

## 5.0 VASCULAR PLANTS

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### 5.1 CYPRIPEDIUM FASCICULATUM

*Cypripedium fasciculatum* is a perennial herb in the Orchidaceae family and is commonly known as clustered lady's-slipper, brownie lady's-slipper, or brownie slipper orchid.

#### 5.1.1 Regulatory Status and Ranking

The 2001 ROD identifies *C. fasciculatum* as a Category C (uncommon) species across the NSO range. The ORBIC evaluated *C. fasciculatum* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of the *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be not rare and apparently secure, but with cause for long-term concern, within its global range (G4). In Oregon, it was imperiled because of rarity or other factors that make it vulnerable to extinction (S2). The species is on the ORBIC List 2. It is considered a BLM and Forest Service Sensitive species in Oregon and is a candidate for listing in Oregon.

#### 5.1.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*C. fasciculatum* is a long-lived perennial orchid that may take multiple years to flower (Vance 2005). It develops symbiotic relationships with specific mycorrhizal fungi to obtain nutrients, and relies on a small predatory wasp for pollination (Vance 2005, Lichthardt 2003). It may take several years of mycorrhizal-supported growth before seedlings accumulate enough stored starch to develop a stem and leaves above ground (Vance 2005). The species can remain dormant below ground for multiple years while receiving moisture and nutrients from mycorrhizal fungi. It returns as a vegetative shoot to reproduce when environmental conditions are favorable and sufficient carbohydrates have been stored.

Unlike most other plant species, *C. fasciculatum* cannot replace damaged new spring growth until the following year after injury is incurred. Plants whose spring growth is injured by fire, late frost, disease, foraging animals, or other damaging events suffer severe impediments to growth and may die (Vance 2005). Plants with low energy reserves may require more than one vegetative growth season before flowering and may remain dormant below the soil. Fire may play an important role in the species' life cycle (Holthausen et al. 1994), as the species tends to inhabit areas that regularly experience low intensity fire (ORBIC 2004).

#### *Range*

*C. fasciculatum* is found in multiple disjunct ranges in mountainous areas of the western and interior-western United States, from central California to Washington and from the Pacific coast

to Colorado and Wyoming (ORBIC 2004, Vance 2005). The species tends to be scattered and widely separated across its range (Vance 2005), although its distribution within each state is sparse and limited (Lichthardt 2003). In California, *C. fasciculatum* has been found in the Santa Cruz Mountains and Coast Range and from the central Sierra Nevada Mountains through the southern Cascade Range and the Klamath Mountains (ORBIC 2004). In Oregon, it has been found in the Cascade and Coast Ranges and Klamath Mountains, as well as in the northern Cascade and Sawtooth Ranges. The currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across western North America. Local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### ***Population Status***

The ORBIC (2004) reported *C. fasciculatum* from more than 300 element occurrences across western North America in 2004. In the Pacific Northwest, Oregon had the highest number of element occurrences with 304. California had an estimated 100 element occurrences, and Washington had 59 element occurrences (ORBIC 2004). Based on 2004 information, the species had experienced a short-term decline across its range and in Oregon and was also considered to be at moderate risk of further long-term population decline. *C. fasciculatum* has many sites in southwest Oregon that have been documented since the 2001 ROD was published. Many of these sites consist of very few individuals, and small sites are often not relocated in subsequent visits such that the numbers of occurrences may not be an adequate representation of numbers of viable populations (Richard Helliwell, Pers. Comm.). Notwithstanding that information, a large number of occurrences of this species remain. The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 462 sites on federal lands and 1,283 total sites on all lands in the NSO range.

For the PCGP Project, surveys for special-status plants were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011a). These surveys targeted *C. fasciculatum*, but resulted in no observations of the species. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### ***Habitat***

In the Pacific Northwest, *C. fasciculatum* is found in a wide array of habitats, including a diversity of soil types, vegetation communities, slopes, and aspects (Vance 2005). The species tends to occur at elevations ranging from 100–6,500 feet msl and appears to be strongly associated with Douglas-fir. Habitat ranges from mature coniferous forests to openings and edges of mixed successional forests. The species requires a rich organic humus layer that can support the microfauna associated with its life cycle. It can become damaged by direct sunlight and therefore requires shade from overstory vegetation. In successional forest habitats where tree canopy shading is too thin, *C. fasciculatum* often occurs where it can receive cover from understory vegetation. Localized habitats range from stream banks to forested slopes and areas

that have been subject to some level of disturbance, such as roadside ditches or road cuts, but the plant is almost always found under shade from overhanging vegetation. *C. fasciculatum* may prefer specific microclimate conditions of LSOG forests, but it may not be as restricted to these conditions.

### **Threats**

Primary threats to *C. fasciculatum* are those that remove the overstory canopy and disturb soil (Lichthardt 2003), including logging, road construction, development, and grazing (ORBIC 2004, Vance 2005). High intensity fires have a strong potential to eliminate populations, especially in areas that have been subject to decades of fire suppression (ORBIC 2004). Localized threats include collection and trampling, particularly in or near campgrounds (Lichthardt 2003). Habitat fragmentation, physical trampling, specimen collection, and fire suppression are known to have led to reductions in habitat and populations (USDA and USDI 2007). In 1995, lady-slipper orchids of the *Cypripedium* genus, including *Cypripedium fasciculatum*, were rated by the World Wildlife Fund to be among the top 10 most sought plants or animals threatened by illegal trade (Seevers and Lang 1998).

### **Management Recommendations**

As a Category C S&M species, the direction from the 2001 ROD is to manage high-priority sites to provide a reasonable assurance of species persistence (USDA and USDI 2001). Management recommendations for *C. fasciculatum* were developed in 1998 and updated in 2005 (Vance 2005). The guidance includes:

- Maintain sufficient cover to avoid any more than intermittent direct solar radiation on *C. fasciculatum* plants.
- Maintain decayed down logs (decay class 4 and 5), snags, and duff layer within the species habitat area for favorable forest floor conditions, habitat, soil moisture and mycorrhizal associates. Where fuel concentrations are within the historic range of variability, provide for future recruitment of coarse woody debris.
- Avoid activities that alter or remove soil, duff, or the organic matter in the species habitat area.
- Manage sites to include entire populations plus an area large enough to maintain current habitat and associated microclimate, primarily temperature and moisture.
- Where fuel concentrations exceed historic range of variability (fuel condition class 2 and 3), treat fuels within and adjacent to the site to reduce risk of high intensity fire.
- Restrict activities within species habitat areas during the species' growing season which ranges from March (or whenever leaves visible) through August (or when capsules split and shed seeds). Growth season can vary from site-to-site and year-to-year and should be checked before activity takes place.
- Because plants do not appear above ground every year, it is important to buffer species locations in order to capture dormant plants.

### 5.1.3 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species’ currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### Species Distribution

The distribution of *C. fasciculatum* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table CYFA-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 3,245 observations from BLM and Forest Service geodatabases were converted into 1,504 sites in the NSO range (region). Table CYFA-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table CYFA-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure CYFA-1 displays the regional distribution of the species across BLM and NFS lands, and Figure CYFA-2 displays the species’ regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 7,000 feet on BLM and NFS lands within the currently known range of the species.

TABLE CYFA-1

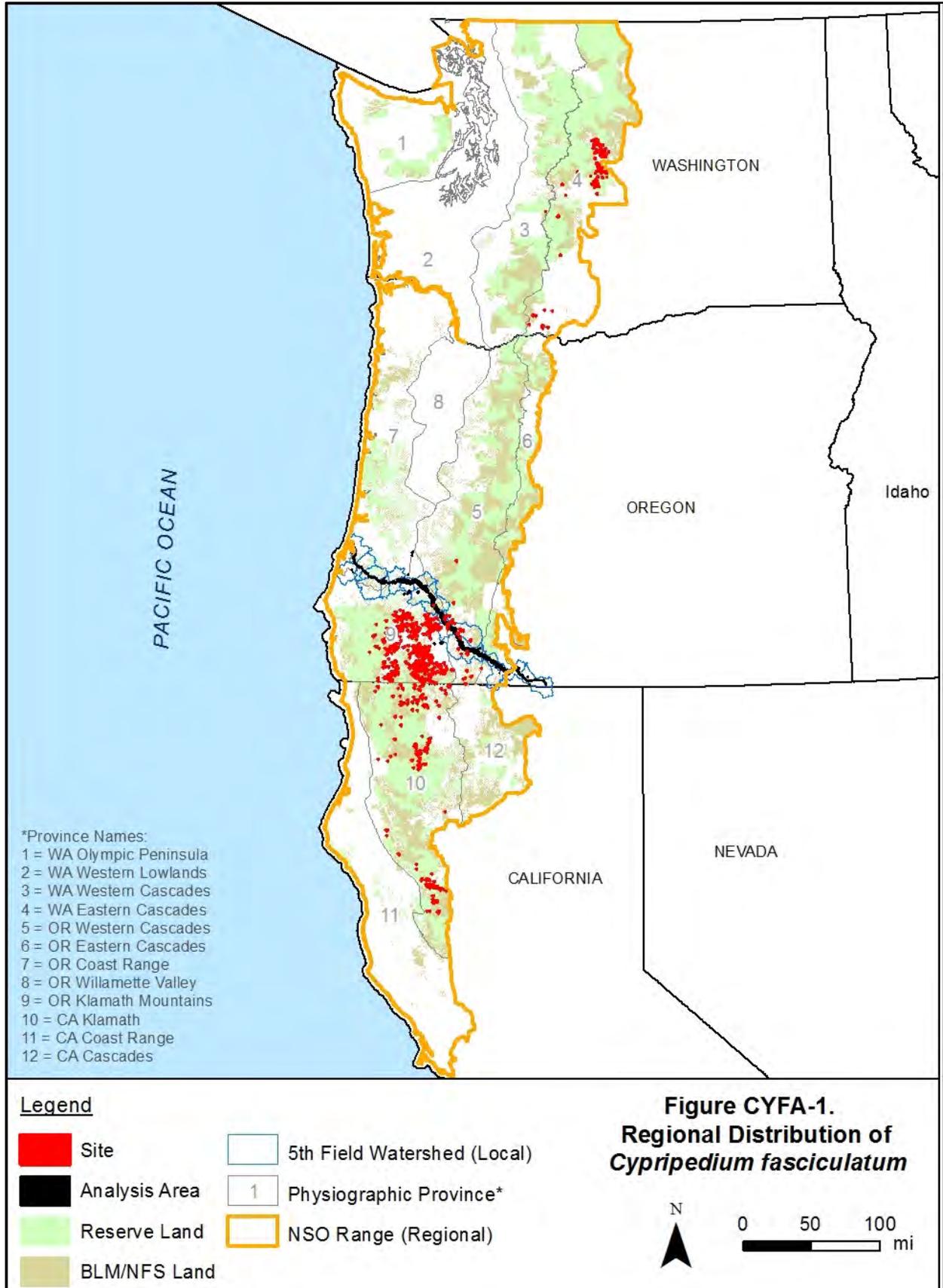
Number of <i>Cypripedium fasciculatum</i> Sites (2013)	
Location*	Number of Sites
Regional Area	1,504
Local Area	34
Analysis Area (Project Area)	2 (2)
Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013	
*Definitions of regional, local, and project areas are provided in Chapter 1.	

TABLE CYFA -2

Distribution of <i>Cypripedium fasciculatum</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	799	32	1
Forest Service	673	3	1
NPS	-	-	-
Fish and Wildlife Service	1	-	-
Other (Private, State, etc.)	233	11	1

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



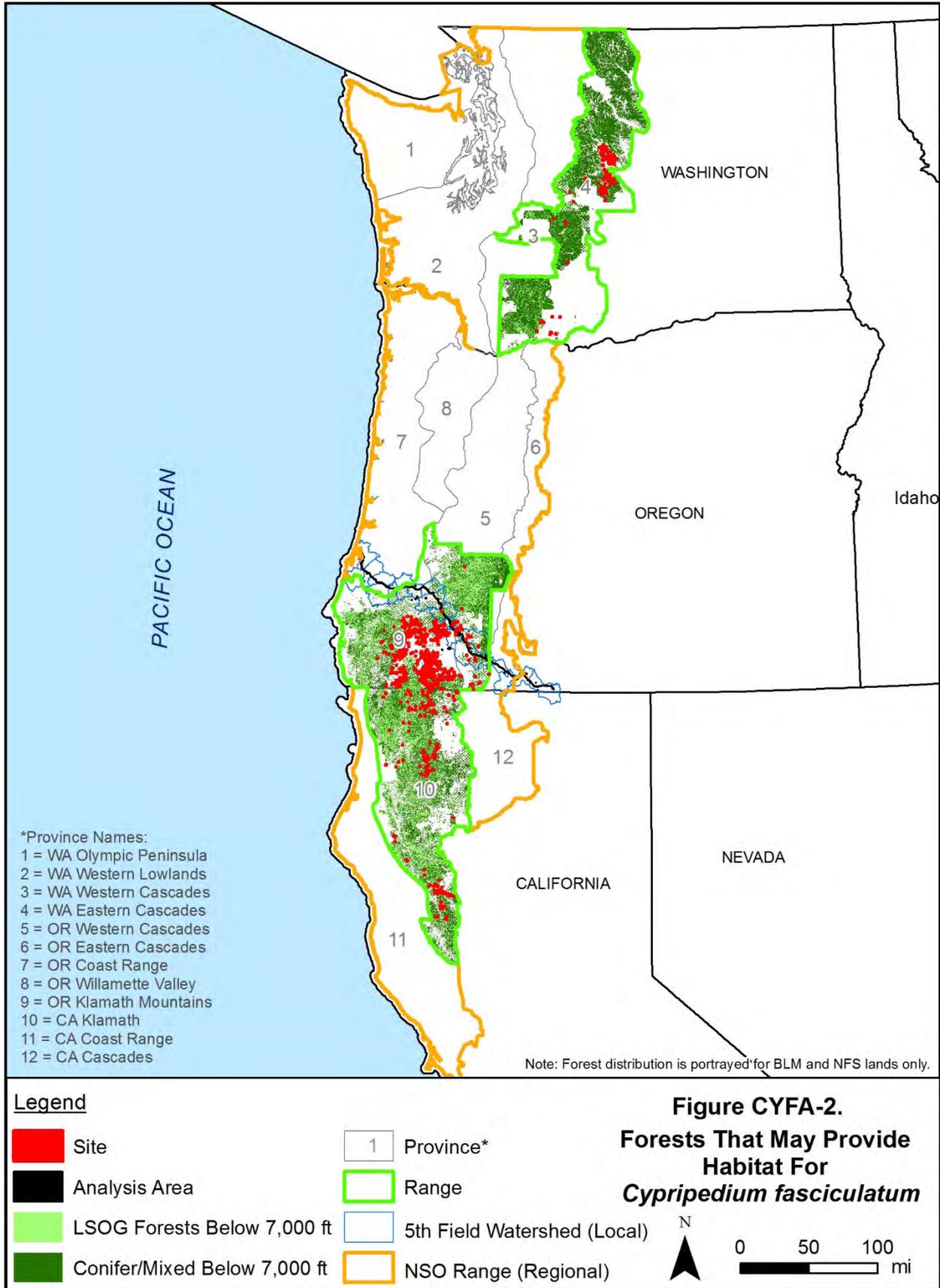


TABLE CYFA -3

Distribution of <i>Cypripedium fasciculatum</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	467	-	-
Adaptive Management Reserves (AMR)	3	-	-
Administratively Withdrawn (AW)	33	-	-
<b>Congressionally Reserved (CR)</b>	<b>10</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>220</b>	<b>1</b>	<b>1</b>
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>81</b>	<b>4</b>	-
Managed Late Successional Area (MLSA)	16	-	-
Not Designated (ND)	1	-	-
Other (Matrix, Riparian Reserve, Other)	714	32	1
<b>Riparian Reserve**</b>	<b>2</b>	<b>2</b>	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations, some sites occur in multiple allocations, and the allocations only apply to BLM and NFS lands. **Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).

### Regional Distribution

*C. fasciculatum* has a somewhat wide distribution across five physiographic provinces in Washington (Western and Eastern Cascades), Oregon (Cascades West and Klamath Mountains), and California (Klamath) (see Figure CYFA-1). Sites are found in three general groups in the Klamath Mountains in Oregon and California, southern Klamath Mountains in California, and eastern Cascade Range in Washington. Within each group, sites are abundant and clustered, with some scattered sites around the main clusters. The species is extremely abundant in the Klamath Mountains and is less abundant in the Cascade Range. Many opportunities for dispersal between sites within each group appear to exist based on the proximity of the sites to one another and the extent of coniferous and mixed hardwood-coniferous forests. The species appears to be well distributed in the Klamath Mountains in Oregon and California and eastern Cascade Range in Washington based on the abundance and size of sites, proximity of sites to one another, and distribution of sites across forests that may provide suitable habitat in the mountain ranges.

Of the 1,504 sites in the region, 233 sites are at least partially located on private lands; one site is located on U.S. Fish and Wildlife Service land; and 1,465 sites are at least partially on BLM and NFS lands across the region. Sites managed by the BLM Districts that encompass the project area include 797 sites in the Medford District. Sites managed by the National Forests that encompass the project area include 229 sites on the Rogue River National Forest and three sites on the Umpqua National Forest. The remaining 443 sites on BLM and NFS lands are in the Redding District and on the Gifford Pinchot, Klamath, Mendocino, Mt. Baker-Snoqualmie, Shasta-Trinity, Siskiyou, Six Rivers, and Wenatchee National Forests.

Across the NSO range, 313 sites are located on reserve lands managed by BLM or the Forest Service, including 220 in LSRs, 81 in Known Owl Activity Centers, 10 in Congressionally Reserved areas, and two in Riparian Reserves. This represents 21 percent of the total BLM- and Forest Service-managed sites in the region. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*C. fasciculatum* is more commonly found in LSOG forests based on available data (1,204 of 1,504 total sites are in LSOG), but it is also relatively common in non-LSOG forests and has been found in a variety of forest types. Based on current site locations, the species is found primarily in coniferous and mixed forests below about 6,600 feet msl and has been documented in part of the NSO range. Coniferous and mixed hardwood-coniferous forests below 7,000 feet msl, including the LSOG component of these forests, in the Klamath Mountains and parts of the Cascade Range in Oregon and Washington could provide habitat for *C. fasciculatum* and support additional sites. These forests encompass an estimated 10.3 million acres on BLM and NFS lands in the species’ range, including an estimated 5.8 million acres in reserve land allocations (56 percent of the forests; Table CYFA-4). Of this acreage, an estimated 3.0 million acres are LSOG (see Figure CYFA-2), including 1.8 million acres in reserve land allocations (60 percent of the forests). These forests are widespread across the species’ range.

TABLE CYFA-4

<b>Extent of Forests that Could Provide Habitat for <i>Cypripedium fasciculatum</i> on BLM and NFS Lands*</b>				
<b>Location</b>	<b>Coniferous/Mixed Forests below 7,000 feet</b>		<b>LSOG Forests below 7,000 feet</b>	
	<b>Total</b>	<b>Reserves</b>	<b>Total</b>	<b>Reserves</b>
Regional Area	10,294,900	5,800,854	2,999,450	1,803,450
Local Area	394,210	119,960	122,910	45,760
Project Area	1,050	410	230	130

Data Source: GNN vegetation data from Moerur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *C. fasciculatum* is distributed across five 5<sup>th</sup> field watersheds that overlap the project area (see Table CYFA-5 and Figure CYFA-3). Sites in four of the watersheds are clustered and close to one another. Scattered sites are located in the Upper Cow Creek and Big Butte Creek watersheds. All of the sites appear to have some level of connectivity between them and others in the region because the sites are part of a large group of sites in the Klamath Mountains.

All of the 34 sites in the local area are at least partially on BLM and NFS lands, and 11 sites are at least partially on private lands. The sites are located on lands designated as Other (Matrix), LSR, and Riparian Reserve. Of the 34 sites in the local area, seven sites are on reserve lands, representing 21 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table CYFA-5 and on Figure CYFA-3.

