, 104.2, 153.5)

Concern Statement: Some commenters supported or rejected all or portions of alternative B (proposed plan). (161.90, 162.55, 161.9, 161.77, 161.67, 161.51, 161.33, 159.3, 146.2, 128.7, 128.1, 109.3)

Concern Statement: Some commenters supported or rejected all or portions of alternative C. (161.95, 86.1, 87.1, 42.4, 161.79, 161.87, 160.1, 113.2, 91.2)

Concern Statement: Commenters supported or rejected all or portions of alternative D. (162.58, 39.7, 33.9, 33.7, 162.63, 162.160, 162.153, 115.4, 162.127, 162.59, 124.8, 33.2, 140.4, 33.4, 161.28, 161.80)

Response: All four alternatives are described in chapter 2 and analyzed in chapter 3 of the EIS. Rationale for the selection of alternative B and the final plan are described in the record of decision document.

Concern Statement: Alternative A cannot be labeled the "no action" alternative because the map is inconsistent with the 1987 plan (displays wild and scenic rivers and wilderness, does not display all roads). (104.1, 147.4, 147.6)

Response: The map of alternative A (no action alternative) displayed in appendix J (“Maps”) of the EIS does represent the 1987 plan’s management areas. The map in the DEIS was created from the forests’ GIS data which was developed directly from the 1987 plan’s Forest Management Areas Index Map published in August 1987.

The alternative A map displays major roads consistent with other alternative maps in this appendix. The map displays the wilderness areas as identified in the 1987 plan. The map does not display the eligible and suitable wild and scenic rivers. Eligible and suitable wild and scenic rivers occur in all alternatives, although the eligibility of these rivers and the suitability of two rivers were determined after the approval of the 1987 plan. More information can be found in the “Eligibility Report for the National Wild and Scenic River System” (Forest Service, 2009b) and the “Final Environmental Assessment for Blue River and KP Creek Wild and Scenic River Suitability Study” (Forest Service, 2010a) in the plan set of documents and on the forests’ Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning.

Concern Statement: The Forest Service should discuss the successes and failures of the 1987 plan to determine what management actions will succeed in the future. (127.32, 26.127, 26.126, 147.3, 132.1, 127.31, 127.28, 127.19, 127.18, 162.165, 132.4)

Response: See the "Summary of the Analysis of the Management Situation" section in chapter 1 of the plan. The Analysis of the Management Situation includes the "Comprehensive Evaluation Report" (Forest Service, 2008a) that described how the 1987 plan does not provide adequate management guidance for the present and future, and identified where the conditions and trends indicate a need for change from the 1987 plan.

Concern Statement: The Forest Service should not rely on monitoring to drive future actions when monitoring does not always occur. (127.30)

Response: The provisions of the 1982 Planning Rule (section 219.7(f)) require that monitoring and evaluation be conducted. The monitoring strategy reflects the Apache-Sitgreaves NFs' intent which is based on an assumption of recent and relatively stable budgets. Within that context, the forest is committed to integrating monitoring with its management decisions as discussed in chapter 5 of the plan. By focusing on effective monitoring and movement toward desired conditions, the Apache-Sitgreaves NFs will be able to better assess future actions. If funding is significantly decreased, it is expected that both monitoring and implementation would be less than what is planned.

Concern Statement: Alternative C should not be considered because it violates the Roadless Area Conservation Rule by removing protections for inventoried roadless areas. (33.15, 58.1, 55.1, 54.1, 52.1, 51.1, 39.4, 39.2, 39.1, 59.1, 33.16, 67.4, 33.14, 33.10, 31.2, 29.2, 37.1, 76.2, 39.5, 92.4, 85.1, 84.1, 82.5, 82.1, 65.1, 77.1, 63.1, 75.1, 73.1, 71.1, 68.2, 67.5, 162.152, 65.4, 78.1, 115.3, 125.15, 125.14, 162.149, 125.12, 31.1, 125.1, 125.17, 124.1, 125.13, 115.2, 108.15, 107.4, 125.4, 69.11, 91.3, 39.3, 124.7, 126.6, 162.128, 158.1, 125.11, 140.1, 125.18, 126.4, 126.3, 126.2, 125.19, 125.8, 125.7, 125.5, 125.24, 125.22, 125.20, 126.1, 140.2)

Response: Alternative C is still considered a valid alternative in the EIS. The Forest Service included consideration of no IRAs and no IRA management in alternative C in response to public comments that requested full multiple use of IRAs. The National Environmental Policy Act (NEPA) allows for the consideration of alternatives that an agency may not legally implement but which address public concerns (40 CFR 1502.14(c)). While alternative C was properly developed and analyzed in conformance with NEPA requirements, it was not ultimately selected as the revised Apache-Sitgreaves NFs' plan, in part, due to its being in violation of the 2001 Roadless Area Conservation Rule (RACR).

Concern Statement: Explain why the DEIS evaluates an alternative that conflicts directly with the National Roadless Conservation Rule but will not consider in detail other alternatives because those alternatives would not be consistent with the law (e.g., an alternative that would eliminate timber harvesting). (125.9)

Response: Unlike other alternatives that were considered but eliminated from detailed study, the responsible official decided to include consideration of no IRAs and no IRA management as an alternative (alternative C) in the EIS in response to public comments.

During the forest plan revision process, there were two conflicting legal decisions concerning the status of IRAs. The District of Wyoming ruled that the 2001 Roadless Area Conservation Rule

(RACR) was invalid and issued a nationwide injunction precluding its application. However in 2009, the 9th Circuit Court of Appeals affirmed a 2006 Northern District of California ruling that reinstated the 2001 RACR in the 9th Circuit (includes Arizona) and New Mexico. The alternatives considered in the EIS were initially developed during this time of uncertainty. One aspect of alternative C was designed to address public concerns that wanted full multiple use for those lands that had been designated as an IRA.

In October 2011, the 10th Circuit Court of Appeals reversed the District Court of Wyoming's 2008 decision and reinstated the 2001 RACR nationwide. Because there was continued public concern (both for and against the continued management of IRAs), the responsible official decided to continue the analysis of alternative C as originally designed. Under all other alternatives, IRAs would continue to be managed in compliance with RACR. The EIS discloses the environmental consequences of managing IRAs consistent with RACR, as well as the environmental consequences if they were managed differently (see the Inventoried Roadless Areas section in chapter 3).

The National Environmental Policy Act (NEPA) does allow the consideration of alternatives that may not be legal but address public concerns (40 CFR 1502.14(c)). The responsible official did consider other alternatives that may not meet legal mandates but chose not to analyze them in detail. The "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS provides information about those alternatives and the rationale for not analyzing them in detail.

Concern Statement: Explain the specific legal requirements of NFMA and MUSYA that state the forest must have domestic livestock use no matter what the current conditions or pending impacts to the ecosystem. (132.7)

Response: The "Alternatives Considered but Eliminated from Detailed Study" section in chapter 1 of the EIS states,

"A no grazing alternative would not meet the legal direction of the National Forest Management Act or Multiple Use–Sustained Yield Act which direct that forests will be managed using multiple use, sustained yield principles."

The Multiple Use-Sustained-Yield Act (MUSYA) of 1960 (section 1) states that,

"the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

The National Forest Management Act (NFMA) (section 6(e)(1)) states that in revising plans,

"provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple-Use, Sustained-Yield Act of 1960, and in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness…"

The forests are managed for range (livestock grazing) consistent with NFMA and MUSYA. These laws do not require livestock grazing when/where ecological conditions are not appropriate. The plan is designed to manage for ecological desired conditions, as well as social and economic desired conditions (including uses such as livestock grazing, harvest of forest products, and recreation).

<u>Concern Statement:</u> Suggest the selected alternative include: (1) provisions of alternative B - up to 25,000 acres per year treated of grasslands; (2) provisions of alternative C - to increase the number of acres logged annually to accelerate the pace of ecological restoration; increase the amount of forest byproducts resources by prioritizing mechanical thinning treatments over fire as a thinning tool; and increase the maximum allowable sale quantity (ASQ) volume to 268,000 CCF (hundred cubic feet) per year to meet the foreseeable requirements of the existing and currently developing industry in the White Mountains; (3) provisions of alternative C - retain the suitability of 80 percent of the lands of the Apache-Sitgreaves NFs for future consideration of new motorized areas and trails; (4) provisions of alternative C - forested ecosystems restoration and catastrophic wildfire prevention treatment types, scale, pace and prioritization; (5) provisions of alternative C - watersheds restoration objectives; (6) provisions of alternatives B and C - designation of management areas as follows: Community Forest Intermix: approximately 61,000 acres (3 percent); High Use Developed Recreation Area: approximately 17,000 acres (1 percent); Energy Corridor: approximately 2,500 acres (<1 percent); Wild Horse Territory: approximately 19,000 acres (1 percent); Wildlife Quiet Area: approximately 50,000 acres (2 percent); Research Natural Area: approximately 8,000 acres (<1 percent); Primitive Area: approximately 200,000 acres (10 percent); and existing Wilderness: approximately 23,000 (1 percent); (7) removing the proposed Research Natural Areas from suitable rangelands for the specific purpose of quantifying and improving the understanding of the rangelands resources ecosystem processes and how they relate to improved management practices; (8) guidelines for a rangelands resources adaptive management plan that provides clear quantitative, qualitative and effectiveness monitoring requirements, and a more balanced approach between the goal of restoration and the goal of economic production, as the need for restoration in rangelands may not carry the same clear and present benefits as restoration in forestlands; (9) alternatively include a specific plan under conventional management to reach full utilization of the available animal unit months and to result in the full economic impact of approximately 120 jobs and $1.3 million in labor income annually; (10) the necessary analysis, and the resulting authority for the responsible official to simultaneously implement a restoration program designed to support the existing and currently developing industry in the White Mountains, and the contract(s) expected to result from the second analysis of the Four Forest Restoration Initiative, including a maximum allowable sale quantity (ASQ) volume of 450,000 CCF annually; (11) guidance for the upcoming implementation of the national Travel Management Rule and for authorized cross-country travel, in order to simultaneously achieve the required preservation and conservation objectives and allow reasonable motorized access, travel and recreation for dispersed camping, big game retrieval, firewood collection and dispersed shooting as outlined in the above comments and the Navajo County Motorized Travel and Recreation Management Objectives; (12) guidelines to integrate the provisions of the Four Forest Restoration Initiative stakeholders-approved document Old Growth Protection and Large Tree Retention Strategy (OGPLTRS) to allow mechanical treatments to proceed without using 16-inch diameter caps, while retaining the social license necessary for an expeditious, non-conflictual and non-litigious implementation of landscape scale restoration; (13) a comparative analysis of prioritization of the 10 priority watersheds designated under alternatives, B, C and D, if they are different and have higher or lower priority levels as compared to each other; (14) include a revised analysis differentiating more clearly between degrading factors and the effects of degrading factors on watersheds physical and biological characteristics and processes that affect the hydrologic and soil

functions, and between natural processes and management effects; (15) specific information on the potential location of the proposed 405,000 acres of Natural Landscape Areas under alternative B; (16) specific information on the rationale supporting the proposed elimination of the existing 322,000 acres of Inventoried Roadless Areas (IRAs) under alternative C, (17) the requirements for a quantitative, qualitative and effectiveness monitoring strategy, a very specific monitoring implementation plan, and a specific monitoring budget, required resources allocation and funding, to the planning and NEPA review process of all management projects, to be submitted to public review and comments in the draft environmental impact statements (DEIS), to be included in the records of decisions (ROD) and to be included in the final environmental impact statements (FEIS) of all management projects, in order to insure that monitoring will actually be implemented and funded; (18) the responsible officials to be bound by the findings of multi-party monitoring boards and to act upon the findings of a multi-party monitoring boards in a manner that appropriately addresses the issues raised by the multi-party monitoring boards; (19) a fourth phase that outlines clearly the responsibility and authority of responsible officials to implement adaptive and if necessary corrective management action during the implementation of large scale long duration specific projects as a response to the quantitative, qualitative, and effectiveness monitoring of the project, in addition to the three phases of planning (assessment, planning, and monitoring) identified in Title 36, Code of Federal Regulations, part 219 (36 CFR part 219) and designed to support a framework for adaptive management; (20) guidelines to responsible officials to integrate social and economic sustainability and social and economic science into the framework of best available scientific information to inform their land management planning process and their management decisionmaking process; (21) guidelines to responsible officials to implement substantive - even though possibly scientifically imperfect - management actions that move the ecosystems significantly toward the desired future conditions, when such actions are supported by social consensus, rather than spend years attempting to forcibly impose, and possibly trigger litigation of management actions that may be deemed scientifically more perfect but that do not benefit from the support of the social consensus; (22) an emphasis on executing well less than perfect projects now, over developing scientifically perfect projects that are never implemented; (23) an emphasis on allowing the public to participate meaningfully in, influence substantially, and when appropriate alter the content of the decision of responsible officials while they retain their statutory decisionmaking authority; (24) a special forum for local government elected officials such as county supervisors to represent the socioeconomic interests of the local residents in the decisionmaking process of the Forest Service responsible officials, (25) guidelines to reviewing officers to exercise careful judgment in their resolution or rejection of objections, in relation to the true material importance of the objections – as opposed to their symbolic or emotional importance, and the potential effect of litigation on the implementation of the project. (161.19, 161.43, 161.83, 161.82, 161.81, 161.20, 161.150, 161.168, 161.42)

Response: This alternative was considered but eliminated from detail study. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS under the "Alternative Proposed by Counties" header. Several of the counties' recommendations (1, 2, 3, 4, 5, and 6) are analyzed as alternatives B and C in chapter 2 and 3 of the EIS.

Recommendation 7 is consistent with the plan where research natural areas are considered to be not suitable for livestock grazing. The specific purposes or types of research to be conducted have

not been decided. The backgrounds in the “Research Natural Areas” and “Recommended Research Natural Areas” sections in chapter 3 of the plan identify potential opportunities for research. The recommended Lower Campbell Blue and Sandrock RNA specifically mention the possibility of using these research natural areas to study rangeland-related topics.

The plan provides a monitoring strategy in chapter 5 that outlines the general framework for achieving plan monitoring and informing adaptive management. A specific rangelands resources adaptive management plan (recommendation 8) is beyond the scope of the plan and would be developed at the project-level. The plan contains a guideline in the “All PNVTs” section that,

“Project plans should include quantitative and/or qualitative objectives for implementation monitoring and effectiveness monitoring to assist in moving toward or maintaining desired conditions.”

Desired conditions include ecological, social, and economic aspects.

A plan to reach full utilization of available unit months (recommendation 9) is beyond the scope of the plan. Available unit months fluctuate from year-to-year based on site specific resource conditions, weather, and livestock operations. Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of this analysis. Grazing is authorized through term grazing permits (i.e., a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Changes to these authorizations would be made through project-level analyses.

The plan does not authorize or mandate any site specific projects or activities; therefore it cannot authorize the implementation of restoration projects, including the Four Forest Restoration Initiative (4-FRI) (recommendation 10). The plan does set the framework for these restoration projects by describing desired conditions for ecological components that are resilient to disturbance and setting treatment objectives in forested, woodland, grassland, and riparian vegetation.

The plan contains standards and guidelines for limiting motorized travel to designated roads, trails, and areas and sets the framework for implementing the Travel Management Rule (36 CFR §212). However, the responsible official has decided not to address the issues of motorized big game retrieval, dispersed camping, firewood collection, and dispersed shooting in the plan (recommendation 11); they will be addressed during the planning process for the implementation of the Travel Management Rule.

The plan’s interdisciplinary team considered the “Old Growth Protection Large Tree Retention Strategy” (OGPLTRS) (recommendation 12) in its entirety, but recommended that it not be analyzed in detail. See the “Alternatives Considered but Eliminated from Detailed Study” section in chapter 2 of the EIS. Additionally, see the response to comment #26.118 in the “Vegetation” section of this appendix.

The plan does not specify a specific implementation schedule for improving the condition class in priority watersheds. Therefore, there is no need for a comparative analysis in the EIS of prioritization of the 10 priority watersheds (recommendation 13).

The “Watershed” section in chapter 3 of the EIS was updated based on the recommendation to clarify degrading factors on watershed characteristics and processes (recommendation 14). The

locations of the approximate 405,000 acres of Natural Landscape Management Area can be found in appendix F ("Maps") of the plan (recommendation 15).

The rationale (recommendation 16) for considering alternative management for Inventoried Roadless Areas (IRAs) is described in the response for comment # 33.15 in the "Alternatives" section of this appendix.

Responses to recommendations 17 to 25 can be found in the response for comment #161.100 in the "Monitoring" section of this appendix.

Concern Statement: An alternative should focus on managing forests for biological diversity and at-risk species by providing a substantial increase in protection for plant and animal species to address scientific uncertainty and controversy regarding climate change impacts. Err on the side of ecological caution (a "no-regrets strategy") by managing the national forests as a safe harbor and refuge for fish and wildlife, even at the expense of competing multiple use activities. (26.96, 162.45, 3.16, 9.12, 9.10, 5.11, 33.11, 3.5, 162.164, 26.94, 26.93, 26.132, 26.128, 162.9, 23.11, 26.95)

Response: This alternative was considered but eliminated from detail study. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS under the "Alternative that Emphasizes Biodiversity" header. The alternative was not considered in detail because, by focusing solely on biodiversity (i.e., biological diversity) over other uses, it would not meet the legal direction of the National Forest Management Act or Multiple Use–Sustained Yield Act which direct that forests will be managed using multiple use, sustained yield principles. Also, in light of changes predicted by current climate models (e.g., increased wildfires, greater vulnerability to invasive species, changes in timing of precipitation), there is a need to reduce vulnerability by maintaining and restoring resilient native ecosystems which would be an outcome in alternatives B, D, C, and A (in order from greatest resilience to least). Management practices that sustain healthy plant and animal communities (e.g., thinning for age class diversity and structure, reclaiming and restoring native grasslands) promote resilience and reduce opportunities for disturbance and damage.

As identified in chapter 1 of the plan, one of the primary focus areas, or revision topics, for the plan is "Maintenance and Improvement of Ecosystem Health." The plan provides specific direction (see the "Overall Ecosystem Health," "Aquatic Habitat and Species," "All PNVTs," and "Wildlife and Rare Plants" sections) to provide for biodiversity and protect endangered species, other animals, and habitat. The plan provides for the viability of all terrestrial and aquatic species. Climate change is addressed throughout the plan; indirectly through desired conditions in the form of functional ecosystems and resilient landscapes, and directly in management approaches and the monitoring strategy, where appropriate. Appendix A ("Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning") in the plan provides a comprehensive discussion of climate change trends and Apache-Sitgreaves land management planning.

Concern Statement: One alternative should maximize long term vegetative health through a conservative strategy toward grazing that minimizes the damage of livestock grazing and maximizes the retention of water and forage for wildlife. (127.46)

Response: This alternative was considered but eliminated from detail study. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS under the "Alternative with Different Livestock Grazing Management" header.

The plan's primary desired condition for livestock grazing is to "balance livestock grazing with available forage" on suitable grazing lands. Stocking decisions (amount of livestock grazing authorized) are authorized through term grazing permits (a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Changes to these authorizations would be made through project-level analyses.

The plan provides direction for healthy and resilient vegetation, riparian, and water resources conditions in the short and long term. Therefore, the plan provides the framework for livestock stocking decisions that would provide for the health of vegetation and retention of water and forage for wildlife because those decisions must be consistent with applicable plan direction.

Concern Statement: A stand-alone alternative should: (1) implement existing standards and guidelines, (2) forbid new road construction in protected activity centers (PACs), (3) incorporate fuel treatment concepts to minimize risk of stand-replacing fire in PACs including large tree retention, management of surface fuels and sub-canopy forest structure, and spatial orientation of treatments, and (4) apply fuel treatment modeling in Mexican spotted owl habitat conducted by Northern Arizona University Forest Ecosystem Restoration Analysis. (26.58, 26.177)

Response: This alternative was considered but eliminated from detail study. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS under the "Alternative to Compare Viability for the Mexican Spotted Owl" header.

The implementation of 1987 plan standards and guidelines is considered in the analysis of alternative A in the EIS. The plan provides direction that projects and activities would be managed consistent with the Mexican spotted owl recovery plan, including constraints on road construction and fuel treatments.

Methodologies for fuel treatment modeling would be determined by the responsible official on a site specific basis. The Northern Arizona University Forest Ecosystem Restoration Analysis may be used if determined applicable.

Concern Statement: There should be an alternative that maximizes timber sales, volumes offered for sale, the use of mechanical equipment, prescribed fire, and natural fires to accomplish the needed work. The acreage of planned fire, prescribed and natural fire use, needs to be expanded dramatically. Accomplishments averaging 100,000+ acres per year are achievable. (98.19, 98.21)

Response: This alternative was considered but eliminated from detail study. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS under the "Alternative with Maximum Treatments (Mechanical and Wildland Fire)" header.

The action alternatives were developed to be realistic and able to be implemented within anticipated future budgets (expected to be similar to current budgets). Alternative C represents the maximum mechanical treatments, and alternative D represents the maximum burning treatments the forests anticipate being able to accomplish within the planning period. An alternative that would maximize both treatment types was not considered to be feasible based on anticipated future budgets.

EIS - General

<u>Concern Statement:</u> The TES (terrestrial ecosystem survey) data should be based on current soil conditions. There is concern that the TES may not be achievable because it is based on soil conditions inventoried in the 1980s. (131.12, 138.35, 30.1, 139.1, 138.10, 108.189, 108.36, 131.3)

<u>Response</u>: The "Soil" section of the plan in chapter 2 has been updated to describe the TES, including how it was developed. In addition, the management approaches section emphasizes the forests' commitment to update the TES to reflect current conditions and concepts.

The TES process fully integrates climate and climate variability into the sampling and interpretations of the description for potential plant community composition (potential natural vegetation type or PNVT); therefore conditions at the time of initial inventory in the 1980 did not skew the information. A 30-year National Oceanic and Atmospheric Administration record from a representative climate station/life zone is used to plot the ecological amplitude of the key species along an elevational gradient and employs both direct and indirect analysis to objectively assign the appropriate vegetation species within their inherent range; this is reported in the TES plant community descriptions. There are papers written (Keane, 2013; Fulé at al., 2013) that state historic reference conditions are still a valid baseline to understand the past and evolutionary history of current ecosystems presently experiencing some form of climate change. Furthermore, the first and only publication (Brusca et.al, 2013) that has documented the effects of climate change on species distribution was recently published. TES uses the same modeling techniques Whitaker (Whittaker and Niering, 1964) used and therefore allowing legacy climate, soil, and vegetation data from TES to be adaptable for any climate change scenario.

Assuming the commenter is asking whether the historic range of variation (HRV) is attainable during the life of the plan, the simple answer is no. The "Vegetation" section in chapter 3 of the EIS and the "Vegetation Specialist Report" (Forest Service, 2014g) describe in detail for each PNVT, based on modeling of plan objectives, where the vegetation condition may be at the end of the planning period. Based on modeling, the plan objectives in all cases move vegetation condition towards HRV.

<u>Concern Statement:</u> The affected environment should reflect conditions following the Wallow Fire. (122.8)

<u>Response</u>: The EIS does reflect conditions following the Wallow Fire. As stated in chapter 3,

"unless noted, the effects of the 2011 Wallow Fire are incorporated into the affected environment descriptions."

For example, soil condition and watershed conditions were estimated based on predicted effects of the Wallow Fire. An estimated 28 percent of the soils within the Wallow Fire area moved from satisfactory condition to impaired or unsatisfactory as a result of the fire. A new table and maps are found in the EIS "Watershed" section reflecting post-Wallow Fire changes to watershed condition. Recovery rates for both are highly variable and depend on many factors, including soil burn severity, soil type, rainfall patterns, aspect, slope and type of burned area emergency treatments to name a few. Other resource areas discussed effects of Wallow throughout the document.

<u>Concern Statement:</u> The DEIS should disclose the effects on the human environment, including impacts to social and economic values, goods, and services. (108.6, 108.8, 138.5)

<u>Response</u>: The EIS does disclose the effects on the human environment throughout chapter 3. In particular see the "Socioeconomic Resources" section for impacts to expenditures, revenues, social consequences, recreation, minerals, grazing, and wood products by alternative.

National Environmental Policy Act (NEPA) provides the direction for disclosing the effects on the human environment,

"Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Sec. 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment." (40 CFR §1508.14)

<u>Concern Statement:</u> Remove language from the DEIS that provides an impression that the plan will have no direct effects. (108.79)

<u>Response</u>: See chapter 3 of the EIS. Because the plan does not authorize or mandate any site specific projects or activities (including ground-disturbing actions), there can be no direct effects. However, there may be implications or longer term environmental consequences of managing the forests under the programmatic framework of the land management plan. The plan sets the stage for what future management actions are needed to achieve desired outcomes (e.g., desired conditions, objectives, special areas) and provides the sideboards (e.g., suitability, standards, guidelines) under which future activities may occur in order to manage risks to ecological, social, and economic environments.

To actually implement site specific projects, project and activity-level planning, environmental analysis, and decisions must occur. For example, the plan may contain direction to close or rehabilitate roads in order to benefit riparian areas; however, a subsequent site specific analysis (including disclosure of potential effects) and decision must be made for proposals that involve road closures or decommissioning.

<u>Concern Statement:</u> Natural water sources, aspen regeneration, and grazing must be addressed thoroughly in the EIS. (127.34)

<u>Response</u>: These topics are addressed in chapter 3 of the EIS. Natural water sources (e.g., springs, rivers, streams, groundwater) are addressed in the "Water Resources" and "Riparian" sections. Aspen regeneration is addressed under the "Vegetation" and "Forest Health" sections. Livestock grazing is addressed in several sections including "Soil," "Watershed," "Water Resources," "Riparian," "Fisheries," "Wildlife and Rare Plants," and "Livestock Grazing."

<u>Concern Statement:</u> The plan and DEIS should use criteria (indicators) that can be measured so the public can understand and relate to what is taking place on the national forest. (108.11, 108.196, 108.197)

Response: Where appropriate, the plan uses science-based criteria that can be measured in the description of desired conditions, standards, and guidelines. For example, in the desired conditions for the "Forests: Ponderosa Pine" section:

"Coarse woody debris, including logs, ranges from 3 to 10 tons per acre. Logs average 3 per acre within the forested area of the landscape."

Additional criteria for project or activity design are determined by public involvement, science, and professional experience at the project or activity-level.

The EIS uses indicators (quantitative or qualitative measures) to describe differences between alternatives. Table 3 displays a comparison of indicators by alternative. These indicators are based on the need for change and issues for the four alternatives.

Concern Statement: Explain the implications if the assumptions in the DEIS are wrong. (122.11)

Response: If assumptions in the DEIS are incorrect, then the potential environmental consequences of alternatives may be incorrect. The results of monitoring and evaluation (see chapter 5 of the plan) should identify how well the land management plan is working and whether the purpose and direction are appropriate. If new information is acquired and change in plan direction is needed, the plan can be amended or revised.

Concern Statement: The Forest Service must address and disclose threats to the forests from climate change. (162.4, 26.90, 50.1, 162.8, 26.157)

Response: Appendix A ("Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning") of the plan identifies the potential climate change trends and impacts to management of the Apache-Sitgreaves NFs. In addition, the possible environmental consequences associated with climate change on applicable resources are discussed in chapter 3 of the EIS (see the "Climate Change" header under "Environmental Consequences" sections).

Concern Statement: The Forest Service should disclose the degree to which effects of a revised Forest Plan on the environment "are likely to be highly controversial" 40 CFR § 1508.27(b)(4). (26.171)

Response: The National Environmental Policy Act (NEPA) regulation found at 40 CFR §1508.27(b)(4) "the degree to which the effects on the quality of the human environment are likely to be highly controversial" is not a requirement but one of the considerations in evaluating intensity. Intensity, along with context, is a consideration in defining significantly. If an agency's action may be environmentally significant according to these criteria, the agency must prepare an EIS. The EIS addresses those controversial issues raised by the public (see the "Issues that Served as the Basis for Alternative Development" section in chapter 1 of the EIS).

Coordination

Concern Statement: Explain how the Forest Service complied with requirements for public participation, tribal, and intergovernmental coordination and review (36 CFR 219.4 (b)(2), 36 CFR 219.6(k), 36 CFR 219.7,40 CFR 1502.16(c), 40 CFR 1506.2). (108.58, 108.51, 161.5,

161.6, 161.4, 161.2, 161.121, 161.120, 108.56, 108.53, 108.52, 108.49, 108.20, 108.18, 108.16, 108.17)

Response: The EIS at chapter 4 ("Consultation and Coordination") and appendix C ("Coordination with Other Public Planning Efforts") describe how the Forest Service met requirements for public participation and tribal and intergovernmental coordination.

Concern Statement: Apache County requests documentation of the Forest Service's rejection of the county's cooperating agency request. (108.55)

Response: In a letter dated August 16, 2013, the Forest Service provided Apache County the cooperating agency agreement the forests had with the County for the purpose of revising the land management plan. The agreement was initiated in August 2004; it expired in 2009 and was not renewed. In the 2013 letter, the Forest Supervisor made a determination not to reinitiate cooperating agency status with the County. The letter is available in the plan set of documents.

Concern Statement: Navajo, Gila, Graham, and Greenlee Counties and Eastern Arizona Counties Organization request cooperating agency status. (161.3)

Response: In separate letters dated August 16, 2013, the Forest Service denied Navajo, Gila, Graham, and Greenlee Counties and Eastern Arizona Counties Organizations request for cooperating agency status. It was not considered timely for the Apache-Sitgreaves NFs to grant cooperating agency status because the forests are in the final stages of the plan revision process. These letters are available in the plan set of documents.

Requests for cooperating agency status are normally considered at the beginning of the environmental analysis process. To qualify as a cooperating agency, an agency must be able to demonstrate jurisdiction by law or ability to contribute special expertise.

Air

Concern Statement: The following rules apply to reducing dust from open areas, dry washes or riverbeds, roadways and streets: Arizona Administrative Code R18-2-604 and R18-2-605 Arizona Administrative Code R18-2-804. (4.2)

Response: These references are now included in appendix D ("Relevant Laws, Regulations, and Policies") in the plan.

Concern Statement: Portions of the Apache-Sitgreaves NFs are located in a sulfur dioxide (SO2) maintenance plan area. (4.3)

Response: This oversight was remedied by additions to the background portion of the "Air" section in plan and the "Air" section in chapter 3 of the EIS. These sections have been updated to recognize the sulfur dioxide (SO_2) maintenance plan area near Morenci.

Concern Statement: The Air background statement "smoke and visibility impairment from wildland fire that closely mimics what would occur naturally is generally acceptable." should be modified because it implies that "natural" is good and "man caused" is bad. Smoke is smoke. (102.53)

Response: This statement was removed from the plan.

Concern Statement: Analyze and describe the potential for further reductions in air emissions by lessening or eliminating pile burning of residual fuels in favor of biomass energy production. (159.8)

Response: The plan does not prescribe a specific method (e.g., pile burning, biomass utilization) for treating slash (residual fuels). The plan does not set limits on pile burning, although, a range of mechanical treatments are provided, of which, pile burning is considered an option for treating residual fuel. While the plan does not prescribe specific methods (or tools) to be used, those specific methods would be identified by the interdisciplinary team during project or activity-level analysis. The team would identify appropriate methods that are consistent with the programmatic guidance in the plan.

Biomass energy production is one way the forest is currently reducing residual fuels. The forests also employ air quality models that display differences in emissions based on fuel treatment methods at the project-level, with results reported as environmental effects of alternatives.

Soil

Concern Statement: Explain the basis for existing and historic soil conditions and why returning to historic vegetation conditions would reduce the amount of impaired soils. (108.109)

Response: Existing soil conditions described in the plan and EIS were derived from the Terrestrial Ecosystem Survey (TES) for the Apache-Sitgreaves NFs. The survey provides information using mapping unit averages, modal sites, and representative sites to characterize existing conditions. Reference (historic) soil conditions were estimated using Southwestern Region guidance documents, which are based on best available science as well as climate data collected within Arizona and New Mexico.

The plan's vegetation desired conditions are based on reference conditions. The desired conditions provide ground cover (herbaceous vegetation and litter) distributed across the soil surface. Once a desired ground cover is reached (as documented within each TES unit) the soils can be considered to be in satisfactory condition.

Currently, not all potential natural vegetation types (PNVTs) have large percentages of unsatisfactory soil conditions. Within the fire-adapted ecosystems, vegetative treatments including fire prescriptions that reduce canopy cover that move towards desired conditions allow fire to burn under low or mixed severity maintenance intensities and reduce competition for light and water for establishment and retention of grasses and forbs. Impaired or unsatisfactory soil conditions caused by the lack of effective ground cover are most prevalent in the Madrean pine-oak woodland, Great Basin grassland, and semi-desert grasslands PNVTs. As overstory canopies are reduced to desired condition levels, it is expected that grasses and forbs will replace bare soil.

Concern Statement: Plan direction for soils is in conflict with the idea that fire will create healthy ecosystems and watersheds by consuming accumulations of coarse woody debris. Periodic fires burning across the landscape will limit the growth of vegetation and will make the accumulation of litter difficult to achieve. Remove conflicting direction. "Soils are stable within their natural capability. Vegetation and litter limit accelerated erosion (e.g., rills, gullies, root exposure, topsoil loss) and contribute to soil deposition and development"

(proposed plan p. 20), "Soils provide for diverse native plant species. Vegetative ground cover is well distributed across the soil surface to promote nutrient cycling and water infiltration." (proposed plan p. 20), "Biological soil crusts (e.g., mosses, lichens, algae, liverworts) are present and reestablished if potential exists." (proposed plan p. 20), "Coarse woody debris retention and/or creation should be used as needed to help retain long term soil productivity" (proposed plan p. 21). (108.203, 108.181)

Response: The plan has been developed in an interdisciplinary process to minimize conflicting direction. The plan provides desired conditions for coarse woody debris within each PNVT in chapter 2. It specifically outlines the acceptable range of coarse woody debris in tons per acre within the forested and woodland PNVTs.

Prescribed fires and managed wildfires used to meet desired conditions (see “Wildland Fire Management” section of the plan) would be mitigated for the protection of soil and vegetation at the project-level. Mitigations, including limiting overall fire intensity, varying ignition sequences and patterns, and avoiding lighting heavy fuels are commonly prescribed to protect coarse woody debris. Effects to biological soil crusts and desirable plants would be mitigated through timing burning when soil and vegetation has sufficient moisture to limit mortality.

The guideline “Soils are stable within their natural capability” was further clarified by adding the footnote,

“Satisfactory soil condition exists when indicators signify that soil function is being sustained and soil is functioning properly and normally. The ability of soil to maintain resource values and sustain outputs is high.”

Concern Statement: Evaluate the effects of the Wallow Fire on soil conditions and provide a new and accurate accounting of soil ratings for the forest. Use the new information to analyze environmental consequences and determine watershed management direction. (108.202)

Response: Based upon this and other comments, the current soil and watershed conditions in the plan and EIS have been updated to reflect post-Wallow Fire conditions as estimated immediately after the fire. Recovery rates are highly variable as noted in the revised section. See the “Soil” and “Watershed” sections in chapter 3 of the EIS.

Concern Statement: Reference the importance of litter (organic materials on the soil surface) in all forest NEPA project documents. Include the following two references: (1) FSH 2409.18.2.05 and (2) Managing for Mulch, Molinar, Galt & Holechek; August 2001, Rangelands 23(4) page 6 recommendations for minimum residual herbage. Cite these references in the plan and EIS. (132.31, 132.40)

Response: Desired litter levels vary widely across the Apache-Sitgreaves NFs depending on soil type, microclimate, vegetation type, etc. As a result, litter was addressed directly through desired conditions. The Apache-Sitgreaves NFs uses these factors along with the TES to determine appropriate litter levels for project planning and decisionmaking. Forest Service Handbook 2509.18 was removed in lieu of new handbook direction that is in progress. The Southwestern Region has issued technical guidance (Forest Service, 2013b) to use until the new direction is in place which has been added to “Other Sources of Information” for soils section in Appendix D.

Although the Molinar et al. paper was not referenced within the soils or vegetation specialist's reports, other references to litter were cited, such as Holechek et al. (1998).

Project-level National Environmental Policy Act (NEPA) analyses are beyond the scope of the plan and plan revision process.

Concern Statement: Explain the soil desired condition "vegetative ground cover is well distributed across the soil surface to promote nutrient cycling and water infiltration" (proposed plan p. 20). Well distributed, in comparison to what? (138.9)

Response: The plan desired condition has been clarified to read,

"Vegetative ground cover (herbaceous vegetation and litter) is distributed evenly across the soil surface to promote nutrient cycling, water infiltration, and maintain natural fire regimes."

The term "well distributed" comes from Technical Guidance for Soil Quality Monitoring in the Southwestern Region, (Forest Service, 2013b). It refers to having ground cover evenly distributed across the soil surface, as opposed to no litter or litter only associated with prominent plants. An example commonly found in the Great Basin grasslands is in areas where the juniper and/or piñon overstory is closed (greater than 40 percent canopy). Litter accumulates under tree canopy, with very little between tree canopies. This can lead to accelerated soil loss in these tree interspaces.

Concern Statement: The effect of organic matter loss on site productivity is not well understood; therefore the Forest Service should study this matter of scientific uncertainty and disclose its significance relative to the environmental impact of plan revision. (26.107)

Response: Organic matter is discussed in the context of its relationship to soil condition (EIS pp. 59-61). There are numerous studies that compare organic matter levels to soil productivity. A recent study conducted in Arizona showed the difference in herbage productivity under a forest canopy compared to openings between canopies tied directly to levels of organic matter (Abella et al., 2013). It is commonly known that the majority of organic matter in the soil profile occurs in the topsoil or upper most layer or topsoil except in soils with lithologic discontinuities and in landforms such as recent alluvial plains. Loss of topsoil at a rate higher than the rate of formation is considered loss of soil productivity. This is the basic concept used in the application of the soil loss tolerance factor by the Natural Resource Conservation Service found in the National Soil Survey Handbook, § 618-66 (USDA NRCS, 2014). Soils with current soil loss rates above tolerance are characterized as in unsatisfactory soil condition.

Concern Statement: Verify that prescribed fires would not result in high severity burns as described in the effects to soils and vegetation (DEIS p. 77). (112.31)

Response: The potential effects of prescribed fires, including high soil burn severity, are addressed within chapter 3 of the EIS (see the "Soil," "Forest Health," and "Forest Products" sections). Specific effects to soil and vegetation resources would also be analyzed at the project-level. See also the response to comment # 98.3 in the "Wildland Fire Management" section of this appendix.

Concern Statement: There should be standards for litter, bare soil, and erosion rates. (132.42, 132.41)

Response: Desired litter levels, herbaceous cover, and estimated erosion rates vary widely across the Apache-Sitgreaves NFs depending on soil type, microclimate, vegetation type, etc. As a result, litter and herbaceous cover were addressed directly through desired conditions rather than as a standard (see the "Soil," "All PNVTs," "Riparian Areas," "Woodlands: Piñon-Juniper," and "Grasslands" sections of the plan). The Apache-Sitgreaves NFs uses these factors along with the terrestrial ecosystem survey (TES) to determine appropriate ground cover levels for project-level planning and decisionmaking.

Watershed

Concern Statement: Evaluate the effects of the Wallow Fire on watershed conditions and provide a new and accurate accounting of watershed classifications for the forest. Use the new information to analyze environmental consequences and determine watershed management direction. (108.227, 162.57, 108.204, 108.23)

Response: The Forest Service has updated the EIS to account for post-Wallow Fire watershed conditions. This can be found in table 12 and figures 7 and 8 in chapter 3 of the EIS under the "Watershed" section. There are desired conditions, standards, and guidelines within the "Landscape Scale Disturbance Events" section of the plan that provide watershed management direction as it relates to the protection of soil and water resources following a large scale disturbance such as fire.

Concern Statement: Within the watershed affected environment section, suggest adding "and the production of water for downstream consumption" to the end of "Watershed condition is the state of the physical and biological characteristics and processes within a watershed that affect the hydrologic and soil functions that support aquatic ecosystems." (DEIS p. 63). (161.84)

Response: The recommended language was not added to the EIS. The definition used for watershed condition is from the document "Watershed Condition Framework – A Framework for Assessing and Tracking Changes to Watershed Conditions" (Forest Service, 2011b). The production of water for downstream consumption is inferred in the definition.

Concern Statement: There is a need to make a distinction between degrading factors and the effects of degrading factors in the watershed section of the DEIS (DEIS p. 65). (161.155, 161.88)

Response: This section of the EIS was corrected and rewritten for clarity based on this comment.

Concern Statement: Sedimentation from natural geological features, such as Gila Conglomerate, is a natural process. This should indicate that removal of OHV use on the San Francisco River will have minimal to no effect on suspended sediment in the river system. (42.1, 42.5)

Response: The effects of motorized vehicle use (e.g., off-highway vehicle or OHV), including increases in sedimentation to streams and waterbodies, are discussed in chapter 3 of the EIS in the "Soil," "Watershed," "Water Resources," "Riparian," and "Fisheries" sections.

The natural sediment load is high in the San Francisco and Blue watersheds as a whole (Inman, 2000). However, critical habitat and habitat conditions for aquatic species in areas within the Blue

River watersheds are not always affected by natural input from Gila Conglomerate. Management actions and other activities that generate and deliver sediment to streams can locally reduce spawning habitat and food production such as sediment produced from poorly located, poorly maintained or overly dense system roads and trails and unauthorized routes.

Concern Statement: There is concern that a watershed has to be "natural pristine" and "show little to no influence from human actions" to be considered properly functioning according to the Watershed Condition Classification Technical Guide. Instead use monitoring of ground cover, soil loss, sediment loads entering key drainages and downstream water quality as indicators of functioning watersheds. (108.78)

Response: As discussed in the "Overall Ecosystem Health" section of the plan, the "Watershed Condition Framework – A Framework for Assessing and Tracking Changes to Watershed Conditions" (Forest Service, 2011b) is the national guidance the Apache-Sitgreaves NFs will use to determine watershed condition. The watersheds were described in discrete categories as to how they compared to healthy watersheds that show little or no influence from human actions. However, there are 12 indicators and 24 attributes that provide the basis for the watershed condition rating. It is possible that a few attributes potentially could be rated as "at risk" or "impaired" and the watershed could still mathematically attain an overall rating of good (properly functioning).

The Apache-Sitgreaves NFs is bound by State and National water quality standards, such as those found in ARS § 18 State Water Quality Standards (see the desired conditions for the "Water Resources" section of the plan). The State monitors streams across Arizona on a schedule. If monitoring demonstrates an impaired condition, a stream could be placed on the impaired stream list (303d) resulting in a total maximum daily load analysis and possible mitigation measures required within a watershed.

The "Monitoring Strategy" in the plan (chapter 5) contains the question "How well are management activities contributing to desired conditions or maintaining watersheds in a healthy state and meeting Arizona water quality standards?" Site-specific monitoring of other items such as ground cover, soil loss, and sediment may be required at the project-level but would be inappropriate at the forest level due to cost and variable conditions across the forest. Implementation and monitoring of best management practices (BMPs) is an effective surrogate for instream monitoring (Forest Service, 2013b). The plan directs that project-specific soil and water conservation practices and BMPs are developed (see the guidelines for the "Water Resources" section); these would be monitored on all ground-disturbing projects.

Concern Statement: The DEIS should present the assessments of watershed degradation that was done through the Wallow Fire BAER (Burned Area Emergency Response) planning. Coordinate the recovery of degraded watersheds with the production and sale of forest products and use timber sale receipts to provide for watershed management programs, and employ local workforce when possible. (108.200)

Response: Watershed and soil conditions were updated and included in the EIS "Soil" and "Watershed" sections for post-Wallow fire conditions. Information gathered during the Wallow Fire BAER effort was used to help determine post-Wallow fire conditions. Following the Wallow fire, approximately 28 percent of soils in satisfactory soil condition class were moved to impaired and unsatisfactory classes. Watershed condition moved from about 68 percent impaired and

unsatisfactory to 80 percent. Recovery rates are variable based on factors such as amount of high soil burn severity, post burn treatment type, inherent soil properties, and others.

The plan provides direction to restore priority watersheds that have degrading factors. The plan calls for the use of mechanical, fire and other treatments to help restore conditions. The specific method (e.g. stewardship contract, timber sale contract) for accomplishing restoration is not directed by the plan. Contract awards (including those to local contractors) are beyond the scope of the plan. In addition, the use of timber sale receipts is beyond the scope of the plan. The further sale of forest products is not precluded from the Wallow Fire area.

Receipts generated from the sale of forest products are very low, and no funding has been made directly available for watershed improvement activities such as stream channel or riparian improvement for many years. However, thinning the forest has benefitted watershed conditions by improving the fire regime condition class and reducing fuel loads, which reduces risk of high intensity fire and provides for more herbaceous understory components through reduction of light and moisture competition.

Multiple salvage sales began immediately the fire, which cleared rights-of-way. Some revenue was generated, however no direct watershed receipts were provided. There is, however, benefit to watersheds from reduced fuel load. Seeding disturbed areas caused by salvage offset soil disturbance. A large (15,000 acre) salvage sale was approved and work began last year, however, the value of the wood diminished quickly, making it somewhat uneconomical to harvest now and little revenue is expected from this activity. Soil and water BMPs along with monitoring have occurred on this sale to mitigate disturbance. As stated in the “Management Approaches for Landscape Scale Disturbance Events” section of the plan, salvage of dead trees may be considered where this contributes to the movement toward desired conditions, including satisfactory soil condition.

Concern Statement: Explain the plans for implementation and the impacts of implementation related to the objective "During the planning period, improve the condition class on at least 10 priority 6th level HUC watersheds by removing or mitigating degrading factors" (proposed plan p. 17). (108.244, 161.156, 146.3, 138.8)

Response: The plan does not specify a specific implementation schedule for improving the condition class in priority watersheds. However, the forests have already started the process to identify priority watersheds. For each priority watershed, a watershed restoration action plan will be developed, which contains a comprehensive list of critical projects that address removing or mitigating degrading factors. Projects will have site specific National Environmental Policy Act (NEPA) completed prior to implementation. When projects are completed and monitored, the watershed condition rating should move to or remain in satisfactory condition (Forest Service, 2011b).

Concern Statement: The number of restored watersheds should be increased in all of the action alternatives. The watershed treatment prioritization effort should be given a higher priority and larger resources. (161.157, 162.167)

Response: The plan objective of improving 10 priority watersheds within the planning period is a minimum level based on the estimated workforce capacity and anticipated funding. Most of the watersheds on the forest are at risk, with a few impaired. If additional funding and personnel opportunities arise, more watersheds could be added.

Concern Statement: Inform the public of the level of management and the expected outcomes are for watershed management in the next 10 to 15 years. (108.241, 108.242)

Response: As stated in the plan objectives for the "Overall Ecosystem Health" section, the forests would improve the condition class of at least 10 priority 6th code watersheds during the planning period. This entails the development and implementation of watershed restoration action plans for each, with critical projects identified to remove or mitigate degrading factors. When these projects are completed, watersheds would be considered improved. Examples of projects include thinning of closed canopy forests in those vegetation types where open canopies are the desired condition to allow for improved ground cover conditions or direct stream channel improvement through improved cover and stability conditions.

Water Resources

Concern Statement: Remove the statement "pumping from the Little Colorado and Morenci groundwater aquifers associated with the forests is greater than the estimate recharge, resulting in reduced water availability and affecting some streamflows" and the photo of Eagle Creek (proposed plan p. 22). If this increased demand can be documented, such documentation should be referenced. (150.3, 150.4, 151.6)

Response: The reference to Morenci aquifer was removed from this statement. A picture of the Blue River was substituted for Eagle Creek in this section. The original statement was estimated from the Morenci Basin Water Atlas, and should have stated "potential pumping from…" as the potential capacity of the wells was compared to the estimated recharge. The reference to Morenci aquifer was removed as there were too few actual groundwater pumping studies published to verify the claim that pumping was greater than estimated recharge.

Concern Statement: Clarify the desired condition "Soil erosion above the floodplain minimally contributes to the impairment of stream function or water quality." (108.111)

Response: This desired condition does not exist in the proposed plan. The desired condition did appear in the 2009 "Working Draft Land Management Plan," and based on public and employee feedback, it appears in the "Water Resources" section of the proposed plan as,

"Vegetation and soil conditions above the floodplain contribute to downstream water quality, quantity, and aquatic habitat."

Concern Statement: Clarify that 4th, 5th, and 6th level hydrologic unit codes (HUCS) are equivalent to 8 (sub basin), 10 (watershed), or 12 (sub watershed) digit HUC codes, respectively. Explain the rationale for separating different desired conditions in the 4th, 5th, and 6th level HUCs. The plan should identify water-resource objectives to make progress toward or maintain desired conditions. (112.3, 112.4)

Response: The description of watershed hierarchy was clarified in the plan and EIS.

Concern Statement: Explain the Water Resources desired condition "Flooding does not disrupt normal stream characteristics (e.g., water transport, sediment, woody material) or alter stream dimensions (e.g., bankfull width, depth, slope, sinuosity)" (proposed plan p. 23). Concern that flooding will occur and will 'disrupt' stream hydrology. Recommend stating "Stream condition is sufficient to withstand large floods of high magnitude without

flooding causing disruption of normal stream characteristics (e.g., water transport, sediment, woody material) or altering stream dimensions (e.g., bankfull width, depth, slope, sinuosity).” (108.112, 112.5, 138.37)

Response: The desired condition has been rewritten to clarify the statement within the plan,

“Stream condition is sufficient to withstand floods without disrupting normal stream characteristics(e.g., water transport, sediment, woody material) or uncharacteristically altering stream dimensions (e.g., bankfull width, depth, slope, sinuosity).”

Concern Statement: Explain the maintenance procedures and impacts of implementing the Water Resources desired condition "Water resources maintain the capability to respond and adjust to disturbances without long term adverse changes" (proposed plan p.22). (138.36)

Response: Maintenance and improvement of water resources is dependent on the proper functioning of riparian and stream systems. Improving riparian condition to proper functioning condition (PFC) is desired and would provide resilience with regard to disturbance. PFC riparian areas dissipate stream energy from high flows, filter sediment, capture bedload, aid in floodplain development, develop root masses that stabilize stream banks, and improve floodwater retention and groundwater recharge. The environmental consequences to water are further described in the “Water Resources” section in chapter 3 of the EIS.

Concern Statement: Clarify the Water Resources desired condition "Vegetation and soil conditions above the floodplain contribute to downstream water quality, quantity, and aquatic habitat" (proposed plan p. 23). Does it mean that desired vegetation and soil conditions contribute to desired water quality, quantity, and aquatic habitat? (102.54)

Response: Desired vegetation and soil conditions would provide for desired water resources, such as preventing and capturing sediment and moderating water flows during heavy precipitation events. The desired condition has been modified to help clarify the meaning,

“Vegetation and soil conditions above the floodplain protect downstream water quality, quantity, and aquatic habitat.”

This topic is described in the EIS in the ‘Soils,” “Water Resources,” and “Riparian” sections.

Concern Statement: Modify the Water Resources Desired Condition (proposed plan p. 23) to read "Streamflow provide connectivity among fish populations and provide unobstructed routs critical for fulfilling needs of aquatic, riparian dependent, and many upland species of plants and animals *except as needed for native species recovery and management*." Recovery of native fishes would not be possible in most locations on the Apache-Sitgreaves NFs without the use of man-made fish barriers (in the absence of a natural emigration barrier). (101.38)

Response: The desired condition was not modified because it does not preclude management actions to recover native species.

Concern Statement: Modify the Water Resources Desired Condition (proposed plan p.23) to read "Water quality meets the needs of *all desirable* aquatic species, *including* ~~such as~~ the

California floater, northern and Chiricahua leopard frog, and invertebrates that support fish populations." (101.39)

Response: It is assumed this modification is to make the distinction that some aquatic species are not desirable such as crayfish. The adjective “desirable” has been added to the desired condition for clarity.

Concern Statement: Remove reference and statements based on the idea that no management of forest would have the same effect on water yield as management or human activity. Concern is that the DEIS states water yield impacts are the same for all alternatives (DEIS p. 367). (108.89, 81.12)

Response: The statement, “There would be no effects to water availability and use under all alternatives” appeared in the DEIS under the header “Environmental Consequences of Wilderness Recommendations.” It was modified for clarity by removing the term “availability”.

Concern Statement: In the Water Resources section of the DEIS, add language regarding the use of best management practices (BMPs) to the discussion of mechanical treatment effects on water quality (p. 76). (112.60)

Response: BMPs are discussed within this section under the “Mechanical Treatment” header and all other ground-disturbing activities under the environmental consequences for water quality.

Concern Statement: Add a guideline to protect streamflow regimes, timing, and floods, as recommended in USDA 2000, Water & the Forest Service. FS-660, at http://www.fs.fed.us/publications/policy-analysis/water.pdf, pages 10-11. The guideline should acknowledge the importance of intact groundcover on hydrologic regime, and suggest that grazing allotments be modified when necessary to protect streams. (162.75)

Response: The interdisciplinary team determined that there was no need to add an additional guideline. The plan provides protections for streamflow regimes, timing, and floods through desired conditions, standards, and guidelines contained within the “Water Resources” section.

Within the “Riparian Areas” section of the plan, the desired conditions have been updated to include new verbiage that addresses groundcover and vegetation height specifically. Ground cover is a key component of soil condition, which is discussed in the “Soil” section of the EIS.

Modification of grazing allotments and specific locations of livestock grazing are determined at the project-level on a site specific basis. There is manual, handbook, and policy guidance in place to make determinations where and when cattle may graze.

Concern Statement: Add to guidelines: “To protect water quality and aquatic species, and to prevent the spread of exotic plant and animal species throughout watersheds, heavy equipment and vehicles driven into a water body to accomplish work should be completely clean of plant materials and seeds, mud and sediment, and aquatic animals." (162.77)

Response: Refer to the standard and guidelines found in the “Invasive Species” section of the plan. Projects are to be designed and monitored to reduce the potential for introduction of new species or spread of existing invasive or undesirable nonnative populations.

<u>Concern Statement:</u> Include the following, as well as other relevant USDA information about surface water protection, under "Other Sources of Information for Water Sources": (1) USDA 2011. "Forests to Faucets" interactive maps and data. At http://www.fs.fed.us/ecosystemservices/FS_Efforts/forests2faucets.shtml and (2) USDA 2000. Water & the Forest Service. FS-660. At http://www.fs.fed.us/publications/policy-analysis/water.pdf (162.74)

<u>Response</u>: These references are excellent for general background information but were not referenced within the EIS or plan. The concepts discussed in the publication are incorporated into plan components.

<u>Concern Statement:</u> Remove water diverting regimes and reject proposals that will deplete or divert the water table or any rivers or streams. (5.16, 8.4)

<u>Response</u>: The plan does not prescribe or prevent water diverting regimes. The plan does contain a standard in the "Water Resources" section that,

"Consistent with existing water rights, water diversions or obstructions shall at all times allow sufficient water to pass downstream to preserve minimum levels of water flow that maintain aquatic life and other purposes of national forest establishment."

Water rights laws in Arizona dictate ownership and priority for water in the state. There are also guidance documents within the Forest Service that can help the forest determine if federal rights may have been impacted (Forest Service, 2011a). The forest will determine on a site-by-site basis each instance where depletion or diversion is observed or predicted.

<u>Concern Statement:</u> The Forest Service should not own water rights. (129.1, 130.3, 135.1, 137.2)

<u>Response</u>: The Forest Service can and does own water rights, some are federally reserved, and most are obtained following Arizona State Statutes like any other water right owner. Most of the Apache-Sitgreaves NFs' water rights are tied to management of the forest, such as water for grazing. Without federally owned water rights, land uses for many management activities, such as grazing, could not be allowed. The plan contains an objective to prepare at least one instream flow water rights application annually (see the "Water Uses" section).

<u>Concern Statement:</u> Explain how the Forest Service's objective to obtain water rights for instream flows (proposed plan p. 22) is not in conflict with honoring the continuing validity of private, statutory, and pre-existing rights (proposed plan p. 1). (150.2, 150.1)

<u>Response</u>: Water rights laws in Arizona follow the prior appropriations doctrine or first in time, first in right. Instream flow rights (ISF) were filed relatively recently and are junior to all existing rights with prior appropriation dates. The water rights are also non-consumptive, meaning no water is diverted out of the stream channel, as the objective is to retain water in the stream channel. Additionally, ISF rights protect current priority users from new claims. ISF does not affect transfer of water rights by higher priority water right owners in the future.

Concern Statement: Add an objective to immediately begin the process necessary to apply for Arizona instream flows on important perennially flowing streams, and to begin the application process for new streams each year. (162.76)

Response: The objective in the "Water Uses" section of the plan adequately covers the comment. The objective gives a minimum level of acquiring instream flow water rights; it does not preclude more if funding and staffing is available to do more.

Concern Statement: Add a guideline to work with water rights holders and the recipients of diverted water to increase water delivery efficiency, thereby maximizing instream water flows. Add a standard that withdrawal systems should be checked to ensure maximum efficiency in water transport and end point usage. (162.80)

Response: There is a desired condition within the "Water Uses" section of the plan that states,

"Dams, diversion or other water control structures are designed, maintained, and operated to conserve water resources."

An addition has been made in the management approaches of the "Water Uses" section that the forests will work with water right holders that are "permitted" through terms of easements or special use permits to help conserve water.

Riparian

Concern Statement: Explain whether table 15 in the DEIS is current and represents conditions following the 2011 Wallow Fire (DEIS p. 84). (112.34)

Response: The table represents pre-Wallow Fire conditions. New riparian information is not generally available for post-Wallow Fire conditions. The Forest Service has not been funded to complete all of the needed post-Wallow Fire investigations to date. The discussion in the EIS regarding riparian condition and the Wallow Fire has been clarified.

Concern Statement: Explain whether the language in the Riparian Areas background of the proposed plan is in conflict: "All of the riparian PNVTs, except for the cottonwood-willow riparian forest PNVT, are considered departed from reference conditions" and "The wetland/cienega and cottonwood willow fire regimes are moderately departed." (proposed plan p. 33) (112.6)

Response: The departure mentioned in the first statement refers to departure from reference condition for overstory vegetation; while the second reference refers to departure of the fire regime by vegetation type. The plan has been updated to clarify this distinction. The two "departures" are measured using different criteria. For further information, see the information provided by vegetation type within the "Vegetation Specialist Report" (Forest Service, 2014g) in the project record. Both metrics and criteria are explained in detail.

Concern Statement: The background for Riparian Areas (proposed plan p. 33) should mention that plant density has increased tremendously since 1996 and salt cedar has begun to invade riparian areas. (121.5)

Response: The background section for "Riparian Areas" has not been updated to mention salt cedar. The forests have no trend data on salt cedar invasion. However, salt cedar is considered an

invasive species, is a concern, and would be addressed through plan guidance contained in the "Invasive Species" section. Salt cedar is specifically mentioned in chapter 3 of the EIS in the affected environment of the "Invasive Species" section, as becoming common along many streams. Salt cedar habitat is within the riparian areas on the forests.

Concern Statement: Explain what the Riparian Areas desired condition "sedimentation and soil compaction do not negatively impact riparian areas" means, how and when it's measured, and how the cause is detected. (proposed plan p. 34) (108.122, 138.20, 30.5)

Response: This desired condition has been updated for clarity,

> *"Soil compaction from forest activities (e.g., vehicle use, recreation, livestock grazing) does not negatively impact riparian areas."*

Sedimentation and soil compaction can affect riparian areas by reducing the potential for vegetative ground cover or plants for stabilizing stream banks. These conditions are detected and measured through site observation using proper functioning condition protocols, or other methodologies (e.g., Multiple Indicator Monitoring (BLM, 2011); Monitoring the Vegetation Resources in Riparian Areas (Winward, 2000) specified at the project-level.

Concern Statement: Explain the term xeroriparian as used in the plan. (108.120)

Response: This terminology is not found in the proposed plan. The term was used in the June 2009 Working Draft Land Management Plan but was removed from subsequent versions.

Concern Statement: Remove generalizations in Riparian Areas desired conditions (e.g. "stream bottoms that are predominantly composed of sand and gravel have large coarse woody debris which provides habitat and food and helps dissipate hydraulic energy"). Concern is that desired conditions may not be attainable, given specific stream characteristics (e.g., wetland-cienega PNVT may not have the capability to provide coarse woody debris) (proposed plan p. 33-34). (108.94, 30.3, 138.22, 112.7, 112.11)

Response: The desired condition indicated in this comment was removed.

Concern Statement: Modify or remove the Riparian Areas desired condition "Willows (e.g., Bebb, Geyer, Arizona) are reproducing with all age classes present" because not all sites have the potential for willows. (30.4, 138.43, 131.4, 123.16, 123.1, 112.8, 108.121, 105.14, 102.26)

Response: The desired condition mentioned above was modified for clarity, adding "where the potential exists." It now reads,

> *"Willows (e.g., Bebb, Geyer, Arizona, Goodding's) are reproducing with all age classes present, where the potential exists."*

Potential would be determined at the project-level based on site specific conditions. In addition, the following statement has been added to chapters 1, 2, and 3 of the plan to clarify the applicability of plan decisions,

> "*Plan decisions apply to projects or activities where site conditions provide an inherent capability to meet those plan decisions."*

Concern Statement: The Riparian Areas desired condition "The spatial extent of wetlands is maintained" (proposed plan p. 34), if the predictions of drier and warmer conditions due to climate change are correct, this desired condition is not likely to be met. (102.27)

Response: The plan's appendix A ("Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning") discusses a number of potential strategies to provide for maintenance of riparian areas and wetlands, such as improving current riparian conditions, implementing water conservation strategies, and restoring uplands to resilient native ecosystems. Monitoring is also needed to determine trends in weather and resource conditions. The plan's monitoring strategy in chapter 5 identifies monitoring questions that will help the forest assess whether the desired condition is achievable. The monitoring strategy includes questions that address riparian, wetlands, and climate change. If the desired condition is determined not to be achievable, the plan can be amended to remove or modify the desired condition.

Concern Statement: Modify Riparian Areas Desired Condition (proposed plan p. 34) "Willows (e.g. Bebb, Geyer, Arizona) are *free of disease*, and reproducing with all age classes present." Need to acknowledge the significant role that disease has played in the loss of willows across the Apache-Sitgreaves NFs. (101.50)

Response: The suggested language was not added to the desired condition. The threats to successful willow reproduction include numerous factors (e.g., changes to water regime, physical modification, introduction of invasive species, disease). More information about threats to willows can be found in the affected environment of the "Vegetation" section in chapter 3 of the EIS.

Concern Statement: Add Riparian Areas Desired Condition (p. 34) "Wetlands created with treated wastewater from municipalities provide additional critical wildlife habitat." (101.51)

Response: This desired condition was not added. There is a similar guideline found in the "Water Resources" section stating,

> *"Treated wastewater may be used to provide wetland habitats."*

Concern Statement: Modify or remove the Riparian Areas desired condition "Floodplains and wet meadows provide sufficient herbaceous cover (55 percent or greater) and height (9 inches or longer) to trap sediment, mitigate flood energy, and provide wildlife habitat" and guideline "Wet meadows and active floodplains with riparian-obligate species should provide sufficient herbaceous cover (55 percent or greater) and height (6 to 9 inches or longer) to trap sediment, mitigate flood energy, stabilize banks, and provide for wildlife and plant seeds" (proposed plan p. 34-35). There are concerns that the specified amounts may not be achievable or measurable. (123.17, 30.7, 139.9, 30.6, 138.24, 131.7, 131.5, 123.3, 112.13, 108.95, 105.5, 105.15, 102.32, 102.28, 102.29, 112.9)

Response: These desired conditions have been modified to reflect research and ranges of plant taxonomic descriptions in Arizona and found in many cases within the forests' boundary. References to the plant height source material are now included in footnotes within the "Riparian Areas" section. There is also an established protocol for measurement of plant height used on the forests found in national and regional direction such as the "Region 3 Rangeland Analysis and Management Training Guide" (Forest Service, 1999) and others as found in "Other Sources of Information" for livestock grazing in Appendix D in the plan.

<u>Concern Statement:</u> Define geologic control feature as used in the Riparian Areas desired condition "Riparian areas that do not depend on geologic control features for stability have large, coarse woody debris that provides key habitat for riparian-dependent species" (proposed plan p. 34). (112.10)

<u>Response</u>: Geologic control features in this instance is natural geologic features that resist vertical or lateral stream movement, such as bedrock outcrops and boulders. This desired condition was modified to clarify geologic control,

> *"Large coarse woody debris provides stability to riparian areas and stream bottoms lacking geologic control (e.g., bedrock) or geomorphic features (e.g., functioning floodplains, stream sinuosity, width/depth ratio)."*

<u>Concern Statement:</u> Remove floodplains from Riparian Areas desired conditions. A better way to describe it would be from green line to green line or something similar that defines and restricts the areas to the places where it is possible. (123.2)

<u>Response</u>: References to floodplains have not been removed from the "Riparian Areas" desired conditions. Floodplains are necessary to dissipate flood energy and to capture excess sediment in the stream system. Vegetation and other components, like coarse woody debris or cobbles, resist flow across the floodplain which allows for energy dissipation and sediment deposition. The term "stream banks" was added to one of the "Riparian Areas" desired condition statements as this is another critical component needing protection from high flows. It reads,

> *"Vegetation and root masses stabilize stream banks, islands, and shoreline features against the cutting action of water."*

<u>Concern Statement:</u> The DEIS discusses the ability of riparian systems to recover and improve as being affected by ongoing and new impacts (DEIS p 84, 95). This was not discussed under standards or guidelines for management activities in the proposed plan. (108.232, 112.350)

<u>Response</u>: Effects of current or new impacts are appropriately discussed in the "Riparian" section in chapter 3 of the EIS and are not appropriate for the plan. The plan provides guidance for management, including standards and guidelines for project or activity design that would reduce or minimize potential impacts to riparian systems.

<u>Concern Statement:</u> Review the Riparian Areas guideline "Ground-disturbing projects (including planned ignitions) which may degrade long term riparian conditions should be avoided" (proposed plan p. 35) and the DEIS Riparian environmental consequences for Forest Restoration Activities (DEIS p. 86) to ensure there is no contradiction. (112.38)

<u>Response</u>: The interdisciplinary team reviewed the guideline and environmental consequences and did not identify a contradiction. The environmental consequences listed in the EIS describe effects of both low severity beneficial burning, as well as effects of high severity burns which can result from wildfire.

Concern Statement: Review the Riparian DEIS environmental consequences for Mechanical and Burning (p. 87) to ensure there are no contradictions. (112.39, 112.40)

Response: The interdisciplinary team reviewed the environmental consequences of mechanical treatments and burning; no contradictions were identified. The effects sections describe possible effects of mechanical and burning treatments if best management practices (BMPs) or soil and water conservation practices (SWCPs) are inadequate or not implemented. Mitigation of projects using BMPs and SWCPs are effective in preventing long term riparian degradation.

Concern Statement: Elk grazing should be taken into account in the specific guidelines for vegetation cover and/or height. (102.31)

Response: The plan provides desired conditions for herbivory to be in balance with available forage (see the "All PNVTs," "Livestock Grazing," and "Wild Horse Territory" sections). Within the "Livestock Grazing" section, the plan does provide the following guideline,

> *"Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state."*

The effects of all grazers, including elk, would be taken into account to move towards desired conditions. The allocation of forage to domestic or wild animals is not determined at the plan level. It would be a site specific decision completed at the project-level.

Concern Statement: Account for factors (soil loss and erosion, distance to a water body, road-stream crossings) and disclose potentially significant impacts that may result from existing road networks. (26.137, 112.41)

Response: The environmental consequences of motorized routes, including roads, are discussed in chapter 3 of the EIS in the "Soil," "Watershed," and "Riparian" sections. The design and use of site specific best management practices (BMPs) and streamside management zones are found in the guidelines in the "Water Resources" section in chapter 2 of the plan. There are no known significant impacts resulting from the existing road network. All new road construction, as well as maintenance of existing roads, is subject to BMPs to mitigate impacts to water quality.

Concern Statement: Consider best management practices, streamside management zones, and wildlife mitigation during livestock grazing implementation (DEIS p. 86). (112.37)

Response: Guidance for design and use of site specific best management practices (BMPs) and streamside management zones are found in the guidelines in the "Water Resources" section in chapter 2 of the plan. The "Livestock Grazing" section in chapter 2 of the plan provides standards and guidelines to protect wildlife species when implementing livestock grazing activities. BMPs, streamside management zones, and wildlife mitigation are also incorporated at the project-level analysis and implementation for grazing activities.

Concern Statement: Riparian areas present a significant issue for analysis because they are severely degraded and the Forest Service is required by NFMA to ensure viability of species that depend on aquatic habitats. (26.184)

Response: Chapter 3 of the EIS discloses potential environmental consequences to riparian areas in the "Riparian" section. The species viability analysis in the EIS ("Fisheries and Aquatic

Habitat" and "Wildlife") addresses the needs of aquatic species. Effects to riparian areas would also be evaluated during project and activity-level planning. Project-level analysis evaluates both positive and negative effects to riparian areas. Riparian condition is commonly found to be a need for change, which leads to treatment, mitigation of effects, monitoring and adaptive management to improve conditions.

Concern Statement: Explain how the Riparian Areas objectives: "annually, restore 200 to 500 acres…" and "Annually, remove an average of 2 miles of unauthorized roads or trails …" will help that much across a large national forest (proposed plan p. 34). (122.7, 146.14)

Response: These objectives represent a minimum level due to planning guidance that set our planning levels at or near current levels; however, they are considered to be lower limits of treatments. A greater number of acres or miles of improvement may be achieved depending upon environmental conditions, available funding, and staffing.

Concern Statement: Explain how the riparian objectives would be achieved and what impact would be incurred by users. Concern if objectives are not met, restrictions may be imposed in areas that could eliminate user opportunities. (123.18, 138.44, 138.38)

Response: Objectives would be met by implementing site specific projects, generally identified within priority watersheds. Types of treatments could include fencing, planting riparian vegetation, grade control, or removal of invasive or unwanted species. The actual level of accomplishment would depend on environmental conditions, budgets, and staffing. The potential impacts to users would be disclosed during the National Environmental Policy Act (NEPA) process at the project-level.

Concern Statement: The DEIS discusses "objectives to treat riparian areas," explain where the objectives are in the plan. (127.43)

Response: They are found in chapter 2 of the plan within the objectives for the "Riparian Areas" section.

Concern Statement: The Forest Service should prioritize road removal in riparian areas associated with aquatic ecosystems. (26.140)

Response: The plan contains two objectives in the "Riparian Areas" section that are designed to minimize (through actions such as decommissioning, removing, relocating) the effect of roads that add sediment to streams, damage riparian vegetation erode stream banks, cause gullies, and/or compact floodplain soils. In addition, road removal treatments could be part of watershed restoration plans (WRAPs) that are developed for priority watersheds. There is a plan objective (see the "Overall Ecosystem Health" section) to improve the condition class on at least 10 priority watersheds during the planning period over the next 15 years.

Concern Statement: Modify the Riparian Areas Objective (proposed plan p. 34) "Within the planning period, relocate, repair, improve, or decommission a minimum of 4 miles of National Forest Systems roads or trails that add sediment to streams, damage riparian vegetation, erode stream banks, cause gullies, and/or compact floodplain soils. *These activities should promote adequate trail access that addresses public recreational access needs (e.g. fishing and hiking) and minimizes creation of additional unauthorized trails.*" (101.52)

Response: Further additions or stipulations to the objective are not deemed necessary. The plan allows for the creation of additional trail opportunities. However, additional trail access would have to comply with plan guidelines in the "Nonmotorized Opportunities" and "Motorized Opportunities" sections to avoid wetlands, riparian areas, and stream bottoms.

Concern Statement: Explain whether there are cheaper fixes for changing riparian conditions for the better (e.g., removing cows, changing the time when they graze). (122.10)

Response: Several cost efficient methods for improving riparian conditions are discussed in the management approaches for the "Riparian Areas" section of the plan. Other methods could include timing of livestock use, level of use, and administratively closing non-National Forest System roads and trails within riparian areas. Opportunities such as these would be identified during project-level analysis.

Concern Statement: The proposed plan acknowledges the generally degraded condition of riparian areas, explain why it proposes no new management direction to restore conditions. (26.60, 162.182)

Response: There are desired conditions, objectives, and guidelines within the "Riparian Areas" section of the plan that provide direction to protect and improve conditions. Specifically, an objective to move 200 to 500 acres per year towards desired riparian condition and removal of a minimum of 2 miles of unauthorized roads and trails can be found in this section.

Concern Statement: Modify Riparian Management Approaches (proposed plan p. 35) in the last paragraph the word "elk" should be replaced with "ungulate." In addition, the preceding paragraph should more strongly emphasize the need for landscape scale restoration treatments within the context of riparian area management. (101.53)

Response: "Elk" was replaced with "wildlife." The sentence now reads,

> *"The Apache-Sitgreaves NFs work with the Arizona Game and Fish Department (AZGFD) to minimize wildlife impacts to riparian vegetation and structure and to develop project design criteria to protect important habitat features such as springs, bogs, seeps, and fens."*

The following statement was added to management approaches for "Riparian Areas,"

> *"Landscape scale restoration is expected to improve riparian conditions through the expected improved hydrologic function of uplands."*

Concern Statement: Review the role of the proper functioning condition (PFC) assessment as a standard or a guideline under Riparian Areas. Since the PFC assessment method is not intended to be used as a monitoring tool, clarify how information on changes in ground cover, species composition, bank stability, and water quality will be used. (112.2, 112.28)

Response: Many of the elements used in defining desired conditions are similar to the PFC literature (BLM, 1998; BLM, 1999). PFC is currently used by the forests to determine riparian condition and was added to the management approaches section. The monitoring strategy in chapter 5 of the plan includes a monitoring question,

> *"Are riparian areas attaining and/or moving toward proper functioning condition?"*

PFC elements that indicate at risk or nonfunctioning conditions would be monitored using established and approved methods (e.g., Multiple Indicator Monitoring, (BLM, 2011), Monitoring the Vegetation Resources in Riparian Areas, (Winward, 2000)). Specific riparian monitoring would also be developed and implemented through project-level monitoring plans.

Concern Statement: Review language in the DEIS "riparian areas can regain their equilibrium within a few years" and "the riparian system make take decades to reach PFC" (DEIS p. 84) to ensure there is no contradiction. Explain the concept of regaining equilibrium, whether it involves the area regaining stability or proper functioning condition. (112.36)

Response: The statements were reviewed, and no conflict was noted. Equilibrium in this instance refers to proper functioning condition.

Concern Statement: The DEIS states the desired condition for riparian areas and wetlands is to be in proper functioning condition. Many of the important attributes and processes needed by a riparian area to function properly are generally discussed in the desired conditions but not specifically stated in the proposed plan. Review consistency between the DEIS and plan in discussing desired conditions of riparian areas and wetlands. (112.32, 112.33)

Response: The plan and EIS were reviewed for consistency. Many of the desired conditions in the plan are based on or are similar to elements found in the proper functioning condition definitions.

Chapter 1 of the plan explains that desired conditions and guidelines are not discretionary; projects must either maintain resources in desired conditions or move them toward desired conditions. Any project documentation should explain how the project is consistent with desired conditions and describe any short or negligible long term effects the project may have concerning the maintenance or attainment of any desired condition.

Concern Statement: There should be a standard(s) to manage riparian areas for proper functioning condition. (112.43, 127.42)

Response: The Forest Service has chosen not to frame riparian condition as a standard, but it has described many elements of properly functioning condition (PFC) as desired conditions in the plan. (BLM, 1998; BLM, 1999). Chapter 1 of the plan explains that desired conditions and guidelines are not discretionary; projects must either maintain resources in desired conditions or move them toward desired conditions. Any project documentation should explain how the project is consistent with desired conditions and describe any short or negligible long term effects the project may have concerning the maintenance or attainment of any desired condition.

Fisheries and Aquatic Habitat

Concern Statement: Update information in the Fisheries section of the DEIS including: (1) watershed conditions following the 2011 Wallow Fire for Gila trout in Raspberry Creek, (2) persistence of loach minnow, and (3) persistence of spikedace. (112.45, 112.46, 112.47, 112.65)

Response: Watershed condition ratings have been updated for conditions resulting from the Wallow Fire, which is summarized in the EIS (table 12). The specific updated condition for the Raspberry Creek 6th code HUC is located within the "Watershed Specialist Report" (Forest Service, 2014i). The suggested edit to the sentence regarding the loach minnow was incorporated as follows,

> *"Recent surveys (last 5 to 20 years) have not documented the presence of this species within the East Fork Black River, Eagle Creek, or the San Francisco River populations; although the U.S. Fish and Wildlife Service considers the populations to still exist."*

The additional suggested edits regarding loach minnow and spikedace distributions and introductions were not incorporated, as they are not within the Apache-Sitgreaves NFs, or downstream within the action area of the plan.

Concern Statement: Explain why turbidity (muddy water) is considered "good" for chubs, dace, and other native minnows in the Colorado River, but not in the Apache-Sitgreaves NFs. The emphasis on managing for more heavily consumptive riparian vegetation and less turbidity seems like a prescription for a crisis for native warm water fish. References: (1) Stream Fish Responses to Grazing Exclosures, Peter B. Baley and Hiram W. Lee, North American Journal of Fisheries Management (2) Pacific Salmon Restoration: Trade-offs Between Economic Efficiency and Political Acceptance, Junjie Wu, et al., Contemporary Economic Policy, January 2003, (3) Native fishes, exotic mammals, and the conservation of desert springs, Astrid Kodrie-Brown and James B. Brown, Front Ecol Environ 2007, and (4) "At age 50, dam still generates love, hate," Shawn Mckinnon, The Arizona Republic. (133.2, 133.3)

Response: This comment is concerned with the approach that improving hydrologic conditions and riparian vegetation will actually result in the loss of native fish species and the reduction of streamflows and is being used as a reason to remove human disturbances.

The article (McKinnon, 2007) about Glen Canyon Dam is not considered science and is not applicable to the Apache-Sitgreaves NFs plan. Both water temperature and turbidity are issues that impact water resources and aquatic habitat and species on the Apache-Sitgreaves NFs and were considered and discussed within chapter 3 of the EIS in the "Water," "Watershed," "Riparian," and "Fisheries" sections.

While the articles (Bayley and Li, 2008; Wu et al., 2003) were not used in the development of the plan, this issue has been recognized as relevant to the Apache-Sitgreaves NFs and is considered and discussed in the "Fisheries Specialist Report" (Forest Service, 2014a). The speckled dace is the most widely distributed (table 16, EIS) and secure fish species occurring on the Apache-Sitgreaves NFs, and it is recognized that improvements that benefit cold water fish species (i.e., Apache and Gila trout) could result in reductions in distribution for this species, and it is not considered to be a threat to the viability of the species.

The article (Kodric-Brown and Brown, 2007) studied one pupfish in Nevada and five fish species in Australia. This literature was not considered in the preparation of the plan and is not considered applicable to the Apache-Sitgreaves NFs or the management of its native fish species. The pupfish is limited to only small isolated springs; while some native fish can use these habitat types, they occur throughout lotic systems on the Apache-Sitgreaves NFs using various habitat types.