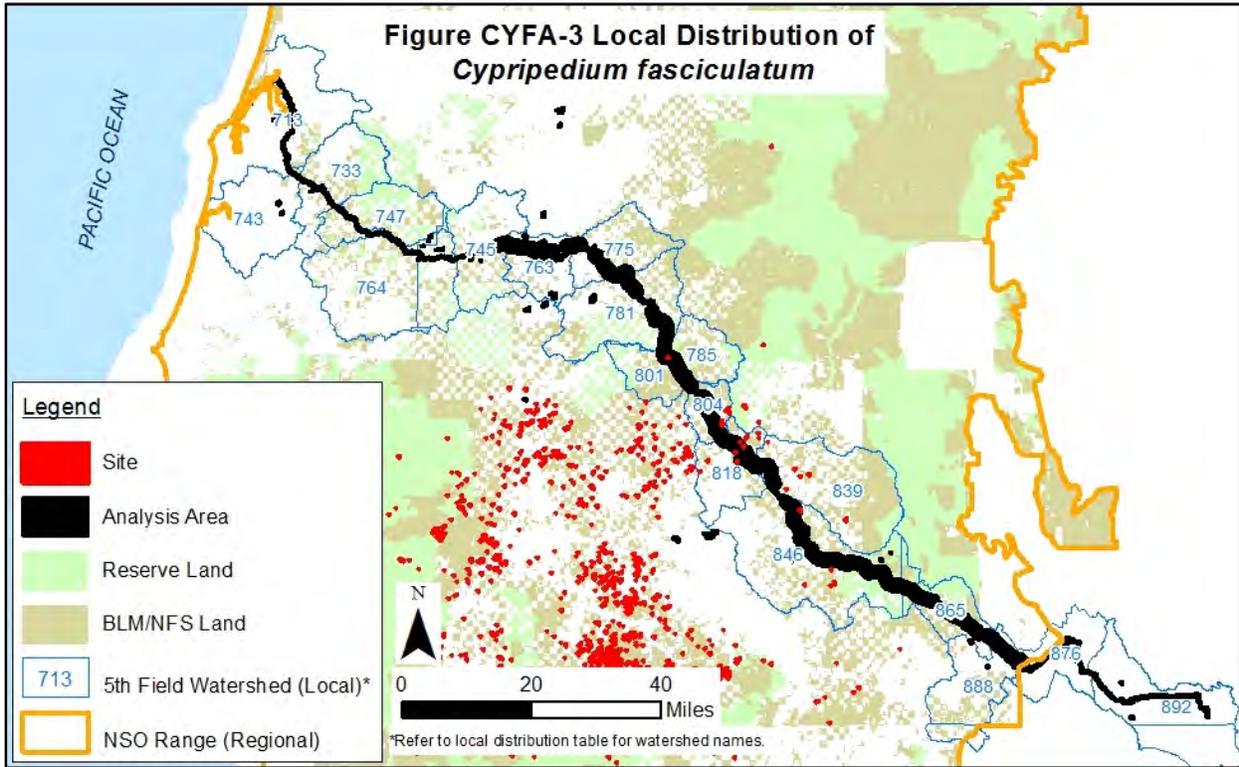
Coniferous and mixed hardwood-coniferous forests below 7,000 feet msl encompass approximately 394,210 acres on BLM and NFS lands in the local area, with 119,960 acres in reserve land allocations (30 percent of the forests). Of this acreage, an estimated 122,910 acres are LSOG, including 45,760 acres in reserve land allocations (37 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the distribution and abundance of sites in the local and regional areas and extent of forests that may provide suitable habitat (see Figures CYFA-2 and CYFA-3).

TABLE CYFA-5

**Distribution of *Cypridium fasciculatum* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	8	2
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	7	2
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	12	2
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	5	-
Upper Cow Creek (801)	2	1

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011



Analysis/Project Area Distribution

The analysis and project areas contain two sites of *C. fasciculatum*, both of which are at least partially on BLM or NFS lands. One site is on BLM-managed lands, and one site is partially on NFS lands and private lands. The analysis area sites are in two watersheds: Rogue River-Shady Cove watershed in the Medford District and Upper Cow Creek watershed on the Umpqua National Forest. Several sites are located within the immediate vicinity of the analysis area (see Local Distribution discussion above).

The site on BLM land is located on land designated as Other (Matrix) and is not within a regionally mapped reserve. The site on NFS land is located in an LSR.

Surveys for the PCGP Project did not result in any observations of the species (Siskiyou BioSurvey LLC 2008, 2011a). Two recorded observations from 1994 and 2003 in agency databases comprise the two sites in the analysis area. Within the project area, one site is at MP 104.1, and the other site is along a road west of MP 128.

**Project Impacts**

Analysis

The PCGP Project would affect two sites out of the 1,465 sites on BLM and NFS lands in the region, representing less than 1 percent of the sites (or two out of 1,504 total sites on all lands in the NSO range). Table CYFA-6 presents an overview of the features of the PCGP Project that would affect the *C. fasciculatum* sites. The construction corridor, associated work areas, and road improvements would affect approximately 0.5 acre within two sites (about 9 percent of the sites). Measures outlined in Chapter 1 would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *C. fasciculatum* in and near the project area. This discussion presents an overview of the types of impacts that would be expected in the sites based on the features of the PCGP Project and that could affect site persistence.

Vegetation removal and grading activities in the construction corridor would disturb about 0.3 acre of vegetation and soils within one site and could result in the removal of *C. fasciculatum* populations or individuals. Disturbance in the TEWAs would result in similar impacts on about 0.1 acre within the same site. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and disturbance to soil could negatively affect *C. fasciculatum* in adjacent areas by removing its habitat and potentially dormant individuals, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the sites no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Road improvements and establishment would disturb approximately 0.1 acre within two sites and could remove habitat and extant populations or individuals of *C. fasciculatum*.

TABLE CYFA-6

Impacts to <i>Cyripedium fasciculatum</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.3 ac
Temporary Extra Work Area (TEWA)	1	0.1 ac
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	2	0.1 ac
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because some sites would be subject to impacts from multiple project activities.

Across the project area, the PCGP Project would remove an estimated 810 acres of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl, including 160 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *C. fasciculatum*. Within this impact area, about 520 acres (about 64 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 160 acres of coniferous and mixed forests below 7,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the two sites as a result of the PCGP Project, 32 sites of *C. fasciculatum* would remain on BLM and NFS lands in the local area, including six in reserves, and 1,463 sites, including 312 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 312 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 21 percent of the remaining *C. fasciculatum* on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *C. fasciculatum* is a Category C (uncommon) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category C species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information, however, since the species was listed in the 2001 ROD indicates that the species appears to be more common than previously documented, as noted below:
  - *C. fasciculatum* has a somewhat wide distribution across five physiographic provinces and three states in the region and a moderate-high number of overall sites (1,465 on BLM and NFS lands). The species appears to be well distributed in the Klamath Mountains and eastern Cascade Range in Washington. The currently known number of sites on BLM and NFS lands is an increase of about 1,003 sites on BLM and NFS lands since 2007.
  - An estimated 21 percent of the sites (313 sites) are in reserves.

- Coniferous and mixed hardwood-coniferous forests below 7,000 feet msl (general habitat for the species) are widespread across the species' range and encompass approximately 10.3 million acres on BLM and NFS lands with an estimated 56 percent in reserves. A subcomponent of these forests likely provides habitat for *C. fasciculatum*.
- The PCGP Project would affect two of 1,465 BLM- and Forest Service-managed sites of *C. fasciculatum*, representing less than 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the two sites, a moderate-high number of sites (1,463 sites) would continue to be documented on BLM and NFS lands in the region. Many sites (32 sites) would remain in the local vicinity of the analysis area with many other sites in the nearby Klamath Mountains. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would affect site persistence at one site in an LSR, but would not change the percentage of sites in reserves. Of the remaining sites, 300 are in LSRs where management actions are restricted to those activities that benefit LSOG forests, and 10 are in Congressionally Reserved areas where management activities that may adversely affect *C. fasciculatum* are unlikely. At least two other sites are in Riparian Reserves where management actions are restricted to those activities that benefit the conservation of aquatic and riparian-dependent terrestrial resources.
- The PCGP Project would result in a permanent loss of an estimated 160 acres of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 5.8 million acres (56 percent) of coniferous and mixed forests and 1.8 million acres (60 percent) of LSOG forests below 7,000 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *C. fasciculatum*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category C species for which pre-disturbance surveys are practical and have been conducted in many areas; thus, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during surveys.

#### 5.1.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *C. fasciculatum* at two sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 1,463 sites would remain on BLM and NFS lands across the region, and 32 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project would affect site persistence of *C. fasciculatum* at two sites, these sites are part of the large group of sites in the Klamath Mountains in Oregon and California where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *C. fasciculatum* would persist in the region without considering the two sites as part of the population.

- The PCGP Project would remove approximately 810 acres of coniferous and mixed forests and 160 acres of LSOG forests below 7,000 feet msl (a negligible amount of the forests). An estimated 64 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 5.8 million acres (56 percent) of coniferous and mixed forests and 1.8 million acres (60 percent) of LSOG coniferous and mixed forests below 7,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2007.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is somewhat widely distributed.

The PCGP Project would not be able to avoid impacts to all *C. fasciculatum* sites in the analysis area, although some individuals or populations within the sites may persist following project implementation. Based on the above conclusions, avoidance of the two *C. fasciculatum* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for *C. fasciculatum* sites affected by the PCGP Project. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near affected sites over the long term, as specified by the agency responsible for management of the site. The monitoring plan shall be approved by the BLM and Forest Service.

## 5.2 CYPRIPEDIUM MONTANUM

*Cypripedium montanum* is a perennial herb in the Orchidaceae family and is commonly known as mountain lady's-slipper or moccasin slipper.

### 5.2.1 Regulatory Status and Ranking

The 2001 ROD identifies *C. montanum* as a Category C (uncommon) species across the NSO range. The ORBIC evaluated *C. montanum* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of the *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be not rare and apparently secure globally, but with cause for long-term concern (G4). In Oregon, it was between rare, uncommon, or threatened, but not immediately imperiled, and not rare and apparently secure, but with cause for long-term concern (S3S4). The species is on the ORBIC List 4. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

### 5.2.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation

in the following section and is updated with more recent information specifically used for the persistence evaluation.

### ***Life History***

*C. montanum* is a long-lived perennial orchid that can take multiple years to flower (Vance 2007). It develops a symbiotic relationship with specific mycorrhizal fungi for seed germination and to obtain nutrients (ORBIC 2004). It requires an insect vector for pollination, typically small generalist bee species (Vance 2007). Seed dispersal is typically over short distances via light air currents and over longer distances by wind, water, or animals. It may take several years of mycorrhizal-supported growth before seedlings accumulate enough stored starch to develop a stem and leaves above ground. The species can remain dormant below ground for multiple years while receiving moisture and nutrients from mycorrhizal fungi, returning as a vegetative shoot to reproduce when environmental conditions are favorable and sufficient carbohydrates have been stored.

### ***Range***

*C. montanum* is found in mountainous areas of western North America, from southeastern Alaska to California and eastward to Saskatchewan, Montana, Wyoming, Idaho, Utah, and Colorado (ORBIC 2004, Vance 2007). It occurs in the Pacific Northwest from Alaska to California. The currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across western North America. Local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### ***Population Status***

The ORBIC (2004) reported *C. montanum* from more than 400 element occurrences in western North America in 2004. In the Pacific Northwest, Oregon had the highest number of element occurrences with more than 300 (ORBIC 2004). California had an estimated 60 occurrences, and Washington had an estimated 50 occurrences. Based on 2004 information, the species had experienced a decline across its range and was considered to be highly vulnerable because of its mycorrhizal fungal associate, long dormancy, and dependency on pollination (ORBIC 2004). The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 868 sites on federal lands and 876 total sites on all lands in the NSO range.

For the PCGP Project, surveys for special-status plants were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011a). These surveys targeted *C. montanum*, but resulted in no observations of the species. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### **Habitat**

In the Pacific Northwest, *C. montanum* is found in diverse habitat types across varying moisture regimes, substrates, and vegetation communities (Seevers and Lang 1998), from full sun on dry eastern-facing mountain slopes to dense shade in moist valley woodlands (ORBIC 2004). The species has been found at elevations ranging from 1,500–6,500 feet msl, primarily on northern facing slopes of 25 to 30 percent (Seevers and Lang 1998). It can tolerate drier conditions than most other members of the *Cypripedium* genus and appears to be most often associated with stands of conifer trees, particularly Douglas-fir, with 60 to 80 percent canopy cover. Suitable habitat ranges from coniferous to mixed hardwood-coniferous forests. In the western Cascade Range, the plant is most often found in Douglas-fir forests with madrone, sugar pine, or ponderosa pine and to a lesser degree with grand fir, incense cedar, Pacific yew (*Taxus brevifolia*), and California black oak (*Quercus kelloggii*) (Seevers and Lang 1998). *C. montanum* may prefer specific microclimate conditions of LSOG forests, but it may not be as restricted to these conditions.

### **Threats**

Primary threats to *C. montanum* are actions that physically destroy or alter habitat and create changes in forest structure that alter interior stand-level habitat conditions and microclimates (Seevers and Lang 1998). These actions include timber harvesting, road building, grazing, recreational activities, and other human-caused disturbances. High intensity fires also threaten many populations, especially in areas that have been subject to decades of fire suppression (ORBIC 2004). Localized threats include collection of *C. montanum* by plant collectors and trampling disturbance by mushroom collectors and medicinal plant collectors, particularly in or near campgrounds (ORBIC 2004). In 1995, lady-slipper orchids of the *Cypripedium* genus, including *C. montanum*, were rated by the World Wildlife Fund to be among the top 10 most sought plants or animals threatened by illegal trade (Seevers and Lang 1998).

### **Management Recommendations**

As a Category C S&M species, the direction from the 2001 ROD is to manage high-priority sites to provide a reasonable assurance of species persistence (USDA and USDI 2001). Management recommendations for *C. montanum* were developed in 1998 (Seevers and Lang 1998). The guidance includes:

- Maintain or restore habitat conditions in areas with populations of *C. montanum*.
- Maintain canopy closure at 60 percent or greater.
- Maintain down logs, snags, and duff layer within the habitat area for soil moisture and mycorrhizal associates. Provide for future recruitment of coarse woody debris.
- Avoid activities that alter soil, duff, down wood, and the mycorrhizal community in the habitat area.
- Maintain/secure known sites from prescribed burns.
- Manage population sites to include an area large enough to maintain current habitat and associated microclimate, primarily temperature and moisture. The size should be determined by a field visit and should consider factors such as canopy cover, slope,

aspect, topographic position, vegetation structure (growth form, stratification, and coverage), and species composition.

- Given the long life-span of individuals, manage *C. montanum* and associated communities to be responsive to short-term (wildfire, soil disturbance) and long-term (ecological succession) environmental changes and maintain the species evolutionary potential.
- Manage for biological (mycorrhizae and pollinators) and ecological (soil temperature, moisture, and organic matter) requirements at each life stage. Each life stage may require specific mitigation. Ensure that indiscriminate insecticide spraying does not affect the populations of bees or other insects this species depends on for pollination.

### 5.2.3 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species’ currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *C. montanum* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table CYMO-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 1,635 observations from BLM and Forest Service geodatabases were converted into 756 sites in the NSO range (region). Table CYMO-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table CYMO-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure CYMO-1 displays the regional distribution of the species across BLM and NFS lands, and Figure CYMO-2 displays the species’ regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 7,000 feet on BLM and NFS lands within the currently known range of the species.

TABLE CYMO-1

<b>Number of <i>Cypripedium montanum</i> Sites (2013)</b>	
<b>Location*</b>	<b>Number of Sites</b>
Regional Area	756
Local Area	55
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013

\*Definitions of regional, local, and project areas are provided in Chapter 1.

TABLE CYMO-2

**Distribution of *Cypripedium montanum* Across Federal, Private, and Other Lands**

Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	377	49	1
Forest Service	356	4	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	130	12	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE CYMO-3

**Distribution of *Cypripedium montanum* Across 1994 ROD Land Allocations**

Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	134	-	-
Adaptive Management Reserves (AMR)	1	-	-
Administratively Withdrawn (AW)	36	1	-
<b>Congressionally Reserved (CR)</b>	<b>1</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>133</b>	-	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>32</b>	<b>6</b>	<b>-</b>
Managed Late Successional Area (MLSA)	21	1	-
Not Designated (ND)	3	-	-
Other (Matrix, Riparian Reserve, Other)	412	48	1
<b>Riparian Reserve**</b>	<b>3</b>	<b>-</b>	<b>-</b>

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

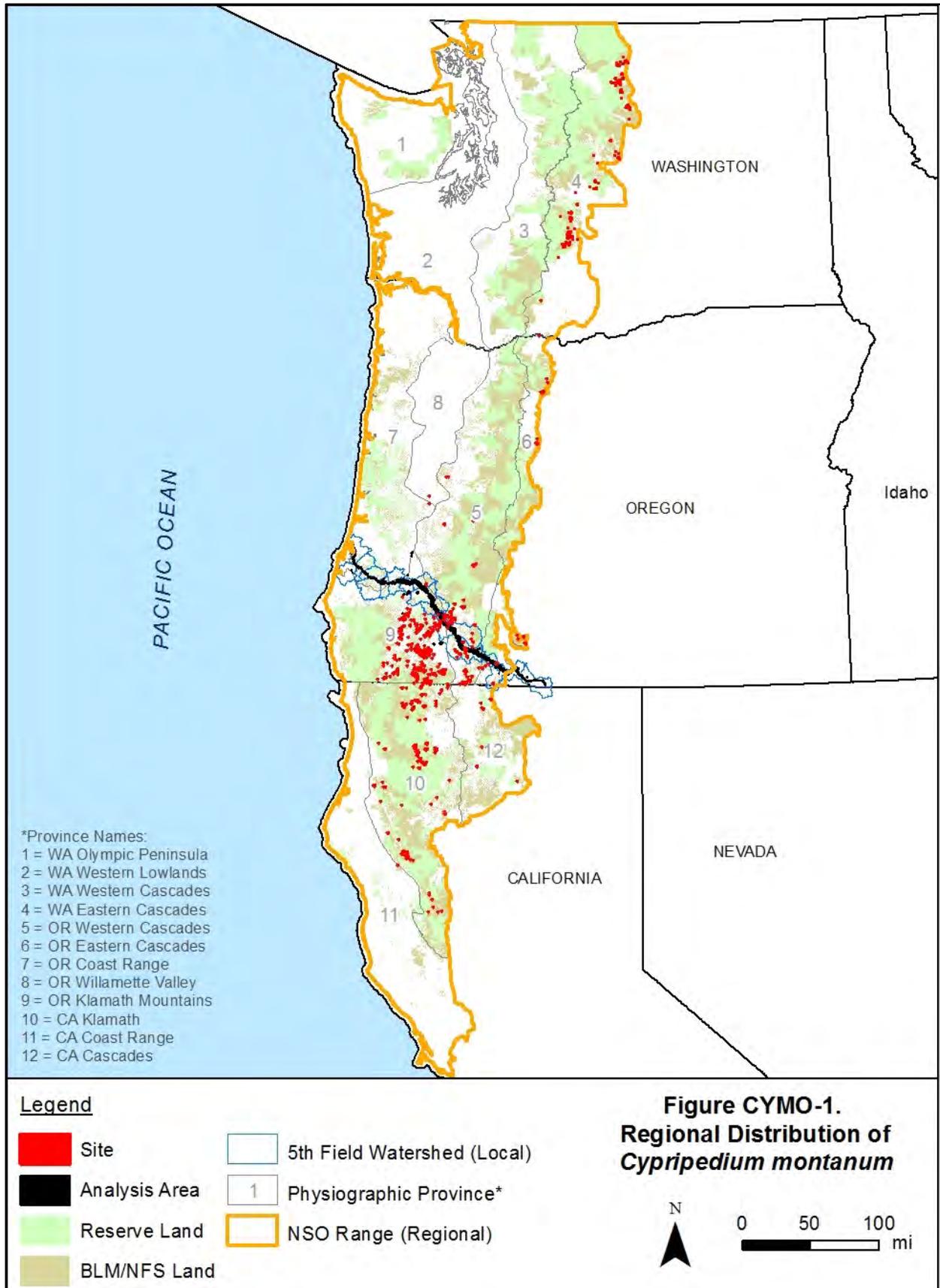
Notes: Columns are not additive because of overlap between some allocations, some sites occur in multiple allocations, and the allocations only apply to BLM and NFS lands. **Bolded** allocations are designated reserve areas.

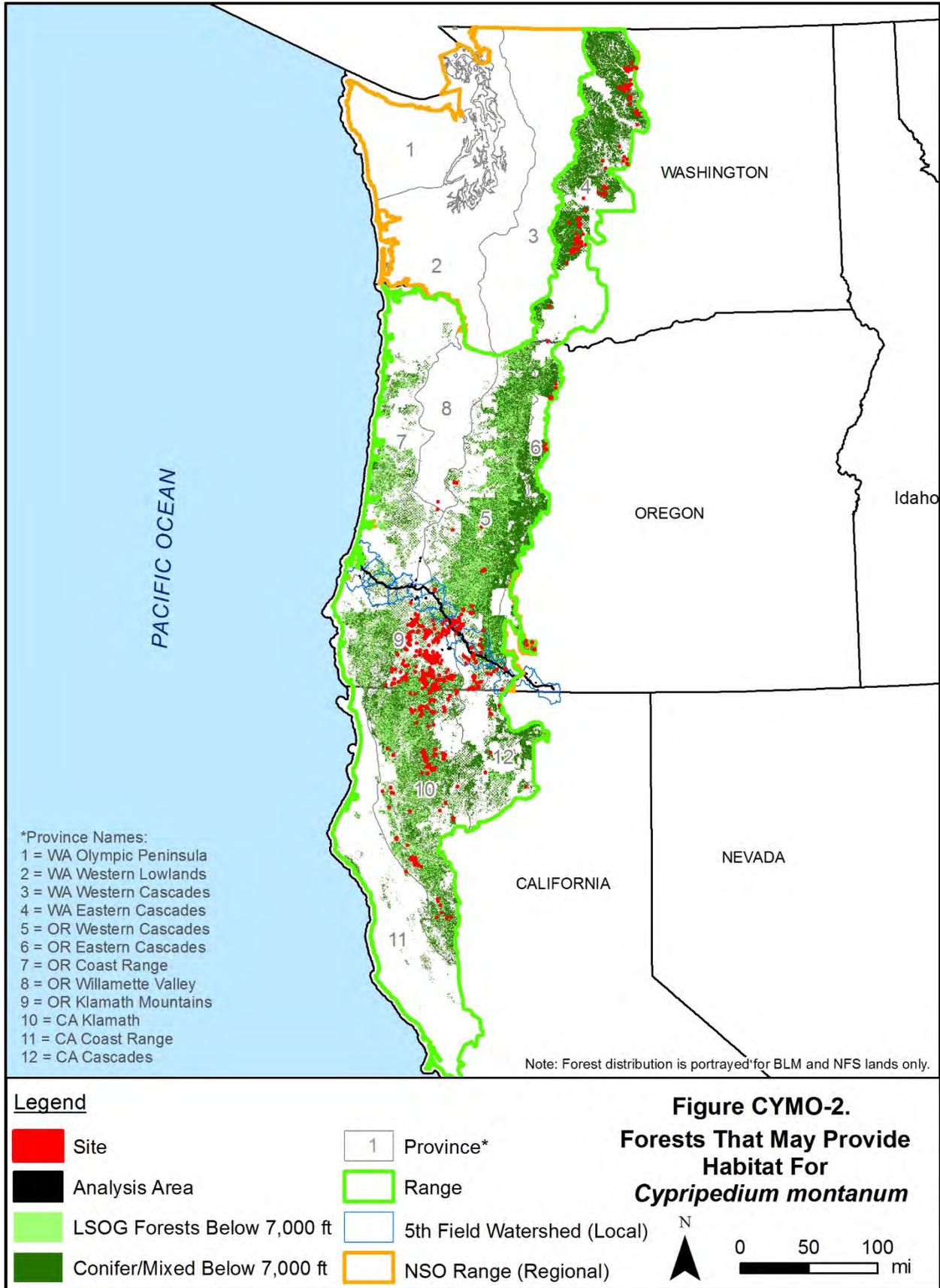
\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).

### Regional Distribution

*C. montanum* is widely distributed across nine physiographic provinces in Washington (Eastern Cascades), Oregon (Coast Range, Cascades West and East, Klamath Mountains, and Willamette Valley), and California (Klamath and Cascades) (see Figure CYMO-1). Sites are found in two general groups in the Klamath Mountains in Oregon and California and eastern Cascade Range in Washington, with several scattered sites in other parts of the region. Within each group, sites are abundant and clustered, with some scattered sites around the main clusters. The species is extremely abundant in the Klamath Mountains and is less abundant in the Cascade Range. Many opportunities for dispersal between sites within each group appear to exist based on the proximity of the sites to one another and the extent of coniferous and mixed hardwood-coniferous forests. The species appears to be well distributed in the Klamath Mountains and eastern Cascade Range in Washington based on the abundance and size of sites, proximity of sites to one another, and distribution of sites across forests that may provide suitable habitat in the mountain range.





Of the 756 sites in the region, 130 sites are at least partially located on private lands, and 731 sites are at least partially on BLM and NFS lands. Sites managed by the BLM Districts that encompass the project area include five sites in the Klamath Falls Resource Area of the Lakeview District, three sites in the Roseburg District, and 365 sites in the Medford District (one site is partially on the Rogue River National Forest and one site is partially on the Umpqua National Forest). Sites managed by the National Forests that encompass the project area include 11 sites on the Winema National Forest, 73 sites on the Rogue River National Forest (one site is partially in the Medford District), and six sites on the Umpqua National Forest (one site is partially in the Medford District). The remaining 268 sites on BLM and NFS lands are in the Redding District and on the Deschutes, Gifford Pinchot, Klamath, Lassen, Mendocino, Mt. Hood, Okanogan, Shasta-Trinity, Siskiyou, Six Rivers, Wenatchee, and Willamette National Forests.

Across the NSO range, 168 sites are located on reserve lands managed by BLM and the Forest Service, including 133 at least partially in LSRs, 32 at least partially in Known Owl Activity Centers, one in a Congressionally Reserved area, and three in Riparian Reserves. This represents 23 percent of the total BLM- and Forest Service-managed sites in the region. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*C. montanum* is more commonly found in LSOG forests based on available data (508 of 756 total sites are in LSOG), but it is also relatively common in non-LSOG forests and has been found in a variety of forest types. Based on current site locations, the species is found primarily in coniferous and mixed forests below about 6,700 feet msl and has been documented in part of the NSO range. Coniferous and mixed hardwood-coniferous forests below 7,000 feet msl, including the LSOG component of these forests, in the Klamath Mountains, western Cascade Range in Oregon, and Cascade Range in Washington could provide habitat for *C. montanum* and support additional sites. These forests encompass an estimated 15.8 million acres on BLM and NFS lands in the species’ range, including an estimated 8.4 million acres in reserve land allocations (53 percent of the forests; Table CYMO-4). Of this acreage, an estimated 4.9 million acres are LSOG (see Figure CYMO-2), including 2.9 million acres in reserve land allocations (58 percent of the forests). These forests are widespread across the species’ range.

TABLE CYMO-4

Extent of Forests that Could Provide Habitat for <i>Cyripedium montanum</i> on BLM and NFS Lands*				
Location	Coniferous/Mixed Forests below 7,000 feet		LSOG Forests below 7,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	15,821,420	8,405,940	4,932,140	2,871,630
Local Area	578,930	199,250	184,450	81,260
Project Area	1,350	490	300	150

Data Source: GNN vegetation data from Moerur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

## Local Distribution

Within the local area, *C. montanum* is distributed across seven 5<sup>th</sup> field watersheds that overlap the project area (see Table CYMO-5 and Figure CYMO-3). The sites are scattered across the watersheds, with a few small clusters of sites. All of the sites appear to have some level of connectivity between them and others in the regional area because the sites are part of a large group of sites in the Klamath Mountains.

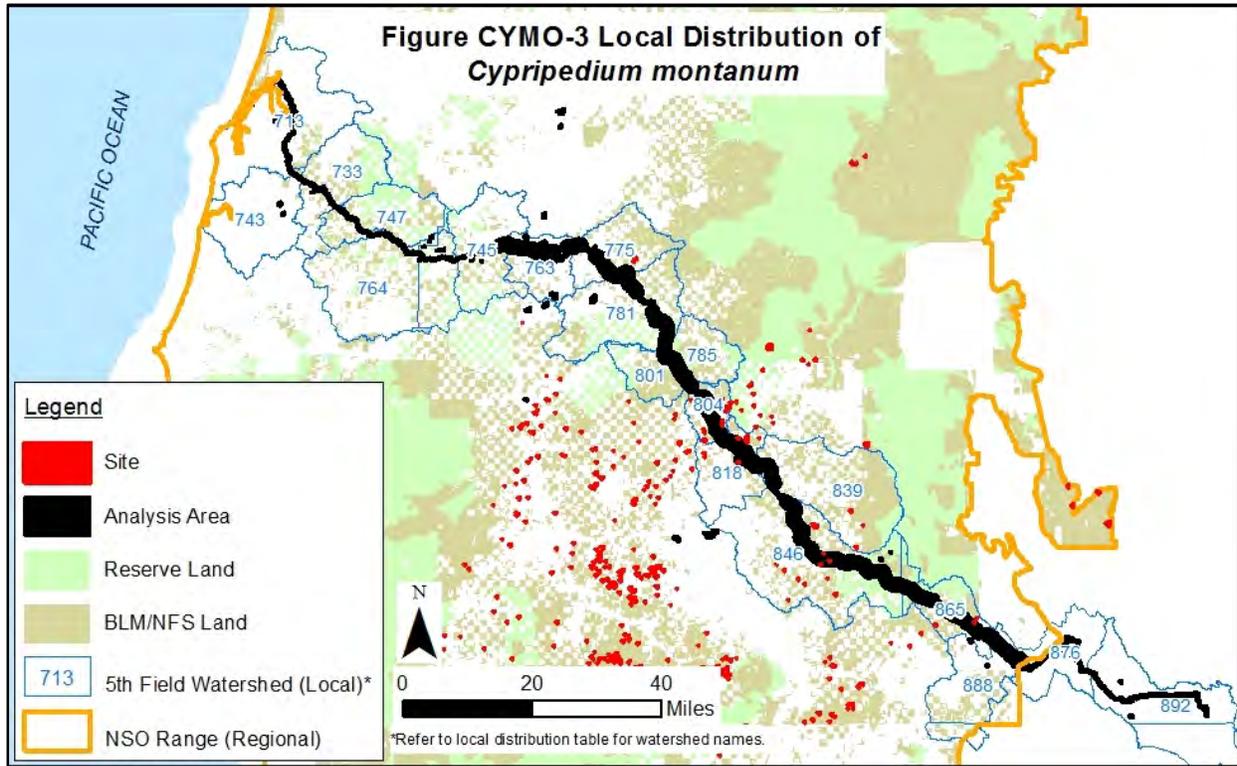
Of the 55 sites in the local area, 52 sites are at least partially on BLM and NFS lands, and 12 are at least partially on private lands. The sites on BLM and NFS lands are primarily located on lands designated as Other (Matrix). Of the 52 sites on BLM and NFS lands in the local area, six sites are on reserve lands, representing 12 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table CYMO-5 and on Figure CYMO-3. These sites are in the Little Butte Creek, Rogue River-Shady Cove, and Trail Creek watersheds.

Coniferous and mixed hardwood-coniferous forests below 7,000 feet msl encompass approximately 578,930 acres on BLM and NFS lands in the local area, with 199,250 acres in reserve land allocations (34 percent of the forests). Of this acreage, an estimated 184,450 acres are LSOG, including 81,260 acres in reserve land allocations (44 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the distribution and abundance of sites in the local and regional areas and extent of forests that may provide suitable habitat (see Figures CYMO-2 and CYMO-3).

TABLE CYMO-5

Distribution of <i>Cypripedium montanum</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	4	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	1	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	17	4
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	3	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	8	1
South Umpqua River (781)	-	-
Spencer Creek (865)	3	-
Trail Creek (804)	19	1
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011



### Analysis/Project Area Distribution

The analysis and project areas contain one site of *C. montanum*, which is in the Rogue River-Shady Cove watershed on BLM-managed land. Several sites are located within the immediate vicinity of the analysis area (see Local Distribution discussion above). The site is located on land designated as Other (Matrix) and is not within a regionally mapped reserve.

Surveys for the PCGP Project did not result in any observations of the species (Siskiyou BioSurvey LLC 2008, 2011a). A recorded observation from 1979 in agency databases comprises the site in the analysis area. The site is located west of MP 128.

### ***Project Impacts***

#### Analysis

The PCGP Project would affect one site out of the 731 sites on BLM and NFS lands in the region, representing less than 1 percent of the sites (or one out of 756 total sites on all lands in the NSO range). Table CYMO-6 presents an overview of the features of the PCGP Project that would affect the *C. montanum* site. Road improvements would affect approximately 0.7 acre within the site (about 26 percent of the site), but other PCGP Project features would not directly affect the site. Measures outlined in Chapter 1 would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *C. montanum* in and near the project area. This discussion presents an overview of the types of impacts that would be expected in the site based on the features of the PCGP Project and that could affect site persistence.

Road improvements and establishment would disturb approximately 0.7 acre within the site and could remove habitat and extant populations or individuals of *C. montanum*. The road would create an open corridor with low-growing vegetation through the site, which could modify microclimate conditions around populations or individuals adjacent to the road. The removal of forests and disturbance to soil could negatively affect *C. montanum* in adjacent areas by removing its habitat and potentially dormant individuals, potentially affecting site persistence even if the entire site is not disturbed.

TABLE CYMO-6

Impacts to <i>Cypripedium montanum</i> on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	-	-
Temporary Extra Work Area (TEWA)	-	-
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	1	0.7 ac
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because some sites would be subject to impacts from multiple project activities.

Across the project area, the PCGP Project would remove an estimated 1,070 acres of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl, including 220 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *C. montanum*. Within this impact area, about 720 acres (about 67 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 230 acres of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl across the species’ range.

Discussion

Assuming site persistence cannot be maintained at the site as a result of the PCGP Project, 51 sites of *C. montanum* would remain on BLM and NFS lands in the local area, including six in reserves, and 730 sites, including 168 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 168 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 23 percent of the remaining *C. montanum* on BLM and NFS lands in the NSO range would be protected in reserves.

**Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the

persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *C. montanum* is a Category C (uncommon) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category C species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information, however, since the species was listed in the 2001 ROD has increased the availability of information on the species, as noted below:
  - *C. montanum* has a wide distribution across nine physiographic provinces and three states in the region and a moderate-high number of overall sites (731 on BLM and NFS lands). The species appears to be well distributed in the Klamath Mountains and eastern Cascade Range in Washington. The currently known number of sites on BLM and NFS lands is actually a decrease in the number of sites on BLM and NFS lands since 2007, but is still moderate-high.
  - An estimated 23 percent of the sites (168 sites) are in reserves.
- Coniferous and mixed hardwood-coniferous forests below 7,000 feet msl (general habitat for the species) are widespread across the species' range and encompass approximately 15.8 million acres on BLM and NFS lands with an estimated 53 percent in reserves. A subcomponent of these forests likely provides habitat for *C. montanum*.
- The PCGP Project would affect one of 731 BLM- and Forest Service-managed sites of *C. montanum* representing less than 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (730) would continue to be documented on BLM and NFS lands in the region with a wide distribution across the NSO range. Many sites (51 sites) would remain in the local vicinity of the analysis area with many other sites in the nearby Klamath Mountains and Cascade Range. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect any sites in reserves. Of the remaining sites, 165 are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and one is in a Congressionally Reserved area where management activities that may adversely affect *C. montanum* are unlikely. At least three other sites are in Riparian Reserves where management actions are restricted to those activities that benefit the conservation of aquatic and riparian-dependent terrestrial resources.
- The PCGP Project would result in a permanent loss of an estimated 230 acres of coniferous and mixed hardwood-coniferous forests below 7,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 8.4 million acres (53 percent) of coniferous and mixed forests and 2.9 million acres (58 percent) of LSOG forests below 7,000 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *C. montanum*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category C species for which pre-disturbance surveys are practical and have been conducted in many areas, and additional sites may exist in the range of the NSO that have not been discovered.

## 5.2.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *C. montanum* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 730 sites would remain on BLM and NFS lands in the region, and 51 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project would affect site persistence of *C. montanum* at one site, this site is part of the large group of sites in the Klamath Mountains in Oregon and California where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *C. montanum* would persist in the region without considering the site as part of the population.
- The PCGP Project would remove approximately 1,070 acres of coniferous and mixed forests and 220 acres of LSOG forests below 7,000 feet msl (a negligible amount of the forests). An estimated 67 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 8.4 million acres (53 percent) of coniferous and mixed forests and 2.9 million acres (58 percent) of LSOG forests below 7,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is widely distributed.

The PCGP Project would not be able to avoid impacts to the *C. montanum* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *C. montanum* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *C. montanum* site affected by the PCGP Project. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near the affected site over the long term, as specified by the agency responsible for management of the site. The monitoring plan shall be approved by the BLM and Forest Service.

## 5.3 EUCEPHALUS VIALIS

*Eucephalus vialis* is a perennial plant in the Asteraceae family and is commonly known as wayside aster.

### 5.3.1 Regulatory Status and Ranking

The 2001 ROD identifies *E. vialis* as a Category A (rare) species. The ORBIC evaluated *E. vialis* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of the *Rare, Threatened and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be rare, uncommon or threatened, but not

immediately imperiled, within its global range and in Oregon (G3, S3, respectively). The species is on the ORBIC List 1. It is considered a BLM and Forest Service Sensitive species in Oregon and is listed as threatened in Oregon.

### 5.3.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*E. vialis* is a perennial forb that grows from a stout base to a height of about 4 feet (Vance and Larson 2005). Vegetative reproduction is common, and the plant is almost completely self-sterile, relying largely on cross-pollination of individuals for fertilization (Forest Service, BLM, and U.S. Fish and Wildlife Service 2006). Pollinators of *E. vialis* include various bees (*Bombus* sp., *Lasioglossum* sp.), the punctate blister beetle (*Epicanta puncticollis*), and the woodland skipper butterfly (*Ochlodes sylvanoides*) (Vance and Larson 2005). Seeds may be dispersed by wind, but remain close to the parent plant and may be nonviable (Newton et al. 2010). The flowering period is typically from mid-July to September.

Plant vigor and flower production appear to be greater where more light reaches plants (Vance and Larson 2005). The species is dependent on small habitat disturbances that assist reproductive success (ORBIC 2004). Low-intensity fire, historically caused by lightning, benefits the species by maintaining canopy openings that increase light infiltration, but the species can also benefit from human-caused disturbances, such as road building and some methods of timber harvesting (Vance and Larson 2005).

#### *Range*

The range of *E. vialis* is restricted to southwestern Oregon and the extreme northwest of California (Vance and Larson 2005). In 1994, its range was known to be highly fragmented, such that interactions between populations on a wide scale were considered to be unlikely to occur (Holthausen et al. 1994). The currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, Vance and Larson (2005) indicated that the species was likely more widely distributed under historical natural fire regimes, as fire is important to seed establishment. Its range may have been similar to the current range, with populations limited to the Pacific Northwest or western North America. It may have had more abundant local distributions across its range, but habitat modifications and other environmental factors, as discussed under Threats below, have likely reduced available habitat and further restricted the species' distribution.

### ***Population Status***

The ORBIC (2004) reported *E. vialis* from 76 element occurrences in Oregon and one element occurrence in California in 2004. Based on 2004 information, *E. vialis* was considered to be moderately vulnerable, primarily because of its moderate rate of maturity, moderate reproduction frequency, and low fecundity (ORBIC 2004). The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 140 sites on federal lands and 174 total sites on all lands in the NSO range.

For the PCGP Project, surveys for special-status plants were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011a). These surveys targeted *E. vialis* and resulted in one observation of a population of the species in 2008, although the population was not relocated in 2010. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### ***Habitat***

*E. vialis* grows in low- to mid-elevation (500–3,150 feet msl) coniferous forests, including openings and near edges, on dry upland sites dominated by Douglas-fir with a hardwood component, such as oaks (*Quercus* sp.), Pacific madrone, and tanoak (*Lithocarpus densiflora*) (ORBIC 2004). It occurs within all stages of forest succession, from recent clear-cuts to mature forest (Forest Service, BLM, and U.S. Fish and Wildlife Service 2006). Preferred habitat consists of open forest conditions with widely spaced conifers, which was historically maintained by fire and are thought to be of particular importance in flowering vigor (Vance and Larson 2005). *E. vialis* may prefer specific microclimates of LSOG forests, but it does not appear to be as restricted to these conditions.

### ***Threats***

Threats to *E. vialis* include fire suppression, which leads to increased overstory with decreased sunlight infiltration and increased fuel loads that intensify fires (Forest Service, BLM, and U.S. Fish and Wildlife Service 2006). Although some populations have been known to respond positively in the first 3–6 years after certain timber harvesting practices, the plant can decline after that time period as a result of out-competition by aggressive understory species. Logging often results in detrimental soil disturbance and establishment of aggressive weed species that out-compete *E. vialis* (Vance and Larson 2005). Fragmentation of forests and non-contiguity of *E. vialis* populations also threaten the species through limited genetic exchange and have restricted movement capabilities of pollinators. Other human-related effects include roadside mowing, spraying, roadside dust, and recreational vehicle use; native ungulate browsing can also be destructive.

### ***Management Recommendations***

As a Category A S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations for *E. vialis* were developed in 1998 and updated in 2005 (Vance and Larson 2005). The guidance includes:

- Minimize browsing damage where site viability is a concern through the use of enclosures.
- Control recreation use (off highway vehicle, hiking, equestrian trail use) around sites using techniques such as gates, signs, fences, and closures.
- Avoid new wildlife and recreation developments where these actions would negatively affect individual plants or adversely modify habitat.
- Create gap and edge habitat with a 50 to 75 percent canopy cover using techniques such as prescribed fire, tree girdling (or other types of snag creation), tree falling, and selective tree harvest in populations that are in poor condition or have a decreasing trend. Consider factors such as aspect, slope, and adjacent stand structure to determine the size of the treatment area. Where increased light from the above prescriptions has led to high levels of competing under story vegetation, implement control measures such as prescribed fire, which produce conditions that allow for recruitment. Emphasis should be on fine scale disturbances. Avoid direct impact to plants during implementation of management activities. Monitor to evaluate effects of treatments. Avoid timber management activities such as regeneration harvests and salvage logging that would result in the creation of habitat conditions outside of this prescription.
- To facilitate germination, periodically reduce duff layers through the use of such tools as prescribed burning. Monitor to evaluate effects of treatment.
- Control noxious and exotic weeds using integrated noxious weed management techniques that do not negatively affect individual *E. vialis* plants or that will not adversely modify habitat.

### 5.3.3 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species' currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *E. vialis* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table EUVI-1 presents the total number of sites in the regional (NSO range), local (19 5th field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 840 observations from BLM and Forest Service geodatabases were converted into 299 sites in the NSO range (region). Table EUVI-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table EUVI-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure EUVI-1 displays the regional distribution of the species across BLM and NFS lands, and Figure EUVI-2 displays the species' regional

distribution with the extent of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl on BLM and NFS lands within the currently known range of the species.

TABLE EUVI-1

Number of <i>Eucephalus vialis</i> Sites (2013)	
Location*	Number of Sites
Regional Area	299
Local Area	12
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013  
\*Definitions of regional, local, and project areas are provided in Chapter 1.