The article (Blaney, 1954) measures water loss from evapotranspiration, especially associated with willows and cottonwoods. While this specific article was not considered in the preparation of the plan, the evapotranspiration process is widely recognized and considered in the management of watersheds, riparian areas, and aquatic habitat. Where improvements and restoration of riparian vegetation is considered necessary or desired, the resulting beneficial impacts are many, and overall increases in streamflow can occur from improvements in hydrologic conditions and functions.

Concern Statement: Explain how the quality of fish habitat is evaluated for historic conditions (e.g., native fish have decreased 50 to 75 percent over the past 10 years) and explain the cause of decline. (108.113)

Response: The statement (e.g., native fish have decreased 50 to 75 percent over the past 10 years) provided by the commenter is not found within the proposed plan nor the DEIS. Declines in aquatic habitat conditions, fish populations, and limitations associated with various aquatic habitat and fish population surveys are discussed within the “Fisheries,” “Riparian,” and “Water Resources,” sections in chapter 3 of the EIS and the “Fisheries Specialist Report” (Forest Service, 2014a).

Concern Statement: There is a need to recognize that not all nonnative species (sportfish) are undesirable and include more discussion on current management practices and recent research. (109.12, 109.11)

Response: The social and economic values associated with recreational sportfishing are recognized by the Apache-Sitgreaves NFs. The plan has three desired conditions that include providing for desirable nonnative plants and animals, and these are located within the “Overall Ecosystem Health,” “Aquatic Habitat and Species,” and the “All PNVTs” sections in chapter 2. The commenter provides no specifics regarding their reference to current management actions and research conducted by the Arizona Game and Fish Department that demonstrated rainbow trout are compatible with recovery of native fishes.

Concern Statement: Within the riparian and aquatic habitat sections of the DEIS, explain what the term degraded means. (108.220)

Response: The term degraded means, “A decline in the viability of ecosystem functions and processes” (Armantrout, 1998). This clarification has been added to the both the “Riparian” and “Fisheries” (aquatic habitat) sections in chapter 3 of the EIS.

Concern Statement: Modify Aquatic Habitat and Species Background (proposed plan p. 25). There are only 23 nonnative fishes that are currently found on the Apache-Sitgreaves NFs, not 25. Need to characterize the lower elevation warm water habitat as "cyprinid and catostomid (minnow and sucker families) streams" instead of only cyprinid. Mineral Creek should be added to the list of streams that are totally diverted. (101.40)

Response: The plan was edited in response to this comment and now reads as follows,

> *“The forests are home to 14 native and 24 nonnative fish species. Fish habitats range from high elevation cold water streams (trout) to the lower elevation warm water streams (minnow and sucker).”*

The number of nonnative fish species noted in the proposed plan was incorrect; the correct number is 24 species. The 24 nonnative fish species are listed in the "Fisheries" section in chapter 3 of the EIS.

The sentence regarding specific streams being totally diverted was also reworded to the following,

> *"Some streams, during low flow years can be totally diverted, impacting habitat and aquatic species."*

Concern Statement: Modify the Aquatic Habitat and Species Desired Condition (proposed plan p. 25) "Streamflows, habitat, and water quality support native and *desirable nonnative* aquatic and riparian-dependent species and habitat." (101.41)

Response: The desired condition was not modified. The plan has three desired conditions that include providing for desirable nonnative plants and/or animals; these are located within the "Overall Ecosystem Health," "Aquatic Habitat and Species," and the "All PNVTs" sections in chapter 2.

Concern Statement: Modify the Aquatic Habitat and Species Desired Condition (proposed plan p.25) "Habitat and ecological conditions are capable of providing for self-sustaining populations of native *and desirable nonnative,* riparian dependent plant and animal species." (101.42)

Response: The desired condition was not modified. The plan has three desired conditions that include providing for desirable nonnative plants and/or animals; and these are located within the "Overall Ecosystem Health," "Aquatic Habitat and Species," and the "All PNVTs" sections in chapter 2.

Concern Statement: Modify the Aquatic Habitat and Species Desired Condition (proposed plan p. 26) "Desirable nonnative fish species*, and native fish species (i.e. Apache trout, Gila trout, roundtail chub)* provide recreational fishing in waters where those opportunities are not in conflict with recovery of native fish species." (101.43)

Response: The desired condition was not modified. The intent of this specific desired condition is to provide for opportunities for desirable nonnative fish species; the "Aquatic Habitat and Species" section within chapter 2 of the plan has four desired conditions, two objectives, and two guidelines that provide for native fish species recovery and improvements to aquatic habitat and species.

Concern Statement: The wording used to describe impacts of nonnative fish on page 132 and of fish stocking on page 133 of the DEIS is inappropriate and disproportionate to the descriptions given to other impacts on native fish species. The statement that the Department continues to impact native fish throughout the A-S through stocking and management of nonnative fish is misleading and unnecessarily confrontational. The Department does not dispute that nonnative fish are a major cause of the current status of many native fishes on the A-S. However, the impact is not at the level that it used to be decades ago. There are numerous processes in place to minimize additional impacts of nonnative fishes, fish stocking. The Department goes through intensive consultation with the U.S. Fish and Wildlife Service on all stocking activities to determine impacts on native

wildlife and to gain associated clearances for those stocking activities. In most cases, there are no impacts or it is minimal, and in those few cases where an impact to native wildlife has been identified, the Department actively mitigates those impacts. The Department therefore asks that a more pragmatic and balanced discussion of nonnative fish and fish stocking exist by replacing current narrative with language similar to that within the Livestock Grazing impacts section on page 130, which states that livestock grazing activities can have numerous impacts..., and that livestock also have the potential to introduce nonnative species. (101.91)

Response: No modifications were made to the plan based on this comment. This comment is concerned with the EIS' characterization of the impacts to native fish from past and ongoing fish stocking programs conducted by the Arizona Game and Fish Department. The intent of the discussion within the EIS is to capture the historical, current and ongoing, and future impacts associated with all known causes and sources associated with nonnative species, and references are also made to impacts associated with private lands and both the San Carlos and White Mountain Apache tribal lands.

Concern Statement: Objectives should include restore a third or more of the forest's aquatic habitats during the life of the plan. (162.78)

Response: The objectives associated with the restoration and improvements of aquatic habitats are based on levels that are considered within the capacity of the Apache-Sitgreaves NFs. There is acknowledgement in the introduction to chapter 3 of the EIS stating that the objectives were developed with the assumption that budgets would be similar to the past 5 years and the level of accomplishment would depend on environmental conditions, budget, and staffing. Several of the "Aquatic Habitat and Species" and "Riparian" plan objectives describes a minimum level to accomplish; if conditions allow greater accomplishments could be achieved.

Concern Statement: Add a guideline to maintain or restore functioning riparian plant communities provide water filtration, shade and temperature regulation, shelter from predators, and foraging areas to protect aquatic species. (162.79)

Response: The plan contains objectives, desired conditions, standards, and guidelines for maintaining, improving, and restoring riparian areas, aquatic habitats, and aquatic species. (For specifics see desired conditions, objectives, standards, and guidelines for the "Water Resources" and "Aquatic Habitat and Species" sections in chapter 2 of the plan). These plan decisions provide for the maintenance and restoration of riparian areas and the specific concerns of buffers and water filtration, riparian canopy (i.e., shade) and water temperature, and aquatic habitat that provides for cover from predators and foraging needs of species.

Concern Statement: Modify Aquatic Habitat and Species Guideline (proposed plan p. 26) "To prevent degradation of native species habitat and the incidental or accidental introduction of diseases or nonnative species, *when transferring* aquatic species ~~should not be transferred~~ through management activities from one 6th code watershed to another. *Measures should be taken to prevent the spread of non-target fish species, invasive species, parasites, or diseases."* As written, this does not allow critical management actions to recover rare species such as T&E fish and candidate species. (101.44)

Response: No modifications were made to the plan based on this comment. The intent of this guideline is to prevent the spread of nonnative species or diseases that could occur through site specific actions implemented under the plan (e.g., water transfers, movement of equipment).

Concern Statement: Modify Aquatic Habitat and Species Guideline (proposed plan p. 26) "Projects and activities should avoid damming or impounding free-flowing waters to provide streamflows needed for aquatic and riparian-dependent species, *except as needed for native species recovery and management, or instream structures that improve stream functionality and stability or improve aquatic habitat conditions for aquatic species.*'(101.45)

Response: No modifications were made to the plan based on this comment. The "Aquatic Habitat and Species" section within chapter 2 of the plan has four desired conditions, two objectives, and two guidelines that provide for native fish species recovery and improvements to aquatic habitat and species.

Concern Statement: Correct the sentence in the Aquatic Habitat and Species background (proposed plan p. 25) that says Eagle Creek is "totally diverted for several months." (121.4)

Response: In response to this comment, the statement was changed to read,

"Some streams, during low flow years can be totally diverted, impacting habitat and aquatic species."

Concern Statement: Aquatic systems in good condition should be maintained and those degraded or at risk should have reparative and/or restorative action taken. There is a need for recovery plans. (14.7, 5.18)

Response: The plan identifies and recognizes the need to maintain and restore aquatic habitats. Desired conditions, objectives, standards, and guidelines are located within the "Riparian Areas," "Water Resources," and "Aquatic Habitat and Species" sections within chapter 2 of the plan. Through implementation of the plan, watershed, riparian, and aquatic habitat maintenance and restoration activities would be identified and implemented through site specific projects and actions.

Concern Statement: Analyze and disclose what is known about the existing condition of riparian areas, aquatic ecosystems, and associated species on the national forest, with special attention to fish and amphibian species at risk of extinction. (162.44, 26.125)

Response: The existing conditions for riparian areas on the Apache-Sitgreaves NFs can be found within the "Riparian" section of chapter 3 (affected environment and environmental consequences) of the EIS. Four riparian PNVTs are also described in detail within the "Vegetation" section of chapter 3 of the EIS. Existing condition information for aquatic habitat and associated species (e.g., fish and amphibians) and threatened and endangered species can also be found within chapter 3 of the EIS under the "Fisheries" and "Wildlife and Rare Plants" sections. Additionally, more specific and detailed information can also be found within the "Ecological Sustainability Report" (Forest Service, 2008c), "Vegetation Specialist Report" (Forest Service, 2014g), "Riparian Specialist Report" (Forest Service, 2014f), "Fisheries Specialist Report" (Forest Service, 2014a), "Water Specialist Report" (Forest Service, 2014h), "Watershed Specialist Report" (Forest Service, 2014i), and "Wildlife Specialist Report - Viability" (Forest Service, 2014l).

<u>Concern Statement:</u> The Forest Service should adopt an ecosystem-scale aquatic conservation strategy for management of aquatic habitat and at-risk fisheries similar to the one adopted in the Pacific Northwest: (1) Designate "key watersheds" in large drainage basins that offer the highest quality aquatic habitat, (2) establish "riparian reserves" to maintain and restore aquatic habitat, (3) enacts standards and guidelines for management in riparian reserves that require project-level actions to meet objectives related to physical, chemical and biological aspects of aquatic ecosystems, (4) require watershed analysis at the scale of large drainage basins to account for such factors as road density, vegetation cover and ecological processes that contribute to aquatic habitat quality, (5) compel active restoration of aquatic ecosystems in compliance with standards and guidelines for riparian reserves, and (6) prohibits use of site specific mitigation measures or planned restoration activities as a substitute for preventing degradation of existing high-quality aquatic habitat. (26.181, 162.183, 26.18, 26.73, 26.130)

<u>Response</u>: The plan recognizes the need to maintain, improve, and restore watersheds, riparian areas, and aquatic habitat and their associated species on the Apache-Sitgreaves NFs. The primary approaches of the plan to address these issues are through ecosystem restoration of the various PNVTs across the landscape, addressing degraded watershed conditions, and improving conditions within riparian areas and their associated aquatic habitats and species. Numerous objectives, desired conditions, standards, and guidelines have been developed for each of these for improving conditions by reducing historical, ongoing, and potential impacts through restoration activities and moving towards desired conditions through project implementation. Two examples of specific plan decisions (objectives) are:

> *(1) "During the planning period improve the condition class on at least 10 priority 6th level HUC watersheds by removing or mitigating degrading factors."*
>
> *(2) "Annually, enhance or restore 5 to 15 miles of stream and riparian habitat to restore structure, composition, and function of physical habitat for native fisheries and riparian-dependent species."*

<u>Concern Statement:</u> Modify Aquatic Habitat and Species Management Approaches (proposed plan p. 27) "The Apache- Sitgreaves NFs cooperate with the Arizona Game and Fish Department (AZGFD), *the state wildlife agency with authority over wildlife management in Arizona* to protect and reintroduce native aquatic species where appropriate and control or eradicate nonnative species *where appropriate."* Need to clarify the Department's wildlife management authority, and that control or eradiation of nonnative species on the Apache-Sitgreaves NFs is not an appropriate management action in all circumstances. (101.46)

<u>Response</u>: The Apache-Sitgreaves NFs and the plan recognize the state's authority over wildlife management in Arizona. The sentence has been reworded to read,

> *"The Apache-Sitgreaves NFs assist the Arizona Game and Fish Department (AZGFD) with efforts to protect and reintroduce native aquatic species where appropriate and control or eradicate nonnative species."*

Vegetation

Concern Statement: Explain "historic" or "reference" vegetation conditions, including whether it is possible to achieve those conditions. (105.2, 108.240, 108.231, 102.55, 138.34, 161.13, 108.93, 102.45, 102.4, 102.21, 102.16, 26.103, 162.2, 138.1)

Response: Reference conditions are defined in the glossary of both the plan and EIS. In short, reference conditions describe environmental conditions that infer ecological sustainability. Reference condition information is used to define restoration goals, determine the restoration potential of sites, and evaluate the success of restoration efforts. Reference conditions and desired conditions are not necessarily one and the same. The development of desired conditions was informed by reference conditions; however, there is no intention to recreate reference conditions. For example reference conditions for forest trees (spatial arrangements, densities, and composition) were used to develop desired ranges for management, but there is no intent to recreate exact historic patterns. Plan decisions provide the framework for restoration and movement towards desired conditions. The “Vegetation” section in chapter 3 of the EIS describes the ability of each alternative to move towards desired conditions within 50 years. For those potential natural vegetation types (PNVTs) modeled except spruce-fir forest, all alternatives, including the plan, would produce some movement toward desired conditions within the planning period.

Concern Statement: Disagree with the representation made in the DEIS (p. 138-139) that in wet mixed conifer and spruce-fir there is an overrepresentation of vegetation structural states that are lacking aspen regeneration due to elk browsing. (101.20)

Response: As noted in the Vegetation Specialist Report, vegetation state and transition models were developed for the vegetation analysis to compare current vegetation conditions (states) with desired conditions and to compare expected results from implementation of the forest plan alternatives. The wet mixed conifer and spruce-fir forest PNVTs each currently have 19 described vegetation structural states. Based on Smith’s (2006a and 2006b) literature reviews, stand structure for these two PNVTs was historically single storied, dense closed canopy, with a plurality of shade-tolerant trees, and with aspen regeneration where conifers were removed by fire, disease, etc., within their natural disturbance regimes. However, 11 of today’s 19 structural states do not reflect reference or the historic range of variability (HRV) conditions but rather reflect conditions on contemporary landscapes found only since Euro-American settlement.

Existing conditions relative to structural states for these two PNVTs were derived from data gathered during the Forests' mid-scale vegetation mapping project. From these data, tabular summaries of acreages and percentages within each state were generated for each PNVT. Today these two PNVTs exhibit structural states that are not part of the their HRV, because they exhibit one or more of the following characteristics: open canopies (states I, J, M, P, Q, R, S); multi-storied (states J, M, O, Q, S); and/or are dominated by shade-intolerant or mixed shade-tolerant tree species (states I, J, L, M, N, O, Q, R, S). In addition, prior to the 2011 Wallow Fire, aspen regeneration was limited or lacking due to impacts of elk browsing (states K through S). The development of state and transitions models for the Apache-Sitgreaves NFs incorporated impacts of elk on aspen regeneration as documented prior to the 2011 Wallow Fire (Shepperd and Fairweather, 1994; Fairweather, 2008; U.S. Forest Service, 2009a; Rogers, 2009 and 2011; Beschta and Ripple, 2010; Lynch et al., 2010). However, this does not mean that all acres in these two PNVTs are lacking aspen as these two PNVTs also currently have eight vegetation structural

states representing aspen (plan appendix B). These eight states (states A through H) are considered to be consistent with HRV and therefore, represent desired conditions.

Concern Statement: Explain how climate change can be an ecosystem component as stated in the background of Overall Ecosystem Health "Prior to 1850s, the Apache-Sitgreaves NFs ecosystems were considered to be resilient. … Fire, disease, and climatic changes were natural components of these functioning ecosystems" (proposed plan p. 15). Climate is an influence on the system not an integral part of it. (102.33)

Response: The sentence has been corrected to read,

> *"Fire, disease, and weather variability were natural components of these functioning ecosystems."*

Concern Statement: Clarify Overall Ecosystem Health desired conditions: (1) "Ecological components are resilient to disturbances including human activities and climate variability" (proposed plan p. 16). What is the meaning of 'resilient to disturbances'? (2) "Natural ecological processes...return to their innate role within the ecosystem" (proposed plan p. 16). Why and how can historical disturbances return to their natural role? (3) "Natural ecological processes allow for a shifting of plant communities, structure, and ages across the landscape. ... The mosaic of plant communities and the variety within the communities are resilient to disturbances" (proposed plan p. 17). What does this mean? (102.12, 108.107)

Response: These desired conditions have been clarified to read:

> *(1) "Ecological components (e.g., soil, vegetation, water) are resilient to disturbances including human activities and natural ecological disturbances (e.g., climate variability, fire, drought, wind, insects, disease, pathogens)."*
>
> *(2) "Natural ecological disturbances return to their characteristic roles within the ecosystem. Wildfire, in particular, is restored to a more natural function."*
>
> *(3) "Natural ecological cycles (i.e., hydrologic, energy, nutrient) facilitate shifting of plant communities, structure, and ages across the landscape. Ecotone shifts are influenced at both the landscape and watershed scale by ecological processes. The mosaic of plant communities and the variety within the communities are resilient to disturbances."*

Also see the response to comment # 108.177 below.

Concern Statement: Clarify the meaning of resiliency. (108.177, 108.216)

Response: Resiliency is defined in the glossary of the plan and EIS. Resiliency is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Concern Statement: When the term "functioning" or "properly functioning" is used, does it not really mean that the system is desirable from the standpoint of sustaining the values people desire? Why not define desired vegetation as that which will provide sustainable resource outputs and values for human beings? (102.5)

Response: Desired conditions represent both ecological and socioeconomic sustainability. The vegetation desired conditions are worded in such a way as to describe those characteristics that will contribute to resilient ecosystems that sustain desired resource outputs and values. While people may have differing opinions about how vegetation might meet their desired outputs and values, the plan's desired conditions are based on a synthesis of the best available science to provide those outputs and values, without degrading their sustained provision by the ecosystem.

Outputs and values of vegetation conditions for humans are incorporated throughout the plan, especially in the desired conditions and objectives stated in chapter 2 "Community-Forest Interactions" section (e.g., "Forest Products," Special Uses," "American Indian Rights and Interests," "Livestock Grazing"), and the "Managed Recreation" section (e.g., "Motorized Opportunities," "Nonmotorized Opportunities," "Scenic Resources"); as well as in chapter 3 "Management Area Direction," and chapter 4 "Suitability." Social and economic implications of the plan were analyzed in the EIS. Future projects and activities must be consistent with the plan and various laws, and agency policy and direction to manage vegetation and natural resources for multiple uses, all of which provide resource outputs for human society either directly or indirectly.

Concern Statement: Explain potential natural vegetation type (PNVT) and, as a goal, if it meets the Forest Service mission or mandates. (152.12, 122.12)

Response: PNVTs are defined in the plan ("All PNVTs" section and glossary). In addition, PNVTs are explained in chapter 3 of the EIS under the affected environment in the "Vegetation" section and further analyzed under environmental consequences.

PNVTs are coarse-scale groupings of ecosystem types that share similar geography, vegetation, and historic ecosystem disturbances, such as fire, drought, and grazing by native species. PNVTs are only a means to define ecosystems and are not a "goal" in and of themselves. PNVTs represent the vegetation type and characteristics that would occur when natural disturbance regimes and biological processes prevail (Vander Lee et al., 2006). PNVT desired conditions describe vegetation states that are resilient to disturbances, including uncharacteristic fire, human activities, and climate variability. Wood products, forage, clean water, etc. would be byproducts from the implementation of plan objectives that would move the forests towards PNVT desired conditions.

Plan direction to maintain or move toward PNVT desired conditions are in alignment with the Forest Service mission to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. They will also help the Forest Service meet the intent of Congressional mandates such as the Multiple Use-Sustained Yield Act of 1960 and the Healthy Forests Restoration Act of 2003.

Concern Statement: The plan seems heavy on dealing with trees but weak on other plant layers. (122.9)

Response: Other plant layers besides trees are addressed by the plan. A description of existing understory conditions was added to the plan in the background for the forested, woodland, and interior chaparral PNVTs. The plan also provides desired conditions for grasses, forbs, shrubs, native plants, and rare or unique plan communities in the "All PNVTs" section. Also, see the "Riparian," "Invasive Species," and "Grasslands" sections in chapter 2 for more plan direction for non-tree vegetation. Additions to plan appendix B ("Vegetation Conditions and Management

Practices”) were also made, see the bar graphs for each PNVT entitled “Herbaceous Understory Vegetation Conditions.”

Concern Statement: Use a "future range of variability" that accounts for foreseeable impacts of climate change and management effects in DEIS analysis and plan desired conditions. (162.3, 26.100)

Response: Reference conditions (based on the historic range of variation) and climate change were considered when determining the desired conditions. Reference conditions are considered a “best” estimate of a resilient and functioning ecosystem because they reflect the evolutionary and historical ecology of forests. Reference conditions are thereby a powerful template for improving the resiliency of fire-adapted forests. By restoring resiliency, current fire-adapted forests will be better able to adapt to climate change. Climate change is addressed throughout the plan: indirectly through desired conditions in the form of functional ecosystems and resilient landscapes and directly in management approaches and the monitoring strategy, where appropriate. Appendix A (“Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning”) in the plan provides a comprehensive discussion of climate change trends and Apache-Sitgreaves NFs land management planning.

Concern Statement: The Forest Service should apply the full body of available science to describe possible trajectories of plant community succession after fire under the management objectives described for each alternative. (26.106)

Response: The plant communities (PNVTs) assume a range of structure, composition, and dynamics characteristic to the ecosystem, including that successional patterns in the natural disturbance processes are intact. This is reflected in the Vegetation Dynamics Development Tool (VDDT) model, which is a state and transition model that shows probabilistic and not deterministic transitions for succession. PNVTs are used primarily as a descriptor of a vegetation community, and do not imply management toward a vegetative end-state. The desired conditions describe the range of conditions that are desired for each PNVT. The state and transitions inputs into the model used for the Apache-Sitgreaves NFs plan analysis were built using peer-reviewed literature and the best available science, including the Forest Service Southwestern Region’s calibration of the VDDT model using the fire and fuels extension of the Forest Vegetation Simulator (FVS) model runs conducted for prescribed fire under low-, moderate-, and high severity burning conditions, as well as for different wildfire probabilities (Weisz et al., 2012) Inputs for probability of occurrence under current management came from rates of treatment and known disturbances. The vegetation data on the distribution of states came from the mid-scale vegetation mapping assessment data provided by the Southwestern Regional Office following a nationally consistent process. The indices developed for comparing alternatives relate to specific desired conditions.

Concern Statement: There should be a large tree retention alternative. (26.124, 26.121, 26.123)

Response: Alternative D maximized this concept by including a standard to *“Retain all large and old trees regardless of size or condition.”* Environmental consequences of alternative D were analyzed and disclosed in the EIS, with greater detail addressed in specialist reports. Some consequences include the following: inability to restore forest interspaces, the need to manage for desired uneven-aged forest structure in many PNVTs, need to manage for desired tree species

composition, need to manage insects and diseases, need to remove hazard trees. The interdisciplinary team also considered a stricter version of this concept (see response to comment 26.118 in the "Vegetation" section of this appendix) but dropped it from further consideration because of the following factors: (a) use of fire as a management tool cannot be controlled to guarantee protection of every large tree on every acre burned and (b) maintaining every large tree within the Community Forest Intermix Management Area is not consistent with the defensible desired conditions adjacent to private communities. (also see response to comment below).

Concern Statement: An alternative should maximize retention of existing large trees (>16-inches diameter) outside of a wildland-urban intermix ("WUI") zone that includes forest lands located one-quarter (1/4) mile distant from established residential and other essential community infrastructure. (26.117)

Response: This comment describes alternative D almost exactly, which emphasizes retention of all trees ≥16 inches diameter on all acres treated by cutting, except inside the Community-Forest Intermix Management Area where some trees over 16 inches could be cut to meet fire hazard reduction needs. Sixteen inches diameter was used as a proxy for both large trees and old trees in the vegetation modeling analysis, because tree/forest age is not a factor in the model (Vegetation Dynamics Development Tool). Alternative D maximized this concept by including a standard to *"Retain all large and old trees regardless of size or condition."* The environmental consequences of alternative D were analyzed and disclosed in the EIS as unsustainable. The Community-Forest Intermix Management Area serves the purpose of a wildland-urban interface zone that includes forest lands located one-half mile distant from established residential and other essential community infrastructure. Reducing this distance to a quarter of a mile would jeopardize the effective safety zone in which firefighters can aggressively defend community perimeters.

Concern Statement: There is no scientific basis for extracting large trees to promote fire resistance in ponderosa pine and mixed conifer forest. (26.120, 26.167)

Response: Fire resistance is not a stand-alone desired condition in the plan for these potential natural vegetation types (PNVTs). Restoration to ecological function, integrity, and resiliency against uncharacteristic fire and insect/disease outbreaks as well as other severe disturbances is one goal (supported by Reynolds et al., 2013) among many others addressed in the plan's desired conditions for these forested PNVTs.

The plan neither mandates nor prohibits removal of large trees. The majority of forest restoration scientists and land managers agree that an arbitrary "one-size-fits-all" restoration approach is not scientifically sound and a site specific approach is needed (Allen et al., 2002; Brown et al., 2004; DellaSala et al., 2004; Covington, 2000). The choice to retain all, or remove some, large trees from any particular project area would still reside with the project interdisciplinary team's site specific analysis, as needed to move the area toward desired conditions including considerations for fire hazard, wildlife habitats, watershed stability, visual quality, and/or other multiple-use needs.

Removing some large trees may be needed on certain sites to move acres toward desired conditions for several ecological reasons:

- In order to attain the desired condition to have uneven-aged forest structures, some trees larger than 16 inches in diameter at breast height need to be removed. Brown et al. (2004) discusses using the "percentile method" as an acceptable forest restoration approach

which also happens to be a means of achieving uneven-aged forest structure. Studies (Abella et al., 2006; Triepke, et al. 2011) have shown that mandating the conservation of all trees greater than 16 inches in diameter creates the inability to develop or maintain uneven-aged forest structures. Retention of all trees greater than 16 inches in diameter obstructs establishment of ponderosa pine regeneration which would perpetuate even-aged forest structures in the ponderosa pine and dry mixed conifer PNVTs.

- Sites where understory trees are sufficiently large and dense, and/or have sufficiently large trees of less-fire-resistant species, that attempts to kill (thin) them with fire alone would run a high risk of also killing larger overstory trees near them (Brown et al., 2004; Allen et al., 2002; Arno and Fiedler, 2005; Fiedler et al., 2010).
- Mid-seral stands that are developing old-growth characteristics but are too dense and thus may need some variable-density thinning to mimic a clumpy distribution that can enable the old growth development trend to continue (Brown et al., 2004).
- Removal of insect-infested and/or disease-infected large trees within an area may be needed to help prevent outbreaks that would ultimately spread these damaging agents and destroy more large trees in the long-run. Widespread tree health decline and/or tree mortality in large numbers can contribute to abnormal fire behavior outside the natural fire regime for the ponderosa pine and dry mixed conifer PNVTs (Jenkins et al., 2014; Parker et al., 2006; Hoffman et al., 2007).
- Agee and Skinner (2005) recommend after large trees have been left in the short-term, provision must be made in the longer term for sufficient spatial variation in age classes to provide for replacement of the larger trees as they die. This case may exist on portions of the Apache-Sitgreaves NFs, especially in wildland-urban interface areas where all or the vast majority of large trees were left in fuels reduction treatments.
- All of the above reasons can be consistent with the localized need to reduce crown bulk density in the main canopy, and/or break up a continuous main canopy or continuous overstory of large trees in order to reduce crown fire spread potential, provided the resulting slash is treated effectively (Arno and Fiedler, 2005; Brown et al., 2004; Allen et al., 2002). Restoration of characteristic forest patterns (tree groups with interspaces, particularly in frequent fire forests) is key to restoring the low severity frequent fire regime on those acres (Abella, 2006; Reynolds et. al, 2013; Fiedler et al., 2010).

Concern Statement: An alternative should be analyzed in detail based on the Old Growth Protection and Large Tree Retention Strategy (OGPLTRS) collaboratively developed by the Four Forest Restoration Initiative (4FRI) public stakeholders, which could allow the plan to proceed with a lower risk of conflict. This should be a stand-alone action alternative based on the entire OGPLTRS as it was originally designed, or include it as a plan design feature common to all action alternatives. (26.118, 161.154, 161.76, 162.42)

Response: The plan's interdisciplinary team considered the public stakeholders' August 8, 2012 revised final and approved "Old Growth Protection Large Tree Retention Strategy" (OGPLTRS) (4FRI Stakeholders' Group, 2011a and 2011b) in its entirety, but recommended that it not be analyzed in detail. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS.

Although OGPLTRS does not dictate a universal upper cutting size limit (diameter cap); it does universally dictate keeping all pre-European-settlement (old) trees in all cases. The modeling tools used by Forest Service Southwestern Region and the Apache-Sitgreaves NFs for programmatic plan revision analysis (Forest Vegetation Simulator (FVS) and Vegetation

Dynamics Development Tool (VDDT) models) are not sensitive to the many fine-detailed facets of the stakeholders' OGPLTRS. However, alternative D was developed to capture relatively the same concept for tree retention on mechanically treated lands, and was modeled using tree diameter as a proxy for tree age, with the results disclosed in the EIS (see the "Vegetation" section in chapter 3) and in the "Forest Products Specialist Report" (Forest Service, 2014c). The plan does not need to incorporate the OGPLTRS because it directs project managers to retain appropriate amounts of large/old trees and/or old growth. The following are just a few of the plan decisions that provide this guidance,

> *"Old growth is dynamic in nature and occurs in well-distributed patches that spatially shift across forest and woodland landscapes over time." (desired condition in "All PNVTs")*
>
> *"Old or large trees, multistoried canopies, large coarse woody debris, and snags provide the structure, function, and associated vegetation composition as appropriate for each forested and woodland PNVT." (desired condition in "All PNVTs")*
>
> *"Where current forests are lacking proportional representation of late seral states and species composition on a landscape scale, old growth characteristics should be retained or encouraged to the greatest extent possible within the scope of meeting other desired conditions (e.g., reduce impacts from insects and disease, reduce the threat of uncharacteristic wildfire)." (guideline in "All Forested PNVTs")*
>
> *"Treatments should leave single or small groups of medium to large trees that are widely spaced with expanses of herbaceous vegetation and coarse woody debris to provide for soil productivity, traditional uses (e.g., piñon nut gathering), and wildlife needs such as foraging habitat for migratory birds (e.g., black-throated gray warbler, pinyon jay) and other birds." (guideline in "All Woodland PNVTs")*
>
> Also see response to comments 26.124, 26.121, and 26.123.

<u>Concern Statement:</u> Due to past losses, forbid the harvest of all old trees and old growth. Preserve and encourage the recovery of old growth. (5.5, 9.5 14.4, 23.5, 99.32)

<u>Response</u>: The plan was developed using the best available science for restoration and management of the various forest and woodland PNVTs (see the analysis results and literature citations/bibliographies in the plan, EIS, and supporting plan record of documents.) Forest Service policy also requires interdisciplinary specialists to use the best available science for their analyses at the project-level, to inform the deciding official.

The plan calls for managing old growth structural stages as a component of desired stand structure and arrangement (described in the PNVT desired conditions), as part of the ecosystem restoration/recovery effort. For example, in the ponderosa pine and dry mixed conifer forests, it is desired to manage for uneven-aged forest stands with a similar proportion of young-mid-old structural stages in small groups and patches throughout the stand. Every stand would be managed to have or develop these approximate structural stage proportions over time. But for infrequent fire forests (spruce-fir, wet mixed conifer), it is desired to manage for a landscape scale mosaic of early, mid, and late seral stages. In these infrequent fire forests, stand scale old growth structure is desired, but not for frequent fire forests (Reynolds et al., 2013).

To attain the desired condition of uneven-aged forest structures and desired arrangement, some old trees or old tree groups may need to be harvested. Studies (Abella et al., 2006; Triepke, 2011) have shown that a mandate to conserve all trees greater than 16 inches in diameter creates the inability to develop or maintain uneven-aged forest structures. A mandate which forbids cutting trees of a certain age or size in all cases on all sites is not appropriate for a programmatic land management plan. While recognizing that maximum harvest age or size may be useful or appropriate in isolated or site specific cases to move toward certain vegetation desired conditions, the plan neither dictates nor prohibits the use of any maximum harvest age, age class, diameter limit, or size class. A project level decision to implement management that would move the existing forest/woodland conditions away from the plan's desired conditions (either by reducing too many old trees or old growth, or by retaining too many) would be required to provide defensible rationale for a project specific amendment to the plan.

Concern Statement: Preserve and encourage the recovery of old growth. (94.5, 33.3, 3.15)

Response: The plan defines "old growth," "old growth components," and "old tree" according to the best available science on this topic for southwestern ecosystems. Old trees (see Keen's tree class number 4 in appendix B under "Age Classes Typically Occurring on the Apache-Sitgreaves NFs") are one component of old growth.

Large trees were removed in past timber sales. But many old growth acres set aside for protection from logging under the 1987 plan have subsequently been lost in large stand-replacement wildfires, notably the Rodeo-Chediski and Wallow Fires (ERI, 2011).

Many sections of the plan (see those listed in the response to comment # 26.118 in the "Vegetation" section of this appendix) provide numerous desired conditions, standards, and guidelines as direction for future management of old growth and its components, regardless of historical events. Project-level analysis and designs for restoration would need to comply with that plan direction. In addition to retaining characteristic amounts of existing large trees combined with other old growth components, maximizing vigor and growth of younger trees into older age classes is equally essential to promote old growth development across the landscape over time. In general, restoring forest health and natural processes to prevent further losses, and focusing on uneven-aged management for future development of more late-seral forest stages, should encourage recovery of old growth. Also see responses to comment numbers 21.1, 26.124, 26.117, 26.120, 26.118, 5.5, 26.112, 162.5, 26.189, and 26.111 in the "Vegetation" section of this appendix.

Concern Statement: The plan should include standards and guidelines that require assessment and designation of old growth habitat at site, watershed, and ecosystem scales, and allow management treatments within identified old growth only to enhance old growth characteristics, such as primary ecological functions mediated by fire. Standards and guidelines should specifically address the problem of fragmentation of old growth habitat and apply spatially- explicit analysis demonstrating that functional old growth ecosystems will be sustained over time under any chosen management alternative. (26.112, 26.113, 162.41, 26.115)

Response: The plan's desired conditions were developed to provide for a flow of old-growth conditions and function over time at the fine, mid, and landscape scales, which roughly approximate the site, watershed, and ecosystem scales. Ecological functions mediated by fire and

other historic disturbances include the presence of coarse woody debris, downed logs, snags, vertical canopy diversity, as well as distributions of large/old/decadent trees. The desired conditions provide for the presence of these characteristics, as well as spatial shifting or transition of old growth on the landscape over time, consistent with reference conditions. Where existing conditions differ from desired conditions, there is a need for change. Finer, more spatially explicit direction is determined at the project-level.

In southwestern frequent fire forests, old growth is naturally fragmented, and occurs as tree groups, clumps, individual trees, and occasional patches in an unevenaged forest landscape (Reynolds et al., 2013). The fragmentation concept is not applicable for frequent-fire forests in the Southwest; it is applicable to infrequent-fire forest ecosystems where large blocks of even-aged old growth develops and persists over long periods of time (e.g., coastal Douglas-fir or high-elevation spruce-fir), based on the ecology of those forests. For the spruce-fir/wet mixed conifer forest, the plan has a desired condition at the landscape scale that old growth occurs over larger areas as large patches, stands, or forests.

The plan does specify a desired condition for old growth throughout the landscape that shifts location over time as a result of succession and disturbance in ponderosa pine and dry mixed conifer. An intensely intermixed variety of age classes (i.e., fragmentation) is natural and therefore desired in these frequent fire forest types. Thus, designation of old growth stands or larger-scale areas is not consistent with the frequent fire forest desired condition to have old growth as a proportional component within every uneven-aged stand.

Also see responses to comments 21.1, 26.124, 26.117, 26.120, 26.118, 5.5, 162.5, 26.189, and 26.111 in the “General Comments” and “Vegetation” sections of this appendix.

Concern Statement: The EIS should provide a scaled analysis of the current status and projected future structure, composition, extent and distribution of old growth and compare effects of alternatives. (162.40, 26.110)

Response: Old growth is addressed as a component of vegetation structure within each forested, riparian forested, and woodland potential natural vegetation type (PNVT), which includes size and age classes and specific habitat features (i.e., old trees, dead trees (snags), downed wood (coarse woody debris)) rather than old growth as a unique vegetation type of its own. The scale in which old forest structure develops differs by the ecology of each forest type. For frequent fire forest types, old forest structure characteristically develops at the fine scale (sub-stand), and infrequently at the midscale (stand scale). For infrequent fire forest types, old forest structure characteristically develops as mid-scale patches (stand scale), patterned in the footprints of previous high-severity fires.

Analyses on the components of vegetation structure using the Vegetation Dynamics Development Tool (VDDT) model did make this comparison by alternative for current and future timeframes in the “Vegetation” section of the EIS. Vegetation structural states representing late developmental or “climax” forest for each PNVT were modeled. Some old trees and other old growth components are also included at the fine scale within the younger structural states modeled in VDDT. This analysis was conducted at the forestwide level, which includes aggregations of all three scales set forth in the plan. A more detailed analysis of existing old growth is not required.

During plan implementation and project design the Apache-Sitgreaves NFs conducts analyses using a variety of sources of forest succession and vegetation structural data that inform and

consider the existing spatial extent, distribution, and structural qualities of old growth at different scales when comparing existing conditions to desired conditions. Also see response to comment 26.112 in the "Vegetation" section of this appendix.

Concern Statement: Preserve old growth forest to mitigate effects of climate change. (162.5, 26.159)

Response: Forest carbon storage to mitigate climate change is optimized through a number of strategies depending on the PNVT. In some PNVTs carbon may be concentrated in late succession stands; and in other PNVTs, such as all-aged systems, carbon storage is maximized within stands relative to the resistance of the system from losses to fire, insects, and disease. Old growth stores carbon in the large trees, snags, logs, coarse woody debris, roots, and organic soil reserves. Some stands within spruce-fir and wet mixed conifer will reach old growth status, when a number of the large trees are in decline thus, only hold the carbon currently in their tissues or begin releasing some carbon through decay. Sequestration of additional large amounts of carbon from the atmosphere is performed by healthy, vigorously growing trees which absorb carbon dioxide and produce oxygen during consistently high rates of photosynthesis and respiration. It is recognized that herbaceous vegetation also serves the same function.

Thinning trees within and around old growth forest structure can reduce competition for limited resources, and thus, enable some level of continued carbon sequestration. Restoring natural processes that enabled old growth to develop will help maintain old growth on the landscape. Reducing risk of stand-replacement wildfire in frequent fire forest types will also help retain old growth and reduce massive carbon emissions should it burn severely. Large trees and old growth cannot be "preserved" in perpetuity because they are not static in permanent locations; they must be constantly shifting across the landscape with replacements in early- and mid-developmental stages concurrently moving toward climax or late-development stages. This ongoing replacement process usually takes many decades to centuries for completion before repeating again on the same acres. It is important to permit this process to complete the cycle and begin again, at the tree group and/or stand scale (see old growth "scale" response to comments **162.40 and 26.110)**. The plan provides extensive direction to maintain adequate proportions of old growth in balance with younger, healthier forest and herbaceous vegetation, which can help to mitigate climate change. Also see responses to comments 21.1, 26.124, 26.117, 26.120, 26.118, 5.5, 26.189, and 26.111 in the "General Comments" and "Vegetation" sections of this appendix.

Concern Statement: Removal of large, mature or old growth trees may constitute an irretrievable commitment of resources. (26.189)

Response: Irretrievable is a term that applies to the loss of production, harvest, or use of natural resources (Forest Service Handbook 1909.15). These opportunities for use are those lost for a period, but could be regained, such as younger trees growing into older trees. The plan would allow the removal of some large, mature, and old trees as needed to restore forest conditions toward those similar to natural conditions, which would improve resiliency and the evolutionary environment of these forests, providing the best opportunity for trees of all age classes to persist and adapt to future climates (Reynolds et al., 2013).

Yet, because the plan does not directly authorize or mandate any site specific project or activity (including ground-disturbing actions like tree cutting), the plan cannot cause an irretrievable commitment of resources. Future project-level decisions under the plan may result in potential

irretrievable commitments of resources, which would be disclosed accordingly with each project site specific analysis. This distinction is clearly stated in the EIS, and in the "Forest Products Specialist Report" (Forest Service, 2014c), "Vegetation Specialist Report" (Forest Service, 2014g), and "Forest Health Specialist Report" (Forest Service, 2014b).

Concern Statement: Clarify the All PNVT desired conditions and guidelines (e.g., "…reduce potential for damage to residual vegetation in order to prevent premature or excessive mortality", "landscape scale restoration projects should be designed to spread out treatments…", "restoration methods…should leave a mosaic of undisturbed areas…", fire "may be used to meet desired resource conditions…") by removing conflicting program direction (fire program direction versus direction for soil, watershed, wildlife, and other resource programs). (108.184, 108.183)

Response: The desired conditions and guidelines have been developed in an interdisciplinary process to minimize conflicting direction. Desired conditions describe the desired outcomes for a particular resource (e.g., watershed, soil, wildlife, individual potential natural vegetation types (PNVTs)). A new section entitled "Wildland Fire Management" has been added to the plan to better clarify the forests' management approach for wildland fire.

How and when individual projects are applied within a landscape would be evaluated during the project-level NEPA analysis. Treatments (e.g., burning, thinning) are commonly applied in mosaic patterns to meet the needs of the vegetative communities and desired conditions. Additionally, the use of fire can help to achieve a mosaic pattern within the landscape because fire rarely carries the same severity and intensity through an entire project area.

Although some plan decisions (e.g., "reduce potential for damage to residual vegetation") may seem to conflict with the forests' intent to use fire as a tool, they do not because fire has played an important ecological role in shaping the vegetation on the Apache-Sitgreaves NFs. The PNVTs are adapted to recurring wildfires started by lightning from spring and early summer thunderstorms. A primary emphasis area for the plan is to manage for desired fire regimes and restore fire to a more natural role as one of the forests' primary disturbance agents. The use of fire is a tool to help maintain or move towards desired conditions similar to a mechanical treatment or a fish barrier. When using fire as a tool, managers design their burning activities based on constraints described in the standards and guidelines and to maintain or move towards desired conditions.

Concern Statement: Since climate change is a major factor that determines stand density and species composition, explain the meaning of the All PNVT desired condition, "Stand densities and species compositions are such that vegetation conditions are resilient under a variety of potential future climates" (proposed plan p. 29). (102.10)

Response: Effects of climate change upon vegetation conditions were addressed in various sections of the EIS. To the extent that existing native species have evolved under various climatic conditions over geologic time, it is likely that there are some species better suited to survive and/or adapt to whatever climate change occurs.

This desired condition means the vegetation conditions (vegetation species and diverse genetic phenotypes within each species, critical symbiotic relationships with other species, structural arrangement, function, and natural disturbance patterns) are intact, healthy, and functional as much as possible to enable forest and woodland vegetation to retain their capability to survive

and/or adapt to potential future climate changes. Structural arrangement, such as stand density, needs to be suited to the desired tree species' needs (shade-tolerant or shade-intolerant, fire-adapted or non-fire-adapted, etc.). Desired conditions are described at three scales (fine, mid, and landscape). The mid-scale (100 to 1,000 acres) is roughly equivalent to stand size. See definition of "stand" in the plan's glossary.

Concern Statement: Modify All PNVTs Desired Condition (proposed plan p. 29) "Herbivory is in balance with available forage (i.e., grazing and browsing by authorized *and unauthorized* livestock, wild horses, *feral horses and hogs,* and wildlife do not exceed available forage production within established use levels)." (101.47)

Response: The desired condition was not modified. The intent of this desired condition is to manage allowable use levels for livestock authorized under a permit and wild horses in consideration of wildlife needs. A definition for feral horses was added to the glossary to help reduce confusion with the term "wild horses." Feral hogs fall under the definition for unauthorized livestock.

Concern Statement: Add a desired condition to All PNVTs (proposed plan p. 29) "The A-S is free of unauthorized, feral, and trespass livestock." There is concern over the negative impacts of unauthorized, feral, and trespass livestock on wildlife habitat. (101.48)

Response: Unauthorized livestock (including feral and trespass) are prohibited on National Forest System land by regulation (36 CFR 261.7). There is not a need to repeat existing law and regulations in the plan. The plan does provide direction to manage plants and animals that do, or have the potential to do, ecological or economic harm in the "Invasive Species" section of the plan in chapter 2. The Forest Service added a discussion about feral horses within this section. A definition for feral horses was added to the glossary of the plan.

Concern Statement: Modify All PNVTs Desired Condition (proposed plan p. 30) "Herbaceous vegetation amount and structure (e.g. plant density, height, litter, seed heads) provides habitat to support *wildlife, including* prey species." (101.49)

Response: The desired condition under the "All PNVTs" section of the plan has been modified as suggested above for completeness.

Concern Statement: Stress the need and intent to focus mechanical thinning efforts on the overabundant small diameter trees within the forested vegetation types. (101.23)

Response: The suggested further emphasis is not needed. Departure indices stated in the plan's "Background" section for each different forested PNVT describe which size classes are in excess of desired. Vegetation bar graphs in plan appendix B ("Vegetation Conditions and Management Practices") display the disproportionate excesses of small size class states with respect to desired levels across the Apache-Sitgreaves NFs. The commenter's stressed need may be the case on many forested acres, but not necessarily on all. The site specific excesses or deficits of certain tree size classes must be determined for each project area by the project interdisciplinary team, with respect to moving that area toward desired conditions. The plan's desired conditions emphasis for having uneven-aged forest structure on the majority of forested PNVT acres is key direction to ensure that the correct proportions of small to medium to large diameter trees will occupy most acres treated mechanically.

<u>Concern Statement:</u> Appropriate tree stocking levels should be maintained on suitable timberlands regardless of whether the land is treated by mechanized harvest or by fire. Apply to fire the All Forested PNVTs standard "On lands suitable for timber production, timber harvest activities shall only be used when there is reasonable assurance of restocking within 5 years after final regeneration harvest …" (proposed plan p. 36). (108.187)

<u>Response</u>: This standard is included in accord with the provisions of the 1982 Planning Rule (§ 219.27 (b)(2) and (c)(3)) for legal compliance with the National Forest Management Act. It generally applies to "final regeneration harvest" cuts which are implemented with the intent of creating a new generation of tree seedlings. The intended use of wildland fire as a management tool often is not to create a new generation of trees. However, in response to this comment, this plan standard has been modified with added text to now read:

> *"On lands suitable for timber production, timber harvest activities shall only be used when there is reasonable assurance of restocking within 5 years after final regeneration harvest. This also applies where wildland fire is used to create openings for tree regeneration purposes on suitable timberlands. Restocking level is prescribed in a site specific silviculture prescription for a project treatment unit and is determined to be adequate depending on the objectives and desired conditions for the plan area. In some instances, such as when lands are harvested or prescribed burned to create openings for firebreaks and vistas or to prevent encroaching trees, it is appropriate not to restock."*

For consistency, the thirteenth monitoring question of the plan's "Monitoring Strategy" (chapter 5) was revised to now read:

> *"Are forest and woodland stands adequately restocked within 5 years of final harvest treatment or after fire-created regeneration openings?"*

Furthermore, Forest Service Manual 2400, Chapter 2470 requires reforestation tracking that ensures each area deforested or understocked by natural causes, fire, or harvest is planned for either reforestation treatment or natural regeneration, or a mix of both. Lands planned for artificial and/or natural recovery are tracked until they are certified as stocked. Chapter 2490 requires a reforestation needs assessment to be done immediately following fires or other natural disasters on both suitable and non-suitable timberlands.

<u>Concern Statement:</u> Clarify the Spruce-Fir desired condition "The wildland-urban interface (WUI) is comprised primarily of grass/forb/shrub vegetation. Structures in the WUI are surrounded by grassy openings with very few or no trees. These conditions result in ground fires." (proposed plan p. 48). If there are no WUIs in spruce-fir, this desired condition should be removed. (99.2)

<u>Response</u>: The Apache-Sitgreaves NFs contain over 3,000 acres of spruce-fir forest potential natural vegetation type (PNVT) in WUI areas (including areas within the Apache County and Greenlee County Community Wildfire Protection Plans) on the Alpine and Springerville Ranger Districts.

The desired condition stated in this comment reflects the characteristics of the primary species in this forest type, which are shade-tolerant and not wind-firm. Thus, thinning them to the degree needed for WUI fuels reduction objectives would not be sound silviculture. Likewise, this desired condition is needed because leaving spruce-fir stands or large groups in a densely-stocked

condition for the shade and wind-firmness these species require is inconsistent with WUI fire hazard reduction objectives directly next to structures.

Concern Statement: Increase the targeted acreage of aspen forests (proposed plan p. 50). (162.83)

Response: The plan's objective is for maintaining no less than 50,000 acres of aspen on the Apache-Sitgreaves NFs (which is the general historic level of aspen on the forests); it does not set that as the upper limit of aspen occurrence.

Concern Statement: Modify the Aspen guideline, "To preclude concentrated herbivore impacts, new surface water development should not be constructed within proximity to aspen stands (approximately ¼ mile)" (proposed plan p. 50) by increasing the distance to several miles. (162.84)

Response: The guideline has not been modified based on this comment. The interdisciplinary team considered other distances for this guideline. However, one-quarter mile was chosen for the following reasons. Where aspen normally occurs, surface water developments are usually located to draw herbivorous livestock and wildlife away from pressuring riparian areas. The plan's objective is to maintain 50,000 acres or more of aspen on the Apache-Sitgreaves NFs. The existing aspen acreage comprises numerous small, dispersed aspen clones, many of which are within one-half mile of each other, and/or within one-half mile of riparian areas. Setting a distance greater than one-quarter mile up to several miles away from one aspen clone becomes a self-defeating exercise by forcing that water development to automatically be located too close to another aspen clone or riparian area.

Concern Statement: Add a guideline to restore large predator populations, in particular wolves, to restore healthy aspen stands. (162.85)

Response: This comment is outside the scope of the plan. Wildlife populations are managed by the state of Arizona (Arizona Game and Fish Department). The plan does include a management approach in the "Forests: Aspen" section which says,

> *"The forests work with the AZGFD to address concerns about aspen reestablishment in both the short and long term."*

Concern Statement: In the background for Forests: Aspen (Proposed Plan, page 49), add lack of large predators and ungulate browsing as causal agents behind aspen decline. (162.88)

Response: The suggested plan addition has not been made. Ungulate browsing effects are already addressed in the plan's aspen section and in the EIS ("Vegetation" and "Forest Health" sections in chapter 3) as contributors to aspen decline. While there may be a potential link demonstrated between large predators and ungulate browsing on aspen in Yellowstone National Park (Ripple and Beschta, 2011), this has not yet been demonstrated on the Apache-Sitgreaves NFs (Beschta and Ripple, 2010). Predators are only one means by which ungulate numbers, locations and/or timing impacts on aspen could be controlled (Eisenberg et al., 2013) but management of predators and wild ungulates is beyond the scope of the plan and is the responsibility of the Arizona Game and Fish Department. Also see the response to comments 101.20 and 101.19.

<u>Concern Statement:</u> What is meant by "overmature" aspen clones in the second guideline "Restoration of aspen clones should occur where aspen is overmature or in decline to maintain a sustainable presence of this species at the landscape level" (proposed plan p.50)? Large, old aspen should not be removed to make way for small aspen, since small aspen are harder to protect from browsing and therefore difficult to keep alive. Maintaining mature aspen will ensure that there is a live root stock in soils to create new suckers after disturbance events. Please clarify this guideline so that it does not suggest the removal of "overmature" aspen. (162.87)

<u>Response</u>: Trees which are determined to be "overmature" are those which will soon lose their ability to reproduce successfully. The ultimate biological age at which any tree species can lose its vigor and ability to reproduce successfully, is just one of several considerations used for proper management of that tree species. This age can vary from one aspen stand or clone to another based on several factors, such as site quality, tree or clonal health/insect/disease issues, genetic phenotype, root carbohydrate reserve levels, time since origin and disturbance, and ability to reproduce vegetatively versus sexually. Overmature aspen are generally those which have lost their hormonal chemistry and vigor that give them the ability to stimulate new vegetative suckers in response to aspen tree mortality.

Removing overmature aspen trees (either by cutting, girdling, or burning) is a standard practice used to stimulate clonal root sucker production (DeByle and Winokur, 1985). The 1987 plan sets this age class at 80 to100 years. The revised plan does not define a set age for aspen over-maturity in recognition of the above variables. Instead, it leaves this site specific determination to be made by a qualified specialist during project-level analysis, using site and clonal conditions with best science available at the time. Maintaining mature aspen is desired. Removal of over mature aspen is precisely the intent of this plan guideline to regenerate this species where needed for maintaining it on the landscape. Therefore this guideline will not be changed.

The concern regarding protecting small aspen from ungulate browsing damage is addressed in the plan's "Forests: Aspen" section through the following:

> *"Areas of aspen occur across the forested landscape and are successfully regenerating and being recruited into older and larger size classes. Size classes have a natural distribution, with the greatest number of stems in the smaller size classes." (Desired Condition)*
>
> *"Aspen restoration and retention efforts should include measures to ensure viability of the aspen stand."(Guideline)*
>
> *"Management activities that kill or stress overstory trees (e.g., clearcutting, fire) may be used since they mimic natural disturbances and enhance aspen regeneration. Aspen restoration efforts may include providing/improving substitute forage away from aspen, removing conifer competition, fencing to exclude ungulates, and range management practices (e.g., salt locations;, herding; timing, intensity, frequency, and duration of livestock use). (Management Approaches)*

In addition, the plan's "Livestock Grazing" section contains the guideline that reads, in part,

> *"Salt or nutritional supplements should also be located to minimize herbivory impacts to aspen clones."*

<u>Concern Statement:</u> There is a need for further research and monitoring to improve understanding of the complex relationship among aspen and other factors and to support development of management responses. (101.19, 102.38)

<u>Response</u>: The best available science on aspen physiology, silvics, management, and recent contributors to aspen decline have been consulted and discussed in the EIS analyses, as well as direction provided in the plan for aspen as an ecological indicator. The "Research Needs" section of appendix B ("Description of the Analysis Process") identifies the aspen topic as a need for additional research. In recognition of this need for more information and adaptive management, the plan recommends the new Corduroy Research Natural Area be established on the Alpine Ranger District to provide researchers a controlled aspen area for study under various management actions and climate trends. The plan's "Monitoring Strategy" in chapter 5 also includes aspen data collection as a plan ecological indicator.

The responsibility to conduct and publish research is held by the research branch of the Forest Service, often in cooperation with accredited universities (Forest Service Manual 1400). The executive branch of the agency charged with administering national forest lands may assist researchers, but is usually limited to conducting monitoring and issuing permits for formal research projects.

<u>Concern Statement:</u> Aspen and willow recovery should be described as a forest health issue and not attributed to herbivory alone. (109.23, 109.24)

<u>Response</u>: The added descriptions requested are not needed. Aspen health and recovery with respect to numerous factors (in addition to herbivory) are already summarized in the plan (see the "Forests: Aspen Background" section in chapter 2). The plan's desired conditions, guidelines, and management approaches sections further provide direction to address other aspen management issues not caused by ungulates. The existing condition of aspen (affected environment) is also summarized in the EIS "Forest Health" section in chapter 3, wherein multiple factors affecting aspen health are discussed. Effects of management direction in alternative B (the plan) upon aspen health and function in the ecosystem are fully disclosed in the EIS. Also see the response to comment numbers 101.20 and 162.88 in the "Vegetation" section of this appendix.

The plan lists three riparian forested PNVTs in which willows are found. The plan's background for the "Riparian Areas" section in chapter 2 states that water diversions for agriculture, several changes in watershed condition due to various factors, and drought are also responsible for willow community declines, in addition to past grazing impacts.

<u>Concern Statement:</u> Large old piñons should be preserved and not cut during restoration, habitat, or structural treatments. This should be reflected in the All Woodland PNVTs objectives and guidelines. (162.90, 162.89)

<u>Response</u>: The requested additions are not needed. The "All Woodlands" section, a guideline for All Woodland PNVTs which includes large native trees was modified to clarify wildlife needs, and now reads:

> *"Treatments should leave single or small groups of medium to large native trees that are widely spaced with expanses of herbaceous vegetation and coarse woody debris to provide for soil productivity, traditional uses (e.g., piñon nut gathering), and wildlife*

> *needs such as foraging habitat for migratory birds (e.g., black-throated gray warbler, pinyon jay) and other birds."*

Because piñon pines typically grow on poorer sites and thus grow very slowly with narrow annual growth rings, leaving large diameter trees usually equates with old trees.

Concern Statement: The need for some closed condition woodlands should be reflected in the All Woodland PNVT guidelines. (162.91)

Response: The requested guideline has not been added. The desired conditions for woodlands by density class (canopy cover used as a proxy) differ somewhat by each woodland potential natural vegetation type (PNVT). Desired closed canopy conditions for woodlands have been defined for seedling and sapling sized trees (state E), small sized trees (state F), and medium to very large sized trees (state G). Desired percentages of closed canopy woodlands consisting of various tree size classes can be found in the "Vegetation Conditions and Management Practices" portion of appendix B of the plan for both woodland PNVTs. An existing "All Woodlands" guideline partially address this concern; it states,

> *"Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife."*

In addition, the plan includes a desired condition for the "Piñon-Juniper-Persistent Woodland" which states,

> *"Tree canopy cover is closed (greater than 30 percent)…"*

However, closed canopy is not a desired condition for the piñon-juniper–savanna woodland fire regime (Margolis, 2014), and thus, such an addition to the "All Woodlands" section is not appropriate.

Concern Statement: Clarify the statement in background for Woodlands: Piñon-Juniper, "There are too many medium to very large trees with open canopies... and small to medium size trees with open or closed canopies." (proposed plan p. 54) How can it be true that all of these conditions are simultaneously overrepresented? (162.92)

Response: The wording has been updated to read:

> *"When compared to desired conditions, there are too many medium to very large trees with open and/or closed canopies. While there are too few seedlings, saplings, and small trees with open and/or closed canopies, understory vegetation is lacking in many areas."*

The size classes "medium to very large trees" and "small trees" are distinct size classes. The terminology may be slightly confusing; however, these are defined in the appendix B ("Vegetation Conditions and Management Practices") of the plan.

Concern Statement: Clarify whether piñon-juniper woodland refers only to those areas where piñon-juniper occurred historically. (108.219, 108.233)

Response: The piñon-juniper woodland potential natural vegetation type (PNVT) refers to the historic extent of piñon-juniper based on analysis by The Nature Conservancy (Vander-Lee et al.,

2006) and further refinement of the Apache-Sitgreaves NFs terrestrial ecosystem survey (TES). The background of the "Woodlands: Piñon-Juniper" section of the plan explains,

> *"many areas that appear to be piñon-woodland are actually Great Basin grassland that has been encroached by woody species."*

Concern Statement: Modify Piñon-Juniper Savanna Desired Condition (proposed plan p. 54) " Scattered shrubs and a continuous herbaceous understory, including native grasses, forbs, and annuals, are present to support a natural fire regime *and provide for wildlife needs*." (101.54)

Response: The desired condition was not modified. Wildlife needs are provided for in other desired conditions, objectives, standards, and guidelines throughout the plan.

Concern Statement: Modify Piñon-Juniper - Persistent Woodland Desired Condition (proposed plan p. 54) "Grass and forb cover is maximized, based on site capability, to protect and enrich soils *and provide for wildlife needs*." (101.55)

Response: The desired condition was not modified. Wildlife needs are provided for in other desired conditions, objectives, standards, and guidelines throughout the plan.

Concern Statement: Adopt desired condition wording from the Kaibab NF draft plan "Understory composition is within the natural range of variation and contains diverse native herbaceous plant species that provide nutrition for pronghorn and other species. Depending on soil type, ground cover typically averages 50% live vegetation and 50% nonliving vegetation, with vegetation composition averaging 40 to 60 percent grass, 10 – 30 percent forbs and 5 to 15 percent shrub." (132.34)

Response: The suggested desired condition was not added to the plan. The desired levels of ground cover are addressed in desired condition in the "All PNVTs" and "Soils" sections relative to soil protection, erosion, water infiltration, and the ability to carry frequent fire and provide wildlife habitat,

> *"Soils provide for diverse native plant species[1]. Vegetative ground cover (herbaceous vegetation and litter) is distributed evenly across the soil surface to promote nutrient cycling, water infiltration, and maintain natural fire regimes" (Soils)*
>
> *"Vegetative ground cover (herbaceous vegetation and litter) is optimized to protect and enrich soils and promote water infiltration." (All PNVTs)*

In addition, a fine scale desired condition in the "Grasslands" section of the plan more specifically addresses vegetation cover for grasslands.

> *"Average herbaceous vegetation heights[2] vary by grassland PNVT and yearly weather conditions. Ungrazed herbaceous vegetation heights[3] range from 7 to 29 inches in Great*

[1] Species composition and cover amounts and the amount of vegetation and litter needed for soil protection are described by ecological unit in the "Terrestrial Ecosystem Survey for the Apache-Sitgreaves National Forests" (Laing et al., 1987, as amended).

[2] Measured on ungrazed plants as an indicator of vigor.

> *Basin grasslands, 7 to 26 inches in montane/subalpine grasslands, and 10 to 32 inches in semi-desert grasslands." (grasslands)*

Other desired conditions that provide for vegetative ground cover are included in the "Soils," "All PNVTs," and "Riparian Areas" sections.

In addition, a standard was added to the "All PNVTs" section to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential.

Concern Statement: Modify Grasslands Desired Condition (proposed plan p. 56) "*Herbaceous vegetation* and litter provides for and maintains the natural fire regime (fire regime I)..." (101.56)

Response: The grassland desired condition "Litter provides for and maintains the natural fire regime (fire regime I and II)" was modified to read,

> *"Herbaceous vegetation and litter provide for and maintain the natural fire regime (fire regime I and II)."*

Concern Statement: Clarify the Grasslands desired condition "Prairie dogs are present and support healthy grassland soil development and the diversity of other species associated with them such as the western burrowing owl" (proposed plan p. 56). Concern that prairie dogs will create areas that do not meet the cover and height guidelines and will have a very low similarity index (proposed plan p. 57). (102.41, 131.20, 108.234, 108.155, 123.21, 102.59)

Response: Desired conditions are described at various scales reflecting appropriate ecological structure, function, and processes. To reflect that healthy grasslands are not fully occupied by prairie dog colonies, the desired condition has been moved from the landscape to the midscale level. Desired ungrazed herbaceous vegetation heights have been clarified and as a fine scale desired condition these are not expected to occur across the landscape.

Concern Statement: Clarify the Grasslands desired condition, "The extent, abundance, cover and composition of grasslands is maintained or reestablished and moving closer to reference conditions" (proposed plan p. 56). What does "abundance" of grasslands mean? (102.42, 108.156, 138.45)

Response: This desired condition statement was rewritten for clarification. The plan's use of "abundance" is consistent with the traditional definition, which may be found in any standard dictionary.

Concern Statement: Clarify the Grassland desired conditions and guidelines by removing conflicting program direction with fire. (108.188)

Response: The plan has been developed in an interdisciplinary process to minimize conflicting direction. No conflicts between the desired conditions for grasslands and the management

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[3] Plant height source material: Vine 1960; Hermann 1970, 1975; Hitchcock and Chase 1971; McDougall 1973; Correll and Correll 1975; Gould 1977; Martin and Hutchins 1980; Benson and Darrow 1981; Hickman 1993; Cronquist et al. 1997; Ruyle and Young 1997; Welsh et al. 1997; Hurd et al. 1998; Barkworth et al. 2003, 2007; Flora of North America 2008; and Springer et al. 2009. See the plan for reference citations.

direction for fire have been identified. As noted in the background of the "Grasslands" section in chapter 2 of the plan,

> *"fire plays a key role in the maintenance of the forests grasslands."*

Prescribed fires and managed wildfires used to meet desired conditions would be mitigated for the protection of vegetation at the project-level.

Concern Statement: Explain, modify, or remove the Grasslands desired conditions: "The extent, abundance, cover, and composition of grasslands is maintained or reestablished and moving closer to reference conditions. Ground cover is 35 percent or greater and herbaceous vegetation height ranges from 10 to 31 inches depending on grassland type.", "Vegetative cover (herbaceous ground cover and litter) is between 45 and 80 percent in Great Basin grasslands, 35 to 70 percent in semi-desert grasslands, and 60 to 100 percent in montane/subalpine grasslands. These percentages may vary depending on the amount of surface rock as described in each ecological mapping unit.", "Average ungrazed grass height varies by grassland PNVT and yearly weather conditions. Grass heights range from 11 to 26 inches in Great Basin grasslands, 10 to 25 inches in montane/subalpine grasslands, and 13 to 31 inches in semi-desert grasslands", "During the critical pronghorn fawning period (May through June), cool season grasses and forbs provide nutritional forage; while shrubs and standing grass growth from the previous year provide adequate hiding cover (10 to 18 inches) to protect fawns from predation." (proposed plan p. 56-57). There are concerns that the specified amounts may not be achievable. (102.44, 30.8, 139.3, 131.19, 131.13, 123.5, 108.24, 102.43, 123.4)

Response: Each of these desired conditions was rewritten for clarity and to incorporate new information. Specific ground cover ranges for grassland types were removed from this section, as the range of groundcover represented across the forest is variable and depends on many factors, including soil type, surface rock, and overstory canopy cover. In addition, grass heights were updated to represent research and taxonomic descriptions of individual plants. All references used in determining the range of plant heights are found within footnotes of the desired conditions.

The desired levels of ground cover are addressed in the desired condition in the "All PNVTs" section:

> *"Vegetative ground cover (herbaceous vegetation and litter) is optimized to protect and enrich soils and promote water infiltration."*

The amount of groundcover needed to protect soils is estimated in the TES and can be modified with detailed site specific investigations.

Concern Statement: The Forest Service should measure both grazed and ungrazed plants to determine the actual height distributions of grasslands (proposed plan 56-57). (162.95, 162.96)

Response: Desired condition statement was rewritten for additional clarification following accepted forest protocols. In addition, comparison of grazed and ungrazed plants is employed for determining percent utilization of plants to determine whether site specific forage use objectives are being met and is commonly done at the project-level. In this case, measurement of ungrazed

plants is an indicator of a sites' production potential and to determine relative plant health and vigor.

Concern Statement: Herbaceous cover and height desired conditions, standards and guidelines significantly exceed those attributes ranges found in NRCS ESI documents, which are much more current than FS inventories. (30.2)

Response: These are not Forest Service documents, standards, direction or policy. The plan's desired conditions for herbaceous cover and height are based upon the Apache-Sitgreaves NFs terrestrial ecosystem survey (TES) and research relevant to the forests, including taxonomic descriptions of individual plants. The plan describes the forests' management approach to update the TES to reflect current conditions and concepts (see the "Soil" section in chapter 2).

Concern Statement: Explain, modify, or remove the Grasslands guideline "Grasslands and openings should provide for sufficient vegetative ground cover (45 percent or greater in Great Basin grasslands, 35 percent or greater in semi-desert grasslands, and 60 percent or greater in montane/subalpine grasslands) to prevent accelerated erosion, dissipate rainfall, facilitate the natural fire regime, and provide wildlife and insect habitat" (proposed plan p. 57). There are concerns that the specified amounts may not be achievable or measurable. (108.25, 138.26, 30.9)

Response: This guideline has been deleted. These concepts are covered by desired conditions in the "Grasslands" and "All PNVTs" sections. For example, the "All PNVTs" desired condition reads,

> *"Vegetative ground cover (herbaceous vegetation and litter) is optimized to protect and enrich soils and promote water infiltration."*

The ground cover amounts and grass heights are considered to be achievable and measureable.

Concern Statement: Explain why other vegetation types do not have a standard like the one for Grasslands "A moderate to high similarity to vegetation climax conditions for plant canopy cover and composition as described in each ecological mapping unit shall be achieved and/or maintained" (proposed plan p. 57). (127.24)

Response: The standard has been rewritten for clarity and moved to the "All PNVTs" section to make it applicable to not only grasslands but all vegetation types. It reads,

> *"Within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential."*

Concern Statement: Provide more details in the Grasslands standard "A moderate to high similarity to vegetation climax conditions for plant canopy cover and composition as described in each ecological mapping unit shall be achieved and/or maintained" (proposed plan p. 57). There is a concern that it points to other documents and is not the best method to convey the details of the standard. (132.33, 108.239)

Response: The standard has been rewritten for clarity and moved to the "All PNVTs" section. It no longer points to a specific methodology or document (see comment above). Forest Service

policy (e.g., manuals, handbooks) describes approved methods for measuring whether a project contributes to moving plant composition to, or maintaining at, site potential.

Concern Statement: Similar guidelines are presented on page 57 of the proposed plan as objectives at different scales and as guidelines for Grasslands. These should be removed. (102.46)

Response: The guideline to provide sufficient vegetative ground cover was removed because the concept was covered under desired conditions in the "All PNVTs" and "Grasslands" sections. The desired conditions read,

> *"Vegetative ground cover (herbaceous vegetation, litter, and woody riparian species) is optimized4 to protect and enrich soils and promote water infiltration. There is a diverse mix of cool and warm season grasses and desirable forbs species." (All PNVTs)*
>
> *"Average herbaceous vegetation heights[5] vary by grassland PNVT and yearly weather conditions. Ungrazed herbaceous vegetation heights6 range from 7 to 29 inches in Great Basin grasslands, 7 to 26 inches in montane/subalpine grasslands, and 10 to 32 inches in semi-desert grasslands." (grasslands)*

Concern Statement: Keep the Grasslands guideline "Mechanical restoration of grasslands should emphasize individual tree removal to limit soil disturbance" (proposed plan p. 57). Fire may be enough to remove excess woody vegetation, but if mechanical methods are used, they should be applied on a tree-by-tree basis and retain fragile soils. (162.97)

Response: The guideline remains in the plan. This guideline does not exclude the use of fire.

Concern Statement: The reintroduction of fire, combined with long term rest from livestock grazing, should be implemented to restore grasslands to their full capacity. (162.94)

Response: There are many ways that grasslands can be restored to their full capacity. The plan does not limit options and provides an objective to accomplish restoration. The objective is to treat (mechanically or with fire) up to 25,000 acres annually to decrease or maintain woody canopy at less than 10 percent.

A primary emphasis area for the plan is to manage for desired fire regimes and restore fire to a more natural role as one of the forest' primary disturbance agents. In particular, the "Grasslands" section of the plan describes the fire regime and fire return interval desired conditions for the three grassland types. There is an emphasis to provide enough grass to reduce topsoil loss and allow fire to spread and resume its role in maintaining grasslands.

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[4] Based on site capability as defined by the specific ecological unit under consideration in the "Terrestrial Ecosystem Survey for the Apache-Sitgreaves National Forests" (Laing et al., 1987, as amended).

[5] Measured on ungrazed plants as an indicator of vigor.

[6] Plant height source material: Vine 1960; Hermann 1970, 1975; Hitchcock and Chase 1971; McDougall 1973; Correll and Correll 1975; Gould 1977; Martin and Hutchins 1980; Benson and Darrow 1981; Hickman 1993; Cronquist et al. 1997; Ruyle and Young 1997; Welsh et al. 1997; Hurd et al. 1998; Barkworth et al. 2003, 2007; Flora of North America 2008; and Springer et al. 2009. See the plan for reference citations.

Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of this analysis. Grazing is authorized through term grazing permits (a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Changes to these authorizations would be made through project-level analyses.

Concern Statement: Concern that plan desired condition to reestablish the historic fire frequencies in grasslands, especially desert grassland and Great Basin grassland, may not be feasible or practical and will not necessarily reduce the shrub cover to historic levels. (102.58)

Response: The "Vegetation" section in chapter 3 of the EIS acknowledges this concern and discloses that some portions of these grasslands may not be restorable.

> *"Currently, much of this grassland more closely resembles woodland than grassland. Overall, approximately 68 percent, or nearly 126,200 acres, of this grassland have been encroached by woody species, primarily piñon and juniper. According to Vander Lee et al. (2006) approximately 70 percent of these encroached acres may be non-restorable to their former grassland state. Historically, these grasslands were dominated by herbaceous vegetation." (Grassland PNVTs – Great Basin)*

> *"Currently, much of this grassland more closely resembles woodland than grassland. Overall, approximately 80 percent, or nearly 85,600 acres, of this PNVT has been encroached by woody species, primarily juniper and mesquite. According to Vander Lee et al. (2006) approximately 36 percent of these encroached acres may be non-restorable to their former grassland state. Historically, these grasslands were dominated by herbaceous vegetation." (Grassland PNVTs – Semi-Desert)*

There are many ways that grasslands can be restored. The plan does not limit options and provides objectives to accomplish restoration. Specific treatments would be determined at the project level.

Wildland Fire Management

Concern Statement: Correct the list and community-forest intermix management area showing the Community Wildlife Protection Plan WUI (wildland-urban interface) areas. Areas in Greenlee County are missing. Explain why the CWPP area's in Apache and Navajo counties are surrounded with a designation of "General Forest" and the CWPP area in Greenlee County is surrounded by a designation of "natural landscape." (103.1, 103.2, 103.6)

Response: No changes were made to the list or management area. The Community Forest Intermix Management Area consists of National Forest System (NFS) lands within one-half mile of communities-at-risk. The 12 communities-at-risk listed in the EIS are those identified as "Urban Wildland Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire" within the Federal Register (66 FR 751-777). The communities are referenced under the heading "National Fire Policy and Wildland-Urban Interface" within the "Fire" section in chapter 3. None of these communities are located within Greenlee County.

The Natural Landscape Management Area reflects, in most cases, the presence of Inventoried Roadless Areas (IRAs). A large portion of NFS land in Greenlee County is in IRAs. This is why much of the land in Greenlee County falls within the Natural Landscape Management Area, where other counties have more land in General Forest Management Area.

The 2001 Roadless Area Conservation Rule provides protection and management direction for the areas identified in a set of inventoried roadless area maps contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000. Management activities within the Natural Landscape Management Area may include restoration of ecological conditions or habitat components, soil stabilization, planned and unplanned ignitions, hazardous fuels reduction, and invasive species reduction.

Concern Statement: Correct the statement "Fire is the most important natural disturbance …" (proposed plan p.17). Concern that this statement is not necessarily correct and should include reference to geologic processes and climatic fluctuations. (108.116)

Response: This statement is not found in the proposed plan. However a similar statement did appear on page 27 under the "All PNVTs" section,

> *"Fire is among the most important natural ecological processes that shaped these vegetation communities."*

It has been updated to read,

> *"Fire and climatic variability are among the most important natural ecological disturbances that shaped these vegetation communities."*

Concern Statement: The occurrences of large fires need to be included in the analysis and their occurrence and impacts planned for. (98.10)

Response: The vegetation analysis (see environmental consequences in "Vegetation" section in chapter 3 of the EIS) did include the effects of large fires, such as the Rodeo-Chediski, Thomas, 3-Forks, and KP.

The occurrence of uncharacteristic (e.g., large) fires was one of the key reasons behind the need for change (see the "Purpose and Need for Change" section in chapter 1 of the EIS). Uncharacteristic wildfires were considered in the analysis in chapter 3 of the EIS.

A primary emphasis area for the plan is to manage for desired fire regimes and restore fire to a more natural role as one of the forest' primary disturbance agents. The plan also has a section titled "Landscape Scale Disturbance Events" to address disturbance events (including large fires) generally over 10,000 acres. This section contains desired condition, standards, guidelines, and management approaches to guide Forest Service managers following these types of events. Also see the response to comment # 26.106 in the "Vegetation" section of this appendix.

Concern Statement: With the appropriate resource specialist, analyze and discuss the impacts to vegetation strata (percent mortality, value, volume) of current and potential changes of fire regime condition class (FRCC) and high intensity fire. Recommend that the impacts of a wildfire be evaluated using a rating such as the ERC (Energy Release Component) and evaluate the fire at the 90th or 95th percentile and higher of the ERC rating for the respective fuel model(s). Include a loss or benefit analysis based upon recent

high intensity wildfires throughout the Southwest using comparable vegetative: (1) types/classes, pre-wildfire and (2) treatments and extrapolated to the proposed alternatives. (98.8, 98.6, 108.229, 98.7, 98.5, 98.9)

Response: The "Vegetation" section contained in chapter 3 of the EIS discusses in detail the 14 potential natural vegetation types (PNVTs) and the measure of departure index. It further outlines how each alternative's proposed treatments would affect the departure index. The "Fire" section within chapter 3 demonstrates how each alternative would affect current and potential fire regime condition classes (FRCCs). The information contained within these two sections demonstrates the impacts on vegetation strata and how this will affect FRCCs.

The recommendation to use ERCs to compare wildfires and their impacts on the fuel type was appreciated. However, after further evaluation, it was determined there was no need for additional analyses because the plan and EIS, as written, both provide alternatives that are designed to improve the FRCCs.

Chapter 3 in the EIS discusses the affected environment by resource and compares alternatives. The "Forest Products" section discloses wood and tree products availability. Table 146 displays treatment acres by alternative. This demonstrates the potential value. If lost to a landscape scale disturbance, this would indicate the associated lost value.

An increasing body of research is becoming available locally and regionally which generally demonstrates the economic practicality of implementing restoration projects at relatively lower financial costs. This is compared to the higher financial costs of wildfire suppression plus the ecological and social values of natural resources lost in stand-replacement wildfires such as old growth, critical wildlife habitats, watershed stability, carbon storage, air quality, wood volume, and recreation/scenic values, among others (Snider et al., 2006; ERI, 2011; Donovan et al. 2008; Huang et al., 2013; Lynch, 2001).