TABLE EUVI-2

Distribution of <i>Eucephalus vialis</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	232	8	1
Forest Service	57	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	67	7	1

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE EUVI-3

Distribution of <i>Eucephalus vialis</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	131	-	-
Adaptive Management Reserves (AMR)	3	-	-
Administratively Withdrawn (AW)	8	-	-
<b>Congressionally Reserved (CR)</b>	-	-	-
<b>Late Successional Reserve (LSR)</b>	<b>25</b>	-	-
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>20</b>	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	118	8	1
<b>Riparian Reserve**</b>	<b>1</b>	-	-

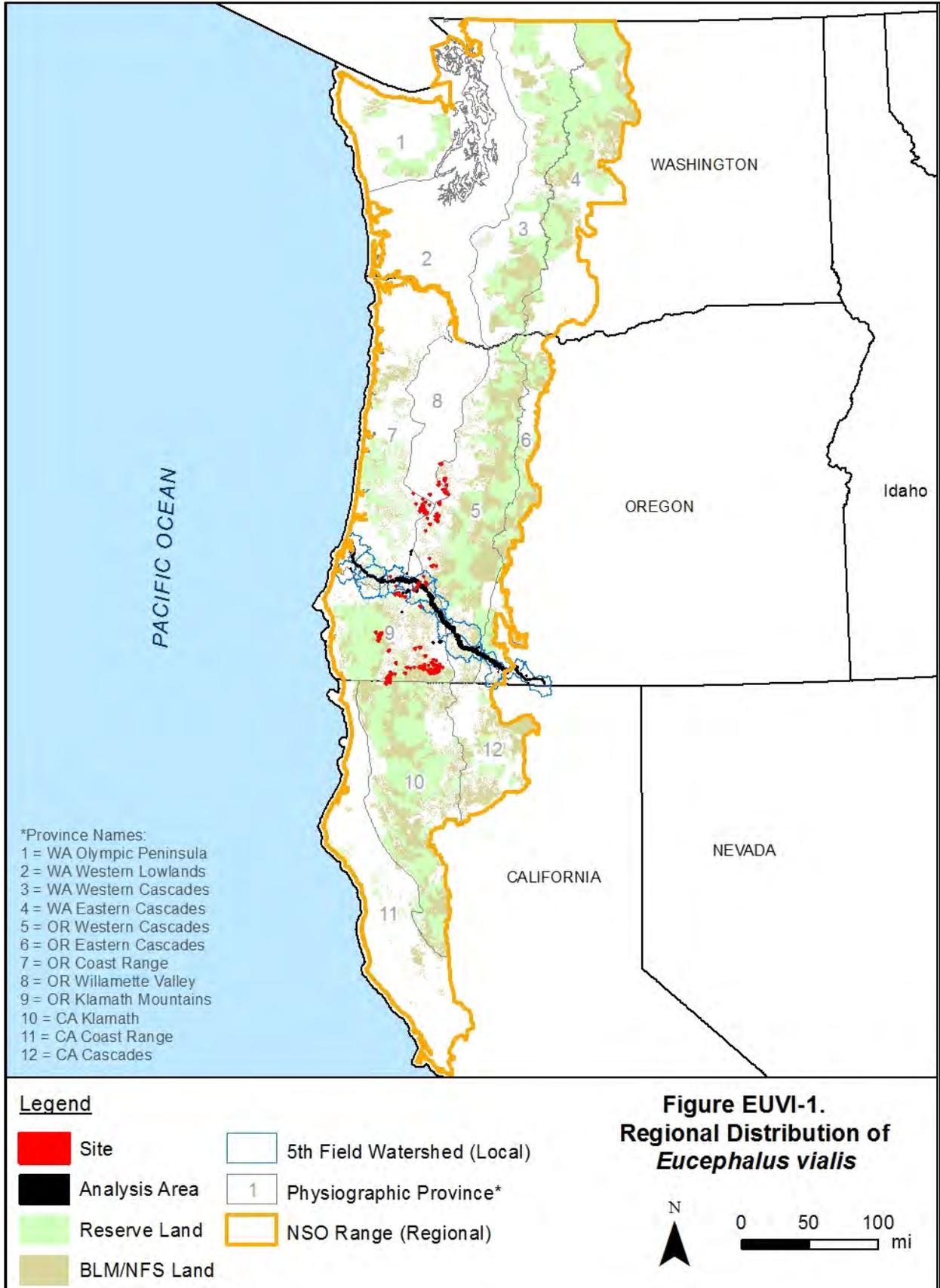
Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0  
Notes: Columns are not additive because of overlap between some allocations, some sites occur in multiple allocations, and the allocations only apply to BLM and NFS lands. **Bolded** allocations are designated reserve areas.

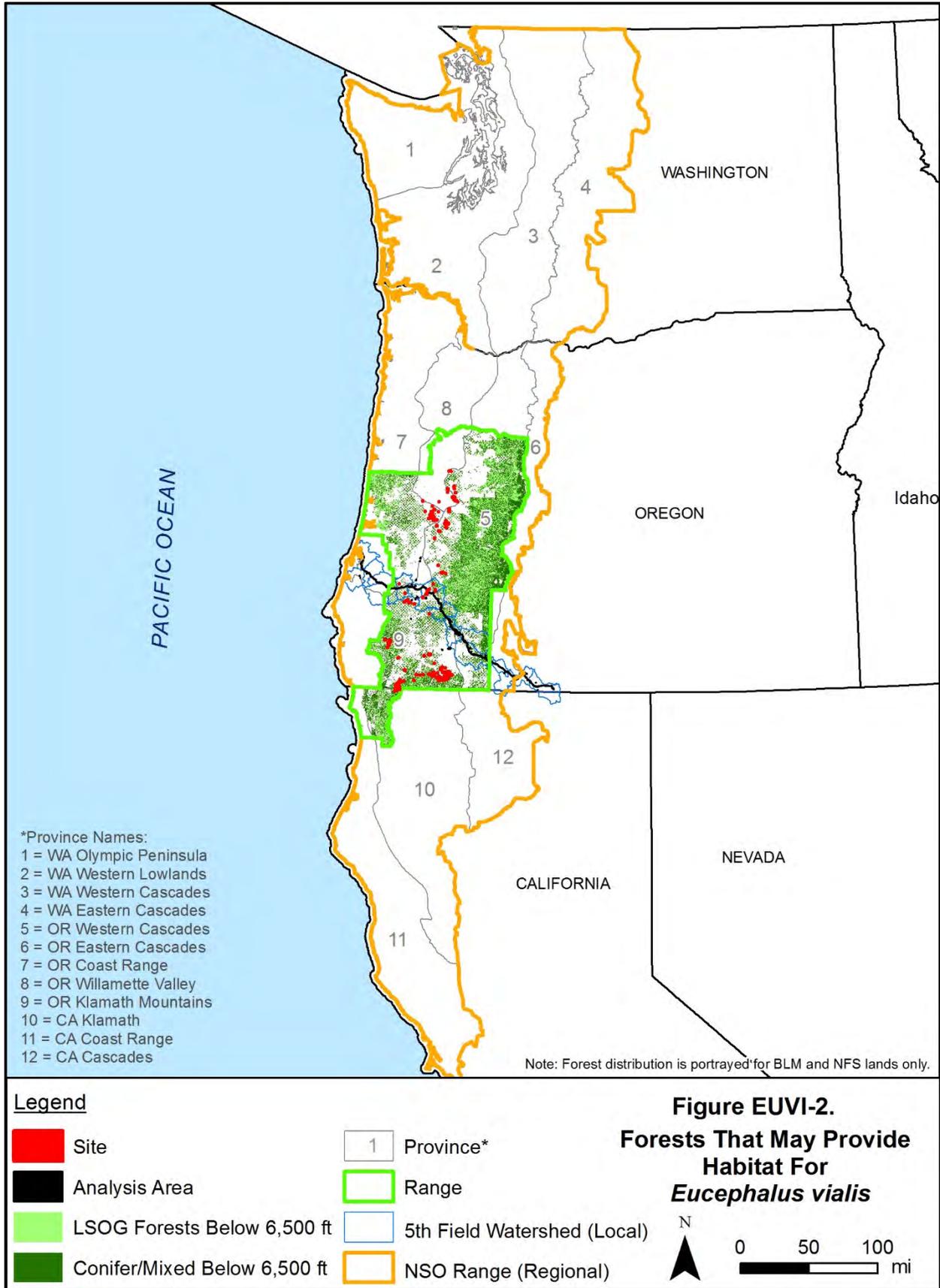
\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).

### Regional Distribution

*E. vialis* is somewhat widely distributed across five physiographic provinces in Oregon (Coast Range, Cascades West and East, Willamette Valley, and Klamath Mountains), and California (Klamath) (see Figure EUVI-1). Sites are found in three general groups, with the majority of sites in the Klamath Mountains. Sites within each group are generally clustered and near other sites, although they are scattered across the southern and central parts of Oregon. The sites in the Klamath Mountains in California represent the southern extent of the species in the NSO range. *E. vialis* appears to be well distributed across its range based on the abundance of sites and proximity of sites to one another.





Sixty-seven of 299 sites are at least partially located on private lands, and 283 sites are at least partially on BLM and NFS lands across the region. Sites managed by the BLM Districts that encompass the project area include 149 sites in the Medford District (six sites are partially on the Rogue River National Forest) and 16 sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include 57 sites on the Rogue River National Forest (six sites are partially in the Medford District). The remaining 61 sites on BLM and NFS lands are in the Eugene District and on the Siskiyou National Forest.

Across the NSO range, 46 sites are located on reserve lands managed by BLM and the Forest Service, including 25 in LSRs, 20 in Known Owl Activity Centers, and one in a Riparian Reserve. This represents 16 percent of the total BLM- and Forest Service-managed sites in the region. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*E. vialis* is more commonly found in LSOG forests based on available data (193 of 299 total sites are in LSOG), but it is also relatively common in non-LSOG forests and has been found in a variety of forest types. Based on current site locations, the species is found primarily in coniferous and mixed forests below about 6,300 feet msl and has been documented in parts of Oregon and California. Coniferous and mixed hardwood-coniferous forests below 6,500 feet msl, including the LSOG component of these forests, in Linn, Douglas, Josephine, Jackson, and Lane counties in Oregon and in Del Norte County in California could provide habitat for *E. vialis* and support additional sites. These forests encompass an estimated 5.3 million acres on BLM and NFS lands in the species’ range, including an estimated 2.5 million acres in reserve land allocations (46 percent of the forests; Table EUVI-4). Of this acreage, an estimated 2.2 million acres are LSOG (see Figure EUVI-2), including 1.2 million acres in reserve land allocations (54 percent of the forests). These forests are widespread across the species’ range.

TABLE EUVI-4

Location	Coniferous/Mixed Forests below 6,500 feet		LSOG Forests below 6,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	5,329,990	2,475,450	2,181,230	1,170,680
Local Area	401,780	126,740	124,490	46,900
Project Area	1,070	420	230	130

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *E. vialis* is found in three 5<sup>th</sup> field watersheds that overlap the project area (see Table EUVI-5 and Figure EUVI-3). The sites in the Myrtle Creek watershed are more clustered than sites in the Olalla Creek-Lookingglass Creek and South Umpqua River watersheds. Most of the sites appear to have some level of connectivity between them and others in the region, although the site in the Olalla Creek-Lookingglass Creek watershed appears to be more isolated. The sites likely have multiple opportunities for dispersal, based on the extent of coniferous and mixed hardwood-coniferous forests in the watersheds.

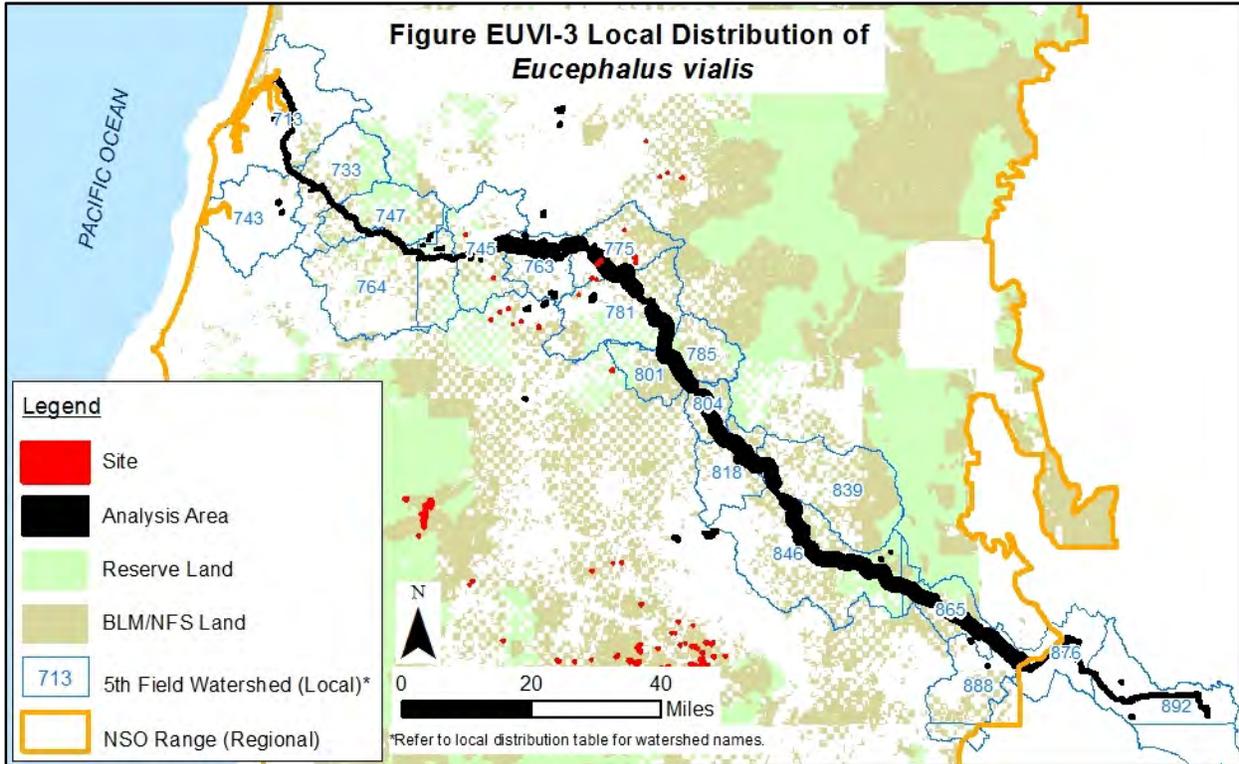
Of the 12 sites in the local area, eight are at least partially on BLM lands, and seven are at least partially on private lands. The sites on BLM lands are located on lands designated as Other (Matrix) and are not within regionally mapped reserves.

TABLE EUVI-4

**Distribution of *Eucephalus vialis* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	9	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	2	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	1	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011



Coniferous and mixed hardwood-coniferous forests encompass approximately 401,780 acres on BLM and NFS lands in the local area, with 126,740 acres in reserve land allocations (32 percent of the forests). Of this acreage, an estimated 124,490 acres are LSOG, including 46,900 acres in reserves (38 percent of the forests). Other sites may also exist in the local area where surveys

have not been completed, based on the number of sites nearby in the region, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures EUVI-2 and EUVI-3).

Analysis/Project Area Distribution

The analysis and project areas contain one site of *E. vialis*, which is partially on BLM-managed land and partially on private land. The analysis area site is in the Myrtle Creek watershed in the Roseburg District. Some sites are located within the immediate vicinity of the analysis area (see Local Distribution discussion above). The site is located on land designated as Other (Matrix).

Surveys for the PCGP Project resulted in eight observations of the species in one location (Siskiyou BioSurvey LLC 2008). These recorded observations in combination with other observations in agency databases comprise the site in the analysis area. The site is along a road west of MP 80.3.

**Project Impacts**

Analysis

The PCGP Project would affect one site out of the 283 sites on BLM and NFS lands in the region, representing less than 1 percent of the sites (or one out of 299 total sites on all lands in the NSO range). Table EUVI-6 presents an overview of the features of the PCGP Project that would affect the *E. vialis* site. Road improvements would affect approximately 1.4 acres within the site (about 19 percent of the site), but other PCGP Project features would not directly affect the site. Measures outlined in Chapter 1 would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *E. vialis* in and near the project area. This discussion presents an overview of the types of impacts that would be expected in the site based on the features of the PCGP Project and that could affect site persistence.

Road improvements and establishment would disturb approximately 1.4 acre within the site and could remove habitat and extant populations or individuals of *E. vialis*. The road would create an open corridor with low-growing vegetation through the site, which could modify microclimate conditions around populations or individuals adjacent to the road. The removal of forests and disturbance to soil could negatively affect *E. vialis* in adjacent areas by removing its habitat and potentially dormant individuals, potentially affecting site persistence even if the entire site is not disturbed, although the plant seems to prefer open forests and may benefit from some edge effects within the site.

TABLE EUVI-6

Impacts to <i>Eucephalus vialis</i> on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	-	-
Temporary Extra Work Area (TEWA)	-	-
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	1	1.4
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because some sites would be subject to impacts from multiple project activities.

Across the project area, the PCGP Project would remove an estimated 830 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl, including 160 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *E. vialis*. Within this impact area, about 540 acres (about 65 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 170 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the site as a result of the PCGP Project, seven sites of *E. vialis* would remain on BLM lands in the local area, with none in reserves, and 282 sites, including 46 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 46 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 16 percent of the remaining *E. vialis* on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *E. vialis* is a Category A (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category A species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information, however, since the species was listed in the 2001 ROD indicates that the species appears to be more common than previously documented, as noted below:
  - *E. vialis* has a somewhat wide distribution across five physiographic provinces in Oregon and California and a moderate-high number of overall sites (283 on BLM and NFS lands). The species appears to be well distributed in its range. The currently known number of sites on BLM and NFS lands is an increase of about 143 sites on BLM and NFS lands since 2007.
  - An estimated 16 percent of the sites (46 sites) are in reserves.
- Coniferous and mixed hardwood-coniferous forests below 6,500 feet msl (general habitat for the species) are widespread across the species' range and encompass approximately

5.3 million acres on BLM and NFS lands with an estimated 46 percent in reserves. Most of the forests are found in the Cascade Range and Klamath Mountains, where most sites are documented. A subcomponent of these forests likely provides habitat for *E. vialis*.

- The PCGP Project would affect one of 283 BLM- and Forest Service-managed sites of *E. vialis*, representing less than 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the single site, a moderate-high number of sites (282) would continue to be documented on BLM and NFS lands in the region with a somewhat wide distribution across Oregon and California. Some sites (seven sites) would remain in the local vicinity of the analysis area with many other sites in the nearby Klamath Mountains. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect any sites in reserves. Of the remaining sites, 45 are in LSRs where management actions are restricted to those activities that benefit LSOG forests, and one site is in a Riparian Reserve where management actions are restricted to those activities that benefit the conservation of aquatic and riparian-dependent terrestrial resources.
- The PCGP Project would result in a permanent loss of an estimated 170 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 2.5 million acres (46 percent) of coniferous and mixed forests and 1.2 million acres (54 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *E. vialis*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category A species for which pre-disturbance surveys are practical and have been conducted in many areas; thus, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during surveys, including surveys associated with the PCGP Project.

#### 5.3.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *E. vialis* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 282 sites would remain on BLM and NFS lands across the region, and seven sites would remain on BLM lands in the local area. Although the PCGP Project would affect site persistence of *E. vialis* at one site, this site is part of a group of sites in the northern Klamath Mountains and southern Cascade Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *E. vialis* would persist in the region without considering the site as part of the population.
- The PCGP Project would remove approximately 830 acres of coniferous and mixed forests and 160 acres of LSOG forests below 6,500 feet msl (a negligible amount of the

forests). An estimated 65 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 2.5 million acres (46 percent) of coniferous and mixed forests and 1.2 million acres (54 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys.

- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is somewhat widely distributed.

The PCGP Project would not be able to avoid impacts to the *E. vialis* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *E. vialis* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *E. vialis* site affected by the PCGP Project. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near the affected site over the long term, as specified by the agency responsible for management of the site. The monitoring plan shall be approved by the BLM and Forest Service.

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## 6.0 MOLLUSK SPECIES

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### 6.1 DEROCERAS HESPERIUM

*Deroceras hesperium* is a land slug in the Limacidae family and is commonly known as evening fieldslug. A recent study on the molecular characteristics of the species and a similar species also found in the Pacific Northwest, *D. laeve*, revealed that *D. hesperium* is likely a variant of *D. laeve* and not a distinct species (Roth, et al. 2013). Identification of *D. hesperium* in the NSO range is being reviewed, but this discussion presents information on *D. hesperium* as it has been known by that name in the NSO range because it is still on the S&M list, pending an annual species review.

#### 6.1.1 Regulatory Status and Ranking

The 2001 ROD identifies *D. hesperium* as a Category B (rare) species. The ORBIC evaluated *D. hesperium* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and 2010 *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2010), but the species was not re-evaluated in the most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2010, the species was considered to be imperiled because of rarity or other factors that make it vulnerable to extinction within its global range (G2) and was critically imperiled because of its extreme rarity or because it is somehow especially vulnerable to extinction or extirpation in Oregon (S1). This species is on the ORBIC List 1. It is considered a BLM and Forest Service Sensitive Species in Oregon.

#### 6.1.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*D. hesperium* is a hermaphroditic (has both male and female organs) terrestrial gastropod slug (Duncan 2005a). It is able to self-fertilize or cross-fertilize and lays eggs in porous soils and forest duff. The slug requires high moisture environments throughout its life cycle. Food likely consists of bacteria, fungi, yeasts, and other microscopic organisms (microscopic periphyton) scraped from the moist surfaces of green and decaying vegetation, rocks, and wood. *D. hesperium* is sometimes found in association with Crater Lake tightcoil (*Pristiloma arcticum crateris*).

#### *Range*

*D. hesperium* is endemic to the Pacific Northwest. In Oregon, it has been found in scattered locations from the Pacific coast to the both sides of the Cascade Range (Duncan 2005a). It has also been found across western Washington to Vancouver Island, British Columbia. The

currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, Holthausen et al. (1994) indicated that the species was thought to historically have been widely distributed on the west side of the Cascade Range. Habitat modifications and other environmental factors, as discussed under Threats below, have likely reduced available habitat and may have further restricted the species' distribution.

### ***Population Status***

The ORBIC (2004) reported *D. hesperium* from an estimated seven element occurrences across the species' range in 2004. This species was only found in two areas in the NSO range: northwestern Oregon and northern Olympic Peninsula in Washington (ORBIC 2004). In 2004, *D. hesperium* was considered to be one of the least known slugs in western North America, and population trends of the species appeared to be substantially declining (ORBIC 2004). Duncan (2005a) reported 19 known sites in agency databases in 2005; these known sites were in the Klamath Range and other parts of Oregon outside the NSO range. The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 14 sites on federal lands and 20 total sites on all lands in the NSO range.