Concern Statement: Discuss impact of wildfire on the human environment including, but not limited to: (1) smoke, (2) air pollution, (3) socioeconomic effects, (4) assess mechanical v. burning treatments on smoke and other negative effects, and (5) cost for post-fire flooding and infrastructure damage and loss of revenue from activities shut down by fires. (108.77, 108.23, 108.213, 108.230)

Response: The "Fire" section in chapter 3 of the EIS analyzes the impacts of smoke and air pollution under the header "Air Quality Related to Smoke." This section also compares the impacts from treating with wildland fire and mechanical treatments. Other socioeconomic effects related to the use of fire are described under "Wildland-Urban Interface," "Fire Regime Condition Class," and "Cumulative Environmental Consequences." Additionally, the "Social Consequences" header under the "Socioeconomic Resources" section further discusses the impacts from prescribed burns. Post-fire impacts are discussed under the "Environmental Consequences" headers in other chapter 3 sections (e.g., "Soil" "Forest Health," "Wildlife and Rare Plants," "Scenic Resources").

The plan contains direction for "Landscape Scale Disturbance Events," including large wildfires. This forestwide direction specifically addresses post-fire flooding and infrastructure damage following large disturbance events. Restoration of PNVTs to their desired conditions would contribute to lowering the risk of negative social and economic costs resulting from severe

wildfires. Also see the response to comment # 98.8 in the "Wildland Fire Management" section of this appendix.

Concern Statement: Explain when a high intensity wildfire would be considered acceptable. (98.3)

Response: The "Fire History and Behavior" header in the "Fire" section in chapter 3 of the EIS provides examples of when high fire intensity is necessary to create the fire severity required for positive ecological results within each of the potential natural vegetation types. For example, the natural fire regime for spruce-fir forest and interior chaparral PNVTs indicate high fire severity, indicating that high intensity wildfires may be acceptable in these vegetation types. Also, high intensity fire could be appropriate to create patchy tree regeneration openings and/or to remove (sanitize) insect or disease infested trees. See also the "Vegetation Management Practices" section in the plan's appendix B ("Vegetation Conditions and Management Practices"). This section contains a table that displays how fire may be used as a silvicultural management tool.

Concern Statement: Assess more than the degree of fire regime departure from FRCC (fire regime condition class) and disclose implications of climate change on wildland fire and management. (26.141)

Response: The "Fire" section in chapter 3 of the EIS assesses other topics (e.g., hazards associated with wildland-urban interface, air quality related to smoke, cumulative environmental consequences) in addition to the degree of fire regime departure from FRCC. The degree of departure from natural fire regimes utilizing FRCC is a valuable tool to determine the resiliency of an ecosystem.

Climate change is also addressed in this section.

Appendix A ("Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning") of the plan also outlines the potential implications of climate change to the Apache-Sitgreaves N.F. they are:

- Increase in frequency of extreme weather events
- Increase in wildfire risk
- Increase in outbreaks of insect, diseases and nonnative invasive species
- Increase in demand for decreasing upland water supplies
- Increase in national forest socioeconomic uses and demands

Appendix A also outlines five potential strategies for management:

- Enhance adaptation by anticipating and planning for disturbances from intense storms
- Reduce vulnerability by restoring resilient native ecosystems
- Increase water conservation and plan for reductions in upland water supplies
- Anticipate increase in forest recreation use
- Monitor climate change influences

Concern Statement: The environmental analysis (forest structure and crown fire hazard) should ensure professional and scientific information based on field observations. To accurately assess fuel treatment effects on the likelihood of crown fire initiation and spread,

it is necessary to consider: (1) surface fuel density and arrangement; (2) canopy base height; (3) local topography; and (4) weather patterns. (26.143, 26.187)

Response: The four critical factors listed above may lead to crown fire initiation. Tables 59 to 62 in the EIS compare each of the alternatives relative to potential natural vegetation type (PNVT), and demonstrate how each PNVT relates to fire regime condition class (FRCC) and its progression or lack thereof to a more resilient ecosystem. Each action alternative provides different techniques for specifically altering factors surface fuel density and arrangement and canopy base height.

The four factors above would be taken into consideration in the development of a site specific burn plan. In the event of natural ignitions (i.e., lightning), these factors would be considered during a risk management-based decisionmaking process to determine if the ignition would provide acceptable restoration results.

Concern Statement: Consider the effect of activity-created fuels on fire hazard. Disclose how much slash may remain on the ground after logging in different vegetation types. Look at slash fuels and treatment options on fire hazard and ecosystem resilience, particularly on steep slopes where prescribed fire may not be used due to operability constraints. Provide plan guidance for management of activity-created fuels. (26.145, 26.150, 26.188)

Response: The effects of activity-created fuels are discussed in chapter 3 of the EIS in the "Soil," "Forest Health," "Fire," "Invasive Species," "Recreation," "Scenic Resources," "Cultural Resources," and "Forest Products" sections.

The plan provides desired conditions for coarse woody debris within each potential natural vegetation type (PNVT) in chapter 2. It specifically outlines the acceptable range of coarse woody debris in tons per acre within forested and woodland PNVTs. Additionally, a guideline for "All Forested PNVTs" states,

> *"Where a site-specific analysis indicates the need to reduce fire-kill of desired residual trees, fuel continuity and/or loading should be reduced before use of prescribed fire."*

Concern Statement: Disclose benefits and potential liabilities of using prescribed fire at broad spatial scales to reduce risk, provide ecosystem services, and regulate greenhouse gas emissions. (26.165, 26.169)

Response: The "Fire" section in chapter 3 of the EIS discusses the application of fire on the landscape at broad spatial scales. It compares the existing fire regime condition class (FRCC) by alternative to determine the percent of the forest that would move toward desired conditions, thus reducing the risk of uncharacteristic wildfires. It also outlines how each alternative varies in its emphasis of treatments near wildland-urban interface, thus reducing the hazards from uncharacteristic wildfires. Other sections in chapter 3 (e.g., "Water Resources," "Vegetation," "Wildlife and Rare Plants," "Forest Products," "Scenic Resources") describe the effect of fire on resources that provide ecosystem services. As discussed in the "Fire" section, limits to smoke emissions (including greenhouse gases such as carbon dioxide) from prescribed fires and wildfires are imposed by the Arizona Department of Environmental Quality.

<u>Concern Statement:</u> Correct statement on p. 208 of the DEIS that says previously burned areas stop fires. (108.224)

Response: No change was made in the EIS to the statement,

> *"Historically, fires could burn until they were extinguished by precipitation, ran out of fuel, or reached a previously burned area."*

This statement remains accurate both historically and under current environmental conditions. This sentence does not state or infer that fires are completely stopped by previously burned areas.

<u>Concern Statement:</u> There should be discussion of the effects of different ignition types on subsequent fire events and watershed management activities. (108.243)

<u>Response</u>: Effects from different ignition types is beyond the scope of plan level analysis. Different ignition patterns would vary depending on the specific location, potential natural vegetation type (PNVT), and topography of the individual watershed. Specific ignition patterns would be discussed within the project burn plan following completion of area-specific environmental analysis that defines specific ecosystem objectives and goals.

In the event of natural ignitions (i.e., lightning), each fire is evaluated through a risk management-based decisionmaking process to determine if the ignition would provide acceptable restoration results.

<u>Concern Statement:</u> Explain the need to return to natural fire regimes compared to simply using fire as a tool to achieve the desired vegetation conditions. (108.224, 108.226, 102.56, 102.7)

Response: The plan's desired conditions for individual potential natural vegetation types (PNVTs) describes the natural fire regime, including fire frequency and severity that would occur in a properly functioning system. Simply using fire as a tool does and can assist in reaching desired conditions; however, utilizing fire in a way that mimics natural intensity and frequency allows for maintenance of or movement towards the desired conditions.

<u>Concern Statement:</u> The plan should focus on safely restoring natural fire regimes and identify where natural fires are a priority. (33.6, 5.7, 9.6, 94.6, 3.17, 23.14)

<u>Response</u>: The plan does focus on safely restoring natural fire regimes. To further emphasize this point, a new section entitled "Wildland Fire Management" was added to the plan because of public comments on the proposed plan and DEIS. The plan does not specifically identify the priority areas for unplanned ignitions. However, it does discuss the management approach for wildland fire, including areas where fire may be the only viable tool for treating the landscape.

<u>Concern Statement:</u> There is a need to address increasing fire occurrence. (98.11, 14.5)

<u>Response</u>: Historical data from 1997 to 2011, including the number of unplanned ignitions and acres burned, is displayed under the "Fire History" header, "Fire" section in chapter 3 of the EIS. This data shows that the number of ignitions (occurrence) per year has stayed within a similar range; however, the two landscape scale uncharacteristic events (Rodeo-Chediski and Wallow Fires) caused the acreage burned to significantly increase. Average fire occurrence, based on the historical combined wildfire record for the national forests above the Mogollon Rim in Arizona,

was used in the EIS vegetation modeling (see "Vegetation" section in chapter 3) for the Apache-Sitgreaves NFs.

All alternatives analyzed in the EIS focus on restoration to increase the resiliency of the ecosystem and individual PNVTs. Resiliency will not necessarily reduce the number of ignitions; it would provide, in the next 15 to 50 years, a more fire-adapted ecosystem that is functioning so that detrimental effects are not widespread across the landscape. Tables 61 and 62 in the EIS depict trends for each fire regime condition classes.

Concern Statement: The plan should describe predetermined burning conditions to establish when fires should be suppressed or managed to meet resource objectives. (108.185, 108.27)

Response: The "Wildland Fire Management" section of the plan in chapter 2 provides general forestwide guidance for the Apache-Sitgreaves NFs' fire program. Additional management area direction for fire can be found in chapter 3 for General Forest, Community-Forest Intermix, Natural Landscape, and Wilderness Management Areas.

The plan does not direct suppression or management of fires based on predetermined burning conditions. The Apache-Sitgreaves NFs' annual fire management plan provides the operational parameters whereby fire managers implement the plan decisions of the land management plan. The fire management plan describes fire management strategies, tactics, and alternatives for fire management units. The specific strategies chosen for the management of wildfires includes interdisciplinary input to assess site specific values to be protected. Incident objectives and courses of action are developed to enhance or protect those values.

More information about wildfire management approaches can be found in the "Wildland Fire Management" section of the plan.

Concern Statement: De-emphasize restoration and prioritize the safety of people and property, including fire prevention, suppression activities, and reducing fuels in key locations. (108.186, 108.41, 108.42, 108.43, 146.6)

Response: Although "Maintenance and Improvement of Ecosystems" is one of the primary focus areas of the plan, the proposed plan was modified based on public comment to include a "Wildland Fire Management" section. This section of the plan contains a background, desired conditions, guidelines, and management approaches to better describe the management intent of the Apache-Sitgreaves NFs. The safety of people and property are described in the first desired condition. The specific strategies (e.g., use of wildland fire, suppression) for managing a wildfire are discussed under the management approaches. Fire prevention is emphasized in desired conditions under the "Conservation Education" section. The plan emphasizes reduction of fuels in the Community-Forest Intermix Management Area and areas identified in community-wildfire protection plans (CWPPs).

In addition, the "Elements Common to All Alternatives" section of the EIS in chapter 2 has been updated to include,

> *"During response to wildland fire, risks to firefighters and the public shall be mitigated. Protection of human life overrides all other priorities."*

<u>Concern Statement:</u> The analysis should consider different approaches (e.g., fire resistant landscape features) for the strategic location of fuel treatments. Prioritize fuel treatments at locations where relatively little resource investment may create fire resistant conditions in the shortest amount of time. (26.153, 26.155)

<u>Response</u>: The plan provides the desired condition in the "Overall Ecosystem Health" section,

> *"Natural ecological disturbances return to their characteristic role within the ecosystem. Wildfire in particular, is restored to a more natural function."*

The plan also contains objectives to treat vegetation using both mechanical and fire treatments. The priority for restoration treatments (including fuel treatments) is to treat priority watersheds and locations identified in community wildlife protection plans, including the Community-Forest Intermix Management Area.

Different approaches for the strategic location of fuels treatments would be identified during the forests' annual and out-year program of work development. Costs (based on location, extent of treatment) and benefits of implementing treatments would be considered before selecting specific locations to treat.

<u>Concern Statement:</u> The DEIS and fire specialist report fail to address critical fire suppression management variables. (108.74)

<u>Response</u>: Analysis of specific fire suppression variables is beyond the scope of the plan and plan revision process. The risk of suppressing a wildfire or managing the fire to meet resource objectives is analyzed and decisions are made during each individual wildfire situation.

The Apache-Sitgreaves NFs' annual fire management plan provides the operational parameters whereby fire managers implement the plan decisions of the land management plan. The fire management plan describes fire management strategies, tactics, and alternatives for fire management units. It identifies areas where varying levels of response should take place. There are areas on the forests that are identified for immediate and direct suppression responses. The specific strategies chosen for the management of wildfires includes interdisciplinary input to assess site specific values to be protected. Incident objectives and courses of action are developed to enhance or protect those values. More information can be found under the management approaches for the "Wildland Fire Management" section of the plan.

<u>Concern Statement:</u> The Forest Service should analyze direction of fire spread and slope and demonstrate that proposed fuels treatments will meet the need for change. Fuels treatments should be oriented in concert with prevailing spatial patterns of fire spread in the project area. (26.152)

<u>Response</u>: This level of analysis is completed during project planning and the specific factors listed would be addressed there.

The plan does contain a guideline in the "All PNVTs" section that says,

> *"Landscape scale restoration projects should be designed to spread out treatments spatially and/or temporally to reduce implementation impacts and allow reestablishment of vegetation and soil cover."*

This would result in fuels treatments that are arranged on the landscape to provide a checkerboard pattern to minimize the impact on areas that may be susceptible to high severity fire.

Concern Statement: Prescribed fire planning should minimize the effects of smoke on public health, public nuisance, and visibility in Federal Class I Areas. Prescribed fire activities must also comply with the requirements of Title 18, Chapter 2, Article 15 of the Arizona Administrative Code entitled "Forest and Range Management Burns." (4.1, 159.7)

Response: The "Fire" section in chapter 3 of the EIS addresses smoke management requirements and applicable laws related to smoke management. The Clean Air act of 1970 describes the level of protection required for Class I airsheds.

Air quality management direction is addressed under forestwide direction within the plan. It outlines strategies and expectations for management of airsheds on a landscape scale. It also reaffirms the Apache-Sitgreaves NFs cooperation and coordination with Arizona Department of Environmental Quality. The Title 18 State regulation is also listed in appendix D ("Relevant Laws, Regulations, and Policies").

Wildlife and Rare Plants

Concern Statement: The Forest Service is obligated to consult with USFWS to ensure the plan revision "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species." (26.166)

Response: The Forest Service compiled a biological assessment (BA) describing the short and long term effects to federally listed species and their habitats from the proposed actions and direction contained within the plan. This BA is the basis for consultation with the U.S. Fish and Wildlife Service regarding federally listed species under § 7(a)(2) of the Endangered Species Act, as amended. The information compiled for the BA was used to update the EIS between draft and final, including updates on listing status, threats to species and habitat, and effects determination. The USFWS has prepared a biological opinion (BO) of the plan (USFWS, 2015); a summary of the conclusions from the BO are documented in the record of decision.

Concern Statement: Modify Wildlife and Rare Plants Background (proposed plan p. 59). In the last paragraph it states that "Other species have been introduced, such as Rocky Mountain elk and crayfish." The Department considers elk to be a native Arizona species. Accordingly, the Department views it wholly inappropriate to present elk, a desired native species that provides significant economic and social benefits to the forest and local communities, in the same context as crayfish, which is a clearly undesirable and destructive nonnative species. (101.57)

Response: This sentence in the background for "Wildlife and Rare Plants" section of the plan has been modified to read,

> *"Other species, some desirable and some not, have been introduced and have become naturalized."*

A definition for 'naturalized' has been added to the plan's glossary.

<u>Concern Statement:</u> Modify Wildlife and Rare Plants Background (proposed plan p. 59). Acknowledge the economic contribution of wildlife (hunting, fishing, wildlife viewing) and provide such information within the Background for Wildlife and Rare Plants section. (101.58)

<u>Response</u>: Additional language that acknowledges the economic contribution of visitors, including those that view wildlife, hunt, and fish was added to the background for "Overall Recreation Opportunities" section of the plan. The background now notes that the forests' contribution to the local economy from the recreation and wildlife areas is approximately 69 percent of the local jobs and 68 percent of the local labor income.

<u>Concern Statement:</u> Modify Wildlife and Rare Plants Background (proposed plan p. 60). The reference to ″Mexican wolf″ should be changed to ″Mexican gray wolf.″ (101.59)

<u>Response</u>: As noted in the "Roles and Contributions of the Apache-Sitgreaves NFs" section in chapter 1 of the plan, the 'Mexican gray wolf' is thereafter referred to as the 'Mexican wolf.' This is consistent with this wolf's recovery plan terminology and with the most recent U.S. Fish and Wildlife Service proposal to remove the gray wolf from the list of endangered and threatened wildlife but to maintain endangered status for the Mexican wolf by listing it as a subspecies (*Canis lupus baileyi*).

<u>Concern Statement:</u> Correct table 103 (DEIS p. 299), the rating description does not match the values in the table. (112.57)

<u>Response</u>: Table 103 ratings in the EIS have been corrected to match the values in the rating descriptions; thank you for pointing this out.

<u>Concern Statement:</u> Clarify the discussion on habitat connectivity and linkages including Table 108. (DEIS p. 308). (162.168, 162.66, 162.68)

<u>Response</u>: Table 108 under the "Habitat Connectivity and Linkages" header of the "Wildlife and Rare Plants" section of the EIS was found to have some calculation errors which have been corrected. The table has also been simplified to provide a clearer picture of habitat connectivity across the Apache-Sitgreaves NFs as a whole, rather than showing partial information for the Sitgreaves and Apache sides of the forests. The correction has also been reflected in the following "Alternatives Compared" narrative.

<u>Concern Statement:</u> Explain whether threatened and sensitive wildlife species associated with closed-canopy forest will maintain habitat if significant reductions of crown bulk density is necessary to meet the need for change. (26.122)

Response: The plan does not use "crown bulk density" terminology; however, fine scale forested PNVT desired conditions provide for mature trees with interlocking crowns consistent with historic reference conditions. In addition, during site specific analyses of projects or activities, the needs of species (and their prey, as necessary) for more closed canopies would be addressed by the plan standard that requires "habitat conditions contribute to the recovery of federally listed species." Sensitive species would be addressed by the plan guideline that "management and activities should not contribute to a trend toward the federal listing of a species."

<u>Concern Statement:</u> The plan should meet the NFMA (National Forest Management Act) requirement for estimation of effects to proposed MIS (management indicator species). Concerns include: (1) it ignored criteria prescribed by NFMA for viability determinations, including "changes in vegetation type, timber age classes, community composition, rotation age, and year-long suitability of habitat related to mobility of [MIS]." 36 CFR § 219.19(a)(1) (1982), (2) relies on "plan decisions" as the sole basis for viability findings, and asserts that projects "would incorporate" applicable recovery plans for federally listed species, (3) recovery plans for federally listed species are not enforceable in project-level management decisions, and (4) the efficacy of proposed management direction in promoting the conservation and recovery of Mexican spotted owl is uncertain. The Forest Service is required to disclose controversy and uncertainty regarding effects to Mexican spotted owl and its critical habitat. (26.46, 26.48)

<u>Response</u>: The Forest Service has conformed to the direction of NFMA by adhering to the provisions of the 1982 Planning Rule (219.19) for analyzing effects of MIS. These effects are described in the "Wildlife" section in chapter 3 of the EIS under the header "Management Indicator Species, Migratory Birds, and Eagle Consequences."

The process to assess viability is described in the EIS under the "Provision for Species Viability" and the "Analysis of Species Viability" headers in the "Wildlife and Rare Plants" section. Rotation age is a term associated with even-age timber management of which the plan calls for limited treatments; instead the plan emphasizes uneven-aged management with desired conditions to develop or maintain uneven-aged forest structure. The vegetation treatments modeled for the EIS analysis incorporated the plan's limited even-aged and the plan's primarily uneven-aged direction/amounts. In addition, this modeling addressed vegetation type and composition and vegetation states (e.g., age classes). More information about vegetation modeling can be found in the "Vegetation" section in chapter 3 of the EIS.

Wildlife species viability was conducted in accordance with National Forest Management Act direction (provisions of the 1982 Planning Rule) to assure the plan (and plan decisions) maintain viable populations of wildlife relative to well distributed habitat, species occupancy, and maintenance or restoration of habitat. The viability process included an assessment of species abundance and distribution, habitat abundance and distribution, risk ratings for species, etc. See the "Wildlife Specialist Report-Viability" (Forest Service, 2014l).

Failure to follow a species' recovery plan at the project-level would be inconsistent with the legal requirements of the plan and the Endangered Species Act and the direction of the National Forest Management Act. Guidelines under the "Aquatic Habitat and Species" and the "Wildlife and Rare Plants" sections of the plan require that,

> *"activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans."*

The site specific projects or activities address species recovery plans and the National Environmental Policy Act (NEPA) and Endangered Species Act analyses for these must disclose how the project or activity would impact the Mexican spotted owl.

<u>Concern Statement:</u> The remote nature and remarkable elevation gradient of roadless areas make them potentially critical as wildlife refuges from the impacts of climate change. (27.2, 56.2, 90.3)

Response: Climate change is likely to affect all areas, whether they are roaded or unroaded. Wildlife within unroaded areas have one less impact (i.e., stress/disturbance from motorized use associated with roads and motorized trails) to contend with. This environmental consequence is discussed in the "Wildlife Quiet Areas and Habitat Security" portion of the "Wildlife and Rare Plants" section of the EIS.

Concern Statement: Clarify the desired conditions "Livestock conflicts with wildlife rarely occur" and "Vegetation conditions support a healthy population of Montezuma Quail in suitable habitat." (108.149, 108.154)

Response: Neither of these desired conditions is found in the proposed plan or DEIS.

Concern Statement: Explain why beaver dams are considered a benefit to riparian area functionality ("Beavers occupy capable stream reaches and help promote the function and stability of riparian areas" p. 33) while the Riparian Areas management approach states that "Large human constructed dams may be altered or removed to restore ….wetland functionality" (proposed plan p. 35). (102.57)

Response: Unlike human constructed dams, beaver dams are permeable and not permanent. As such, they are hydrologically different. However, clarification has been added to the statements quoted in the comment.

Concern Statement: Establish standards for ungulate browsing of aspen, willow, and cottonwood. These standards should (1) inform stocking on allotments, closures, and retirement of allotments and (2) establish ungrazed "reference" areas in a diversity of ecological and soil types to use as baseline of an area's potential. Study and monitor areas for attainment of standards. (162.113)

Response: Regarding item (1), the plan provides direction relative to livestock grazing and riparian area conditions. For example, a plan guideline in the "Riparian Areas" section would require that,

> *"active grazing allotments should be managed to maintain or improve to desired riparian conditions."*

Where necessary to move toward desired conditions, this could include determining a level for browsing of willows and cottonwoods during a site specific project. The plan also contains a guideline in the "Livestock Grazing" section that addresses livestock impacts to aspen and riparian areas; it requires that in order,

> *"to minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source. Salt or nutritional supplements should also be located to minimize herbivory impacts to aspen clones."*

Regarding item (2), the "Recommended Research Natural Area" (RRNAs) section of the plan notes that the Corduroy Recommended Research Natural Area is representative of high elevation vegetation types including aspen. RRNAs are not suitable for livestock grazing (see chapter 4 of the plan); hence, the Corduroy RRNA would provide a baseline or benchmark for aspen potential on the Apache-Sitgreaves NFs. Chapter 5 of the plan provides the monitoring strategy for aspen

and riparian forests as both are identified “ecological indicators” or EIs. For a discussion of EIs, see the “Habitat Ecological Indicators (EIs)” header in the “Wildlife and Rare Plants” section of the EIS.

Concern Statement: Clarify the Wildlife guideline "Rare, unique habitats (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be protected" (proposed plan p. 61). Define 'rare', 'unique', 'habitat', and 'protection' (from what?). (139.4)

Response: Types of rare and unique habitats are provided by the for example (“e.g.”). There may be other types of examples based on site specific examination of habitat by the wildlife or fisheries biologists or by the forest ecologist during site-specific project or activity analyses. The guideline has been rewritten to describe the need for protection,

> *“Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be protected to retain their distinctive ecological functions and maintain viability of associated species.”*

Concern Statement: Add a standard to inspect project areas for rare plants before project implementation, and modify project plans appropriately to protect rare plants. (162.100, 162.98)

Response: A standard is not necessary because the plan contains the desired condition that “localized rare plant and animal communities are intact and functioning” which requires knowledge of the presence and condition of rare plants (or their absence) in a project or activity area. In addition, the “Wildlife and Rare Plant” section of the plan contains a guideline that requires that:

> *“management activities should not contribute to a trend toward the Federal listing of a species.”*

This may result in modification of project actions for rare plants but this would be determined on a site specific project analysis basis.

Concern Statement: Add a guideline to survey grazing allotments for rare plants and modify pastures appropriately. (162.99)

Response: See response above. Modification of a proposed action for livestock grazing could include changing pasture use, fencing rare plant sites, etc., but this is determined on a site specific project basis.

Concern Statement: Add a Guideline to Wildlife and Rare Plants (proposed plan p. 60) "Right-of-way fencing where pronghorn antelope may be present should be placed and constructed in a manner that considers maximizing fence and road permeability for pronghorn antelope while addressing public safety concerns." (101.60)

Response: The guideline has not been added; however the plan, within the management approaches for the “Wildlife and Rare Plants” section, has been updated. The discussion about the Arizona Wildlife Linkages Working Group and the Arizona Department of Transportation regarding passage of wildlife and public safety has been expanded to include the potential for increasing the distance that roadway fences are set back from the road’s edge in order to provide herds of animals more room to maneuver during crossings.

Concern Statement: Modify Wildlife and Rare Plants Guideline (proposed plan p. 61) "Prairie dog controls should not be authorized except when consistent with approved State of Arizona Gunnison's prairie dog conservation strategies, *or as authorized by the Arizona Game and Fish Commission*." (101.61)

Response: This guideline in the "Wildlife and Rare Plants" section of the plan has been footnoted to clarify that:

> *"controls do not include State authorized hunting."*

Concern Statement: Modify Wildlife and Rare Plants Guideline (proposed plan p. 61) "The needs of localized species (e.g. New Mexico meadow jumping mouse, Bebb willow, White Mountain paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost *or degraded*." (101.62)

Response: This suggested guideline edit has been incorporated into the plan.

Concern Statement: Ecological based management should be put in place immediately on the current and historical areas used or needed by northern goshawk and antelope. (132.29, 132.30)

Response: Desired conditions for the ponderosa pine potential natural vegetation type (PNVT) reflect historic or reference forest conditions that supported northern goshawk. The plan also incorporates provisions of the "Management Recommendations for the Northern Goshawk in the Southwestern United States" (Reynolds, 1992), although not its exact language. Desired conditions for Great Basin and other grasslands reflect the open grassland with vigorous herbaceous plant cover and growth of historic or reference conditions needed to support pronghorn antelope.

A plan decision example for goshawk is the mid-scale desired condition for each of the forested PNVTs (ponderosa pine, dry mixed conifer, wet mixed conifer, and spruce-fir):

> *"Northern goshawk nest areas have forest conditions that are multi-aged and dominated by large trees with relatively denser canopies than the surrounding forest."*

A plan decision example for pronghorn antelope is the fine scale grasslands desired condition:

> *"Average ungrazed herbaceous vegetation heights vary by grassland PNVT and yearly weather conditions. Ungrazed herbaceous vegetation heights range from 7 to 29 inches in Great Basin grasslands, 7 to 26 inches in montane/subalpine grasslands, and 10 to 32 inches in semi-desert grasslands."*

Concern Statement: The management indicator species information is a very generic analysis and discussion which makes the bland summary "antelope populations appear to be stable." (132.36)

Response: The quoted statement is not found in the proposed plan or DEIS. However, the "Management Indicator Species (MIS) and Indicator Habitat" portion of the "Wildlife and Rare Plants" section of the EIS discusses the status of antelope as a management indicator species. It states that,

> *"Overall, population trend is considered static with approximately 600 to 700 pronghorn on the Apache-Sitgreaves NFs portion of game management units 1, 3A, and 3B in the last two years."*

This information was provided by Arizona Game and Fish Department in 2012. The Forest Service has met the requirements to analyze MIS by following the provisions of the 1982 Planning Rule (219.19). These effects are described in the "Wildlife" section in chapter 3 of the EIS under the header "Management Indicator Species, Migratory Birds, and Eagle Consequences."

Concern Statement: Seed and plant collections, greenhouse collections, and replanting should be considered when there is a chance of increasing rare plant species viability through these procedures. (162.101)

Response: Propagation of rare plants is outside of the scope of the plan. Sources for plantings would be determined during project or activity-level planning. For example, the Natural Resources Conservation Service's Plant Materials Center in Albuquerque, NM propagates uncommon plants like Bebb willow from cuttings on the Apache-Sitgreaves NFs that have, in turn, been planted back on the forests.

Rare or sensitive plants are each considered a "forest planning species" (FPS) for the viability analysis required by the National Forest Management Act for both plant and animal species on the Apache-Sitgreaves NFs. FPS are identified in the EIS under the section by that name, and these include all Regional Forester sensitive plant species. The process for assessing viability of plants and animals is found in the "Analysis of Species Viability" portion of the "Wildlife and Rare Plants" section of the EIS.

Concern Statement: Maintain and improve habitat security by protecting whole areas rather than individual road or route closures. (1) Enforce wildlife and plants closure areas. (2) Regularly monitor closure areas to ensure fences are in place to ensure violations are not occurring. (3) Regularly check road signs for closure areas. (162.115)

Response: Habitat security is addressed in the EIS under the header "Habitat Security and Connectivity and Wildlife Quiet Areas" in the "Wildlife and Rare Plants" section. As noted in the introductory paragraphs for "Wildlife and Rare Plants" section in the EIS, habitat security and connectivity and the amount of wildlife quiet areas were concerns raised by the public during scoping (see the "Alternative Development" section in chapter 2). The "Wildlife Quiet Areas (WQAs) and Habitat Security" environmental consequences discussion in the EIS examines the number and acreage of management areas best providing for wildlife habitat security and connectivity. Besides WQAs, other management areas providing more secure habitat noted in this section include wilderness, recommended wilderness, natural landscape, and primitive area.

One plan guideline in the "Wildlife Quiet Area" management area section requires inspection of fences where these coincide with wildlife area boundaries. An additional guideline would require signing to identify the areas and educate the public about their purpose. Enforcement of closure areas to prevent violations is a law enforcement responsibility and is beyond the scope of the plan.

Concern Statement: Modify Wildlife and Rare Plants Management Approaches (proposed plan p. 62). Reference is made to the Arizona Wildlife and Fisheries Comprehensive Plan.

This is an outdated plan. A more appropriate reference would be the State Wildlife Action Plan as well as the Wildlife 20/20 Arizona Game and Fish Department's Strategic Plan. (101.63)

Response: These two document citation updates have been made in the plan in the "Wildlife and Rare Plants" section under "Other Sources of Information for Wildlife and Rare Plants."

Concern Statement: Modify Wildlife and Rare Plants Management Approaches (proposed plan p. 63). Promoting healthy population of predators while, reducing livestock conflicts with wildlife is discussed. It should be noted that predator control may also be required to reduce conflict and meet management objectives for wildlife prey species such as pronghorn, especially where degraded habitat conditions or other factors influence the natural predator prey relationship. (101.64)

Response: While the Apache-Sitgreaves NFs coordinates annually with the Arizona Game and Fish Department on hunt recommendations, this coordination does not include recommendations for predators such as coyotes which can influence pronghorn fawn survival, as noted, especially in degraded habitat conditions. Instead the plan contains a fine scale desired condition in the "Grasslands" section to provide healthy habitat conditions in pronghorn fawning areas to help limit predation on fawns early in life.

Concern Statement: Within the plan, clarify how the desired conditions for ponderosa pine, dry-mixed conifer, and wet-mixed conifer provide for Mexican spotted owl nesting/roosting habitat. Recommend discussing the desired conditions, standards, and guidelines favorable for Mexican spotted owl as identified in the DEIS (p. 269). (112.14)

Response: Examples of plan components and how they help provide for Mexican spotted owl nesting/roosting habitat follow.

Plan guidelines under the "Forests: Ponderosa Pine" and "Forests: Dry Mixed Conifer" sections state,

> *"Where Gambel oak or other native hardwood trees and shrubs are desirable to retain for diversity, treatments should improve vigor and growth of these species."*

This would help retain and improve MSO pine-oak habitat. As noted in the MSO recovery plan, MSO are known to nest in ponderosa pine forests with a well-developed Gambel oak component. Large Gambel oaks can provide open cavities that may be used for nesting and the leaves of this deciduous species can contribute to cooler understory conditions preferred by MSO for nesting and roosting.

Plan desired conditions under "Forests: Dry Mixed Conifer" section states,

> *"Northern goshawk post-fledging family areas (PFAs) may contain 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest."*
>
> *"Northern goshawk nest areas have forest conditions that are multi-aged and dominated by large trees with relatively denser canopies than the surrounding forest."*

> *"Northern goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively denser canopies than the surrounding forest."*

The biological assessment (Forest Service, 2014k), located in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning, provides extensive discussion of conditions important to Mexican spotted owl and plan effects relative to plan decisions. These are summarized in chapter 3 of the EIS under the header "Endangered Species Act (ESA) Species Existing Condition and Critical Habitat" in the "Wildlife and Rare Plants" section.

Concern Statement: Add guidelines under Ponderosa Pine (proposed plan p. 41) for canopy cover and openings that provide habitat conditions consistent with the Mexican spotted owl Recovery Plan. (112.18)

Response: Tree density and openings for ponderosa pine are contained in desired conditions for this PNVT. While pure ponderosa pine is not Mexican spotted owl (MSO) recovery habitat, ponderosa pine with Gambel oak is MSO recovery habitat. Examples of guidelines and desired conditions with ponderosa pine that provide habitat conditions identified in the MSO recovery plan are noted in the response above.

Concern Statement: Include desired conditions, standards, and guidelines for the Forest Service to continue to work with the USFWS toward Mexican spotted owl recovery, including opportunities to incorporate conservation measures pursuant to 7(a)(1)of the Endangered Species Act. (112.20)

Response: There are numerous desired conditions, standards, and guidelines that address the composition, structure, and condition of forested PNVTs used by the Mexican spotted owl. One guideline, under the "Aquatic Habitat and Species" and the "Wildlife and Rare Plants" sections of the plan, requires that,

> *"Activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans."*

The Forest Service is required by law to work with the U.S. Fish and Wildlife Service to contribute to species recovery under the Endangered Species Act, (symbol) 7(a)1 which may include the development of conservation measures, if necessary.

Concern Statement: The Mexican spotted owl Recovery Plan does not discuss specific amounts or densities of snags, coarse woody debris, etc. but rather recommends retaining as much of these components as possible without affecting human safety, forest restoration and owl habitat so review the desired conditions for these components to match the owl recovery plan. (112.17)

Response: Desired conditions for PNVTs providing Mexican spotted owl habitat (ponderosa pine with Gambel oak, dry mixed conifer, wet mixed conifer, and spruce-fir) as described in the plan include ranges of snags, logs, or amounts of woody debris for each PNVT, although in the Community-Forest Intermix Management Area, the latter two PNVTs would be treated to be more open overall than elsewhere. In addition, desired conditions for "Wildlife and Rare Plants" state, "habitat conditions contribute to the recovery of federally listed species," so the needs of Mexican spotted owls are provided for in all cases.

Concern Statement: Include more specific guidelines for management and protection of Mexican spotted owls and other listed species on the Apache-Sitgreaves NF, under the Guidelines for Forest: All Forested PNVTs and Guidelines for Wildlife and Rare Plants sections, in order to incorporate section 7(a)(l) recovery responsibilities. (112.15)

Response: The plan guideline under the "Wildlife and Rare Plants" section requiring that, "activities occurring within federally listed species habitat should apply habitat management objectives and species protection measures from recovery plans" provides the specific direction for species like the Mexican spotted owl that have recovery plans. This helps address Federal agency responsibility under the Endangered Species Act § 7(a)(1).

Concern Statement: Correct the third column in table 74 (DEIS p. 247) that refers to remaining currently suitable northern goshawk habitat. This should be Mexican spotted owl habitat. (112.55)

Response: This error has been corrected in the EIS; thank you for pointing this out.

Concern Statement: Disclose the method used to estimate the availability of Mexican spotted owl critical habitat or changes to habitat that resulted from the 2011 Wallow Fire. (26.28)

Response: Mexican spotted owl habitat is provided by four forested potential natural vegetation types (PNVTs) (ponderosa pine with Gambel oak, dry mixed conifer, wet mixed conifer, and spruce-fir) and by three forested riparian PNVTs (cottonwood-willow, montane willow, and mixed broadleaf deciduous riparian forest). Note that the spruce-fir PNVT on the Apache-Sitgreaves NFs meets the definition for "mixed conifer" found in the 2012 MSO recovery plan.

The acreages and vegetation states or seral stages within these PNVTs are detailed in the "Vegetation Specialist Report" (Forest Service, 2014g) located in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. This report details how vegetation states were determined and includes post-Wallow Fire information. Changes in habitat for the owl from the Wallow Fire are noted in the "Management Indicator Species (MIS) and Indicator Habitat" portion of the "Wildlife and Rare Plants" section of the EIS in table 74. This information is based in part on the biological assessment for the Wallow Fire Burned Area Emergency Response cited as "Forest Service, 2011d" which describes how habitat changes post-Wallow Fire were assessed.

Concern Statement: Consider foreseeable cumulative effects to Mexican spotted owl viability and recovery resulting from post-fire management activities authorized in critical habitat. (26.31)

Response: Endangered Species Act (ESA) cumulative effects include the effects of future State, tribal, or private actions that are reasonably certain to occur. Future Federal actions (e.g., post-fire management activities in critical habitat on Federal land) are not considered ESA cumulative effects for plan consultation because future Federal actions are required by law to have their own separate consultation (50 CFR § 402.14(g)(3) and (4).

<u>Concern Statement:</u> Include the reintroduction of Mexican wolves to their historic homes. (1.1, 162.111)

<u>Response</u>: The reintroduction of Mexican wolves is outside of the scope of the plan. It is addressed by the "Reintroduction of the Mexican Wolf within its Historic Range in the Southwestern United States Final Environmental Impact Statement" (USFWS, 1996). At this time, the Apache-Sitgreaves NFs are one of two national forests in the Nation to provide a home for the recovery of the Mexican wolf. The plan provides direction to ensure the habitat (including secure habitat for the wolf and its prey) is available.

<u>Concern Statement:</u> The plan and implementation should give priority to the viability of the Mexican grey wolf population including: (1) minimizing human interference by motorized vehicles (including snowmobiles), (2) issuing temporary motorized closures near wolf denning and rendezvous sites, (3) minimizing conflicts with domestic livestock, and (4) allowing non-use of allotments. (127.4, 146.11, 162.110)

<u>Response</u>: Plan desired conditions under the "Wildlife and Rare Plants" section include,

> *"Wildlife are free from harassment and disturbance at a scale that impacts vital functions…that could affect persistence of the species."*

The plan's management approaches for the "Wildlife and Rare Plants" section addresses the use of closures. The latter two comment items are outside of the scope of the plan. However, the Wolf Interagency Field Team works with grazing permittees and ranger district managers to help minimize conflicts with domestic livestock on a time-specific and site specific basis, including changing pasture rotations to avoid pastures with dens during the denning period. Forest Service Manual direction at 2231.7 and Forest Service Handbook direction at 2209.13 address nonuse for livestock grazing.

<u>Concern Statement:</u> Implement formal recovery plans and establish clear, binding standards to ensure the recovery of the Mexican wolf. (162.109)

<u>Response</u>: A plan guideline under the" Wildlife and Rare Plants" section requires that,

> *"Activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans."*

This would help toward Mexican wolf recovery.

<u>Concern Statement:</u> Add standards or guidelines specific to Mexican wolves: (1) require all permittees to remove or render inedible or unpalatable all livestock carcasses before wolves have the opportunity to scavenge them and (2) require all permittees to practice responsible livestock management practices, e.g., range riders, guard dogs. (162.112)

<u>Response</u>: Item 1 was a guideline within the June 2009 Working Draft Land Management Plan; however, this was an "Alternatives Considered and Eliminated from Detailed Study" (see the EIS section with this title). Specifically, this livestock grazing guideline for treatment of livestock carcasses to make them unpalatable was dropped because further review of the scientific literature showed this is not a cause of increased wolf predation. For item 2, as noted in a response above, the Wolf Interagency Field Team works with grazing permittees and ranger

district managers to help minimize conflicts with domestic livestock on a time-specific and site-specific basis.

Concern Statement: Require wolf-compatible livestock management in wolf use areas and enable the Forest Service to decrease livestock grazing in areas of high conflict, or when necessary to mitigate conflicts: (1) ensure sufficient prey availability to reduce livestock conflicts, (2) include plans for voluntary grazing retirements, and (3) include voluntary grazing non-use to protect denning and rendezvous sites, and (4) ensure a proper allocation of forage for non-livestock herbivores. (162.169)

Response: Livestock grazing administration involving allotment status or non-use such is outside of the scope of the plan as is retirement of grazing allotments. Ranger districts and the Wolf Interagency Field Team work with grazing permittees to help minimize conflicts with domestic livestock on a time-specific and site specific basis. This has included area closures around wolf den sites and sometimes changing pasture rotations to avoid areas where wolves are denning.

In terms of wolf prey, the plan fine scale desired condition for "All PNVTs" provides that,

> *"Herbaceous vegetation amount and structure (e.g., plant density, height, litter, seed heads) provides habitat to support wildlife and prey species."*

This would help support elk prey populations.

The plan contains one desired condition and one guideline under the "Livestock Grazing" section that addresses allocation of forage among herbivores. Respectively, these are:

> *"Livestock grazing is in balance with available forage (i.e., grazing and browsing by authorized livestock, wild horses, and wildlife do not exceed available forage production within established use levels)."* (desired condition)
>
> *"Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state."* (guideline)

Concern Statement: Limit or restrict roads and routes in sensitive wolf habitat (e.g., close roads around denning sites and pack territories, locate roads in forested areas and bounded by natural features, reassess roads and routes after the Wallow Fire). (162.114)

Response: The plan does not identify specific roads or routes for closure. Regarding road location and closures, as noted in the plan under the management approaches for the "Motorized Opportunities" section, potential changes to the Apache-Sitgreaves NFs transportation system will be evaluated and implemented through future project-level decisionmaking, including the implementation of the Travel Management Rule (36 CFR §212). The plan does provide direction to protect wildlife, including the Mexican wolf. For example, the following plan decisions are in the "Wildlife and Rare Plants" section,

> *"Wildlife are free from harassment and disturbance at a scale that impacts vital functions (e.g., breeding, rearing young) that could affect persistence of the species." (desired condition)*

> *"Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives." (guideline)*

On a yearly basis, areas around wolf denning sites including associated roads are closed temporarily as needed via forest special order as part of the Apache-Sitgreaves NFs responsibilities under the Endangered Species Act § 7(a)(2) and as a participatory member of the Interagency Wolf Management Team. It is not practical to permanently close roads within territories because individual wolf pack territories, that range from 75,000 to over 800,000 acres, are fluid (e.g., wolves don't stay within defined territories) and because wolf packs themselves are changing.

Concern Statement: Wilderness designation is an important means of protecting wolf habitat in Arizona and New Mexico. (88.2)

Response: The EIS analysis regarding "Habitat Security and Connectivity," in the "Wildlife and Rare Plants" section, acknowledges that wilderness contributes to more secure wildlife habitat.

Concern Statement: The proposed plan has no standards for management of northern goshawk habitat, and omits any requirement to survey for goshawks prior to habitat disturbance, monitor populations, or retain structural attributes of ponderosa pine forest (e.g., canopy cover) essential to nesting and fledging behaviors of the sensitive species. (26.178, 162.26, 26.59)

Response: While there are no plan standards specifically related to northern goshawks, there are two guidelines under the "Wildlife and Rare Plants" section that address goshawk needs:

> *"A minimum of six nest areas (known and replacement) should be located per northern goshawk territory. Northern goshawk nest and replacement nest areas should be located around active nests, in drainages, at the base of slopes, and on northerly (northwest to northeast) aspects. Nest areas should be 25 to 30 acres each in size."*
>
> *"Northern goshawk post-fledging family areas (PFAs) of approximately 420 acres in size should be designated around the nest sites."*

In addition, desired conditions incorporate direction for northern goshawk under all the forested potential natural vegetation types (PNVTs) (ponderosa pine, dry mixed conifer, wet mixed conifer, and spruce-fir). For example, structural attributes are addressed in several desired conditions including these in the "Forests: Ponderosa Pine" section,

> *"Northern goshawk post-fledging family areas (PFAs) may contain 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest."*
>
> *"Northern goshawk nest areas have forest conditions that are multi-aged and dominated by large trees with relatively denser canopies than the surrounding forest."*
>
> *"The forest arrangement consists of individual trees, small clumps, and groups of trees interspersed within variably-sized openings of grasses, forbs, and shrubs. Vegetation associations are similar to reference conditions. The size, shape, and number of trees per*

> *group and the number of groups per area vary across the landscape. Tree density may be greater in some locations, such as north-facing slopes and canyon bottoms."*
>
> *"The tree group mosaic comprises an uneven-aged forest with all age classes, size classes, and structural stages present. Occasionally, patches of even-aged forest structure are present (less than 50 acres). Disturbances sustain the overall age and structural distribution."*
>
> *"Trees typically occur in irregularly shaped groups and are variably spaced with some tight clumps. Tree crowns in the mid- to old-aged groups are interlocking or nearly interlocking providing for species such as Abert's squirrel."*

Survey for goshawks is conducted in accordance with the "Northern Goshawk Inventory and Monitoring Technical Guide" (Forest Service, 2006).

Concern Statement: Remove or greatly restrict herbivore use by domestic livestock and work with the AZGFD to manage elk use or decrease populations. Concern how the Grasslands fine scale desired conditions can be achieved given the current management of domestic livestock and uncontrolled herbivory by elk (proposed plan p. 57). (132.32)

Response: The plan provides desired conditions for herbivory to be in balance with available forage (see the "All PNVTs," "Livestock Grazing," and "Wild Horse Territory" sections). Within the "Livestock Grazing" section, the plan does provide the following guideline,

> *"Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state."*

The effects of all grazers would be taken into account to move towards grassland and other desired conditions. The allocation of forage to domestic or wild animals is not determined at the plan level.

Each year the Apache-Sitgreaves NFs provides the Arizona Game and Fish Department input on elk hunt recommendations based on precipitation, plant growth, and vegetation impacts expected and from the previous year; however, management of elk populations is outside of the mission of the Forest Service. Projects, including analyses of livestock grazing, must demonstrate how grassland desired conditions will be met or moved toward in order for the project to be consistent with the plan (as described in the "Plan Consistency" section).

Concern Statement: Provide specifications for pronghorn antelope fence and other crossings (proposed plan p. 48). (132.35, 132.39)

Response: The plan addresses fences within pronghorn antelope habitat and other crossings through guidelines for grassland potential natural vegetation types (PNVTs) including:

> *"New fence construction or reconstruction where pronghorn antelope may be present should have a barbless bottom wire which is 18 inches from the ground to facilitate movement between pastures and other fenced areas. Pole and other types of fences should also provide for pronghorn antelope passage where they are present."*

> *"Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation."*

In addition, an objective in the "Wildlife and Rare Plants" section would help improve wildlife habitat connectivity for pronghorn:

> *"Annually, improve wildlife connectivity by removing at least five unneeded structures (e.g., fence)."*

Concern Statement: Describe how many miles of fence are in current and historic antelope habitat that need to be modified to prevent habitat fragmentation. (132.38)

Response: Additional information has been added for pronghorn antelope under the "Management Indicator Species (MIS) and Indicator Habitat" portion of the "Wildlife and Rare Plants" section of the EIS. Specifically,

> *"…about 200 miles of unneeded fence line has been removed on the forests during the last 10 to 15 years (mostly in grasslands), and roughly 300 miles of fence line has been modified or rebuilt to wildlife passage standards. While not all of this affects the over 700 miles of fence line in pronghorn grassland habitats, it does benefit pronghorn in areas where they encounter fences outside of grasslands."*

Concern Statement: Any project that could affect antelope should consider: (1) isolated small pronghorn populations become increasingly vulnerable to extirpation as numbers decrease. Genetic consequences are commonly considered, but stochastic events like predation, disease, and climatic events have a greater likelihood of causing extirpations, and (2) "predators taking 100 fawns from a population in a valley were 1,000 fawns are borne probably is biologically insignificant, but their taking 100 fawns in the same valley when only 150 fawns are born is significant.". Reference: Pronghorn Ecology and Management, Bart O'Gara and Jim Yoakum, University of Colorado Press, 2004. (132.64)

Response: The "Management Indicator Species (MIS) and Indicator Habitat" portion of the "Wildlife and Rare Plants" section of the EIS notes that while pronghorn antelope are common and persistent on the Apache-Sitgreaves NFs, they occur at densities less than habitat capacity per information provided by the Arizona Game and Fish Department. As such, extensive restoration treatments of grasslands (up to 25,000 acres annually) and overly dense woodlands (5,000 to 15,000 acres annually) are provided by plan objectives in order to expand suitable habitat conditions and facilitate pronghorn movement. In addition, as noted above, there are a number of guidelines that address fences for improved passage of wildlife including pronghorn antelope. Fawn to doe ratios (fawn:doe) are set by Arizona Game and Fish Department and are outside of the Forest Service mission.

Concern Statement: Explain how the plan provides for the needs of antelope (hiding cover and food resources) while also providing forage for nonnative species. (132.62)

Response: A plan fine scale desired condition for grasslands addresses antelope needs for certain forage and herbaceous plant height during the critical fawning period. This does not mean that a project (e.g., livestock grazing on an allotment) must provide these conditions everywhere or all the time. Hence, livestock management can be adjusted, as by pasture rotations, to meet the

temporal and spatial requirements for pronghorn antelope fawning while still providing forage for cattle, elk, and other species.

Concern Statement: There should be a desired condition that has a goal of at least 40 fawns per 100 does to expand the existing populations of antelope. (132.63)

Response: Fawn to doe ratios (fawn:doe) are set by Arizona Game and Fish Department and are outside of the scope of the plan.

Concern Statement: "In grasslands, maximum achievable cover height should be present in pastures with known antelope fawning areas each spring/summer …" (p. 119) This statement effectively removes any known antelope fawning area from all livestock grazing without any evidence that properly managed grazing influences antelope fawning success. If other than only anecdotal evidence exists, then data should be provided. (108.238)

Response: This quote is not found in the proposed plan or DEIS. However, see the response above to comment number 132.62 in the "Wildlife and Rare Plants" section of this appendix.

Concern Statement: Correct the DEIS at page 249: "Semi-desert grasslands which on the forests occurs below the Mogollon Rim is isolated by topography and dense woodlands, supports limited numbers of pronghorn, and is not currently managed for the species by the AZGFD." Although pronghorn numbers may be limited, this area is currently managed for pronghorn. (101.92)

Response: This paragraph in the "Management Indicator Species (MIS) and Indicator Habitat" portion of "Wildlife and Rare Plants" section of the EIS has been rewritten to reflect the above clarification.

Concern Statement: Provide for high quality habitat and the maintenance of wildlife connectivity to preserve species viability. (101.1, 162.65, 37.3, 56.1, 132.37)

Response: The plan provides for quality wildlife habitat and connectivity. Wildlife habitat quality and connectivity are discussed under "Habitat Connectivity and Linkages" header in the "Wildlife and Rare Plants" section of the EIS. As noted, in addition to WQAs, other management areas such as wilderness, recommended wilderness, primitive area, and natural landscape also provide greater habitat security and connectivity.

Concern Statement: Protect wildlife corridors: (1) limit roads in some areas such as Little Creek, Paddy Creek, and along the Mogollon Rim, (2) wildlife linkages should have a road density of no more than 0.25 mile/square mile, limited developed sites, no logging (except restoration treatments), no vehicle or mountain bike use off of designated roads and trails, and no new road construction, and (3) roads and routes that threaten or significantly impair wildlife movement through critical corridors (162.116)

Response: The comment implies there are distinct, identified wildlife corridors; the plan does not delineate specific wildlife corridors. However, it does provide for wildlife habitat quality and connectivity. See the discussion of environmental consequences in the "Wildlife and Rare Plants" section of the EIS. As noted in the plan under the management approaches for the "Motorized Opportunities" section, potential site specific changes to the Apache-Sitgreaves NFs

transportation system will be evaluated and implemented through future project-level decisionmaking, including the implementation of the Travel Management Rule (36 CFR §212).

The Arizona Game and Fish Department, in cooperation with various stakeholders, has completed a wildlife connectivity assessment identifying linkages for Coconino County. This process is underway for Navajo and Apache Counties (Apache-Sitgreaves NFs biologists have provided input), but the final report is not yet complete. The process has not been initiated for Greenlee County. The assessment would be used to better understand wildlife needs during project and activity-level planning

Concern Statement: We do not need any wildlife corridors. (24.3)

Response: The plan does not identify any "wildlife corridors." The National Forest Management Act directs that plans address the viability of species. This entails providing for a wide range of wildlife needs such as forage, water, and cover. Genetic exchange between groups of individuals of a species is also important to species viability; hence, habitat connectivity has been addressed in the plan. Habitat connectivity is discussed under the "Habitat Connectivity and Linkages" header in the "Wildlife and Rare Plants" section of the EIS.

Concern Statement: Implement species recovery plans to ensure recovery of threatened and endangered species and establish standards to ensure the recovery of each at-risk plant and animal species that may occur on the forest. (14.2, 94.2, 23.10, 3.4)

Response: Plan guidelines under the "Aquatic Habitat and Species" and under the "Wildlife and Rare Plants" sections include the requirement that,

> *"Activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans."*

For other species, guidelines in these same plan sections include the requirement that,

> *"Management and activities should not contribute to a trend toward the Federal listing of a species."*

These guidelines help to contribute to recovery of threatened and endangered species and help address the needs of species that may be at-risk such as Regional Forester designated sensitive species.

Concern Statement: Provide the greatest possible safe habitat for predators (e.g., Mexican wolves, mountain lions). (80.3, 12.1)

Response: Plan alternatives provide varying levels of more secure habitat for wildlife, including Mexican wolves and mountain lions. See the EIS tables 1 and 2 for the acreages of those management areas providing more secure habitat (no motorized vehicle use) for wildlife. Alternative D has the most acreage in secure habitat areas such as wilderness, recommended wilderness, primitive area, wildlife quiet areas, and natural landscape.

Concern Statement: Provide habitat for Mexican wolves, and eventually grizzlies, jaguars and all other native species which formally lived in the region. (80.7)

Response: Introduction of extirpated species is outside of the scope of the plan. Habitat for Mexican wolves and their prey is addressed under the "Analysis of Species Viability" and the Endangered Species Act (ESA) Species" headers within the "Wildlife and Rare Plants" sections of the EIS.

Concern Statement: As is often the case, the issue of status of elk as being a nonnative species is raised in this document. The existence of the Merriam's subspecies is not well established in credible science. It is indisputable that *Cervus elaphus* or the American elk existed in the area now known as the Apache-Sitgreaves NFs. It is important to understand that the taxonomic status of what is purported to be Merriam's elk is in question. (109.22)

Response: There is limited information regarding what is called Merriam's elk being extirpated from the White Mountains of Arizona and nearby New Mexico in the early 1900s; therefore, there is debate about this animal.

Information used in the EIS about the Merriam's elk was taken primarily from "Elk of North American–Ecology and Management" (Thomas and Toweill, 1982) and from historic records of Roosevelt elk introductions specifically on the Apache-Sitgreaves NFs. Another source of information is Heffelfinger et al. (2002) wherein some genetic samples of early Arizona elk remains (e.g., bones, skulls) were compared to genetics of elk in the White Mountains today. They found that the genetic haplotypes of today's Arizona elk match those of elk in the Yellowstone region, the source of the early 1900 elk introductions into this area. They found differences between the genetics of today's elk and genetics from those limited historic elk samples. With limited samples and limited DNA segments, questions will remain.

Concern Statement: Clarify why fragmentation of habitat would be the major issue for wildlife as opposed to cover and food (forage). (108.221)

Response: To be fully viable, all life function needs of wildlife have to be met across their habitat and over time (Hunter, 1990). Habitat fragmentation may limit the ability to reach or have adequate amounts of cover and food (forage) as well as limit genetic exchange and species survival fitness over the long term. Habitats on the Apache-Sitgreaves NFs are fragmented by urban areas, roads, and power lines; however, habitat connectivity can help address this; the "Habitat Connectivity and Linkages" header in the "Wildlife and Rare Plants" section of the EIS addresses habitat connectivity.

Concern Statement: Explain the plan's definition of diversity and how it will be measured to evaluate progress. Explain the evidence that diversity has changed on the Apache-Sitgreaves NFs. (102.24, 108.247, 108.96, 102.3, 102.2, 102.1, 102.50)

Response: The definitions for both ecosystem diversity and biological diversity have been added to the plan's glossary. Ecosystem diversity was further clarified in the plan in the "Maintenance and Improvement of Ecosystem Health" section:

> *"Healthy ecosystems are diverse and self-sustaining, displaying a variety of conditions (e.g., composition, structure, function, and processes) between and within them. Ecosystem diversity provides for the distribution, diversity, and complexity, and natural*

> *disturbance regimes of watershed and landscape scale features, affecting including natural disturbance regimes of terrestrial, aquatic, and riparian ecosystems. Communities, populations, and individual plant and animal species are uniquely adapted to and dependent upon ecosystem diversity."*

The plan itself does not call for measuring "diversity" per se, but the monitoring strategy set forth in the plan (chapter 5) includes the requirement to monitor various components of ecosystem and biological diversity. During plan analysis, the Vegetation Dynamics Development Tool (VDDT) was used to determine how PNVT conditions have changed, i.e., how departed they are from historic or reference conditions. For more information, see the "Vegetation" section in chapter 3 of the EIS.

Concern Statement: Explain the scientific basis and purpose for management indicator species (MIS). (102.34, 102.6, 102.20)

Response: Management indicator species (MIS) are used based on the assumption that they can reflect effects on a broader group of species in terms of assessing species viability and for use in developing plan alternatives in accordance with the National Forest Management Act (NFMA). The Forest Service direction for use of MIS species is reiterated in the "Report on the Selection of Management Indicator Species and Ecological Indicators for Apache-Sitgreaves NFs" (Forest Service, 2014e) found in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. This report contains that direction, in part:

> *"The 1976 National Forest Management Act (NFMA) regulations direct that 'Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area.' For planning purposes, "a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." MIS is a concept adopted by the agency (1982 Planning Rule provision 219.19) to serve, in part, as a barometer for species viability at the forest level.*
>
> *The 1982 regulations to implement the NFMA require that MIS be identified as part of the forest plan. Indicator species serve multiple functions in forest planning by focusing development of management alternatives and providing a means to analyze effects on biological diversity… Upon plan implementation, monitoring of MIS population trends in relationship to habitat changes serves as a reliable feedback mechanism about the consequences of land management."*

Additional information can be found in the "Wildlife Specialist Report-Viability" (Forest Service, 2014l), including the referenced white paper on managing for population viability (Holthausen, 2002).

Concern Statement: The plan's identification of management indicator species (MIS) is controversial because it (1) fails to capture the range of PNVT that host TES species whose viability is of planning concern and (2) significantly changes course from the 1987 plan which designates 17 MIS that better represent the range of habitats found on the forests. (127.48, 26.43, 127.50, 162.21, 162.18, 26.41, 162.19, 162.20)

Response: There is no requirement to select a management indicator species (MIS) for every potential natural vegetation type (PNVT). Rather MIS were selected for PNVTs where extensive restoration objectives are planned: ponderosa pine PNVT (northern goshawk), dry and wet mixed conifer PNVTs (Mexican spotted owl), and grassland PNVTs (pronghorn antelope). Threatened, endangered, and sensitive (TES) species have their own analyses in the EIS and plan biological assessment and biological evaluation.

Application of the 17 MIS identified in the 1987 plan was found to be less than useful because some species are habitat generalists (e.g., elk use grasslands, woodlands, forests, riparian areas, etc.) so their populations are not closely tied to management in any one habitat or PNVT. In addition, population changes of some 1987 plan MIS were too difficult to assess compared to influences (e.g., macroinvertebrates in watersheds that have more influencing factors than can be measured).

Also, in lieu of selecting for a whole variety of birds that can be influenced by management and a broad range of species associated with water on the Apache-Sitgreaves NFs, two "ecological indicators" or EIs were selected. For a discussion of these aspen and riparian ecological indicators, see the "Habitat Ecological Indicators (EIs)" header in the "Wildlife and Rare Plants" section of the EIS.

Additional information about the MIS and EI selection process is documented in the "Report on the Selection of Management Indicator Species and Ecological Indicators for Apache-Sitgreaves NFs" (Forest Service, 2014e) found in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning.

Concern Statement: Explain why aspen was not selected as an ecological indicator (EI). (127.49)

Response: Aspen was selected as an ecological indicator, as noted above, along with a riparian ecological indicator.

Concern Statement: Designate management indicator species (MIS) to evaluate the health of aquatic and riparian systems. (162.82, 26.45, 162.23, 162.22, 26.176)

Response: See the response as noted two comments above. It describes the difficulties of selecting a management indicator species for riparian areas and how the riparian ecological indicator was chosen to evaluate the health of riparian systems.

Concern Statement: Include the wetland/cienega PNVT as a riparian ecological indicator (EI). (112.51)

Response: Neither the wetland/cienega riparian area PNVT nor the mixed broadleaf deciduous riparian forest PNVT were selected for inclusion in the riparian ecological indicator. The cottonwood/willow riparian forest PNVT and the montane willow riparian forest PNVT together are selected as the riparian ecological indicator.

This was not clear and has been corrected in the EIS along with rationale for not including the wetland/cienega riparian area PNVT and not including the mixed broadleaf deciduous riparian forest PNVT. The rationale for not including these two PNVTs is documented in the "Report on the Selection of Management Indicator Species and Ecological Indicators" (Forest Service,

2014e) found in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning.

The rationale for not including them as noted in that document follows:

- While the wetland/cienega riparian area PNVT was initially considered as part of the riparian ecological indicator, it was dropped because riparian areas are critical areas for monitoring livestock grazing per many National Environmental Policy Act (NEPA) grazing decisions. Hence, there was no need to duplicate monitoring efforts.

The mixed broadleaf deciduous riparian forest PNVT was not considered effective as part of a riparian ecological indicator. This PNVT occurs along larger streams and rivers on the Apache-Sitgreaves NFs within large watersheds and is extensively affected by a multitude of impacts. This creates difficulties in trying to relate impacts within this PNVT to specific forests management and activities in the broad watershed.

Concern Statement: The agency admits failure to monitor threatened Mexican spotted owl and sensitive northern goshawk populations. Therefore, any estimate of management effect to the viability those MIS is arbitrary and capricious. Monitoring failures cast doubt on conclusions in the DEIS that the plan will maintain viable populations of proposed MIS. (26.179)

Response: The 1987 plan management indicator species (MIS) have been monitored. See the "Assessment of Management Indicator Species" (Forest Service, 2012a) document on file at the Apache-Sitgreaves NFs Supervisor's Office that covers multiple years.

Both the Mexican spotted owl and northern goshawk are selected as management indicators in the plan and analyzed in the EIS. The 1982 Planning Rule provision at 219.12(k) requires a monitoring protocol or plan as discussed in the "Report on the Selection of Management Indicator Species and Ecological Indicators" (Forest Service, 2014e) found in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. Information gleaned from monitoring is used to detect changes in indicator populations and habitat trends. That information serves as a reliable feedback mechanism about the consequences of land management and facilitates adaptive management. Forest Service Manual 1922.7 and Forest Service Handbook 1909.12 chapter 6 provide direction for conducting monitoring and evaluation of indicators. Monitoring of MIS population trends in relationship to habitat changes is a required plan decision and is discussed in chapter 5 ("Monitoring Strategy") of the plan.

Concern Statement: Include fine filter habitat elements to reduce viability risk for Mexican spotted owls. Include Mexican spotted owl as an associated forest plan species for riparian forests and Madrean pine-oak woodland PNVTs. (DEIS p. 227, 240). (112.49, 112.50, 112.53)

Response: A number of fine filter habitat elements that contribute to Mexican spotted owl viability are included in the plan. An example of a fine filter habitat guideline under "Forests: All Forested PNVTs" is:

> *"Where current forests are lacking proportional representation of late seral states and species composition on a landscape scale, old growth characteristics should be retained or encouraged to the greatest extent possible within the scope of meeting other desired*

> *conditions (e.g., reduce impacts from insects and disease, reduce the threat of uncharacteristic wildfire).”*

Another example of a guideline under “Forests: Wet Mixed Conifer” is:

> *“In mid-aged and older forests, trees are typically variably spaced with crowns interlocking (grouped and clumped trees) or nearly interlocking providing for species such as red squirrel. Trees within groups can be of similar or variable species and ages.”*

The Mexican spotted was included for the Madrean pine-oak woodland PNVT (DEIS table 66) but it was omitted for riparian forests. This has been corrected in the EIS; thank you for pointing this out.

Concern Statement: The plan should offer a different approach to ensure species viability that is both more protective of existing habitat and more pro-active in restoration of reference ecological condition. (162.17, 26.21, 26.3)

Response: The approach to species viability was conducted in accordance with the National Forest Management Act (provisions of the 1982 Planning Rule). The Forest Service Southwestern Regional Office also provided guidance for viability procedures (see the “Wildlife Specialist Report-Viability” (Forest Service, 2014l) in the plan set of documents and on the forests’ Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning for more detail). PNVT desired conditions are based on historic or reference conditions (see the “Vegetation” section in chapter 3 of the EIS).

Concern Statement: Explain why the proposed plan's management approach to species viability is different than the 1987 plan and compare the impacts to the environment. (26.15)

Response: Species viability analyses under the 1987 plan (alternative A) and under the proposed plan (alternative B) and the other action alternatives (alternatives C and D) were conducted as directed by the National Forest Management Act (NFMA). The EIS analyzes and discloses the environmental consequences of all alternatives in chapter 3. The Forest Service Southwestern Regional Office provided guidance for conducting NFMA plan viability analyses at: http://www.fs.usda.gov/detail/r3/landmanagement/planning/?cid=stelprdb5177400. Also see the “Provision for Species Viability” and “Analysis of Species Viability” headers in the “Wildlife and Rare Plants” section in the EIS.

Concern Statement: The species viability analysis does not meet NFMA (National Forest Management Act) requirements because it does not use a reliable and accurate habitat-proxy. To meet the species viability requirement: (1) avoid grouping TES species with more common or less specialized animals in the viability analysis, (2) identify a minimum number of individuals comprising viable populations, and (3) demonstrate spatially that adequate habitat exists for each species of planning concern. (26.32, 108.235, 26.40, 26.39, 26.34, 26.27, 26.26, 26.25, 26.23, 26.44, 26.175, 26.24, 162.15, 162.16, 26.13, 26.173, 127.22, 26.20, 162.14)

Response: In assessing species viability, the Apache-Sitgreaves NFs first looked at the potential natural vegetation types (PNVTs) providing habitat for a species (coarse filter step). Next, if the desired conditions for that PNVT do not fully meet the needs for a species, a fine filter step was

taken wherein a plan decision was added (standard or guideline). For more information, see the "Wildlife Specialist Report-Viability" (Forest Service, 2014l) in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. However, the coarse filter/fine filter approach does not assume that the PNVTs are a proxy for viability, nor is the viability analysis process a habitat proxy. In addition, there is no National Forest Management Act (NFMA) requirement to spatially demonstrate adequate habitat for each species and the Vegetation Dynamics Development Tool (VDDT) modeling is not spatially explicit.

The viability analysis grouped species by the PNVT(s) or habitat element(s) they rely on for habitat. Other wildlife specialist reports assessed these species relative to requirements based on their status (e.g., threatened/endangered, sensitive, management indicator species, etc.). For example, the threatened/endangered species were also analyzed in accordance with Endangered Species Act requirements in the biological assessment.

The analysis of species viability was conducted as directed in accordance with National Forest Management Act (36 CFR § 219.19) that defines a viable population as,

> *"one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning areas."*

This species viability analysis is not population viability analysis which is the probability of a population persisting for a biologically meaningful timeframe and which often seeks to identify a minimum number of individuals for population persistence.

Concern Statement: The EIS should account for southwestern willow flycatcher designated critical habitat as identified in the final USFWS rule (See 78 Fed. Reg. 344-534 (Jan. 3, 2013) (final rule)). (26.174)

Response: The DEIS was submitted for printing prior to the final designation of critical habitat for the Southwestern willow flycatcher; the EIS has been updated to include the latest critical habitat status and analysis.

Concern Statement: Please vote yes on A.B. 1213 (Bloom), the Bobcat Protection Act of 2013, which would ban trapping and commercial sale of bobcats in California. California's native wildlife should not be exploited and harmed for personal commercial gain. (17.1)

Response: The comment is beyond the scope of the plan. The Apache-Sitgreaves NFs is located in Arizona, not California. In addition, as an agency, the Forest Service does not have voting rights.

Invasive Species

Concern Statement: Treat more than the planned Invasive Species objective "Annually, control or eradicate invasive species (e.g., tamarisk, bullfrogs) on at least 2 stream miles" (proposed plan p. 64). (146.4, 162.102)

Response: The plan objective above describes a minimum level based on the estimated workforce capacity and anticipated funding. As described in the "Plan Content" section in chapter 1 of the plan,

> *"Objectives are strongly influenced by recent trends, past experiences and anticipated staffing levels, and short term budgets. Variation in achieving objectives may occur during the next 15 years because of changes in environmental conditions, available budgets, and other factors."*

If conditions allow, additional stream mileage could be treated to control or eradicate invasive species.

Concern Statement: Eradication of cowbirds is included as an objective in this Invasive Species section (proposed plan p. 64). Please note that such actions need to be coordinated with the Department and appropriate permitting obtained. (101.65)

Response: The Apache-Sitgreaves NFs would follow existing law, regulation, and policy (which is not repeated in the plan) when implementing the objectives to contain, control, or eradicate plant or animal invasive species. This includes obtaining all State and Federal permits for wildlife work as required.

Concern Statement: Add a guideline for Invasive Species: "Treatments should be prioritized to minimize effort and maximize results." (162.104)

Response: There is an existing guideline in the "Invasive Species" section within chapter 2 of the plan that addresses treatment efficacy. Prioritization of treatments is critical to treatment efficacy. The guideline states,

> *"Treatment of invasive species should be designed to effectively control or eliminate them; multiple treatments may be needed."*

Concern Statement: Add a guideline for Invasive Species: "Motorized equipment used in projects should be cleaned of all mud and plant propagules before entering a project area, and workers should be instructed on how to identify invasive species and avoid spreading them (i.e., clean mud and seeds off of shoes and socks, avoid walking though invasive plant patches, don't throw plants that have gone to seed into streams or washes)." (162.105)

Response: Although not explicit, this would be covered by the standard for "Invasive Species" in chapter 2 of the plan,

> *"Projects and authorized activities shall be designed to reduce the potential for introduction of new species or spread of existing invasive or undesirable aquatic or terrestrial nonnative populations."*

Additional guidance that would prevent or limit the spread of invasive species has been added to the "Other Sources of Information" for invasive species section of Appendix D in the plan. For example, appendix A of the "Environmental Assessment for the Apache-Sitgreaves NFs Integrated Forestwide Noxious or Invasive Weed Management Program" (Forest Service, 2008b) provides guidance to prevent new noxious and invasive weed infestations and the spread of existing noxious and invasive weeds.

Concern Statement: Add a guideline to require weed and seed free hay and feed. (162.106)

Response: Although not explicit, this would be covered by the standard for invasive species in chapter 2 of the plan,

> *"Projects and authorized activities shall be designed to reduce the potential for introduction of new species or spread of existing invasive or undesirable aquatic or terrestrial nonnative populations."*

In addition, Forest Service Manual 2900 Invasive Species Management was added to the "Other Sources of Information" for invasive species section of Appendix D in the plan. This manual describes Forest Service policy on weed-free materials.

Concern Statement: Modify Invasive Species Guideline (proposed plan p. 64) "Projects and activities*, except as needed for wildlife conservation and management projects (i.e., native species recovery and management, and sportfish stocking*), should not transfer water between drainages or between unconnected water bodies within the same drainage to avoid spreading disease and aquatic invasive species. *For projects and activities where water transfers will occur, measures should be taken to prevent the spread of non-target fish species, invasive species, parasites, or diseases."* (101.66)

Response: No modifications were made to the plan based on this comment. The intent of this guideline is to prevent the spread of nonnative species or diseases that could occur through site specific actions implemented under the plan (e.g., water transfers, movement of equipment) and would apply to all projects and activities.

Concern Statement: The objective should be to encourage species which contribute to the goals of the plan and to control or eliminate (where feasible) those that don't regardless of whether they are native or not. (102.23)

Response: The desired conditions, standards, and guidelines throughout the plan are purposely intended to maintain and improve native and desirable nonnative species and prevent the spread of noxious or invasive species (through containment, control, or eradication).

Concern Statement: The forests should plan to repeat invasive species eradication treatments annually for at least five years. (162.103)

Response: Treatment of invasive species populations would be conducted annually as identified in the objectives for invasive species in order to contain, control, or eradicate these populations. The specific amount or repetition of treatments for a particular piece of ground would be identified at the project level. For some species, annual treatments may exceed five years in order to successfully eradicate established populations.

Concern Statement: Juniper and salt cedar need to be eliminated. (148.2)

Response: Objectives for "Woodlands: All Woodland PNVTs" within chapter 2 of the plan identify the need to treat 5,000 to 15,000 acres annually to promote a highly diverse structure. The intent is not to eliminate juniper but to provide for a more open canopy with trees being widely spaced with a higher amount of understory herbaceous vegetation to provide for soil productivity, traditional uses, and wildlife needs.

In regard to salt cedar, there is a need to contain, control, or eradicate this invasive species. The plan provides direction for this in the "Invasive Species" section in chapter 2 including,

> *"Invasive species (both plant and animal) are nonexistent or in low occurrence to avoid negative impacts to ecosystems." (desired condition)*

"Undesirable nonnative species are absent or present only to the extent that they do not adversely affect ecosystem composition, structure, or function, including native species populations or the natural fire regime." (desired condition)

"Annually, contain, control, or eradicate invasive species (e.g., musk thistle, Dalmatian toadflax, cowbirds) on 500 to 3,500 acres." (objective)

Concern Statement: Add to Other Sources of Information for Invasive Species (proposed plan p.65): Aquatic Nuisance Species Task Force. 2011. State of Arizona Aquatic Invasive Species Management Plan. At http://anstaskforce.gov/State%20Plans/AZ/AISMPlan.pdf (162.107)

Response: This has been added to the plan in appendix D.

Concern Statement: Clarify the term wild horses. Concern that wild horses associated with the Heber Wild Horse Territory may be confused with unauthorized horses. (105.19, 123.8, 99.35, 99.33, 99.20, 99.1, 123.10, 131.17)

Response: The definition for feral horse was added to the plan. See definitions for feral horse, unauthorized livestock, and wild horse in the plan's glossary.

Concern Statement: Complete the herd management plan for the Heber Wild Horse Territory with full public review as required by NEPA (National Environmental Policy Act). (109.10, 109.9)

Response: The completion of a management plan for the Heber Wild Horse Territory is outside the scope of the plan and plan revision process. The Forest Service is currently working toward the completion of the Heber Wild Horse Territory Management Plan; the expected date of completion is the fall of 2015.

Concern Statement: Recognize the impact of unauthorized horses in the Black River drainage, including their destruction of habitat. (109.8)

Response: The Forest Service recognizes the presence of unauthorized livestock, including feral horses, across the forests. The background of the "Invasive Species" section of the plan has been updated to include information about these feral horses and their impact on ecological conditions.

Concern Statement: Horses, other than wild horses, should not be included when determining the needs and management of livestock and wildlife. Concern with guideline "forage, browse and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage" (proposed plan p. 96). (138.33, 123.9, 123.7)

Response: Unauthorized livestock, including feral horses (see definition in EIS glossary), are not included as part of this guideline. This guideline only applies to wildlife, authorized livestock, and wild horses.

Concern Statement: Explain why there is not an established use level for wild horses except for the Heber Wild Horse Territory. (138.15)

Response: Use levels are assigned only to wild horses in the Heber Wild Horse Territory. Established use levels are not assigned to unauthorized livestock, including feral horses.

Unauthorized livestock are prohibited on National Forest System land by regulation (36 CFR § 261.7).

Concern Statement: If no wild horses currently inhabit the wild horse territory, this area should be dropped as a management area. (99.10, 99.12)

Response: The wild horse territory remains as one of the 12 management areas identified in chapter 3 of the plan. The Heber Wild Horse Territory management plan (in progress) will identify the appropriate management level (number of wild horses) for this area. If this number is zero, the plan could be amended in the future to remove the territory.

Concern Statement: The Heber Wild Horse Territory should be abolished. (108.167)

Response: The Heber Wild Horse Territory was established by Congress and as such, can only be removed by a Congressional Act.

Concern Statement: Modify Wild Horse Territory Desired Condition (proposed plan p. 111) "Grazing is in balance with available forage (i.e., grazing and browsing by *authorized and unauthorized livestock*, wild horses, *feral horses and hogs*, and wildlife do not exceed the available forage production within established use levels)." (101.82)

Response: The desired condition has not been modified based on this comment. Feral horses and hogs fall under the definition for unauthorized livestock. The intent of this desired condition is to address allowable use levels for authorized livestock under a permit, wild horses, and wildlife. Unauthorized livestock, including feral horses and hogs, are not part of any desired condition.

Recreation

Concern Statement: In Overall Recreation Opportunities affected environment (DEIS p. 316), there should be a discussion identifying the uses practiced by the local residents and the importance of the forests to the local population and economy. (99.23)

Response: The recreation data from the National Visitor Use Monitoring used in the EIS does not differentiate between local users and users from more distant population centers. Additional language was added to the “Overall Recreation Opportunities” section of the EIS to highlight the percentage of visitor use the forests receive from the counties where the forests are located. The importance of the forests to the local population and economy is reflected throughout the plan and EIS, especially the “Recreation,” “Forest Products,” and “Socioeconomic Resources” sections.

Concern Statement: Modify Overall Recreational Opportunities Background (proposed plan p. 68). Add boating to the list of primary recreational activities. Kayaking and canoeing are becoming very popular activities on some lakes such as Fool Hollow, Bear Canyon, and Woods Canyon, in addition to some motorized boating recreation. (101.68)

Response: Additional language was added to the “Background for Overall Recreation Opportunities” section of the plan,

> *“A wide variety of other activities, including boating and hunting, also occur on the forests.”*

The primary recreation activities (those with the higher primary activity percentages) listed in the plan are taken from table 110 in the "Recreation" section of the EIS and are based on the national visitor use monitoring results (Kocis et al., 2002).