For the PCGP Project, surveys for Category A and B S&M mollusks were conducted in 2007 in the PCGP Project area and within 100 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008). These surveys targeted *D. hesperium* and resulted in one observation of the species. *D. hesperium* has not been found in high numbers during past survey efforts, although limited mollusk surveys have been conducted across the NSO range, and more survey effort may locate additional populations of the species. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### ***Habitat***

Relatively few details are known about the specific habitat requirements of *D. hesperium* (Duncan 2005a). The species is known to occur in perennially wet meadows in forest and riparian habitats. It has been found from coastal meadows just above sea level to higher elevations near the crest of the Cascade Range. Most observations have been documented in high moisture locations in or near herbaceous vegetation, under litter, or around rock substrate. Porous soils, low-growing vegetation, rocks, and decomposing vegetation on the forest floor provide cover for hiding and escaping from predators, as well as protection against extreme temperature and humidity. Suitable habitat may be limited to within 100 feet of perennial water sources (i.e., within Riparian Reserves) except in areas where coastal fog provides continuous moisture. *D. hesperium* is not likely restricted to specific microclimate conditions of LSOG forests as much as it is restricted to high moisture habitats.

### ***Threats***

Primary threats to *D. hesperium* are those that result in degradation or destruction of occupied habitat through activities that compact the soil, reduce litter cover, alter available moisture by changing shade and water inputs, or impact food sources (Duncan 2005a). These activities

include removal of standing trees and woody debris on the forest floor for firewood, spring water diversions, livestock grazing, camping, heavy equipment operations, and fire. Development of wet meadow habitat for agriculture, urbanization, and forest management presents a threat to the species (Duncan 2005a). The slug's habitat is also susceptible to ingrowth of tree and shrub species in historically herbaceous habitats. Winter recreational activities, such as snowmobiling and skiing, can negatively alter microsite conditions by compacting snow and causing it to lose its insulative properties, possibly resulting in freezing of hibernation habitat.

### ***Management Recommendations***

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *D. hesperium* in 1998 and updated in 2005 (Duncan 2005a). This guidance includes: minimizing alterations in microsite characteristics, including management of areas large enough to moderate fluctuations in humidity and temperature; maintaining existing cover by preserving dead and downed woody debris; protecting occupied rockslides and talus areas from road construction, quarrying, and other activities; maintaining the canopy closure of trees within the habitat area to moderate fluctuations of temperature and humidity on the site; maintaining the hardwood tree component (i.e., maples, cottonwood, red alder, aspen) and native plant diversity to provide a constant supply of logs, leaves, and leaf mold; maintaining riparian areas according to S&M ROD guidance and, if necessary, increasing Riparian Reserve widths; avoiding burning within occupied habitats and managing burns to minimize adverse effects of fire; avoiding activities that would lower the water table at the site, thus reducing soil moisture below that required by the species, or possibly altering vegetative communities; protecting known sites from grazing; and avoiding activities that would cause soil compaction.

### **6.1.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### ***Species Distribution***

The distribution of *D. hesperium* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table DEHE-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 40 observations from BLM and Forest Service geodatabases were converted into 34 sites in the NSO range (region). Table DEHE-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table DEHE-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure DEHE-1 displays the regional distribution of the

species across BLM and NFS lands, and Figure DEHE-2 displays the species' regional distribution with the extent of all forest types and LSOG forests below 6,000 feet msl on BLM and NFS lands, including mapped drainages within these forests, within the currently known range of the species.

TABLE DEHE-1

Number of <i>Deroceras hesperium</i> Sites (2013)	
Location*	Number of Sites
Regional Area	34
Local Area	13
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013  
\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1.

TABLE DEHE -2

Distribution of <i>Deroceras hesperium</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	18	3	-
Forest Service	8	8	1
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	10	2	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE DEHE -3

Distribution of <i>Deroceras hesperium</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	-	-	-
Adaptive Management Reserves (AMR)	1	-	-
Administratively Withdrawn (AW)	2	-	-
<b>Congressionally Reserved (CR)</b>	-	-	-
<b>Late Successional Reserve (LSR)</b>	7	1	-
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	2	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	14	12	1
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

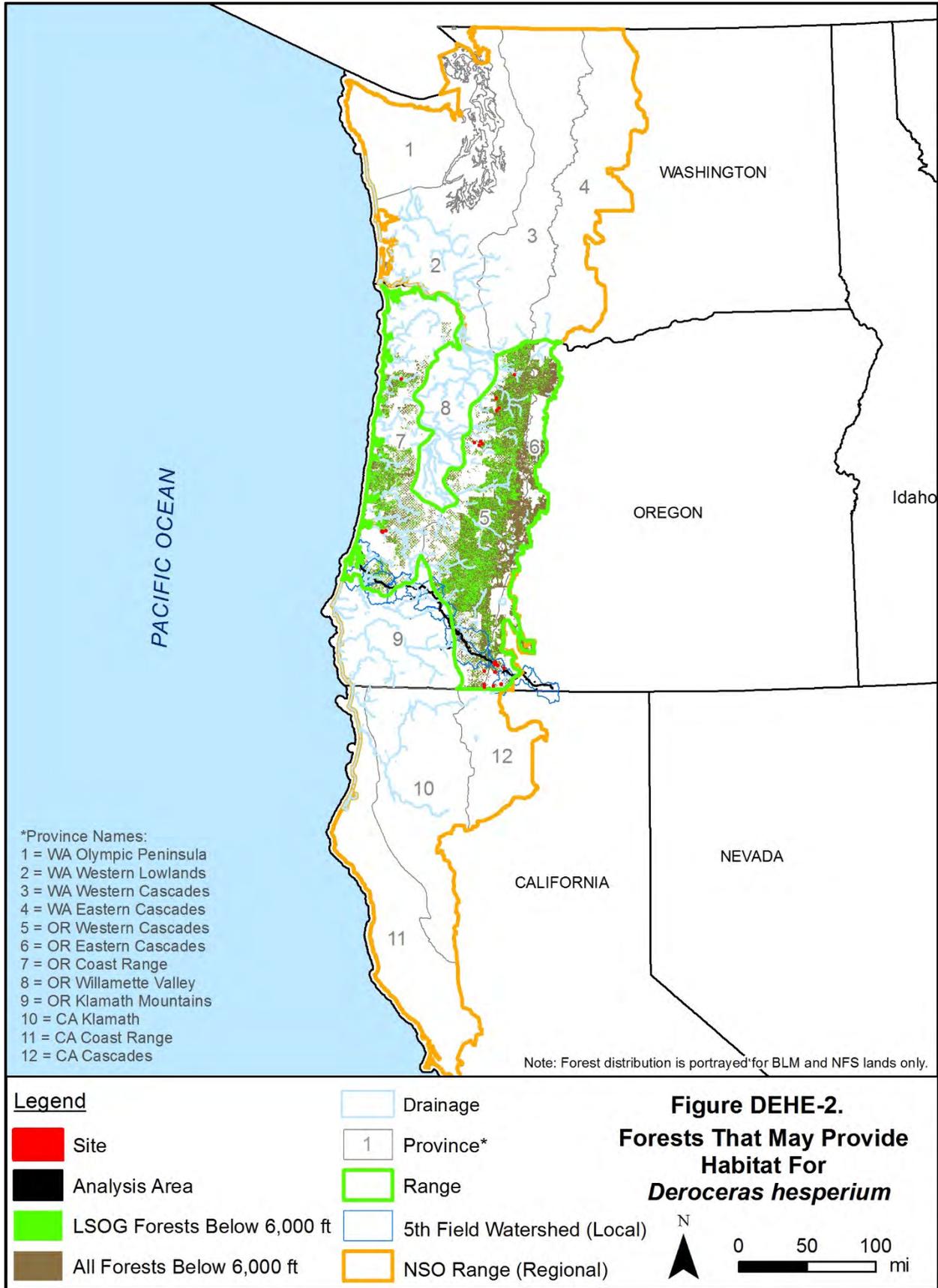
**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*D. hesperium* has a somewhat limited distribution across three physiographic provinces in Oregon (Coast Range, Cascades East and West) (see Figure DEHE-1). Sites are found in four general areas in Oregon, including a relatively large cluster of sites in the southern Cascade Range, a small cluster of sites in the southern Coast Range, a scattered group of sites in the northern Cascade Range, and an isolated site in the northern Coast Range. The species appears to have a limited distribution outside the Cascade and Coast Ranges based on the lower number of sites and scattered nature of most sites. *D. hesperium* does not appear to be well distributed within its range in the NSO range.





Ten of 34 sites are located on private or state lands (at least partially), and 26 sites are on BLM and NFS lands across the region (at least partially). Sites managed by the BLM Districts that encompass the project area include five sites in the Klamath Falls Resource Area of the Lakeview District, one site in the Coos Bay District, and two sites in the Medford District. Sites managed by the National Forests that encompass the project area include eight sites on the Winema National Forest. Sites managed by other BLM Districts include 11 sites in the Salem District.

Across the NSO range, nine sites are located on reserve lands managed by BLM and the Forest Service, including seven in LSRs and two in Known Owl Activity Centers. This represents 35 percent of the total BLM- and Forest Service-managed sites in the region. Other sites may also be associated with Riparian Reserves that have not been mapped at the regional scale, as defined in the respective BLM and Forest Service land management plans. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*D. hesperium* is less common in LSOG forests based on available data (13 of 34 total sites are in LSOG) and is more likely restricted to moist conditions associated with riparian areas (i.e., Riparian Reserves). Based on current site locations, the species is primarily found in coniferous, mixed hardwood-coniferous forests and to a lesser extent in hardwood forests below about 5,300 feet msl in the Cascade and Coast Ranges in Oregon. Coniferous, mixed hardwood-coniferous, and hardwood forests within this range could provide habitat for *D. hesperium* and support additional sites. These forests encompass an estimated 6.6 million acres on BLM and NFS lands in Oregon, including an estimated 3.2 million acres in reserve land allocations (48 percent of the forests; Table DEHE-4). Of this acreage, an estimated 2.5 million acres are LSOG (see Figure DEHE-2), including 1.4 million acres in reserve land allocations (55 percent of the forests). Although coniferous, mixed hardwood-coniferous, and hardwood forests below 6,000 feet msl are widespread across the species' range, moist riparian areas are much less common.

TABLE DEHE-4

Location	Extent of Forests that Could Provide Habitat for <i>Derocheras hesperium</i> on BLM and NFS Lands*			
	All Forests below 6,000 feet		LSOG Forests below 6,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	6,624,830	3,181,230	2,513,390	1,378,370
Local Area	425,180	131,930	129,110	56,260
Project Area	830	310	170	90

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for Oregon only, which is the extent of the species' currently known range.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *D. hesperium* is found in two 5<sup>th</sup> field watersheds (Klamath River-John C. Boyle Reservoir and Spencer Creek) that overlap the project area (see Table DEHE-5 and Figure DEHE-3). The sites are in the eastern Cascade Range in the eastern portion of the local area. The 13 local sites are part of a large group of sites in the southern Cascade Range in Oregon, but they appear to be isolated from other sites in the region (the nearest regional sites are more than 100 miles to the northwest in the Coast Range). Multiple avenues of connectivity appear to be

available between sites in the Cascade Range based on the extent of coniferous, mixed, and hardwood forests and drainages within these forests.

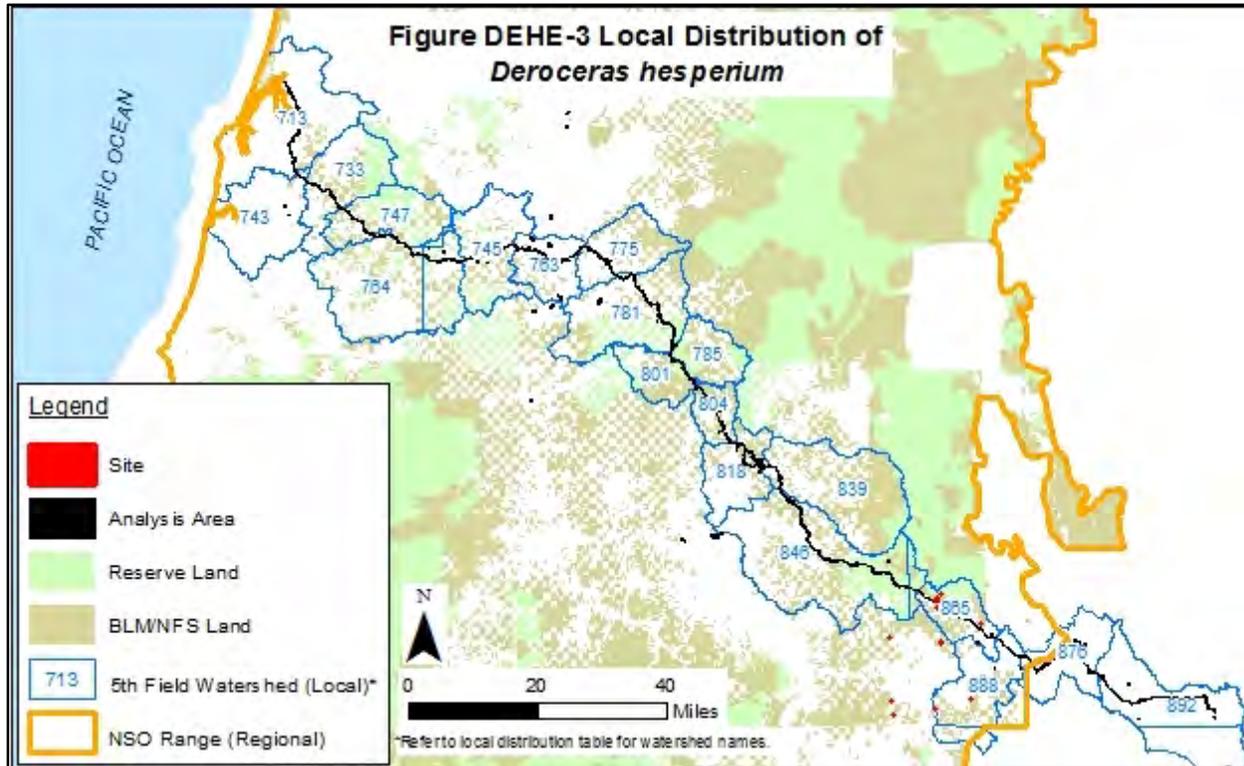
Of the 13 sites in the local area, three are on BLM lands in the Lakeview District, eight are on NFS lands on the Winema National Forest, and two are on private lands. The BLM- and Forest Service-managed sites are primarily located on lands designated as Other (Matrix); these sites may be in Riparian Reserves, as defined in the Lakeview District and Winema National Forest land and resource management plans, because of the species' preference for moist habitats along or near drainages. One site is in an LSR in the Spencer Creek watershed, representing 9 percent of the 11 sites on BLM and NFS lands (Table DEHE-5).

Coniferous, mixed hardwood-coniferous, and hardwood forests below 6,000 feet msl encompass approximately 425,180 acres on BLM and NFS lands in the local area, including 131,930 acres in reserve land allocations (31 percent of the forests). Of this acreage, an estimated 129,110 acres are LSOG, including 56,260 acres in reserve land allocations (44 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, particularly in the Cascade Range, based on the number of sites in the local area, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures DEHE-2 and DEHE-3).

TABLE DEHE-5

Distribution of <i>Deroceras hesperium</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	2	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	11	1
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011



### Analysis/Project Area Distribution

The analysis and project areas contain one site of *D. hesperium*. This site is on NFS land designated as Other (Matrix) on the Winema National Forest. It is part of a large group of sites in the southern Cascade Range, as described in the Local Distribution discussion above.

Although surveys for the PCGP Project resulted in one observation of *D. hesperium* in the survey area (Siskiyou BioSurvey LLC 2008), the observation is outside the analysis area, and a recorded observation from 2010 in agency records comprises the site in the analysis area. The site is located near MP 171.1.

### ***Project Impacts***

#### Analysis

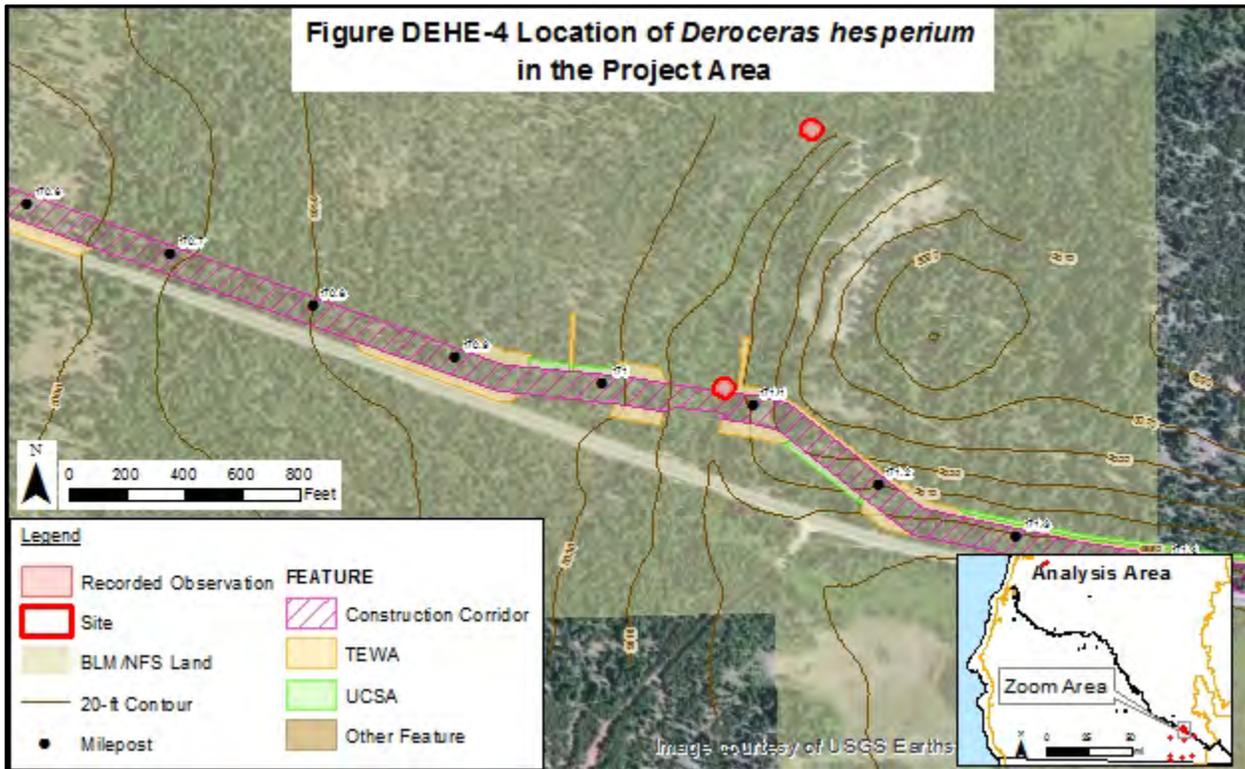
The PCGP Project would affect one site out of the 26 sites on BLM- and Forest Service-managed lands in the region, representing approximately 4 percent of the sites (or one out of 34 total sites on all lands in the NSO range). Table DEHE-6 presents an overview of the features of the PCGP Project that would affect the *D. hesperium* site. The construction corridor and associated work areas would affect approximately 0.02 acre (25 percent) of the site (the site is approximately 0.08 acre), and the corridor would cross through the southern portion of the site (see Figure DEHE-4). Measures outlined in Chapter 1 would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *D. hesperium* in and near the project area. Due to the limited distribution of the species, the effects on one site could potentially alter the distribution of the species in the NSO range. This discussion presents a detailed analysis of the features of the PCGP Project that could affect site persistence.

TABLE DEHE-6

Impacts to <i>Deroceras hesperium</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.02 ac
Temporary Extra Work Area (TEWA)	1	<0.01 ac
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because the site would be subject to impacts from multiple project activities.



The PCGP Project would result in ground disturbance and vegetation removal across the southern and eastern portions of the site near MP 171.1. The recorded observation of the species is on the northern side of the project area, and individuals could be directly affected by activities within the corridor (see Figure DEHE-4).

Establishment of the construction corridor would disturb vegetation and soils around the recorded observation within the site and could result in injury or mortality to individuals. The area within the site is forested in a relatively level area, and a dirt road is located just east of the site where a TEWA would be located. The establishment of the corridor and a TEWA could modify microclimate conditions around the recorded observation. The removal of forests and disturbance to soil and understory components would negatively affect *D. hesperium* by removing its habitat and affecting humidity, temperatures, and refugia in the understory of the habitat, affecting site persistence. Nearby suitable habitat could still be used by the species, but the habitat affected by the PCGP Project is no longer expected to be suitable. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor

would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project.

Based on this analysis, *D. hesperium* is not likely to persist at the site following project implementation. This site is one of 11 sites on BLM and NFS lands in the local area and is part of a large cluster of sites in the southern Cascade Range in Oregon. It may contribute to the distribution of the species within the local area and nearby portions of the Cascade Range. However, if site persistence is not maintained, *D. hesperium* would still be found in the southern Cascade Range in Oregon, and nearby suitable habitat within the mountain range would still provide opportunities for the species to be found in the general vicinity based on the distribution of other sites in nearby portions of the local and regional areas.

Across the project area, the PCGP Project would remove an estimated 710 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,000 feet msl, including 130 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *D. hesperium*. Within this impact area, about 450 acres (about 63 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, but these areas would not likely provide habitat for the species during the life of the PCGP Project, unless they are restored to moist riparian habitat. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 150 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 6,000 feet msl in the species' range.