Concern Statement: Modify Developed Recreation Background (proposed plan p. 72). In addition to the Apache-Sitgreaves NFs and State Parks, Fool Hollow Lake Recreation Area is operated through a partnership with the Arizona Game and Fish Department and the City of Show Low. (101.69)

Response: The Arizona Game and Fish Department and the City of Show Low have been added to the sentence about Fool Hollow Lake in the "Background for Developed Recreation" section of the plan.

Concern Statement: Dispersed camping should be part of the future of the forest. (153.1, 149.5)

Response: The plan recognizes the importance of dispersed recreation, including dispersed camping, to the forests' visitors. Desired conditions, objectives, standards, guidelines, and management approaches for dispersed recreation are found in the "Dispersed Recreation" section of the plan.

Concern Statement: Concern that there may be conflicts between ROS (recreation opportunity spectrum) classification and access (motorized and non-motorized) to State Trust Land. For example, NFS land adjacent to State Land is classified as Semi-Primitive Motorized (SPM), however access and motorized use through State Trust land is allowed only on designated routes permitted by the Arizona State Land Department. (34.7, 34.6, 34.2, 34.4)

Response: The Recreation Opportunity Spectrum (ROS) is a planning tool for defining and identifying the types of outdoor recreation opportunities available on forest lands based on the social, physical, and managerial settings. ROS is discussed in the affected environment of the "Managed Recreation" section of the EIS. The plan provides guidance that recreation related project-level decisions and implementation activities should be consistent with the ROS. The plan does not direct or designate routes or areas for motorized travel. Specific access and motorized use determinations adjacent to State Trust Land would be done through future project-level decisionmaking, including the implementation of the Travel Management Rule (36 CFR §212).

Concern Statement: More effort should be placed on encouraging volunteerism. (99.16, 99.4)

Response: The desired conditions in the "Overall Recreation Opportunities" section of the plan include volunteers:

> *"Recreation opportunities provide for a variety of skill levels, needs, and desires in partnership with recreation permit holders, private entities, volunteer groups, community groups, and State, Federal, and tribal governments."*

The use of volunteers is also included as a management approach for accomplishing plan desired conditions, objectives, standards, and guidelines. Volunteers are specifically mentioned in the plan as management approaches for "Motorized Opportunities" and "Nonmotorized

Opportunities," in the introductory paragraphs for "Community-Forest Interaction," and in appendix E ("Possible Management Actions").

Concern Statement: Describe the recreation development planned in each alternative. (149.1)

Response: The plan is programmatic in nature and does not identify any new recreation developments. Therefore, no specific recreation developments are analyzed in the EIS. Any new recreation development would be addressed site specifically at the project-level. The plan provides a framework for future recreation development and focuses on maintaining existing recreation facilities in a safe and sustainable manner for quality visitor opportunities. Any new construction would be balanced with current and future maintenance requirements.

Concern Statement: Make the developed campgrounds more spacious with larger parking places for trailers, motor homes, and tow vehicles. Provide more space between camping sites. (98.25)

Response: The redesign of existing campgrounds and the design of any new campground are beyond the scope of the plan. Modifications to recreation sites would be subject to project-level National Environmental Policy Act (NEPA) analyses, including opportunities for public involvement.

Concern Statement: Recreation demand data should be used to inform decisions on recreation. The forests should ensure the next National Visitor Use Monitoring (NVUM) survey has a sufficient response rate to be meaningful. (162.123, 162.173, 108.28, 162.122)

Response: Data on recreation demand was used in the analysis presented in the "Recreation" section of the EIS. Sources included the 2001 National Visitor Use Monitoring (NVUM) survey (Kocis et al., 2002), National (Cordell et al., 2004, 2008a, and 2009), and State (Arizona State Parks, 2007 and 2009) information. It is recognized that not all forest uses can occur at the same time in the same location. The plan provides a spectrum of recreation settings and opportunities for a variety of users and activities.

The request concerning the NVUM survey is beyond the scope of the plan and plan revision process. Presently, there is no data specific to the Apache-Sitgreaves NFs available to determine recreation use trends. When the data collected by the Fiscal Year 2014 NVUM survey is analyzed, this information should be available.

Concern Statement: The plan should meet the people's desires for recreation as they have historically enjoyed it. (149.4, 81.1)

Response: The plan strives to balance the developed, dispersed, motorized, and nonmotorized recreation opportunities available on the forests. If only "historically enjoyed" recreation were allowed, that could limit the recreation opportunities currently available and those that may arise in the future.

Concern Statement: Shooting sports, including shooting ranges, should not be considered a use on public land. (2.1, 2.2)

Response: Eliminating shooting sports is beyond the scope of the plan and plan revision process. Shooting sports, including target ranges, are a legitimate use of National Forest System lands.

Target ranges are permitted as a recreation special use under Forest Service Handbook 2709.14 - Recreation Special Uses Handbook, Chapter 70 - Target Ranges and Other Outdoor Recreation Improvements. The plan contains a guideline in the "Special Uses" section that would limit the location of new target ranges to the General Forest and Community-Forest Intermix Management Areas.

Concern Statement: Wildlife-based recreation is important to the economy. There is a need to protect wildlife habitat. (18.1, 60.3)

Response: The plan acknowledges the economic contribution of visitors, including those that view wildlife, hunt, and fish. Wildlife habitat would be improved and maintained through the activities and treatments identified throughout the plan to restore potential natural vegetation types and functioning ecosystems. Several management areas identified in the plan would also respond to a variety of wildlife needs; these include Wildlife Quiet Area, Natural Landscape, Recommended Wilderness, Primitive Area, and Wilderness.

Motorized and Nonmotorized Opportunities

Concern Statement: Consider development of more multi-use single track and OHV trails. (44.1, 22.1)

Response: The plan would allow the development of single track and off-highway vehicle (OHV) trails (see "Motorized Uses Suitability" in chapter 4). Development of any new motorized trail would be addressed site specifically and a decision made following a project-level National Environmental Policy Act (NEPA) analysis.

Concern Statement: Do not eliminate opportunities to use OHVs (off-highway vehicles) or ATVs (all-terrain vehicles) on the forest. (43.2, 42.3, 114.1)

Response: The plan allows a variety of motorized recreation opportunities, including off-highway vehicle (OHV) and all-terrain vehicle (ATV) use. The identification of specific OHV and ATV routes would be considered in future project-level decisions, including implementation of the Travel Management Rule (36 CFR §212) for the Apache-Sitgreaves NFs. Some management areas and other areas may not be suitable for motorized use (see plan chapter 4 under "Motorized Uses Suitability").

Concern Statement: Consider the impacts from OHVs (off-highway vehicles) including loss of meadows and traditional campsites, exhaust and noise pollution, soil loss causes (loss of vegetation, wildlife habitat, overall long term forest productivity, biological diversity, etc.). (66.1, 124.5, 124.14)

Response: The environmental consequences of OHVs, motorized recreation, and motorized cross-country travel on forest resources are discussed in chapter 3 of the EIS in the "Air," "Soil," "Watershed," "Water Resources," "Invasive Species," "Riparian," "Recreation," "Infrastructure," "Inventoried Roadless Areas," "Wilderness Resources," "Scenic Resources," "Cultural Resources," "American Indian Rights and Interests," and "Livestock Grazing" sections.

<u>Concern Statement:</u> Maintain the OHV trail system along the San Francisco River. (113.4, 160.2)

<u>Response</u>: The plan is programmatic in nature and does not address specific off-highway vehicle (OHV) trails. This topic could be addressed in future project-level decisionmaking, such as implementation of the Travel Management Rule (36 CFR §212) for the Apache-Sitgreaves NFs.

<u>Concern Statement:</u> The Forest Service should more carefully consider the sources it cites to support development of more ORV routes. Those that have a bias do not represent the interests of the majority of forest users. (162.185)

<u>Response</u>: The commenter refers to the following statement from the "Recreation" section of the EIS:

> *"The use of motorized vehicles for recreation activities has increased dramatically in recent years."*

The source of this information is the State of Arizona (Arizona State Parks, 2007). The commenter did not provide references to refute this statement.

<u>Concern Statement:</u> Clarify Motorized Opportunities Background (proposed plan p. 73). The final sentence in this paragraph states "These roads and trails are also needed for forest management." It is unclear if the Apache-Sitgreaves NFs is also considering unauthorized roads (user-created) as being needed for forest management. (101.70)

<u>Response</u>: The paragraph under "Background for Motorized Opportunities" in the plan has been reorganized to eliminate the confusion. The statement in the proposed plan was not intended to infer that unauthorized roads are needed for management.

<u>Concern Statement:</u> Modify Motorized Opportunities Desired Condition (proposed plan p. 73) "*Open NFS roads and* motorized trails are easily identified on the ground (e.g., well-marked*, and marked open unless closed*). (101.71)

<u>Response</u>: The plan has been modified in the desired conditions for the "Motorized Opportunities" section to read:

> *"NFS roads, motorized trails, and motorized areas are easily identified on the ground (e.g., well marked)."*

The specific requirements for how the routes will be marked (e.g., closed unless designated open) would be addressed in a separate site specific implementation plan following the completion of the public motorized travel management planning process (implementation of Subpart B of the Travel Management Rule (36 CFR §212)).

Concern Statement: Modify Motorized Opportunities Management Approaches (proposed plan p.76) "The Apache-Sitgreaves NFs coordinate with Federal Highways Administration, *Arizona Game and Fish Department,* and ADOT to facilitate transportation needs, planned improvements, and transportation conditions. Apache-Sitgreaves NFs work with ADOT *and Arizona Game and Fish Department* to alleviate concerns with scenic resources; maintenance activities; use of herbicides; use of deicing agents; and creation of turnouts, parking lots, and wildlife crossings." (101.74)

Response: This management approach describes how the Apache- Sitgreaves NFs provide input to the Arizona Department of Transportation (ADOT) and Federal Highways Administration when those agencies propose any reconstruction and/or heavy maintenance of their roads (easements) that cross National Forest System (NFS) land. The Arizona Game and Fish Department was not included because they do not own any roads that cross NFS land.

Concern Statement: Use decommissioned roads as hiking trails. (109.27)

Response: The plan would allow the consideration of this concept. However, conversion of a decommissioned road to a hiking trail would be determined site specifically following project-level National Environmental Policy Act (NEPA) analysis.

Concern Statement: Address maintenance and management of cross-country ski facilities. Add an objective to accomplish this. (99.14, 99.15, 99.17)

Response: The “Dispersed Recreation” and “Nonmotorized Opportunities” sections of the plan provide management direction for winter recreation. The plan is programmatic in nature and management of specific recreation facilities would be addressed through site-specific recreation plans and day-to-day management at the project-level.

Concern Statement: Correct the Motorized Routes affected environment statement "An inventory has not been completed, but it is estimated that there are hundreds of miles of unauthorized routes" (DEIS p. 332). CMLUA (Citizens for Multiple Land Use and Access) spent over 2 years cataloging many of these routes for the Forest Service. (147.10)

Response: The Forest Service acknowledges and appreciates the contribution made by the Citizens for Multiple Land Use and Access (CMLUA). The group identified many unauthorized motorized routes on the Apache NF portion of the forests in response to the travel management planning efforts. The forests are required to validate this information prior to adding it to our geographic information system (GIS) database, and this will be an on-going process as resources are made available. In addition to the inventory provided by CMLUA, it is still estimated there are hundreds of miles of unauthorized routes on the Sitgreaves NF portion of the forests.

Concern Statement: Remaining roads should be decommissioned or significantly reduced to limit incursion by motorized travel into sensitive areas. (5.13)

Response: Objectives for closing, relocating, and decommissioning of existing system roads and unauthorized motorized routes to protect sensitive areas are contained in the “Riparian Areas” section of the plan. The plan also contains standards and guidelines in the “Motorized Opportunities” section to minimize incursion or effects of motorized trails into sensitive areas. The plan provides a framework to guide future changes to the transportation system. Actual

decommissioning or closure of roads would only be authorized following project-level National Environmental Policy Act (NEPA) analyses, including opportunity for public involvement.

Concern Statement: Prohibit new road and motorized trail development. There are too many roads. (5.20, 9.13, 41.1, 94.4, 94.3, 8.2, 64.2, 47.1, 23.12, 158.2, 107.2, 80.4, 73.2, 74.1)

Response: An alternative to prohibit new road or motorized trail construction was considered; however; it was considered not feasible. For example, new road construction may be required when access to a particular resource or private inholding is needed. New motorized trails may be needed to provide a variety of opportunities, including destinations and loops. See the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS for more information.

All of the action alternatives, including the plan, were designed to address the impacts of roads and motorized trails on forest resources. Plan direction identifies areas suitable for new road and motorized trail development, minimizes new road construction, and provides objectives to decommission existing roads and unauthorized motorized routes and relocate existing roads. Any new road or motorized trail construction would only be authorized following project-level National Environmental Policy Act (NEPA) analyses and would be accomplished using best management practices (BMPs) to minimize resource impacts while providing for access needs to the forests.

Concern Statement: Do not close roads. (95.1, 130.2, 136.1, 6.4)

Response: The plan provides a framework to guide future changes to the transportation system. Potential changes to the forests' transportation system, including road closures, would be evaluated in future project-level decisionmaking, including the implementation of the Travel Management Rule (36 CFR §212). Those decisions would be consistent with the National Environmental Policy Act (NEPA), including analysis and opportunity for public involvement.

Concern Statement: Prioritize maintenance and access for level 3-5 roads (suitable for passenger cars) and close level 2 roads (high clearance vehicles) when financial limits restrict the amount of maintenance that can be performed. (162.124)

Response: Prioritization of road maintenance planning is outside the scope of the plan and plan revision process. Maintenance planning is a requirement of Forest Service Manual 7732.11 that requires the forest to,

> *"Develop annual road maintenance plans based on road management objectives and expected traffic for all National Forest System Roads."*
>
> *"Clearly display the allocation of available funds in highest priority order in road maintenance plans in case of funding short falls."*

Concern Statement: No new level 2 roads should be considered and large portions of the forest should not be considered suitable for additional road development unless level 3-5 roads are required. (162.125)

Response: The plan provides a framework to guide future changes to the transportation system. Potential changes to the forests' transportation system, including new roads, would be evaluated

in future project-level decisionmaking, including the implementation of the Travel Management Rule (36 CFR §212).

The plan describes the suitability of areas for new roads in the "Motorized Uses Suitability" section in chapter 4 of the plan. Although certain areas may be determined suitable for the development of new roads, there may be specific locations where plan standards and guidelines would restrict the development of new roads.

Proposals for new road development and the associated environmental effects would be considered through project-level planning. Any new road construction design would be consistent with plan standards and guidelines, best management practice (BMPs), and Forest Service Handbook 7709.56 Road Preconstruction Handbook.

The assigned road maintenance level (e.g., level 2) is a function of the road management objective (RMO). Direction on RMOs can be found in Forest Service Manual 7714 and Forest Service Handbook 7709.59, Chapter 10. The RMOs should complement the resource management objectives contained in the documentation for the project. The resource prescriptions and RMOs are key items used to determine road design criteria, elements, and standards.

Concern Statement: Add a standard for road density of 2.0 mile/square mile or less. (162.39, 94.13, 26.138, 3.3)

Response: An alternative was considered but not analyzed in detail that included a road density standard (see the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2 of the EIS). The plan provides for the protection and management of healthy and sustainable soils, watersheds, and wildlife connectivity which are the primary resource concerns associated with National Forest System roads and motorized trails.

Potential changes to the forests' transportation system would be evaluated in separate analysis through future project-level decisionmaking such as the implementation of the Travel Management Rule (36 CFR§212). Site specific travel management planning will use the framework set by the plan (e.g., desired conditions, standards, guidelines) and will consider potential resource impacts, access needs, public input, and alternative views rather than using an arbitrary road density target. If undesirable resource conditions resulted from open roads, they could be addressed through site specific evaluation and analysis.

Concern Statement: The plan should enact standards prohibiting commercial timber harvest and road construction in recently burned forests more than one-quarter (1/4) mile from existing system roads. (94.7, 23.13, 3.9, 5.9, 9.14)

Response: The plan provides direction for management following fires in the "Landscape Scale Disturbance Events" section of the plan in chapter 2. It includes desired conditions and guidelines to protect and facilitate recovery of soil and vegetation components and improve ecosystem health.

Wildfires burn with different intensities and require different activities for restoration to achieve desired conditions. Where extensive tree mortality results from fires and economic value exists, salvage of dead trees may be considered where this contributes to the movement toward desired conditions. Deferral of ecological restoration or salvage projects and activities may also be considered where these are not necessary for recovery. Site specific projects that include timber

harvest or road construction would only be authorized following project-level National Environmental Policy Act (NEPA) analyses, including opportunity for public involvement.

Concern Statement: Explain why historically open roads have been closed. (6.2)

Response: Past decisions are outside the scope of the plan. Road closures would have been evaluated in a project-level National Environmental Policy Act (NEPA) analysis and decision. The rationale would be specific to that project decision.

Concern Statement: Motorized cross-country travel should be allowed. (153.4, 40.1, 100.3, 100.4, 100.2)

Response: An alternative (alternative A) that would allow motorized cross-country travel was considered in the EIS.

Concern Statement: Motorized cross-country travel should not be allowed. (8.3, 124.10, 101.9)

Response: The plan contains a standard that would prohibit motorized cross-country travel unless specifically authorized or exempted. The plan is programmatic in nature; therefore, subsequent site specific National Environmental Policy Act (NEPA) analyses would be needed before the prohibition of motorized cross-country travel could be implemented.

This change to current management would be evaluated in the future project-level implementation of the Travel Management Rule (36 CFR §212). Once the implementation of the Travel Management Rule is complete and the transportation system is designated, motor vehicle use off the designated system would be prohibited.

This travel management planning process will use the framework set by the plan (e.g., desired conditions, standards, guidelines.) and would consider potential resource impacts, access needs, public input and alternative views in accordance with Forest Service regulations (CFR 36 §212 (Travel Management) and 36 CFR §251 (Land Uses, Part 261 (Prohibitions)).

Concern Statement: Allow motorized cross-country travel for big game retrieval; allow motorized cross-country travel for big game retrieval on at least 95 percent of the hunting areas in each district. (161.59, 161.58, 161.57, 101.7, 109.18, 153.2, 101.88)

Response: The plan would prohibit motorized cross-country travel unless specifically authorized or exempted. The responsible official has decided not to address the issue of motorized big game retrieval in the plan; it will be addressed during the planning process for the implementation of the Travel Management Rule (36 CFR §212).

Concern Statement: Clarify Motorized Opportunities Standards (proposed plan p. 74) "Motorized vehicle travel shall be managed to occur only on the designated system of NFS roads and motorized trails and designated motorized areas." It should be made clear that there will be authorized exemptions, including motorized big game retrieval. (101.72)

Response: The standard has not been modified. The plan does list the Travel Management Rule (36 CFR §212) exemptions for motorized travel off of National Forest System (NFS) roads, NFS motorized trails, or designated motorized areas (see the “Motorized Uses Suitability” section in chapter 4). The responsible official has decided not to address the issue of motorized big game

retrieval in the plan; it will be addressed during the planning process for the implementation of the Travel Management Rule. Agency regulations at 36 CFR §212.51(b) specifically address motor vehicle use for big game retrieval.

Concern Statement: Clarify Motorized Opportunities Standard (proposed plan p. 74) "Unless specifically authorized, motorized cross-country travel shall be managed to occur only in designated motorized areas." It should be made clear that motorized big game retrieval is included in the activities that are specifically authorized. (101.73)

Response: See the response above.

Concern Statement: Do not restrict dispersed camping to a 300 foot corridor off either side of a designated road or trail. (161.60, 161.61, 161.62, 98.26)

Response: The plan does not restrict dispersed camping adjacent to roads or trails.

Potential changes to the forests' transportation system, including motorized access to known dispersed camping sites, would be evaluated during the implementation of the Travel Management Rule. The travel management planning process will use the framework set by the plan (e.g., desired conditions, standards, guidelines.) and would consider potential resource impacts, access needs, public input and alternative views in accordance with Forest Service regulations (CFR 36 §212 (Travel Management) and 36 CFR §251 (Land Uses), part 261 (Prohibitions)).

36 CFR §212.51(b) specifically addresses motor vehicle use for dispersed camping.

Concern Statement: Allow motorized cross-country travel for firewood gathering in areas specifically designated for motorized firewood gathering, or that the authorized motorized collection of firewood consist of the minimum number of trips each way, as defined based on the transport capacity of the vehicle and the trailer, from the downed tree to the closest legally open road or trail in the authorized firewood collection area, by the most direct route compatible with safety and the preservation of other values such as riparian areas, archeological sites, etc. (161.63)

Concern Statement: Allow motorized cross-country travel for dispersed shooting. (161.65)

Response: This response addresses the above two concern statements. The plan would prohibit motorized cross-country travel unless specifically authorized or exempted. Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations would be allowed. Written authorizations would be issued on a site-specific basis.

The plan is programmatic in nature; therefore, subsequent site-specific National Environmental Policy Act (NEPA) analyses would be needed before the prohibition of motorized cross-country travel could be implemented.

This change to current management would be evaluated in the future project-level implementation of the Travel Management Rule (36 CFR §212). This travel management planning process will use the framework set by the plan (e.g., desired conditions, standards, guidelines.) and would consider potential resource impacts, access needs, public input and alternative views. Once the implementation of the Travel Management Rule is complete and the

transportation system is designated, motor vehicle use off the designated system would be prohibited.

Concern Statement: Address OSV (over -snow vehicle) travel in the plan. Do not exclude snowmobiles from the motorized cross-country travel ban. Apply Executive Order 11644, as amended by Executive Order 11989, minimization criteria to route and area designations. (99.24, 162.172, 162.120, 162.121)

Response: The plan would prohibit motorized cross-country travel unless specifically authorized or exempted. One of the exemptions provided by the Travel Management Rule (36 CFR §212) is for over-snow vehicles.

Use by over-snow vehicles is regulated by 36 CFR § 212 Subpart C and defers to the responsible official to propose restrictions or prohibitions on use by over-snow vehicles under this subpart. Potential restrictions and prohibitions for over-snow vehicles will be addressed in the future project-level implementation of the Travel Management Rule. This travel management planning process will use the framework set by the plan (e.g., desired conditions, standards, guidelines) and would consider potential resource impacts, access needs, public input, and alternative views.

Executive Order 1164, as amended by Executive Order 11989 requires agencies to develop procedures (i.e., Travel Management Rule) to manage off-road vehicles, including over-snow vehicles. As of March 29, 2013 there was a court case pending to remove the Travel Management Rule over-snow vehicle exemption from subpart B of 36 CFR §212 and require the designation of specific routes, trails and areas to include over-snow vehicles and remove Subpart C deferring it to the responsible official consistent with the executive order.

Concern Statement: Do not include travel management rule-related direction in the plan. (108.48, 147.11)

Response: The plan is required to be in compliance with all applicable Executive Orders. Implementation of the Travel Management Rule (36 CFR §212) is required by Executive Order 11644. The designation of specific routes, trails, and areas for motorized vehicle travel on the Apache-Sitgreaves NFs will be addressed in the separate public motorized travel management planning process. The process will use the framework provided by the plan and be consistent with the plan decisions.

Concern Statement: Include guidance for the implementation of the travel management rule. (161.71, 161.70, 161.56)

Response: The plan provides the framework (e.g., desired conditions, standards, guidelines) for implementing the Travel Management Rule (36 CFR §212). In particular, the “Motorized Opportunities” section in chapter 2 contains standards that would limit motorized vehicle travel to a designated system of NFS roads and motorized trails, and designated motorized areas. In addition, the “Motorized Uses Suitability” in chapter 4 describes the suitability of areas for motorized uses. Once the final decision on the plan has been made, the implementation of the Travel Management Rule will be conducted under a separate National Environmental Policy Act (NEPA) analysis.

Concern Statement: Implement a ban on cross-country travel with the implementation of the land management plan instead of waiting on the implementation of the Travel Management Plan. (162.171)

Response: The plan contains a standard that would prohibit motorized cross-country travel unless specifically authorized or exempted. The plan is programmatic in nature; therefore, subsequent site-specific National Environmental Policy Act (NEPA) analyses would be needed before the prohibition of motorized cross-country travel could be implemented.

This change to current management would be evaluated in the future project-level implementation of the Travel Management Rule (36 CFR §212). Once the implementation of the Travel Management Rule is complete and the transportation system is designated, motor vehicle use off the designated system would be prohibited.

This travel management planning process will use the framework set by the plan (e.g., desired conditions, standards, guidelines) and would consider potential resource impacts, access needs, public input and alternative views in accordance with Forest Service regulations.

Concern Statement: Explain why the forest doesn't have guidelines that restrict the use of OHVs (off-highway vehicles) on NFS land. (124.11)

Response: The plan provides direction for motorized vehicles; it does not differentiate management specifically for off-highway vehicles (OHVs).

36 CFR §212 defines an "off-highway vehicle" as,

> *"any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland or other natural terrain…"*

It would be difficult to restrict and enforce the use of OHVs differently than other motorized vehicles. OHVs are considered motorized vehicle and fall under the standards and guidelines for using roads and motorized trails in chapter 2 and chapter 3 of the plan. The plan contains a standard that would prohibit motorized cross-country travel for all motorized vehicles unless specifically authorized. In addition, the "Motorized Uses Suitability" section in chapter 4 ("Suitability") describes those vehicles and uses (e.g., aircraft, emergency vehicles, use specifically authorized by permit) that are exempted from the motorized cross-country travel prohibition per the Travel Management Rule (36 CFR §212).

Concern Statement: Explain where the enforcement is to address people driving motor vehicles that cause damage. (6.3)

Response: The enforcement of laws and regulations is outside the scope of the plan. Enforcement is not a plan decision but is a requirement of the Agency; agency regulations at 36 CFR §261.9 prohibit damage of any natural feature or other property of the United States.

Eligible and Suitable Wild and Scenic Rivers

Concern Statement: The designation of Sardine Creek as "wild" is not consistent with its location near the Morenci copper mining complex, the historical homestead use, or with

potential future uses associated with mining operations as afforded by the statutory rights of unpatented mining claimants. (151.7)

Response: Sardine Creek is not a designated wild and scenic river—only Congress can designate a river as "wild and scenic." Sardine Creek was first evaluated for wild and scenic river eligibility in 1993 as part of the "Resource Information Report, Potential Wild-Scenic-Recreational River Designation, National Forests in Arizona" (Forest Service, 1993). Because of changed conditions (e.g., Endangered Species Act (ESA) and sensitive species), Sardine Creek was re-evaluated in 2009 for wild and scenic river eligibility per direction in Forest Service Handbook 1909.12, Chapter 80. It was found to be eligible and was given a potential classification of "wild." The classification criteria for wild, scenic, and recreational river areas can be found in Section 82.3 - Exhibit 01 of the above document. Potential classification is based on the condition of the river and the adjacent lands at the time of the study (the Morenci mine complex is not adjacent to Sardine Creek), "the presence of a few inconspicuous structures, particularly those of historic or cultural value, is acceptable" in wild river areas, and there were no mining claims or operations on adjacent lands at the time of the eligibility re-evaluation.

The plan provides guidance for eligible wild and scenic rivers consistent with the interim management direction provided in Forest Service Handbook 1909.12, Chapter 80, Section 82.5. The river segment class (wild, scenic, or recreational) determines the types of actions or activities that may occur

Concern Statement: There are concerns regarding river classification around man-made fish barriers as identified in the 2009 Eligibility Report for the National Wild and Scenic River System Apache-Sitgreaves National Forests. The eligibility of these segments and the associated management that is required to maintain and possibly modify barriers may be in conflict. For the 2009 analysis, two segments of two streams, Fish Creek and East Fork Lower Colorado River (LCR) were requested to be excluded and classified as not eligible for WSR designation given the same conditions involving existing man-made fish barriers, but were not. The East Fork LCR, included an excluded segment for two gabion fish barriers, but did not include an exclusion for another fish barrier upstream at Colter Dam. (101.15, 101.18, 101.17, 101.16)

Response: The 2009 "Eligibility Report for the National Wild and Scenic River System, Apache-Sitgreaves National Forests" (Forest Service, 2009b) is the result of extensive coordination with all ranger districts on the Apache-Sitgreaves NFs. Information in this report was either verified by or supplied by district personnel.

> *"The determination of eligibility is an assessment that does not require a decision or approval document, although the results of this inventory need to be documented as part of the ... plan set of documents. " (Forest Service Handbook 1909.12, Chapter 80 - Wild and Scenic River Evaluation, Section 82.1)*

Specifically, the forests requested that the segment of Fish Creek with the fish barrier be classified as "recreational," with the remainder of the river classified as "scenic." Maintenance or modification of the fish barrier on the recreational segment of Fish Creek would be governed by the following guideline:

> *"Construction of structures ... to protect and enhance wildlife and fish habitat should full protect identified river values. Any portion of a wildlife or fisheries restoration project*

> *that has the potential to affect the river's free-flowing character shall be evaluated as a water resources project." (Forest Service Handbook 1909.12, Chapter 80 - Wild and Scenic River Evaluation, Section 82.51 (8.c.)).*

Additional internal coordination concerning the East Fork of the Little Colorado River and Colter Dam resulted in no changes to eligibility or classification. As a scenic river segment, the following Forest Service Handbook guideline would govern maintenance or modification of a fish barrier:

> *"Construction of structures ... to protect and enhance wildlife and fish habitat should harmonize with the area's largely undeveloped character and fully protect identified river values. Any portion of a wildlife or fisheries restoration project that has the potential to affect the river's free-flowing character shall be evaluated as a water resources project." (Forest Service Handbook 1909.12, Chapter 80 - Wild and Scenic River Evaluation, Sec. 82.51 (8.b.))*

Research into Colter Dam yielded the following information: (1) Colter Dam does not impound water, (2) the dam itself is in an "unsafe, non-emergency condition requiring rehabilitation or removal," and (3) the State of Arizona will not allow the owner, Lyman Water Co., to store water there.

The concern statement also makes reference to requests to exclude river segments with fish barriers. Research into the plan record did not identify any correspondence with the Arizona Game and Fish Department specific to fish barriers.

When suitability studies are done for eligible rivers, there will be opportunities for the public to comment.

Concern Statement: Wildlife-related recreational (hunting, fishing, watchable wildlife) opportunities should continue to be allowed in eligible and suitable wild and scenic rivers. (101.14)

Response: The plan provides guidance for eligible and suitable wild and scenic rivers consistent with the interim management direction in Forest Service Handbook 1909.12, Chapter 80, Section 82.5. The river segment class (wild, scenic, or recreational) determines the type of actions or activities that may occur. In general, hunting, fishing, and watchable wildlife activities would be allowed in eligible and suitable wild and scenic river corridors, provided plan direction, including suitability, and the Forest Service Handbook are followed. For example, motorized travel may not be appropriate in wild river areas/corridors. This is reflected in the plan "Motorized Uses Suitability" discussion and tables in chapter 4.

Concern Statement: Eligible and suitable scenic river segments should be managed for very high scenic integrity, not just moderate to high. (162.161)

Response: The plan describes the desired scenic integrity levels for wild, scenic, and recreational river segments in the desired conditions for the "Eligible and Suitable Wild and Scenic Rivers" section of the plan in chapter 2.

Moderate to high scenic integrity objectives (SIO) are appropriate for scenic river segments. By definition (plan) scenic river segments are free of impoundments, with shorelines or watersheds

still largely primitive, and shorelines largely undeveloped but accessible in places by roads. Small communities, dispersed dwellings, or farm buildings; grazing, hay production, or row crops; or evidence of past or ongoing timber harvest are also acceptable (Forest Service Handbook 1909.12, Chapter 80, Section 82.3 - Exhibit 01). The presence of roads, buildings, agriculture, and timber harvest would not be compatible with a very high SIO, which "generally provides for ecological change only." Management of eligible and suitable scenic rivers for very high scenic integrity would unnecessarily restrict current and future facilities and activities.

Concern Statement: AZGFD requests the Apache-Sitgreaves NFs coordinate closely regarding any development of management direction for eligible and suitable wild and scenic rivers to ensure full consideration is given to the potential impacts on the ability of AZGFD to manage fish and wildlife resources. (101.13)

Response: The plan provides guidance for eligible and suitable wild and scenic rivers in the "Eligible and Suitable Wild and Scenic Rivers" section in chapter 2. This guidance is consistent with the interim management direction in Forest Service Handbook 1909.12, Chapter 80, Section 82.5. Management guidelines for specific resources and activities are found in Section 82.51. The Apache-Sitgreaves NFs will work with the Arizona Game and Fish Department to manage fish and wildlife resources, while following the above Forest Service Handbook direction and guidelines and plan decisions in managing eligible and suitable wild and scenic rivers.

Concern Statement: No wild and scenic rivers or any other restricted or enlarged restricted areas. (154.2, 156.2)

Response: As part of the plan revision process, national forests are required to complete a comprehensive evaluation of the potential for rivers to be eligible for inclusion in the National Wild and Scenic Rivers System (Forest Service Handbook 1909.12, Chapter 80 - Wild and Scenic River Evaluation, Section 81.2). This evaluation is documented in the "Eligibility Report for the National Wild and Scenic River System, Apache-Sitgreaves National Forests" (Forest Service, 2009b).

Consideration of wilderness suitability is also inherent in land management planning. All lands on forest were inventoried to determine if any satisfied the definition of wilderness found in the Wilderness Act of 1964. Those that met the definition of wilderness were evaluated further. These are documented in the "Potential Wilderness Evaluations" (Forest Service, 2012b) in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606. The plan contains preliminary administrative recommendations for wilderness. These recommendations would receive further review, including applicable site specific National Environmental Policy Act (NEPA) analysis.

Congress has reserved the authority to make final decisions on wilderness designation and the inclusion of rivers into the National Wild and Scenic Rivers System.

Concern Statement: More miles of eligible wild and scenic rivers should be studied for suitability. (162.162)

Response: Wild and scenic river suitability determinations are beyond the scope of the plan and plan revision process. During the plan revision effort, the forests are not required to make suitability determinations for eligible wild and scenic rivers. This policy is set forth in Forest

Service Handbook 1909.12, Chapter 80 and is specifically disclosed in the "Scope of Analysis" section in chapter 1 of the EIS. Suitability studies would, most likely, occur on a case-by-case basis as opportunities arise or projects on eligible rivers are proposed. The need to conduct suitability studies in the future is acknowledged in appendix E ("Possible Management Actions") of the plan.

Concern Statement: The forests must determine eligibility of rivers and cease carrying the "potentially" eligible designation. The plan should indicate a timeframe for analysis and designation of wild and scenic rivers. (99.26, 99.37, 99.5)

Response: In 2005, the Ninth Circuit Court of Appeals concluded that the Forest Service's 1993 Resource Evaluation Report constituted eligibility for the rivers contained in that report. Therefore, at the time plan revision was initiated, there were 22 eligible wild and scenic rivers on the forests. An eligibility re-evaluation, conducted for plan revision, yielded 25 eligible rivers. A suitability study for the Blue River and KP Creek was conducted in response to a proposal to install fish barriers on these rivers. Additional suitability studies for eligible rivers on the Apache-Sitgreaves NFs are deferred to a later time consistent with direction in Forest Service Handbook 1909.12, Chapter 80. This is specifically disclosed in the "Scope of Analysis" section in chapter 1 of the EIS.

The plan is programmatic in nature and does not identify compulsory language (i.e., timeframes) as its implementation is subject to fluctuating budgets and changing capacity. Only Congress can designate a wild and scenic river.

Concern Statement: To protect the health of all eligible wild and scenic river segments, roads should be kept as far from the waterways as possible, and maintained to reduce sediment inputs. Proper crossings should be built and maintained where required. (162.163)

Response: The health and integrity of eligible wild and scenic rivers is provided for by the plan decisions in the "Eligible and Suitable Wild and Scenic Rivers" section in chapter 2 of the plan. Most eligible wild and scenic river segments are in steep canyons where few roads currently exist, with no new roads planned. Road maintenance is subject to the standard in the "Motorized Opportunities" section of the plan:

> *"Road maintenance and construction activities shall be designed to reduce sediment (e.g., water bars, sediment traps, grade dips) while first providing for user safety."*

It is also subject to the "Apache-Sitgreaves National Forests Best Management Practices for Road Maintenance" (listed in "Other Sources of Information" for motorized opportunities in Appendix D of the plan). The forests also implement streamside management zones which provide guidance on number of roads, orientation with the stream, and number of crossings within them (see the guideline in "Water Resources" section and the discussion in management approaches for the "Water Resources" section). Road maintenance, best management practices, and streamside management zones are implemented at the project-level.

Concern Statement: Concern that the Campbell Blue wild and scenic river designation conflicts with the wildland-urban interface treatments to protect the health and safety of people. (104.8)

Response: The "Eligible and Suitable Wild and Scenic Rivers" section of the plan in chapter 2 provides direction for managing these rivers. Campbell Blue Creek has been managed as an eligible wild and scenic river since 2005. The recreational river classification of Campbell Blue Creek from Castle Creek to Dry Blue Creek, excluding the private lands, allows for a

> *"range of vegetation management and timber harvest practices..., provided these practices are designed to protect, restore, or enhance the river environment, including the long-term scenic character" (Forest Service Handbook 1909.12, Chapter 80, Section 82.51, 9.b.).*

Only Congress can designate a wild and scenic river. The plan provides direction to maintain the outstandingly remarkable values of these eligible and suitable rivers until Congress takes action.

Concern Statement: Concern that wild and scenic river designations conflict with multiple use management, including other land owner's ability to manage the land. (104.7)

Response: The "Eligible and Suitable Wild and Scenic Rivers" section in chapter 2 of the plan provides direction for managing these rivers. Eligible and suitable river corridors on the Apache-Sitgreaves NFs do not include private lands. The Forest Service has no jurisdiction over private lands. National Forest System lands are managed for multiple uses under the Multiple Use-Sustained Yield Act of 1964. A variety of uses and activities are allowed in eligible and suitable rivers corridors as described in Forest Service Handbook 1909.12, Chapter 80, Section 82.5. Only Congress can designate a wild and scenic river. The plan provides direction to maintain the outstandingly remarkable values of these eligible and suitable rivers until Congress takes action.

Inventoried Roadless Areas

Concern Statement: Correct the statement "When the roadless lands were reconsidered in the 2000 Roadless Area Conservation FEIS, there was no additional inventory or adjustment of boundaries to reflect these activities" (DEIS p. 349). There was an opportunity in 2000 for the forests to alter boundaries of the inventoried roadless area (IRA) boundaries, but based on public and internal reviews the forest did not do so. (162.174)

Response: The "Inventoried Roadless Areas" section in chapter 3 of the EIS has been updated by removing the phrase "additional inventory or."

Concern Statement: Recognize that once roads are allowed into roadless areas, the ecological values and other attributes of roadless and wilderness areas are degraded to a point of affecting the whole system. (124.2, 124.13, 68.1)

Response: The effects of roads and other activities on inventoried roadless areas and roadless character are described in the "Inventoried Roadless Areas" section in chapter 3 of the EIS.

Concern Statement: Protect inventoried roadless areas IRAs). (81.20, 67.2, 28.2, 28.1)

Response: The plan protects inventoried roadless areas (IRAs) through implementation of the 2001 Roadless Area Conservation Rule (RACR) and management guidance under Natural Landscape Management Area (most of the IRAs are located within this management area).

Protection of IRAs is considered in the EIS. IRAs are protected in alternative A through implementation of the 2001 RACR. In alternative B they are protected through implementation of the RACR and by management as Natural Landscape Management Area. In alternative D, almost all of these lands are included in the Recommended Wilderness Management Area. Alternative C considers multiple-use management for the IRA lands.

Concern Statement: RARE II lands were released to multiple use management per the 1984 Wilderness Act. Therefore, these released lands (inventoried roadless areas) should be managed under multiple use and other land management regulations. (32.15, 32.3, 32.6, 32.7, 32.14)

Response: The Arizona Wilderness Act of 1984 did release the RARE II lands in Arizona to multiple use management. However, the 2001 Roadless Area Conservation Rule provides protection and management direction for the areas identified in a set of inventoried roadless area maps contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000. These inventoried roadless areas (IRAs) are, in most cases, the RARE II lands.

Management guidance for inventoried roadless areas is found in chapter 2 of the plan under Managed Recreation and chapter 3 of the plan under Natural Landscape Management Area. This management area consists of generally undeveloped areas that are natural appearing and provide primitive and semi-primitive recreation opportunities. This management area includes most of the inventoried roadless areas identified in the Roadless Area Conservation Rule. All IRAs would be managed to protect and conserve their roadless character.

Concern Statement: The plan should adjust inventoried roadless area (IRA) boundaries to remove those portions which no longer have roadless characteristics. The plan should indicate a timeframe for accomplishment of analysis and designation. (99.28, 99.27)

Response: The first part of this concern statement is beyond the scope of the plan and plan process. Inventoried roadless area (IRA) boundaries were set in place by the 2001 Roadless Area Conservation Rule (RACR). Changing IRA boundaries would require Federal rulemaking in accordance with the Administrative Procedures Act.

All Apache-Sitgreaves NFs lands, including the IRAs, were considered in the potential wilderness inventory. The IRA lands that met the inventory criteria were included (analyzed) in the potential wilderness evaluation process. Any IRA lands that are recommended for wilderness in the plan (Recommended Wilderness Management Area) would be managed to protect wilderness and roadless character until a congressional decision is made. Any IRA lands not recommended for wilderness would be managed to protect roadless character. There is no provision in the 2001 RACR to release IRAs to multiple-use management.

Wilderness Resources

<u>Concern Statement:</u> Underrepresented ecosystems should not be used as a criterion in the wilderness evaluation process. (32.12, 108.85, 81.9)

<u>Response</u>: The Forest Service considered underrepresented ecosystems as a criterion in the wilderness evaluation process consistent with agency policy. Forest Service policy/planning direction is found in the Forest Service Manual 1920 and Forest Service Handbook 1909.12. Forest Service Handbook 1909.12, Chapter 70 (January 2007) is the policy direction that guides wilderness evaluations. Section 72.3 specifically directs the evaluation process to:

> *"Deal with 'need' on a regional basis and evaluate such factors as geographic distribution of areas and representations of landforms and ecosystems."*

Six specific factors, one of which is to consider "ecosystems underrepresented in wilderness," are listed in Section 72.31.

The methodology and results of the wilderness evaluation process are documented in the "Potential Wilderness Evaluation" reports (Forest Service, 2012b) available in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606.

<u>Concern Statement:</u> The Forest Service should use the former chapter 7, instead of FSH1909.12 chapter 70 to guide the wilderness evaluation process including considering areas that contain closed system roads. (162.130, 162.131, 162.132)

<u>Response</u>: Consistent with agency policy, the Forest Service used Forest Service Handbook 1909.12, Chapter 70 to guide the wilderness evaluation process and did not consider areas that contained forest roads or other authorized roads. Forest Service policy/planning direction is found in the Forest Service Manual 1920 and Forest Service Handbook 1909.12. As such, Forest Service Handbook 1909.12, Chapter 70 (January 2007) is the policy direction that guides wilderness evaluations. The Chapter 7 referenced in the comment was replaced by Chapter 70. Chapter 7 no longer exists as policy direction, and thus, is not eligible to be applied.

Further, the October 23, 2009, Washington Office correspondence provides guidance as to which "the planning directives to use to carry out the 1982 Planning Regulation[s]." Chapter 70 - Wilderness Evaluation of Forest Service Handbook 1909.12 is listed as applicable to plan revisions under the 1982 Planning Regulations. This correspondence can be found in the plan set of documents.

The current Chapter 70 requirements at Section 71.1 - Inventory Criteria, explicitly state that areas considered for the inventory,

> *"do not contain forest roads (36 CFR § 212.1) or other permanently authorized roads..."*

The methodology and results of the wilderness evaluation process are documented in the "Potential Wilderness Evaluation" reports (Forest Service, 2012b) available in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606.

<u>Concern Statement:</u> Consider the need for preserving this last-of-its-kind intact system of wildland rather than only analyze their value as stand-alone potential wilderness units. There is concern that the ecological "need" for preserving the wilderness characteristic of quiet, resilient and unfragmented habitat is high for all potential wilderness units. (162.141, 162.139, 39.15, 107.3, 162.157, 23.9, 140.3, 94.11, 80.5)

<u>Response</u>: There is no Forest Service guidance to consider wildland systems or unfragmented habitat during the wilderness evaluation process. Forest Service policy/planning direction is found in the Forest Service Manual 1920 and Forest Service Handbook 1909.12. Forest Service Handbook 1909.12, Chapter 70 (January 2007) is the policy direction that guides wilderness evaluations.

The current Chapter 70 requirements at Section 71.1 - Inventory Criteria, explicitly state that areas considered for the inventory,

> *"do not contain forest roads (36 CFR § 212.1) or other permanently authorized roads..."*

For this reason, only stand-alone potential wilderness and areas adjacent to existing wilderness and the primitive area were evaluated. Wilderness character, as defined in the Wilderness Act of 1964, does not include "quiet, resilient and unfragmented habitat."

Alternative strategies for managing "wildlands" were considered in the EIS. "Wildlands" on the Apache-Sitgreaves NFs (wilderness, primitive area, inventoried roadless areas, recommended wilderness) are managed under alternatives A, B, and D through plan direction, a variety of laws, regulations, policies, and the 2001 Roadless Area Conservation Rule (RACR) to protect their wilderness and roadless character. Under alternative C, wilderness, primitive area, and recommended wilderness are managed through plan direction and a variety of laws, regulations, and policies. The plan also provides for quality wildlife habitat and connectivity. Wildlife habitat quality and connectivity are discussed under the "Habitat Connectivity and Linkages" heading in the "Wildlife and Rare Plants" section of the EIS.

<u>Concern Statement:</u> Explain the criteria used in "factor one" and "factor three" of the wilderness need evaluation. There is concern that arbitrary distances from illogical community centers lead to the conclusion that the need for additional wilderness is low. (162.133)

<u>Response</u>: Factor 1 considers the location and size of other wilderness areas near a potential wilderness and their distance from a potential wilderness. It also considers the location of a potential wilderness with regard to population centers because public demand for wilderness may increase with proximity to growing population centers. Factor 3 examines the extent to which non-wilderness lands on the forests or other Federal lands are likely to provide opportunities for unconfined outdoor recreation experiences. Non-wilderness lands include inventoried roadless areas, wilderness study areas, proposed wilderness, and recreation opportunity spectrum semi-primitive nonmotorized and primitive lands.

The "Regional Demand for Wilderness, Southwestern Region" (Forest Service, 2009c) and the "R3 Wilderness Need Assessment Instructions" (Forest Service, 2007) were used to determine the population centers and distances from those population centers to be used in factors 1 and 3 of the need assessment.

The population centers used in the factor 1 and 3 need assessments were Flagstaff, Phoenix, and Tucson, Arizona. These population centers align with the counties of origin for the majority of the forests' visitors. Silver City, New Mexico, was considered as a population center only for the three potential wilderness areas that will be considered during the Gila NF potential wilderness evaluation and land management plan revision processes and the one where a portion of the potential wilderness is located on the Gila NF.

The need assessments for all potential wilderness on the Apache-Sitgreaves NFs were updated prior to issuance of the proposed plan and DEIS to include rating criteria and individual ratings for the six need factors. An overall need rating was determined and presented for each potential wilderness. This information is found in each "Potential Wilderness Evaluation" (Forest Service, 2012b) and is summarized in the "Capability, Availability, and Need Ratings Documentation" (Forest Service, 2012a) that can be found under "Potential Wilderness Evaluation" on the Apache-Sitgreaves NFs Web site:
http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606

Concern Statement: Reconsider the underrepresentation of wilderness in the northeast quadrant of Arizona in the evaluation of Need Assessment Factor 2. (162.135, 162.136)

Response: The underrepresentation of wilderness in the northeast quadrant of Arizona was considered in the rating criteria developed for factor 2. The need assessments for all potential wilderness were updated prior to issuance of the proposed plan and DEIS to include rating criteria and individual ratings for the six need factors. This information is found in each "Potential Wilderness Evaluation" (Forest Service, 2012b) that can be found under "Potential Wilderness Evaluation" on the Apache-Sitgreaves NFs Web site:
http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606

Concern Statement: Remove any recommendation for designation of wilderness solely based on a desire to provide recreation opportunities. (108.83)

Response: No wilderness recommendation is based solely on an area's recreation opportunities. Rationale for the alternative B, C, and D wilderness recommendations is included in the environmental consequences for the "Recommended Wilderness" section in the EIS.

Opportunities for a primitive and unconfined type of recreation is one characteristic that was considered in the potential wilderness capability evaluation. Other capability characteristics (the basic characteristics that make the area appropriate and valuable for wilderness designation) evaluated were naturalness, undeveloped, opportunities for solitude, special values, and manageability. Potential wilderness were also evaluated for availability (examines the potential impact of designating an area as wilderness to both the current and future land uses and activities) and need (considered at the regional level and considers other opportunities for unconfined outdoor recreation or preservation of certain ecosystem characteristics). Each "Potential Wilderness Evaluation" (Forest Service, 2012b) can be found under "Potential Wilderness Evaluation" on the Apache-Sitgreaves NFs Web site:
http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606

<u>Concern Statement:</u> Reconsider "factor four" of the wilderness need evaluation. (162.137, 162.138)

<u>Response</u>: The Forest Service considered factor 4 during the wilderness need evaluation. Factor 4 specifically addresses,

> *"The need to provide a refuge for those species that have demonstrated an inability to survive in less than primitive surroundings, or the need for a protected area for other unique scientific values or phenomena" (Forest Service Handbook 1909.12, Chapter 70, § 72.31).*

The need assessments for all potential wilderness areas were updated prior to issuance of the proposed plan and DEIS to include rating criteria and individual ratings for the six need factors. An overall need rating was determined and presented for each potential wilderness. This information is found in the "Potential Wilderness Evaluations" (Forest Service, 2012b) and is summarized in the "Capability, Availability, and Need Ratings Documentation" (Forest Service, 2012a) that can be found under "Potential Wilderness Evaluation" on the Apache-Sitgreaves NFs Web site: http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606

Factor 4 specific changes included the following: (1) removal of references to "Species of Concern" and" Species of Interest," (2) inclusion of information on Forest Planning Species, and (3) inclusion of information on species and habitats from the "Wildlife Specialist Report - Viability" (Forest Service, 2014l) and "Fisheries Specialist Report" (Forest Service, 2014a).

Evaluation of factor 4 was coordinated with forest plan revision wildlife and fisheries biologists. No species were identified that require primitive surroundings. However, many species and their habitats were identified as benefitting from primitive surroundings. These species and habitats are shown in the "Factor 4 Table" in the "Wilderness Need Evaluation Tables" document (Forest Service, 2012e) that can be found at the following Web site:
http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5406404.pdf

<u>Concern Statement:</u> The Forest Service should reconsider evaluating areas within the Wallow fire that were burned with moderate to high intensity as potential "wilderness." (81.8)

<u>Response</u>: The Forest Service considered if there was a need to update the potential wilderness evaluations to account for the effects of the 2011 Wallow Fire. It was determined that the potential wilderness evaluations were still valid based on the assumption that fire does not change wilderness character. For more information, see the "Wallow Fire Changed Condition Assessment" (Forest Service, 2012d) at the following Web site:
http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5406194.pdf

<u>Concern Statement:</u> The current condition, including the impacts of the 2011 Wallow Fire, of wilderness should be described in the plan. (81.14, 108.246, 81.22, 108.245)

<u>Response</u>: The current conditions for wilderness are described in the affected environment of the "Wilderness Resources" section in the EIS. The wilderness character of these lands was not affected by the Wallow Fire.

<u>Concern Statement:</u> Wilderness Background (proposed plan p. 120) Add to the first paragraph regarding Mt. Baldy wilderness. "The East Fork Little Colorado River and West Fork Little Colorado River originate on Mt. Baldy and flow throughout the year through this wilderness, providing habitat for the threatened Apache trout." This language mirrors language provided for the Bear Wallow Wilderness and Bear Wallow Creek. (101.85)

<u>Response</u>: Language addressing the comment has been added to the "Background for Wilderness" section in chapter 3 of the plan.

<u>Concern Statement:</u> Consider the effects of wilderness or other restrictive land use on the human and natural environment. Remove assumptions and conclusions that human activity creates negative impacts on wildlife (DEIS p. 366). (108.82, 108.88, 81.19, 81.2, 81.11)

<u>Response</u>: The EIS analyzes the effects of wilderness recommendations and management in the environmental consequences for the "Wilderness Resources" section in chapter 3. Additional analysis can be found in the "Wilderness Resources and Inventoried Roadless Areas Specialist Report" (Forest Service, 2014j) and the "Potential Wilderness Evaluations" (Forest Service, 2012b).

The statement in question from page 366 of the DEIS has been modified to read,

> *"Recommended wilderness would provide greater protection for wildlife and wildlife habitats because of reduced disturbance from motorized vehicle use."*

General effects to wildlife and wildlife habitats can be found in the "Fisheries" and "Wildlife and Rare Plants" sections in chapter 3 of the EIS. The "Wildlife Specialist Report - Viability" (Forest Service, 2014l), "Fisheries Specialist Report" (Forest Service, 2014a), and the Biological Assessment (Forest Service, 2014k), located in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning, also document environmental consequences, based on current literature and science, to wildlife and wildlife habitats.

<u>Concern Statement:</u> Acknowledge that wilderness designation will affect the use of fire a vegetation treatment tool (DEIS p. 367). (81.13, 108.90)

<u>Response</u>: The plan, consistent with Forest Service policy, allows the use of prescribed fire as a vegetation treatment tool in wilderness. The DEIS acknowledges the general environmental consequences of recommending an area for wilderness on the use of fire as a vegetation treatment tool on page 368 under the "Fire, Insects and Disease, Non-Federal Lands" heading and in the "Wilderness Resources and Inventoried Roadless Areas Specialist Report" (Forest Service, 2014j). Additional effects and more detail can be found in the "Potential Wilderness Evaluations" (Forest Service, 2012b). These documents can be found in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. The plan revision process does not designate wilderness; only Congress has that authority.

<u>Concern Statement:</u> Acknowledge that wilderness designation will affect active management practices such as mechanical thinning. (81.4, 109.7)

<u>Response</u>: Active management (e.g., prescribed fire, livestock grazing, trail management) compatible with wilderness resource management objectives is allowed in wilderness. However,

motorized vehicles and equipment and mechanical transport cannot be used. The EIS acknowledges the general environmental consequences of recommending an area for wilderness on the use of mechanical thinning under "Environmental Consequences of Wilderness Recommendation" portion of the "Wilderness Resources" section in chapter 3. Additional information can be found in the "Wilderness Resources and Inventoried Roadless Areas Specialist Report" (Forest Service 2014j) and "Potential Wilderness Evaluations" (Forest Service, 2012b) for the Apache-Sitgreaves NFs. These documents can be found in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. The forest planning process does not designate wilderness; only Congress has that authority.

Concern Statement: Use data regarding what percentage of the public does or does not want more wilderness to inform recommendations for wilderness designation. Delete the statement that indicates the public desires more wilderness (DEIS p. 364). (81.10, 134.2, 108.86)

Response: The comment refers to the statement,

> *"Alternative B would address public desire for more wilderness by recommending 7,074 acres…"*

Many commenters throughout the planning process requested the consideration of additional wilderness on the Apache-Sitgreaves NFs. In a national study Cordell et al. (2008b) found that a majority of U.S. residents age 16 and older felt there was not enough land designated as wilderness. Based on comments received on the Apache-Sitgreaves NFs proposed plan and DEIS and Forest Service review, the statement concerning public desire for more wilderness is retained.

Concern Statement: The wilderness party size standard is too restrictive: "Party size of 12 persons and/or 12 head of stock for hiking and riding groups in Mount Baldy Wilderness shall not be exceeded. A party size of 6 persons for overnight camping shall not be exceeded" (proposed plan p.121). Concern that it may impact families and scout troops. (123.13)

Response: The group size limits for Mount Baldy Wilderness, as described above, have been in effect since at least 1978; the group size limits were printed on the back side of the 1978 Mount Baldy Wilderness Map and Guide. These limits have been enforceable through forest orders since at least 1978. The plan continues these long standing group size limits. Group size limits are set to protect wilderness characteristics and to maintain opportunities for solitude.

Concern Statement: The party size standards for wilderness and primitive area should not apply to wildlife and fisheries management activities (e.g. stream renovation and fish restocking activities). (101.86, 101.87)

Response: All requests from agencies for fish and wildlife management activities by groups exceeding the group size limit would be considered administratively on a case-by-case basis. As discussed in the management approaches for the "Wilderness" section and referenced in the "Other Sources of Information" for wilderness section of the plan in Appendix D, these proposals would be considered through a minimum requirements analysis using the "Minimum Requirements Decision Guide" (USDA and USDOI, 2012). Group size limits are set to protect wilderness characteristics and to maintain opportunities for solitude.

<u>Concern Statement:</u> Correct conflicting Wilderness guidelines about fire (proposed plan p. 121). (108.190)

<u>Response</u>: The wilderness guidelines regarding fire and fire management in the proposed plan were reviewed and determined to not be in conflict with wilderness desired conditions. However, the fourth guideline has been rewritten for clarity as follows:

> *"Prescribed fire should be considered to reduce the risks and consequences of uncharacteristic wildfire within wilderness or escaping from wilderness by reducing unnatural fuel accumulations, if necessary to meet wilderness fire management objectives. Naturally occurring wildfires should be allowed to perform, as much as possible, their natural ecological role within wilderness."*

This guideline can be found in chapter 3 of the plan in the "Wilderness" section.

<u>Concern Statement:</u> Provide provisions for AZGFD management in wilderness. Specific actions which may be necessary, and may necessitate the use of motorized equipment, include periodic fish surveys and nonnative fish removal utilizing nets or battery and gas powered electrofishing equipment, construction or maintenance of fish barriers, chemical stream renovations, fish stocking, low-level aerial wildlife surveys, research, and law enforcement flights, wildlife capture, construction of temporary release pens, construction and maintenance of wildlife waters, providing salt and mineral supplements, depredation, and wildlife mortality investigations. (101.10, 101.8)

<u>Response</u>: The plan provides guidance to manage wilderness consistent with law and policy. Wilderness is managed according to the Wilderness Act of 1964 and Forest Service Manual 2300 Chapter 2320 - Wilderness Management. Section 4(c) of the Wilderness Act specifically prohibits the use of motorized equipment in designated wilderness "except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act." Forest Service Manual 2320.3 specifically applies to the management of wildlife and fish. Forest Service Manual 2326 provides direction on the use of motorized equipment in wilderness.

Specific proposed actions would be considered on a case-by-case basis with use of the "Minimum Requirements Decision Guide" (MRDG) (USDA and USDOI, 2012). The MRDG is designed for use when making a determination that one of the 'prohibited uses' (listed in Section 4(c) of the Act) is the minimum necessary requirement. The MRDG is discussed in the management approaches for the "Wilderness section and referenced in the "Other Sources of Information" for wilderness section of the plan in Appendix D.

<u>Concern Statement:</u> Additionally, the Department must maintain motorized access to and around the Chevelon Lake dam to adequately monitor and maintain this structure. Inadequate maintenance of this dam can create a safety issue to those using the lake and those downstream of the lake, and presents liabilities that the Department is not willing to assume. (101.29)

<u>Response</u>: Chevelon Lake Dam and its access road are not included in Chevelon Lake Potential Wilderness. These features were "cherry-stemmed" out when the area was inventoried for wilderness potential because of the forest road and the dam. See Forest Service Handbook 1909.12, Chapter 70, Section 71.1, #3. Under the plan, Chevelon Lake, Chevelon Lake Dam, and the access road would be managed under the General Forest Management Area direction.

<u>Concern Statement:</u> Trespass into wilderness and unclear boundaries should be dealt with within current management capabilities. (32.10)

<u>Response</u>: The plan is programmatic in nature. Within the desired conditions for the "Wilderness" section in chapter 3 it provides direction that,

> *"Wilderness boundaries are posted and visible to visitors."*

The actual task of posting boundaries and addressing trespass issues would be addressed at the project level.

<u>Concern Statement:</u> Remove wilderness designation for areas where the designation was solely based upon the desire to provide recreation opportunities. (81.5)

<u>Response</u>: Removal of wilderness designation is beyond the scope of the plan decision to be made. Only Congress can designate (or remove a designation) a wilderness.

No wilderness designation is based solely on an area's recreation opportunities. An area considered for or designated as wilderness must:

> *"(1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." (Wilderness Act of 1964, Section 2 (c)).*

<u>Concern Statement:</u> The Forest Service should withdraw its recommendation to designate the Blue Range Primitive Area as wilderness and move forward managing the lands for the various resource values they contain. (81.18)

<u>Response</u>: This is beyond the scope of the decision to be made. Because a presidential recommendation to Congress has been made, the plan does not contain a preliminary administrative recommendation for the Primitive Area Management Area. It is up to Congress to make a decision about the Blue Range Primitive Area and presidential recommended additions.

In 1971, the Forest Service submitted a recommendation to the President of the United States for the Blue Range Wilderness in New Mexico and Arizona. The President forwarded the recommendation to Congress, who eventually acted on a portion of the recommendation. In 1980, Congress designated, and the President signed into law, the Blue Range Wilderness in New Mexico. The Arizona portion of the 1971 presidential recommendation (166,591 acres) included 20,031 acres outside and along the west primitive area boundary. The Forest Service and presidential recommendation for the Blue Range Wilderness in Arizona has not been acted upon.

Until Congress acts on the 1971 wilderness recommendation, the plan provides direction to manage the Blue Range Primitive Area and the presidential recommended additions as a primitive area (see the "Primitive Area" section of the plan in chapter 3).

<u>Concern Statement:</u> Revise recommended wilderness guidelines to manage these areas as multiple use lands. (108.206)

<u>Response</u>: The Forest Service is authorized to manage recommended wilderness through law and policy. The Arizona Wilderness Act of 1984 states,

> *"...areas recommended for wilderness designation [in revised land management plans] shall be managed for the purpose of protecting their suitability for wilderness designation..." (Section 103 (b)(4)).*

Forest Service Manual (FSM) gives a Forest Supervisor the responsibility to

> *"Develop management direction for recommended wilderness. . ." (FSM 1923.04c)*

The FSM gives the Regional Forester the responsibility for

> *"Approving management direction for recommended wilderness. . ." (FSM 1923.04b).*

Recommended wilderness in the plan would be managed to retain their wilderness characteristics (see the first guideline in the "Recommended Wilderness" section in chapter 3 of the plan) until further review and possible modification by the Chief of the Forest Service, Secretary of Agriculture, and the President of the United States. Congress takes action to formally designate them. However, recommended wilderness is not subject to the same management restrictions as formally designated wilderness. Unlike the Wilderness and Primitive Area Management Area plan direction, no group size limits are identified for the Recommended Wilderness Management Area. Also, FSM 2300, Chapter 2320 - Wilderness Management and the Congressional Grazing Guidelines are not applicable to recommended wilderness. The project or activity-level decision maker may exercise discretion in determining that proposed site specific actions within a given recommended wilderness are consistent with retaining the area's wilderness characteristics.

<u>Concern Statement:</u> Modify the Recommended Wilderness guideline "Motorized equipment (i.e., chain saws) may be used for trail maintenance" (proposed plan p. 124) by (1) change 'motorized equipment' to 'gasoline powered equipment' and (2) add 'and fence repair'. (121.1, 99.11)

<u>Response</u>: This comment is no longer applicable. This guideline has been removed, because there are no National Forest System trails in the Recommended Wilderness Management Area. As mentioned in the management approaches for the "Recommended Wilderness" section (chapter 3 of the plan), the "Minimum Requirements Decision Guide" (USDA and USDI, 2012) would be used to evaluate actions proposed within recommended wilderness.

<u>Concern Statement:</u> There is a need for more protections for wilderness-type areas (i.e., designated wilderness, primitive area, roadless areas, recommended wilderness, potential wilderness). (29.1, 146.8, 70.1, 5.15, 14.3, 106.3, 124.9, 107.1, 48.1, 88.1, 107.5)

<u>Response</u>: The plan provides for protection of designated wilderness and the primitive area consistent with the Wilderness Act of 1964, Forest Service Manual 2300, Chapter 2320 - Wilderness Management, and 36 CFR §293.17(a) through implementation of Wilderness Management Area and Primitive Area Management Area direction. Recommended wilderness is protected through plan direction for the Recommended Wilderness Management Area consistent with the Arizona Wilderness Act of 1984 and Forest Service Manual 1923.

The plan provides for protection of Inventoried Roadless Areas (IRAs) and most potential wilderness areas through Natural Landscape Management Area direction and the implementation of the 2001 Roadless Area Conservation Rule (RACR).

Protection of "wilderness-type areas" is considered in all EIS alternatives. Protection of designated wilderness and the primitive area does not change by alternative and would be as described above. IRAs and most potential wilderness lands are protected in alternative A through implementation of the RACR. In alternative B they are protected by management under Natural Landscape Management Area direction and implementation of the RACR. In alternative D, almost all IRAs and potential wilderness areas are included in the Recommended Wilderness Management Area and would also be subject to the RACR. Varying amounts of recommended wilderness would be protected in the action alternatives through Recommended Wilderness Management Area direction.

Concern Statement: Review areas of recommended wilderness, including additions to Escudilla Wilderness that do not meet the requirements for wilderness designation (DEIS p. 364 paragraph 3). (108.87)

Response: All areas identified in the EIS as potential wilderness were evaluated through the Forest Service policy/planning direction found in the Forest Service Manual 1920 and Forest Service Handbook 1909.12. Forest Service Handbook 1909.12, Chapter 70 (January 2007) contains the policy direction that guides wilderness evaluations. "Potential Wilderness Evaluations" (Forest Service, 2012b) for each area can be found on the Apache-Sitgreaves NFs Web site: http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606.

The responsible official reviewed and included in the action alternatives those areas that would be recommended for wilderness. The EIS discloses that lands in the Escudilla Mountain area would need additional actions to reduce signs of past activities before any wilderness designation.

Concern Statement: Explain why table 4 (proposed plan p. 124) displays 261 acres for Bear Wallow Wilderness Additions and the DEIS shows 260 acres (p. 364). (121.2)

Response: The 1-acre difference is the result of rounding. A footnote has been added to the EIS to explain the acreage difference.

Concern Statement: Wilderness areas and recommended wilderness restrict access for senior citizens and persons with disabilities. (134.3, 22.4, 98.22, 123.20)

Response: The plan provides for a variety of recreation opportunities: motorized, nonmotorized, developed, dispersed, and everything in between. However, not every recreation opportunity can be found everywhere on the forests. For example, while much of the forests is available for motorized recreation, there are fewer opportunities for primitive or semi-primitive, non-motorized activities.

The plan provides guidance to manage wilderness consistent with the Wilderness Act of 1964. The Forest Service does not exclude anyone from wilderness; restrictions are based on the method of transportation and types of assistive devices permitted, not on the abilities of visitors. Motorized wheelchairs are permitted in wilderness, as long as they are designed for mobility purposes, are used by a person with such an impairment and are suitable for indoor use (i.e., electric, not internal combustion). Other appropriate modes of travel in wilderness include horses,

mules, pack stock, and nonmotorized watercraft, where appropriate. The Forest Service is not obligated to modify trails and natural areas to accommodate mobility devices or persons with limited mobility.

Concern Statement: Explain how the Forest Service has the authority to provide management area guidance for recommended wilderness. Concern is that only Congress can create wilderness areas. (32.13, 32.4, 32.8, 97.1)

Response: The Forest Service has authority to provide management area guidance for recommended wilderness through law and policy. The Arizona Wilderness Act of 1984 states,

> *"...areas recommended for wilderness designation [in revised land management plans] shall be managed for the purpose of protecting their suitability for wilderness designation..." (Section 103 (b)(4)).*

Forest Service Manual (FSM) gives a Forest Supervisor the responsibility to "Develop management direction for recommended wilderness. . ." (FSM 1923.04c) and the Regional Forester the responsibility for "Approving management direction for recommended wilderness…" (FSM 1923.04b). Forest Service policy/planning direction is found in the Forest Service Manual 1920 and Forest Service Handbook 1909.12. Forest Service Handbook 1909.12, Chapter 70 (January 2007) contains the policy direction that guides wilderness evaluations and the process of recommending areas for wilderness.

A recommendation for wilderness within the plan is,

> *"a preliminary administrative recommendation that would receive further review and possible modification by the Chief of the Forest Service, Secretary of Agriculture, and the President of the United States. The Congress has reserved the authority to make final decisions on wilderness designation." (Forest Service Handbook 1909.12, Chapter 70, Section 73.11).*

This language is included in both the EIS and plan.

The areas recommended for wilderness in the Apache-Sitgreaves NFs plan would not be managed as wilderness; they would be managed to:

> *"protect their wilderness characteristics pending legislation and designation and to provide for existing uses where compatible" (chapter 3 of the EIS, environmental consequences for the "Wilderness Resources" section).*

The direction provided in the Recommended Wilderness Management Area section in chapter 3 of the plan would accomplish this requirement of the Arizona Wilderness Act of 1984 and the responsibilities found in Forest Service Manual 1923.04.

The plan just makes wilderness recommendations; only Congress can designate a wilderness. The plan provides guidance to maintain the wilderness characteristics of these areas until Congress takes action.

<u>Concern Statement:</u> For areas that received a medium, medium/high, or high capability rating in the wilderness evaluation, the Forest Service should manage them in a way to preserve their wilderness values. (162.148, 162.188)

<u>Response</u>: Section 217.17 of the 1982 Planning Rule requires that unroaded areas within the National Forest System be evaluated and considered for recommendation for wilderness designation during plan revision. The Apache-Sitgreaves NFs used the wilderness evaluation process outlined in Forest Service Handbook 1909.12, Chapter 70. Identification as a potential wilderness does not confer any special status to an area nor does it require any additional management restrictions; it simply identifies which areas were capable and available for wilderness recommendation and could help meet regional wilderness needs (Potential Wilderness Evaluations (Forest Service, 2012b).

The Arizona Wilderness Act of 1984 states,

> "*…areas not recommended for wilderness designation [in revised land management plans] need not be managed for the purpose of protecting their suitability for wilderness designation prior to or during revision of such plan...*" (Section 103 (b)(4)).

The logical extension of this is that areas not recommended for wilderness in a plan, do not need to be managed to protect their wilderness suitability.

Conversely, the Arizona Wilderness Act of 1984 also states,

> *"...areas recommended for wilderness designation [in revised land management plans] shall be managed for the purpose of protecting their suitability for wilderness designation..." (Section 103 (b)(4)).*

Only areas recommended for wilderness designation by the Regional Forester will be managed to maintain their wilderness characteristics (see the "Recommended Wilderness Management Area" section in chapter 3 of the plan). Preliminary administrative recommendations for wilderness are included in the record of decision for the plan.

Potential wilderness not recommended for wilderness designation would be managed under plan forestwide direction and the appropriate management area direction. Potential wilderness within the Primitive Area Management Area (29 percent) would be managed according to that management area direction consistent with 36 CFR §293.17(a). Another 58 percent would be managed under the Natural Landscape Management Area. Any inventoried roadless area, regardless of its management area location, would be managed to protect its roadless character.

<u>Concern Statement:</u> The DEIS states that "opportunity" for additional wilderness/primitive areas exists; however no justification is provided as to the purpose of designating more. (108.222)

<u>Response</u>: The rationale for recommending additional areas for wilderness is discussed under the "Recommended Wilderness" header in the "Wilderness Resources" section in chapter 3 of the EIS.

Section 217.17 of the 1982 Planning Rule requires that unroaded areas within the National Forest System be evaluated and considered for recommendation for wilderness designation during plan revision. The Apache-Sitgreaves NFs used the wilderness evaluation process outlined in Forest

Service Handbook 1909.12, Chapter 70; the areas assessed were identified as potential wilderness. Identification as a potential wilderness does not confer any special status to an area nor require any additional management restrictions; it simply identifies which areas were assessed in the "Potential Wilderness Evaluations" (Forest Service, 2012b). The plan only makes recommendations; only Congress can designate a wilderness.

Concern Statement: Include ample wilderness recommendations to protect large contiguous habitats and protect opportunities for quiet recreation. (23.9, 140.3, 94.11, 80.5)

Response: The plan protects large contiguous habitats and opportunities for quiet recreation primarily through management area direction. The Wilderness, Primitive Area, and Recommended Wilderness Management Areas all have desired conditions that these areas provide primitive and/or semi-primitive nonmotorized recreation opportunities and that recognize the importance of these areas to wildlife. Several Natural Landscape Management Area desired conditions also emphasize the area's contributions to quiet recreation opportunities and wildlife habitat and connectivity.

Concern Statement: Complete a conservation vision for Escudilla Mountain that allows for planned vegetation management and motorized access to Terry Flat loop while protecting solitude and quiet wilderness of Escudilla Wilderness: (1) Protect as recommended wilderness the maximum additions to Escudilla Wilderness as submitted by the White Mountain Conservation League and the Arizona Wilderness Coalition, (2) Increase the proposed wilderness addition in Alternative B to wrap around the south side of Terry Flat along Alpine wildland-urban interface boundary (WUI) to Crackerjack Lake and the boundary of the Nutrioso WUI, (3) maintain the Hulsey Bench Wildlife Quiet Area and extend it into Paddy Creek drainage to eventually share its boundary with the wilderness proposal at Crackerjack Lake. (39.14, 39.20, 39.12, 39.11, 162.155, 146.7, 162.178, 162.175, 162.156, 162.187)

Response: The plan includes a preliminary administrative recommendation for 6,813 acres of wilderness adjacent to the north and east sides of Escudilla Wilderness and southeast of the wilderness between Forest Service roads 275 and 8056 on Terry Flat. The plan does not include item 2 above or the extension of Hulsey Bench Wildlife Quiet Area (WQA) south of Forest Service road 8056. These lands would be part of the General Forest Management Area. The Hulsey Bench WQA was not extended to the south (item 3), because FS road 8056 would bisect the WQA and the area would not meet WQA desired conditions.

The Recommended Wilderness Management Area in alternative D of the EIS includes all potential wilderness around Escudilla Wilderness. However, there are no changes to the Hulsey Bench Wildlife Quiet Area (WQA) in any alternative because of the reason stated above. More detailed information about each potential wilderness can be found under "Potential Wilderness Evaluations" (Forest Service, 2012b) on the Apache-Sitgreaves NFs Web site: http://www.fs.usda.gov/detail/asnf/landmanagement/planning/?cid=stelprdb5405606.

Concern Statement: The contiguous roadless lands surrounding the Blue Range Primitive Area to the north, west, and south (including the Pipestem, Lower San Francisco, Mitchel Peak, and Sunset Inventoried Roadless Areas) should be recommended for wilderness designation and must be managed to preserve wilderness values per Parker v. U.S. (162.143, 162.186)

Response: The Apache-Sitgreaves NFs reviewed the report concerning the applicability of Parker v. U.S. to the Blue Range Primitive Area contiguous lands in 2010 and responded to seven individuals and two organizations. The Forest Service disagrees with the opinion presented in the report that lands contiguous to the Blue Range Primitive Area must be managed to preserve wilderness values. The response letter is available in the plan set of documents.

The plan would manage these lands primarily within the Natural Landscape Management Area; guidance is found in chapter 3. This management area consists of generally undeveloped areas that are natural appearing and provide primitive and semi-primitive recreation opportunities. This management area includes most of the inventoried roadless areas (IRA) identified in the 2001 Roadless Area Conservation Rule; the IRAs would be managed to protect and conserve their roadless character.

Lower San Francisco and Pipestem IRAs are contiguous to the Blue Range Primitive Area. Sunset and Mitchell Peak IRAs are considered to not be contiguous to the Blue Range Primitive Area. Forest Service road 212 separates Sunset IRA from Lower San Francisco and Mitchel Peak IRAs. Forest Service road 475 separates Mitchell Peak IRA from Pipestem IRA.

Concern Statement: Leonard Canyon, West Chevelon Canyon, Chevelon Canyon North, Chevelon Canyon, Wildcat Canyon South, Black Canyon, and Chevelon Lake should be recommended for wilderness designation. (162.158, 39.16)

Response: These areas are not recommended for wilderness in the plan. However, the effects of recommending these areas were considered in the EIS. The areas are included in the alternative D Recommended Wilderness Management Area. Portions of these areas are included in eligible wild and scenic river corridors in all alternatives.

Concern Statement: Chevelon Lake should not be recommended for wilderness designation. (101.4)

Response: Chevelon Lake is not recommended for wilderness in the plan. The area is considered for wilderness recommendation in alternative D in the EIS; while alternatives A, B, and C consider the effects of not recommending the area for wilderness.

Concern Statement: There is no need for additional wilderness. (24.1, 24.4, 98.23, 148.1, 109.6, 22.2)

Response: This is considered under alternative A in the EIS, where no lands are recommended for wilderness.

Concern Statement: Remove wilderness designations and wilderness recommendations for areas within the Wallow Fire that burned with moderate and high intensity. Concern is these areas should be managed to stop further degradation and be re-vegetated. (108.81)

Response: Wilderness is designated by Congress. It is beyond the scope of the plan revision process and Forest Service authority to remove wilderness designations.

The Wallow Fire may have affected Bear Wallow Wilderness, Escudilla Wilderness, portions of the Blue Range Primitive Area, and recommended wilderness adjacent to Bear Wallow and Escudilla but it did not affect the wilderness character of these areas. They still possess naturalness, opportunities for solitude or a primitive and unconfined type of recreation, and

special values. Plan direction for these areas is found in chapter 3 in the “Wilderness,” “Primitive Area,” and “Recommended Wilderness” sections. The “Potential Wilderness Evaluations” (Forest Service, 2012b) were reviewed following the Wallow Fire. It was determined that the evaluations were still valid based on the assumption that fire does not change wilderness character.

The priorities for rehabilitation post-Wallow were areas with the potential flooding and/or erosion effects to human life and property. No rehabilitation treatments occurred in designated wilderness or the primitive area. Only a small portion of the recommended wilderness north of Escudilla Wilderness was seeded to reduce erosion and establish vegetation. The remaining recommended wilderness was not seeded or mulched because the danger to human life and property was not present. Seeding and/or mulching of recommended wilderness is not permanent and would not negatively affect wilderness character (naturalness) in the long term. Natural revegetation is occurring in many areas.

Research Natural Areas

Concern Statement: Clarify the affected environment for the proposed research natural areas (RNAs): (1) amount burned in 2011 Wallow Fire and (2) whether lands were impacted by high intensity fire, erosion, or flooding. (108.210, 81.23)

Response: The interdisciplinary team evaluated the forests’ one existing research natural area (RNA) and seven proposed RNAs for potential inclusion into the plan. This is documented in “Research Natural Areas (RNAs) of the Apache-Sitgreaves NFs and the Revision of the Forest Plan” (Forest Service, 2012c). This document describes the amount these areas were burned by the Wallow Fire and the severity of the burn. This document provides the basis for those areas recommended as research natural areas in the plan and analyzed in the EIS.

Concern Statement: Modify Background for Recommended Research Natural Areas (proposed plan p. 118). The recommended Sandrock Research Natural Area is described as having been excluded from domestic grazing for 25 years. Though the intent was to exclude livestock grazing for the period described, livestock were present on Sandrock throughout the entire period. (101.83)

Response: The forests acknowledge unauthorized and feral cattle have been reported on the allotment. The plan provides a guideline stating that if necessary, recommended research natural areas (RNAs) should be fenced to manage unique features (see the “Research Natural Areas” section in chapter 3).

Concern Statement: Modify Recommended Research Natural Area Desired Condition (proposed plan p. 118) "The Three Forks Closure Area (30 acres) of the recommended Three Forks RNA is free from human trampling and other disturbances to protect very sensitive and unique species, such as the Three Forks springsnail, California floater, New Mexico meadow jumping mouse, *and* Chiricahua leopard frog, ~~and loach minnow~~." Loach minnow have never been documented within the actual closure area. Loach minnow have been documented within the mainstem of the East Fork Black River, which runs parallel to but not within or through the closure area. Designated Critical Habitat for loach minnow also exists on the East Fork Black River but not within the closure area. (101.84)

Response: No change was made to the desired condition for "Recommended Research Natural Areas" as loach minnow are present in the lower reach of Coyote Creek, which falls within the Three Forks Closure Area.

Concern Statement: Remove research natural area (RNA) designations. Concern is that it leads to de facto wilderness management. (108.209, 81.17)

Response: The interdisciplinary team evaluated the forests' one existing research natural area (RNA) and seven proposed RNAs for potential inclusion in the plan (see the "Research Natural Areas" section in chapter 3 of the EIS). The evaluation considered the need for the existing or additional RNAs. The primary criterion for determining need was the lack of ecological representation in the RNA system regionwide.

Research Natural Areas are units of land where natural conditions are maintained to allow natural physical and biological processes to continue without human intervention. These areas are essential for comparison to managed areas and to provide baseline conditions; they are especially important with regards to climate change. However, some deliberate manipulation can be utilized to maintain the unique feature that the RNA was established to protect, such as the aspen in the Corduroy Recommended RNA near Hannagan Meadows.

The plan retains the existing Phelps Cabin RNA and adds the Phelps Botanical Area to the RNA. The plan includes six recommended RNAs: Thomas Creek, Corduroy, Three Forks, Lower Campbell Blue, Sandrock, and the recommended Phelps Cabin RNA addition (Phelps Cabin Botanical Area). Following approval of the plan, further evaluation and a National Environmental Policy Act (NEPA) environmental assessment would be completed for each recommended RNA. If approved by the regional forester, with concurrence of the station director, the plan would then be amended to recognize these areas as designated RNAs. As stated in the management approaches for the "Recommended Research Natural Areas" section, if the RNA is not designated within 5 years, it may be re-evaluated to verify its need for RNA designation.

Concern Statement: Concern that in U.S. v. NM, the Supreme Court defined the law as to the limitations of Forest Service's use of water resources and forbid the agency's use of waters for the purposes of such as research natural areas. (104.9)

Response: In 1978, in *United States of America* v. *New Mexico*, the Court found that the reserved water rights on national forests apply only to the preservation of timber resources and water flows. All other claimed needs were to be considered secondary purposes and the Federal government would have to obtain rights like any other appropriator under State law. Federal reserved water rights may only include quantities of water necessary to meet the primary purpose for which the reservation was established ("primary purpose" requirement) and only in the minimum amounts necessary to meet those purposes ("minimal needs" requirement). The forests have followed statutes set forth by the State for purposes such as for wildlife use and for instream flow uses, which may occur in proposed research natural areas. The plan addresses management of water in the "Water Resources" and "Water Uses" section of the plan in chapter 2.

Scenic Resources

Concern Statement: Explain the link between ecological function and scenic values. (108.236)

Response: The phrase “and ecological function” has been removed from the third desired condition in the “Scenic Resources” section of the plan to clarify the desired condition.

Lands and Special Uses

Concern Statement: Address road trespass, in particular, where private inholdings have alternative legal access across non-Federal lands. (99.30)

Response: The plan contains a desired condition and an objective to resolve trespass cases; these are listed in the “Lands section of the plan in chapter 2. The Apache-Sitgreaves NFs would address road trespass at the project-level on a case-by-case basis as resources and funding is available.

Concern Statement: Clarify whether the number of recreation residences is correct in table 133 (DEIS p. 393). (99.29)

Response: Table 133 in the “Lands and Special Uses” section in chapter 3 of EIS has been updated. There are 25 recreation residences on the Apache-Sitgreaves NFs.

Concern Statement: Modify the Special Uses guideline "Large group and recreation event special uses should not be authorized within wilderness, recommended wilderness, primitive area, wildlife quiet areas, eligible "wild" river corridors, Phelps Cabin Botanical Area, Phelps Cabin Research Natural Area, or recommended research natural areas to protect the unique character of these areas" (proposed plan p. 101) to exclude or limit riparian and wetlands areas as sites authorized for large group and recreational special use events, where practicable. (112.27)

Response: The guideline has been modified to include riparian and wetland areas. This would exclude or limit large group and recreational special use events within riparian and wetlands to protect the unique character of these areas.

Concern Statement: Modify the Special Uses guideline to read "Commercial outfitters and guides should not be authorized to use developed campgrounds and developed trailheads so those sites remain available for noncommercial forest visitors" (proposed plan p. 101). (99.7)

Response: The guideline was not modified, it reads

> *“Commercial outfitters and guides should not be authorized to use developed campgrounds so those sites remain available for noncommercial forest visitors.”*

The interdisciplinary team discussed the proposed change and concluded parking at trailheads could be allowed by outfitters and guides to reduce parking along roads that could interfere with safe travel. Restrictions at trailheads could be imposed during the outfitter-guide permitting process or through site specific analysis.

<u>Concern Statement:</u> Recognize that small communities (e.g., Eagar, Alpine) depend on water sources (e.g., wells, springs) located on the Apache-Sitgreaves NFs. (99.21)

<u>Response</u>: The following sentence was added to the "Water Resources" section of the EIS, under the "Water Yield" header,

> *"Although there are no designated municipal watersheds within the forests, many local communities and individuals depend on water generated from the forests through springs, streams, and groundwater pumping for domestic, irrigation, and some industrial/agricultural uses."*

Added a phrase on small communities in the Management Approaches for Water Uses section of the plan,

> *"Management emphasis is to provide adequate water supplies to support the mission of the Agency in addition to helping maintain continuous water supplies to downstream users on and off the forests including small communities located adjacent to the Apache-Sitgreaves NFs."*

<u>Concern Statement:</u> Select a plan that will protect the greatest amount of biodiversity and allow you to purchase more land of such type and quality. (8.6)

<u>Response</u>: The plan provides protections for biodiversity (i.e., biological diversity); it sets forth desired conditions, objectives, standards, and guidelines to maintain species diversity and species viability across the planning area. The management approaches for the "Lands" section in chapter 2 describes criteria for lands desirable for acquisition. These criteria include those directly related to biodiversity: vital wildlife habitat and riparian areas.

<u>Concern Statement:</u> Forbid the exchange or sale of any land to any public or private entity. (8.7)

<u>Response</u>: Exchange, sale, or purchase of land is beyond the scope of the plan and the plan process. Land adjustments (e.g., exchanges, purchases) benefit the Forest Service and the public through consolidating the National Forest System land base, reducing administrative problems and costs, enhancing public access and use, and supporting resource management objectives. The Forest Service would follow law (e.g., General Exchange Act of 1922, Townsite Act, Small Tracts Act) when considering or conducting land adjustments.

<u>Concern Statement:</u> Explain how non-permitted signs located on the forests are managed. (99.31)

<u>Response</u>: Specific direction for the management of signs is not addressed in the plan; programmatic direction for special uses can be found in the "Special Uses" section in chapter 2 of the plan.

Signs on the Apache-Sitgreaves NFs that are not permitted are either placed under a special use permit or removed from the forests. Permitting is accomplished on a site specific case-by-case basis in conformance with Forest Service Handbook 2709.11 - Special Uses Handbook.

Cultural Resources

Concern Statement: Recognize that historic places include not only Indian ruins, but also ranger stations, fire lookouts, administrative sites, historic stock driveways (Sheep Driveway and Grapevine Canyon), old cabins (Greenwood cabin), and corrals. (105.17, 131.14)

Response: The plan does recognize historic places including lookouts, ranger stations, and administrative sites in the "Cultural Resources" section. The properties presently listed on the National Register of Historic Places (NRHP) are described in the background. The plan also contains the following objective:

> *"During the planning period, nominate at least five eligible cultural resources for inclusion in the NRHP."*

Concern Statement: Correct table 137 (DEIS p. 402) to include Yavapai under protohistoric and prehistoric occupation. (7.1)

Response: Table 137 in the EIS, "historic-age activities and possible site types" has been updated to recognize the Yavapai and Apache peoples. Thank you for pointing this out.

Concern Statement: Consider using a database like AZGFD HabiMap as an efficient method to research all culture clearances on the Apache-Sitgreaves NFs. (121.3)

Response: The plan does not identify specific methods for researching cultural clearances. During plan implementation, the Apache-Sitgreaves NFs archaeologists use a variety of methods (as allowed by agency policy) to determine whether to grant cultural resources clearance for a project or activity. The Arizona Game and Fish Department HabiMap is used, in addition to other inventories and tools, to assist the archaeologists in their analyses.

American Indian Rights and Interests

Concern Statement: "Members of affiliated Tribes have access to gather traditional forest resources" (p 54). "Traditional forest resources" is not defined. (108.148)

Response: The desired condition listed above does not appear in the proposed plan. It appeared in the June 2009 Working Draft Land Management Plan (see EIS, chapter 2, "Alternatives Considered but Eliminated from Detailed Study" section). Based on public feedback, the desired condition was clarified and appears in the "American Indian Rights and Interests" section of the plan as:

> *"Members of affiliated tribes have access to gather forest resources and products for traditional cultural purposes7 (e.g., medicinal plants, boughs, basket materials, pollen, plants and minerals for pigments)."*

[7] Sacred sites as defined in E.O. 13007, traditional cultural properties as defined in National Register Bulletin 38, traditional cultural purposes as defined in the 2008 Farm Bill Section 8102, Subtitle B.

Concern Statement: The provision of consulting tribes during planning and project design to incorporate tribal perspectives and knowledge into decisions should be extended to other people, including those that have ancestral links to places and artifacts. (108.205)

Response: No additional direction requiring consultation with members of the public was added to the plan. Law and policy (e.g., National Environmental Policy Act, National Forest Management Act, Forest Service Manual 1500) already require the Forest Service to include public participation during planning and project design and decisions.

American Indian tribes are sovereign nations. As a result, the Forest Service has a Federal Trust Duty to American Indians. Several laws require the Forests Service to consult with tribes. Executive Order 13175 specifically requires consultation with Tribes when proposed policies or management actions may affect their interests.

Extensive public involvement and collaboration, in addition to tribal consultation, has occurred in the development of the plan. See the EIS "Public Involvement" section (chapter 1) and appendix F ("Collaboration and Public Involvement").

Forest Products

Concern Statement: The Forest Service must consider and disclose the contribution of foreseeable management activities to climate change including: groundwater extraction, surface water diversions and withdrawals, use of existing roads and trails, construction of new roads and trails livestock grazing, fire and fuel management, timber harvest, minerals development, and spread of invasive species. (26.158, 26.160, 46.1, 64.3, 162.6)

Response: Global and national climate change is beyond the scope of the plan. The largest extent considered in the cumulative environmental consequences analyses in chapter 3 of the EIS was set at the White Mountains-San Francisco Peaks- Mogollon Rim Ecoregion scale. Climate change effects were analyzed at this ecoregion scale in the "Vegetation," "Forest Products," and "Forest Health" sections of the EIS. The effects of climate change to forest resources was also analyzed in the "Air," "Soil," "Watershed," "Water Resources," "Riparian," "Wildlife and Rare Plants," "Invasive Species," and "Livestock Grazing" sections of the EIS.

Additional text has been added to the EIS "Forest Products" section that discloses the potential environmental effects with respect to carbon storage and sequestration. In summary, the science indicates that many complex variables and tradeoffs must be considered. Scientific literature on the role of forests and forest management in carbon storage versus carbon emissions indicates that many complex variables and tradeoffs must be considered. In general, according to Ryan et al., 2010; Huang et al., 2013; North and Hurteau, 2011; Hurteau et al., 2010; North et al., 2009; Hurteau and North, 2009; Finkral and Evans, 2008; and Dore et al., 2010, treatments that prevent deforestation, reforest severely burned forests, retain the majority of large trees, retain soil organic reserves, increase health and growth rates of existing forests and herbaceous vegetation, and convert trees into durable wood products retain and improve carbon storage. Use of biomass energy can reduce fossil fuel carbon emissions. Exhaust from harvesting and industrial operations and from wildland fire treatments would cause immediate carbon emissions. However, these activities can reduce greater pulses of carbon emitted from large stand-replacement wildfires in addition to preventing large scale losses of forests as important carbon sinks. Well-designed restoration thinning and maintenance of tree groups and/or stands to sustainable levels of all tree

sizes present should be an important treatment consideration for the site capability, species silvics, and fire regime involved (Fiedler et al., 2010; Dore et al., 2010; Reynolds et al., 2013; Triepke et al., 2011; Hurteau et al.. 2010; Covington, 2000).

Concern Statement: Concern that the maximum allowable sale quantity (ASQ) volumes identified by alternative in the EIS may prove a limiting factor for the continued long term growth of the existing industry, even without considering the Four Forest Restoration Initiative (4FRI) contract. It is unrealistic to expect long term sustained contributions from non-suitable lands to the availability of steady volumes of industrial forest products. Increase the ASQ volume to 450,000 CCF annually, in order implement a restoration program designed to support the existing and currently developing industry in the White Mountains and to simultaneously support the contract(s) expected to result from the second analysis of the4FRI. To ensure that this higher volume is harvested, follow these strategies for the lifetime of the plan: (1) subordinate the focus on restoring grasslands and other non-suitable timberlands; (2) reduce extensive use of moderate and/or high severity fire as a first entry thinning treatment on suitable timberlands and treat with mechanical harvest instead. (161.37, 161.39, 161.40, 161.41)

Response: The Allowable Sale Quantity (ASQ) from suitable timberlands (wood volume) is analyzed and the environmental consequences disclosed in the "Forest Products" section of the EIS. Forest ecosystem restoration is one of the primary goals of the plan, to ensure that all forest products and services are sustainable long term. Therefore, wood volume generated from restoration cuts is considered a by-product of restoration treatments.

For the wood volumes to be produced as projected in the plan (see the objectives in the "Forest Products"), restoration of over-stocked forested acres is necessary before additional uncharacteristic wildfire and/or insect outbreak events impact the forests. Designating national forest acres as suitable timberlands does not exclude them from legally mandated multiple use requirements and resource protections. In accordance with the1982 Planning Rule provisions, in compliance with the National Forest Management Act and other legislation, the plan in its totality requires that timber harvesting levels must be compatible with providing wildlife habitat, watershed stability, and numerous natural resource protections.

Note that approximately 29 percent of the forested PNVT acres were removed from immediate timber production by the Rodeo-Chediski, Wallow, and other large wildfires since the year 2000; the higher wood volumes this commenter desires to see produced annually would not readily be available within the planning period (approximately 15 years).

Alternative C explored the maximum wood harvest volumes possible in the context of existing conditions, multiple use mandates, predicted budgets and workforce capacity. It was not selected due to ecological analysis results, and because alternative B (the plan) was found to provide adequate wood harvest volumes to support industrial demands during the planning period. To increase post-Wallow Fire wood volumes offered annually above those already analyzed would require either: cutting more acres per year; cutting more commercial-sized trees per each acre treated annually; targeting only large diameter trees in all annual cuts; increasing the number of suitable timberland acres; or some combination thereof. Increases in cutting levels beyond those analyzed in detail would have the potential to threaten the viability of some wildlife and/or fish species. An alternative to have large increases in timber harvest was considered in chapter 1 of the EIS (see the "Alternatives Considered but Eliminated from Detailed Study" section).

The analysis of cumulative environmental consequences in the "Forest Products" section in chapter 3 of the EIS shows that the plan would meet a large portion of the increasing market demand when combined with the other three national forests participating in the Four-Forest Restoration Initiative (4FRI). If the 4FRI treatments are limited to mostly ponderosa pine and dry mixed conifer acres, with less emphasis on treating the other PNVT acres, this could prevent larger increases in possible industrial volume offerings. One possible offset might be additional salvage volume made available after current or future insect/disease outbreaks, wildfire, and/or use of wildland fire, which is not included in the ASQ volume calculations.

The plan's focus to restore grasslands and riparian forest acres is preferred to improve overall ecosystem health and fire-resiliency in PNVTs which should normally function as natural barriers to rapid crown fire spread. Conifer encroachment can be removed at relatively lower costs, and once restored, grasslands should provide improved herbaceous ground cover with better forage production and watershed stability contributing to other aspects of the local economy. Expeditious restoration of the landscape cannot be achieved entirely by mechanized tree removal, which is a much slower method than using fire. The plan strikes a reasonable balance between these two methods. (Also see response to comment 161.22 in the "Vegetation" section of this appendix)

New industrial uses for small diameter (non-commercial sized) trees (Livingston 2008, 2006, 2004), uses for previously non-industrial tree species, and improvements with in-forest wood removal as well as new milling efficiencies (waste reductions) are further expected to help support developing markets to better utilize more of the same volume offered per acre (Drury and Boehning, 2013). The Forest Service would continue to monitor market demand and if resource conditions allow, the plan could be amended to increase the ASQ if needed.

Concern Statement: Concern that the Forest Service guaranteed 5,000 acres/year to the White Mountain Stewardship project resulting in approximately 12% of the forest actually treated. Thus the Fire Specialist Report statement which says that "since 2001, there has been a management emphasis to treat areas identified in the CWPPs and WUIs" should be removed or corrected. (108.228)

Response: Upon further review, the statement was determined to be correct and has not been removed or corrected.

This first sentence of the above comment is made with respect to recent vegetation treatments implemented under the current 1987 plan (alternative A). The quote the commenter refers to is taken from the "Fire" section in chapter 3 of the EIS. In full, it states,

> *"Alternative A (1987 plan) does not address the hazards associated with the WUI. However, since 2001, there has been a management emphasis to treat areas identified in the CWPPs and WUI."*

Treatments completed in the wildland-urban interface (WUI) and within the community wildfire protection plans (CWPP) areas in the past 12 years have been focused on fuels and fire hazard reduction, rather than complete forest or woodland restoration. Acres treated by the White Mountain Stewardship (WMS) contracts do not reflect total acres which received fuels reduction treatments, as numerous additional acres were treated independently from the WMS mechanized treatments during the same timeframe, by using other methods instead of, or in addition to, mechanized thinning.

<u>Concern Statement:</u> Modify the Forest Products standard "Permits which authorize the collection of forest products shall include permit provisions to ensure the needs of wildlife, which depend upon those forest products, will continue to be met (e.g., cone and mushroom collection and the overwinter forage needs of squirrels)" (proposed plan p. 94) to include conditions on forest product harvest permits that ensure the needs of aquatic and riparian resources, watershed protection, and listed species habitat needs. (112.21)

<u>Response</u>: The standard was not modified based upon this comment.

The phrase "…provisions to ensure the needs of wildlife…" in this standard is all-inclusive and partially addresses this comment. Moreover, this standard has been edited to now read,

> *"Authorizations to cut, collect, or use forest products for any personal, commercial, or scientific purpose (i.e., permits, contracts, agreements) shall include permit provisions to ensure the needs of wildlife, which depend upon those forest products, will continue to be met (e.g., fungi and cone and mushroom collection with respect to and the overwinter forage needs of squirrels)."*

This change was made to strengthen the standard's applicability to all administrative forms of permitted forest products removal.

The "Forest Products" section in chapter 2 of the plan contains a desired condition and a guideline that are also all-inclusive in meeting the intent of this Concern Statement:

> "*The collection of live plants, mushrooms, and other forest products does not impact species persistence onsite." (Desired Condition)*
>
> *"Permits issued for forest products should include stipulations to protect resources." (Guideline)*

To further address this comment, text was added to the management approaches for the "Forest Products" section:

> *"Plan direction and interdisciplinary input are used to develop additional project-specific and/or resource specific conditions to be included in all forest product permits and contracts issued."*

The plan's "Special Uses" section contains a standard and a guideline that are also all-inclusive and tie in with a sentence in the management approaches:

> *"Special use authorizations for the collection of live species with limited distribution (e.g., some invertebrates, plants) shall include permit provisions to ensure the species persist onsite." (Standard)*
>
> *"As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens)." (Guideline)*
>
> *"Forest users should have information regarding when there is a need to obtain a permit, particularly for collection of forest products."(Management Approach)*

Finally, there are related plan decisions in the "Water Resources," "Aquatic Habitat and Species," "All PNVTs," "Riparian Areas," "All Forested PNVTs," and the "General Forest Management Area," sections that would apply.

Concern Statement: Bring back logging so the forest can be groomed. (153.3)

Response: Tree thinning and/or cutting is identified for nearly all potential natural vegetation types (PNVTs) as one means to attain desired conditions identified in the plan. Table 146 in chapter 3 of the EIS shows a succinct comparison of cutting levels by alternative. The "Lands Suitable for Timber Production" section of the plan lists management areas in which commercial timber production prescriptions and activities are suitable, as well those areas in which tree cutting is suitable to meet non-commercial restoration and maintenance goals, using either mechanized and/or hand cutting as appropriate. Timber harvest on suitable timberlands would be done at sustainable levels as identified in the long term sustained yield capacity determination which is documented in appendix B ("Description of the Analysis Process") of the EIS.

Concern Statement: Forest products management actions should be dictated primarily by the expeditious implementation of landscape scale restoration primarily through mechanical treatments that produce products to sustain the existing forest industry and to allow natural resources-based rural economic development through new infrastructure of small diameter tree utilization at industrial scale. To ensure that this can be done most expeditiously, follow these strategies for the lifetime of the plan: (1) subordinate the focus on scientific silviculture priorities and traditional forestry methods of uneven-aged management and sustained yield of harvest volumes on a regulated non declining even-flow basis for the long term; (2) sustain the social license required for the re-introduction of appropriate scale industry logging activities at the landscape scale in a non-conflictual and non-litigious manner. (161.22, 161.31, 161.34, 161.73, 98.16, 61.1)

Response: Just as industry has physical limits to the capacity of raw material it can handle or treatment rates it can produce, the Apache-Sitgreaves NFs have a limit to budget and workforce capacities for analyzing, preparing, and implementing annual restoration projects. The plan offers a reasonable treatment rate for mechanized operations on this national forest, especially when viewed in combination with the acreages to be offered to industry for treatment on the other three national forests in northern Arizona under the Four Forest Restoration Initiative (4FRI) contract. Removal of strictly small-diameter trees does not necessarily constitute ecosystem restoration. It is neither practical nor possible to expect that the entire ecosystem can be restored within 10 years after the 100+ years it took to become departed from desired conditions. Avoidance of all conflict is a worthwhile ideal, but providing social license to avoid conflict is outside the scope of the plan.

The plan states that federal laws and Forest Service policy must also be followed in all projects. The Forest Service uses the best available science, in an interdisciplinary National Environmental Policy Act (NEPA) process, for all project analyses to inform the deciding official. However the official is not required to choose the alternative or to implement the project design which is most consistent with the current science, especially if new pertinent sound science comes to light. The plan incorporates the best available science into its components. All projects and activities must be consistent with the plan as described in chapter 1 under the "Plan Consistency" section.

Appendix B in the plan's "Vegetation Management Practices" section cites chapters in FSM 2470 and FSM 5100 which require sound forestry science to be applied through silvicultural systems and methods, by a certified Silviculturist working in cooperation with a qualified Fuels Specialist if needed (Rasure and Harbor 2011, Bartuska and Croft 2001). Traditional forestry and silviculture practices are adaptable to new restoration concepts and techniques (Arno and Fiedler 2005), and can be applied in consistency with FSM 2020 for management toward ecological restoration and resilience.

Uneven-aged management is perhaps the least-litigious management system because it retains trees of all sizes across the treatment area for sustainable forest conditions. There have been numerous timber sale lawsuits and court injunctions across the Forest Service Southwestern Region for cutting too many large trees under even-aged management methods in the 1980s and 90s. Tribal foresters in the southwest have preferred uneven-aged management for decades with very little conflict. Uneven-aged management is the most clearly-defined system to achieve the plan's many desired conditions for restoring forest structure and function. It should provide a high degree of success now that more markets are available to take the excessive numbers of small diameter trees per acre, which is vital for complete restoration. Sustained yield of harvest volumes on a regulated non declining, even-flow basis for the long term is required by the provisions of the 1982 Planning Rule, and by FSM 2400 directives, for legal compliance.

Concern Statement: Do not eliminate ability to cut firewood used to heat homes. (24.5)

Response: The plan contains an objective in the "Forest Products" section in chapter 2 to annually provide up to 94,000 hundred cubic feet (CCF) of firewood for personal and commercial use. On a side note, the cord volume estimate was found to be in error in the proposed plan; it has been corrected to the true equivalent of 119,380 cords. The plan's "Monitoring Strategy" in chapter 5 includes a monitoring question to track whether forest products provided to communities are consistent with the plan's projections.

Concern Statement: Concern with recent policy of accomplishing forest restoration work by paying contractors to do all the work, while the national deficit increases and budgets diminish. The Forest needs to provide timber sales with sufficient product, quality and value so operators can do forest restoration work while making a profit and in so doing provide stumpage income to the Government. Eliminating certain size classes of timber from consideration needs to be modified in order to establish multiproduct sales that will accomplish restoration. Permit cutting (including sanitation cuts) of any size material or trees necessary to manage for desired stand conditions (e.g., stand densities, fuel loading, species composition, etc.). (98.15, 98.17)

Response: The plan would generally allow projects to remove live or dead trees of any size, species, or condition as needed to move the project area toward the plan's desired conditions as long as the project is consistent with the other plan decisions and site specific considerations during National Environmental Policy Act (NEPA) analyses.

Modeling analysis for alternative B (the plan) described in the EIS and resulting harvest volumes do include removing varying numbers of trees of all sizes and species on most (but not all) cutting treatment acres. During project-level analysis, the interdisciplinary team would be tasked with disclosing the need to remove particular trees of certain sizes, species, or conditions on certain sites, in balance with retaining enough of the same tree sizes/species needed to be

consistent with the plan and other legal requirements for wildlife habitat, watershed stability, visual quality, and so forth.

The plan neither directs nor restricts the Apache-Sitgreaves NFs from using any particular type of contract or timber sale as the means of project-specific implementation. Managers of each site specific project would have the flexibility to choose the most efficient, cost-effective contract design to accomplish restoration quickly and in-step with market demands/conditions at the time. Multiproduct sales are just one of many methods or tools that could be used to treat toward desired conditions while also offering wood products as stumpage for sale.

Livestock Grazing

Concern Statement: Disclose scientific controversy related to the statement "Livestock grazing and associated activities contribute to healthy, diverse plant communities, satisfactory soils, and wildlife habitat" (proposed plan p. 95). Concern is there is no science that says livestock grazing 'contributes' to satisfactory soils and virtually every current study acknowledges that livestock degrade diverse plant communities and wildlife habitat. (127.44, 132.9, 132.27)

Response: We have edited the desired condition to state:

> *"Livestock grazing and associated activities occur such that healthy, diverse plant communities, satisfactory condition soils, and wildlife habitat are maintained or improved."*

Concern Statement: Explain the statement "Also, it would not allow the attainment of the desired condition for livestock grazing to contribute to the social, economic, and cultural diversity and stability of rural communities" (DEIS p. 15). Concern how these intrinsic/romantic statements of benefit off-set the negative impacts of nonnative herbivores. (132.8)

Response: Page 15 of the DEIS describes an alternative with no livestock grazing; however, it was not considered in detail (see the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 2). An alternative with no livestock grazing would not meet legal direction of the National Forest Management Act or Multiple Use–Sustained Yield Act which direct that forests will be managed using multiple use, sustained yield principles. In addition, as mentioned in the concern statement, an alternative with no livestock grazing would not contribute to the plan desired condition,

> *"Livestock grazing contributes to the social, economic, and cultural diversity and stability of rural communities."*

The plan manages herbivory with a focus on balancing available forage, as described in the "Livestock Grazing" section desired condition,

> *"Livestock grazing is in balance with available forage (i.e., grazing and browsing by authorized livestock, wild horses, and wildlife do not exceed available forage production within established use levels)."*

The management approach for livestock grazing as described in chapter 2 of the plan is to improve or maintain the health of rangelands. The plan contains desired conditions, standards, and guidelines to manage livestock grazing. The plan is designed to manage for ecological desired conditions, as well as social and economic desired conditions (including uses such as livestock grazing, harvest of forest products, and recreation).

Achievement of desired conditions would occur through completion of site specific National Environmental Policy Act (NEPA) environmental analysis, assessments, and decisions and updating allotment management plans for individual grazing allotments that take into account the desired conditions. The "Socioeconomic Resources" section in chapter 3 of the EIS analyses social and economic environmental consequences and takes into account the livestock grazing program area.

Concern Statement: Modify Livestock Grazing Desired Conditions (proposed plan p. 95) "Livestock grazing is in balance with available forage (i.e., grazing and browsing by authorized *and unauthorized* livestock, wild horses, *feral horses and hogs,* and wildlife do not exceed available forage production within established use levels)" (101.75)

Response: The desired condition was not modified. The intent of this desired condition is to manage allowable use levels for livestock authorized under a permit, wild horses, and wildlife. A definition for feral horses was added to the glossary of the plan. Feral hogs fall under the definition for unauthorized livestock. Unauthorized livestock and feral horses will be addressed through the National Environmental Policy Act (NEPA) process for the completion of the Heber Wild Horse Territory Management Plan.

Concern Statement: Modify Livestock Grazing Desired Conditions (proposed plan p. 95). Add "Livestock Grazing does not negatively affect wildlife habitat and populations." There is a similar desired condition under Managed Recreation on page 69. (101.76)

Response: No additions to livestock grazing desired conditions were made based on this comment. There is already a desired condition under the "Livestock Grazing" section in chapter 2 that states,

> *"Livestock grazing and associated activities contribute to healthy, diverse plant communities, satisfactory condition soils, and wildlife habitat."*

In addition, there are numerous desired conditions, standards, and guidelines in chapter 2 that will guide future project design to protect wildlife habitat and species. For example, the "Overall Ecosystem Health" section contains the desired condition,

> *"Ecological conditions for habitat quality, distribution, and abundance contribute to self-sustaining populations of native and desirable nonnative plants and animals that are healthy, well distributed, connected, and genetically diverse. Conditions provide for the life history, distribution, and natural population fluctuations of the species within the capability of the landscape."*

<u>Concern Statement:</u> Explain how forest restoration that opens canopies will be expected to produce additional forage to a degree that would decrease livestock use in riparian areas (DEIS p. 89). (112.42)

<u>Response</u>: This is described under the "Woody Species Reduction" header in the "Livestock Grazing" section in chapter 3 of the EIS. It states,

> *"By removing trees in woodlands and grasslands, the resulting open canopy would promote understory herbaceous plant growth. The understory vegetation would benefit from reduced competition with trees and would increase in vigor, expand its basal and canopy cover, and deposit seeds that could sprout into new plants and result in improved forage conditions and ground cover."*

The increase in forage would improve livestock distribution in pastures reducing impacts on use on other areas.

> *"Riparian area and wetland protection strategies should be integrated with upland management strategies. The health of the riparian and wetland ecosystems, receiving waterbody quality, and stream base flow levels are often dependent on the use, management and condition of adjacent uplands. Proper management of uplands can reduce grazing pressure on riparian areas and also increase forage productivity due to increased water table height and stream base flow. Increased forage productivity and overall upland health can result in increased economic benefits to the landowner or grazing management entity" (EPA, 2003).*

There are numerous research articles, some in Arizona, that have identified relationships between forest canopy or basal area and forage production for forest and woodland ecosystems (e.g., Jameson, 1967; Thill et al., 1983). Current conditions as described in the EIS indicate that ponderosa pine, piñon-juniper, Madrean pine-oak, and dry mixed conifer potential natural vegetation types (PNVTs) have closed canopies; desired conditions are for more open canopies. The potential acreage available for restoration treatment is large. Great Basin and semi-desert grasslands have also been found to have canopy cover well in excess of desired conditions. As these acreages are treated mechanically or by prescribed fire, forage production would increase. There has been forage monitoring within the Rodeo-Chediski Fire burned area, which shows large increases in forage as compared to pre-fire conditions. Monitoring forage in mechanically treated areas have also shown increases in available forage.

<u>Concern Statement:</u> Obtain soil, riparian, and vegetation information, particularly with respect to livestock grazing, to substantiate claims that areas will improve with implementation of the plan. (127.37)

<u>Response</u>: The plan contains guidance to improve or maintain the health of rangelands. The affected environment of and potential environmental consequences to soil, riparian areas, and vegetation are discussed in those respective sections in chapter 3 of the EIS. The EIS describes potential indirect effects of grazing based on the management guidance brought forward in the plan. There are other plan documents that describe in detail potential causes of current conditions, such as the "Comprehensive Evaluation Report" (Forest Service, 2008a).and the "Ecological Sustainability Report" (Forest Service, 2008c).

The plan provides guidance in the form of desired conditions, standards, and guidelines to protect, maintain, and improve soil, riparian areas, and vegetation conditions; it is at the project-level where site specific existing conditions are compared to desired conditions along with social and economic issues. Direct effects of grazing are tied to project-level allotment management, where site specific mitigation is developed and implemented and monitoring plans to trigger adaptive management are developed.

The monitoring strategy and questions presented in chapter 5 of the plan would help determine the effects of resource management activities and movement toward desired conditions and objectives identified in the plan.

Concern Statement: Consider the anticipated continuation of livestock grazing and its contribution to climate change. Disclose effects from herbivory by nonnative species in both wet as well as drought periods. (132.21, 132.23, 26.162, 26.85)

Response: The potential environmental consequences of climate change are discussed in appendix A ("Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning") of the plan and in the "Livestock Grazing" section in chapter 3 of the EIS. Livestock grazing should have no measurable effect on air quality, but it could contribute to the risk of invasive plant infestation and spread which is addressed in the standards and guidelines under the invasive species section in chapter 2 of the plan.

Concern Statement: Address the impacts of livestock grazing including: soil productivity, water quantity and quality, soil stability, forest fires, and invasive or nonnative species. (127.40, 132.17, 132.22)

Response: Potential impacts of livestock grazing are described in the EIS within the "Soils," "Water Resources," "Riparian Areas," "Fisheries," "Wildlife and Rare Plants," and "Invasive Species" in chapter 3. Since the plan does not include project and activity decisions, it is not appropriate to identify direct impacts. Analysis of site specific impacts would be completed later during the National Environmental Policy Act (NEPA) process, after specific proposals are made and there is additional opportunity for public involvement.

The plan addresses potential impacts of livestock grazing. For example, the standards and guidelines in chapter 2 have been developed to minimize long and short term impacts to soil and water resources, and reduce the potential for introduction or spread of invasive or nonnative species. The "Landscape Scale Disturbance Events" section of the plan provides direction to protect existing resources and facilitate recovery of soil and vegetation following large fires. In addition as mentioned in the management approaches for the "Livestock Grazing" section:

> *"Forest managers work with permittees to adjust timing, intensity, and frequency of livestock grazing to respond to changing resource conditions. Livestock and associated developments are managed to minimize impacts to forest resources, including cultural resources, native plant and animal species, wetlands, and riparian areas."*

<u>Concern Statement:</u> Take a hard look at the effects of foreseeable range improvements to the environment. Propose standards and guidelines to limit their impact, quantify the financial cost to taxpayers that may result, and specify any source of appropriated funds that the Forest Service intends to use to pay for them. (26.87)

Response: The effects of range developments upon the environment and measures to reduce the potential effects are addressed individually at the project-level environmental analysis. The costs of those developments and sources of funding would also be determined at the project-level. There are often multiple opportunities to fund range structural developments through other Federal programs or wildlife groups such as the Arizona Elk Society, Rocky Mountain Elk Foundation, Mule Deer Foundation, etc., the quantification of financial costs to taxpayers and specification of funding sources to pay for them is beyond the scope of the plan and plan revision process.

The plan contains direction to minimize the impacts of range developments, including the following desired condition and standards and guidelines:

> *"Range developments for livestock minimize impacts to wildlife and blend with the natural environment," (Desired Condition)*
>
> *"New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing)." (Standard)*
>
> *"New livestock watering facilities shall be designed to allow wildlife access and escape."(Standard)*
>
> *"During maintenance of existing watering facilities, escape ramps that are ineffective or missing should be replaced."(Guideline)*
>
> *"New livestock troughs, tanks, and holding facilities should be located out of riparian areas to reduce concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions."(Guideline)*
>
> *"New range developments should be located to minimize impacts to scenic resources and reduce the potential for vandalism and livestock-vehicle conflicts. Range developments should be designed in consideration of public safety, especially in areas of concentrated recreation use." (Guideline)*
>
> *"Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed." (Guideline)*

These plan decisions are located in the "Livestock Grazing" section of the plan in chapter 2.

<u>Concern Statement:</u> Explain how the Forest Service can improve soil conditions while still permitting herbivory by nonnative species both livestock and elk grazing. (132.51, 132.61)

<u>Response</u>: Potential impacts of herbivory by nonnative species (i.e., livestock grazing, elk grazing) to ecosystems and native wildlife species were considered during development of the plan. These impacts are disclosed in the "Soils" section in chapter 3 of the EIS. This section concludes that site specific best management practices (BMPs) and soil and water conservation

practices (SWCPs) would provide protection from the effects of grazing and are prescribed in project-level analysis.

The plan provides guidance to maintain or move soil conditions to a satisfactory condition (see the "Soils" section of the plan in chapter 2) and direction to maintain adequate ground cover (see the "All PNVTs" section). The plan includes standard guidelines to specifically manage livestock grazing activities across the forests (see the "Livestock Grazing" section). This guidance allows management flexibility to adapt to changing conditions, including vegetation responses to herbivory, drought and wildfire. The plan also includes additional guidelines that protect riparian areas and vegetation from livestock damage.

Concern Statement: Integrate the scientific research and implement the science-based recommendations developed by rangelands resources management peer-reviewed expert scientists such as Allan Savory of the Savory Institute; Steve Rich of the Rangeland Restoration Academy; Eric Schwennesen of Resource Management International; Dr. Lamar Smith, Associate Professor Emeritus at the University of Arizona; Dr. Jerry Holechek, Professor at New Mexico State University; and Dr. J. Wayne Burkhardt, Professor Emeritus at University of Nevada, Reno. Also include information from the National Riparian Team. (40.3, 139.10, 131.21, 161.11)

Response: The National Riparian Services Team and Dr. Holechek are cited in the EIS. Scientific information from numerous authors, universities, research facilities, and State and Federal publications has been considered in the development of the plan (e.g., Arizona Game and Fish Department, National Resource Conservation Service, University of Arizona, Society of Range Management). Literature citations for both the plan and EIS are listed in the "References" chapter of each document. Science-based recommendations have been implemented throughout the plan. The commenters did not list specific literature to be considered.

Concern Statement: The statement that available rangeland may vary by alternative must be clarified as to its meaning and how it varies from one alternative to another. (108.223)

Response: The plan and the EIS do not use the term "available rangeland." The amount of land suitable for livestock grazing is described for each alternative in the "Livestock Grazing" section in chapter 3 of the EIS. This amount would vary slightly between the action alternatives (alternatives B, C, and D) based on the number of recommended and designated research natural areas (RNAs). Livestock grazing is considered not suitable in these areas. The following is a list of the acres and percent of National Forest System land suitable for livestock grazing by alternative:

- Alternative A – 1,931,951 acres suitable for livestock grazing or approximately 96 percent of NFS lands on the Apache-Sitgreaves NFs.
- Alternative B – 1,901,512 acres suitable for livestock grazing or approximately 94 percent of NFS lands on the Apache-Sitgreaves NFs.
- Alternative C – 1,901512 acres suitable for livestock grazing or approximately 94 percent of NFS lands on the Apache-Sitgreaves NFs.
- Alternative D – 1,903,116 acres suitable for livestock grazing or approximately 94 percent of NFS lands on the Apache-Sitgreaves NFs.

The livestock grazing suitability analysis is described in more detail in appendix B ("Description of the Analysis Process") of the EIS.

<u>Concern Statement:</u> Support for establishing forage reserves as opportunities arise (proposed plan p. 96). (101.26)

<u>Concern Statement:</u> The establishment of forage reserves is not necessary (proposed plan p. 96). (131.15, 102.18, 105.9)

<u>Concern Statement:</u> Explain how forage reserves would be managed (e.g., how the reserves will be selected, who will have access to them, who will do the maintenance on the fences and waters) (proposed plan p. 96). (102.60, 138.47, 108.26, 112.22, 30.10)

<u>Response</u>: Forage reserves were considered in each of the action alternatives (alternatives B, C, and D) in the DEIS. Alternative A considered no forage reserves. Based on concerns regarding maintenance of rangeland improvements, associated economics, and impacts to wildlife the plan objective to establish forage reserves on each ranger district has been removed. However, the plan would not preclude establishing forage reserves as opportunities arise.

<u>Concern Statement:</u> Include livestock grazing standards that identify how desired conditions for grasslands and other PNVTs would be met. (112.23)

<u>Response</u>: The proposed plan contained a standard in the "Grasslands" section in chapter 2 that related to vegetation similarity as compared to TES potential. After reviewing comments received, this standard was determined to apply to all vegetation and was rewritten and moved to the standards for the "All PNVTs" section. This standard states that,

> *"Across the planning unit, within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity[8] as compared to site potential."*

This standard would apply to livestock grazing and other management activities that may affect plant composition. The concern is addressed through this standard; no additional standards have been added to the plan based on this comment.

<u>Concern Statement:</u> There is a need for livestock grazing standards to address the degraded condition of riparian areas. (26.62)

<u>Response</u>: The plan contains desired conditions, objectives, and guidelines specifically designed to address the degraded condition of riparian areas and improve their condition (see the "Riparian Areas" section in chapter 2 of the plan). In particular this section contains six guidelines to prevent resource damage or degradation and promote maintenance or improvement of riparian conditions that apply to all projects and activities. In addition, the "Livestock Grazing" section provides additional guidelines to protect forest resources, including three that specially address protection of riparian areas. The concern is addressed through plan guidelines and projects and activities must be consistent with guidelines; no additional standards have been added to the plan based on this comment.

[8] Moderate similarity to the desired plant community begins at 34 percent; high similarity to the desired plant community begins at 67 percent. Similarity is described in FSH 2090.11 (1.47a - Ecological Status). Current methodology for estimating similarity is found in the Region 3 Rangeland Analysis and Management Training Guide, July 1999 (revised November 2013).

<u>Concern Statement:</u> Modify Livestock Grazing Standard (proposed plan p. 96) "New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g. elk). ***Construction of new fences parallel to existing .fences shall not be allowed unless there is concurrent removal of the existing unneeded fence."*** **(101.77)**

<u>Response</u>: No changes have been made to this standard. This comment is partially addressed by the guideline in the "Livestock Grazing" section in chapter 2 of the plan,

> *"Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed."*

An additional guideline within this section, addresses range developments and impacts to scenic resources and public safety. It is further addressed under the management approaches for the "Livestock Grazing" section where it states,

> *"Livestock and associated developments are managed to minimize impacts to forest resources, including cultural resources, native plant and animal species, wetlands, and riparian areas."*

<u>Concern Statement:</u> Delete or modify the Livestock Grazing guideline "To prevent resource damage, trailing of livestock should not occur along riparian areas" (proposed plan p. 96). Concern that it is not attainable because there are times when it is necessary to move livestock through these areas. (121.9, 123.11, 105.20, 102.48, 131.16)

<u>Response</u>: This guideline was modified and occurs as follows,

> *"To prevent resource damage, (e.g., stream banks) and disturbance to federally listed and sensitive wildlife species, trailing of livestock should not occur along riparian areas. Where no alternative route is available, approval may be granted where effective mitigation measures are implemented (e.g., timing of trailing, number of livestock trailed at one time)."*

<u>Concern Statement:</u> Mention other methods to separate domestic sheep from wild sheep to preclude the introduction of lethal diseases such as purchase and retirement of existing sheep allotments or conversion of these allotments to other types of use such as cattle operations. (109.21)

<u>Response</u>: As noted under management approaches for the "Wildlife and Rare Plants" section in chapter 2 of the plan, efforts to help prevent disease transmission among domestic and wild sheep are determined at the site specific project analysis level. Although changes in class of livestock or removal of livestock are outside of the scope of the plan, some additional methods have been added to this section as examples.

<u>Concern Statement:</u> Adopt the recommendation that 9- to 14-mile wide buffer zones be established between bighorn sheep habitat and domestic sheep grazing (Western Association of Fish and Wildlife Agencies 2010). (112.24)

<u>Response</u>: As noted in the cited document, buffers may or may not be effective or practical. As noted in the response above, the site specific project or activity analyses would determine the best methods to help prevent disease transmission between domestic and wild sheep under each situation. Therefore a designated buffer zone has not been added to the plan.

<u>Concern Statement:</u> Modify Livestock Grazing Guideline (proposed plan p. 96) "Efforts (e.g. temporary fencing, increased herding, herding dogs) should be made to prevent transfer of disease from domestic sheep and goats to bighorn sheep wherever bighorn sheep occur. Permit conversions to domestic sheep or goats should not be allowed in areas adjacent to or inhabited by bighorn sheep *or areas identified by the Arizona Game and Fish Department for bighorn sheep reintroductions."* (101.79)

<u>Response</u>: The phrase "adjacent to or" has been added to this guideline. However, how close "adjacent to" might be would be determined on a site specific basis when permit conversions are considered. The Arizona Game and Fish Department would be consulted on any such permit conversions as a normal course of action so the last phrase is not necessary.

<u>Concern Statement:</u> Remove Livestock Grazing guideline "To minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source ..." (proposed plan 96). Salt is used as a method to move cattle and treat areas; it is addressed in the annual operating instructions (AOI). (112.26, 121.8)

<u>Response</u>: The guideline has not been removed nor has it been modified to allow placement of salt or supplement blocks near water resources. As described in chapter 1 of the plan, guidelines must be followed but they may be modified if the intent of the guideline is followed. A plan amendment would not be required as long as the project contributes to the maintenance or attainment of the relevant desired conditions and objectives. Therefore, if the project or activity can be designed to minimize resource impacts from the salt or supplements and meet the relevant desired conditions and objectives, placement of salt or supplement blocks near water could occur.

<u>Concern Statement:</u> Modify Livestock Grazing guidelines "During maintenance of existing watering facilities, escape ramps that are ineffective or missing should be replaced" and "New livestock troughs, tanks, and holding facilities should be located out of riparian areas to prevent concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions" (proposed plan p. 96) to add "to occur as partnering process to improve wildlife habitat" and to be flexible because cultural and wildlife clearance prevent timely occurrence. (123.6, 148.3, 121.10, 121.6)

<u>Response</u>: These guidelines have not been modified based on this comment. The specific methods and timing to conduct clearances and maintain, modify, relocate, or remove developments would be determined at the project-level. The Apache-Sitgreaves NFs has existing cooperators and partnerships available to help with construction and/or maintenance of structural range improvements.

<u>Concern Statement:</u> Modify the Livestock Grazing guideline "Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture" (proposed plan p. 96) by adding "and riparian areas" after seasonal allotments to allow for future riparian grazing if necessary. (121.7)

<u>Response</u>: This guideline has not been modified based on this comment. This recommendation is addressed by the updated guideline in the "Livestock Grazing" section in chapter 2 of the plan,

> *"Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state."*

The guideline would apply in all vegetation types, including riparian areas.

Concern Statement: Modify the Livestock Grazing guideline "New range developments should be located to minimize impacts …" (proposed plan p. 97) to include "where possible and practical." (123.12)

Response: This guideline has not been modified based on this comment. The specific methods for placement of range developments (e.g., design, location, mitigation measures) would be determined at the project-level.

Concern Statement: Modify Livestock Grazing Guideline (proposed plan p. 96) "New livestock watering facilities shall be designed to allow wildlife access and escape. *Existing livestock watering facilities shall be modified as opportunities arise to allow for wildlife access and escape.'(101.78)*

Response: This guideline has not been modified based on this comment. There is a guideline under the "Livestock Grazing" section in chapter 2 of the plan that addresses this concern. The guideline states,

> *"During maintenance of existing watering facilities, escape ramps that are ineffective or missing should be replaced."*

Concern Statement: In the plan, reference the document "Guide to Rangeland Monitoring and Assessment" produced by Arizona Grazing Lands Conservation Association. (105.21, 105.16, 121.11, 131.8, 123.22)

Response: The "Arizona Grazing Lands Association Guide to Rangeland Monitoring and Assessment" (Arizona Grazing Lands Conservation Association, 2012), was added to the "Other Sources of Information" for livestock grazing section in Appendix D of the plan.

Concern Statement: Eliminate or minimize livestock grazing. (125.10, 94.8, 9.8, 3.2, 23.7, 21.3, 132.47, 12.2, 80.2, 14.6)

Response: The Apache-Sitgreaves NFs considered a no grazing alternative but did not analyze in detail because it would not meet the legal direction of the National Forest Management Act or Multiple Use–Sustained Yield Act which direct that forests will be managed using multiple use, sustained yield principles (see the "Alternatives Considered but Eliminated from Detailed Study" section in chapter 1 of the EIS).

The plan does not specify the actual amount of livestock grazing (stocking) that could occur on the forests. The management focus described in chapter 2 of the EIS under "Elements Common to All Alternatives," including the plan, is to "balance livestock grazing with available forage" on suitable grazing lands. The amount of land suitable for livestock grazing varies slightly between all alternatives. The livestock grazing program has multiple mechanisms to evaluate, review, and adapt management as needed to effectively protect resources and respond to changing conditions. Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of the plan. Grazing is authorized through term grazing permits (a long term

authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Grazing can be reduced or adjusted in response to any site specific resources conditions within any grazing allotment. Changes to these authorizations would be made through project-level analyses.

Concern Statement: There is a need for more livestock grazing. (148.5)

Response: The plan does not specify the actual amount of livestock grazing (stocking) that could occur on the forests. The management focus described in chapter 2 of the EIS under “Elements Common to All Alternatives,” including the plan, is to “balance livestock grazing with available forage” on suitable grazing lands. The amount of land suitable for livestock grazing varies slightly between all alternatives. The livestock grazing program has multiple mechanisms to evaluate, review, and adapt management as needed to effectively protect resources and respond to changing conditions. Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of this analysis. Grazing is authorized through term grazing permits (a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Changes to these authorizations would be made through project-level analyses.

Concern Statement: Explain how the desired condition that grazing is "balanced with available forage" will make a difference in the new plan since the 1987 plan had similar direction. (122.2)

Response: The plan identifies a “Monitoring Strategy” in chapter 5. The results of this forest level monitoring would be evaluated biennially and would describe the progress made towards the plan’s desired conditions, including the one stated above.

In addition, livestock grazing allotments on the Apache-Sitgreaves NFs use an adaptive management approach to match livestock numbers with forage production. The management focus described in chapter 2 of the EIS under elements common to all alternatives is to “balance livestock grazing with available forage” on suitable grazing lands. The criteria for the suitability of livestock grazing are the same in all action alternatives. The amount of land suitable for livestock grazing varies slightly between the action alternatives based on the number of recommended research natural areas (RNAs). Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of this analysis. Grazing is authorized through term grazing permits (a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Changes to these authorizations would be made through project-level analyses.

Concern Statement: Explain where in the plan basic grazing considerations are addressed (ensuring cattle are not in the same pasture year after year). (122.4)

Response: Considerations for ensuring livestock are not authorized in the same pasture at the same time year after year are addressed by the standard in the “All PNVTs” section and guidelines in the “Livestock Grazing” section in chapter 2 of the plan.

As mentioned in the management approaches for the “Livestock Grazing” section of the plan in chapter 2,

"Forest managers work with permittees to adjust timing, intensity, and frequency of livestock grazing to respond to changing resource conditions."

Concern Statement: Alternatives should address the effects of grazing: (1) the loss of cold season grasses, (2) riparian systems, (3) water developments, (4) capability/suitability, (5) the amount of unsatisfactory or impaired lands, and (6) how monitoring has been implemented and what it has shown. (127.39, 122.1, 127.38)

Response: The plan contains components to address cool season grasses and other vegetation, riparian systems, natural and constructed waters, suitability of livestock grazing, and soils and watershed. The EIS analyzes the capability and suitability of livestock grazing (see Chapter 5). It also describes current rangeland conditions in the "Vegetation" section in chapter 3.

Under the action alternatives, there are objectives, guidelines, and standards for the maintenance of or movement toward desired conditions identified throughout the plan. Under all alternatives, grazing can be adjusted through site specific project analysis utilizing an adaptive management approach in response to any site specific resource conditions within any grazing allotment.

Most range-related monitoring is site specific and conducted at the project-level; however, the "Monitoring Strategy" presented in chapter 5 in the plan does help to ensure effectiveness of grazing management.

Concern Statement: Authorize the voluntary, permanent retirement of grazing allotments by permittees for conservation purposes, including endangered species recovery. (132.46)

Response: Allowing permittees to permanently retire their allotments is outside the scope of the plan.

Concern Statement: Rangelands resources management needs to be modified to include: (1) maximum management flexibility in terms of seasonal use, any use at all, numbers of livestock, etc., (2) real time three tier rangelands resources management quantitative monitoring, (3) dynamic real time adaptive management allowing the permittees to make required management adjustments on their own initiative in response to short term variables. (161.12, 161.16)

Response: Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of the plan. Grazing is authorized through term grazing permits (a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Livestock grazing is managed through an adaptive management approach and adjustments in the timing, intensity, duration, and frequency are made continuously in relation to short and long term monitoring information. Grazing can be adjusted in response to any site specific resources conditions within any grazing allotment.

Concern Statement: The plan should encourage greater opportunity for adaptive management suited to the needs of improved resource conditions: i.e. flexibility of timing, intensity and duration of grazing periods, use of livestock as a tool for improving previously ungrazed and or debilitated areas managed with electric fences to limit the disconnect of landscape areas. (138.46)

Response: Chapter 5 ("Monitoring Strategy") in the plan describes adaptive management and its value in allowing the use of alternative solutions to meet desired conditions. Livestock grazing is managed through an adaptive management approach and adjustments in the timing, intensity, duration, and frequency are made continuously in relation to short and long term monitoring information. Under the plan, grazing can be reduced or adjusted in response to any site specific resources conditions within any grazing allotment.

Minerals and Energy

Concern Statement: The DEIS should add some mention of phosphate mining activity on non-forest lands in Navajo County that are adjacent to the Apache-Sitgreaves NFs. (99.39)

Response: The cumulative environmental consequences analysis for mineral resources (see "Minerals and Energy" section in chapter 3 of the EIS) is limited to those lands adjacent to the Apache-Sitgreaves NFs. The Forest Service is not aware of phosphate mining activity immediately adjacent to the forests. There is proposed potash mining that could occur approximately 40 to 50 miles from the forests, southeast of Holbrook.

Concern Statement: The guidelines for Minerals and Geology (proposed plan p.98-99) should provide guidance related to locatable minerals and recognize the statutory rights of those who maintain unpatented mining claims and sites. (151.5)

Response: Regulations governing locatable minerals are found in 36 CFR § 228, Part A. The plan does not repeat existing law, policy, or regulation. Locatable minerals are discussed in the "Minerals and Energy" section in chapter 3 of the EIS. The Apache-Sitgreaves NFs would work with claimants to ensure their actions are consistent with overall plan guidance.

Concern Statement: Recommend deleting the second Minerals and Geology guideline because they say the same thing: (1) " Key cultural sites, research natural areas, and administrative and recreation sites with an investment in facilities should be withdrawn from mineral entry to protect resources and existing infrastructure. Research natural areas" or (2) "Administrative sites, high use developed recreation areas, and other areas with substantial investment in infrastructure should be withdrawn from mineral entry" (proposed plan p.98-99). (99.18)

Response: The last guideline has been removed because it repeats the first guideline (see the "Minerals and Geology" section in chapter 2 of the plan).

Concern Statement: The plan should provide guidance for karst and cave management. Reference the karst and cave implementation plan. (35.2, 35.3, 35.4, 35.5, 35.1)

Response: The plan is programmatic and provides broad guidance for cave and karst management. For example, there are several desired conditions in the "Minerals and Geology" section in chapter 2 of the plan specific to caves. A guideline in the "Wildlife and Rare Plants" would provide protection for caves and karsts,

> *"Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be protected to retain their distinctive ecological functions and maintain viability of associated species."*

As mentioned in the management approaches for the "Minerals and Geology" section, cave and karst management plans would be developed as needed. The site specific details of cave and karst management would be addressed in these separate plans. This site specific plan would be beyond the scope of decision to be made in forest planning.

Forest Service Manual 2300, Chapter 2350, Section 2356 - Cave Management and the Memorandum of Understanding between the National Speleological Society and the USDA, Forest Service Cave and Karst Management have been added as "Other Sources of Information" for minerals and geology in Appendix D of the plan. These references would be used as cave and karst management plans are developed.

Concern Statement: Karst and cave geologic areas should be identified as a management area and have specific management direction. (35.6)

Response: A geological area is a special area that the Forest Service can designate. During initial plan revision scoping, including the identification of the "need for change," the need for geological areas was not identified. Because of time and financial constraints an extensive inventory for potential special areas, including geologic areas, was not completed (Forest Service, 2009e). The forests relied on information gathered from previous revision efforts, public scoping, and internal sources for the need for change evaluation.

Because geological areas were not identified, no specific management area was created. Forestwide desired conditions, standards, and guidelines, including the plan decisions in the "Minerals and Geology" section of the plan, would guide management of these lands.

Concern Statement: Correct the Minerals Report, proposed plan, and DEIS to reflect the fact that a world class copper deposit is located in the immediate vicinity of the southern portion of the forest, that the potential for locatable minerals is extremely high in this area, and that the potential for locatable minerals on Apache-Sitgreaves NFs lands may be much greater at depth than surface geology would otherwise suggest. (151.1)

Response: The "Background for Minerals and Geology" in chapter 2 of the plan and the "Minerals" section in chapter 3 of the EIS have been updated to recognize the copper deposit located near the Apache-Sitgreaves NFs' southern boundary.

Concern Statement: Update the Minerals Report to properly reflect all unpatented mining claims and sites maintained on Apache-Sitgreaves NFs lands as of at least December 6, 2012. (151.4, 151.2, 151.3)

Response: The EIS and the "Minerals and Energy Specialist Report" (Forest Service, 2014d) have been updated to reflect the number of unpatented mining claims and mill sites as of July 2013.

Socioeconomic Resources

Concern Statement: Provide an economic analysis for recreation, grazing, and wildlife on par with what was produced for other functions. (132.28)

Response: The 1982 Planning Rule provisions provide direction for conducting plan revision efforts and outline the requirements for economic analysis to include:

Direct and indirect benefits and costs, analyzed in sufficient detail to estimate --

i. the expected real-dollar costs …
ii. the expected real-dollar value …
iii. the economic effects of alternatives …
and
iv. the monetary opportunity costs (changes in present net value) …

[from § 219.12(g)(3)].

The results of the economic analysis are summarized in the "Socioeconomic Resources" section in chapter 3 of the EIS. The economic impact analysis for all program areas, including recreation, grazing and wildlife, including methodology and economic models, can be found in the "Socioeconomic Resource Report" available on the Apache-Sitgreaves NFs Web site at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5411486.pdf

Concern Statement: Provide a detailed accounting of the economic impact of grazing including the cost to administer the livestock program. (132.10, 132.26, 132.24)

Response: The "Socioeconomic Resources" section in chapter 3 of the EIS provides a financial efficiency analysis for all alternatives, including the plan (alternative B). This analysis takes into account the livestock grazing program area. It compares the forest expenditures and revenues throughout the life of the plan.

Concern Statement: Provide an assessment of returns to the treasury and costs to the public of livestock grazing. Concern is that the Forest Service charges grazing permit holders a low fee (subsidy) and returns less than 10 percent of its expenditure for grazing management to the U.S. Treasury. (127.33, 26.88)

Response: An assessment of returns to the treasury and costs to the public of livestock grazing is beyond the scope of the plan and plan revision process. Grazing fees on public lands are determined using a formula established by Congress in the Public Rangelands Improvement Act of 1978 and has continued under a presidential Executive Order issued in 1986.

Concern Statement: The economic analysis needs to include a calculation of the economic costs of the constraints imposed on the permittees by the current rangelands resources management agency processes that limits the ability of the permittees to manage optimally the land and the livestock due to the rigidity of the administrative processes. (161.17)

Response: The effects of administrative processes are beyond the scope of the plan and plan revision process. Therefore, they have not been analyzed in the EIS.

Concern Statement: Concern that the current level of economic contribution of livestock grazing, approximately 66 jobs and $713,000 in labor income annually, is only approximately half of the approximately 120 jobs and $1.3 million in labor income annually that can be supported by the full utilization of the available animal unit months (AUMs) (DEIS p. 491). (161.148)

Response: The current economic contribution is based on authorized animal unit months for 2010 (see the "Socioeconomic Resources" section in chapter 3 of the EIS.) Authorized animal

unit months fluctuate from year-to-year based on site specific resource conditions, weather, and livestock operations. Stocking decisions (amount of livestock grazing authorized) for specific grazing allotments are beyond the scope of this analysis. Grazing is authorized through term grazing permits (a long term authorization subject to forestwide standards and guidelines), allotment management plans, and annual operating instructions. Changes to these authorizations would be made through project-level analyses.

Concern Statement: The forest should eliminate livestock grazing and fund counties an annual payment of $43,900 to save the tax payers $1,296,000 per year. (132.50)

Response: Elimination of livestock grazing was considered but not analyzed in detail because it would not meet the legal direction of the National Forest Management Act or Multiple Use–Sustained Yield Act which direct that forests will be managed using multiple use, sustained yield principles (see the "Alternatives Considered but Eliminated from Detailed Study section in chapter 1 of the EIS).

Payments to counties are beyond the scope of the plan and plan revision process. There are no legal mechanisms that would allow the forests to directly transfer appropriated Federal monies to county governments.

Concern Statement: Consider the economic impact of additional roadless area designations and/or roads closure and/or limitation of suitability for future consideration of new motorized areas and trails and/or indiscriminate cross-country motorized travel restrictions that would further decrease recreation opportunities. (161.152)

Response: The "Socioeconomic Resources" section in chapter 3 of the EIS discloses the economic and social consequences of all four alternatives, including the plan. The alternatives contain varying amounts of land suitable for future consideration of new motorized areas and trails; the environmental consequences are discussed in the "Recreation" section of the EIS. The effects of recommended wilderness and inventoried roadless areas are discussed in the "Wilderness Resources" and "Inventoried Roadless Areas" sections of the EIS. The plan does not designate additional roadless areas; these areas were identified in the Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000.

More detailed economic analysis would be considered during project-level analysis, including implementation of the Travel Management Rule (36 CFR §212).

Concern Statement: Explain why there is no value for hunting and fishing. (132.25)

Response: Specific recreation activities are not analyzed separately. The economic contributions from hunting, fishing, and other recreation activities are included under recreation in the socioeconomic analysis portion of the "Socioeconomic Resources" section in chapter 3 of the EIS.

Additional language that acknowledges the economic contribution of visitors, including those that view wildlife, hunt, and fish was added to the background for "Overall Recreation Opportunities" section of the plan. The background now notes that the forests' contribution to the local economy from the recreation and wildlife areas is approximately 69 percent of the local jobs and 68 percent of the local labor income.

Landscape Scale Disturbance Events

<u>Concern Statement:</u> Identify criteria (e.g., size of burn, slope) to be met before using nonnative seeds to manage soil erosion post-wildfire. (109.16)

Response: Nonnative persistent plant seeds would not be used. The plan provides direction to ensure the persistence of native species including the guideline in the "Soil" section in chapter 2 of the plan,

> *"Locally collected seed should be used where available and cost effective. Seeds should be tested to ensure they are free from noxious weeds and invasive nonnative plants at a State certified seed testing laboratory before acceptance and mixing."*

The specific methods to address soil post-wildfire would be determined at the project-level. In general, annual cereal grains are added to many seed mixes to provide quick and effective ground cover. These species grow quickly, and generally do not last more than one or two growing seasons, while producing large amounts of mulch to protect the soil, retard overland flow, and improve native plant survival. Use of cereal grain in the mix is dependent whether the risk to downstream or on-site values of life, property or land productivity outweighs the cost or risk of the treatment itself. Great care is taken to ensure nonnative/invasive seed is not included in the mix and that treatments are monitored afterwards for unwanted weed and treated if needed.

<u>Concern Statement:</u> Burned but standing forest and single burned snags should be managed for natural recovery and not looked to for commercial gain. (5.8, 9.7)

<u>Response</u>: Plan guidelines for large-scale disturbance events primarily focus on restoring the land to meet desired conditions in the plan (see the "Landscape Scale Disturbance Events" section in chapter 2 of the plan). The desired conditions are integrated and are intended to reflect healthy ecological systems as well as social and economic considerations as described in chapter 1 of the plan. The desired conditions for forest and woodland communities would not change after large-scale disturbances, including severe fire. The plan decisions in the "Landscape Scale Disturbance Events" section were developed to protect existing resources and facilitate recovery of soil and vegetation components, and assist in attaining desired conditions in areas affected by large-scale disturbance, should a site specific proposal be made following the disturbance.

As described in the management approaches for the "Landscape Scale Disturbance Events" section, hazard trees may be removed and where there is extensive tree mortality and economic value exists, salvage of dead trees may be considered where this contributes to the movement toward desired conditions. Deferral of ecological restoration or salvage projects and activities may also be considered where these are not necessary for recovery.

<u>Concern Statement:</u> Salvage logging should not be equated with ecological restoration or forest management objectives other than economically-motivated multiple uses. (26.105)

<u>Response</u>: Salvage logging is not equated with ecological restoration; however, salvage is a tool for achieving certain restoration objectives and desired conditions (see the "Vegetation," "Soil," "Watershed," "Forest Health" and "Forest Products" sections in chapter 3 of the EIS). In some cases where excessive pre-fire forest density existed, removal of excessive biomass may be necessary to initiate the restoration processes towards desired ecosystem structure and functions.

Removal of excess biomass may be necessary to facilitate reforestation and survival of natural forest regeneration, at levels that are compatible with re-establishment of frequent surface fires.

Concern Statement: There is a need to remove or reduce livestock grazing post-fire. (122.3, 127.41, 127.5)

Response: There is a guideline within the "Livestock Grazing" section in chapter 2 of the plan that addresses modifying grazing in areas after large disturbances,

> *"As areas are mechanically treated or burned, or after large disturbances, timing of livestock grazing should be modified as needed, in order to move toward desired conditions and to accomplish the objectives for the treatment or disturbed area."*

Concern Statement: Add a drought policy to the plan. Recommend using the Drought Monitor from the National Climate Data Center. (132.58)

Response: The plan provides reference to Forest Service Southwestern Region drought policy (Forest Service Handbook 2209.13) in the "Other Sources of Information" for livestock grazing in Appendix D of the plan. The management approaches in the "Livestock Grazing" section of the plan has been update to include the following language,

> *"Because drought is inevitable in the Southwest, livestock grazing management on the ASNFs incorporates, as necessary, 1) evaluation of drought conditions, 2) drought management relative to vegetation impacts, 3) stocking during and after drought, and 4) early and effective communications with all affected parties."*

Concern Statement: Modify Landscape Scale Disturbance Events Guideline (proposed plan p.66) "Erosion control mitigation features should be implemented to protect significant resource values and infrastructure such as stream channels, roads, structures, threatened and endangered species, and cultural resources. *The use of nonnative grass seed for aerial seeding should be discouraged*." Concern with the use of "non- persistent" nonnative grass seed to mitigate wildfire impacts and possible unintended consequences such as concentrating elk within seeded locations, discouraging normal daily and seasonal movement patterns, outcompeting native forbs and grasses, and impacting aspen regeneration. (101.67)

Response: The plan provides direction to ensure the persistence of native species including the guideline in the "Soil" section in chapter 2 of the plan,

> *"Locally collected seed should be used where available and cost effective. Seeds should be tested to ensure they are free from noxious weeds and invasive nonnative plants at a State certified seed testing laboratory before acceptance and mixing."*

The specific methods to address soil post-wildfire would be determined at the project-level. Seeding with non-persistent annual or native perennial plants is a tool the forests would continue to utilize to protect watershed values at risk. The decision to seed is determined at the forest level by the forest supervisor and is based on recommendations from the burned area emergency response (BAER) assessment team.

The Forest Service considers the concentration of elk within seeded areas a positive outcome. Observations made post-fire have shown that riparian areas and meadows (which contain

sprouting vegetation and additional moisture) revegetate sooner than other areas, and consequently, draw wildlife to them. The result is over utilization and retarded recovery. Therefore, it is beneficial to draw wildlife to other areas because these riparian areas are the last line of defense for filtering ash and sediment after a wildfire. Cattle are generally removed or restricted from these areas after a fire, so effects of grazers are from wildlife.

Research has shown mixed results on effectiveness of seeding, some areas were successful, and some were not as far as providing enough groundcover to reduce soil erosion. Preliminary results on a research study within the Wallow Fire show no statistical difference between native species recovery of seeded and unseeded plots (Robichaud et al., 2014) with small but not statistically different increases in ground cover. Seeding under mulch was vastly different in effective ground cover compared to untreated and is reflected in many applications across the west (Robichaud et al., 2010).

Conservation Education

Concern Statement: Delete the statement in Conservation Education background "There is a clear lack of public understanding regarding forest issues, laws, consequences of forest user behavior, and forest management actions" (proposed plan p. 85). (152.11)

Response: The statement was modified to read,

> *"There is a need for the public to understand forest issues, laws, consequences of forest user behavior, and forest management actions."*

Concern Statement: Modify the last sentence in the Conservation Education management approach (proposed plan p. 86) to read: "The forests place an emphasis on providing interpretive programs, especially through its visitor centers (Big Lake and Mogollon Rim) and front line desk at Ranger Districts and Supervisor's Office and development of education tools (e.g., invasive species prevention)." (99.6)

Response: This proposed plan sentence was not modified,

> *"The forests place an emphasis on providing interpretive programs, especially through its visitor centers (Big Lake and Mogollon Rim) and development of education tools (e.g., invasive species prevention)."*

Although the forests' front line desk personnel provide information and other services to the public, they generally do not provide interpretive programs at the front desk.

Overall Ecosystem Health

Concern Statement: Clarify the Overall Ecosystem Health desired condition "Habitat quality, distribution, and abundance exist to support the recovery of federally listed species and the continued existence of all native and desirable nonnative species" (proposed plan p.17). Explain the justification for this and discuss instances when such habitat never occurred on the site or is incapable of being produced now. (108.108)

Response: The implementing regulations (1982 Planning Rule Section 219.19) of the National Forest Management Act require that,

> *"Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area."*

This desired condition contributes to meeting that requirement as well as requirements of the Endangered Species Act to support the recovery of federally listed species.

As noted in chapter 1 of the plan, plan decisions apply to projects or activities where site conditions provide an inherent capability to meet those plan decisions.

Concern Statement: Clarify terms used in the Overall Ecosystem Health section of the plan, including ecotone, high geomorphic, hydrologic, biotic integrity, ecological maintenance, and natural potential condition. (108.174, 108.29, 102.52, 108.214, 108.237)

Response: These terms have now been defined and are found in the plan's glossary.

Concern Statement: Concern that the Overall Ecosystem Health background statement "…ecosystems were considered to be resilient" (proposed plan p.15) implies that ranchers, settlers and farmers were the inherent cause of deviation from desired conditions. (138.6)

Response: There are many documented causes for deviation from desired conditions. The premise of the plan is to acknowledge current conditions and work towards desired conditions.

Concern Statement: Correct the Overall Ecosystem Health desired condition "Natural ecological processes allow for a shifting of plant communities …plant communities and the variety within the communities are resilient to disturbances" (proposed plan p. 17). Statement is contradictory, shifting means changing and resilient means going back to the same. (138.7)

Response: The desired condition statement has been rewritten to provide clarity. The desired condition statement now reads

> *"Natural ecological cycles (i.e., hydrologic, energy, nutrient) facilitate shifting of plant communities, structure, and ages across the landscape. Ecotone shifts are influenced at both the landscape and watershed scale by ecological processes. The mosaic of plant communities and the variety within the communities are resilient to disturbances."*

Shifting in this instance refers to moving from one vegetation state to another vegetation state. With both natural and man caused disturbance, the state (which in this case is determined by overstory vegetation size class, dominant species, and canopy cover class) can change. The ability of the site to move from one state to another in a natural progression or pathway can be considered its resiliency. As an example, a fire removes the overstory vegetation (trees) in an area with large trees, closed canopy forest. As a result, the state has changed to an open, grass/forb state. As tree seedlings establish, the state changes to an open canopy, seedling/sapling state. As trees grow, it then changes to an open or closed mid-sized tree state, and finally to an open or closed large tree state. There are many pathways on how the vegetation state changes. Some, such as high burn severity fire, may lead to a non-natural state, such as found on areas within the Rodeo-Chediski and Wallow Fires, where bare soil dominates the burned areas for years. Grazing by cattle and wildlife, invasive plant infestations, and commercial tree harvest can affect the progression as well.

Management Areas

<u>Concern Statement:</u> Prescribed burning or natural fires need to be repeated not more than every 10 years. Critical locations could be treated more frequently. (98.12)

<u>Response</u>: Wildfires cannot be predicted or put onto a regular maintenance cycle further defining which of these could be used to achieve desired results. However, the plan describes desired conditions based on natural fire regimes, including natural return intervals for fires, by potential natural vegetation type (PNVT). The exact or desired maintenance cycle for a particular piece of ground would be recommended in project-level planning and during the development of project burn plans for prescribed fires.

<u>Concern Statement:</u> Increase the treatment areas around the Community-Forest Intermix Management Area from half-mile to one- or two-miles. (98.14)

<u>Response</u>: The size of the Community-Forest Intermix Management Area has not been increased. The interdisciplinary team considered this option but determined the desired conditions and future treatments adjacent to the Community-Forest Intermix Management Area would provide for a resilient landscape and further protection from uncharacteristic wildfires for communities themselves. The plan's landscape scale treatment approach is to create a mosaic pattern to reduce fire intensity and long range spotting potential which would also further reduce hazards to communities. The actual Community-Forest Intermix Management Area is designed to provide firefighters an area where they can aggressively defend communities based on expected lower fire behavior.

<u>Concern Statement:</u> Modify Community-Forest Intermix Desired Condition (proposed plan p. 106) "Native grasses, forbs, shrubs, and litter (i.e., fine fuels) are abundant enough to maintain and support natural fire regimes, protect soils, *provide for wildlife needs*, and support water infiltration." (101.80)

<u>Response</u>: This desired condition has not been modified in the plan. The interdisciplinary team reviewed the comment and felt there was no need to add the additional qualifier (provide for wildlife needs). The plan provides for species viability and includes other specific plan decisions that provide for wildlife needs, including the following found in the "Wildlife and Rare Plants" section:

> *"Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives."*
>
> *"Cool and/or dense vegetation should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk, western yellow-billed cuckoo)."*

<u>Concern Statement:</u> The plan should allow for utilities to have motorized access to the energy corridors as well as within the energy corridor. (128.3, 101.81, 101.89)

<u>Response</u>: This guideline to manage energy corridors for nonmotorized travel has been modified to allow motorized equipment for operations and maintenance,

> *"Energy corridors should be managed as nonmotorized areas to avoid conflicts with corridor operations and maintenance needs, although operations and maintenance activities may use motorized equipment."*

This is located in the "Energy Corridor" section in chapter 3 of the plan.

Concern Statement: Include National Energy Regulatory Commission compliance requirements for vegetation clearing within and adjacent to energy corridors and the 2010 Memorandum of Understanding providing for the coordination among federal agency reviews of electric transmission facilities in the plan. (128.5, 128.6)

Response: The following statement has been added to the management approaches for the "Energy Corridor" section of the plan in chapter 3:

> *"Energy utility companies also comply with maintenance standards enforced by the North American Electric Reliability Corporation."*

The 2010 Memorandum of Understanding has been added to the "Other Sources of Information" for energy corridor section of Appendix D in the plan.

Concern Statement: The Carr Lake and Palomino areas, in addition to the eight existing wildlife quiet areas (WQAs), should be designated as wildlife quiet areas. (101.3, 101.5)

Response: Carr Lake and Palomino Wildlife Quiet Areas (WQAs) were proposed and analyzed under alternative D in the EIS, but they were not included in the other alternatives in order to provide a range of WQAs across alternatives.

Concern Statement: The commenter supports the designation of Cottonwood and Bear Springs areas as wildlife quiet areas. (101.6)

Response: The plan provides guidance for Bear Springs and Cottonwood Seep, in addition to eight other areas, in the "Wildlife Quiet Areas" section of the plan in chapter 3.

The Cottonwood Seep and Bear Springs Wildlife Quiet Areas were both proposed and analyzed under alternatives B and D, but they were not included under alternatives A and C of the EIS.

Concern Statement: The plan (e.g., need for Wildlife Quiet Area Management Area) should be based on actual data concerning wildlife populations on the forest and wildlife interaction with motorized vehicles. (108.207, 81.15)

Response: The Wildlife Quiet Area Management Area was established not on actual wildlife population numbers but on the need for some habitat areas across the landscape that are free of motorized vehicle impacts (disturbance/stress). The "Wildlife Quiet Areas (WQAs) and Habitat Linkages Report" (Forest Service, 2014m) located in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning details the need for and history of the establishment of WQAs and subsequent changes and results of implementation.

Since established, the need for and effectiveness of WQAs have been evaluated a number of times. Some findings based on research from the Arizona Game and Fish Department (AZGFD) and observations by Apache-Sitgreaves NFs and AZGFD biologists and wildlife managers include: (1) more acres of available and suitable habitat being used, (2) improved wildlife

population recruitment (more effective habitat), (3) improved nature viewing and greater chance of observing and photographing wildlife, and (4) increased quality of the non-motorized hunt experience and, likely, hunter success (based on ongoing hunter input). Forest and State biologists believe these benefits are likely the function of: (1) wildlife knowledge of, and site fidelity to, long term security (core habitat) areas, (2) improved (more natural) predator prey functions (reduced human related disturbance to both predator and prey), and (3) secure areas helping to provide habitat linkages across open, heavily human-utilized and managed areas.

Concern Statement: There is a concern that the existing Sitgreaves' wildlife quiet areas (DEIS p. 305-306) are "few and greatly spaced." (162.159)

Response: Currently, on the Sitgreaves NF distances between wildlife quiet areas (WQAs) are up to 50 miles. For this reason two additional WQAs were proposed and analyzed for the Sitgreaves NF under alternatives B and D in the EIS. These are the Bear Springs and Cottonwood Seep WQAs (see EIS Table 106).

The plan provides guidance for Bear Springs and Cottonwood Seep, in addition to eight other areas, in the "Wildlife Quiet Areas" section of the plan in chapter 3.