### Discussion

Assuming site persistence cannot be maintained at the site as a result of the PCGP Project, 10 sites of *D. hesperium* would remain on BLM and NFS lands in the local area, with one site in a reserve, and 25 sites, including nine in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions, pending an annual species review if the species is removed from the S&M list. The nine sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 36 percent of the remaining *D. hesperium* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *D. hesperium* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information,

however, since the species was listed in the 2001 ROD indicates that the species appears to be more common than previously documented, as noted below:

- *D. hesperium* has a somewhat limited distribution across three physiographic provinces and one state in the region and a moderate-high number of overall sites (26 on BLM and NFS lands). *D. hesperium* does not appear to be well distributed in any part of its range because sites are scattered despite the distribution of potentially suitable habitat. The currently known number of sites on BLM and NFS lands is an increase of 12 sites on BLM and NFS lands since 2007.
- An estimated 35 percent of the sites (nine sites) are in reserves. More sites are likely located in Riparian Reserves based on the species' habitat preferences.
- Coniferous, mixed hardwood-coniferous, and hardwood forests below 6,000 feet msl (general habitat for the species) are widely distributed across the species' range and encompass approximately 6.6 million acres on BLM and NFS lands with an estimated 48 percent in reserves. Moist riparian areas within these forests are less common. A subcomponent of these forests likely provides habitat for *D. hesperium*.
- The PCGP Project would affect one of 26 BLM- and Forest Service-managed sites of *D. hesperium*, representing approximately 4 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (25) would continue to be documented on BLM and NFS lands in the region with a somewhat limited distribution across the NSO range. Several sites (10 sites) would remain in the local vicinity of the analysis area with several other sites in the southern Cascade Range in Oregon. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect any sites in reserves. Of the remaining sites, nine are in LSRs where management actions are restricted to those activities that benefit LSOG forests. Other sites are likely in Riparian Reserves based on the species' habitat requirements, which afford additional protections to the sites.
- The PCGP Project would result in a permanent loss of an estimated 150 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,000 feet msl (less than 1 percent of the total acreage in Oregon). An estimated 3.2 million acres (48 percent) of coniferous, mixed, and hardwood forests and 1.4 million acres (55 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the species' range.
- The remaining forests may support additional populations of *D. hesperium*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys.

#### 6.1.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *D. hesperium* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 25 sites would remain on BLM and NFS lands across the region, and 10 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project would affect site persistence of *D. hesperium* at one site, the site is part of a large group of sites in the southern Cascade Range in Oregon. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *D. hesperium* would persist in the region without considering the site as part of the population.
- The PCGP Project would remove approximately 710 acres of coniferous, mixed hardwood-coniferous, and hardwood forests and 130 acres of LSOG forests below 6,000 feet msl (a negligible amount of the forests). An estimated 63 percent of the forests would be restored to similar conditions or shrublands, although they may not provide habitat for the species, and a permanent unforested corridor would remain across the project area. An estimated 3.2 million acres (48 percent) of coniferous, mixed, and hardwood forests and 1.4 million acres (55 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future, pending an annual species review if the species is removed from the S&M list. Although a single natural disturbance event or combination of events could affect a significant portion of sites in one of the three groups of sites in the Oregon Cascade or Coast Range, the sites are scattered across the region and are less likely to be collectively affected by a single event.

The PCGP Project would not be able to avoid impacts to the *D. hesperium* site in the analysis area. Based on the above conclusions, avoidance of the *D. hesperium* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *D. hesperium* site affected by the PCGP Project. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near the affected site over the long term (or until the species is removed from the S&M list), as specified by the agency responsible for management of the site. The monitoring plan shall be approved by the BLM and Forest Service.

## 6.2 MONADENIA CHACEANA

*Monadenia chaceana* is a land snail in the Bradybaenidae family and is commonly known as Chace sideband or Siskiyou sideband.

### 6.2.1 Regulatory Status and Ranking

The 2001 ROD identifies *M. chaceana* as a Category B (rare) species. The ORBIC evaluated *M. chaceana* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be between imperiled because of rarity or other factors that make it vulnerable to extinction and rare, uncommon or threatened, but not immediately imperiled, within its global range and in Oregon (G2G3, S2S3, respectively). The species is on the ORBIC List 3. It is considered a BLM and Forest Service Sensitive Species in Oregon.

### 6.2.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

Like other species in the genus *Monadenia*, *M. chaceana* is a hermaphroditic terrestrial gastropod and requires high moisture content throughout its life cycle (Duncan 2005b). Eggs are laid in loose soil, and the life span of the species is thought to be approximately 6 years. It becomes dormant during summer and winter and is normally crepuscular (active during dawn and dusk) during spring and fall. Dormant periods are spent in refugia deep within the interstitial space between rocks. The snail likely assists in dispersal of fungal spores and hyphae through its feces. Individuals that inhabit talus slopes also use the surrounding forest habitat during moist, cool weather to forage for food.

#### *Range*

*M. chaceana* is endemic to the Pacific Northwest, where it has only been found in southwest Oregon and far northern California, primarily in Siskiyou County (Duncan 2005b). The known range of the species in 2004 encompassed approximately 100–400 square miles (ORBIC 2004). The currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range may have been similar to the current range, with populations limited to the Pacific Northwest. It may have had more abundant local distributions across its range, but habitat modifications and other environmental factors, as discussed under Threats below, have likely reduced available habitat and may have further restricted the species' distribution.

#### *Population Status*

The ORBIC (2004) reported *M. chaceana* from an estimated 33 element occurrences across the species' range in 2004. This species was only found in two areas in the NSO range: southern Oregon and Siskiyou County, California (ORBIC 2004). In 2004, *M. chaceana* was thought to

be rare because it was only known from two population areas (ORBIC 2004). The species was found in two locations during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 206 sites on federal lands and 223 total sites on all lands in the NSO range.

For the PCGP Project, surveys for Category A and B S&M mollusks were conducted in 2007 in the PCGP Project area and within 100 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008). These surveys targeted *M. chaceana* and resulted in 12 observations of the species. Based on the increased number of sites since 2004 with increased surveys, it is likely that this species is more abundant than previously known, and more survey effort would be expected to locate additional populations within the NSO range, particularly in southern Oregon and northern California where most observations have been reported. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### ***Habitat***

*M. chaceana* is typically found in shaded areas in dry coniferous, mixed hardwood-coniferous, and hardwood forests (Duncan 2005b). It has been found in the lower reaches of major drainages, in talus and rock slides, under rocks and woody debris in moist conifer forests, in caves, and in shrubby areas in riparian corridors (ORBIC 2004). Favorable microsite conditions include stable rock formations and lower talus slopes with availability of subsurface water and large interstitial spaces between rocks (Duncan 2005b). In mesic habitats, the snail may use hollow cavities in living hardwoods, large woody debris, dense ground cover, bark, sword fern root masses, or rodent burrows for aestivation and refugia from predation, desiccation, or fire. *M. chaceana* is not likely restricted to specific microclimate conditions of LSOG forests as much as it is restricted to moist forests with suitable rock substrate.

### ***Threats***

Threats to *M. chaceana* include habitat alteration and fragmentation and activities that increase temperature, decrease moisture, or decrease food supplies (Duncan 2005b). Timber harvest resulting in less than 40 percent canopy closure is considered to adversely affect the species, particularly where residual habitat is additionally affected by prescribed fire. Prescribed burns threaten the species because they are typically conducted in the spring and fall when *M. chaceana* is active (USDA and USDI 2007). Wildfires are less of a threat because they typically occur in summer months when *M. chaceana* undergoes aestivation. Other threats include herbicide use, recreation development, quarry development, road construction, timber harvest and monoculture, and disturbances that alter hydrologic patterns or refugia habitat (ORBIC 2004).

### ***Management Recommendations***

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *M. chaceana* in 1998 and updated in 2005 (Duncan 2005b). This guidance includes: maintaining a food supply of leaf and needle litter and fungi within a cool moist environment during fall and spring active periods, providing stable refuge sites used during dormant periods in summer and winter, maintaining undisturbed talus and rock

substrates, and managing the surrounding vegetative cover sufficient to maintain suitable environmental conditions and provide coarse woody debris and uncompacted forest litter.

### 6.2.3 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species’ currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *M. chaceana* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table MOCH-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 313 observations from BLM and Forest Service geodatabases were converted into 258 sites in the NSO range (region). Table MOCH-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table MOCH-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure MOCH-1 displays the regional distribution of the species across BLM and NFS lands, and Figure MOCH-2 displays the species’ regional distribution with the extent of all forest types and LSOG forests below 6,500 feet msl on BLM and NFS lands, including mapped drainages within these forests within the currently known range of the species.

TABLE MOCH-1

Number of <i>Monadenia chaceana</i> Sites (2013)	
Location*	Number of Sites
Regional Area	258
Local Area	98
Analysis Area (Project Area)	5 (2)

Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1.

TABLE MOCH -2

Distribution of <i>Monadenia chaceana</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	121	76	5
Forest Service	125	21	-
NPS	1	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	13	2	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



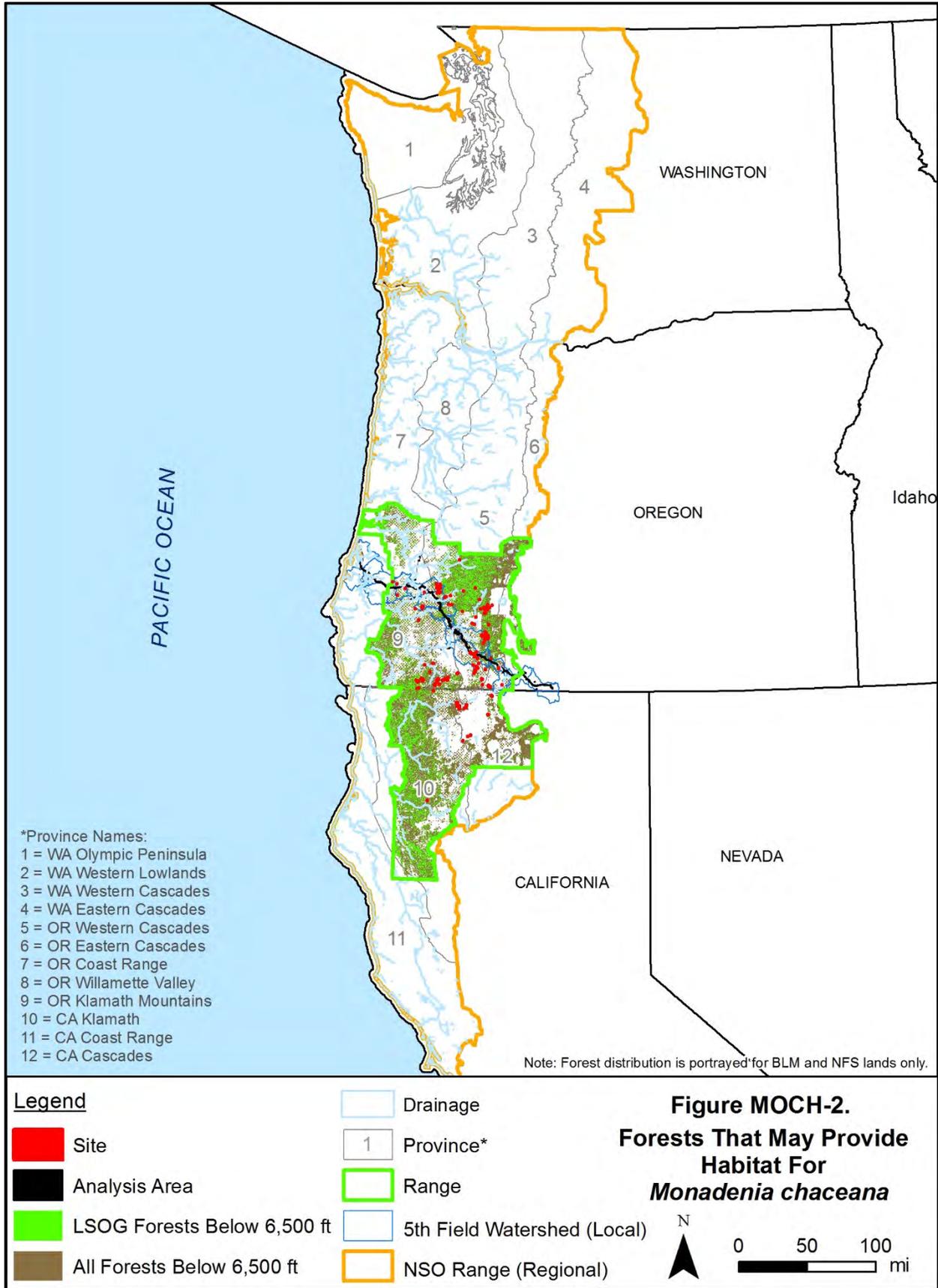


TABLE MOCH -3

Distribution of <i>Monadenia chaceana</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	57	-	-
Adaptive Management Reserves (AMR)	-	-	-
Administratively Withdrawn (AW)	17	-	-
<b>Congressionally Reserved (CR)</b>	<b>2</b>	<b>1</b>	-
<b>Late Successional Reserve (LSR)</b>	<b>24</b>	<b>12</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>8</b>	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	3	-	-
Other (Matrix, Riparian Reserve, Other)	138	87	5
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations, some sites may occur in multiple allocations, and the allocations only apply to BLM and NFS lands. **Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*M. chaceana* has a somewhat wide distribution across six physiographic provinces in Oregon (Coast Range, Klamath Mountains, and Cascades East and West) and California (Klamath and Cascades) (see Figure MOCH-1). Sites are primarily found in a large group of several clusters in the eastern Klamath Mountains and southern Cascade Range in Oregon and extreme northern California. An apparently isolated site is found further south in the Klamath Mountains in California. *M. chaceana* appears to be well distributed in its range in southern Oregon and extreme northern California.

Thirteen of 258 sites are located on private lands (at least partially); one site is on NPS land (Crater Lake National Park); and 246 sites are on BLM and NFS lands across the region (at least partially). Sites managed by the BLM Districts that encompass the project area include 13 sites in the Klamath Falls Resource Area of the Lakeview District, 62 sites in the Medford District, and 40 sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include 95 sites on the Rogue River National Forest and five sites on the Umpqua National Forest. Sites managed by other BLM Districts and National Forests include six sites in the Redding District and 25 sites on the Klamath National Forest.

Across the NSO range, 34 sites are located on reserve lands managed by BLM and the Forest Service, including 24 in LSRs, eight in Known Owl Activity Centers, and two in Congressionally Reserved areas. This represents 14 percent of the total BLM- and Forest Service-managed sites in the region. Other sites may also be associated with Riparian Reserves that have not been mapped at the regional scale, as defined in the respective BLM and Forest Service land management plans. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The NPS site, while not covered by the S&M Standards and Guidelines, also likely receives some degree of protection based on National Park management.

*M. chaceana* is less common in LSOG forests based on available data (101 of 258 total sites are in LSOG) and is relatively common in non-LSOG forests. Based on current site locations, the species is found in coniferous, mixed hardwood-coniferous, and hardwood forests between about 1,500–6,300 feet msl in parts of Oregon and California. Coniferous, mixed hardwood-

coniferous, and hardwood forests in Douglas, Jackson, Josephine, Klamath, Siskiyou, and Trinity counties could provide habitat for *M. chaceana* and support additional sites. These forests encompass an estimated 6.8 million acres on BLM and NFS lands in the species’ range, including an estimated 3.1 million acres in reserve land allocations (45 percent of the forests; Table MOCH-4). Of this acreage, an estimated 2.2 million acres are LSOG (see Figure MOCH-2), including 1.2 million acres in reserve land allocations (55 percent of the forests). Although coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl are widespread across the species’ range, the specific habitat requirements of the species are likely less common.

TABLE MOCH-4

Extent of Forests that Could Provide Habitat for <i>Monadenia chaceana</i> on BLM and NFS Lands*				
Location	All Forests below 6,500 feet		LSOG Forests below 6,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	6,806,740	3,062,520	2,186,240	1,204,690
Local Area	491,200	147,820	135,390	51,550
Project Area	1,310	450	270	140

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *M. chaceana* is distributed across nine 5<sup>th</sup> field watersheds that overlap the project area (see Table MOCH-5 and Figure MOCH-3). The sites are scattered across the local area in the Coast Range, Klamath Mountains, and Cascade Range. Most sites appear clustered and near one another, but sites in the Olalla Creek-Lookingglass Creek watershed appear more isolated near the western portion of the local area. Across the watersheds, multiple avenues of connectivity appear to be available between sites based on the extent of coniferous, mixed, and hardwood forests. Many sites are located in the nearby Klamath Mountains and Cascade Range.

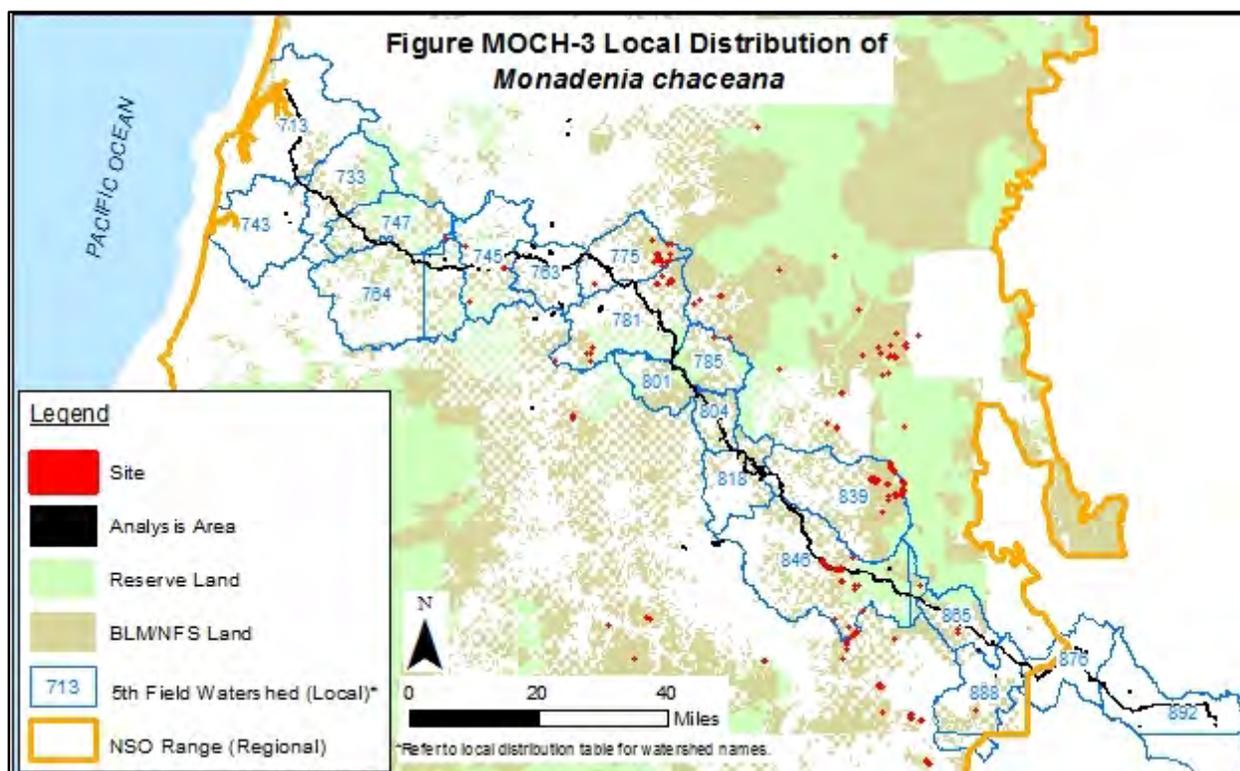
Of the 98 sites in the local area, 97 are on BLM or NFS lands, including 76 on BLM lands and 21 on NFS lands. These sites are located on lands designated as Other (Matrix), Congressionally Reserved, and LSR. Two sites are at least partially on private lands. Of the 98 sites in the local area, 13 sites are on reserve lands, representing 13 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table MOCH-5 and on Figure MOCH-3. The sites in reserves are in the Big Butte Creek, Little Butte Creek, and Olalla Creek-Lookingglass Creek watersheds.

Coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl encompass approximately 491,200 acres on BLM and NFS lands in the local area, with 147,820 acres in reserve land allocations (30 percent of the forests). Of this acreage, an estimated 135,390 acres are LSOG, including 51,550 acres in reserves (38 percent of the forests). Other sites may also exist in the local area, particularly in the Klamath Mountains and Cascade Range, where surveys have not been completed, based on the number of sites in the local area, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures MOCH-2 and MOCH-3).

TABLE MOCH-5

Distribution of <i>Monadenia chaceana</i> in Local 5th Field Watersheds			
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands	
Big Butte Creek (839)	15	7	
Coos Bay Frontal (713)	-	-	
East Fork Coquille River (747)	1	-	
Elk Creek-South Umpqua (785)	1	-	
Klamath River-John C Boyle Reservoir (888)	1	-	
Lake Ewauna-Upper Klamath River (876)	-	-	
Little Butte Creek (846)	41	4	
Lower Coquille River (743)	-	-	
Lower Lost River (892)	-	-	
Middle Fork Coquille River (764)	-	-	
Middle South Umpqua River (763)	-	-	
Myrtle Creek (775)	22	-	
North Fork Coquille River (733)	-	-	
Olalla Creek-Lookingglass Creek (745)	3	2	
Rogue River-Shady Cove (818)	-	-	
South Umpqua River (781)	12	-	
Spencer Creek (865)	2	-	
Trail Creek (804)	-	-	
Upper Cow Creek (801)	-	-	

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011



### Analysis/Project Area Distribution

The analysis area contains five sites of *M. chaceana*, and the project area contains two sites. All of these sites are on BLM lands designated as Other (Matrix) in the Medford District. The analysis area sites are found in the Little Butte Creek watershed in the eastern portion of the analysis area. Many sites are also located within the immediate vicinity of the analysis area in the Cascade Range and Klamath Mountains (see Local and Regional Distribution discussions above).