Concern Statement: Remove Natural Landscape Management Area. Concern is that it leads to de facto wilderness management. (108.208, 81.6, 81.7, 81.16)

Response: The Apache-Sitgreaves NFs manage National Forest System lands under the multiple use concept. However, management of some areas is constrained by laws and regulations. The Forest Service must follow laws and regulations. As stated in the "Background for Natural Landscape" section of the plan,

> *"This management area includes most of the Inventoried Roadless Areas (IRAs) that were identified in the 2001 Roadless Area Conservation Rule."*

The Forest Service is required to manage IRAs to protect and conserve their roadless character. The Natural Landscape Management Area is not managed as wilderness or for wilderness character.

Concern Statement: Provide information on the potential location of the proposed 405,000 acres of Natural Landscape Management Area. (161.94)

Response: The Natural Landscape Management Area is shown on the management areas maps found in appendix F ("Maps") of the plan.

Suitability

Concern Statement: Allow grazing in areas that may not be under allotment or in special use areas that are otherwise suitable for grazing. (98.24)

Response: Areas not under an Apache-Sitgreaves NFs' allotment that are identified as suitable for livestock grazing include portions of the Apache NF along the boundary with the Gila NF and an area near Clifton. The area along the Gila NF comprises the majority of acreage and these areas are grazed by livestock but they are administered by the Gila NF since the larger portion of the allotment is on the Gila NF. The area near Clifton weaves back and forth across the forest

boundary and these lands are not under an existing grazing allotment due to the topographical limitations.

A plan suitability determination as "suitable" indicates that grazing is compatible with the desired conditions for the relevant portion of the plan area. It is guidance for project and activity decisionmaking, and is not a commitment or a final decision. It does not mean that grazing will or will not occur in a particular area. The final decision to authorize livestock grazing and the determination for how lands are managed (including those that have been identified as not capable of producing forage), is made at the project or allotment level. The decision to authorize grazing and under what conditions is made following environmental analysis (National Environmental Policy Act) where site specific conditions can be assessed and addressed through project design.

Concern Statement: Support removing proposed and designated research natural areas from suitable rangelands. However, these rangelands should be managed for the specific purpose of quantifying and improving the understanding of the rangelands resources ecosystem processes and how they relate to improved management practices. (161.18, 161.7, 161.8)

Response: In determining the future need for research natural areas (RNAs), the interdisciplinary team followed the regional plan revision guidance "Research Natural Area Process for Forest Plan Revision Under the 1982 Planning Rule Provisions" (Forest Service, 2009d). RNAs are protected and maintained in a natural condition for the purpose of conducting non-manipulative research and for fostering education. As such, they were identified as areas not suitable for livestock grazing in the suitability analysis presented in the "Livestock Grazing Suitability" section in chapter 4 of the plan and described in appendix B ("Description of the Analysis Process") of the EIS.

The specific purposes or types of research to be conducted have not been decided. The backgrounds in the "Research Natural Areas" and "Recommended Research Natural Areas" sections in chapter 3 of the plan identify potential opportunities for research. The recommended Lower Campbell Blue and Sandrock RNA specifically mention the possibility of using these areas to study rangeland-related topics.

Concern Statement: Explain how the Forest Service met the requirements to identify capable and suitable lands for livestock grazing. Concern that the Forest Service needs to calculate suitability and capability as required by regulations at 219.20. (127.25, 26.83, 132.13, 132.12, 26.84, 127.35, 127.1, 127.36)

Response: The Forest Service completed capability and suitability estimates as required by the provisions of the 1982 Planning Rule (Section 219.20). This is described in appendix B ("Description of the Analysis Process") of the EIS under the "Livestock Grazing Suitability Analysis" section. It notes,

> *"Capability to produce forage for grazing animals was originally determined in the 1980s during the development of the 1987 plan and was based on individual allotment data. Landscape scale conditions that determine capability have not changed since the first evaluation. The Analysis of the Management Situation (1983) and the Environmental Impact Statement (1987) document the analysis of grazing capability and suitability for the 1987 plan."*

Suitable rangeland was determined based on whether an area was appropriate for the activity of livestock grazing in consideration of relevant social, economic, and ecological factors. Recommended research natural areas, research natural areas, and current National Forest System land not in a grazing allotment were considered to be not suitable for livestock grazing.

The identification of lands suitable for livestock grazing within the plan is not a decision to authorize livestock grazing. The final decision to authorize livestock grazing would be made at a project (individual grazing allotment) level. On a site-specific basis, grazing allotments are guided by an adaptive management strategy whereby results from long and short term monitoring are used to determine yearly stocking rates, pasture rotations, and whether other adjustments are needed in order to meet management objectives and desired conditions for rangelands.

Concern Statement: In the livestock grazing suitability analysis, consider: (1) food and hiding cover for wildlife, (2) distance from water, (3) amount of litter, (4) amount of bare soil, (5) erosion rates, (6) current plant composition, abundance and distribution as compared to historical and/or potential, (7) fire, (8) moisture cycles, and (9) slope. (132.43, 132.18, 132.60, 132.20, 132.14, 132.44, 132.59)

Response: The suitability determination for livestock grazing has not been changed based on this comment. The factors listed above are generally considered in the capability for livestock grazing determination. Capability is the potential of an area of land to produce resources and supply goods and services. Capability depends upon current conditions and site conditions such as climate variability, slope, landform, soils, and geology. Capability was determined in the 1980s during the first round of forest planning by compiling data from the most recent individual allotment analyses. Landscape scale conditions have not changed significantly since that evaluation; the capability determination was not updated during this revision process. The factors listed above could be considered at the project-level for individual allotment analysis.

Concern Statement: Include the following in the plan and implement immediately once the plan is approved: (1) new criteria for lands capable of supporting livestock using a specific distance to water (Holechek) as well as "other" criteria as noted by Cook, (2) a requirement that there is a quantitative and qualitative analysis prior to the issuance of any annual operating instruction (AOI), that there is adequate open water available for the term of livestock grazing and ample supply to support the current populations of native wildlife in the area adjacent to that open water. (132.19)

Response: The identification of lands suitable for livestock grazing within the plan is not a decision to authorize livestock grazing. The final decision to authorize livestock grazing would be made at a project (individual grazing allotment) level. The considerations in the comment could be considered at that time. On a site-specific basis, grazing allotments are guided by an adaptive management strategy whereby results from long- and short-term monitoring are used to determine yearly stocking rates, pasture rotations, and whether other adjustments are needed in order to meet management objectives and desired conditions for rangelands.

Concern Statement: There should be a change in suitability for grazing in and around aspen stands: livestock grazing should be moved away from aspen stands. (162.86, 162.93)

Response: The suitability determination for livestock grazing has not been changed based on this comment. The plan identifies a guideline under the "Forests: Aspen" section in chapter 2 to preclude concentrated herbivore impacts within proximity to aspen stands and another guideline

within the "Livestock Grazing" section to minimize herbivory to aspen clones. In addition, where there are site-specific concerns related to livestock grazing, they may be addressed in the annual operating instructions and throughout the season. The "Monitoring Strategy" in chapter 5 of the plan includes questions that will also help identify any potentially negative impacts from livestock in aspen stands.

Concern Statement: There should be a change in grazing suitability of piñon-juniper woodlands so that the understory can rebound.

Response: The suitability determination for livestock grazing has not been changed based on this comment. The plan identifies a desired condition under the "All PNVTs" section in chapter 2 that would address understory for all PNVTs, including piñon-juniper woodland,

> *"Vegetative ground cover (herbaceous vegetation and litter) is optimized to protect and enrich soils and promote water infiltration."*

The identification of lands suitable for livestock grazing within the plan is not a decision to authorize livestock grazing. The final decision to authorize livestock grazing would be made at a project (individual grazing allotment) level. On a site-specific basis, grazing allotments are guided by an adaptive management strategy whereby results from long and short term monitoring are used to determine yearly stocking rates, pasture rotations, and whether other adjustments are needed in order to meet management objectives and desired conditions for rangelands.

Concern Statement: Explain the statement that landscape scale conditions that determine capability have not changed significantly since the first evaluation (DEIS p. 451). Concern that the 1987 plan permitted use of 219,510 AUMS, in 2008 authorized use was 200,259 AUMs, and the 2000 analysis estimated the grazing capacity to be 78,984 AUMs. Concern that rangelands in the planning area ever will unlikely return to "historical norms" that supported forage production capacity over the past century. (26.186, 26.81)

Response: Capability is defined in the glossary of the 1987 plan as,

> *"The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon site conditions such as climate variability, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease."*

Capability was determined in the 1980s during the first round of forest planning by compiling data from the most recent individual allotment analyses. Slope, landform, soils, and geology have not changed significantly since the 1980s.

Climate has been variable since the first round of forest planning was completed in the 1980s. Adaptive management strategies to address potential change in climatic conditions are described in appendix A of the plan.

The 1987 plan's EIS (Forest Service, 1987), table 48, shows the existing livestock grazing capacity at 204,348 animal unit months (AUMs). At that time, allowable use levels were closer to 50 percent of forage production as identified in the Supplemental Monitoring Report (July 2000). Allowable use levels applied in the grazing capacity analysis for the Supplemental Monitoring

Report are more conservative (23 percent) allocating more forage production to ecosystem maintenance including watershed protection of soils and streams as well as wildlife needs. This is, in part, based on more recent project-level assessments completed during the mid-1990s. In addition, this conservative allowable use level is primarily directed at improving areas that are in poor or very poor range condition. Applying this conservative value across the forests, the grazing capacity estimate of 78,984 AUMs identified in the Supplemental Monitoring Report is substantially lower than the capacity identified in the first round of forest planning.

As stated in the report, site specific data accounts for 55 percent of AUM capacity and geographic information system (GIS) projects account for 45 percent of the capacity estimates. In other words, where site specific data was lacking, GIS was used to develop a projection of forestwide range capability. Applying the allotment percentages of acreages for full, potential, and no capability acres identified in the report, allotments on one Ranger District have a significantly higher (67 percent) amount of no capability acres (279,397 acres). Forestwide capability and capacity estimates are considerably more conservative in part due to the lack of site specific data. As stated in the report,

> *"this data should not be used for making site specific decisions or inferences for lands without additional information."*

The 1987 plan's "Analysis of the Management Situation" (Forest Service, 1983) and the "Environmental Impact Statement" (Forest Service, 1987) document the analysis of grazing capability and suitability for the 1987 plan. Suitable rangeland was determined based on whether an area was appropriate for the activity of livestock grazing in consideration of relevant social, economic, and ecological factors. Recommended research natural areas, research natural areas, and current NFS land not in a grazing allotment were considered to not be suitable for livestock grazing.

The identification of lands suitable for livestock grazing within the plan is not a decision to authorize livestock grazing. The final decision to authorize livestock grazing would be made at a project (individual grazing allotment) level. On a site-specific basis, grazing allotments are guided by an adaptive management strategy whereby results from long- and short-term monitoring are used to determine yearly stocking rates, pasture rotations, and whether other adjustments are needed in order to meet management objectives and desired conditions for rangelands.

Concern Statement: Disclose the foreseeable climate effects to range suitability and capability, and disclose past instances when excessive livestock grazing has exceeded capability. (26.86, 162.53)

Response: The potential environmental consequences of climate change are discussed in appendix A ("Climate Change Trends and Apache-Sitgreaves NFs Land Management Planning") of the plan and in the "Livestock Grazing" section in chapter 3 of the EIS. The plan states,

> *"Changes in climate may affect the vigor and productivity of forage plants and, thus, the overall conditions of both wildlife habitat and ecological conditions which may affect grazing capability. It is possible that higher temperatures and decreased precipitation described for the next century will also decrease forage production and shorten the growing and grazing season, causing a reduction in livestock numbers; while flash floods and increased risk of animal disease can adversely affect the livestock industry (Joyce et*

> *al., 2001) dependent upon the Apache-Sitgreaves NFs' forage resources. Coupled with poor forage conditions, there may be a general scarcity of water for livestock, which may affect grazing capability."*

The determination of instances where excessive livestock grazing has exceeded capability is outside the scope of this analysis. Actual balancing livestock use with available forage occurs at the project-level individual allotment environmental analysis.

Concern Statement: Provide the science to support the livestock grazing capability and suitability criteria slope and production, pounds per acre. (132.55, 132.15, 132.52)

Response: As shown in appendix B ("Description of the Analysis Process") of the EIS under the "Livestock Grazing Suitability Analysis" section,

> *"Capability to produce forage for grazing animals was originally determined in the 1980s during the development of the 1987 plan and was based on individual allotment data. Landscape scale conditions that determine capability have not changed since the first evaluation. The Analysis of the Management Situation (1983) and the Environmental Impact Statement (1987) document the analysis of grazing capability and suitability for the 1987 plan."*

Suitable rangeland was determined based on whether an area was appropriate for the activity of livestock grazing in consideration of relevant social, economic, and ecological factors. Recommended research natural areas, research natural areas, and current National Forest System land not in a grazing allotment were considered to be not suitable for livestock grazing.

The identification of lands suitable for livestock grazing within the plan is not a decision to authorize livestock grazing. The final decision to authorize livestock grazing would be made at a project (individual grazing allotment) level. On a site-specific basis, grazing allotments are guided by an adaptive management strategy whereby results from long- and short-term monitoring are used to determine yearly stocking rates, pasture rotations, and whether other adjustments are needed in order to meet management objectives and desired conditions for rangelands.

Concern Statement: The following should be considered suitable for livestock grazing: (1) current NFS land not in a grazing allotment, (2) Black River Conservation Area. (proposed plan p.128). (105.13, 131.18)

Response: Provisions of the 1982 Planning Rule require that the capability and suitability for producing forage for grazing animals on NFS lands be determined. Capability is the potential of an area of land to produce resources, and supply goods and services. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices.

The capability of the lands on the Apache-Sitgreaves NFs to produce forage for grazing animals was determined in the 1980s during the first round of forest planning. Landscape scale conditions that determine capability have not changed significantly since the first evaluation.

Suitability is the appropriateness of applying certain resource management practices to a particular area of land, in consideration of relevant social, economic, and ecological factors. A unit of land may be suitable for a variety of individual or combined management practices.

There are 77,000 acres outside of grazing allotments. Active and vacant allotments are generally suitable. Closed allotments and NFS areas that are not in allotments are generally not suitable (Forest Service, 2008d). The Black River Conservation Area has been removed from the suitability table because it is not in a grazing allotment.

Concern Statement: Karst and cave geologic areas may be suitable for livestock grazing, energy transportation, communications infrastructure, recreation, timber production, and motorized uses in accordance with the guidelines and restrictions set forth in the Karst and Cave Management plan. (35.7, 35.8, 35.9, 35.10, 35.11)

Response: There are currently no karst and cave geological areas on the Apache-Sitgreaves NFs. The plan does not provide suitability determinations for areas on or near karst and cave features.

The plan does provide guidance to protect cave and karst features including desired conditions in the "Minerals and Geology" section and a guideline in the "Wildlife and Rare Plants" that states,

> *"Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be protected to retain their distinctive ecological functions and maintain viability of associated species."*

As mentioned in the management approaches in the "Minerals and Geology" section of the plan,

> *"Cave and karst management plans are developed as needed."*

The site-specific details of cave and karst management would be addressed in these separate plans. Specific methods to protect caves and karsts would be determined in project or activity-level analysis.

Concern Statement: Review the prior classification of lands unsuitable for timber production; it is not sufficient under the National Forest Management Act to carry forward lands that previously were deemed unsuitable without further analysis. (162.48, 26.78)

Response: The only lands previously classified as unsuitable for timber production under the 1987 plan that were carried forward again in this analysis were those areas specified by the 1982 Planning Rule provisions as areas legally/administratively withdrawn from timber production such as wilderness (Section 219.14(a)(4)).

The 1987 plan neither classifies forest lands as potential natural vegetation types (PNVTs) nor has the same management areas as were used for the action alternatives in the EIS. Thus, for fair comparison, all forested PNVT lands and soils criteria (Section 219.14(a)(1)) were re-evaluated further in this analysis for all four alternatives (including alternative A) according to the 1982 Planning Rule (Sections 219.14(a)(c), along with consideration of section 219.27). See EIS appendix B ("Description of the Analysis Process") and "Forest Products Specialist Report" appendix A2 (Forest Service, 2014c) for further descriptions of the steps used in this re-analysis process.

<u>Concern Statement:</u> Consider the following as criteria for designating lands as unsuitable for timber production: (1) high or severe erosion hazard soils, (2) steep slopes over 30 percent, (3) lands within one site-potential tree height of perennial or intermittent streams or wetlands, (4) areas larger than 1,000 acres without roads, (5) critical habitat of threatened or endangered species, or candidate species proposed for listing, (6) designated conservation areas for sensitive or management indicator species, including proposed "wildlife quiet areas," and (7) occupied locations of endemic species with ranges limited to the national forests. (162.49, 26.78)

<u>Response</u>: The determination of timber suitability process is described in chapter 4 of the plan in the "Lands Suitable for Timber Production" section and in appendix B ("Description of the Analysis Process") of the EIS. The EIS and "Forest Products Specialist Report" (Forest Service 2014c), including appendix A2 and appendix F, demonstrate in detail how the Apache-Sitgreaves NFs terrestrial ecosystem survey (TES) soils units were used to eliminate lands from timber production suitability status in the plan (alternative B). Lands eliminated possess many characteristics, including the following: unstable soils and/or steep slopes (high erosion hazard), irreversible damage likely from mechanical equipment, riparian, and water.

Lands located inside certain management areas (wilderness, recommended wilderness, research natural areas, recommended research areas, natural landscapes, high use developed recreation areas), eligible and suitable wild and scenic river corridors, TES riparian soils, and water acreages (containing the majority of perennial or intermittent streams and wetlands) have been excluded from timberland suitability status. These lands are either administratively withdrawn or are lands where management area prescriptions preclude timber production, or are lands where management objectives limit timber harvest. Additionally, lands which are steep but loggable, unroaded (any size), and/or are too isolated or too small to log were dropped as not being economically cost-efficient for timber harvest.

Additionally, all Mexican spotted owl protected activity centers (critical habitat for a threatened species) were categorized as lands where management objectives limit timber harvest and therefore, eliminated from timberland suitability status. Some other threatened and endangered species habitat acres, like fisheries, are included in the same lands previously eliminated for other reasons, and thus, were not listed again in order to avoid double- or triple-counting the same acres in the suitability classification process. Including any forthcoming critical habitats for candidate species proposed for listing, as well as occupied locations of endemic species with ranges limited to the national forests, would be too speculative and premature at the time of this analysis for an accurate accounting of acres involved.

The identification of an area as suitable for a particular use or uses is guidance for project and activity decisionmaking; it is not a commitment or a final decision and does not mean that a particular use will or will not occur in the area. When projects are proposed under plan implementation, the appropriateness of timber harvest or mechanical treatments would be evaluated and the project interdisciplinary team would address site-specific resource concerns such as the presence of perennial and intermittent streams or wetlands; trees on stream-banks or wetland edges; roadless areas; lands directly impacted by high severity fire effects; wildlife quiet areas; and habitat for species that are threatened, endangered, proposed, rare, endemic, management indicator, or otherwise of concern. Such project-level determinations would also be included for consideration in the next 10-year timber suitability re-evaluation that is required by law.

A project with the purpose of timber production may only occur in an area identified as suitable for timber production (16 USC 1604(k)). The documentation for the project would confirm the project area meets the suitability requirements.

Also see responses to comment numbers 162.48, 26.185, 26.184, and 26.111 in the "Suitability of Areas," "Riparian," and "Vegetation" sections of this appendix.

Concern Statement: Consider lands impacted by high severity fire effects to vegetation or soil as criteria for designating lands as unsuitable for timber production. Consider long term losses of soil productivity resulting from synergistic impacts of fire and mechanical disturbance (i.e., "salvage logging"), particularly where spread of exotic invasive species is a risk, in the timber suitability determination. Add a caveat to the suitability designation stating that forests affected by severe fire will be managed for natural recovery rather than for economic production. (26.185, 162.50, 26.79)

Response: The timber suitability determination (classification) process is consistent with the provisions of the 1982 Planning Rule and Southwestern Region planning advice (Forest Service, 2009f). Risk of exotic invasive species spread is a surface condition that can be reversed on a site-specific basis, and thus, has no merit in the classification process for timberland land suitability status. Further, Section 219.27(c)(1) of the 1982 Planning Rule clarifies that post-fire salvage logging and tree planting may also be used on non-suitable timberlands, when determined to be appropriate to achieve multiple-use objectives of the plan. The 1982 Planning Rule does not provide for making caveats to the land suitability designation involving site specific management actions, which are to be determined at the project-level on a case-by-case analysis.

The management approaches for the "Landscape Scale Disturbance Events" section describes possible options following fire,

> *"Where extensive tree mortality results from landscape scale disturbance and economic value exists, salvage of dead trees may be considered where this contributes to the movement toward desired conditions. Deferral of ecological restoration or salvage projects and activities may also be considered where these are not necessary for recovery."*

According to the Apache-Sitgreaves NFs terrestrial ecosystem survey, soils most sensitive to mechanical disturbance impacts have already been classified as non-suitable timberlands in this analysis. See EIS appendix B "Timber Suitability Analysis" section, "Forest Products Specialist Report" and report appendix A2 and appendix F (Forest Service, 2014c) in the plan set of documents and on the forests' Web site at http://www.fs.usda.gov/main/asnf/landmanagement/planning. Project-level designs to minimize mechanical disturbance and/or noxious weeds during management activities are directed in the plan, chapter 2 through desired conditions in the "Overall Ecosystem Health" and "Soil" sections; guidelines in the "Soil," "Invasive Species," "Landscape Scale Disturbance Events" sections; and standards in the "Special Uses" section. The management approaches for the "Forests: All Forested PNVTs" section in the plan further describes protection measures, including those that would follow high severity fire.

Any long term losses of soil productivity resulting from fire or other disturbances and management activities would be considered in the next 10-year timber suitability re-evaluation, after monitoring is conducted under the plan to determine if site productivity has been lost or

degraded. See the plan's "Monitoring Strategy" in chapter 5, (first and twelfth monitoring questions), as well as objectives and management approaches in the "Soil" section. Also see response to comment 26.111.

Concern Statement: Recommend deferral of all old growth forest that meet standards and guidelines set forth in the 1987 plan from designation as suitable for timber harvest. (26.111)

Response: Timber suitability classification was conducted in compliance with the provisions of the 1982 Planning Rule and Southwestern Region planning direction (Forest Service, 2009f) is based on land availability, capability, operability, management area objectives and requirements, and economic feasibility of the land. See EIS appendix B "Timber Suitability Analysis" section and the "Forest Products Specialist Report" (Forest Service, 2014c) including appendices (appendix A2 and appendix F - item 3 under "Timber Production Suitability Analysis" header). Also see plan chapter 3 for management area direction and chapter 4 for land suitability by management area.

Timberland suitability classification is made irrespective of current tree age classes and/or forest structure, or presence of exotic/invasive plant species, presently standing on any particular acres of land. For example, bare ground currently un-forested can qualify as suitable timberland in the required classification process. Standards and guidelines for old growth set forth in the current 1987 plan, as amended in 1996, would only apply to alternative A, but they would still not serve as criteria for determination of land suitability for timber production nor do they reflect today's best available science on old growth, especially in frequent-fire PNVTs (Reynolds et al., 2013). Forested acres meeting the plan's definition of old growth that occur on lands classified as suitable or non-suitable timberlands could be either treated, or deferred from treatment, under each site specific analysis and decision made at the project-level to best meet multiple resource objectives consistent with plan direction.

Those project-level decisions would be directed at multiple scales and would be consistent with the plan including the following sections: "Overall Ecosystem Health," "All PNVTs," "Riparian Areas," "Forests: All Forested PNVTs," "Forests: Ponderosa Pine," "Forests: Dry Mixed Conifer," "Forests: Wet Mixed Conifer," "Forests: Spruce-Fir," "Forests: Aspen," " Woodlands: All Woodland PNVTs," "Woodlands: Madrean Pine-Oak," "Woodlands: Piñon-Juniper," and "Wildlife and Rare Plants."

The plan provides direction to manage for well-distributed occurrences of old growth. The following are three examples from the plan's desired conditions from the "All PNVTs" section:

> *"Diverse vegetation structure, species composition, densities, and seral states provide quality habitat for native and desirable nonnative plant and animal species throughout their life cycle and at multiple spatial scales. Landscapes provide for the full range of ecosystem diversity at multiple scales, including habitats for those species associated with late seral states and old growth forests."*
>
> *"Old growth is dynamic in nature and occurs in well-distributed patches that spatially shift across forest and woodland landscapes over time."*
>
> *"Old or large trees, multistoried canopies, large coarse woody debris, and snags provide the structure, function, and associated vegetation composition as appropriate for each forested and woodland PNVT."*

An example of a guideline from the "Forests: All Forested PNVTs" section includes:

> *"Where current forests are lacking proportional representation of late seral states and species composition on a landscape scale, old growth characteristics should be retained or encouraged to the greatest extent possible within the scope of meeting other desired conditions (e.g., reduce impacts from insects and disease, reduce the threat of uncharacteristic wildfire)."*

Concern Statement: Recommend identifying chainsaws as gasoline powered or non-mechanized instead of motorized in table 7 footnotes (proposed plan p.130). (99.13)

Response: This comment is no longer applicable. Footnote 3 has been removed from table 8 because there are no National Forest System trails in the Recommended Wilderness Management Area.

Concern Statement: Timber suitability designations must apply cost-benefit analysis and "stratify" lands by allowable intensity of timber management. (162.184)

Response: In accordance with the 1982 Planning Rule provisions (Section 219.14) tentatively suitable lands were stratified by various timber management harvesting and access systems into four strata. Then a financial (present net value and benefit-cost ratio) analysis was conducted by stratum following the procedure outlined by Connelly (2009). The list of proposed and possible harvest actions, including mechanical thinning, and probable management prescriptions are listed in appendix B ("Vegetation Conditions and Management Practices") and in appendix E of the plan. See EIS appendix B ("Description of the Analysis Process") and "Forest Products Specialist Report" appendices A2, A3, and A3Roads (Forest Service, 2014c). The stratification maps and tables used for this step of the timberland suitability analysis are filed in the plan set of documents.

Monitoring

Concern Statement: Explain how the monitoring strategy will address attainment of objectives and compliance with guidelines. (102.47, 26.104)

Response: An additional monitoring question ("Are plan objectives being achieved?") was added to the plan's monitoring strategy. This, along with the existing question "Are the standards and guidelines prescribed being incorporated in National Environmental Policy Act (NEPA) documents and implemented in projects and activities?" will focus the forests monitoring and evaluation efforts to address attainment of objectives and compliance with guidelines.

Concern Statement: Explain how the monitoring strategy addresses diversity. Forest Service regulations call for environmental monitoring to insure that natural diversity is maintained. (102.51)

Response: The Forest Service planning regulations (provisions of the 1982 Planning Rule) do not contain a requirement for monitoring to ensure that natural diversity is maintained. However, the plan's monitoring strategy (chapter 5) does have several monitoring questions that can provide information about the biological and ecosystem diversity of the Apache-Sitgreaves NFs. For example:

"Are habitat for threatened, endangered, sensitive, and other species for the forests being maintained or enhanced...?"

"Are PNVTs and habitat needs being provided for and contributing to desired conditions?"

"How are management activities affecting late successional forest structure in relation to desired conditions?"

Concern Statement: Establish a science-based monitoring plan that results in an adaptive management strategy. (138.4)

Response: The monitoring strategy is identified in chapter 5 of the plan. This strategy outlines the general framework for achieving plan monitoring. Plan monitoring is one piece of the adaptive management strategy which includes measurable objectives, monitoring, learning and making changes, and recognizing the uncertainties of outcomes. A monitoring implementation plan, based on the monitoring strategy, is currently under development. This guide will provide the specific science-based protocols for specific monitoring items. The monitoring implementation plan is not part of the plan; it will be contained in a document outside of the plan and updated based on new information gathered from the adaptive management process.

Concern Statement: Identify what will be monitored and on what schedule. (109.14, 26.170)

Response: The monitoring strategy in chapter 5 of the plan identifies monitoring questions, possible monitoring methods, and frequency of measurement. More detailed information about the specific monitoring items will be identified in the monitoring implementation plan (currently under development). The monitoring implementation plan is not part of the plan; it will be contained in a document outside of the plan and updated based on new information gathered from the adaptive management process. Results of monitoring will be presented in evaluation reports biennially.

Concern Statement: Monitor the impact of ever expanding wild horse populations and the response of aspen to stand-converting fires. (109.15)

Response: The impacts specifically related to the wild horse population have not been identified as a plan level monitoring item. Monitoring of wild horse impacts would be identified in the Heber Wild Horse Territory Management Plan (currently under development).

Aspen is identified as an ecological indicator in the plan and EIS. The plan's monitoring strategy (chapter 5) contains a question focused on understanding the effect of management upon habitat trends of ecological indicators across the forests. The monitoring strategy identifies a possible method to conduct aspen monitoring in both burned and unburned areas.

Concern Statement: Disclose the source of monitoring results. Concern that the Forest Service often does not reveal that it uses permittees to conduct its monitoring, and trusts their answers even though they have zero incentive to self-report their failings. (127.29)

Response: The specific detail of the plan's monitoring strategy (chapter 5), including monitoring protocol and data sources, will be identified in the monitoring implementation plan (currently under development). The monitoring implementation plan is not part of the plan; it will be

contained in a document outside of the plan and updated based on new information gathered from the adaptive management process.

Concern Statement: Include in very specific terms the requirements for a quantitative, qualitative and effectiveness monitoring strategy, a very specific monitoring implementation plan, and a specific monitoring budget, required resources allocation and funding, to the planning and NEPA review process of all management projects, to be submitted to public review and comments in the Draft Environmental Impact Statements (DEIS), to be included in the Records of Decisions (ROD) and to be included in the Final Environmental Impact Statements (FEIS) of all management projects, in order to insure that monitoring will actually be implemented and funded. (1) Include in very specific terms the requirements for the responsible officials to be bound by the findings of multi-party monitoring boards and to act upon the findings of a multi- party monitoring boards in a manner that appropriately addresses the issues raised by the multi-party monitoring boards. (2) Include in very specific terms a fourth phase that outlines clearly the responsibility and authority of responsible officials to implement adaptive and if necessary corrective management action during the implementation of large scale long duration specific projects as a response to the quantitative, qualitative, and effectiveness monitoring of the project, in addition to the three phases of planning (assessment, planning, and monitoring) identified in Title 36, Code of Federal Regulations, part 219 (36 CFR part 219) and designed to support a framework for adaptive management. (3) Include clear and unambiguous guidelines to responsible officials to integrate social and economic sustainability and social and economic science into the framework of best available scientific information to inform their land management planning process and their management decisionmaking process. (4) Include clear and unambiguous guidelines to responsible officials to implement substantive - even though possibly scientifically imperfect - management actions that move the ecosystems significantly toward the desired future conditions, when such actions are supported by social consensus, rather than spend years attempting to forcibly impose, and possibly trigger litigation of management actions that may be deemed scientifically more perfect but that do not benefit from the support of the social consensus. (5) Include an emphasis on executing well less than perfect projects now, over developing scientifically perfect projects that are never implemented. (6) Include an emphasis on allowing the public to participate meaningfully in, influence substantially, and when appropriate alter the content of the decision of responsible officials while they retain their statutory decisionmaking authority. (7) Include a special forum for local government elected officials such as County Supervisors to represent the socio economic interests of the local residents in the decisionmaking process of the Forest Service responsible officials. (8) Include clear and unambiguous guidelines to reviewing officers to exercise careful judgment in their resolution or rejection of objections, in relation to the true material importance of the objections – as opposed to their symbolic or emotional importance, and the potential effect of litigation on the implementation of the project. (161.100, 161.98, 161.97, 161.172, 161.110, 161.111, 161.109, 161.106, 161.105, 161.101, 161.113)

Response: The plan (chapter 5) provides a monitoring strategy, including monitoring questions that can be answered both quantitatively and qualitatively, to evaluate the effectiveness of the plan. The specific details of the monitoring strategy, including monitoring protocol, data sources, necessary resources, and costs of monitoring, will be identified in the monitoring implementation plan (currently under development). The monitoring implementation plan is not part of the plan;

it will be contained in a document outside of the plan and updated based on new information gathered from the adaptive management process. Actual budgets for monitoring would vary by year based on Congressional allocation.

Responses to itemized comments:

(1) Appendix D of the plan ("Relevant Laws, Regulations, and Policies") includes direction that guides responsible officials in public participation (e.g., National Environmental Policy Act, National Forest Management Act, Forest Service Manual 1500). While the Forest Service is committed to public participation and encourages collaboration, the responsible official is accountable for all formal land management decisions affecting National Forest System lands and may not relinquish that responsibility. Responsible officials have the authority to use input from multi-party monitoring boards to inform their decision.

(2) Plan decisions would apply to complex, large scale, long term projects conducted on the Apache-Sitgreaves NFs. This includes monitoring and evaluating the results of the monitoring strategy. Using adaptive management, the responsible official could make corrective actions as the need arises. With exception to development of the plan monitoring program, the 2012 Planning Rule (36 CFR § 219) requirements referenced are beyond the scope of this planning process. This planning process uses the provisions of the 1982 Planning Rule, as allowed per the transition language of the 2012 Planning Rule (36 CFR § 219.17(b)(3)).

(3) The plan is designed to contribute to ecological, social, and economic sustainability. The responsible official's decisions on projects and activities must be consistent with the plan and applicable law, regulations, and policy. Responsible officials have the discretion to determine the best available science to inform their decisions.

(4) This plan provides guidance and information for responsible officials to conduct project and activity decisionmaking on the Apache-Sitgreaves NFs. Those projects and activities would be designed to meet desired conditions. In addition, the plan identifies objectives. The objectives represent just some of the expected outcomes or actions required to accomplish movement toward desired conditions.

(5) Responsible officials have the discretion to determine the scope, design, and use of best available science in their project and activity decisionmaking within the constraints that it is consistent with the land management plan, applicable law, regulations, and policy.

(6) Appendix D of the plan ("Relevant Laws, Regulations, and Policies") includes direction that guides responsible officials in public participation (e.g., National Environmental Policy Act, National Forest Management Act, Forest Service Manual 1500). While the Forest Service is committed to public participation and encourages collaboration, the responsible official is accountable for all formal land management decisions affecting National Forest System lands and may not relinquish that responsibility.

(7) Appendix D of the plan ("Relevant Laws, Regulations, and Policies") includes direction that guides responsible officials in intergovernmental relations and public participation (e.g., National Environmental Policy Act, National Forest Management Act, Forest Service Manual 1500). Responsible officials have the authority to use input from local elected officials to inform their decision.

(8) The objection process is outside the scope of the plan and plan revision process. The decision on the plan is subject to a post-decision administrative review. The review will use an appeal process following the "Optional Appeal Procedures Available during the Planning Rule Transition Period" (the former 36 CFR § 217 appeal procedures that were in effect prior to November 9, 2000) will be used.

Concern Statement: The three phases of planning (assessment, planning, and monitoring) should be augmented with a fourth phase that outlines clearly the responsibility and authority of responsible officials to implement adaptive and if necessary corrective action during the implementation of large scale long duration specific projects as a response to quantitative, qualitative, and effectiveness monitoring of the project. NEPA analysis of complex, large scale, long term projects should specifically be designed from inception to formalize the inclusion of a four phase adaptive management framework. (161.102, 161.175, 161.103, 161.99)

Response: The plan decisions would apply to complex, large scale, long term projects conducted on the Apache-Sitgreaves NFs. This includes monitoring and evaluating the results of the monitoring strategy. Using adaptive management, the responsible official could make corrective actions as the need arises.

Concern Statement: Explain how the Forest Service complied with the monitoring requirements of the 2012 Planning Rule. (161.96, 161.171, 161.173, 161.174, 161.176)

Response: The revised plan, including the "Monitoring Strategy" in chapter 5, was developed following the provisions of the 1982 Planning Rule. The Apache-Sitgreaves NFs plan is not required to comply with the 2012 Planning Rule monitoring requirements until May 2016. The 2012 Planning Rule states that

> *"Where a plan's monitoring program has been developed under the provisions of a prior planning regulation and the unit has not initiated plan revision [under the 2012 Rule], the responsible official shall modify the plan monitoring program within 4 years of the effective date of [the 2012 Rule], or as soon as practicable…" (36 CFR § 219.12(c))*

Since the 2012 Planning Rule became effective on May 9, 2012, the forests have until May 9, 2016, to transition 1982 Planning Rule plan monitoring programs to the 2012 Planning Rule monitoring requirements.

The monitoring strategy has been developed with the 2012 monitoring requirements in mind, and the Forest Service anticipates few changes will be needed to bring it into full compliance.

Concern Statement: Disclose uncertainty and controversy associated with monitoring and adaptive management. (26.80)

Response: Chapter 5 of the plan does acknowledge the uncertainties related to monitoring implementation:

> *"Forest managers may need to prioritize what would be monitored in any given year and would schedule monitoring and evaluation through the annual budget process. Actual budget levels, funding emphasis, and emergence of new issues may affect*

accomplishment. Partnerships may be developed to accomplish monitoring and evaluation."

A monitoring implementation plan, with the specific details of the monitoring strategy (chapter 5 of the plan) is currently under development. The monitoring implementation plan is not part of the plan; it will be contained in a document outside of the plan and updated based on new information gathered from the adaptive management process. As the details of monitoring protocols are identified, uncertainties and controversies would be disclosed.

Concern Statement: The complete monitoring plan, including study design and analysis protocols, should be made available for public review and comment before a decision is made to revise the forest plan. Explain the: (1) criteria for selection of measurable indicators of change; (2) sampling design power analysis and expected observational error rates; (3) sampling procedures including monitoring cycle; (4) confidence levels to be applied in data analysis and reporting; (5) timeframe for evaluation of results; (6) triggers for management adaptation using new information; and (7) funding sources. (26.37)

Response: A monitoring implementation plan, with the specific details of the monitoring strategy (chapter 5 of the plan) is currently under development. The monitoring implementation plan is not part of the plan; it will be contained in a document outside of the plan and updated based on new information gathered from the adaptive management process. The draft monitoring implementation plan is available upon request, and the Forest Service welcomes review and input. The specific measurable indicators of change, sampling design and procedures, confidence levels, triggers for management adaptation, and potential funding sources would be considered for inclusion in the monitoring implementation plan. Monitoring results would be discussed in a biennial evaluation report.

Appendix D – Relevant Laws, Regulations, Policies, and Agreements

Concern Statement: Add additional laws, regulation, and agency directives into the DEIS and plan appendix: (1) National Forest Management Act, (2) Forest and Rangeland Renewable Resources Planning Act, (3) Multiple Use-Sustained Yield Act of 1960, U.S Forest Service 219 Planning Rule: Coordination with Other Public Planning Efforts, (4) Forest Service Manual (FSM) 1921.63(a), (5) FSM 1950.2, (6) FSM 1970, (7) Integrated Resource Management Process-the Road to Ecosystem Management (USFS Region 3, 4 edition, appendix A), (8) National Environmental Policy Act, (9) Joint Planning (40 CFR §1506.2 (b)); Cooperating Agencies (40 CFR§1501.6); (10) President's Council on Environmental Quality Directive to Federal Agencies regarding Cooperating Agency, Feb. 2002, (11) 40 CFR §1501.7; 40 CFR §1503.1, (12) Regulatory Flexibility Act, (13) Proper Consideration of Small Entities in Agency Rulemaking - Presidential Executive Order 13272, (14) Intergovernmental Cooperation Act, (15) Intergovernmental Review of Federal Programs- Presidential Executive Order 12372, (16) Facilitation of Cooperative Conservation- Presidential Executive Order 13352, (17) Environmental Justice- Presidential Executive Order 12898 §302(d), (18) Outdoor Recreation Act, (19) National Trails System Act, (20) Presidential Executive Order 13195: Trails for America in the 21st Century, (21) Arizona Coordination Act, (22) Apache County Board of Supervisors Resolution in Feb. 2010 notified Apache-Sitgreaves National Forest: The need to coordinate the Agency Forest

Plan process, and (23) Catron County Ordinance 002-93: Catron County Environmental Planning & Review Process; and, Catron County Resolution 002-2010: County Board of Supervisors Asserting Legal Standing and Formally Invoking Coordination with All Federal and State Agencies Maintaining Jurisdiction Over Lands And/Or Resources Located Within The County of Catron, New Mexico. (108.50)

Response: Items 1, 2, 3, 4, 5, 8, 9, 11, 14, 15, 17, and 19 were referenced in appendix D ("Relevant Laws, Regulations, and Policies") in the proposed plan. Items 6, 16, and 20 were added to the plan's appendix D.

The remaining items were not added to the plan or EIS. Item 7 is obsolete. Item 10 is a memo and therefore not listed in the plan or EIS. Items 12 and 13 apply to agency rulemaking and are beyond the scope of a land management plan. The Act identified in item 18 does not exist (16 U.S.C. 4601 refers to the Department of Interior's Take Pride in America Program). Items 21 to 23 apply to local and state levels and do not apply to National Forest System lands.

Concern Statement: Modify Appendix D (proposed plan p. 255). Add to the list of agreements: Memorandum of Understanding between the Apache-Sitgreaves National Forests, Arizona Game and Fish Commission, U.S. Fish and Wildlife Service, Arizona Trout Unlimited, Federation of Fly Fishers, and Wildlife Conservation Council for the restoration of native trout on the Apache National Forest. (101.90)

Response: This agreement was not added to the plan. The Memorandum of Understanding expired in 2005 and has not been renewed.

Glossary

Concern Statement: Provide or clarify definitions for the following: native species, functioning ecosystem, herbivory, livestock grazing, scenic integrity, sustainable, resilience, and restoration. (108.217, 108.215, 26.99, 26.98, 108.178, 108.176, 108.175, 102.11, 108.218, 102.18)

Response: These terms are defined in the glossary of the plan and EIS.

Commenter Codes

The following table displays a list of commenter codes with the associated commenter name and organization. Each unique letter was assigned a commenter code. There are seven form letters (letters that have the same content submitted by multiple commenters) listed in the table.

Table 178. List of commenter codes and associated commenter name and organization

Commenter Code	Commenter	Organization
1	Marc Beauchamp	
2	Anonymous1	
3	Thalia Vaillancourt-Lininger	
4	Diane Arnst, Manager Air Quality Legal Support Section	Arizona Department of Environmental Quality
5	Jon Spar	
6	Gary Horner	
7	Linda Ogo, Culture Research Director	Yavapai Prescott Indian Tribe
8	Stefan Kodet	
9	*Form Letter 1*	
10	Kathy Kron	
11	Judith Castiano	
12	Danielle Berd	
13	Rob Mrowka	
14	Pamela Blunt	
15	Francis Schilling	
16	Mary Ray	
17	*Form Letter 2*	
18	Linda Miller	
20	Kristine Richter	
21	Lori Paul	
22	Aniceto Ribeiro	
23	*Form Letter 3*	
24	Barbara And Fred Klug	
26	Jay Lininger, Wildland Ecologist	Center for Biological Diversity
27	Joel Frey	
28	Roy Munroe	
29	Dorothy Reed-Inman	
30	George Ruyle	University of Arizona
31	Pauline Reetz	

Commenter Code	Commenter	Organization
32	Dave Williams	
33	Virginia Dotson	
34	Victoria Carella, Project Manager	Arizona State Land Department
35	Rich Bohman, Conservation Chair	Central Arizona Grotto
37	Cynthia Wicker	
39	*Form Letter 5*	
40	Pascal Berlioux, Executive Director	Eastern Arizona Counties Organization
41	John Soos	
42	Michael Fletcher	
43	Elaine Phelps	
44	Kenneth Bigler	
46	Roger Martin	
47	R Jordan	
48	Luna Woden	
49	Robert Hilgenberg	
50	Claire Chang	
51	Lisa Lynott-Carroll	
52	Francesca Reitano	
53	Jason Kamalie	
54	Joya Feltzin	
55	Jim Miller	
56	Judith Kanfer	
58	Patricia Amazalorso	
59	Cathy Gumtow-Farrior	
60	Christopher Amerding	
61	Andrea Bowen	
63	Susan Ostlie	
64	Lawrence Rosin	
65	Mark Harris	
66	Margaret Paddock	
67	James Field	
68	Drew Roenneburg	
69	Sandra Peterson	
70	Adella Albiani	
71	Anold Lane	

Commenter Code	Commenter	Organization
72	Judee Reel	
73	Tina Stanton	
74	Cary Jones	
75	Maryann Mabbott	
76	Petra Gampper	
77	Sandra Pena	
78	Jerry Chilson	
80	Michael Ghiglieri	
81	Bryce Hamblin, Mayor Submitted by: Shawn Nau	Town of Eagar
82	Fran Field	
83	Fran Salisbury	
84	Mason Frichette	
85	Annie McCombs	
86	Thomas Cole	
87	Barbara Fitzpatrick	
88	Bob Brister	
89	Amby Duncan-Carr	
90	Kathryn Webers	
91	John Andes	
92	Joanne Capozzelli	
93	John Thompson	
94	Ann Yarmal	
95	Sam And Julia Luce	
97	Dave Stucky	
98	George Leech	
99	Joe Sitarzewski	
100	Ralph Harris	
101	Chris Bagnoli, Pinetop Regional Supervisor Submitted by: Dave Dorum	Arizona Game And Fish Department
102	Lamar Smith	Casabel Range Consultants at request of the Ranching Heritage Alliance
103	Mary Macnab	
104	Thomas Macnab	
105	Daric Knight	
106	Alan Timmermann	
107	Lori Adkison	

Commenter Code	Commenter	Organization
108	Barry Weller, District III Supervisor Submitted by: Doyel Shamley	Apache County
109	*Form Letter 7*	Arizona Elk Society and Arizona Desert Bighorn Sheep Society, Inc.
112	Patricia Sanderson Port, Regional Environmental Officer Submitted by: Vanessa Burge	United States Fish and Wildlife Service
113	Michael Fletcher	
114	Anonymous	
115	Laurie Herring	
116	Robert Corbell	
117	Robert Corbell	
118	Robert Corbell	
119	Robert Corbell	
121	Darcy Ely	Four Drag Ranch
122	Van L. Norris	
123	Norman Brown	
124	Richard Inman	
125	Edward B. Zuloski, Staff Attorney for The Wilderness Society and Arizona Wilderness Coalition	Earth Justice The Wilderness Society Arizona Wilderness Coalition
126	*Form Letter 4*	
127	Erik Ryberg, Attorney for Western Watersheds Project	Western Watersheds Project
128	Ray Hedrick, Manager Biological and Cultural Resource Services Submitted by: Lesly Swanson	Salt River Project
129	Scott and Amanda McLaws	
130	Scott and Amanda McLaws	
131	Roxanne Knight	Cinco Noches Ranch
132	Rick Erman, Member	The Friends of Anderson Mesa
133	Mary Macnab	
134	John Tate	
135	John Tate	
136	Melody Tate	
137	Kelly Port	
138	Wink Crigler	X Diamond Ranch
139	Eric Schwennesen	Greenlee Cattle Grower’s Association
140	Sheryl Eaton	
146	Susan Flader	
147	John Bennett	Citizens for Multiple Land Use and Access

Commenter Code	Commenter	Organization
148	Daisy Mae Cannon	
149	Stan Ciminski	
150	Vicente Ramirez	
151	Fennemore Craig, P.C. Marc A. Marra	Freeport-McMoRan Copper & Gold Inc., and its subsidiary, Freeport-McMoRan Morenci Inc.
152	John Macivor	
153	Jim Finch Jr.	
154	Glenda Finch	
155	Gary Finch	
156	Jim Finch Sr.	
157	James D. Finch Jr.	
158	Douglas Reppa	
159	Kathleen Martyn Goforth, Manager Environmental Review Office	Environmental Protection Agency
160	Michael Fletcher	
161	*Form Letter 6*	Gila County, Graham County, Greenlee County, and Navajo County
162	Alicyn Gitlin, Sierra Club – Grand Canyon Chapter Submitted by: Sandy Bahr	Sierra Club, White Mountain Conservation League, Arizona Wilderness Coalition, Center for Biological Diversity, Great Old Broads for Wilderness, Grand Canyon Wolf Recovery Project, Grand Canyon Wildlands Council, Public Employees for Environmental Responsibility, Defenders of Wildlife, and Sky Island Alliance

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Appendix B. Description of the Analysis Process

This appendix shares important features of the analysis that compared alternatives and provided information for the programmatic final environmental impact statement (FEIS).

In order to understand the ability of the Apache-Sitgreaves NFs to be managed in different ways that address resource issues, a series of analyses were performed. Much of the analysis relied on the forests' Geographic Information System (GIS) database and existing inventories. A number of analysis tools and computer models were used to help specialists understand the potential effects of management actions.

This appendix highlights some of the main analysis processes that were used in the development of this FEIS. For each resource area that is described in the FEIS, the related specialist report contains methodology and analysis descriptions. These specialist reports are available in the "Plan Set of Documents." Other key documents and evaluations (including, but not limited to, wilderness, RNA, and wild and scenic river evaluations) that served as references and laid the foundation for FEIS analyses are listed in appendix E and are available in the "Plan Set of Documents."

The appendix is organized by the following sections:

- Vegetation Modeling
- Timber Suitability Analysis and Timber Calculations
- Livestock Grazing Suitability Analysis
- Species Viability Analysis
- Socioeconomic Resources Analysis
- Research Needs

Vegetation Modeling

The vegetation analysis modeled the potential vegetation conditions resulting from natural disturbances and succession in conjunction with proposed management (mechanical, planting, and wildland fire treatments) for the alternatives. Analyses were conducted on vegetation using

potential natural vegetation types (PNVTs), existing mid-scale vegetation types[1], and soil types from the Terrestrial Ecosystem Survey[2].

For each PNVT, model projections were used to show the departure from desired conditions for each alternative and to estimate trends and future conditions.

Modeling projected trends in state and transitions were derived through the use of the Vegetation Dynamics Development Tool (VDDT), Version 6.0.25 (ESSA Technologies, 2006). VDDT software is a non-spatial model that allows the user to model vegetation change over time as a series of vegetation states that differ in structure, composition, and cover and to specify the amount of time it takes to move from one vegetation state to another in the absence of disturbance[3].

Various disturbance agents affecting the movement of vegetation between states (or transitions) are incorporated (e.g., mechanical vegetation treatments, surface fires, mixed-severity fires, stand-replacing fires, grazing, insect outbreaks, drought events). By varying the types and rates of disturbance across the landscape, the effects of different disturbance regimes, such as historic and current fire regimes or different management treatments such as wildland fire ignitions, fire suppression, grazing practices, and mechanical fuel treatments, on vegetation can be investigated (Schussman and Smith, 2006). Input data used in modeling came directly from forest management activities and fire data over the last 25 years.

State destinations and transition probabilities for vegetation treatments were derived from Forest Vegetation Simulator (FVS) modeling, Version 6.31. FVS is a distance-independent; individual-tree forest growth model widely used in the United States and is used to compare alternatives. State destinations for natural fires and prescribed fire treatments were derived from FVS modeling, Version 2.02 and Fire and Fuel Extension (FFE) (Rebain, 2010).

Forest Inventory and Analysis (FIA) plot data were used to calibrate the VDDT model to estimate relative proportions of even- and uneven-aged conditions on the forests (Weisz et al., 2012).

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[1] Mid-scale vegetation types were determined using satellite data and are mapped at the scale of 1:100,000. The mid-scale vegetation inventory for all Apache-Sitgreaves NFs' vegetation types analyzed in this report was conducted in 2005 and 2006. As a result of the 2011 Wallow Fire, the Apache-Sitgreaves NFs' midscale mapping product was updated to reflect changed conditions. This product represents a rapid assessment done to help identify changed vegetation condition within the perimeter of the Wallow Fire. The assessment utilized mid-scale existing vegetation data products for vegetation dominance type, tree size, and overstory canopy cover map units as well as RAVG (Rapid Assessment of Vegetation Condition after Wildfire) data produced by the Remote Sensing Applications Center (RSAC) representing overstory canopy cover mortality classes. The datasets were combined using a standard rule-set, developed by the U.S. Forest Service Southwestern Regional Office, to determine where mid-scale map units had changed according to fire severity. This outcome is intended as a rapid assessment of changed condition and does not represent an update of the official mid-scale map products.

[2] The terrestrial ecosystem survey referenced in this document is specific to the Apache-Sitgreaves NFs and is a classification of ecological types. It maps terrestrial ecological units based on soil types and existing vegetation (Laing et al., 1987).

[3] State and transition models are simple box and arrow diagrams in which boxes represent observed or theoretical ecosystem states and arrows represent the observed or theoretical transitions among these states. These models are commonly used to conceptualize either formal mathematical models or the complex behavior of dynamic systems. They are essentially a means of mapping system behavior in the absence of adequate predictive models (Westoby et al., 1989).

Some of the drawbacks and limitations of VDDT modeling are the following:

- Many of the VDDT inputs used were derived from other modeling outputs (e.g., FVS timber harvest treatment state transition destinations and the probability of those outcomes).
- Many of the VDDT inputs used were derived from incomplete data sources such as the Forest Service Activity Tracking (FACTS[4]) database.
- VDDT is a non-spatial model intended mainly for broad scale analysis.
- VDDT projects changes in vegetative conditions in response to succession, disturbances, and management treatments; however, the VDDT model divides vegetation conditions within each PNVT into a small number of discrete states. It is acknowledged that there is more variability within each state and within nature than has been modeled for plan revision.
- A small number of states were selected because the VDDT model is driven by the data available; the amount of available data was limited.
- VDDT models the distribution of landscape states over time and does not model the more detailed physical (soil, temperature, precipitation, aspect, elevation, productivity), chemical, and biological dynamics of what is happening at each scale of spatial resolution.
- VDDT is a long-range, broad scale, strategic model and does not describe what is happening at a site-specific level of detail to individual trees, groups of trees, etc.
- VDDT does not model detailed mechanisms of landscape change, but by calibrating the VDDT models with FVS model outputs (Weisz et al., 2012), VDDT modeling takes advantage of some of the detailed mechanisms (mortality, regeneration, background dwarf mistletoe presence, natural growth, succession, etc.) that FVS considers.
- VDDT models overstory structure, composition, and cover as defined by mid-scale vegetation mapping in great detail, but does not model understory vegetation (e.g., the species composition of grasses and forbs).
- VDDT models the probability and timing of events (e.g., fire behavior, management activities, insect and disease occurrences) based on empirical observations, but our current information on historical behavior and evidence cannot accurately predict future behavior due to climate change and other phenomena which may not have occurred within the realm of the statistical evidence available.

It is assumed the disturbances (e.g., management activities) selected for the VDDT model represent the majority of disturbances the Apache-Sitgreaves NFs experience. There could be many variations to these disturbances; however these were not modeled in detail for this analysis. According to Lauenroth and Laycock (1989) and others, succession may follow multiple pathways and reach different end-points depending on the effects of disturbance on the life

[4] FACTS is a nationally supported application that tracks land based activities through the NEPA, layout, and accomplished stages of a project. It supports timber sales in conjunction with TIM Contracts and Permits, tracks and monitors NEPA decisions, tracks KV trust fund plans at the timber sale level, and generates national, regional, forest, and/or district reports. The GIS features represent the activity unit on which these activities occur and are depicted in polygons, lines or points in FACTS. Within each feature class, there exists three “subtypes” to identify the stage an activity is in (NEPA, layout, accomplished). The appropriate stage of an activity unit is determined by the status of the project.

history characteristics of the vegetation; causing predictability to be limited by the importance of chance or infrequent events.

The following PNVTs were modeled using VDDT software: ponderosa pine, wet mixed conifer, dry mixed conifer, and spruce-fir forests; Madrean pine-oak and piñon-juniper woodlands; Great Basin and semi-desert grasslands. State and transition modeling was not conducted for interior chaparral, montane/subalpine grasslands, and the four riparian PNVTs. Separate, regionally consistent VDDTs models were not developed for the montane/subalpine and riparian PNVTs.

Various spreadsheets for calculating the relative differences between alternatives for similarity to desired and reference conditions, interspersion of states, acres of aspen, and understory production as a function of overstory tree density were used for processing the output results.

- Assumption: The population and calibration of VDDT using FIA plots and FVS modeling of growth and disturbances generally represents the response of forested PNVTs well enough to compare the potential responses of alternatives in a relative way.

Goals or desired conditions used to evaluate contributions to sustainability come from the desired conditions in the proposed plan. These desired conditions are a combination of the following:

- Forest Service Southwestern Region consistent desired conditions, which were developed using an interdisciplinary process and various scientific references.
- Apache-Sitgreaves NFs specific desired conditions that supplement the Region 3 consistent desired conditions. The Apache-Sitgreaves NFs also developed desired conditions for PNVTs not addressed in the regionally-consistent process.

Additional information about the analysis process can be found in the “Vegetation,” “Forest Products,” and “Fire Specialist” reports in the “Plan Set of Documents.”

Vegetation Treatments

The following tables provide the variables that were input into individual VDDT models to determine the resulting movement toward or away from desired condition and vegetation state makeup. The input variables represent potential management activities by alternative including the acres treated mechanically, by planting, or by wildland fire. Table 179 provides a summary by PNVT and alternative. Table 180 displays more detail, including the treatment types, for the modeled PNVTs.

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Table 179. Summary of modeled annual treatment objectives (acres) by PNVT and alternative for the high, average, and low levels

	Alt. A			Alt. B			Alt. C			Alt. D		
	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low
Ponderosa Pine Forest (602,206 acres on NFS Land)												
Acres treated Mechanically	NA	7,119	NA	11,025	6,289	1,552	24,255	13,341	2,426	9,450	5,434	1,417
Acres treated by Planting	NA	450	NA	1,200	875	550	1,400	1,100	800	400	263	125
Acres treated by Wildland Fire	NA	3,150	NA	11,025	6,300	1,575	10,187	5,614	1,040	22,050	12,679	3,308
Total Acres Treated	NA	10,719	NA	23,250	13,464	3,677	35,842	20,055	4,266	31,900	18,376	4,850
Dry Mixed Conifer Forest (147,885 acres on NFS Land)												
Acres treated Mechanically	NA	1,808	NA	2,772	1,584	396	6,160	3,388	616	2,400	1,380	360
Acres treated by Planting	NA	100	NA	450	338	225	500	383	265	200	150	100
Acres treated by Wildland Fire	NA	800	NA	2,910	1,663	416	2,772	1,525	277	5,880	3,381	881
Total Acres Treated	NA	2,708	NA	6,132	3,585	1,037	9,432	5,296	1,158	8,480	4,911	1,341
Wet Mixed Conifer Forest (177,995 acres on NFS Land)												
Acres treated Mechanically	NA	2,147	NA	3,325	1,900	475	7,315	4,023	731	2,851	1,640	428
Acres treated by Planting	NA	325	NA	500	375	250	700	575	450	0	0	0
Acres treated by Wildland Fire	NA	950	NA	3,325	1,900	475	3,135	1,725	314	6,650	3,824	998
Total Acres Treated	NA	3,422	NA	7,150	4,175	1,200	11,150	6,323	1,495	9,501	5,464	1,426

	Alt. A			Alt. B			Alt. C			Alt. D		
	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low
Spruce-Fir Forest (17,667 acres on NFS Land)												
Acres treated Mechanically	NA	108	NA	95	55	14	208	112	16	36	21	6
Acres treated by Planting	NA	5	NA	50	35	20	10	8	5	0	0	0
Acres treated by Wildland Fire	NA	100	NA	606	347	87	892	493	93	964	555	145
Total Acres Treated	NA	213	NA	751	437	121	1,110	613	114	1,000	576	151
Madrean Pine-Oak Woodland (397,927 acres on NFS Land)												
Acres treated Mechanically	NA	0	NA	0	0	0	0	0	0	0	0	0
Acres treated by Wildland Fire	NA	1,063	NA	11,143	7,429	3,714	5,000	3,125	1,250	22,335	13,029	3,722
Total Acres Treated	NA	1,063	NA	11,143	7,429	3,714	5,000	3,125	1,250	22,335	13,029	3,722
Piñon-Juniper Woodland (222,166 acres on NFS Land)												
Acres treated Mechanically	NA	500	NA	2,341	1,561	780	4,213	2,633	1,053	4,042	2,358	673
Acres treated by Wildland Fire	NA	713	NA	1,412	941	470	600	375	150	3,443	2,009	575
Total Acres Treated	NA	1,213	NA	3,753	2,502	1,250	4,813	3,008	1,203	7,485	4,367	1,248
Great Basin Grassland (185,523 acres on NFS Land)												
Acres treated Mechanically	NA	500	NA	10,269	7,702	5,135	0	0	0	6,161	4,621	3,081
Acres treated by Wildland Fire	NA	41	NA	10,000	7,500	5,000	0	0	0	14,000	10,500	7,000
Total Acres Treated	NA	541	NA	20,269	15,202	10,135	0	0	0	20,161	15,121	10,081

	Alt. A			Alt. B			Alt. C			Alt. D		
	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low
Semi-Desert Grassland (106,952 acres on NFS Land)												
Acres treated Mechanically	NA	0	NA	0	0	0	0	0	0	0	0	0
Acres treated by Wildland Fire	NA	27	NA	3,000	2,500	2,000	0	0	0	3,000	2,500	2,000
Total Acres Treated	NA	27	NA	3,000	2,500	2,000	0	0	0	3,000	2,500	2,000
Montane/Subalpine Grasslands (51,559 acres on NFS Land) - Not Modeled in VDDT												
Acres treated Mechanically	NA	0	NA	500	500	500	500	500	500	500	500	500
Acres treated by Wildland Fire	NA	0	NA	0	0	0	0	0	0	0	0	0
Total Acres Treated	NA	0	NA	500	500	500	500	500	500	500	500	500
Riparian Forests and Areas (48,241 acres on NFS Land) - Not Modeled in VDDT												
Acres treated Mechanically	NA	0	NA	0	0	0	0	0	0	0	0	0
Acres treated by Wildland Fire	NA	0	NA	350	350	350	0	0	0	450	450	450
Total Acres Treated	NA	0	NA	350	350	350	0	0	0	450	450	450

Table 180. Acres by treatment type used to model the low and high annual treatment objectives

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
Ponderosa Pine	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA (basal area)	1,240	396	2,814	683	6,826	11	77
C Thin from below to target BA	2,090	287	2,042	243	2,426	0	0
D Thin under 16-inch diameter to BA	1,999	0	0	0	0	1,348	8,987
E GroupSelect with matrix thin	1,370	677	4,807	1,071	10,706	50	331
F Shelterwood seed cut to target BA	420	192	1,362	429	4,297	8	55
G Clearcut with legacy trees	0	0	0	0	0	0	0
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	450	550	1,200	800	1,400	125	400
J RX FIRE ONLY low conditions	2,836	551	3,858	364	3,565	1,158	7,718
K RX FIRE ONLY moderate conditions	316	866	6,064	571	5,602	1,820	12,128
L RX FIRE ONLY high conditions	0	157	1,102	104	1,020	330	2,205
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0
Dry Mixed Conifer	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	221	19	110	20	192	0	0
C Thin from below to target BA	372	9	70	14	140	0	0
D Thin under 16-inch diameter to BA	355	0	0	0	0	0	1,193
E GroupSelect with matrix thin	244	227	1,585	380	3,961	0	0
F Shelterwood seed cut to target BA	74	23	175	60	660	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
G Clearcut with legacy trees	0	0	0	0	0	0	0
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	100	225	450	265	500	100	200
J RX FIRE ONLY low conditions	720	99	693	66	660	210	1,400
K RX FIRE ONLY moderate conditions	80	277	1,940	185	1,848	588	3,920
L RX FIRE ONLY high conditions	0	40	277	26	264	83	560
M Thin under 9-inch diameter to BA	542	118	832	142	1,207	360	1,207
Wet Mixed Conifer	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	150	14	94	26	254	0	0
C Thin from below to target BA	258	13	94	64	635	0	0
D Thin under 16-inch diameter to BA	600	0	0	0	0	0	1,973
E GroupSelect with matrix thin	450	286	2,000	346	3,423	0	80
F Shelterwood seed cut to target BA	20	3	20	21	211	0	0
G Clearcut with legacy trees	34	13	93	86	846	0	0
H Clearcut-Coppice	34	13	93	86	846	0	0
I Plant Seedlings	325	250	500	450	700	0	0
J RX FIRE ONLY low conditions	855	159	1,107	105	1,044	332	2,214
K RX FIRE ONLY moderate conditions	96	317	2,218	208	2,091	665	4,436
L RX FIRE ONLY high conditions	951	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	601	133	931	102	1,100	428	798

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
Spruce-Fir	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	3	0	3	1	7	0	0
C Thin from below to target BA	17	0	2	0	7	0	0
D Thin under 16-inch diameter to BA	18	0	0	0	0	5	31
E GroupSelect with matrix thin	27	10	70	11	137	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	10	1	3	1	13	0	0
H Clearcut-Coppice	17	1	3	1	13	0	0
I Plant Seedlings	5	20	50	5	10	0	0
J RX FIRE ONLY low conditions	90	28	201	31	297	48	321
K RX FIRE ONLY moderate conditions	10	58	404	62	596	97	643
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	16	2	14	2	31	1	5
Piñon-Juniper	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	180	0	0	96	383	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	150	0	0	0	0	647	3,884
E GroupSelect with matrix thin	40	780	2,341	957	3,830	26	158
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	130	0	0	0	0	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	81	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	9	470	1,412	150	600	575	3,443
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0
Madrean Pine-Oak	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	0	0	0	0	0	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	0	0	0	0	0	0	0
E GroupSelect with matrix thin	0	0	0	0	0	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	0	0	0	0	0	0	0
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	797	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	266	3,714	11,143	1,250	5,000	3,722	22,335
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
Great Basin Grassland	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	0	0	0	0	0	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	0	0	0	0	0	0	0
E GroupSelect with matrix thin	0	0	0	0	0	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	250	5,135	10,269	0	0	3,081	6,161
H Clearcut-Coppice	250	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	0	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	41	5,000	10,000	0	0	7,000	14,000
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0
Semi-Desert Grassland	**Average**	**Low**	**High**	**Low**	**High**	**Low**	**High**
B Free thin all sizes to target BA	0	0	0	0	0	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	0	0	0	0	0	0	0
E GroupSelect with matrix thin	0	0	0	0	0	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	0	0	0	0	0	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	0	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	27	1,333	2,000	0	0	1,333	2,000
L RX FIRE ONLY high conditions	0	667	1,000	0	0	667	1,000
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0

Timber Suitability Analysis

The provisions of the 1982 Planning Rule require lands which are not suited for timber production to be identified. Timber production is the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. The term timber production does not include production of firewood.

An analysis was completed to determine the acres suitable and not suitable for timber production on the Apache-Sitgreaves NFs. This analysis was completed in three main steps to determine (1) the lands tentatively suitable for timber production; (2) the cost efficiency of meeting forest objectives, including timber production; and (3) the lands suitable for timber production by alternative. The analysis process and results are summarized and displayed below.

The forests followed guidance set forth by the Southwestern Region guidance (Forest Service, 2009), National Forest Management Act, and provisions of the 1982 Planning Rule for determining suitability. Further descriptions of the analysis process can be found in the “Forest Products” section of this FEIS and the “Forest Products Specialist Report” (Forest Service, 2014) in the “Plan Set of Documents.”

Step 1: Lands Tentatively Suitable for Timber Production

Tentatively suitable acres were based on the following criteria (table 181). Starting with the entire Apache-Sitgreaves NFs, GIS data was used to overlay and subtract the features listed below. The analysis resulted in 808,368 acres that were carried forward into the next step of the suitability process. Alternative A resulted in a slightly different tentatively suitable acreage (807,289 acres) because more lands were in the research natural area category (1,882 acres).

Table 181. Criteria and acres used to identify lands as tentatively suitable for timber production

Tentatively Suitable Lands	Acres	Total Acres
Total Apache-Sitgreaves NFs		2,110,196
Non-NFS Land	94,844	
Total NFS Lands		2,015,352
Non-forest Lands		
Areas not defined as forest land (>10% at maturity)	4,250	
Quarry, urban/agriculture, water		
Grasslands	344,033	
Great Basin, montane/subalpine, semi-desert		
Woodlands	617,094	
Madrean pine-oak, piñon-Juniper		
Interior chaparral	55,981	
Wetland/cienega riparian areas	17,900	
Lands withdrawn from timber production		
Designated Wilderness	20,628	
Bear Wallow, Escudilla, Mount Baldy		
Blue Range Primitive Area	43,258	
Research Natural Area	219	
Eligible or suitable wild and scenic river segments classified as wild	23,085	
Irreversible resource damage likely		
Unsuited/unstable soils (sensitive and unstable)	23,952	
Inadequate restocking		
Low reforestation potential based on soil properties	56,584	
Lands Tentatively Suitable for Timber Production		808,368

The above table reflects the same step 1 common to all action alternatives.

Acres of “unsuited/unstable soils” and “low reforestation potential” were derived from the “Apache-Sitgreaves NFs Terrestrial Ecosystem Survey” (Laing et al., 1987). They were not modified after the 2011 Wallow Fire, because the forest soil scientist believes it is too early (in 2012) to determine accurate estimates of soil productivity losses due to fire consumption of the organic layers and/or subsequent erosion of topsoil. The fire area soils, watersheds, and ground cover have not yet stabilized post-burn. This is a site-specific determination that is made at the

project-level and based on soils monitoring over time. Any estimates made of possible site conversion from forested PNVTs to grass/rock/shrubland in the “Forest Products Specialist Report” (Forest Service, 2014) for this analysis are purely estimates based on a search of relevant literature, which also require onsite monitoring for validation.

Adjustments to the suitable timberland acreage within the Wallow Fire and other high severity fires may be appropriate in the next 10 years during the scheduled review and update of the forest suitability classification process.

Step 2: Cost Efficiency Analysis

Alternative D was not analyzed for timber harvest economic efficiency because of the alternative theme and its incompatibility with regulated timber production.

The tentatively suitable land for Alternatives A, B, and C was categorized into four strata using GIS:

1. Roaded tractor operable (slopes under 40 percent with an existing road system in place);
2. Unroaded tractor operable (slopes under 40 percent but with no roads existing, thus requiring new construction);
3. Cable/helicopter operable (steep slopes over 40 percent with roads close enough to serve for cable yarding and/or short-turn helicopter yarding);
4. Too isolated or too small to log (areas of otherwise operable ground, but in isolated locations such that logging is impractical).

Stratum 4 was removed from further considerations because logging would be impractical. Alternative A (1987 plan) did not account for these same strata.

Acres of spruce-fir forest were not analyzed in this step because they are located inside lands withdrawn for timber production, are on sensitive/unstable soils, and/or are included in strata 4 above.

Economic efficiency spreadsheets developed by the U.S. Forest Service Washington Office were used to generate the cost efficiency outputs. All economic efficiency analysis spreadsheets are on file in the Plan Set of Documents. The operability costs associated with ponderosa pine, dry mixed conifer, and wet mixed conifer including market revenue values and associated costs, of strata 1 through 3 were input to determine present net values and benefit:cost ratios. Table 182 displays the financial results.

Table 182. Net revenue, present net value, and benefit:cost ratio for ponderosa pine and dry mixed conifer for strata 1 to 3

Stratum	PNVT	Undiscounted Net Revenue	Present Net Value at 3% Discount	Benefit:Cost Ratio at 3% Discount
1	Ponderosa Pine	-$6,558/acre	-$1,473/acre	0.0190
1	Dry Mixed Conifer	-$6,666/acre	-$1,509/acre	0.0185
1	Wet Mixed Conifer	-$7,264/acre	-$1,687/acre	0.0141
2	Ponderosa Pine	-$6,770/acre	-$1,637/acre	0.0171
2	Dry Mixed Conifer	-$7,304/acre	-$1,785/acre	0.0157
2	Wet Mixed Conifer	-$7,834/acre	-$1,970/acre	0.0121
3	Ponderosa Pine	-$19,912/acre	-$4,580/acre	-0.0479
3	Dry Mixed Conifer	Not modeled	NA	negative
3	Wet Mixed Conifer	Not modeled	NA	negative

Benefit:cost ratios for strata 1 and 2 in all three PNVTs are low but positive, while the value for stratum 3 is negative. There was no need to model dry mixed conifer and wet mixed conifer in stratum 3, because they have benefit:cost ratios more negative than the ponderosa pine result, are on steep slopes, and are MSO protected habitat that has management requirements which conflict with timber harvest. Any species mix harvested in the dry mixed conifer and wet mixed conifer brings lower market sale value than ponderosa pine, while the costs of operating in these two PNVTs are higher than the ponderosa pine costs. The excessively high costs to manage a regulated timber production program associated with stratum 3 (cable/helicopter operable lands) on all PNVTs were considered cost-prohibitive and were removed from further consideration.

Forest Service roads budgets have been declining dramatically. Less than 10 miles of new NFS road construction has been done in the past 5 years, and this trend is expected to continue. Additive costs of deferred maintenance roads in stratum 1, combined with new construction roads and future maintenance for stratum 2 under current budget trends, would also make stratum 2 cost-inefficient for this planning period.

Although there are short-term costs associated with stratum 1, long-term benefits of treatments include fewer acres of trees/timber and wildlife habitat lost to uncharacteristic fire, better tree growth rates and overall forest health, and greater resiliency to climate change. There are also benefits associated with contributions to the local economy through a steady flow of timber products.

It was determined that 0 (zero) acres in alternative A, 69,590 acres in alternative B, and 85,234 acres in alternative C are not economically cost efficient. These acres were subtracted from the tentatively suitable land base and not carried forward to the next step.

Step 3: Lands Suitable for Timber Production

The final step in the suitability evaluation was to apply any remaining criteria identified in chapter 4 Suitability of the proposed plan. These criteria (table 183) include lands where management objectives limit timber harvest (e.g., Recommended Wilderness Management Area, Mexican spotted owl (MSO) protected lands). GIS was used to identify the not suitable areas.

Accessible and operable acres in alternative D are not available for commercial timber production, due to this alternative's emphasis on using one single cutting entry, with maintenance by natural processes (e.g., fire) thereafter. Therefore, due to the intentional design of alternative D, all 808,368 acres of tentatively suitable lands are not appropriate for timber production and no economic or further suitability analysis was needed.

Table 183. Lands suitable or not suitable for timber production

Area	Suitable	Not Suitable
General Forest Management Area	X	
Community-Forest Intermix Management Area	X	
High Use Developed Recreation Area Management Area		X
Energy Corridor Management Area		X
Wild Horse Territory Management Area	X	
Wildlife Quiet Area Management Area	X	
Natural Landscape Management Area		X
Recommended Research Natural Area Management Area		X
Research Natural Area Management Area		X
Primitive Area Management Area		X
Recommended Wilderness Management Area		X
Wilderness Management Area		X
Communications sites		X
Developed recreation and administrative sites		X
Eligible or suitable wild and scenic river corridors		X
MSO protected lands		X

Since management areas change by alternative, the resultant acres identified as suitable for timber production vary. These are identified in the results section below.

Results

The following tables (table 184, table 185, and table 186) display the criteria and resulting acres considered to be suitable for timber production by alternative. Differences in final acres of suitable timberlands between the alternatives are a result of different reductions shown from the tentatively suitable lands due to the differing theme of each alternative.

Table 184. Alternative A timber production suitability determination

	PNVT Acres	Acres	Subtotal Acres	Total Acres
Total Apache-Sitgreaves NFS Land				**2,015,352**
Lands Tentatively Suitable for Timber Production				**807,289**
Lands where Management Area Prescriptions Precludes Timber Production			**12,258**	
Special Management Areas, Energy Corridor, and Water		12,258		
Lands where Management Objective Limit Timber Harvest			**30,159**	
Riparian		19,407		
Eligible or suitable wild and scenic river corridors classified as recreational or scenic		10,752		
Lands not economically cost efficient			**0**	
The 1987 plan did not limit suitable acres to cost efficient lands		0		
Lands Not Appropriate for Timber Production				**42,417**
Lands Suitable for Timber Production (38 percent of NFS land)		**764,872**		**764,872**
Dry mixed conifer	108,208			
Ponderosa pine	503,412			
Spruce-fir	5,180			
Wet mixed conifer	148,072			
Lands Not Suitable for Timber Production (62 percent of NFS land)				**1,250,480**

Table 185. Alternative B timber production suitability determination

	PNVT Acres	Acres	Subtotal Acres	Total Acres
Apache-Sitgreaves NFS Land				**2,015,352**
Lands Tentatively Suitable for Timber Production				**808,368**
Lands where Management Area Prescriptions Precludes Timber Production			**65,497**	
High Use Developed Recreation Area, Energy Corridor, Natural Landscape, Recommended Research Natural Area, and Recommended Wilderness Management Areas		65,497		
Lands where Management Objective Limit Timber Harvest			**76,537**	
Riparian		15,696		
Communications sites		91		
Developed recreation sites and administrative sites		5,862		
Eligible or suitable wild and scenic river corridors classified as recreational or scenic		8,258		
Mexican spotted owl protected lands (PACs)		46,630		
Lands not economically cost efficient			**69,590**	
Steep slope but loggable		54,466		
Dry mixed conifer	18,631			
Ponderosa pine	6,327			
Spruce-fir	2,548			
Wet mixed conifer	26,960			
Unroaded areas		12,511		
Dry mixed conifer	1,292			
Ponderosa pine	9,589			
Spruce-fir	32			
Wet mixed conifer	1,598			
Too isolated or too small to log		2,613		
Lands Not Appropriate for Timber Production				**211,624**
Lands Suitable for Timber Production (30 percent of NFS land)		**596,743**		**596,744***
Dry mixed conifer	65,086			
Ponderosa pine	445,440			
Wet mixed conifer	86,217			
Lands Not Suitable for Timber Production (70 percent of NFS land)				**1,418,608**

* Difference from subtotal due to rounding

Table 186. Alternative C timber production suitability determination

	PNVT Acres	Acres	Subtotal Acres	Total Acres
Apache-Sitgreaves NFS Land				**2,015,352**
Lands Tentatively Suitable for Timber Production				**808,368**
Lands where Management Area Prescriptions Precludes Timber Production			**27,321**	
High Use Developed Recreation Area, Energy Corridor, Natural Landscape, Recommended Research Natural Area, and Recommended Wilderness Management Areas		27,321		
Lands where Management Objective Limit Timber Harvest			**91,067**	
Riparian		19,927		
Communications sites (buffer to 5 acres)		94		
Developed recreation sites and administrative sites		6,341		
Eligible or suitable wild and scenic river corridors classified as recreational or scenic		12,174		
Mexican spotted owl protected lands (PACs)		52,531		
Lands not economically cost efficient			**85,234**	
Steep slope but loggable		62,261		
Dry mixed conifer	21,415			
Ponderosa pine	8,731			
Spruce-fir	3,086			
Wet mixed conifer	29,029			
Unroaded areas		13,637		
Dry mixed conifer	1,295			
Ponderosa pine	10,381			
Spruce-fir	82			
Wet mixed conifer	1,879			
Too isolated or too small to log		9,336		
Lands Not Appropriate for Timber Production				**203,622**
Lands Suitable for Timber Production (30 percent of NFS lands)		**604,746**		**604,746**
Dry mixed conifer	65,778			
Ponderosa pine	451,179			
Wet mixed conifer	87,789			
Lands Not Suitable for Timber Production (70 percent of NFS lands)				**1,410,606**

For alternatives B and C all acres of spruce-fir forest were classified as non-suitable because they are located inside withdrawn lands, are too isolated or small to log, and/or are in MSO protected habitat. Some acres of spruce-fir forest were classified as suitable timberlands in the 1987 plan.

MSO protected activity centers (PACs) were eliminated as "lands where management objectives limit timber harvest" due to a 9-inch diameter cutting cap limitation required by the current "MSO Recovery Plan" (USFWS, 2012). Additional MSO protected habitat on steep slopes outside of PACs was further eliminated as not cost-efficient to harvest. Care was taken to avoid double-counting these acreage deductions when more than one reason exists for the deduction. Should the "MSO Recovery Plan" be revised during this planning period, changes in timberland suitability classification may need to be reviewed and adjusted accordingly.

Timber Calculations

The "Forest Products Specialist Report" and report appendices (Forest Service, 2014) in the "Plan Set of Documents" provides complete records of all assumptions, rationale, data sources, methodologies, and references used to estimate timber volumes by alternative. The following is a brief summary of how the ASQ, LTSYC, and nonindustrial wood volumes were derived.

All wood volumes cut under each alternative are considered as byproducts of vegetation restoration treatments that maintain or move toward desired conditions. The PNVTs from which wood could be cut that were modeled in VDDT include ponderosa pine forest, dry mixed conifer, wet mixed conifer forests, spruce-fir forest, piñon-juniper woodland, and Great Basin grassland.

Two models were used to estimate volumes of wood cut under each alternative: (1) Forest Vegetation Simulator (FVS) and (2) Vegetation Dynamics Development Tool (VDDT). Various cutting simulations modeled in the FVS were used by the U.S. Forest Service Southwestern Region to produce estimates of three product categories: cubic feet per acre of industrial timber, and nonindustrial firewood cut, as well as tons of biomass per acre resulting from proposed restoration treatments (Weisz et al., 2012). The per-acre estimates from FVS were then incorporated into the VDDT model as another outcome attribute for the first 5 decades of treatments simulated for each PNVT, and expanded for multiple acres cut in each alternative.

The resulting VDDT wood volumes were entered into MS Excel spreadsheets for further summation of the three different wood product categories, as estimates for treated acres of both suitable timberlands and non-suitable timberlands. Those volumes only represent green trees expected to be cut and offered to markets under plausible cutting methods to implement each alternative. The same average volume estimate of green and dead poles, posts, firewood, power line corridor/roadside hazard tree salvage small sales, and other wood products sold annually under personal and commercial use permits to meet local public demand (not modeled in VDDT) was also included in the total volume estimated for each alternative.

ASQ Volume Calculations

Only volumes of industrial conifer timber species and commercial sizes cut from suitable timberlands, and used as logs, bolts, or roundwood (excluding firewood) are included in the ASQ calculation. See the "Forest Products Specialist Report" (Forest Service, 2014) for industrial definitions and tree species included. Because the modeling only represents one possible green-tree cutting scenario under each alternative, the resulting volume outputs are too precise for a

forestwide programmatic assessment. Therefore, all ASQ values have been rounded to the nearest thousand CCF.

According to the National Forest Management Act (NFMA), dead salvage volume of wildfire-killed and insect/disease-killed trees from suitable timberlands does not contribute to the ASQ. Because such volume may be unpredictable and highly variable, it is an additional volume that can be offered above the ASQ.

LTSYC Calculations

When a forest has achieved the desired regulated condition, the basic concept of long-term sustained yield is that annual harvest levels should cut no more than the net annual growth. Net growth is gross growth less natural mortality. In cases when net growth volume exceeds total cut volume, an excess of overgrowth poses an imbalance in the ecosystem that eventually is not sustainable. Such an imbalance can contribute to higher risks of severe stand-replacement wildfire, and outbreaks of insect or disease species which capitalize on trees weakened by over-crowding. Figure 83 below illustrates this concept.

Long term sustained yield capacity (sustainable harvest) for suitable timberlands was determined for each alternative using the following formula:

> **LTSYC = (24 cubic feet /acre/year of net growth) x (number of suitable timberland acres in the alternative)**

The net growth volume per acre per year is based on an average 30-year re-entry cutting cycle modeled in FVS for each forested PNVT by the USFS Southwestern Region as the ideal timeframe to maintain desired forest conditions stated in the proposed plan and for implementing an uneven-aged cutting system to reach forest regulation for sustained harvest yields (Youtz and Vandendriesche, 2012).

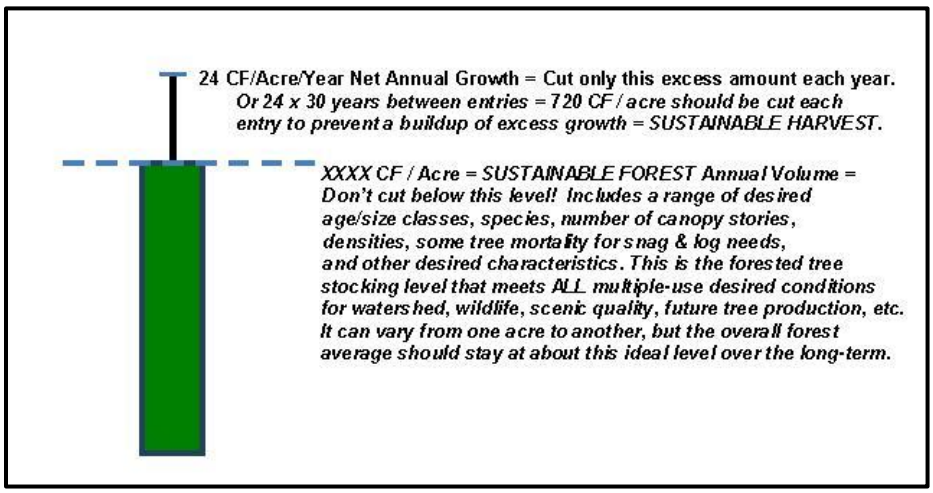

Figure 83. Conceptual diagram of ideal cutting level for a sustainable forest and sustainable harvest (not drawn to any scale)

For simplification of analysis, the long-term sustained yield of 24 cubic feet per acre per year used is a rounded, weighted average value for all suitable timberlands, using the regional model

run results for each PNVT, based on the proportional acres of each forested PNVT present on the Apache–Sitgreaves NFs suitable land base. Only the Southwestern Region's high-site model run for the ponderosa pine/grass type was used in this calculation, because soils not capable of producing at least 20 cubic feet/acre/year (approximately site index of 70 or greater) were eliminated from the tentatively suitable land base with the Apache-Sitgreaves NFs' soils assessment (see the "Forest Products Specialist Report" (Forest Service, 2014)). Because acres of suitable timberland vary by PNVT, a weighted average was used to verify the correct average to be used for all analyses of all PNVTs combined. Table 187 shows how this average was derived mathematically.

Table 187. Average LTSY calculation for all suitable timberland PNVTs on the Apache-Sitgreaves NFs by alternative

PNVT	Suitable Acres[a]	LTSY in cubic feet/acre/year[b]	Multiplication Product
Alternative A			
Ponderosa Pine[c]	503,412	23.6	11,880,523
Dry Mixed Conifer	108,208	22.9	2,477,963
Wet Mixed Conifer	148,072	24.7	3,657,378
Spruce-Fir	5,180	0	0
Totals	764,872	71.2	18,015,864
Weighted Average:	**18,015,864 / 764,872 =**	**23.6, rounded to 24**	**cubic feet/acre/year**
Alternative B			
Ponderosa pine[c]	445,440	23.6	10,512,384
Dry Mixed Conifer	65,086	22.9	1,490,469
Wet Mixed Conifer	86,217	24.7	2,129,560
Spruce-Fir	0	0	0
Totals	596,743	71.2	14,132,413
Weighted Average:	**14,132,413 / 596,743 =**	**23.7, rounded to 24**	**cubic feet/acre/year**
Alternative C			
Ponderosa pine[c]	451,179	23.6	10,647,824
Dry Mixed Conifer	65,778	22.9	1,506,316
Wet Mixed Conifer	87,789	24.7	2,168,388
Spruce-Fir	0	0	0
Totals	604,746	71.2	14,322,528
Weighted Average:	**14,322,528 / 604,746 =**	**23.7, rounded to 24**	**cubic feet/acre/year**

[a] See the "Forest Products Specialist Report" (Forest Service, 2014), appendix A-2 for additional information.

[b] From Youtz and Vandendriesche, 2012.

[c] Only the regional ponderosa pine/grass type high site index LTSY model result was used.

Because this net growth average of 24 cubic feet per acre per year does not vary by alternative, it was used in all LTSYC calculations for all alternatives in FEIS chapter 3, table 149.

To comply with legal direction of the National Forest Management Act (NFMA) and Multiple Use-Sustained Yield Act (MUSYA), long-term sustained yield also means that ASQ volumes harvested from suitable timberlands cannot decline from one decade to the next. Ideally, harvest volumes below the LTSYC should continue increasing to eventually reach the LTSYC and then level off at or near that regulated value. The only exception to this rule is if the cutting volumes are departed above the LTSYC, in which case they would be expected to decline toward the LTSYC over time.

Alternative A's ASQ volumes for decades 1 through 5 are all within 1 to 2 percent of each other, which indicates a flat line of sustained yield harvests. VDDT methodology used in this analysis did not permit the ability to model the most logical changes in cutting methods for subsequent re-entries on acres previously treated with the model inputs. By decade three, less intermediate thinning treatments to cut smaller sized trees would be used; instead more uneven-aged group selection cuts which require cutting bigger trees would be used, thus producing greater harvest volumes than those shown here for decades 3 through 5.

Alternatives A and B comply with legal requirements by cutting at levels which do not decline and are below the LTSYC. The first five decades of VDDT modeling do not produce substantially increasing harvest volumes that ramp up closer to the LTSYC, due to predicted cutting levels on suitable timberlands according to budget and workforce estimates for these alternatives in this planning period.

ASQ cutting departures above the LTSYC can be temporarily justified to correct the imbalance of excess net growth, provided the volumes cut decline over time to eventually level out at or below the LTSYC. This is the case for Alternative C. This declining volume trend came from the VDDT model runs for decades 1 through 5 and is based on treatment inputs for each alternative that are documented in the "Forest Products Specialist Report" (Forest Service, 2014). A declining trend is logical when heavy restoration cuts are needed early to prevent excessive tree mortality from high severity wildfires, competition, and insect/disease outbreaks. Once overgrowth levels have been reduced, then subsequent decades should produce volumes which taper down toward reaching desired conditions that are intended to promote a more sustainable forest. Because VDDT modeling was not done beyond 50 years, it is assumed that continued aggressive cutting levels beyond decade five would be needed to bring forested conditions closer to desired conditions and the LTSYC.

Alternatives A and C were found to comply with the non-declining even flow legal direction by continuing the same treatment strategy each decade in the initial level of VDDT modeling. In the case of alternative B, however, the initial VDDT model runs which repeated the same treatment strategy in subsequent decades after this planning period produced ASQ volumes that consistently declined each decade, while staying below the LTSYC. Therefore, additional analysis at a more refined level of modeling revealed that treatment strategy would need to change after the 15-year planning period for alternative B.

In order to sustain a non-declining even flow of ASQ volumes on suitable timberlands in alternative B, additional modeling revealed that the restoration strategy for decades 2 through 5 would need to do the following: increase treatment acreages in closed canopy transition vegetation states in the ponderosa pine and dry mixed conifer PNVTs; and shift to using low-severity prescribed fire as a maintenance tool for thinning just the seedling/sapling sizes.

These modeling shifts represent adaptive management that is predictable because as more acres are restored to desired open-canopy in these two PNVTs, cuts in each transition state would produce less volume per acre; thus the need to cut more acres overall to sustain the same total volume yields. Likewise, using moderate-high severity fire as a thinning tool would predictably reduce measurable volume available for ASQ harvest. Thinning only seedlings/saplings that have very little measurable wood volume by using only low-severity fire would not impact available ASQ volume.

These shifts in management methodology could begin after the planning period. It is assumed that continued restoration treatments toward desired conditions beyond decade five would eventually bring alternative B ASQ levels up closer to the LTSYC, provided uncharacteristic disturbances don't occur first to drastically alter the trends shown in this analysis.

Base Sale Schedule

The provisions of the 1982 Planning Rule call for a base sale schedule, or timber sale schedule. This planning effort emphasizes proposed management outcomes rather than outputs. The desired outcome is to restore the forested PNVTs toward desired ecological conditions, while also providing wood products to the economy as a byproduct of the restoration activities. Therefore, listing site-specific volume outputs tied to individual sales for each of ten years is not appropriate to provide here as a forest program target. The action alternatives offer a flexible range of annual cutting volumes, based on the realistic objective levels that help to frame the alternative. Annual volume levels offered for sale would vary as budgets, market demand, and opportunities occur.

For example, the annual cutting level for alternative B may vary from one year to the next between the high and low range of ASQ volumes shown in the FEIS chapter 3 table 148 (ASQ volume from suitable timberlands for the first decade), provided the decade total does not exceed the annual average times ten. Therefore, forestwide ASQ cutting volumes could fluctuate between 122,000 CCF and 26,000 CCF each year, provided that the total maximum volume of all cuts in the decade would not exceed 736,000 CCF for the 10-year total ASQ.

ASQ volumes from suitable timberlands only constitute a fraction of the total wood products that would result from cutting treatments implemented to restore forested acres toward the ecological desired conditions. In reality, a majority of industrial tree species in the traditional sawtimber, pulp, and pole size classes are no longer sold as these products. Many are currently sold as firewood, and/or extracted from the forest and scaled as tons of biomass, which are not included in the definition of ASQ volume. This trend is expected to increase, as the nation continues to emphasize alternative energy (heat and electricity) generation from green biomass fuel. The 4FRI contract identifies traditional sawtimber, roundwood products, and biomass offerings which all can be provided from a mix of suitable and non-suitable timberlands on the Apache-Sitgreaves NFs.

Non-ASQ Volume Calculations

All sizes of industrial conifer species cut on lands classified as non-suitable timberlands were also estimated from VDDT model runs, and tabulated as cubic feet of non-ASQ wood volume. Non-commercial sizes of industrial species cut from both suitable and non-suitable timberlands were tabulated as tons of biomass. Woodland species cut from both suitable timberlands and non-

suitable lands were tabulated as cubic feet of firewood. These non-ASQ volumes would be available for market and public offerings.

Total Wood Products

The total of all wood products of all categories potentially available to offer markets in the first decade was tabulated for each alternative, by high and low treatment objective levels in table 188.

Table 188. Estimated ranges of annual wood product volumes potentially available to offer in decade 1, by alternative from all NFS lands (suitable and non-suitable timberlands)

Product Class	Alt. A	Alt. B		Alt. C		Alt. D	
	Average	High	Low	High	Low	High	Low
Cuts on Suitable Lands							
ASQ Industrial Species[a] (Timber 9+" and Pulp 5-9") in CCF	74,392	121,591	25,585	268,353	38,522	0	0
Firewood (5+" non-industrial conifer and hardwood species) in CCF, Non-ASQ	14,606	17,530	8,533	33,615	10,019	0	0
Biomass (0+" non-industrial sizes and species) in Tons, Non-ASQ	323,302	400,667	59,336	1,202,219	128,463	0	0
Cuts on Non-suitable Lands							
Non-ASQ Industrial Species (Timber 9+" and Pulp 5-9") in CCF	5,780	17,804	2,959	31,192	3,402	48,403	6,065
Firewood[b] (5+"non-industrial conifer and hardwood species) in CCF, Non-ASQ	10,976	76,528	46,633	18,413	8,699	59,438	32,203
Biomass (0+"non-industrial sizes and species) in Tons, Non-ASQ	24,822	185,132	82,848	122,548	13,418	246,798	66,026
Summary of Total Cuts on All Treated Lands (ASQ and Non-ASQ Combined)							
Industrial Species[a] (Timber 9+" and Pulp 5-9") in CCF	80,172	139,395	28,544	299,545	41,924	48,403	6,065
Firewood[b] (non-timber conifer and hardwood species) in CCF	25,582	94,058	55,166	52,028	18,718	59,438	32,203
Biomass (non-industrial sizes and species) in Tons Or Converted to CCF[c]	348,124 or 99,464	585,799 or 167,371	142,184 or 40,624	1,324,767 or 378,505	141,881 or 40,537	246,798 or 70,514	66,026 or 18,865
Grand Total of All Wood Products, All in CCF	**205,218**	**400,824**	**124,334**	**730,078**	**101,179**	**178,355**	**57,133**
Averaged Grand Total of All Wood Products, All in CCF	**205,218**	**262,579**	**262,579**	**415,629**	**415,629**	**117,744**	**117,744**

[a] Industrial species for all alternatives include different live trees modeled in VDDT for restoration cutting, plus additional constant volume sold in small sales and on TIM permits (miscellaneous live and dead small salvage sales, road and recreation site hazard trees, pulp and poles).

[b] Firewood for all alternatives is different live trees modeled for restoration cutting plus additional constant TIM permit sales for dead/down firewood sales, plus posts sold in TIM.

[c] Conversion factor used: 3.5 tons = 1 CCF. Source: R3 Measurements Specialist, based on R3 weight scale study conducted locally.

The table above is the source for table 150 in the FEIS chapter 3, and shows how those volumes were further summarized for FEIS display. The same alternative averaged grand total volumes in the table above are shown in figure 84.

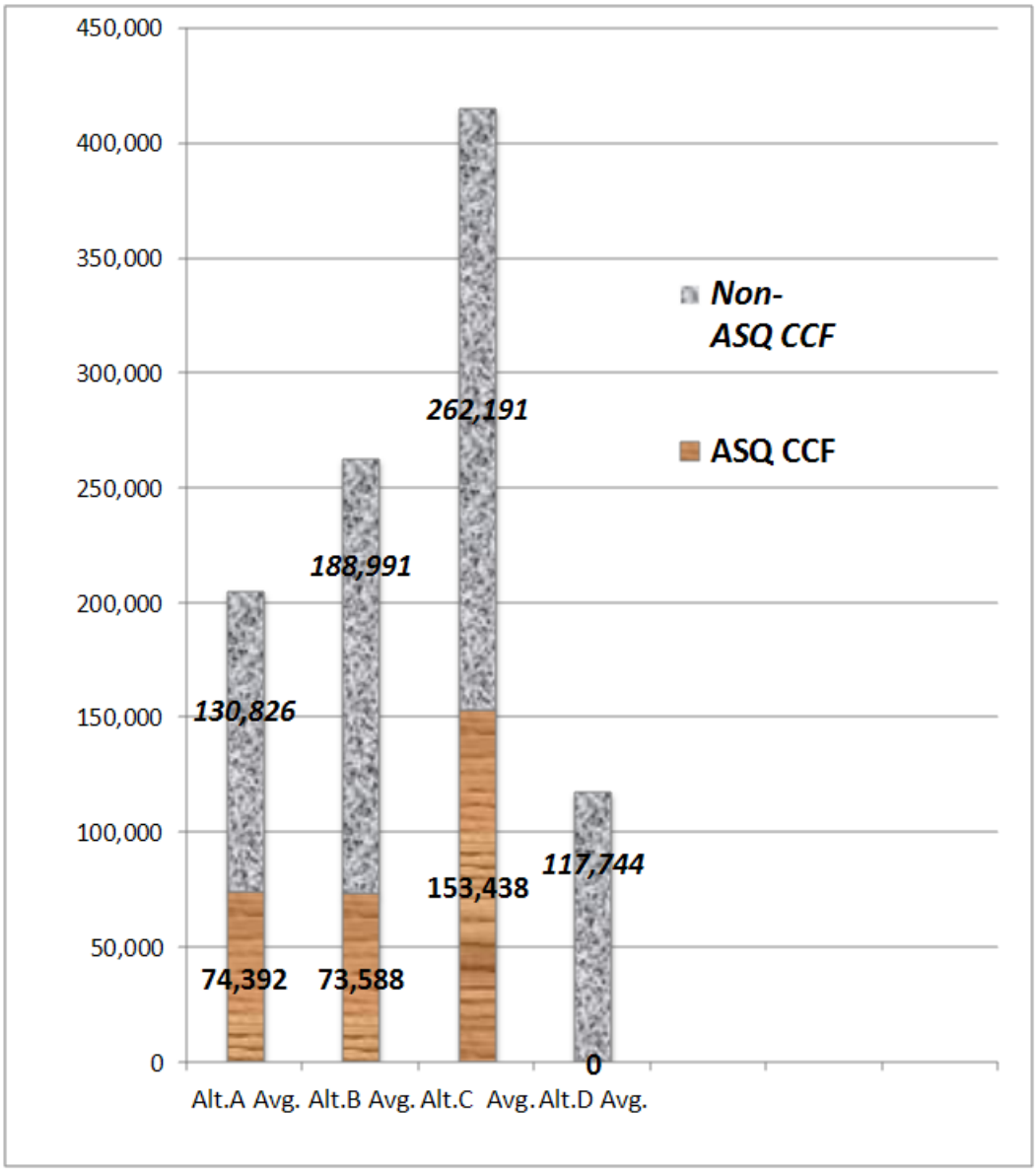

Figure 84. Total annual wood product volume estimates for decade 1 (from both suitable and non-suitable timberlands)

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Livestock Grazing Suitability Analysis

Provisions of the 1982 Planning Rule require that the capability and suitability for producing forage for grazing animals on NFS lands be determined. The analysis process and results are discussed in the following sections.

Capability is the potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture, wildland fire, or insect and disease treatments.

Suitability is the appropriateness of applying certain resource management practices to a particular area of land, in consideration of relevant social, economic, and ecological factors. A unit of land may be suitable for a variety of individual or combined management practices.

Capability

Capability to produce forage for grazing animals was originally determined in the 1980s during the development of the 1987 plan and was based on individual allotment data. Landscape scale conditions that determine capability have not changed since the first evaluation. The Analysis of

the Management Situation (1983) and the Environmental Impact Statement (1987) document the analysis of grazing capability and suitability for the 1987 plan.

Suitability

Suitable rangeland is that which is appropriate for the activity of livestock grazing in consideration of relevant social, economic, and ecological factors. Suitable rangeland is determined based on compatibility with desired conditions and objectives in the plan area. Lands within the plan area are not identified as suitable for a certain use if that use is prohibited by law, regulation, or policy; would result in substantial and permanent impairment of the productivity of the land or renewable resources; or if the use is incompatible with the desired conditions for the relevant portion of the plan area.

An identification of an area as suitable for a particular use does not mean that the use will occur over the entire area. Likewise, identifying that a particular use is not suitable in a management area does not mean that the use will not occur in specific areas. The identification of an area as suitable for various uses is guidance for project and activity decision-making and is not a resource commitment or final decision approving projects and activities. Final decisions on resource commitments are made at the project level.

To identify the lands suitable for livestock grazing, additional criteria (table 189) from chapter 4 Suitability of the proposed plan were used.

Table 189. Lands suitable or not suitable for livestock grazing

Management Area	Suitable for Livestock Grazing	Not Suitable for Livestock Grazing
General Forest	X	
Community-Forest Intermix	X	
High Use Developed Recreation Area	X	
Energy Corridor	X	
Wild Horse Territory	X	
Wildlife Quiet Area	X	
Natural Landscape	X	
Recommended Research Natural Area		X
Research Natural Area		X
Primitive Area	X	
Recommended Wilderness	X	
Wilderness	X	
Other Areas		
Active and vacant grazing allotments	X	
Current National Forest System land not in a grazing allotment		X

Results

Table 190 displays the acres of land that are suitable for livestock grazing in alternative A and table 191 displays the action alternatives. To calculate the acres suitable for livestock grazing in the action alternatives, GIS was used to subtract areas not in an allotment, the Black River Conservation Area, and the designated and recommended research natural areas. The 1987 plan was used as the baseline to identify lands suitable for livestock grazing in alternative A.

Table 190. Alternative A acres suitable for livestock grazing as identified in the 1987 plan

Management Area	Acres
1: Forest Land	836,288
2: Woodland	611,025
3: Riparian	6,870
4: Grasslands	243,126
5: Developed Recreation Site	0
7: Mount Baldy Wilderness	7,079
8: Blue Range Primitive Area and Additions	187,410
9: Escudilla Demonstration Area	10,872
10: Research Natural Area	0
11: Water	0
12: Bear Wallow Wilderness	11,080
13: Escudilla Wilderness	5,200
14: Black River	7,176
15: West Fork Black River	3,465
16: Chevelon Canyon	0
17: East and West Forks Little Colorado River	2,360
18: Sandrock	0
Total Acres Suitable for Livestock Grazing = 1,931,951	

Table 191. Acres suitable for livestock grazing by action alternative

	Alternative B	Alternative C	Alternative D
Total Acres of NFS Land	2,015,352		
Acres of NFS Land in the Black River Conservation Area	-28,430		
Acres of NFS Land outside grazing allotments	-77,270		
Acres of NFS Land in Research Natural Area and Recommended Research Natural Area Management Area	-8,140	-8,140	-6,536
Total Acres Suitable for Livestock Grazing	**1,901,512**	**1,901,512**	**1,903,116**

References

U.S. Forest Service. (1983). Analysis of the Management Situation. Southwestern Region. Apache-Sitgreaves National Forests.

U.S. Forest Service. (1987). Environmental Impact Statement for the Apache-Sitgreaves National Forests Plan. Southwestern Region. Apache-Sitgreaves National Forests.

Species Viability Analysis Process

The process of analyzing all the forest planning species (FPS), potential natural vegetation types (PNVTs), habitat elements, and four plan alternatives is complex. It therefore relies heavily on an approach that categorizes species, habitats, and management and compares plan alternatives. The viability process involved a series of steps for analyzing the 95 non-fish FPS, consisting of 30 mammals, 22 birds, 6 amphibians/reptiles, 12 invertebrates, and 25 plants. The same process was followed, but in a more generalized manner, for the remaining fourteen FPS, consisting solely of fish species. A description of the species viability analysis process follows.

Step 1: Characterize Species

The first part of the process characterizes the existing condition of FPS relative to their current abundance and distribution. Species most subject to risk for viability are generally those that are rare or uncommon or those whose habitat is most likely to be substantially affected by forest management and activities.

FPS were evaluated using information from earlier wildlife assessment reports which reflected input from Apache-Sitgreaves NFs and other biologists, species specialists, a collaborative wildlife group, knowledgeable publics, and Arizona Game and Fish Department. Each FPS was given a forest or F ranking described in table 192.

Table 192. Forest (F) rankings for forest planning species (FPS) on the Apache-Sitgreaves NFs

F Ranking	Description of species abundance and distribution relative to reference or desired habitat conditions
F?[a]	Unknown abundance and distribution
F1	Extremely rare
F2	Rare
F3	Uncommon (including locally common but in rare locations)
F4[b]	Widespread
F5	Secure

[a] Because of insufficient information to determine abundance and distribution, F? species are analyzed as F1 species.

[b] Populations of some F4 species could be affected by extensive landscape scale management and activities depending on timing, both spatial and temporal.

Some of the rarer or uncommon species are designated threatened, endangered, or sensitive species. In addition, some of the FPS are noted as being "highly interactive" species. These are species that play an important ecological role by impacting their habitat or populations of other species, and/or species needing large landscapes and habitat connectivity.

Step 2: Characterize Habitat

The second part of the viability process entails identifying important habitat that is most likely to influence viability. Habitat can be the broad vegetation type or certain habitat features. For the wildlife (non-fish) viability analysis, habitat is characterized by the PNVTs and specific "habitat elements" (e.g., snags, dense cover, down woody debris).

Next, future habitat abundance and future habitat distribution are determined for each PNVT and habitat element based on plan implementation. An underlying assumption is that habitat abundance and distribution within the range of conditions that species have experienced over evolutionary time is likely to maintain them into the future (Haufler, 1999)[1]. As such, the historic or reference condition is the desired condition for habitat in order to sustain FPS viability into the future[2].

Future habitat abundance is qualitatively classified as rare, occasional, or common, Future habitat distribution is qualitatively classified as poor, fair, or good. Table 193 and table 194 provide a description of these classifications. Note that future habitat distribution is classified in terms of desired conditions; hence, while a PNVT or habitat element's abundance may be common across

[1] Note that the scale of abundance and distribution differs among species (Holthausen, 2002) and was so considered for this analysis.

[2] Historic, called reference, condition for PNVTs was provided by The Nature Conservancy. Desired conditions are essentially the same as reference conditions for most PNVTs; however, the desired conditions for three PNVTs were adjusted based on three FPS' needs (see the "Vegetation Specialist Report" (Forest Service, 2014b) for more information). Historic conditions for habitat elements are less well understood but are generally described in other plan desired conditions.

the planning area in the future, if it is still mostly departed from desired conditions based on VDDT modeling states (ESSA Technologies, 2006), it would be considered "poorly" distributed. See the Vegetation Specialist Report (Forest Service, 2014b) for more information.

Table 193. Values used to classify future habitat abundance

Future Habitat Abundance Value	Description
rare	The habitat (PNVT or habitat element) is rare, with limited occurrences, or habitat consists of patches generally occurring over a very minor portion of the planning area.
occasional	The habitat (PNVT or habitat element) is encountered occasionally, generally occurring over a small portion of the planning area.
common	The habitat (PNVT or habitat element) is abundant and frequently encountered, generally occurring over much of the planning area.

Table 194. Values used to classify future habitat distribution

Future Habitat Distribution Value	Description
poor	The habitat (PNVT or habitat element) is poorly distributed within the planning area relative to historic or desired conditions. Number and size of habitat patches and/or their evenness in distribution over the landscape is greatly reduced.
fair	The habitat (PNVT or habitat element) is fairly well distributed within the planning area relative to historic or desired conditions. Number and size of habitat patches and/or their evenness in distribution over the landscape is somewhat reduced.
good	The habitat (PNVT or habitat element) is well distributed within the planning area relative to historic or desired conditions. Number and size of habitat patches and/or their evenness in distribution over the landscape is similar to those conditions.

Combined into table 195, the above classes express the likelihood that a particular PNVT or habitat element would affect viability of the associated species FPS with plan implementation. This is referred to as the likelihood of limitation. Table 196 defines the categories of likelihood of limitation to viability used to compare plan alternatives.

Table 195. Likelihood of limitation to FPS viability based on future habitat abundance and future habitat distribution

Future Habitat Abundance	Future Habitat Distribution		
	Poor	Fair	Good
rare	High limitation	High limitation	Moderate limitation
occasional	High limitation	Moderate limitation	Low limitation
common	Moderate limitation	Low limitation	Low limitation

Table 196. Definitions for likelihood of limitation to viability based on future habitat abundance and distribution

Likelihood of Limitation	Description
High limitation	High probability that the habitat (PNVT or habitat element) will be limiting for a species' viability
Moderate limitation	The habitat (PNVT or habitat element) has a likelihood of some limitation for a species' viability
Low limitation	The habitat (PNVT or habitat element) will likely not be limiting to a species' viability

Step 3: Characterize the Species-Habitat Relationship

The third part of the process characterizes the relationship between species and associated habitat in order to make comparisons between alternatives. The viability risk rating (VRR) value is created by combining F rankings for individual FPS with the likelihood of limitation for its associated PNVT(s) and habitat element(s). This linkage of species ranking and habitat elements is referred to as the species-habitat relationship.

Table 197. Viability risk rating (VRR) values reflecting species' F rank and likelihood of limitation

Likelihood of Habitat Limitation	F? or F1	F2	F3	F4/F5[a]
high	very-high	high	moderately-high	moderate/low[b]
moderate	high	moderately-high	Moderate[b]	low/low[b]
low	moderately-high	Moderate[b]	Low[b]	low/low[b]

[a] F4 and F5 species are not species of viability concern but a few are considered FPS as highly interactive species.

[b] Moderate and low level risk ratings are not considered viability risk ratings of consequence, see the assumptions.

Step 4: Characterize Management Effects

All alternatives include actions to restore or maintain habitat and species viability, but their relative effectiveness varies. Hence, the fourth part of the process characterizes management by alternative in an overall general manner. The management effect (ME) value describes the alternative's relative consequence to each PNVT or habitat element in terms of minimizing risk and contributing to associated species viability as shown in the following table.

Table 198. Description of relative management effect (ME) rating for alternatives

Rating	Management Effect
1	Greatest relative improvement or maintenance of habitat abundance and distribution through management and activities.
2	Intermediate relative improvement or maintenance of habitat abundance and distribution through management and activities.
3	Least to no relative improvement or maintenance of habitat abundance and distribution as a result of management/activities or lack of thereof (or by factors outside of Forest Service control).

Step 5: Viability Consequences

The viability risk rating outcomes and the management effect rating outcomes form the basis for the determination of environmental consequences to FPS as a result of plan implementation. These consequences are expressed as the relative "viability effectiveness" for each alternative for the 15-year planning period, with consideration of trend to 50 years.

This step entails summarizing likelihood of limitation and management effect for each PNVT and habitat element by alternative (figure 85, box 1). The viability risk ratings for each species-habitat relationship by alternative is also summarized (figure 85, box 2).

Next, the number of species-habitat risk ratings of consequence (moderately-high, high, very-high) is tallied for both PVNTs and habitat elements by alternative (figure 85, box 3). The number of viability risk ratings is summarized by alternative for each of the management effects (figure 85, box 4). The viability analysis uses the information generated in the above steps to show how effectively plan implementation would contribute to species viability by alternative.

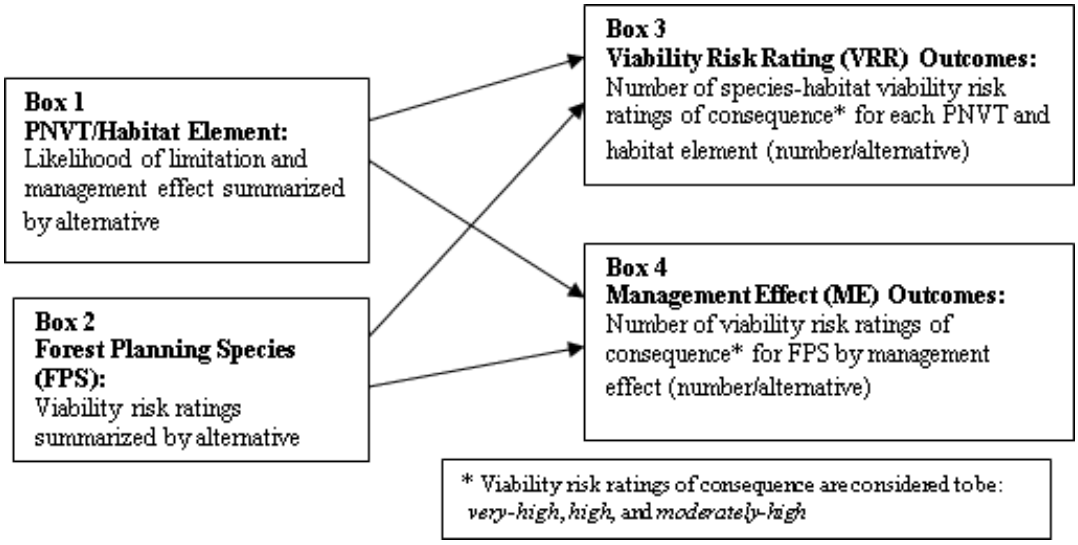

Figure 85. Viability Risk Rating outcomes and Management Effect outcomes that form the basis for environmental consequences

Information used in the species viability analysis as described above include forest plan decisions such as desired conditions, standards and guidelines, different alternative management area allocations, different alternative treatment objectives, and different alternative vegetation states provided by the VDDT modeling (ESSA Technologies, 2006).

Results

The viability risk rating outcomes and the management effect rating outcomes form the basis for the determination of environmental consequences to FPS, expressed as the relative "viability effectiveness" for each alternative. These species viability results are presented in chapter 3 ("Wildlife and Rare Plants" and "Fisheries" sections) of this FEIS. Complete details of the species viability analysis can be found in the wildlife and fisheries specialist reports (Forest Service, 2014c and 2014a) available in the "Plan Set of Documents."

References

ESSA Technologies Ltd. (2006). [online] URL: http://essa.com/

Haufler, J.B. (1999). Strategies for conserving terrestrial biological diversity. Pages 17–34 in R.K. Baydack, H. Campa III and J.B. Haufler (eds.). Practical approaches to the conservation of biological diversity. Island Press, Covelo, CA.

Holthausen, R.S. (2002). White paper on managing for population viability. Draft. July 2002.

U.S. Forest Service. (2010). Technical Guide Species and Ecosystem Diversity Evaluation. February 24, 2010. Washington, DC.

U.S. Forest Service. (2012a). Iterative Update to Species Considered and Identification of Forest Planning Species Report. Springerville, AZ.

U.S. Forest Service. (2014a). Fisheries Specialist and Viability Report Forest Plan Revision FEIS. Springerville, AZ.

U.S. Forest Service. (2014b). Vegetation Specialist Report. Forest Plan Revision FEIS. Springerville, AZ.

U.S. Forest Service. (2014c). Wildlife Specialist Report - Viability. Springerville, AZ.

Socioeconomic Resources Analysis

Section 219.12(h) of the 1982 Planning Rule directs the planning team to

> [E]valuate the significant physical, biological, economic, and social effects of each management alternative that is considered in detail. The evaluation shall include a comparative analysis of the aggregate effects of the management alternatives and shall compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources." The economic analysis helps to fulfill these evaluation requirements.

Data Sources

Economic impacts were modeled using IMPLAN Professional Version 3.0 (IMpact analysis for PLANning, Minnesota IMPLAN Group, Inc.) with 2009 data. IMPLAN is an input-output model, which estimates the economic impacts of projects, programs, policies, and economic changes on a region. IMPLAN analyzes the direct, indirect, and induced economic impacts. Direct economic impacts are generated by the activity itself, such as the value of cattle grazed on the Apache-Sitgreaves NFs. Indirect employment and labor income contributions occur when a sector purchases supplies and services from other industries in order to produce their product. Induced contributions are the employment and labor income generated as a result of spending new household income generated by direct and indirect employment. The employment estimated is defined as any part-time, seasonal, or full-time job. In the economic impact tables, direct, indirect, and induced contributions are included in the estimated impacts. The IMPLAN database describes the economy in 440 sectors using Federal data from 2009.

Data on use levels under each alternative were collected from the Apache-Sitgreaves NFs' resource specialists. In most instances, the precise change is unknown. Therefore, the changes are based on the professional expertise of the forests' resource specialists (provisions of the 1982 Planning Rule, 219.12(g)).

Regional economic impacts of the alternatives are estimated based on the assumption of full implementation of each alternative. The actual changes in the economy would depend on individuals taking advantage of the resource-related opportunities that would be supported by each alternative. If market conditions or trends in resource use were not conducive to developing some opportunities, the economic impact would be different than estimated here.

Financial efficiency analysis was conducted with QuickSilver Version 6. The financial efficiency analysis compares the anticipated Forest Service expenditures and revenues, by alternative over the life of the plan. Data on program revenues and program expenditures were provided by the Apache-Sitgreaves NFs budget staff and resource specialists (provisions of the 1982 Planning Rule, 219.12(e)). A 4 percent discount rate is commonly used for evaluations of long-term investments and operation in land and resource management by the Forest Service (Forest Service Manual 1971.21). This discount rate was used in the calculation of present net value (PNV). PNV is the difference between program revenues (benefits) and program expenditures (costs) over a 15-year period, using a 4 percent discount rate. The annual expenditures were summed over 15 years using a 4 percent discount rate (so that one dollar today is valued higher that one dollar in 10 years). The sum of the discounted annual expenditures represents the present value of costs. The same exercise was conducted using the annual program revenues for key resource areas. The sum of the discounted annual revenues represents the present value of benefits. The difference between the present value of costs and the present value of benefits is PNV. The higher the PNV, the more financially efficient the alternative. Inflation can affect PNV; however, due to the uncertainty of future inflation, OMB Circular A-94 recommends avoiding assumptions about the inflation rate whenever possible. Thus for the purposes of this analysis, inflation is left at zero.

Social impacts use the baseline social conditions presented in the socioeconomic resources affected environment section of the FEIS and visitor profiles from the NVUM results for the Apache-Sitgreaves NFs (Forest Service, 2001) to discern the primary values that the forests provide to area residents and visitors. Social effects are based on the interaction of the identified values with estimated changes to resource availability and uses.

Assumptions

- Information on the timing of costs and benefits was not available for the economic efficiency analysis. Furthermore, the analysis does not provide a full accounting of all costs and benefits. The only benefits considered are program revenues (i.e., forest receipts) and the only costs considered are direct forest expenditures. Therefore, the estimates of net present value are limited to the available data, which was sufficient to conduct a thorough economic efficiency analysis.
- The economic impact of grazing was estimated using authorized levels. However, actual use is permitted annually based on various factors, such as current forage conditions. Therefore, the estimated economic impact of grazing is likely to overstate the jobs and income provided.
- Changes in use levels were estimated using professional judgment. However, actual changes in use are difficult to predict and frequently depend on factors outside the control of the Forest Service.
- The framework for the social analysis employs generalities. Area residents and Apache-Sitgreaves NFs forest visitors have diverse preferences and values that may not be fully captured in the description of social consequences. Nevertheless, the general categories are useful for assessing social impacts based on particular forest-related interests.

References

U.S. Forest Service. (2001). National Visitor Use Monitoring Program (NVUM). Accessed March 21, 2011. http://fsweb.nris.fs.fed.us/products/NVUM_Results/index.shtml

U.S. Forest Service. (2009). Apache-Sitgreaves National Forests Economic and Social Sustainability Assessment. Springerville, AZ.

Research Needs

As a result of extensive environmental analysis related to plan revision, several research needs have been identified related to the resource topics under review. Future data and information provided by research in these areas would help better manage the Apache-Sitgreaves NFs.

- **Aspen**
  - How can the distinction between elk and livestock impacts be made?
  - How can the age of aspen clonal root systems be determined?
  - What is the best indicator of a healthy aspen stand? Is it an even-aged or multi-storied stand?
- **Recreation Use**
  - Are there other monitoring systems, besides the National Visitor Use Monitoring program, that can provide more accurate and timely visitor use information?
- **Grazing**
  - At the project level, how can range readiness be determined based on growing degree days?

- **Species Habitat**
  - What is a reasonable allocation of forage between livestock and wildlife across all ownerships?
- **Wildlife Quiet Areas**
  - What is the effectiveness of wildlife quiet areas?
  - What are the effects of nonmotorized activities, human presence, and level of noise on wildlife?
- **Minor species (sensitive species)**
  - What are the locations, abundance, genetic exchange, and condition of species where this knowledge is lacking?
- **White pine blister rust resistance**
  - What is the genetic diversity of white pine across the forests to counter the impact of white pine blister rust?
- **Priority watersheds**
  - What indicators should be monitored to show actual improvement of watershed condition?
- **Fire**
  - Are planned and unplanned ignitions (wildland fire) an effective tool for moving toward desired conditions?
- **Research Natural Areas (RNA)**
  - What potential research can the recommended RNAs facilitate?

Appendix C. Coordination with Other Public Planning Efforts

Overview

Per the provisions of the 1982 planning regulations, the responsible official shall review the planning and land use policies of other Federal agencies, State and local governments, and American Indian tribes. In addition, the Chief of the Forest Service, Tom Tidwell, has called for an "all-lands approach" to accomplish ecosystem restoration. This involves landowners and stakeholders working together across boundaries to decide on common goals for the landscapes they share. In order to facilitate this all-lands approach, it is important to understand the goals and anticipated activities of landowners adjacent to the national forest. The following sections provide a summary of those goals and activities. Table 199 lists the other public planning efforts that were considered in the plan revision process.

Table 199. Other Federal agencies, State and local governments, and American Indian tribes planning efforts considered in the plan revision process

Eastern Arizona Counties Organization Apache County, Arizona	Show Low, Arizona	Arizona Department of Agriculture
Coconino County, Arizona	Pinetop-Lakeside, Arizona	Arizona Department of Transportation
Greenlee County, Arizona	Greer, Arizona	Arizona Game and Fish Department
Navajo County, Arizona	Springerville, Arizona	Arizona State Forestry Division
Catron County, New Mexico	Eagar, Arizona	Arizona State Land Department
Graham County, Arizona	Nutrioso, Arizona	Arizona State Parks
Gila County, Arizona	Alpine, Arizona	Governor's Forest Health Council
Grant County, New Mexico	Blue, Arizona	Bureau of Land Management
Heber-Overgaard, Arizona	Eagle Creek, Arizona	Federal Highway Administration
Forest Lakes, Arizona	White Mountain Apache Tribe[a]	Coconino National Forest
Clay Springs, Arizona	San Carlos Apache Tribe	Tonto National Forest
Pinedale, Arizona	Arizona Department of Environmental Quality	Gila National Forest
Linden, Arizona	Arizona Department of Water Resources	U.S. Fish and Wildlife Service

[a] The Apache-Sitgreaves National Forests Other Lands and Land Use Plans (Forest Service, 2011e) only reviewed American Indian tribes that have reservations that border the Apache-Sitgreaves NFs. Other tribes that affect forest management are described in the FEIS.

Counties

The Apache-Sitgreaves NFs lie in five counties: Apache, Coconino, Greenlee, and Navajo Counties in Arizona and Catron County in New Mexico. The Apache National Forest portion in New Mexico is administered by the Gila National Forest. The forest borders three other counties: Graham and Gila Counties in Arizona and Grant County in New Mexico.

County comprehensive plans can be used as a source of information on the history of land use within the region, the patterns of development, desired conditions, and current county land use policies. County governments hold no legal authority over independent jurisdictions such as Federal and state lands, incorporated cities and towns or American Indian tribal reservations.

County land use within the planning area ranges from traditional uses such as farming and ranching in rural areas to denser concentrations of residential, industrial, and commercial uses in and around more urban areas (e.g., Show Low, Pinetop-Lakeside, Springerville, Eagar, Heber-Overgaard). One of the common themes is how, and whether, private owners and public land managers can manage the competing priorities of resource conservation and economic development – in particular how to cope with the growing demands for housing and recreation while ensuring preservation of a shrinking natural resource base that contributes to Arizona's highly valued "rural character."

Apache County

The comprehensive county plan's (2004) vision statement includes "Apache County offers a rural character of natural beauty and abundance. This includes values such as independence, privacy, and personal freedom that attract many seeking both permanent residence and seasonal refuge."

Only 13 percent of the county is privately owned, more than 65 percent is covered by American Indian reservations, and 21 percent is in public ownership. There are three incorporated communities in the county, two of which border the Apache-Sitgreaves NFs: Springerville and Eagar. County lands adjacent to the Apache-Sitgreaves NFs are classified as range land, community village, and rural edge.

The county plan recognizes the National Forest System land exchange process as a growth management tool to help facilitate development of new communities and discourage development in remote or sensitive areas. There is one goal with direct ties to the national forest:

- Goal 9: Reduce the danger from fire for all residents living in a wildland-urban interface or near a national forest boundary.

Greenlee County, Arizona

The vision for Greenlee County from the comprehensive county plan (2003) includes the rural character, outdoor recreation, access, and natural resource harvesting and extracting. Forest Service land makes up 64 percent of the county. Only 6 percent of the county is privately owned. The county has two incorporated towns – Clifton and Duncan. The county goals directly tied to the national forest include the following:

- Connect the forest trails with new trails.
- Return to the multi-use of the land.

- Consider local concerns and implement appropriate actions.
- Maintain a healthy sustainable forest that provides raw materials while limiting incompatible uses.
- Develop roads in the forest for people that cannot hike or use horses.

Navajo County, Arizona

The comprehensive county plan (2004) “character areas” describe the vision for the county by helping to protect the existing community character while maximizing balanced economic development. The lands adjacent to the Apache-Sitgreaves NFs are characterized as community village, rural edge, and rural ranch.

Almost 66 percent of Navajo County is American Indian reservation land. The Forest Service and BLM lands make up 9 percent of the county. The county has six incorporated cities/towns: Holbrook, Pinetop-Lakeside, Show Low, Snowflake, Taylor, and Winslow.

The Rodeo-Chediski Fire prompted a focus on long-term forest health as critical to future growth and development of the county. In particular, the plan focuses on population centers, paved roads, and previously treated forest areas as central to managing similar fires in the future. The plan recommends strategically located treatment programs in areas where multiple canyons converge or where canyons allow fires from below the Mogollon Rim to reach and gain strength at higher elevations. It also recommends that the Mogollon Rim Road and State Route 260 be paved to provide broader firebreaks. It also recommends treatment of a defensible area one mile outside each populated area. The plan advocates a forestwide management plan and professional treatment program that would eliminate excess fuels while providing forest-related jobs for the local economy.

Coconino County, Arizona

The comprehensive county plan’s (2003) vision for Coconino County is based on a conservation framework and emphasizes healthy landscapes where natural resources are conserved and land is used efficiently.

Forest Service land makes up 28 percent of the county, most of the land lies within the Coconino and Kaibab National Forests and the rest lies within the Apache-Sitgreaves and Prescott National Forests. Incorporated cities/towns include Flagstaff, Fredonia, Page, Sedona, and Williams.

The county goals tied to the national forest include the following:

- Improve forest health and promote the restoration of forest ecosystems.
- Manage recreational uses in a manner that minimizes impacts to communities and the environment.
- Concentrate development in designated growth areas while preserving open space and landscapes.

Catron County, New Mexico

Catron County borders the Apache National Forest along its eastern border. The primary land owner along the forest boundary is the Gila National Forest, although there are also several non-Federal parcels.

The primary purpose of the plan for Catron County (1992) is to protect the custom, culture, and livelihoods of county residents in the face of onerous state and Federal regulations. The plan states that county citizens are particularly vulnerable to "aggressive" state and Federal land use policies given the fact most of the county is managed under other jurisdictions. Government land agencies (primarily BLM and Forest Service) have jurisdiction on over 70 percent of lands in Catron County. Reserve is the only incorporated town in Catron County.

In response to a perceived abuse of Federal authority on county lands, the plan explains,

> [A]ll natural resource decisions affecting Catron County shall be guided by the principles of protecting private property rights, protecting local custom and culture, maintaining traditional economic structures through self-determination, and opening new economic opportunities through reliance on free markets.

The plan describes Federal and state land use restrictions as arbitrary barriers that have been "illegally imposed" without county government input. This sentiment is found throughout the plan and emphasizes close coordination on the development of Federal and state land use policies that are responsive to the public interest.

The Catron County plan describes both the custom and culture of the county as being linked to traditional land use practices such as livestock grazing, timber harvesting, mining, and hunting. A primary basis for the plan is the stated notion that Federal regulations aimed at protecting the environment and endangered species have had a particularly detrimental effect on the economy and social stability of Catron County.

The plan does not specifically address topics such as preferred locations and densities for residential, commercial, and industrial land uses, nor does it provide guidelines or standards pertaining to community infrastructure or services. The Catron County plan is currently being revised.

Graham County, Arizona

Graham County borders the west side of the Apache National Forest. The San Carlos Indian Reservation occupies the county adjacent to the forests. See the "San Carlos Apache Tribe" section for more info.

Gila County, Arizona

Gila County borders the far southwest portion of the Sitgreaves National Forest along the Mogollon Rim. The county lands adjacent to the Apache-Sitgreaves NFs are not zoned, platted, developed, or are in extremely remote or difficult-to-access locations. The goal for these areas is to maintain a rural, very low density, large lot residential development (LVA Urban Design Studio, 2003).

The “Southern Gila County Community Wildfire Protection Plan” (Logan Simpson Design, Inc., 2010) does not identify wildland-urban interface directly adjacent to the Apache-Sitgreaves NFs. There are several wildland-urban interface areas located within 20 miles and southwest of the forests.

Grant County, New Mexico

Grant County borders the far southeast portion of the Apache National Forest along the New Mexico border. The primary landowner along the boundary is the Gila National Forest, although there are also several non-Federal parcels. The county currently does not have a comprehensive land use plan.

Eastern Arizona Counties Organization

The Eastern Arizona Counties Organization (ECO) is a local government organization created in 1993 to review Federal programs which affect the custom, culture, and economic well-being of the counties. ECO represents five counties: Apache, Gila, Graham, Greenlee, and Navajo.

ECO has identified seven objectives for the counties that relate to the Apache-Sitgreaves NFs land management plan:

1. Rangelands Resources Management
2. Forest Products Resources Management
3. Mineral and Energy Resources Management
4. Motorized Travel and Recreation Management
5. Forested Ecosystems Restoration and Catastrophic Wildfire Prevention
6. Watersheds Restoration
7. Management Areas Designation

Community Wildfire Protection Plans (CWPPs)

Three community wildfire protection plans (CWPP) outline goals for at-risk-communities within and around the Apache-Sitgreaves NFs:

- “Community Wildfire Protection Plan for At-Risk Communities of the Apache National Forest in Apache County” (Logan Simpson Design, Inc., 2004a)
- “Community Wildfire Protection Plan for At-Risk Communities of the Sitgreaves National Forest in Apache, Coconino, and Navajo Counties” (Logan Simpson Design, Inc., 2004b)
- “Greenlee County Community Wildfire Protection Plan for At-Risk Communities of the Apache National Forest in Greenlee County” (Logan Simpson Design, Inc., 2005)

The primary goal of the plans is for Federal land to return to Condition Class I where wildland fire can be incorporated into long-term management practices to sustain forest health. The plans

also delineate the wildland-urban interface where human development meets and intermingles with undeveloped wildland or vegetative fuels. The plans are used by Apache-Sitgreaves NFs' managers to help prioritize areas for fuel reduction treatments.

Communities, Towns, and Cities

There are several communities, towns, and cities within or adjacent to the Apache-Sitgreaves NFs. These include Heber-Overgaard, Forest Lakes, Clay Springs, Pinedale, Linden, Show Low, Pinetop-Lakeside, Greer, Springerville, Eagar, Nutrioso, Alpine, Blue, and Eagle Creek.

The communities surrounding the Apache-Sitgreaves NFs have a history of involvement with and dependence upon the national forests and natural resources in general. Arizona has long been dependent upon natural resources for commodity production, clean water, tourism, and aesthetic enjoyment. As a result the public has frequently expressed interest in the use and management of these resources. Some recent examples include the following:

- Town of Pinetop-Lakeside – In 2008, the town inquired about a special designation for Woodland Lake Park. The park is under permit to the town and is within city limits; however, it is located on NFS land.
- City of Show Low – In 2009, the city adopted a resolution supporting the Four-Forest Restoration Initiative, a strategy to implement landscape-scale restoration of the region's forests, and authorizing the signing of a letter of support urging Congress to provide the necessary resources to implement it.
- Town of Eagar – In 2010, the town council adopted a resolution requesting the Apache-Sitgreaves NF maintain the existing management practice (allowing cross-country travel) and the accessibility of all existing roadways and trails as they currently are within the forests.

One of the most common concerns of these communities is the risk associated with uncharacteristic wildfire and hazardous fuel buildup. This issue has been articulated in the community wildfire protection plans (see above).

Tribes

Federally recognized American Indian tribes occupy about 53.5 million acres (7 percent) of land in the western states. Two reservations border the west side of the Apache-Sitgreaves NFs: Fort Apache Indian Reservation and San Carlos Apache Reservation. These tribes are legally considered to be sovereign nations, meaning the Forest Service has a government-to-government relationship with the tribes. Tribes that enter into contracts with the Federal government do so just as state governments or sovereign nations do.

In addition, the Federal government also holds a special responsibility to consult with tribes about management concerns that may affect them. This process is governed by a variety of Federal regulations and policies, including the Forest Service Handbook 1509.13, the National Environmental Policy Act, the National Indian Forest Resources Management Act, the Tribal Forest Protection Act, the Archeological Resources Protection Act, and several presidential executive orders.

Tribes' use of Forest Service land includes free, non-permitted activities such as gathering boughs and basket materials as well as the use of products such as sawtimber. In addition, the Apache-Sitgreaves NFs include traditional cultural places, the locations of which are known only to the tribes.

Fort Apache Indian Reservation (White Mountain Apache Tribe)

Forest Management

The 2005-2014 Forest Management Plan (Fort Apache Agency, 2005) identifies several reservation-wide forest management objectives. They include the following:

- Utilize a variety of silvicultural tools including commercial harvesting, precommercial thinning, prescribed fire, site preparation, and natural and artificial regeneration to move stand structure, composition, and other characteristics toward that of the target forest.
- To the extent possible, practice uneven-aged management within ponderosa pine and mixed conifer stands. Even-aged methods are silviculturally appropriate for spruce and aspen stands, fire damaged areas, or areas with severe insect or disease infestations.
- Maintain forest qualities that will protect or provide wildlife habitat, recreational opportunities, good forage, quality scenery, clean rivers and streams, and other multiple-use values.
- Improve wildlife habitat by increasing production of forage and browse and diversity in species, density, and cover.
- Enhance opportunities for livestock production by increasing abundance and vigor of palatable forage, through density management of overstory trees. Work with range conservationists to coordinate any grazing deferments or systematic grazing schedules that benefit the resource as a whole.
- Protect soil and water quality by developing prescriptions that will enhance watershed condition through time.
- Conduct harvest operations to obtain as complete utilization of forest products as practical. Assist the White Mountain Apache Tribe in developing markets for previously under-utilized forest products or species.
- Minimize threat to life and property, and damage to forests, soils and watersheds from catastrophic wildfire through effective fire prevention, enforcement, pre-suppression, and suppression programs.
- Provide sufficient initial attack forces to confine fires as soon as possible. For fires which escape, or are expected to escape initial attack, systematically build up suppression and support forces to the level required to bring about control in a safe, effective, and efficient manner.
- Manage natural and activity-created wildland fuels to reduce wildfire size, intensity, behavior, and threat to life and property.

The forest management plan divides the reservation into twelve management emphasis areas (MEAs) including wilderness, sensitive fish, sensitive plants, water, sensitive wildlife, recreation, sensitive sites, scenic byways, community, fuels management, limited management, and forest products.

Recreation and Wildlife

Recreation is managed with a permit system for fishing, hunting, camping, hiking, river rafting, sightseeing, picnicking, biking, and cross-country skiing. The tribe offers a trophy elk hunting program that has been in operation since 1976 (White Mountain Apache Tribe, 2010).

Transportation

There are approximately 1,000 miles of roadways on the Fort Apache Indian Reservation. There are also about 128 miles of State highways, including State Route 73 in the northern part of the reservation which passes through the communities of Fort Apache and White Mountain. U.S. Highway 60/State Route 77 runs from the Salt River Canyon and the border with the San Carlos Indian Reservation to the intersection with State Route 260, north of the reservation border. State Route 260 is an east-west route in the northeast corner of the reservation that goes through Hon-Dah and McNary. The BIA agency roads engineer works closely with the tribe on transportation. The BIA has staff on the reservation and is responsible for the roads' programming and maintenance. The BIA has a consulting contract to develop the long-range transportation plan for the tribe. As of 2004, ongoing and proposed road projects included the reconstruction of BIA Road 690, the construction of dirt and gravel roads in residential areas of McNary, the stabilization, and resurfacing of an 8-mile stretch of BIA Road 69, and a cooperative project with ADOT to improve the intersection of State Road 73 and State Road 260 (FHWA, 2004).

San Carlos Apache Tribe (Nde Nation)

Forest Management

The Tribe has a forest resources program, including timber sales, thinning, wood cutting, and fire activities (San Carlos, 2011).

Recreation and Wildlife

A recreation permit is required for non-tribal members and allows entry on the Reservation for any recreational activities (e.g., hiking, picnicking, touring, camping), other than hunting or fishing. Wildlife resources include Rocky Mountain elk, Coues whitetail deer, Rocky Mountain bighorn sheep, desert bighorn sheep, javelina, pronghorn antelope, black bear, mountain lion, wild turkey, predators, and other small game. The Drylake and Hilltop trophy elk units are managed for older age structure and have produced some of the largest elk in the world (San Carlos, 2010).

Transportation

The San Carlos Apache Tribe does not receive the same Federal Highway Administration (FHA) transportation planning support as the White Mountain Apache Tribe; however, information on transportation concerns on the San Carlos Apache Reservation can be requested through the Inter Tribal Council of Arizona's Transportation Working Group.

State of Arizona

The Apache-Sitgreaves NFs is located in the State of Arizona. State regulatory agencies, as well as adjacent State-owned lands, affect the management of the national forests.

Arizona Department of Environmental Quality

The Arizona Department of Environmental Quality's mission is to protect and enhance public health, welfare, and the environment in Arizona. The agency serves as the State's environmental regulatory agency in the areas of air and water quality and waste programs. Forest management activities strive to be in compliance with the applicable Arizona Revised Statutes (particularly Title 49 which outlines specifics such as water quality standards and total maximum daily loads).

Arizona Department of Water Resources

The Arizona Department of Water Resources (ADWR) mission is to secure long-term dependable water supplies for Arizona (ADWR, 2011). The ADWR administers and enforces the State's groundwater code and surface water rights laws. Title 45 of the Arizona revised statutes contains the provisions related to water and groundwater resources.

Arizona Department of Agriculture

The Arizona Department of Agriculture is the State's regulatory agency for agriculture, including animals, plants, and environmental services (ADA, 2010). Title 3 of the Arizona Revised Statutes contains the provisions related to agricultural topics such as dangerous plant pests and diseases, pesticides, brands and marks, and seizure of livestock.

Arizona Department of Transportation

The Arizona Department of Transportation (ADOT) is responsible for planning, building, and operating a state highway system and maintaining bridges.

Improvement and Construction

The State Transportation Improvement Program (STIP) for Fiscal Years 2010-2013 (ADOT, 2010) was completed in January 2010. The 2011-2015 Five-year Transportation Facilities Construction Program was approved on June 23, 2010. These documents identify planned improvements and construction over the next several fiscal years. The planned improvements to the following highways and forest highways may affect forest management:

- Forest Highway 43-1 Sunrise Park to Big Lake – FY2010 grading, drainage and paving work were initiated; project expected to be complete in FY2013
- State Route 260 Heber to Show Low – FY2011 construct passing lanes
- U.S. Highway 60 Show Low to Little Mormon Lake – FY2014 widen highway
- National Scenic Byways Statewide – FY2011 install signs

Several highway improvement studies are also underway.

Long Range Planning

ADOT's long-range transportation plan for 2010-2035 was completed in November 2011 (ADOT, 2011). It serves as the principal high-level capital programming guide for ADOT and identifies broader statewide transportation investment needs.

Scenic Byways

The Arizona Department of Transportation's Environmental and Enhancement Group prepared the "Coronado Trail Corridor Management Plan" in March 2005. This plan identifies the goals and objectives for the byway corridor.

Arizona Game and Fish Department

The Arizona Game and Fish Department's (AZGFD) Strategic Plan for the Years 2007-2012 Wildlife 2012 (AZGFD, 2007) provides the management direction for the department's program of work. The plan contains several goals and objectives that may have an impact on Apache-Sitgreaves NFs management:

- Wildlife Resource Management – Conserve, preserve, enhance, and restore wildlife populations and their habitats.
- Wildlife Recreation – Increase the opportunity for the public to enjoy Arizona's wildlife resources, while maintaining and improving wildlife resources. In addition, address the underlying reasons for denial of public access across private lands by providing technical and financial assistance to private landowners and educating the public about ethical use and habitat protection.
- Public Awareness, Support and Involvement – Maintain an informed and supportive public that recognizes its ownership and stewardship responsibilities for wildlife resources and helps to disseminate and act upon messages about watercraft safety and the safe, responsible and ethical use of off-highway vehicles.
- Off-highway Vehicle, Watercraft and Shooting Sports Recreation Goals – Increase the opportunity for the public to enjoy shooting sports. Encourage participation in education and information programs supporting safe and responsible use of off-highway vehicles and watercraft, while maintaining or improving wildlife resources and habitats.
- Customer Diversity – Increase customer diversity to better reflect the demographics of Arizona.
- Partnerships – Maintain and develop effective partnerships that enable the Department and its partners to reach mutual goals.

The Arizona State Wildlife Action Plan, titled "Arizona's Comprehensive Wildlife Conservation Strategy: 2005-2015" (AZGFD, 2006) provides the vision for managing Arizona's fish, wildlife, and wildlife habitats over the next 10 years. The plan contains several key elements which may provide information to or have an impact on Apache-Sitgreaves NFs management:

- Species of Greatest Conservation Need – The AZGFD prioritized a list of species for conservation actions aimed at improving conditions for those species through intervention at the population or habitat level. Over 300 species were identified as being vulnerable or the species with the greatest conservation needs.
- Habitats of Greatest Conservation Need – The AZGFD divided the State into 17 vegetation types. All of these habitats were treated as habitat in need of conservation. A statewide habitat analysis that answers the question of where to focus in each habitat has not been completed.
- Stressors/Threats to Arizona's Wildlife and Wildlife Habitats – The AZGFD identified 70 stressors that have serious impacts to habitat in Arizona and an additional 4 stressors

that act on species alone. The stressors were categorized into a rapidly increasing human population, changes to water storage and delivery systems in the Southwest, alteration of communities by invasive nonnative species, and the ongoing drought and warming trend.

- Conservation Actions for Arizona's CWCS – The AZGFD identified several action items to address stressors, these action items will be implemented where feasible and appropriate.

Arizona State Forestry Division

The Arizona State Forester oversees the Arizona State Forestry Division (ASFD). The ASFD mission is to manage and reduce wildfire risk to Arizona's people, communities, and wildland areas and provide forest resource stewardship through strategic implementation of forest health policies and cooperative forestry assistance programs. In 2010, the ASFD released the "Arizona Forest Resource Assessment" (Arizona State Forestry Division, 2010) and "Arizona Forest Resource Strategy" (Arizona State Forestry Division, 2010a).

The strategy identifies major resource issues and their related goals. The Apache-Sitgreaves NFs is a key partner and stakeholder in helping to implement this strategy.

- People and Forests-Goal 1: People and communities receive maximum benefits from forests and trees.
- People and Forests-Goal 2: Minimized human impacts to trees and forests.
- Ecosystem Health-Goal 1: Resilient and diverse ecosystem structures, processes, and functions.
- Ecosystem Health-Goal 2: Progress toward landscape scale outcomes, restoration of unhealthy ecosystems, and enhanced sustainability with limited negative impacts.
- Water-Goal 1: Improved water quality and quantity from forested watershed.
- Water-Goal 2: Improved health and resiliency of forested aquatic systems (riparian areas, springs, and wet meadows.)
- Water-Goal 3: Increased public understanding of the importance of forests to Arizona's water quality.
- Air-Goal 1: Improved air quality.
- Air-Goal 2: Increased public understanding of the importance and effects of fire on Arizona's air quality.
- Fire-Goal 1: Wildland ecosystems where appropriate fire regimes maintain health and resiliency of natural vegetation.
- Fire-Goal 2: "Fire Adapted Communities" that provide shared stakeholder responsibility for healthy landscapes and wildfire prepared communities.
- Fire-Goal 3: Enhanced wildland fire management capacity in Arizona.
- Fire-Goal 4: An Arizona public and government leadership that is well informed about wildland fire management, science, and prevention issues.
- Economics-Goal 1: Realized long-term economic potential of sustainable forest products and bioenergy (while achieving Ecosystem Health goals).
- Economics-Goal 2: Protection of areas with economic development potential related to ecosystem services.

- Economics-Goal 3: Community recognition of the economic importance to protecting healthy natural systems.
- Climate Change-Goal 1: Increased resilience of ecosystems to climate change.
- Climate Change-Goal 2: Reduced rate of future climate change through maximized carbon sequestration in Arizona forests and trees.
- Culture-Goal 1: Improved communication between all land management agencies, indigenous tribes, and other cultural groups about varying perspectives and beliefs related to forests, trees, and other natural resources.
- Culture-Goal 2: Effective collaboration mechanisms for sharing of information about resources, priorities, policies, and management strategies between Tribes and non-Tribal organizations.

Arizona State Land Department

The practice of allocating public lands for various beneficiaries in Arizona dates back to the founding of the territory in 1863. The current system of managing these lands, referred to as State Trust lands, was established with the Arizona State Land Department (AZSLD) in 1915 (AZSLD, 2011a and 2011b).

Since its inception, the AZSLD has been granted authority over all trust lands as well as the natural products they provide. This authority over trust land is central to the AZSLD's primary mission of maximizing revenues for its beneficiaries, a role that distinguishes it from other agencies charged with management of public lands (e.g., national parks, national forests, state parks).

As of 2008, the AZSLD managed over 9 million acres in land holdings for 14 beneficiaries, the most prominent of which is the K-12 public school system. Most of the state lands can be used for livestock grazing purposes only. Public use of the lands is regulated by permit. A recreational permit allows the signatory limited privileges to use State Trust Land for some recreation, namely hiking, horseback riding, picnicking, bicycling, photography, sightseeing, and bird watching. Camping is restricted to no more than 14 days per year. Off-highway vehicle travel on State Trust Land is not permitted without proper licensing.

The AZSLD may dispose of (exchange) or lease the lands for natural resource use or commercial development purposes. Since state lands border much of the national forests, especially the southern portion of the Apache NF and the northern portions of both the Apache NF and Sitgreaves NF, any changes in management could affect the management of the Apache-Sitgreaves NFs. The AZSLD prepares a five-year plan that presents potential areas of concern to initiate land sales and long term leases. As of July 2012, this plan was not available.

Arizona State Parks

The mission of the Arizona State Parks (ASP) is to manage and conserve Arizona's natural, cultural, and recreational resources for the benefit of the people, both in the parks and through their partners (Arizona State Parks, 2010).

ASP manages several parks across Arizona. Four of these parks are near or on the Apache-Sitgreaves NFs; these include Fool Hollow Lake, Lyman Lake, Tonto Natural Bridge, and Roper

Lake. The Fool Hollow Lake Recreation Area, located on the Apache-Sitgreaves NFs, is operated by ASP.

Arizona State Parks have seen a continual increase in visitation over the years, with over 1,000,000 visitors in 1985 to over 2,000,000 visitors in 2010 (Arizona State Parks, 2010). The State and National financial crisis impacted the management of state parks. In FY2010, the ASP reduced the number of employees and closed 13 of its 28 parks (Arizona State Parks, 2010).

The 2008 "Arizona Statewide Comprehensive Outdoor Recreation Plan" (SCORP) identifies the State's outdoor recreation priorities. The priority issues include secure sustainable funding, plan for growth/secure open space, resolve conflicts, improve collaborative planning and partnerships, respond to the needs of special populations and changing demographics, fill the gaps between supply and demand, secure access to public lands and across State Trust Lands, protect Arizona's natural and cultural resources, and communicate with and educate the public (Arizona State Parks, 2007). Several action items have the potential to influence NFS lands:

- Look holistically across geographic boundaries, disciplines, governments, private interests, and generations and examine all benefits and costs, not just fiscal costs (in reference to growth).
- Expand options such as private landowner incentive programs and recreational liability laws, which would allow public access across private and State and Federal leased lands,
- Provide for OHV use on public lands but manage it properly, to reduce conflicts with other recreation users and minimize the activity's impacts on natural and cultural resources, as is done for other recreational activities. Implement standards for constructing sustainable OHV routes, involving user groups in planning, building and maintaining satisfactory routes and facilities, and enacting and enforcing consistent OHV laws and regulations.
- State and Federal agencies should implement coordinated interagency planning efforts for new recreational areas and trail systems to ensure an equitable regional distribution of desired recreational opportunities and access to natural environments.

The SCORP also identifies the major impacts and trends related to outdoor recreation in Arizona. Arizona offers a wide variety of outdoor recreation opportunities with 6 national forests, 21 national park sites, 8 national wildlife refuges, 8 Bureau of Land Management field offices, 21 American Indian tribes, 30 State Parks, 23 State wildlife areas, and hundreds of county and city parks and recreation areas. These public lands provide opportunities for activities such as picnicking, developed and primitive camping, wilderness backpacking, hiking, mountain biking, horseback riding, cross-country skiing, wildlife watching, hunting, fishing, boating, water skiing, rock climbing, four-wheel driving, motorized trail biking, all-terrain vehicle riding, and snowmobiling, among others (Arizona State Parks, 2007).

The Arizona Trails 2010: State Motorized and Nonmotorized Recreation Trails plan provides information and recommendations to guide ASP and other agencies in their management of trails. The priority recommendations for motorized trails are protect access to trails/acquire land for public access; maintain and renovate existing trails and routes; mitigate and restore damage to areas surrounding trails, routes, and areas; and establish and designate motorized trails, routes, and areas. The priority recommendations for nonmotorized trails are maintain existing trails, keep trails in good condition, and protect access to trails/acquire land for public access (Arizona State Parks, 2009).

Governor's Forest Health Council

In 2003, Governor Janet Napolitano formed the Forest Health Advisory Council and the Forest Health Oversight Council in response to the growing number, frequency, and intensity of uncharacteristic wildfires threatening Arizona's resources and communities. In 2007, the councils produced the "Statewide Strategy for Restoring Arizona's Forests" (Governor's Forest Health Council, 2007). The report identifies five key strategies:

1. Increase the human and financial resources dedicated to restoring Arizona's forests and protecting communities.
2. Coordinate and implement action at the landscape scale.
3. Increase the efficiency of restoration, fire management, and community protection activities.
4. Encourage ecologically sustainable, forest-based economic activity.
5. Build public support for accomplishing restoration, community protection, and fire management across the state.

Federal

Other Federal agencies affect the management of the Apache-Sitgreaves NFs, either because they have lands that adjoin the forests (e.g., Bureau of Land Management, other national forests), they manage features that occur on the national forest (e.g., Federal Highway Administration), or they have oversight responsibilities (e.g., U.S. Fish and Wildlife Service).

Bureau of Land Management

The majority of Bureau of Land Management (BLM) land adjacent to the Apache-Sitgreaves NFs occurs on the southern border of the Apache NF and is administered by the Safford Field Office. The 1991 "Safford District Resource Management Plan" (BLM, 1991) provides guidance to the district in the management of its resources. The plan addresses the following issues: access, area of critical environmental concerns and other types of special management areas, off-highway vehicles, riparian areas, wildlife habitat, lands and realty, outdoor recreation and visual resource management, energy and minerals, cultural resources, soil erosion, vegetation, water resources, air quality, and paleontological resources.

The focus of active management includes riparian improvement treatments, wildlife habitat improvement projects (including prescribed fire and suppression), soil erosion reduction, land treatments or vegetation manipulation including mechanical, chemical or prescribed fire, and firewood cutting. The majority of the public lands are managed to limit off-highway vehicle use to existing roads and trails. The 1,708-acre Hot Well Dunes is open to off-highway vehicle use anywhere in the area (Brady, 2011).

The only Area of Critical Environmental Concern (ACEC) or Coordinated Resource Management Plan Area that borders the Apache-Sitgreaves NFs is the 120-acre Coronado Mountain Research Natural Area (RNA) ACEC. This area is managed to exclude rights-of-way, mineral entry and woodcutting; use prescribed fire; and preserve its scenic quality.

Future Activities

A review of the 2011 NEPA Project Log for the Safford Field Office (BLM, 2011) showed that no projects are currently planned. However, personal communication with the district staff highlighted activities that are occurring near Apache-Sitgreaves NFs lands: renewable energy (including windfarm installations north of the forest and potential energy transmission corridors), potential juniper thinning on BLM lands north of the forest, and burning south of the forests.

The district has several ongoing projects (Aravaipa Ecosystem Management Plan, Proposed SunZia Southwest Transmission Line Project, Chiricahua FireScape Project), although they occur in the southeastern part of the State.

Federal Highway Administration

The role of the Federal Highway Administration (FHA) is to ensure that America's roads and highways are safe and technologically up-to-date. Although most highways are owned by State, local, and tribal governments, FHWA provides financial and technical support (FHA, 2011). The Federal Lands Highways funding provides dollars for roads and highways within federally owned lands, such as national forests.

The Central Federal Lands Highway division, of which Arizona is a part, is in the process of developing its long-range transportation plan (FHA, 2010). The planning effort has identified two major trends: (1) Arizona population is increasing primarily in urban areas, and (2) forest visitation and recreation is increasing as a result of population increase. Within Arizona, 12 percent of the paved forest highway network is rated as poor or failed, while 7 percent of the unpaved network is rated as poor or failed and 3 percent of the bridges are in poor condition. Forest Highway 43 improvements, including paving, were completed as of January 2011. These upgrades to the highway have the potential to change visitor use.

Table 200. Forest highways located on the Apache-Sitgreaves NFs

Forest Highway	Owner	Road Type	Condition
FH 41	Federal	Paved	Poor
FH 40	Federal	Unpaved	Good
FH 11 (SR 260)	State	Paved	Good
FH 30	State	Paved	Excellent
FH 43 (SR 273)	State	Paved	Excellent
FH 35 (SR 261)	State	Paved	Fair
FH 20 (U.S. 180)	State	Paved	Good
FH 42	Federal	Unpaved	Good
FH 19 (U.S. 191)	State	Paved	Fair

Forest Service

Three national forests border the Apache-Sitgreaves NFs: the Coconino, Tonto, and Gila National Forests. Each of these forests' management is guided by a land management plan. The Coconino National Forest is currently in the process of revising their plan; the Tonto and Gila National Forests are expected to revise their plans in the near future. As forest management changes are proposed, the forests coordinate and adjust their management strategies as appropriate.

Coconino National Forest

The Coconino National Forest is managed by their forest plan originally developed in August 1987 (Forest Service, 1987). The plan identifies several forestwide goals for 19 topic areas, including (1) outdoor recreation, (2) wilderness, (3) wildlife and fish, (4) riparian, (5) range, (6) noxious and invasive weeds, (7) timber, (8) soil, water and air quality, (9) minerals, (10) lands, (11) transportation and administrative facilities, (12) protection, (13) law enforcement, (14) research natural areas, botanical areas, and geological areas, (15) Elden environmental study area, (16) public affairs, (17) human resources, (18) land management planning, and (19) general administration.

The management areas of the Coconino NF that border the western edge of the Apache-Sitgreaves NFs are the following:

- Management Area 10: Grassland and Sparse Piñon-Juniper Above the Rim – The management emphasis is range management, watershed condition, and wildlife habitat. Other resources are managed to improve outputs and quality. Emphasis is on prescribed burning to achieve management objectives.
- Management Area 7: Piñon-Juniper Woodland, Less than 40 Percent Slope – The management emphasis is firewood production, watershed condition, wildlife habitat, and livestock grazing. Other resources are managed in harmony with the emphasized resources.
- Management Area 6: Unproductive Timber Land – Emphasis is a combination of wildlife habitat, watershed condition, and livestock grazing. Other resources are managed in harmony with the emphasized resources.
- Management Area 3: Ponderosa Pine and Mixed Conifer, Less than 40 Percent Slope – Emphasis is a combination of multiple-uses including a sustained yield of timber and firewood production, wildlife habitat, livestock grazing, high quality water, and dispersed recreation.
- Management Area 19: Mogollon Rim – Emphasis is dispersed and developed recreation, visual quality, and wildlife travel corridors across the Rim, generally the heads of major canyons running to the northeast. Dwarf mistletoe is aggressively treated.

The Coconino NF is currently in the process of revising their forest plan.