Surveys for the PCGP Project resulted in 12 total observations of the species in or near the project area (Siskiyou BioSurvey LLC 2008). An estimated three of these recorded observations in combination with agency records comprise the five sites in the analysis area; the other observations are in sites outside the analysis area. Within the project area, two sites are between MPs 149.6 and 151.

**Project Impacts**

Analysis

The PCGP Project would affect five sites out of the 246 sites on BLM- and Forest Service-managed lands in the region, representing approximately 2 percent of the sites (or five out of 258 total sites on all lands in the NSO range). Table MOCH-6 presents an overview of the features of the PCGP Project that would affect the *M. chaceana* sites. The construction corridor and associated work and storage areas would affect about 0.1 acre within two sites (about 25 percent of the sites), and three sites could be indirectly affected near the project area. This discussion presents an overview of the types of impacts that would be expected in the sites based on the features of the PCGP Project and that could affect site persistence.

Vegetation removal and grading activities in the construction corridor and a TEWA would disturb less than 0.1 acre of vegetation and soils within one site and could result in injury or mortality to *M. chaceana* individuals. The establishment of the corridor and TEWA could modify microclimate conditions in suitable habitat adjacent to the corridor and could also result in indirect effects on the three sites near the project area. The removal of forests and understory components could negatively affect *M. chaceana* in adjacent areas by removing its habitat, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor could make habitat within the sites no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 0.1 acre of understory habitat in one site, which could remove logs or woody debris, potentially making the habitat unsuitable for the species or injuring individuals.

TABLE MOCH-6

Impacts to <i>Monadenia chaceana</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.02 ac
Temporary Extra Work Area (TEWA)	1	0.01 ac
Uncleared Storage Area (UCSA)	1	0.07 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because one site would be subject to impacts from multiple project activities.

Across the project area, the PCGP Project would remove an estimated 1,030 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl, including 190 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *M. chaceana*. Within this impact area, about 660 acres (about 64 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-

term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 210 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 6,500 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the five sites as a result of the PCGP Project, 92 sites of *M. chaceana* would remain on BLM and NFS lands in the local area, including 13 in reserves, and 241 sites, including 34 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 34 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 14 percent of the remaining *M. chaceana* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *M. chaceana* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information, however, since the species was listed in the 2001 ROD indicates that the species appears to be more common than previously documented, as noted below:
  - *M. chaceana* has a somewhat wide distribution across six physiographic provinces and two states in the region and a moderate-high number of overall sites (246 on BLM and NFS lands). The species appears to be well distributed in its range in southern Oregon and extreme northern California. The currently known number of sites on BLM and NFS lands is an increase of 40 sites on BLM and NFS lands since 2007, with many sites documented during the PCGP Project surveys.
  - An estimated 14 percent of the sites (34 sites) are in reserves.
- Coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl (general habitat for the species) are widely distributed across the species' range and encompass approximately 6.8 million acres on BLM and NFS lands with an estimated 45 percent in reserves. Most of the forests are found in the Cascade Range and Klamath Mountains, where most sites are documented. The Coast Range also contains coniferous,

mixed, and hardwood forests, but few sites are located in the mountain range. A subcomponent of these forests likely provides habitat for *M. chaceana*.

- The PCGP Project would affect five of 246 BLM- and Forest Service-managed sites of *M. chaceana*, representing approximately 2 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the five sites in the analysis area, a moderate-high number of sites (241) would continue to be documented on BLM and NFS lands in the region with a somewhat wide and scattered distribution across Oregon and California. Many sites (92 sites) would remain in the local vicinity of the analysis area; these sites would continue to be distributed across nine 5<sup>th</sup> field watersheds. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect any sites in reserves, and the percentage of sites in reserves would be about the same (14 percent). Of the remaining sites, 32 are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests, and two are at least partially in Congressionally Reserved areas where management activities that may adversely affect *M. chaceana* are unlikely.
- The PCGP Project would result in a permanent loss of an estimated 210 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 3.1 million acres (45 percent) of all forests and 1.2 million acres (55 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *M. chaceana*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO, particularly in the Klamath Mountains and Cascade Range, that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

#### 6.2.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *M. chaceana* at five sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 241 sites would remain on BLM and NFS lands across the region, and 92 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project would affect site persistence of *M. chaceana* at five sites, these sites are part of a group of sites in the Cascade Range in southern Oregon where the species is locally abundant and well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *M. chaceana* would persist in the region without considering the five sites as part of the population.

- The PCGP Project would remove approximately 1,030 acres of all forests and 190 acres of LSOG forests below 6,500 feet msl (a negligible amount of the forests). An estimated 64 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 3.1 million acres (45 percent) of all forests and 1.2 million acres (55 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. Although a single natural disturbance event or combination of events could affect a significant portion of sites in a portion of southern Oregon, many sites are found in the area and are less likely to be collectively affected by a single event.

The PCGP Project would not be able to avoid impacts to all *M. chaceana* sites in the analysis area, although some individuals within the sites could persist following project implementation. Based on the above conclusions, avoidance of the five *M. chaceana* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for *M. chaceana* sites affected by the PCGP Project. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near affected sites over the long term, as specified by the agency responsible for management of the sites. The monitoring plan shall be approved by the BLM and Forest Service.

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## 7.0 VERTEBRATE SPECIES

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### 7.1 ARBORIMUS LONGICAUDUS

*Arborimus longicaudus* is a small arboreal rodent in the Muridae family and is commonly known as red tree vole. The species has also been known as *Phenacomys longicaudus* (Oregon red tree vole).

#### 7.1.1 Regulatory Status and Ranking

The 2001 ROD identifies *A. longicaudus* as a Category C (uncommon) species. The ORBIC evaluated *A. longicaudus* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again its most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be between rare, uncommon or threatened, but not immediately imperiled, and not rare and apparently secure, but with cause for long-term concern, within its global range (G3G4). In Oregon, it was rare, uncommon or threatened, but not immediately imperiled (S3). The species is on the ORBIC List 4. It is considered a BLM and Forest Service Sensitive species in the North Oregon Coast Distinct Population Segment where it is a candidate for listing under the Endangered Species Act.

#### 7.1.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*A. longicaudus* is a small microtine rodent that is described as one of the most arboreal mammals in the Pacific Northwest (Forest Service and BLM 2001). Individuals occupy small home ranges and exhibit weak dispersal ability. The species lives in tree canopies and seldom comes to the forest floor. Coniferous tree canopies provide nesting habitat, climatic buffering, refuge from predators, dispersal routes, forage, and drinking water. *A. longicaudus* uses Douglas-fir needles for nest building materials and as its primary food source, which it makes palatable by stripping the resin ducts from each needle (U.S. Fish and Wildlife Service 2013). The rodent is a primary prey item of the NSO and is also preyed on by northern saw-whet owl (*Aegolius acadicus*), raccoon (*Procyon lotor*), ringtail (*Bassariscus astutus*), and members of the weasel family (Mustelidae) (U.S. Fish and Wildlife Service 2013).

#### *Range*

*A. longicaudus* is widespread in mesic and xeric coniferous forests in western Oregon and northwestern California (USDA and USDI 2007, U.S. Fish and Wildlife Service 2011). Its current range extends from Del Norte County, California in the south to the Columbia River in Oregon and from the Pacific coast eastward to just east of the crest of the Cascade Range (U.S.

Fish and Wildlife Service 2011). The red tree vole has primarily been found in Oregon (ORBIC 2004, Hayes 1996). The currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range may have been similar to the current range, with populations limited to parts of Oregon and California. The species was likely found further north of the Columbia River and further east of the Cascade Range crest (U.S. Fish and Wildlife Service 2011). It may have had more abundant local distributions across its range, but habitat modifications and other environmental factors, as discussed under Threats below, have likely reduced available habitat and may have further restricted the species' distribution.

### **Population Status**

The ORBIC (2004) reported *A. longicaudus* from an estimated 81–300 element occurrences across Oregon and California in 2004. Most occurrences were in Oregon (81–300) with fewer (1–5) in California (ORBIC 2004). In 2004, *A. longicaudus* was considered to be moderately vulnerable, primarily because of its relatively slow reproduction frequency, high age of maturity, and/or moderate fecundity (ORBIC 2004). Population trends throughout its range were unknown, although extirpations had been reported in some localities, and the species' distribution was reduced as a result of removal of preferred habitat. In 2007, the species was widespread and rather common in some regions of Oregon, but populations had substantially declined where landscape disturbances, such as logging and fire, resulted in loss of mature forests (USDA and USDI 2007). The species was found in 80 locations during Random Multi-Species surveys across the NSO range (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 1,032 sites on federal lands and 1,039 total sites on all lands in the NSO range.

Protocol surveys are required for *A. longicaudus* and were conducted across approximately 825 acres of suitable habitat in the PCGP Project area between October 2010 and June 2012. These surveys resulted in the identification of 1,324 nest trees, with some trees having multiple nests. A total of 2,736 nests were encountered, which included 1,046 confirmed active nests and 1,677 inactive nests. These observations have increased the number of sites documented in BLM and Forest Service records, and more survey effort would be expected to locate more nest sites and trees. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### **Habitat**

*A. longicaudus* inhabits moist coniferous and mixed hardwood-coniferous forests containing Douglas-fir, grand fir, Sitka spruce, western hemlock, and white fir (Johnson and George 1991, Manning and Maguire 1999, U.S. Fish and Wildlife Service 2011) and has been found from sea level to 5,500 feet msl (Huff et al. 2012). The species has been found in greater abundance and frequency in old-growth forests than in younger forests, with age-associated forest characteristics being important habitat components (Aubrey et al. 1991). Old-growth Douglas-fir trees provide optimal habitat for *A. longicaudus* (Carey 1991). Although *A. longicaudus* has been found to utilize younger forests, data suggest that younger forests may be population sinks rather than population sources (Carey 1991). Younger forests in early seral conditions are considered low quality, transitional habitats (U.S. Fish and Wildlife Service 2011). *A. longicaudus* seems to

prefer specific microclimate conditions of LSOG forests, although it is occasionally found in younger forests.

### ***Threats***

*A. longicaudus* exhibits a very high sensitivity to forest disturbance, has low dispersal capability and reproductive potential, and occupies an extremely small home range. It is threatened by logging, fire, and other management activities that isolate remaining populations by fragmentation of forest habitats that prevent gene flow and negatively affect genetic diversity in the metapopulation (Holthausen et al. 1994). Because of the species' limited dispersal capabilities, connectivity between LSOG habitat is considered important to metapopulation dynamics. Populations inhabiting younger forests may go extinct if they do not reproduce successfully each year (Forest Service and BLM 2001). These threats continue to affect populations of *A. longicaudus* in the NSO range by isolating nest sites and reducing suitable habitat based on information presented by U.S. Fish and Wildlife Service (2011).

### ***Management Recommendations***

As a Category C S&M species, the direction from the 2001 ROD is to manage high-priority sites to provide a reasonable assurance of species persistence. Management recommendations were updated for *A. longicaudus* in 2000 (Forest Service and BLM 2001). The specific objectives for the management recommendations were derived from the 1994 ROD standards and guidelines for the species that stated "management standards will be developed to manage habitat for the species on sites where they are located." These management objectives are to:

- maintain the physical integrity of the habitat at active and undetermined sites;
- maintain red tree vole populations at sites where they currently occur; and
- prevent the inadvertent loss of red tree voles at sites where the species is assumed to occur but were not detected due to incomplete surveys.

The direction includes guidance for establishing Habitat Areas for purposes of managing the species and its habitat in accordance with the 1994 ROD. Any management that occurs within a Habitat Area should not remove or modify nest trees, the canopy structure of the stand, or remove any of the dominant, codominant, or intermediate crowns. This includes activities that may isolate nest trees or alter the microclimate within the stand. Some activities may be appropriate if they maintain or improve, and do not degrade (short- or long-term), the habitat condition in the Habitat Area.

### **7.1.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

**Species Distribution**

The distribution of *A. longicaudus* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table ARLO-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (100-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). More than 10,000 observations from BLM and Forest Service geodatabases were converted into 3,909 sites in the NSO range (region). The sites in the analysis area were further modified to generate Habitat Areas for the red tree vole as defined in the Management Recommendations for the species (Forest Service and BLM 2001), which resulted in 56 Habitat Areas from 103 sites. Table ARLO-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table ARLO-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure ARLO-1 displays the regional distribution of the species across BLM and NFS lands, and Figure ARLO-2 displays the species’ regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 6,000 feet msl on BLM and NFS lands within the currently known range of the species.

TABLE ARLO-1

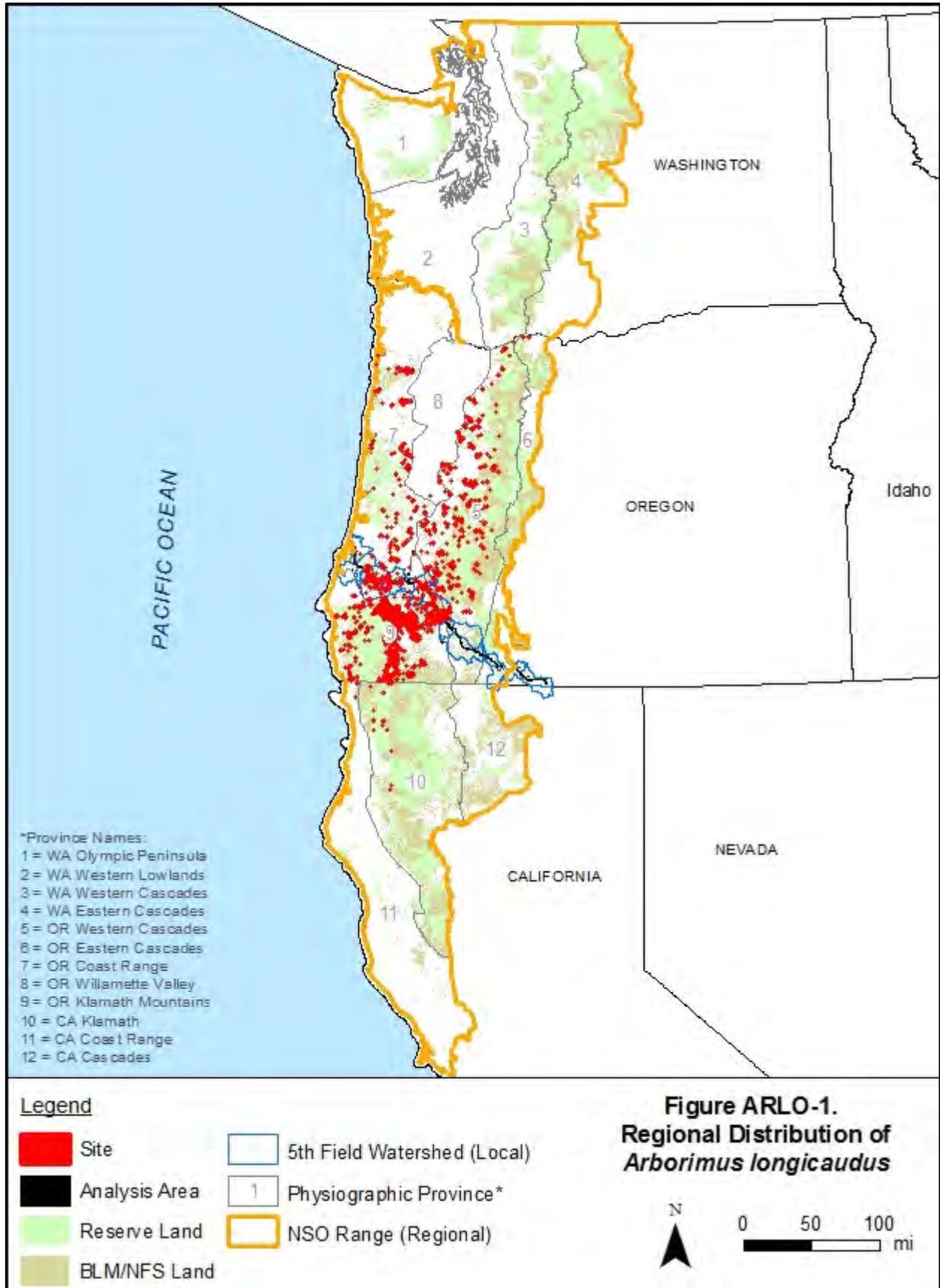
<b>Number of <i>Arborimus longicaudus</i> Sites (2013)</b>	
<b>Location*</b>	<b>Number of Sites</b>
Regional Area	3,909
Local Area	575
Analysis Area (Project Area)	103 (97)
Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013	
*Definitions of regional, local, analysis, and project areas are provided in Chapter 1.	

TABLE ARLO-2

<b>Distribution of <i>Arborimus longicaudus</i> Across Federal, Private, and Other Lands</b>			
<b>Land Ownership</b>	<b>Regional Sites</b>	<b>Local Sites</b>	<b>Analysis Area Sites</b>
BLM	2,938	517	66
Forest Service	977	70	47
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	708	136	32

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



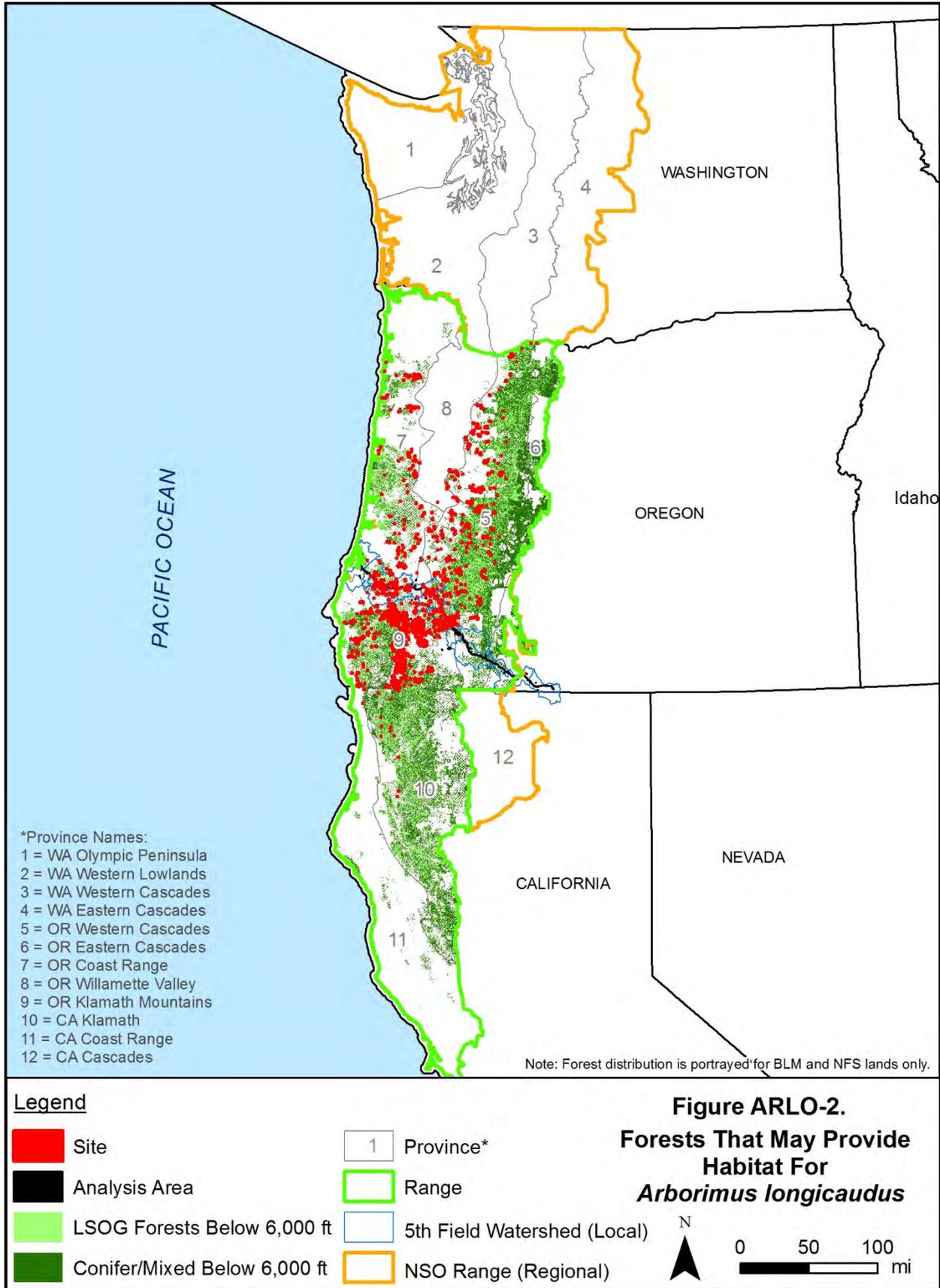


TABLE ARLO-3

Distribution of *Arborimus longicaudus* Across 1994 ROD Land Allocations

Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	333	2	-
Adaptive Management Reserves (AMR)	96	-	-
Administratively Withdrawn (AW)	50	1	-
<b>Congressionally Reserved (CR)</b>	<b>11</b>	<b>-</b>	<b>-</b>
<b>Late Successional Reserve (LSR)</b>	<b>502</b>	<b>90</b>	<b>33</b>
<b>Marbled Murrelet Area (LSR3)</b>	<b>55</b>	<b>41</b>	<b>8</b>
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>112</b>	<b>33</b>	<b>4</b>
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	2,949	480	74
<b>Riparian Reserve**</b>	<b>3</b>	<b>-</b>	<b>-</b>

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations, some sites may occur in multiple allocations, and the allocations only apply to BLM and NFS lands. **Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).