Gila National Forest

The Gila National Forest is managed by their forest plan, originally published in September 1986 (Forest Service, 1986). The plan identifies goals in 17 topic areas including (1) range, (2) recreation, (3) wilderness, (4) timber, (5) wildlife and fish habitat, (6) minerals, (7) soil and water, (8) riparian, (9) air quality, (10) fire, (11) law enforcement, (12) lands and special uses,

(13) facilities, (14) cultural resources, (15) land management planning, (16) human resources, and (17) research natural areas.

The management areas of the Gila NF that border the Apache-Sitgreaves NFs from north to south along the New Mexico border are the following:

- Management Area 3D – management emphasis is to provide for a long term increase of about 20 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive to roaded natural.
- Management Area 3B – management emphasis is to provide for a long-term increase of about 40 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive to roaded natural.
- Management Area 3A – management emphasis is to provide for a long-term increase of about 60 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from primitive to roaded natural.
- Management Area 4B – management emphasis is to provide for a long-term increase of about 10 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from primitive to roaded natural.
- Management Area 7 – management emphasis is to provide for a long-term increase of about 30 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive motorized to roaded natural.
- Management Area 4C – management emphasis is to provide for a long-term increase of about 20 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive to roaded natural.

Tonto National Forest

The Tonto National Forest is currently managed by their forest plan originally developed in October 1985 (Forest Service, 1985). The plan identifies five forestwide goals for the following topics: (1) soil water and air quality, (2) fire management, (3) pest management, (4) wildlife and fish, and (5) transportation and utility corridors.

There is only one Tonto NF management area that lies adjacent to the Apache-Sitgreaves NFs:

- Management Area 4D: Payson Ranger District, Mogollon Rim Area – The management emphasis is to manage for a variety of renewable resource outputs with primary emphasis on intensive, sustained yield timber management, timber resource protection, creation of wildlife habitat diversity, increased populations of harvest species and recreation opportunity. Recreation opportunities range from semi-primitive to urban.

Four-Forest Restoration Initiative

The Four-Forest Restoration Initiative is a collaborative effort to restore forest ecosystems on portions of four national forests—Coconino, Kaibab, Apache-Sitgreaves, and Tonto—primarily along the Mogollon Rim in northern Arizona. Environmental analysis for the proposed action began in 2010 and the contract to begin implementation was awarded in 2012.

The overall goal of the four-forest effort is to create landscape-scale restoration approaches that provides for fuels reduction, forest health, and wildlife and plant diversity. A key objective is doing this while creating sustainable ecosystems in the long term. Businesses play a key role in the effort by harvesting, processing, and selling wood products. This reduces treatment costs and provides restoration-based work opportunities that create jobs.

U.S. Fish and Wildlife Service

The main role of the U.S. Fish and Wildlife Service's (USFWS) is to administer the Endangered Species Act (ESA) (USFWS, 2011). Section 7 (a)(1) of the ESA directs Federal agencies to aid in conservation of listed species and section 7 (a)(2) requires that agencies, through consultation with the USFWS, ensure that their activities are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat. As projects and activities are planned, forest managers consult with the USFWS.

The USFWS also issues national polices to promote the conservation and recovery of listed species, including species recovery plans. The USFWS is in the process of developing a strategic plan to react to climate change.

The USFWS manages the National Wildlife Refuge System; there are no refuges near the Apache-Sitgreaves NFs. They occur primarily in the far west and southern portions of Arizona and central New Mexico.

Other Landowners

The Apache-Sitgreaves NFs border and surround other ownerships besides those listed above. There is no known inventory of these landowners' activities and potential impacts to the forests.

Conclusion

As identified above, other landowners and land policies have the potential to impact the Apache-Sitgreaves NFs and vice-versa. In the development of the land management plan, these considerations have been taken into account. Table 201 identifies some of the key potential impacts and how the proposed plan deals with those impacts. Table 202 identifies potential activities on adjacent lands that may impact forest management. Impacts of actions on adjacent

lands are analyzed in the cumulative environmental consequences section of chapter 3 in the FEIS. No major conflicts with Forest Service planning have been identified at this time.

Table 201. Potential impacts to forest management and their relationship to the proposed plan

Potential Impacts/Issues	How the Proposed Plan Addresses
Call for multiple use of the forests	The overall goal of managing National Forest System lands is to sustain the multiple uses of its resources in perpetuity while maintaining the long-term productivity of the land. The proposed plan carries out that goal.
Community growth demand	The proposed plan identifies a management emphasis to work with local communities to understand their community expansion needs and retain access to NFS land.
Danger from wildfire for residents living in a wildland-urban interface	**Desired Condition:** Human life, property, and natural and cultural resources are protected within and adjacent to NFS lands. **Desired Condition:** The composition, density, structure, and mosaic of vegetative conditions reduce uncharacteristic wildfire hazard to local communities and forest ecosystems. **Desired Condition:** Forest visitors have access to information about topics of concern related to the Apache-Sitgreaves NFs (e.g., ecosystem restoration, unmanaged recreation, uncharacteristic wildfire), including appropriate visitor behavior (e.g., follow forest orders, pack out trash, appropriate sanitation, wildfire prevention). The vegetative treatment objectives are prioritized in priority watersheds and areas identified in community wildfire protection plans. The proposed plan contains a “Wildland Fire Management” section that describes the Apache-Sitgreaves NFs’ management intent for wildland fire. The “Landscape Scale Disturbance Events” section provides direction for protecting existing resources and facilitating recovery of soil and vegetation components following a large disturbance.
Improve forest health and promote the restoration of ecosystems	The desired conditions describe a healthy, sustainable forest and the objectives identify actions that would help restore ecosystems. The proposed plan’s management focus is on achieving satisfatory watershed conditions and restoring ecological functions, especially natural fire regimes. **Objective:** During the planning period, improve the condition class on at least 10 priority 6th level HUC watersheds by removing or mitigating degrading factors.
Maintain a healthy, sustainable forest that provides raw materials	**Desired Condition:** The Apache-Sitgreaves NFs provide a sustainable supply of forest products (e.g., small roundwood, sawlogs, biomass, firewood, cones, Christmas trees,wildings) to business and individuals within the capability of the land.
Forest-related jobs for the local economy	Timber production and tree cutting continue and contribute to the local and regional economy. Other multiple uses of the forests, including recreation, range, and wildlife also contribute to the local economy. See the “Socioeconomic Resources” section of the FEIS.
Support local traditional custom and culture	The uses of livestock grazing, timber harvesting, mining, and hunting continue to be allowed in the proposed plan. The proposed plan acknowledges that many local residents have traditional ties, such as forest product collection, hunting, holiday celebrations, and annual picnics.

Potential Impacts/Issues	How the Proposed Plan Addresses
	Loggers and ranchers continue to be an important part of the forests' history and their traditional uses remain an important part of the cultural landscape.
Rangeland resources management	The proposed plan promotes adaptive management to balance use by livestock, wild horses, and wildlife with estimated short- and long-term forage production. The plan provides direction to manage livestock grazing, invasive species (e.g., feral horses), and the Heber Wild Horse Territory.
Protect private property rights	The proposed plan honors the continuing validity of private, statutory, or pre-existing rights.
Consider local concerns, collaborate with government agencies, consult with tribes	Throughout the proposed plan, there is a management emphasis on collaboration and cooperation with Federal, State, and local governments, tribes, and stakeholders.
Growing demand for recreation (e.g., hiking trails, designated OHV routes)	**Desired Condition:** The Apache-Sitgreaves NFs offer a spectrum of recreation settings and opportunities varying from primitive to rural and dispersed to developed, with an emphasis on the natural appearing character of the forests. Although the proposed plan does not identify specific new developments, it does allow for it, if needed. The proposed plan focuses on maintaining existing recreation opportunities and improving their quality.
Manage recreation and impacts to communities	The Apache-Sitgreaves NFS lands provide less developed opportunities than residents and visitors find in urban settings, such as greenbelts and parks. **Desired Condition:** The construction or placement of fences and gates, structures, signs, or other private property on NFS land (occupancy trespass) rarely occurs. Disposal of personal property (e.g., dumping) rarely occurs on NFS lands. **Guideline:** Access points to NFS land from adjacent non-NFS developments and subdivisions should be limited and provide all residents (not just edge lot owners) common entry points. Individual access points should be discouraged to minimize the development of unauthorized roads or trails.
Tribal use and traditional cultural properties	**Desired Condition:** Significant cultural resources (i.e., archaeological, historic, traditional cultural properties (TCP), known American Indian sacred sites) are preserved and protected for their cultural importance and are free from adverse impacts. **Desired Condition:** Members of affiliated tribes have access to gather forest resources and products for traditional cultural purposes (e.g., medicinal plants, boughs, basket materials, pollen, and plants and minerals for pigments). **Desired Condition:** Traditionally used resources are not depleted and are available for future generations. **Desired Condition:** Sacred sites and significant TCPs are accessible and free of adverse impacts allowing for culturally affiliated tribes to gather traditional forest products and conduct ceremonies. **Desired Condition:** All sacred objects, human remains, funerary objects, and objects of cultural patrimony removed from lands of Apache-Sitgreaves NFs have been repatriated to the appropriate tribe.
Conserve, preserve, enhance, and	**Desired Condition:** Habitat quality, distribution, and abundance exist to

Potential Impacts/Issues	How the Proposed Plan Addresses
restore wildlife and their habitats	support the recovery of federally listed species and the continued existence of all native and desirable nonnative species. **Desired Condition:** Habitat is well distributed and connected. In addition, the proposed plan focuses on restoring vegetative conditions and wildlife habitat. **Desired Condition:** Large blocks of habitat are interconnected, allowing for behavioral and predator-prey interactions, and the persistence of metapopulations and highly interactive wildlife species across the landscape. Ecological connectivity extends through all plant communities. **Desired Condition:** Wildlife are free from harassment and disturbance at a scale that impacts vital functions (e.g., breeding, rearing young) that could affect persistence of the species. The proposed plan also contains other desired conditions that benefit wildlife, including vegetation-specific desired conditions. In addition, the Wildlife Quiet Area Management Area focuses on wildlife habitat.
Provide opportunities for wildlife-related recreation	**Desired Condition:** Dispersed recreation opportunities (e.g., hunting, fishing, hiking, camping) are available and dispersed recreation sites (e.g., campsites, trailheads, vistas, parking areas) occur in a variety of ROS classes throughout the forests. **Objective:** Within the planning period, work with the AZGFD, ADOT, and other partners to provide at least 10 new wildlife viewing opportunities.
Minimize impacts from invasive species	**Desired Condition:** Invasive species (both and animal) are nonexistent or in low occurrence to avoid negative impacts to ecosystems. **Objective:** Annually, contain, control, or eradicate invasive species (e.g., musk thistle, Dalmatian toadflax) on 500 to 3,500 acres. **Objective:** Annually, control or eradicate invasive species (e.g., tamarisk, bullfrogs) on at least 2 stream miles.
Provide opportunities for shooting sports, off-highway vehicles, and watercraft	The proposed plan continues to allow these activities. The plan provides the framework for future travel management planning.
Mineral and energy development	The proposed plan provides direction to manage existing and potential mineral and development. It includes suitability determinations for energy corridor, other energy development, and communications sites.
Threats related to changes in water availability	**Desired Condition:** Water developments contribute to fish, wildlife, and riparian habitat as well as scenic and aesthetic values. **Desired Condition:** Apache-Sitgreaves NFs water rights are secure and contribute to livestock, recreation, wildlife, and administrative uses. **Desired Condition:** Surface water is not diminished by groundwater pumping. **Desired Condition:** Dams, diversions, or other water control structures are designed, maintained, and operated to conserve water resources.
Threats related to changes in climate	Appendix A of the proposed plan provides information and discussion about climate change and considerations for land management planning

Potential Impacts/Issues	How the Proposed Plan Addresses
Public education to benefit wildlife	**Desired Condition:** Forest visitors have access to information about topics of concern related to the Apache-Sitgreaves NFs (e.g., ecosystem restoration, unmanaged recreation, uncharacteristic wildfire), including appropriate visitor behavior (e.g., follow forest orders, pack out trash, appropriate sanitation, wildfire prevention). **Desired Condition:** Forest visitors have access to information about the features of the Apache-Sitgreaves NFs, its ecosystems, multiple uses, and other management aspects of the forests. **Desired Condition:** Interpretive information (e.g., ecology, wildlife, cultural resources, unique geologic features, Forest Service mission) is available to forest visitors at Apache-Sitgreaves NFs visitor centers, administrative offices, recreation sites, and along major forest roadways.
Other	Appendix A of the FEIS addresses other potential impacts/issues highlighted during the 90-day public comment period.

Table 202. Activities on adjacent lands that may impact forest management

Activities	Possible Impact on Forest Management
Changes in land ownership	Commercial harvesting and thinning, forest restoration and thinning, removal of overstory trees/juniper treatments
Highway improvements	Prescribed fires
Fire suppression	Recreation improvements and new construction
Permitted recreation use (restrictions on types of uses)	Renewable energy development (e.g., wind farms, energy corridors)
Removal of nonnative fish species and restoration of native aquatic species	Continued livestock grazing
Noxious and invasive weed treatments	Four-Forest Restoration Initiative

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Appendix D. Management Area Descriptions

This appendix describes the management areas used in the alternatives. The action alternatives share a similar set of management areas. The no action alternative (1987 plan) used a different set of management areas. The management areas are described in this appendix and table 203 shows how they generally relate to one another.

Table 203. Crosswalk showing the general comparison of the action alternatives and the no action alternative management areas

Action Alternative Management Area		No Action Alternative Management Area(s)
General Forest	=	Forest Land, Woodland, Grasslands, Riparian, Water
Community-Forest Intermix	=	The 1987 plan does not contain a similar management area
High Use Developed Recreation Area	=	Developed Recreation Site
Energy Corridor	=	The 1987 plan does not contain a similar management area
Wild Horse Territory	=	The 1987 plan does not contain a similar management area
Wildlife Quiet Area	=	The 1987 plan does not contain a similar management area
Natural Landscape	=	The 1987 plan does not contain a similar management area
Recommended Research Natural Area	=	Research Natural Area
Research Natural Area	=	Research Natural Area
Primitive Area	=	Blue Range Primitive Area and Additions
Recommended Wilderness	=	The 1987 plan does not recommend any areas for wilderness designation
Wilderness	=	Bear Wallow Wilderness, Escudilla Wilderness, Mount Baldy Wilderness

Management Areas – Action Alternatives

There are 12 management areas identified in the action alternatives. A brief description of each follows. For more detailed information about these management areas, including suitability of various uses, see the proposed plan.

- **General Forest:** This management area allows the broadest variety of uses. These areas are managed to restore ecosystem integrity while providing for sustainable economic and social values and uses. A variety of forest products (commercial and noncommercial) are available that may contribute to local and regional communities. This management area contains undeveloped areas as well as developed facilities and open roads and trails.
- **Community-Forest Intermix:** This management area includes lands within ½ mile of communities-at-risk. Due to the threat of wildfire moving into or from developed areas, higher levels of management, including regular maintenance, may be needed to restore fire-adapted ecosystems.
- **High Use Developed Recreation Area:** This management area includes areas with high levels of developed recreation use that provide a wide variety of opportunities to a broad

spectrum of visitors. High use developed recreation areas contain one or more facilities and may accommodate large numbers of people.

- **Energy Corridor:** This management area includes the three existing high power energy corridors. It is limited to the existing rights-of-way corridor. This area is managed to facilitate the operation and maintenance of the energy infrastructure.
- **Wild Horse Territory:** This management area contains the Heber Wild Horse Territory. The territory was established in 1973 under the Wild Free Roaming Horse and Burro Act of 1971 with the purpose of providing use by and for the protection of wild horses.
- **Wildlife Quiet Area:** This management area provides relatively undisturbed habitat where big game and other wildlife can reside with minimal disturbance from motorized vehicle use. Management activities, including habitat improvement projects, may occur in this area.
- **Natural Landscape:** This management area is managed to retain its natural appearance and low level of development. It provides primitive and semi-primitive recreation opportunities, both nonmotorized and motorized. Management activities for ecological restoration purposes may occur, but are limited.
- **Research Natural Area:** This management area is managed for scientific study and education. It also contributes to the maintenance of biological diversity.
- **Recommended Research Natural Area:** These areas are recommended for designation as research natural areas.
- **Wilderness:** Wilderness is managed to protect its values according to the Wilderness Act of 1964. Wilderness areas provide opportunities for solitude or a primitive and unconfined type of recreation and other ecosystem and societal benefits.
- **Primitive Area:** This management area consists of the Blue Range Primitive Area and the Presidential recommended additions to the area. It is managed similar to wilderness, with one exception; the area is open to mineral prospecting and mineral development.
- **Recommended Wilderness:** These areas are recommended for wilderness designation and are managed to retain wilderness characteristics.

Management Areas – No Action Alternative

There are 17 management areas used in the no action alternative (1987 plan). A brief description of each management area follows. For more details, see the 1987 “Apache-Sitgreaves National Forests Plan” (Forest Service, 1987).

- **Forest Land:** Forested lands managed for a variety of values and uses.
- **Woodland:** Woodlands managed for a variety of values and uses.
- **Riparian:** Riparian areas managed to maintain or improve conditions.
- **Grasslands:** Grasslands managed for a variety of values and uses.
- **Developed Recreation Sites:** This management area includes developed recreation facilities and the areas surrounding them.
- **Mount Baldy Wilderness:** Managed to protect wilderness values.
- **Blue Range Primitive Area and Additions:** Managed similar to wilderness, except open for mineral prospecting and development.
- **Escudilla Demonstration Area:** Area for scientific research on a variety of forest management practices.

- **Research Natural Area:** This management area contains one research natural area and four recommended areas that are managed for scientific study and education.
- **Water:** Management emphasis is the production of fish and wildlife and dispersed recreation use.
- **Bear Wallow Wilderness:** Managed to protect wilderness values.
- **Escudilla Wilderness:** Managed to protect wilderness values.
- **Black River:** Managed for possible inclusion into the Wild and Scenic River System.
- **West Fork Black River:** Managed for possible inclusion into the Wild and Scenic River System.
- **Chevelon Canyon:** Managed for possible inclusion into the Wild and Scenic River System.
- **East and West Forks Little Colorado River:** Managed for possible inclusion into the Wild and Scenic River System.
- **Sandrock:** An area deferred from livestock grazing to accelerate recovery of the watershed.

Appendix E. Other Supporting Documentation

The "Plan Set of Documents" is the complete set of documentation supporting the land management plan. It includes, but is not limited to, evaluation reports, documentation of public involvement, the plan including applicable maps, background documents, and applicable NEPA documents. The "Plan Set of Documents" is available in the Supervisor's Office.

Some of the key components of the "Plan Set of Documents" are outlined in table 204.

Table 204. Other supporting documentation for the FEIS

Document	Description
FEIS Supporting Documents	
Specialist Reports: Air Quality, Soil, Water, Riparian, Watershed, Fisheries, Vegetation, Forest Health, Fire, Wildlife, Invasive Species, Recreation, Infrastructure, Eligible and Suitable Wild and Scenic Rivers, Wilderness Resources and Inventoried Roadless Areas, Research Natural Areas, Scenic Resources, Lands, Cultural Resources, American Indian Rights and Interests, Forest Products, Livestock Grazing, Minerals and Geology, and Socioeconomic	Specialist reports include supplementary information that may not appear in the FEIS including methodology, relevant laws, regulations, and policy, assumptions, adaptive management considerations, and other planning efforts.
Biological Assessment and Biological Evaluation	Evaluation of the effects of the preferred alternative to federally listed species and Regional Forester designated sensitive species.
Biological Opinion	The Biological Opinion is the result of the consultation process with USFWS and includes Incidental Take Statements, Conservation Recommendations, Reasonable and Prudent Measures, and Terms and Conditions relating to listed species which occur on the forests.
Species Viability Evaluations	Species viability evaluations are documented in the wildlife and fisheries specialist reports.
2012 Report on the Selection of Management Indicator Species and Ecological Indicators	Documents the process and rational for selection of management indicator species (MIS) and ecological indicators (EI).
Apache-Sitgreaves National Forests Other Lands and Land Use Plans (May 2011)	A review of the planning and land use policies of other Federal agencies, State and local governments, and American Indian tribes.
Suitability Analyses	Suitability analyses for livestock grazing, timber, and recreation can be found in the respective specialist report.
Eligibility Report for the National Wild and Scenic River System (May 2009) Addendum to the Eligibility Report for the National Wild and Scenic River System (April 2012)	Documents the administrative review process, required by Forest Service policy, to identify rivers that are eligible for inclusion in the National Wild and Scenic River System. The addendum updates river conditions in light of the 2011 Wallow Fire.
Final Potential Wilderness Evaluation Reports (October 2012)	As required by the provisions of the 1982 Planning Rule, the Apache-Sitgreaves NFs developed an inventory of potential wilderness and evaluated each area.

Document	Description
Research Natural Area Evaluation (March 2012)	The RNA evaluation is documented in the Research Natural Area Specialist Report.
Scenery Management System (SMS) Inventory Report (March 2009)	Documents the SMS inventory and assessment process for the plan revision.
Need for Change	
Comprehensive Evaluation Report (December 2008)	This report highlights the social, economic, and ecological conditions and trends in and around the Apache-Sitgreaves, as detailed in the Ecological Sustainability Report, the Economic and Social Sustainability Assessment, and the Apache-Sitgreaves National Forests' Resource Evaluations. It summarizes the need for change for revising the 1987 plan.
CER Supplement to Meet AMS Requirements (March 2010)	Documents how the Apache-Sitgreaves NFs' assessments conform to the 1982 Planning Rule provisions.
Wallow Fire Changed Condition Assessment (December 2012)	Documents the change to existing conditions and the proposed plan caused by the 2011 Wallow Fire.
Recreation, Grazing, Minerals, and Timber Demand Analysis of the Management Situation (December 2009)	Estimates of recreation, grazing, mineral, and timber demand to help define need for change. Prepared by Joshua Wilson and Henry Eichman Economists TEAMS Planning Enterprise Unit
Apache-Sitgreaves NFs Planning Team Supplement to the Demand Report (February 2010)	Prepared by the Apache-Sitgreaves NFs' interdisciplinary (ID) planning team to supplement the above report.
Ecological Sustainability Report (December 2008)	Describes how the forests contribute to ecological sustainability and defines the ecological needs for change.
Economic and Social Sustainability Assessment (January 2009)	Describes how the forests contribute to social and economic sustainability and defines the social/economic needs for change.
Apache-Sitgreaves National Forests' Resource Evaluations (July 2008)	This document provides detailed information about the individual resource and program areas outlined in the Apache-Sitgreaves NFs' 1987 plan. It describes the current conditions and trends, how well the plan is working, and what needs to change.
Vegetation	
Mid-scale Existing Vegetation Map (2009, updated 2012)	Forestwide GIS map of vegetation type, canopy cover, and structure (size class).
Potential Natural Vegetation Types (PNVT) Map	Forestwide GIS map showing potential vegetation based on terrestrial ecosystem survey.
Ecological and Biological Diversity of National Forests in Region 3: Apache-Sitgreaves NFs (August 2006)	Describes the extent and distribution of PNVTs, condition of low-elevation grasslands, distribution of stream reaches with native fish, and species richness and conservation status. Prepared by The Nature Conservancy.
Historical Range of Variation for Potential Natural Vegetation Types of the Southwest	Consists of several papers that document the historical range of variation for various PNVTs (chaparral, aspen

Document	Description
(2006)	forest and woodland, Madrean encinal woodland, montane subalpine grassland, mixed conifer forest, piñon-juniper woodland, ponderosa pine forest, semi-desert grassland, and spruce-fir forest). Prepared by The Nature Conservancy.
Historic Fire Return Intervals for Arizona and New Mexico: A Regional Perspective for Southwestern Land Managers (April 2006)	Identifies the historic fire return intervals for 21 PNVTs throughout Arizona and New Mexico. Prepared by The Nature Conservancy.
Other Background Documents	
Forest Insect and Disease Activity on the Apache-Sitgreaves NFs and Fort Apache Indian Reservation (February 2010)	Summarizes the historic and contemporary disturbance information of the major forest insects and diseases. Prepared by Rocky Mountain Research Station and the Arizona Zone Office of Forest Health Protection.
Socioeconomic Assessment of the Apache-Sitgreaves National Forests (2005)	Provides a summary characterizing the social and economic environment surrounding the forests by showing the linkage between NFS lands and neighboring communities. Prepared by Arizona National Forests Socioeconomic Assessment Team and The University of Arizona School of Natural Resources. Manager's summary, annotated bibliography, and a supplement to the socioeconomic assessment are available.
Values, Attitudes, and Beliefs Toward National Forest System Lands: Arizona Tribal Peoples (April 2006)	Describes the context for tribal involvement in plan revision and management decisionmaking, the beliefs and values about the consultation process, and resource and multiple-use beliefs and values. Prepared by John C. Russell, Ph D. and Peggy A. Adams-Russell.
Values, Attitudes, and Beliefs Toward National Forest System Lands: The Apache-Sitgreaves National Forest (May 2006)	Describes the values, attitudes, and beliefs of local stakeholders toward the Apache-Sitgreaves NFs. Prepared by John C. Russell, Ph D. and Peggy A. Adams-Russell.
Collaboration	
Public Participation Plan	Outlines the public participation strategy for the plan revision process.
Collaboration Log	Spreadsheet that tracks public involvement and public contacts.
ReVision Review and Messages from the Forest Supervisor	Newsletters and updates sent to the plan revision mailing list and posted to the web to help inform stakeholders about the revision process.
Mailing lists	Mailing lists used for each public outreach effort.

Appendix F. Collaboration and Public Involvement

This appendix describes the collaborative process and key public involvement opportunities for the Apache-Sitgreaves NFs plan revision effort. More detailed information, including the Public Participation Plan (Forest Service, 2014b) and the Collaboration Log (Forest Service, 2014a), can be found in the "Plan Set of Documents."

Plan Revision Timeline

Table 205 below provides a summary of the key steps in the Apache-Sitgreaves NFs' plan revision process. Plan revision has been conducted under several different planning rules since revision activities began in 2006 (see information in the next section). This table also lists the planning rule that was in effect at various points in the process.

Table 205. Timeline of the Apache-Sitgreaves NFs' plan revision process

Date Started	Key Step	Planning Rule in Effect
April 2006	Interdisciplinary (ID) planning team is formed to begin revision of the 1987 plan	2005
Spring 2006	Public and Forest Service employee meetings to identify need for change	2005
March 2007	U.S. District Court in California enjoined the Forest Service from using the 2005 planning rule	
April 2008	The 2008 planning rule is published in the Federal Register	
August 2008	Iterative Development of the Proposed Plan - the initial set of draft desired conditions is made available for review and comment	2008
September 2008	Iterative Development of the Proposed Plan - public meetings to gather feedback on the draft desired conditions	2008
December 2008	Comprehensive Evaluation Report and related documents (Ecological Sustainability Report and Economic and Social Sustainability Assessment) are available for review and comment	2008
December 2008	Notice of Initiation (to revise the forest plan) is published in the Federal Register	2008
June 2009	Iterative Development of the Proposed Plan - the Working Draft Land Management Plan is available for review and comment	2008
June 2009	U.S. District Court for the Northern District of California enjoined the Forest Service from using the 2008 planning rule	
December 2009	Notice of Intent (to revise the forest plan and to prepare an EIS) is published in the Federal Register; revision efforts proceed following the provisions of the 1982 Planning Rule	2000/1982
March 2010	Development of Initial Alternatives – public meetings to gather feedback on the initial alternatives	2000/1982
May 2010	Interdisciplinary (ID) planning team finalizes alternatives and begins analysis and development of the DEIS and proposed plan	2000/1982

Date Started	Key Step	Planning Rule in Effect
May 2011	Wallow Fire – 538,000 acre fire on the Apache National Forest interrupts plan revision	2000/1982
August 2011	ID planning team begins to inventory, assess , and document the changed conditions caused by the Wallow Fire. The information is used to update the DEIS	2000/1982
April 2012	The Forest Service publishes the final rule and record of decision for the 2012 planning rule	2012/1982
February 15, 2013	Publication of the Apache-Sitgreaves NFs proposed plan and DEIS in the Federal Register for public review and comment	2012/1982
February 15, 2013 – May 17, 2013	90-day public comment period for the proposed plan and DEIS	2012/1982
June 2015	Publication of the Apache-Sitgreaves NFs land management plan, FEIS, and ROD	2012/1982

Planning Rules

The National Forest Management Act (NFMA) of 1976 directs that every national forest or grassland managed by the Forest Service will develop and maintain a land management plan. The process for the development and revision of the plans, along with the required content of plans, is outlined in the planning regulations (planning rule). Individual forests and grasslands then follow the direction of the planning rule to develop a land management plan specific to their unit.

When the Apache-Sitgreaves NFs' plan revision started in 2006, the planning team followed direction under the 2005 Planning Rule, which had been finalized by the Forest Service and published in the Federal Register on December 22, 2004. The following year, on March 30, 2007, the U.S. District Court for the Northern District of California issued an injunction that ordered the Forest Service to discontinue use of the 2005 Planning Rule. The Apache-Sitgreaves NFs complied with the court order, and further planning activities undertaken were in compliance with laws and rulings not affected by the injunction. Much of the information and public comments gathered prior to the injunction remained useful in the planning effort. Work continued until finalization of the 2008 Planning Rule occurred on April 21, 2008. At that time, plan development began following guidance from the 2008 rule.

A little over a year later, on June 30, 2009, the 2008 Planning Rule was enjoined by the U.S. District Court for the Northern District of California and the revision of the Apache-Sitgreaves NFs plan was again interrupted. The U.S. Department of Agriculture subsequently determined on December 18, 2009, that plans could be amended, revised, or developed using the 2000 Planning Rule, as amended. The 2000 Planning Rule's transition provisions allowed use of the provisions of the planning rule in effect prior to the effective date of the 2000 rule, commonly called the 1982 Planning Rule. The Apache-Sitgreaves NFs' planning effort moved forward using the provisions of the 1982 Planning Rule and a notice of intent to revise the plan and publish a DEIS was published in the Federal Register on December 20, 1009.

The Forest Service published the current planning rule, the 2012 Planning Rule, in the Federal Register on April 9, 2012. The transition provision, 36 CFR § 219.17(b)(3), of the 2012 Planning

Rule allows the Apache-Sitgreaves NFs to continue to use the provisions of the 1982 planning to revise the plan.

Key Collaboration and Public Involvement Steps in the Revision Process

This section lists some of the key collaboration and public involvement activities that have occurred in the revision process. In addition to the activities listed in the tables below, several other tools were used to communicate with the public and other entities. Information about the process, including assessments, draft documents, timelines, letters, and meeting announcements were posted to the forests' Web site: http://www.fs.usda.gov/asnf/. Newspaper articles, radio announcements, flyers, legal notices, comment periods, presentations to groups, phone calls, one-on-one meetings, and other tools were used to share information about revision and gather input.

Identification of the Need for Change

The initial step in revising the Apache-Sitgreaves NFs' 1987 plan was to identify the need for change in the land management plan. Two primary methods were used to do this: (1) public and employee input and (2) science-based evaluations. A series of meetings and workshops were conducted to ask "what needs to change in the current forest plan or current forest management." Public and employee input was supplemented with science-based reports describing conditions, trends, and risks to sustainability that indicate where the 1987 plan does not provide adequate guidance for the present and future management of the forests. Some of the key actions taken to identify the need for change are outlined in table 206.

Table 206. Key actions related to the identification of the need for change

Date	Action	Description
2005	Report - Socioeconomic Assessment for the Apache-Sitgreaves National Forests	The report profiles the social and economic environment surrounding the Apache-Sitgreaves NFs.
March 2006	Mailing and Flyers	Letter to mailing list lets receipents know that the forests are beginning forest plan revision. Invites them to be involved by returning postcard so that the mailing list can be updated. Flyers distributed via frontliners, meetings, post offices, campgrounds, etc. Intent to notify folks this summer (especially visitors).
March 2006	Meetings with Employees	Meetings at all ranger districts and the Supervisor's Office to provide an overview of revision and conduct an exercise to identify geographic areas, themes, and need for change.
April 2006	Report – Values, Attitudes and Beliefs Toward National Forest System Lands: Arizona Tribal Peoples	The report contains information on values and beliefs of Arizona tribal peoples about national forest lands based on discussion/focus groups.

Date	Action	Description
May 2006	Report - Values, Attitudes and Beliefs toward National Forest System Lands: The Apache-Sitgreaves National Forests	The report documents the results of a project to identify values, attitudes, and beliefs (VAB) about forest resources and their management for all national forests and grasslands in the Southwestern Region, including the Apache-Sitgreaves NFs.
May – July 2006	Meetings with Greenlee, Navajo, Apache Counties, Arizona Game and Fish Department (AZGFD), Natural Resource Conservation Service, and Natural Resource Conservation District (NRCD).	Meetings to provide an overview of plan revision and ask for input on the need for change.
July – September 2006 7/17 – Clifton 7/18 – Safford 7/19 – Greer 7/20 – Eagar/Springerville 8/1 – San Carlos 8/3 – Pinetop-Lakeside 8/9 – Whiteriver 8/10 – Alpine 8/29 – Heber/Overgaard/ Forest Lakes 8/30 – Clay Springs/Linden/ Pinedale 8/31 – Nutrioso 9/14 – Blue 9/19 – Vernon 9/21 – Snowflake/Taylor 9/27 – Winslow	Public Meetings	Meetings to share information about the forests, the new planning rule, the planning schedule, and how interested parties can become involved. Participants were asked what they value about the national forests, what significant changes have occurred over the last 20 years, and what forest managers should focus on during the next 20 years. Participants encouraged to join discussion groups to further explore topics or issues.
October 2006	Mailing – Letter from the Forest Supervisor	A followup to the July-Sept 2006 public meetings – the letter explains where to find meeting notes and announces the next round of public meetings.
October – November 2006	Comment Analysis	ID planning team reviews public comments and summarizes need for change.
December 2006	Mailing – ReVision Review Newsletter	Newsletter outlines what we've heard so far as well as background on revision and how folks can become involved.

Date	Action	Description
January 2007 1/9 – Clifton 1/11 – Alpine 1/16 – Eagar 1/17 – Heber/Overgaard 1/18 – Show Low	Pubilc Meetings/Workshops	Meetings to obtain more information about issues/topics. Participants asked to share what they feel is a priority (or are priorities) to focus on during revision.
January – February 2007	Employee Meetings	Meetings to gather feedback from employees on issues/topics and what they feel is a priority (or are priorities) to focus on during revision.
February 2007	Mailing – Message from the Forest Supervisor	Followup to January 2007 public meetings. The letter explains where to find meeting notes and discusses the development of the Comprehensive Evaluation Report, next meetings, and dates for upcoming meetings on the Tonto NF.
March 2007 3/5 Mesa 3/13 Cave Creek	Public Meetings – Tonto NF	During Tonto NF revision meetings, provide status of the Apache-Sitgreaves NFs revision process and encourage folks to sign up for the mailing list and submit comments.
March 2007	Meeting with local, state, and tribal representatives – social and economic sustainability assessment	Opportunity for participants to provide feedback on the draft social and economic sustainability assessment.
April 2007	Public Meetings Sponsored by the Arizona Game and Fish Department	Arizona Game and Fish Department informational meetings on how to become involved in the process of Federal land management plan. Forest representatives attend and answer questions.
July 2007	Mailing – ReVision Review Newsletter	Newsletter outlines the key findings of assessments, public input, and need for change and requests comments.
August 2007	Wildlife Discussion Group	A group of interested publics, Forest Service, and other agency representatives meet to discuss the key findings from the draft ecological sustainability report and species list.
October 2007	Mailing – Update from the Forest Supervisor	The letter includes information about new proposed planning rule, upcoming public meeting to share technical information regarding processes, and science used in the upcoming need for change report. Next step together (sometime in 2008) will be describing the desired ecological, economic, and social outcomes of forest management.
November 2007	Public Meeting – Findings from the Sustainability Reports	A public meeting to share the more technical findings regarding need for change. The findings are a result of the work completed so far on the social-economic and ecological sustainability reports.

Date	Action	Description
November 2007	Meeting - Range Discussion Group	A group of interested publics, Forest Service, and other agency representatives discuss status of revision and next steps of revision process: desired conditions and objectives.
April 2008	Mailing – Message from the Acting Forest Supervisor	Letter announces retirement of former Forest Supervisor Elaine Zieroth, release of the 2008 Planning Rule, and notice of amendment to current 1987 plan.
June 2008	Meeting – Wildlife Discussion Group	A group of interested publics, Forest Service, and other agency representatives meet to review and refine the species diversity lists.
July 2008	Report – Forest Plan Revision Resource Evaluations	The report details information about individual resource and program areas outlined in the 1987 Apache-Sitgreaves NFs plan.
December 2008	Mailing – ReVision Review Newsletter	Newsletter provides status of revision, including message from new forest supervisor, upcoming publication of the NOI, and summary of need for change.
December 2008	Report – Ecological Sustainability Report	Report about the ecological environment of the Apache-Sitgreaves NFs and the surrounding area. This report profiles the diversity of ecosystems and species, and identifies threats and associated risks. It also provides information regarding needs for ecological change.
December 2008	Report – Comprehensive Evaluation Report	This report highlights the social, economic, and ecological conditions and trends in and around the forests, as detailed in the Ecological Sustainability Report, the Economic and Social Sustainability Assessment, and the Resource Evaluations.
December 2008	Notice of Initiation	The Notice of Initiation to begin forest plan revision was published in the Federal Register on 12/16/2008. The legal notice was published in the White Mountain Independent.
January 2009	Report – Economic and Social Sustainability Assessment	The report documents the Apache-Sitgreaves NFs contribution to economic and social sustainability within the assessment area.
May 2009	Report – Eligibility Report of the National Wild and Scenic River System	Comprehensive evaluation of the potential for rivers on the Apache-Sitgreaves NFs to be eligible for inclusion into the National Wild and Scenic River System. Note: addendum completed in April 2012
June 2009	Report – Draft Potential Wilderness Evaluation	Draft reports made available for public comment. The Forest Service evaluated all lands possessing wilderness characteristics for potential wilderness during plan revision. The reports presents the evaluation findings.

Date	Action	Description
June 2009	Comment Analysis	ID planning team reviews comments received during the Notice of Initiation comment period and validates the need for change topics
February 2010	Report – Forest Insect and Disease Activity on the Apache-Sitgreaves NFs and Forest Apache Indian Reservation	An assessment of insect and disease impacts.
March 2010	Report – CER Suppment to Meet AMS Requirements	The provisions of the 1982 Planning Rule require the completion of an Analysis of the Management Situation (AMS). The previously published Comprehensive Evaluation Report met most of this requirement. This report addresses the remaining AMS requirements. Note: planning team supplement completed February 2010
December 2010	Report – Final Potential Wilderness Evaluation	Reports for those lands that were evaluated and met the criteria for potential wilderness. Note: reports updated and additional reports completed in 2012

Iterative Development of the Proposed Plan

The next stage of the revision process was to develop the proposed plan. Initial efforts were focused on describing the desired conditions for the forests. Desired conditions are the social, economic, and ecological attributes toward which management of the land and resources is to be directed. After using public and employee input to refine the desired condition statements, the next step was to draft the remaining plan components. The Working Draft Land Management Plan was published to provide a foundation for collaborative discussion and feedback which evolved into the proposed plan. Table 207 identifies some of the key actions completed during the iterative development of the proposed plan.

Table 207. Key actions related to the iterative development of the proposed plan

Date	Action	Description
August 2008	Initial Draft Desired Conditions	The initial set of draft desired conditions are available for review and input.
August 2008	Mailing – Message from the Acting Forest Supervisor	Letter provides an update on revision, including upcoming open houses and an initial draft desired conditions packet.
August – October 2008	Employee Meetings	Meetings to provide status of revision, summary of need for change, what the revised forest plan will look like, and obtain feedback on initial draft desired conditions.
September 2008 9/3 – Alpine 9/4 – Show Low 9/5 – Springerville 9/9 – Overgaard 9/11 – Clifton	Public Meetings – Initial Draft Desired Conditions	Open houses to answer questions and gather input on the initial draft desired conditions.
October 2008	Comment Analysis	ID planning team reviews public comments on the initial draft desired conditions and uses input to update desired condition language.
December 2008	Newsletter – ReVision Review	Newsletter shares status of revision, including message from the new Forest Supervisor, upcoming publication of the NOI, and summary of need for change.
April-May 2009	Employee Meetings	Meetings provide overview of the upcoming working draft plan, how it is organized, and request comment and feedback.
June 2009	Working Draft Land Management Plan	The Working Draft Land Mangement Plan is made available and serves as a foundation for collaborative discussion and feedback.
June 2009	Mailing – Message from the Forest Supervisor & Users Guide to the Working Draft Plan	Letter includes a status of revision and announces release of the Working Draft Land Management Plan for review. Attached is a Users Guide of the Working Draft Plan to aid review.
August 2009	Mailing – Message from the Forest Supervisor	Letter includes update on status of revision, including update on enjoinment of 2008 Planning Rule and discontinued use of the 2008 Planning Rule.
September 2009	Comment Analysis	ID planning team reviewes public comments on the Working Draft Land Management Plan and uses input to modify draft plan language and identify issues.
December 2009	Mailing – Message from the Forest Supervisor	Letter includes update on status of plan revision and announces upcoming publication of Notice of Intent in the Federal Register. Also announces that the revision process will follow the provisions of the 1982 Planning Rule.

Date	Action	Description
December 2009	Notice of Intent	The Notice of Intent to revise the forest plan and prepare an environmental impact statement (EIS) published in the Federal Register on 12/29/2009. Legal notice published in White Mountain Independent.
March –May 2010	Meetings – Catron County Board of Commissioners, Arizona Game and Fish Department, Greenlee County Board of Supervisors.	Meetings to provide update on forest activities, including plan revision.

Development of the Draft Environmental Impact Statement

The next stage in the revision process was to develop alternatives to address issues not covered by the proposed plan. Once the alternatives were identified, the planning team began to develop the draft environmental impact statement (DEIS). The DEIS analyzes the effects of implementing the alternatives. Table 208 outlines some of the key actions taken during the development of the DEIS.

Table 208. Key actions related to the development of the DEIS

Date	Action	Description
March 2010	Initial Draft Alternatives	The initial draft alternatives and associated maps (e.g., management areas, suitability) are made available for review and comment.
March 2010	Mailing – Message from the Forest Supervisor	Letter includes update on progress of revision, the upcoming development of an EIS, explanation of alternatives, presents the initial draft alternatives developed by the forest, asks for comment, and announces open house meetings in April. Includes detailed description of the four initial draft alternatives.
March - April 2010	Employee Meetings	Meetings to discuss and gather feedback on the initial draft alternatives.
April 2010 4/12 – Clifton 4/14 – Heber/Overgaard 4/15 – Lakeside 4/19 – Eagar	Public Meetings	Public open house forum meetings to discuss initial draft alternatives and gather feedback.
May 2010	Comment Analysis	ID planning team reviews public comments on initial draft alternatives and uses to refine alternatives.
August 2010	Mailing - Postcards	Postcards sent to the mailing list. Recipients are asked to identify the format (e.g., printed, electronic) of DEIS they prefer.
September 2010	Mailing – Message from the Forest Supervisor	Letter includes reference to the comments received on the initial draft alternatives and current status of revision.

Date	Action	Description
May–June 2011	Wallow Fire	The 538,000-acre Wallow Fire burns on the Apache NF. Progress on plan revision is interrupted.
August 2011	Mailing – Message from the Forest Supervisor	Letter provides the status of forest plan revision post-Wallow Fire. ID planning team is assessing changes and working on proposed plan and DEIS.
January 2012	Meetings – Greenlee County Board of Supervisors, Apache County Natural Resouce Conservation District, Navajo County, Arizona Game and Fish Department	Meetings with forest supervisor and deputy forest supervisor to discuss status of plan revision.
May 2012	Mailing – Message from the Forest Supervisor	Letter provides update on status of revision: ID planning team is developing the DEIS. The proposed plan and DEIS are scheduled to be available for review and comment this fall. Letter references new planning rule and states that the forests are still following the provisions of the 1982 Planning Rule.
January–March 2013	Employee Meetings	Meetings to discuss the upcoming release of the proposed plan and DEIS.
February 4, 2013	Mailing – Letter from the Forest Supervisor	Letter announces the availability of the proposed plan, DEIS, and associated documents for review. Also anticipates the publication of the Notice of Availability to occur on February 15, 2013.
February 15, 2013	Notice of Availability (NOA)	NOA published in the Federal Register on Friday, February 15, 2013, announces the release of the proposed plan and DEIS. The publication of the NOA begins the 90-day public comment period.
February 2013 2/26 – Show Low 2/27 – Springerville 2/28 – Duncan (Clifton)	Public Meetings	Open house format public meetings to discuss the proposed plan and DEIS.

Development of the Final Proposed Plan and Environmental Impact Statement

The last stage in the revision process was to develop the final proposed land management plan (plan) and final environmental impact statement (FEIS) and to document the responsible official's decision in the record of decision (ROD). Table 209 outlines some of the key actions taken during the finalization of these documents.

Table 209. Key actions related to the development of the final proposed plan and FEIS

Date	Action	Description
May 2013 – April 2014	Analysis of Public Comment	The forests received over 41,000 comment letters. Of these letters, 145 letters contained unique and substantially different comments. In addition 7 different form letters were received. The plannng team, with the assistance of the TEAMS enterprise team, read, sorted, grouped, and responded to public comments. These responses are located in appendix A of this FEIS. The plan and FEIS reflect changes resulting from public and internal comments.
March 2014	Mailing – Letter from the Forest Supervisor	Letter provides an update on the status of plan revision. Describes current efforts (comment analysis, consultation) and estimates the release of the plan and FEIS in fall 2014.
May 2015	State Historic Preservation Office	The Arizona SHPO declined to comment on the DEIS or Draft Land Management Plan.
Sept 2013 – May 2015	Consultation with the U.S. Fish and Wildlife Service	The forests consulted with USFWS on the effects of implementation of the Revised Land Management Plan on federally listed species on the forests. This consultation resulted in the issuance of a Biological Opinion, which is available on the forests' planning web page. http://www.fs.usda.gov/detail/asnf/landmanagement/planning/
June 2015	Notice of Availability (NOA) and Record of Decision (ROD)	The NOA was published in the Federal Register [citation]. The Record of Decision was signed on [date] and is available on the forests' planning web page. http://www.fs.usda.gov/detail/asnf/landmanagement/planning/

Tribal Consultation

The Apache-Sitgreaves NFs have consulted with nine tribes and one chapter that use the forests for traditional, cultural, or spiritual activities. The following tribes and chapter were consulted: White Mountain Apache Tribe, San Carlos Apache Tribe, Hopi Nation, Navajo Nation, Pueblo of Zuni, Yavapai-Apache Tribe, Tonto Apache Tribe, Fort McDowell Yavapai Nation, Yavapai-Prescott Indian Tribe, and the Ramah Chapter of the Navajo Nation.

Tribes were initially informed about plan revision in October 2006, through a letter explaining the revision process and extending an open invitation to meet with the Apache-Sitgreaves NFs. A consultation letter was sent to the tribes in June 2009, asking for input on the working draft land management plan. In December of 2009, the tribes were sent a letter that provided the status of revision and the upcoming publication of the notice of intent (NOI) and invited their comments and concerns. In addition to consultation, the tribes have been included in all public outreach efforts throughout the plan revision process.

Three tribes provided written responses: White Mountain Apache Tribe, Navajo Nation, and Tonto Apache Tribe. Consultation meetings were held with the San Carlos Apache Tribe (August and November 2006), White Mountain Apache Tribe (August 2006, March 2007, April 2010), Navajo Nation (August 2006, September 2008, December 2009), Hopi Tribe (August 2006, November 2009), and Pueblo of Zuni (August 2006, September 2008, July 2011).

Tribes were sent a copy of the proposed land management plan and DEIS for their review in February 2013, slightly before the documents were released to the public. The Yavapai-Prescott Tribe provided written comments.

References

U.S. Forest Service. (2014a). Apache-Sitgreaves National Forests. Collaboration Log. Springerville, AZ.

U.S. Forest Service. (2014b). Apache-Sitgreaves National Forests. Public Participation Plan. Springerville, AZ.

Appendix G. Plan Decisions and Species Viability

The following table (table 210) provides a crosswalk that shows how fine filter plan decisions meet species viability needs. More detailed information on individual species and the species viability analysis can be found in the "Wildlife Specialist Report – Viability" (Forest Service, 2012b) and the "Fisheries Specialist and Viability Report" (Forest Service, 2014a).

As part of the plan revision process, coarse filter plan decisions (i.e., desired condition statements) were developed that describe the desired outcomes and conditions for vegetation, riparian, and aquatic features, and other resources within the planning area. These desired conditions provide habitat for wildlife which helps to reduce risks to species and provides for their viability. Where desired conditions would result in low to moderate risk ratings for some species, meeting and maintaining those desired conditions would provide for their population viability. This is because low to moderate ratings of risk are assumed to be similar enough to normal ecosystem fluctuations and therefore within a species' ability to adjust, thus posing little risk to viability. Where the risk rating would be moderately-high, high, or very high, additional fine filter plan components (e.g., standards, guidelines) were developed to address or mitigate risk. However, the coarse-fine filter approach is not entirely discrete in that standards and guidelines can contribute to viability for some coarse filter species; while the needs of fine filter species can also be provided for, in part, by coarse filter desired conditions and PNVTs.

The crosswalk in table 210 lists those fine filter plan decisions that reduce risks to species and provide for viability. Other plan decisions (objectives, special areas, suitability, and monitoring) and management area allocations also contribute to species viability and are discussed in the "Wildlife and Rare Plants" and "Fisheries" sections of chapter 3 of the FEIS.

In the table below, the following abbreviations are used:

ST = standard
GL = guideline
PNVT = potential natural vegetation type
FPS = forest planning species

Table 210. Species crosswalk for how plan decisions meet species' viability needs

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
All PNVTs, all habitat elements, and other factors of concern	All FPS	**GLs for Soil:** Projects with ground-disturbing activities should be designed to minimize long- and short-term impacts to soil resources. Where disturbance cannot be avoided, project-specific soil and water conservation practices should be developed. Severely disturbed sites should be revegetated with native plant species when loss of long-term soil productivity is predicted. Locally collected seed should be used where available and cost effective. Seeds should be tested to ensure they are free from noxious weeds and invasive nonnative plants at a State-certified seed testing laboratory before acceptance and mixing. Coarse woody debris retention and/or creation should be used as needed to help retain long-term soil productivity. **GL for Water Resources:** Projects with ground-disturbing activities should be designed to minimize long and short-term impacts to water resources. Where disturbance cannot be avoided, project-specific soil and water conservation practices and best management practices (BMPs) should be developed. **ST for All PNVTs:** Vegetation treatments shall include measures to reduce the potential for the introduction of invasive plants and animals and damage from nonnative insects and diseases. **GLs for All PNVTs:** During project design and implementation, precautions should be taken to reduce the potential for damage to residual vegetation in order to prevent premature or excessive mortality. Landscape scale restoration projects should be designed to spread treatments out spatially and/or temporally within the project area to reduce implementation impacts and allow reestablishment of vegetation and soil cover. **GLs for Wildlife and Rare Plants and Aquatic Habitat and Species:** Management and activities should not contribute to a trend toward the Federal listing of a species. Activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans. The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebb willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. **ST for Invasive Species:** Projects and authorized activities shall be designed to reduce the potential for the introduction of new species or spread of existing invasive or undesirable aquatic or terrestrial nonnative

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		populations. **GLs for Invasive Species:** Project areas should be monitored to ensure there is no introduction or spread of invasive species. Treatment of invasive species should be designed to effectively control or eliminate them; multiple treatments may be needed. **GLs for Landscape Scale Disturbance Events:** Erosion control mitigation features should be implemented to protect significant resource values and infrastructure such as stream channels, roads, structures, threatened and endangered species, and cultural resources. Projects and activities (e.g., revegetation, mulching, lop and scatter) should be designed to stabilize soils and restore nutrient cycling, if needed, and establish movement toward the desired conditions for the affected PNVT(s). **GL for Motorized Opportunities**: New roads or motorized trails should be located to avoid Mexican spotted owl protected activity centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. **ST for Forest Products:** Authorizations to cut, collect, or use forest products for any personal, commercial, or scientific purpose (i.e., permits, contracts, agreements) shall include provisions to ensure the needs of wildlife, which depend upon those forest products, will continue to be met (e.g., fungi and cone collection with respect to overwinter forage needs of squirrels). **GLs for Livestock Grazing:** Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture. Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state. **GL for Wildlife Quiet AreaManagement Area:** Restoration treatments should consider the needs of wildlife (e.g., calving/fawning areas, wallows, game crossings) to minimize potential impacts to the species and their habitat. **ST for WildernessManagement Area:** Human-caused disturbed areas that do not complement wilderness characteristics will be rehabilitated to a natural appearance, using plant species or other materials native to the area. **ST for Recommended Wilderness Management Area:** Human-caused disturbed areas that do not complement wilderness characteristics shall be rehabilitated to a natural appearance, using plant species or other materials native to the area.

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		GL for Research Natural AreaManagement Area: To minimize impacts to unique and sensitive plant species, recreational activities (other than use on the designated trail) should not be encouraged. **GL for Recommended Research Natural Area Management Area:** To minimize impacts to unique and sensitive plant and animal species, recreational activities should not be encouraged.
Forested PNVTs	All FPS listed under ponderosa pine, dry mixed conifer, wet mixed conifer and spruce-fir forested PNVTs	**GLs for All Forested PNVTs:** Where current forests are lacking proportional representation of late seral states and species composition on a landscape scale, old growth characteristics should be retained or encouraged to the greatest extent possible within the scope of meeting other desired conditions (e.g., reduce impacts from insects and disease, reduce the threat of uncharacteristic wildfire). Healthy southwestern white pine should be retained to maintain the wide range of genetic variability that contributes to resistance against the nonnative white pine blister rust disease. Tree species that are less susceptible to root disease should be retained within areas of root disease infection to reduce spread of disease. When thinning dwarf mistletoe infected sites, as much mistletoe should be removed as possible without sacrificing the healthiest, most desirable trees for the particular site (in some situations this may involve retaining some trees in the upper canopy that are lightly infected to meet multiple resource objectives). Trees, snags, and logs immediately adjacent to active red squirrel cone caches, Abert's squirrel nests, and raptor nests should be retained to maintain needed habitat components and provide tree groupings. Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife. **GLs for Wildlife and Rare Plants:** A minimum of six nest areas (known and replacement) should be located per northern goshawk territory. Northern goshawk nest and replacement nest areas should be located around active nests, in drainages, at the base of slopes, and on northerly (northwest to northeast) aspects. Nest areas should be 25 to 30 acres each in size. Northern goshawk post-fledging family areas (PFAs) of approximately 420 acres in size should be designated around the nest sites. During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30.

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Ponderosa pine forested PNVT	Arizona myotis bat, Abert's squirrel, northern goshawk, zone-tailed hawk, Grace's warbler, flammulated owl, Mexican spotted owl (where Gambel oak)	**GL for Ponderosa Pine:** Where Gambel oak or other native hardwood trees and shrubs are desirable to retain for diversity, treatments should improve vigor and growth of these species. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
Dry mixed conifer forested PNVT	Arizona myotis bat, red squirrel, northern goshawk, flammulated owl, Mexican spotted owl	**GL for Dry Mixed Conifer:** Where Gambel oak or other native hardwood trees and shrubs are desirable to retain for diversity, treatments should improve vigor and growth of these species. **GL for Aspen:** Restoration of aspen clones should occur where aspen is overmature or in decline to maintain a sustainable presence of this species at the landscape level. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
Wet mixed conifer forested PNVT	red squirrel, black bear, northern goshawk, red-faced warbler, dusky blue grouse, MacGillvray's warbler, Mexican spotted owl, yellow lady's slipper, wood nymph, heathleaf ragwort, yellow Jacob's-ladder, hooded lady's tresses	**GL for Aspen:** Restoration of aspen clones should occur where aspen is overmature or in decline to maintain a sustainable presence of this species at the landscape level. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
Spruce-fir forested PNVT	red squirrel, black bear, Mexican spotted owl, crenulate moonwort, White Mountains paintbrush, yellow lady's slipper, wood nymph, heathleaf ragwort, yellow Jacob's-ladder, hooded lady's tresses	**GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Madrean pine-oak woodland PNVT	mule deer (winter), juniper titmouse, Mexican spotted owl (often in association with canyons), gray vireo, Bigelow's onion	**GL for All Woodland PNVTs:** Treatments should leave single or small groups of medium to large trees that are widely spaced with expanses of herbaceous vegetation and coarse woody debris to provide for soil productivity, traditional uses (e.g., piñon nut gathering), and wildlife needs such as foraging habitat for migratory birds (e.g., black-throated gray warbler, pinyon jay) and other birds. **GL for Madrean pine-oak woodland:** Where Mexican spotted owls are found nesting in canyons or on north slopes within the Madrean pine-oak woodland, adjacent treatments should be modified to meet the needs of foraging owls. **GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30.
Montane/subalpine grasslands PNVT	pronghorn antelope, Gunnison's prairie dog, dwarf shrew, savannah sparrow, splachnoid dung moss	**ST for ALL PNVTs:** Within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential. **GLs for Grasslands:** New fence construction or reconstruction where pronghorn antelope may be present should have a barbless bottom wire which is 18 inches from the ground to facilitate movement between pastures and other fenced areas. Pole and other types of fences should also provide for pronghorn antelope passage where they are present. Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation. **GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Prairie dog controls should not be authorized except when consistent with approved State of Arizona Gunnison's prairie dog conservation strategies. **GL for Livestock Grazing:** Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture.

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Great Basin grassland PNVT	pronghorn antelope, Gunnison's prairie dog, Arizona sunflower	**ST for ALL PNVTs:** Within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential. **GLs for Grasslands:** New fence construction or reconstruction where pronghorn antelope may be present should have a barbless bottom wire which is 18 inches from the ground to facilitate movement between pastures and other fenced areas. Pole and other types of fences should also provide for pronghorn antelope passage where they are present. Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation. **GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Prairie dog controls should not be authorized except when consistent with approved State of Arizona Gunnison's prairie dog conservation strategies.
Semi-desert grassland PNVT	Bigelow's onion, Arizona sunflower, superb penstemon	**ST for All PNVTs:** Within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential. **GLs for Grasslands:** New fence construction or reconstruction where pronghorn antelope may be present should have a barbless bottom wire which is 18 inches from the ground to facilitate movement between pastures and other fenced areas. Pole and other types of fences should also provide for pronghorn antelope passage where they are present. Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
Sometimes shaded or often wet meadow or forest opening (ponderosa pine, dry mixed conifer, wet mixed	Mogollon vole, Merriam's shrew, four-spotted skipperling butterfly, Arizona sneezeweed, Mogollon clover, Oak Creek triteleia	**GL for All PNVTs:** Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies). **GL for Ponderosa Pine and Dry Mixed Conifer Forests:** Where consistent with project or activity objectives, canopy cover should be retained on the south and southwest sides of small, existing forest openings that are naturally cooler and moister. These small (generally one-tenth to one-quarter acre) shaded

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
conifer, and spruce-fir forested and Madrean pine-oak woodland PNVTs)		openings provide habitat conditions needed by small mammals, plants, and insects (e.g., Merriam's shrew, Mogollon clover, four-spotted skipperling butterfly). Where these openings naturally occur across a project area, these conditions should be maintained on an average of two or more such openings per 100 acres. **GL for Riparian Areas:** Wet meadows and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **GLs for Motorized Opportunities:** New roads, motorized trails, or designated motorized areas should be located to avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic species. As projects occur in riparian or wet meadow areas, unneeded roads or motorized trails should be closed or relocated, drainage restored, and native vegetation reestablished to move these areas toward their desired condition. **GL for Nonmotorized Opportunities:** New nonmotorized routes should avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic habitat. **GL for Livestock Grazing:** Critical areas (e.g., meadows) should be managed to address the inherent or unique site factors, condition, values, or potential conflicts. **GL for Special Uses:** As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens).
Cool understory micro-climate (dry mixed conifer forested and Madrean pine-oak woodland PNVTs)	Goodding's onion, Mexican hemlock parsley	**GLs for Wildlife and Rare Plants:** Cool and/or dense vegetation cover should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk, western yellow-billed cuckoo). The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebb willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. **GL for Special Uses:** As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens).

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Mosaic of conditions (species that need adjacent untreated areas for persistence)	lesser long-nosed bat, long-tailed vole, dwarf shrew, White Mountains ground squirrel, Springerville pocket mouse, western burrowing owl, Montezuma's quail, plateau giant tiger beetle, Greene milkweed	**GL for All PNVTs:** Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies). **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **ST for All PNVTs:** Within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential.
Dense, low-mid canopy with ample ground vegetation/litter and/or woody debris (dry mixed conifer, wet mixed conifer, and spruce-fir forested and riparian forested PNVTs)	southern red-backed vole, dusky blue grouse, western red bat, ocelot, White Mountains chipmunk, black bear, red-faced warbler, MacGillvray's warbler (mixed broadleaf deciduous riparian forest), Swainson's thrush, gray catbird (riparian forested PNVTs), southwestern willow flycatcher (montane willow riparian forest)	**GL for Soil:** Coarse woody debris retention and/or creation should be used as needed to help retain long-term soil productivity. **GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Cool and/or dense vegetation cover should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk, western yellow-billed cuckoo).
Seasonally wetted swales (montane/subalpine and Great Basin grassland PNVTs)	Ferris' copper butterfly, Alberta artic butterfly, nitocris fritillary butterfly, nokomis fritillary butterfly, Parish alkali grass (alkali soils only)	**GL for All PNVTs:** Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies). **GL for Special Uses:** As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens).
High quality water (all riparian PNVTs)	water shrew, bald eagle, Arizona toad, Chiricahua leopard frog, northern leopard frog, lowland leopard frog, northern	**GL for Aquatic Habitat and Species:** Sufficient water should be left in streams to provide for aquatic species and riparian vegetation. **GLs for Riparian Areas:** Storage of fuels and other toxicants should be located outside of riparian areas to prevent spills that could impair water quality or harm aquatic species.

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	Mexican gartersnake, narrow-headed gartersnake, false ameletus mayfly, California floater, Mosely caddisfly, Arizona snaketail dragonfly, White Mountains water penny beetle, Three Forks springsnail, Blumer's dock, carnivorous bladderwort, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	Equipment should be fueled or serviced outside of riparian areas to prevent spills that could impair water quality or harm aquatic species. Construction or maintenance equipment service areas should be located and treated to prevent gas, oil, or other contaminants from washing or leaching into streams. **GLs for Water Resources:** Streams, streambanks, shorelines, lakes, wetlands, and other bodies of water should be protected from detrimental changes in water temperature and sediment to protect aquatic species and riparian habitat. Streamside management zones should be in place between streams and disturbed areas and/or road locations to maintain water quality and suitable stream temperatures for aquatic species. As State of Arizona water rights permits (e.g., water impoundments, diversions) are issued, the base level of instream flow should be retained by the Apache-Sitgreaves NFs. Constraints (e.g., maximum limit to which water level can be drawn down, minimum distance from a connected river, stream, wetland, or groundwater-dependent ecosystem) should be established for new groundwater pumping sites permitted on NFS lands in order to protect the character and function of water resources. Short-term impacts in watersheds containing Outstanding Arizona Waters may be allowed when long-term benefits to water quality, riparian areas, and aquatic resources would occur. To protect water quality and aquatic species, heavy equipment and vehicles driven into a water body to accomplish work should be completely clean of petroleum residue. Water levels should be below the gear boxes of the equipment in use. Lubricants and fuels should be sealed such that inundation by water should not result in leaks. **GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Any action likely to cause a disturbance and take to bald and golden eagles in nesting and young rearing areas should be avoided per the Bald and Golden Eagle Protection Act. **ST for Dispersed Recreation:** Dispersed campsites shall not be designated in areas with sensitive soils or within 50 feet of streams, wetlands, or riparian areas to prevent vegetation and bank damage, soil compaction, additional sediment, or soil and water contamination. **ST for Motorized Opportunities:** Road maintenance and construction activities shall be designed to reduce sediment (e.g., water bars, sediment traps, grade dips) while first providing for user safety. **GL for Motorized Opportunities:** New roads, motorized trails, or designated motorized areas should be

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		located to avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic species. **GL for Nonmotorized Opportunities:** New nonmotorized routes should avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic habitat. **GL for Livestock Grazing:** To minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source. Salt or nutritional supplements should also be located to minimize herbivory impacts to aspen clones. **STs for Water Uses:** Special uses for water diversions shall maintain fish, wildlife, and aesthetic values and otherwise protect the environment. Streams on NFS lands with high aquatic values and at risk from new water diversions shall be preserved and protected with instream flow water rights. Groundwater withdrawals shall not measurably diminish surface waterflows on NFS lands without an appropriate surface water right.
Healthy riparian conditions (i.e., well vegetated and untrampled streambanks and floodplains) (all riparian PNVTs)	Arizona montane vole, water shrew, NM meadow jumping mouse, southwestern willow flycatcher, peregrine falcon, Lincoln's sparrow (montane willow riparian forest), northern Mexican gartersnake, narrow-headed gartersnake, Blumer's dock, Arizona willow (montane willow riparian forest only), Bebb willow, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	**GLs for Aquatic Habitat and Species:** The needs of rare and unique species associated with wetlands, fens, bogs, and springs should be given priority consideration when developing these areas for waterfowl habitat and other uses. Sufficient water should be left in streams to provide for aquatic species and riparian vegetation. Projects and activities should avoid damming or impounding free-flowing waters to provide streamflows needed for aquatic and riparian-dependent species. **GLs for Riparian Areas:** Ground-disturbing projects (including prescribed fire) which may degrade long-term riparian conditions, should be avoided. Wet meadows and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation. Active grazing allotments should be managed to maintain or improve to desired riparian conditions. **ST for Water Resources:** Consistent with existing water rights, water diversions or obstructions shall at all times allow sufficient water to pass downstream to preserve minimum levels of waterflow which maintain aquatic life and other purposes of national forest establishment. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to

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		reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **ST for Motorized Opportunities:** Road maintenance and construction activities shall be designed to reduce sediment (e.g., water bars, sediment traps, grade dips) while first providing for user safety. **GLs for Motorized Opportunities:** New roads, motorized trails, or designated motorized areas should be located to avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic species. As projects occur in riparian or wet meadow areas, unneeded roads or motorized trails should be closed or relocated, drainage restored, and native vegetation reestablished to move these areas toward their desired condition. Roads and motorized trails removed from the transportation network should be treated in order to avoid future risk to hydrologic function and aquatic habitat. **GL for Nonmotorized Opportunities:** New nonmotorized routes should avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic habitat. **GLs for Livestock Grazing:** Critical areas (e.g., riparian) should be managed to address the inherent or unique site factors, condition, values, or potential conflicts. New livestock troughs, tanks, and holding facilities should be located out of riparian areas to reduce concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions. To minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source. Salt or nutritional supplements should also be located to minimize herbivory impacts to aspen clones. To prevent resource damage (e.g., streambanks) and disturbance to federally listed and sensitive wildlife species, trailing of livestock should not occur along riparian areas. Where no alternative route is available, approval may be granted where effective mitigation measures are implemented (e.g., timing of trailing, number of livestock trailed at one time). **GL for Minerals and Geology:** Streambed and floodplain alteration or removal of material should not occur if it prevents attainment of riparian, channel morphology, or streambank desired conditions. **GLs for Energy Corridor Management Area:** Trees and shrubs in riparian areas should only be removed

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		when there is an imminent threat to facilities and, in these cases, trees should be left for large coarse woody debris recruitment into the stream and riparian system. When planning and implementing vegetation treatments (e.g., corridor maintenance), vegetation within riparian zones that provides rooting strength important for bank stability should be encouraged.
Large trees, snags, and/or dense canopies (mixed broadleaf deciduous, cotton-willow, and montane willow riparian forested PNVTs)	beaver, greater western mastiff bat, Allen's big-eared bat, Arizona gray squirrel, common black-hawk, evening grosbeak, yellow-billed cuckoo, bald eagle	**GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Cool and/or dense vegetation cover should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk, western yellow-billed cuckoo). During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. **GL for Landscape Scale Disturbance Events:** An adequate number and size of snags and logs, appropriate for the affected PNVT, should be retained individually and in clumps to provide benefits for wildlife and coarse woody debris for soil and other resource benefits.
Permanent wet meadow-like areas (wetland/cienega riparian areas PNVT including fens and bogs)	Ferris' copper butterfly, nitocris fritillary butterfly, nokomis fritillary butterfly, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	**GL for All PNVTs:** Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies). **GL for Aquatic Habitat and Species:** The needs of rare and unique species associated with wetlands, fens, bogs, and springs should be given priority consideration when developing these areas for waterfowl habitat and other uses. **GL for Motorized Opportunities:** As projects occur, existing meadow crossings should be relocated or redesigned, as needed, to maintain or restore hydrologic function using appropriate tools such as French drains and elevated culverts. **GL for Nonmotorized Opportunities:** Meadow crossings should be designed or redesigned to maintain or restore hydrologic function using appropriate tools such as French drains and elevated culverts. **GL for Special Uses:** As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens).
Canyon slopes/cliffs, caves, rocky slopes (often in vicinity of riparian areas, often cool micro-	Townsend's big-eared bat, spotted bat, greater western mastiff bat, Allen's big-eared bat, peregrine falcon,	**GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be

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climate) (all PNVTs)	Eastwood alumroot, Arizona alumroot, Davidson's cliff carrot	protected to retain their distinctive ecological functions and maintain viability of associated species. The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebb willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. **GL for Special Uses:** As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens).
Habitat connectivity (all PNVTs)	Mexican wolf, jaguar, mountain lion, black bear, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	**GL for All PNVTs:** Landscape scale restoration projects should be designed to spread treatments out spatially and/or temporally within the project area to reduce implementation impacts and allow reestablishment of vegetation and soil cover. **GL for Aquatic Habitat and Species:** Sufficient water should be left in streams to provide for aquatic species and riparian vegetation. **GL for All Woodland PNVTs:** Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **GLs for Overall Recreation Opportunities:** Developed and dispersed recreation sites and other authorized activities should not be located in places that prevent wildlife or livestock access to available water. Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed. **GL for Motorized Opportunities:** Roads and motorized trails should be designed and located so as to not impede terrestrial and aquatic species movement and connectivity. **GL for Nonmotorized Opportunities:** New trails and trail relocations should be designed and located so as to not impede terrestrial and aquatic species movement and connectivity. **ST for Livestock Grazing:** New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing). **GLs for Wildlife Quite AreaManagement Area:** Fences surrounding and within WQAs should be inspected and improved to allow wildlife movement within and outside of the areas. Fences should be removed if no longer needed. Hiding cover and travelways for wildlife should be maintained to provide for security and connectivity of habitat.

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		Restoration treatments should consider the needs of wildlife (e.g., calving/fawning areas, wallows, game crossings) to minimize potential impacts to the species and their habitat.
Collection or loss from management	nitocris fritillary butterfly, nokomis fritillary butterfly, yellow lady's slipper, hooded lady's tresses, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	**ST for Aquatic Habitat and Species:** When drafting (withdrawing) water from streams or other waterbodies, measures will be taken to prevent entrapment of fish and aquatic organisms and the spread of parasites or disease (e.g., Asian tapeworm, chytrid fungus, whirling disease). **GL for Aquatic Habitat and Species:** When new water diversions are created or existing water diversions are reanalyzed, measures should be taken to prevent entrapment of fish and aquatic organisms. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **GL for Invasive Species:** Pesticide use should minimize impacts on non-target plants and animals. **ST for Forest Products:** Authorizations to cut, collect, or use forest products for any personal, commercial, or scientific purpose (i.e., permits, contracts, agreements) shall include provisions to ensure the needs of wildlife, which depend upon those forest products, will continue to be met (e.g., fungi and cone collection with respect to overwinter forage needs of squirrels). **GL for Forest Products:** Permits issued for forest products should include stipulations to protect resources. **ST for Special Uses:** Special use authorizations for the collection of live species with limited distribution (e.g., some invertebrates, plants) shall include permit provisions to ensure the species persist onsite. **GL for Special Uses:** As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens). **GLs for Research Natural Area Management Area:** Management measures should be used (e.g., fencing) to protect unique features. To minimize impacts to unique and sensitive plant species, recreational activities, other than use on the designated trail, should not be encouraged. Research special use authorizations should limit impacts to sensitive resources, unique features, and species within the RNA. **GLs for Recommended Resarch Natural AreaManagement Area:** To minimize impacts to unique and sensitive plant and animal species, recreational activities should not be encouraged.

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		If necessary, recommended RNAs should be fenced to manage unique features. Research special use authorizations should limit impacts to sensitive resources, unique features, and species within recommended RNAs. Recommended RNAs should be managed for nonmotorized access within the area to minimize ground disturbances and protect the resources which make these areas unique.
Nest parasitism	southwestern willow flycatcher, Grace's warbler	**GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **ST for Invasive Species:** Projects and authorized activities shall be designed to reduce the potential for the introduction of new species or spread of existing invasive or undesirable aquatic or terrestrial nonnative populations.
Disease	Townsend's big-eared bat, spotted bat, western red bat, Arizona toad, Chiricahua leopard frog, northern leopard frog, lowland leopard frog, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	**GL for Aquatic Habitat and Species:** To prevent degradation of native species habitat and the incidental or accidental introduction of diseases or nonnative species, aquatic species should not be transferred through management activities from one 6th level HUC watershed to another. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **GL for Livestock Grazing:** Efforts (e.g., temporary fencing, increased herding, herding dogs) should be made to prevent transfer of disease from domestic sheep and goats to bighorn sheep wherever bighorn sheep occur. Permit conversions to domestic sheep or goats should not be allowed in areas adjacent to or inhabited by bighorn sheep. **GLs for Minerals and Geology:** To reduce disturbances from human activities and prevent the spread of disease, bat gates should be constructed and installed in cave and mine entrances used as shelter for bats within 3 years of discovery when there are no conflicts with cultural resources. Caves and abandoned mines that are used by bats should be managed to prevent disturbance to species and spread of disease (e.g., white-nose syndrome).
Entrapment	FPS that are small mammals, bats, young of other species, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach	**GLs for Aquatic Habitat and Species:** Sufficient water should be left in streams to provide for aquatic species and riparian vegetation. When new water diversions are created or existing water diversions are reanalyzed, measures should be taken to prevent entrapment of fish and aquatic organisms. **GL for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to

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	minnow, and spikedace	reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **STs for Livestock Grazing:** New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing). New livestock watering facilities shall be designed to allow wildlife access and escape. **GL for Livestock Grazing:** During maintenance of existing watering facilities, escape ramps that are ineffective or missing should be replaced. **GLs for Special Uses:** Environmental disturbance should be minimized by co-locating pipelines, power lines, fiber optic lines, and communications facilities. Power pole installation or replacement under special use authorization should include raptor protection devices in open habitat such as large meadows and grasslands. Raptor protection devices should be installed on existing poles where raptors have been killed. **GL for Wildlife Quite AreaManagement Area:** Fences surrounding and within WQAs should be inspected and improved to allow wildlife movement within and outside of the areas. Fences should be removed if no longer needed.
Substantial predation or competition from invasive species	pronghorn antelope, Three Forks springsnail, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	**ST for All PNVTs:** Vegetation treatments shall include measures to reduce the potential for the introduction of invasive plants and animals and damage from nonnative insects and diseases. **GL for Aquatic Habitat and Species:** To prevent degradation of native species habitat and the incidental or accidental introduction of diseases or nonnative species, aquatic species should not be transferred through management activities from one 6th level HUC watershed to another. **GL for Wildlife and Rare Plants** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. **ST for Invasive Species**: Projects and authorized activities shall be designed to reduce the potential for the introduction of new species or spread of existing invasive or undesirable aquatic or terrestrial nonnative populations. **GL for Invasive Species:** Projects and activities should not transfer water between drainages or between unconnected waterbodies within the same drainage to avoid spreading disease and aquatic invasive species. **ST for Special Uses:** Noxious plants and nonnative invasive species monitoring and control shall be included in contracts, permits, and agreements. **GL for High Use Developed Recreation AreaManagement Area:** Management should focus on

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		operation and maintenance, safety, aesthetics, and control of noxious weeds and nonnative invasive species. **GL for Energy CorridorManagement Area:** Invasive plant species should be aggressively controlled within energy corridors to prevent or minimize spread.
Intentional harassment, forced removal, or avoidable disturbance	Mexican wolf, Gunnison's prairie dog, black bear, many FPS (at least during important life cycle periods)	**GL for All Forested PNVTs:** Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife. **GL for All Woodland PNVTs:** Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife. **GLs for Wildlife and Rare Plants:** Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. Cool and/or dense vegetation cover should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk, western yellow-billed cuckoo). **GL for Wildland Fire Management:** Firelines, helispots, and fire camps should be located to avoid disturbance to critical species and impacts to cultural resources. **GLs for Overall Recreation Opportunities:** Developed and dispersed recreation sites and other authorized activities should not be located in places that prevent wildlife or livestock access to available water. Food and other items that attract wildlife should be managed to prevent reliance on humans and to reduce human-wildlife conflicts. **GLs for Dispersed Recreation:** Timing restrictions on recreation uses should be considered to reduce conflicts with wildlife needs or soil moisture conditions. Dispersed campsites should not be located on or adjacent to archaeological sites or sensitive wildlife areas. **ST for Developed Recreation:** Where trash facilities are provided, they shall be bear resistant. **GLs for Special Uses:** Large group and recreation event special uses should not be authorized within wilderness, recommended wilderness, primitive area, wildlife quiet areas, eligible "wild" river corridors, riparian and wetland areas, cultural resource sites, Phelps Cabin Botanical Area, Phelps Cabin Research Natural Area (RNA), or recommended RNAs to protect the unique character of these areas. The use of underground utilities should be favored to avoid potential conflicts with resources (e.g., scenic integrity, wildlife, wildfire, heritage). **GLs for Minerals and Geology:** To reduce disturbances from human activities and prevent the spread of disease, bat gates should be constructed and installed in cave and mine entrances used as shelter for bats within 3 years of discovery when there are no conflicts with cultural resources.

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		Caves and abandoned mines that are used by bats should be managed to prevent disturbance to species and spread of disease (e.g., white-nose syndrome). **GLs for Wildlife Quiet Area Management Area:** All WQAs should be managed to preclude snowmobile use to minimize disturbance during the critical winter period. WQA boundaries should be signed to identify the areas and educate the public about their purpose. **GL for Research Natural AreaManagement Area:** Research special use authorizations should limit impacts to sensitive resources, unique features, and species within the RNA. **GL for Recommended Resarch Natural AreaManagement Area:** Research special use authorizations should limit impacts to sensitive resources, unique features, and species within recommended RNAs.

References

U.S. Forest Service. (2014a). Fisheries Specialist and Viability Report Forest Plan Revision FEIS. Springerville, AZ.

U.S. Forest Service. (2014b). Wildlife Specialist Report - Viability. Springerville, AZ.