### Regional Distribution

*A. longicaudus* is somewhat widely distributed across seven physiographic provinces in Oregon (Willamette Valley, Coast Range, Cascades East and West, and Klamath Mountain) and California (Klamath and Coast) (see Figure ARLO-1). Most sites are found in the Klamath Mountains in Oregon, where sites are abundant and close together in large clusters or groups. Sites in the western Cascade Range in Oregon are more scattered, but are also relatively abundant with many clusters of sites. Sites in other areas of Oregon and California are scattered and less abundant. *A. longicaudus* appears to be well distributed within its range in Oregon based on the abundance and size of sites, proximity of sites to one another, and distribution of sites across forests that may provide suitable habitat in the mountain ranges.

Of the 3,909 sites in the region, 708 sites are located on private, state, or other lands (at least partially), and 3,886 sites are on BLM and NFS lands across the region (at least partially). Sites managed by the BLM Districts that encompass the project area include 183 sites in the Coos Bay District, 1,920 sites in the Medford District, and 345 sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include 541 sites on the Rogue River National Forest and 217 sites on the Umpqua National Forest. The remaining 730 sites (note that some sites are on both BLM and NFS lands) on BLM and NFS lands are in the Eugene and Salem Districts and on the Klamath, Mt. Hood, Siskiyou, Siuslaw, Six Rivers, and Willamette National Forests.

Across the NSO range, 673 sites are located on reserve lands managed by BLM and the Forest Service, including 502 in LSRs (at least partially), 55 in Marbled Murrelet Areas, 112 in Known Owl Activity Centers (at least partially), 11 in Congressionally Reserved areas, and three in Riparian Reserves. This represents 17 percent of the total BLM- and Forest Service-managed sites in the region. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*A. longicaudus* is primarily found in LSOG forests based on available data (3,625 of 3,909 total sites are in LSOG) and seems to prefer specific microclimates of LSOG forests, although it is occasionally found in younger forests. Based on current site locations, the species is primarily found in coniferous and mixed hardwood-coniferous forests below about 5,300 feet msl in the Klamath Mountains and Coast Range of Oregon and California and the Cascade Range of Oregon. LSOG coniferous and mixed hardwood-coniferous forests in this range could provide habitat for *A. longicaudus* and support additional sites. These forests encompass an estimated 4.4 million acres on BLM and NFS lands in the species’ range (see Figure ARLO-2 and Table ARLO-4), including 2.6 million acres in reserve land allocations (58 percent of the forests). LSOG coniferous and mixed forests below 6,000 feet msl are somewhat widely distributed across Oregon and northern California, but connectivity between the forests may be limited in some areas, restricting the species’ distribution. Younger coniferous and mixed forests may provide habitat for the species as they mature and develop suitable habitat conditions over time, and these forests are more widespread across Oregon and California (see Figure ARLO-2 and Table ARLO-4).

TABLE ARLO-4

Location	Extent of Forests that Could Provide Habitat for <i>Arborimus longicaudus</i> on BLM and NFS Lands*			
	Coniferous and Mixed Forests below 6,000 feet		LSOG Forests below 6,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	11,671,740	5,964,490	4,404,360	2,555,250
Local Area	567,840	192,010	182,040	79,250
Project Area	1,350	490	300	150

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *A. longicaudus* is distributed across 12 5<sup>th</sup> field watersheds that overlap the project area (see Table ARLO-5 and Figure ARLO-3). The sites are distributed across the western Cascade Range, Klamath Mountains, and Coast Range in the local area, with many clusters of sites. Many other sites are located nearby in the same mountain ranges and may offer opportunities for dispersal or connectivity between sites across LSOG coniferous and mixed forests.

Of the 575 sites in the local area, 136 sites are on private or other lands (at least partially), and 569 sites are on BLM and NFS lands (at least partially). The sites on BLM and NFS lands are primarily located on lands designated as Other (Matrix) or LSR. Of the 569 sites in the local area on BLM and NFS lands, 160 sites are on reserve lands, representing 28 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table ARLO-5 and on Figure ARLO-3. The sites in reserves are distributed across most of the watersheds.

LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl encompass approximately 182,040 acres on BLM and NFS lands in the local area, with 79,250 acres in reserve land allocations (44 percent of the forests). Other sites may also exist throughout the local area where surveys have not been completed, based on the number and distribution of sites

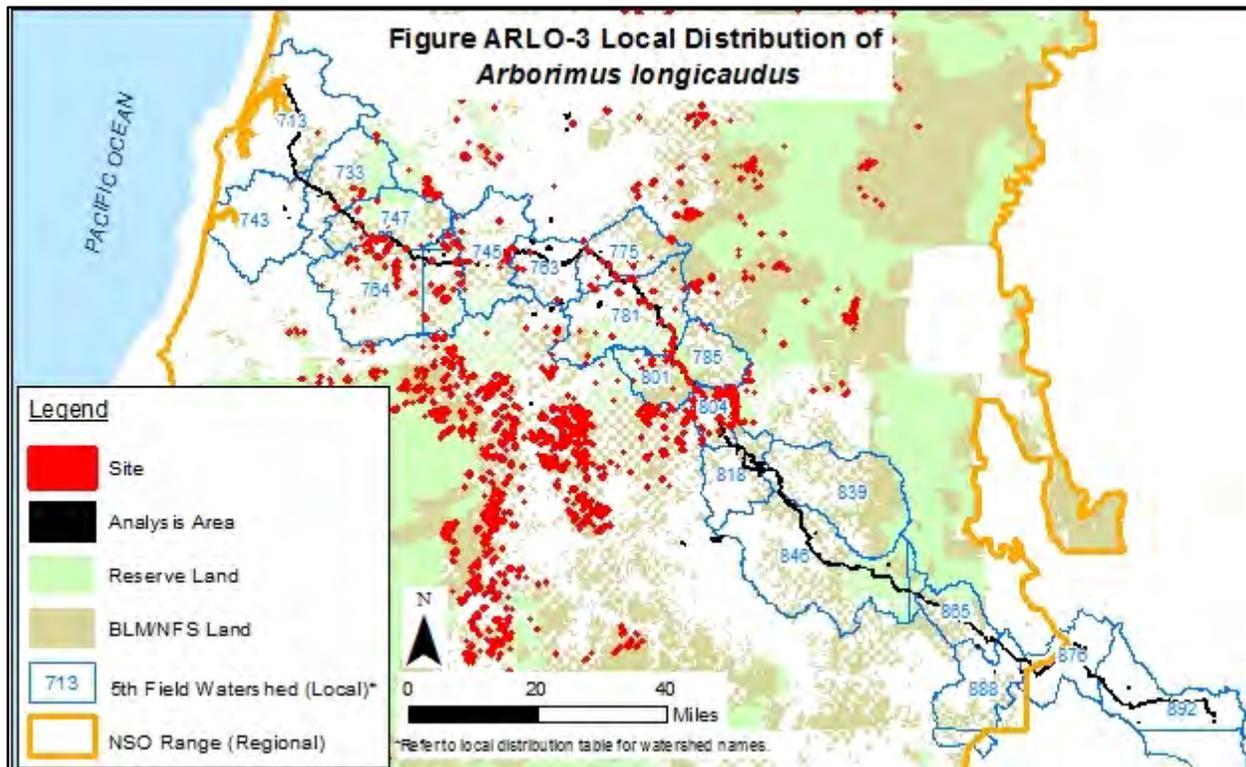
in the local and nearby regional areas and the extent of forests that may provide suitable habitat (see Figures ARLO-2 and ARLO-3).

TABLE ARLO-5

Distribution of <i>Arborimus longicaudus</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	1	-
East Fork Coquille River (747)	22*	11
Elk Creek-South Umpqua (785)	28*	15
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	144*	52
Middle South Umpqua River (763)	9*	-
Myrtle Creek (775)	33*	2
North Fork Coquille River (733)	9	1
Olalla Creek-Lookingglass Creek (745)	33*	13
Rogue River-Shady Cove (818)	4*	3
South Umpqua River (781)	69*	39
Spencer Creek (865)	-	-
Trail Creek (804)	217*	31
Upper Cow Creek (801)	45*	15

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011

\*Note: Site counts are not additive because some sites occur in multiple watersheds and the counts overlap.



### Analysis/Project Area Distribution

The analysis area contains 103 sites of *A. longicaudus*, and the project area contains 97 sites. All of the sites are at least partially on BLM or NFS lands, including 66 sites on BLM lands and 47 sites on NFS lands. Most of the sites are on land designated as Other (Matrix), and 43 sites are in reserves. Thirty-two sites are partially on private lands. The analysis area sites are distributed across 10 5th field watersheds, and many other sites are located in the vicinity of the sites (see Local Distribution discussion above).

Surveys for the PCGP Project resulted in 1,046 total observations of active nests of the species in 70 locations in or near the project area (Siskiyou BioSurvey LLC 2008, 2012b). All of these recorded observations in combination with other observations in agency databases comprise the 103 sites in the analysis area. Within the project area, the 97 sites are between MPs 27.1 and 116.8.

### ***Project Impacts***

#### Analysis

The PCGP Project would affect 103 sites out of the 3,886 sites on BLM- and Forest Service-managed lands in the region, representing approximately 3 percent of the sites (or 103 out of 3,909 total sites on all lands in the NSO range). The 103 sites were converted into 56 Habitat Areas, which were used for the analysis of impacts to the species. Table ARLO-6 presents an overview of the features of the PCGP Project that would affect the *A. longicaudus* Habitat Areas. The construction corridor, associated work and storage areas, and TMP would affect approximately 386 acres within the Habitat Areas (about 18 percent of the Habitat Areas). This discussion presents an overview of the types of impacts that would be expected in the Habitat Areas based on the features of the PCGP Project and that could affect site persistence.

Vegetation removal and grading activities in the construction corridor would disturb about 203.5 acres of vegetation and soil within 52 Habitat Areas and could result in the removal of trees that support *A. longicaudus* nests or cause injury or mortality to individuals. Disturbance in the TEWAs would result in similar impacts on about 46.2 acres within 46 Habitat Areas, and road improvements and establishment would result in similar impacts on about 8.9 acres within nine Habitat Areas. The establishment of the corridor, TEWAs, and roads could modify microclimate conditions around nests or potential nest trees adjacent to these areas. The removal of forests and potential nest trees could negatively affect *A. longicaudus* in adjacent areas by removing its habitat and opening the tree canopy, potentially affecting site persistence at the Habitat Areas even if the entire Habitat Area is not disturbed. In particular, modification of shading and habitat conditions as a result of the corridor, TEWAs, and roads could make entire Habitat Areas no longer suitable for the species because of the preference for closed canopy habitats. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 131.9 acres of understory habitat in 31 Habitat Areas, but these activities would be limited to understory disturbance and are less likely to affect *A. longicaudus* in the canopies of trees. Hydrostatic testing on about 0.4 acre within six Habitat

Areas is also not likely to affect *A. longicaudus* because it would be done after the pipeline is installed and would not affect trees.

TABLE ARLO-6

<b>Impacts to <i>Arborimus longicaudus</i> Habitat Areas on BLM and NFS Lands in the Project Area</b>		
<b>Project Activity</b>	<b>Number of Habitat Areas Affected</b>	<b>Area of Disturbance within Habitat Areas</b>
Construction Corridor	52	203.5 ac
Temporary Extra Work Area (TEWA)	46	46.2 ac
Uncleared Storage Area (UCSA)	31	131.9 ac
Roads (TMP)	9	8.9 ac
Other Minimal Disturbance Activity	6	0.4 ac

ac = acres

Note: Counts are not additive because some Habitat Areas would be subject to impacts from multiple project activities.

Across the project area, the PCGP Project would remove an estimated 220 acres of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl. These impacts would result in a reduction of habitat that may be suitable for *A. longicaudus*. Within this impact area, about 160 acres (about 73 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, but the restored areas would not return to LSOG conditions for more than 80 years and would not likely provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would also remain across the project area and would not provide habitat for the species. The permanent loss of LSOG coniferous and mixed forests below 6,000 feet msl represents less than 1 percent of the total estimated area of these forests across the species’ range.

Discussion

Assuming site persistence cannot be maintained at the 56 Habitat Areas or 103 sites as a result of the PCGP Project, 466 sites of *A. longicaudus* would remain on BLM and NFS lands in the local area, including 117 in reserves, and 3,783 sites, including 630 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 630 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 17 percent of the remaining *A. longicaudus* sites on BLM and NFS lands in the NSO range would be protected in reserves.

**Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *A. longicaudus* is a Category C (uncommon) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category C species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New

information, however, since the species was listed in the 2001 ROD indicates that the species appears to be more common than previously documented, as noted below:

- *A. longicaudus* has a somewhat wide distribution across seven physiographic provinces and two states in the region and a moderate-high number of overall sites (3,886 on BLM and NFS lands). The species appears to be well distributed in its range in Oregon. The currently known number of sites on BLM and NFS lands is an increase of 2,854 sites on BLM and NFS lands since 2007, with many sites documented during the PCGP Project surveys.
- An estimated 17 percent of the sites (673 sites) are in reserves.
- LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (general habitat for the species) are somewhat widely distributed across the species' range and encompass approximately 4.4 million acres on BLM and NFS lands with an estimated 58 percent in reserves. Most of the forests are found in the Cascade Range and Klamath Mountains, where most sites are documented. The Coast Range and other areas also contain LSOG forests, and many sites are located in the Coast Range. A subcomponent of these forests likely provides habitat for *A. longicaudus*.
- The PCGP Project would affect 103 of 3,886 BLM- and Forest Service-managed sites of *A. longicaudus*, representing approximately 3 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the 103 sites (56 Habitat Areas), a moderate-high number of sites (3,783) would continue to be documented on BLM and NFS lands in the region with a somewhat wide distribution across Oregon and California. Many sites (466 sites) would remain in the local vicinity of the analysis area; these sites would continue to be distributed across 12 5<sup>th</sup> field watersheds. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would affect site persistence at 43 sites in reserves, but the percentage of sites in reserves would remain the same (17 percent). Of the remaining sites, 624 are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests, and 11 are at least partially in Congressionally Reserved areas where management activities that may adversely affect *A. longicaudus* are unlikely. Three sites are at least partially in Riparian Reserves, where management actions are restricted to those activities that benefit the conservation of aquatic and riparian-dependent terrestrial resources.
- The PCGP Project would result in a permanent loss of an estimated 220 acres of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 2.6 million acres (58 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *A. longicaudus*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category C species for which pre-disturbance surveys are practical and have been conducted in parts of the NSO range, and

it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during pre-disturbance and other surveys, including surveys associated with the PCGP Project.

### 7.1.1 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *A. longicaudus* at 103 sites or 56 Habitat Areas; however, the remaining sites would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 3,783 sites would remain on BLM and NFS lands across the region, and 466 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project would affect site persistence of *A. longicaudus* at 103 sites or 56 Habitat Areas, these sites are part of the many sites in the Klamath Mountains and western Cascade Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *A. longicaudus* would persist in the region without considering the 103 sites as part of the population.
- The PCGP Project would remove approximately 220 acres of LSOG coniferous and mixed forests below 6,000 feet msl (a negligible amount of the forests). An estimated 73 percent of the forests would be restored to similar conditions or shrublands, but they would not likely provide habitat for the species during the life of the PCGP Project. An estimated 2.6 million acres (58 percent) of LSOG coniferous and mixed forests below 6,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2007.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is somewhat widely distributed.

The PCGP Project would not be able to avoid all *A. longicaudus* sites or Habitat Areas in the analysis area, although some individuals or nests within the sites may persist following project implementation. Based on the above conclusions, avoidance of the 103 *A. longicaudus* sites or 56 Habitat Areas is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for *A. longicaudus* sites and Habitat Areas affected by the PCGP Project. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near affected sites over the long term, as specified by the agency responsible for management of the sites. The monitoring plan shall be approved by the BLM and Forest Service.

## 7.2 STRIX NEBULOSA

*Strix nebulosa* is a forest owl in the Strigidae family and is commonly known as great gray owl. Two subspecies are recognized: *Strix nebulosa nebulosa* in North America and *Strix nebulosa lapponica* in Asia and Europe. A third subspecies, *Strix nebulosa yosemitensis*, has been

proposed as an isolated population restricted to the Yosemite region of the central Sierra Nevada Mountains (Williams 2012).

### 7.2.1 Regulatory Status and Ranking

The 2001 ROD identifies *S. nebulosa* as a Category C (uncommon) species. The ORBIC evaluated *S. nebulosa* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be widespread, abundant, and secure within its global range (G5) and rare, uncommon or threatened, but not immediately imperiled, in Oregon (S3). The species is on the ORBIC List 4. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

### 7.2.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*S. nebulosa* is nocturnal and highly elusive. The species tends to be long lived and has relatively low rates of reproduction and adult mortality (Williams 2012). Individuals in the wild are estimated to live between 10–20 years and begin breeding at three years of age. They are solitary in fall and early winter and become somewhat gregarious in the early spring. Adult males establish breeding territory in the autumn or winter by vocalizing in the vicinity of their nest, most often nocturnally. The owl demonstrates a strong fidelity to breeding and wintering areas (Bull et al. 1988), but individuals do not necessarily use the same nest year after year (Williams 2012). The owl does not build its own nests, but instead uses existing stick nests constructed by other raptors and large corvids. It also utilizes trees with large mistletoe clumps, depressions in the broken tops of large trees, or even artificial nesting platforms (Williams 2012, Quintana-Coyer et al. 2004). The nesting period is from March 1 through July 31 (Williams 2012).

The owl preys primarily on woodland and meadow rodents and to a lesser degree on other small mammal species, birds, and insects (Bull and Henjum 1990). Where other prey is scarce, even frogs may be consumed (Ulev 2007). In the western United States, *S. nebulosa* often preys on California vole (*Microtus californicus*), mole species (*Scapanus* spp.), and Botta's pocket gopher (*Thomomys bottae*). Conversely, adults and owlets are preyed upon by great horned owl (*Bubo virginianus*), raven (*Corvus corax*), northern goshawk (*Accipiter gentilis*), golden eagle (*Aquila chrysaetos*), and American marten (*Martes americana*) (Ulev 2007).

#### *Range*

*S. nebulosa* ranges across the boreal forests of North America, Europe, and Asia (ORBIC 2004). In North America, its range extends from Quebec to Alaska, southward through the alpine and

subalpine forests of the Cascade Mountains in Washington and Oregon, the northern Sierra Nevada Mountains in California, the northern Rocky Mountains, and portions of northern Minnesota, Michigan, and Wisconsin (Williams 2012, Quintana-Coyer et al. 2004). The northern limit of its range extends to the treeline, and the southern limit extends into other forest types (Williams 2012). The currently known range of the species within the NSO range based on 2013 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations widely distributed across North America, Europe, and Asia. Regional and local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### ***Population Status***

The ORBIC (2004) reported *S. nebulosa* from more than 300 element occurrences worldwide in 2004. In the Pacific Northwest, most occurrences were from Oregon (21–300), with fewer in California (6–20) and Washington (1–5) (ORBIC 2004). The ORBIC estimated that 4–12 of the occurrences in Oregon were in protected areas in 2004. In Oregon, *S. nebulosa* was considered rare to uncommon in 2004, but populations were stable to relatively stable (ORBIC 2004). Within the NSO range, the population trend of *S. nebulosa* has been decreasing (USDA and USDI 2007). The species was not included in the Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 118 sites on federal lands and 131 total sites on all lands.

Protocol surveys were conducted for *S. nebulosa* in 2007–2008 and 2010–2011 in suitable habitat in and near the PCGP Project area. Approximately 4,440 acres were surveyed in 2007–2008 (Siskiyou BioSurvey LLC 2008), and two proposed re-routes, including suitable habitat within 0.25-mile, were surveyed in 2010–2011 (Siskiyou BioSurvey LLC 2011c). In 2007, 18 detections of the species were recorded, including two pairs and one resident owl. In 2008, 31 detections of the species were recorded, including 13 clusters, three pairs, and one resident owl. In 2010–2011, two great gray owls were heard, but more details on the owls were not recorded, and they were assumed to be individual detections, not pairs. The current estimated number of sites and distribution of the species based on 2013 data are presented below under the Species Distribution discussion.

### ***Habitat***

*S. nebulosa* has been found in coniferous and mixed hardwood-coniferous forests up to approximately 6,000 feet msl (Williams 2012, Quintana-Coyer et al. 2004). The owl is typically found in mature coniferous forest composed primarily of pine (*Pinus* spp.), fir (*Abies* spp.), and spruce (*Picea* spp.) and nests in large, undisturbed forest stands (Williams 2012). It has a close association with habitat edges, particularly the interface between mature forest and meadows where snags are present and adjacent clearings are generally larger than 10 acres (Williams 2012, Quintana-Coyer et al. 2004). Natural forest openings along the edges of meadows, bogs, and other open areas serve as foraging habitat, where individuals perch on low branches and watch for prey species (Ulev 2007). LSOG forests, selectively logged forests, and clearcuts also provide foraging habitat (Williams 2012). Habitats composed of large open areas with few or no trees or with high shrub density tend to be avoided (Duncan 1997).

In the Siskiyou Mountains in southwestern Oregon, *S. nebulosa* has been reported nesting most frequently in LSOG forest stands composed primarily of Douglas fir located near forest edges (Quintana-Coyer et al. 2004). It tends to select oak (*Quercus* spp.), Pacific madrone (*Arbutus menziesii*), and LSOG Douglas-fir forests adjacent to Oregon white oak (*Quercus garryana*) woodlands and chaparral (Williams 2012). In the central and southern Cascade Range in Oregon, the species most often use lodgepole (*Pinus contorta*) and ponderosa pine (*Pinus ponderosa*) forests (Williams 2012, Bull and Henjum 1992).

### **Threats**

Loss of habitat availability and quality through timber harvesting, including non-clearcut methods, is the greatest threat to the species. Removal of large diameter trees results in loss of dense canopy that the species requires for nesting and roosting and the snags required for foraging (Williams 2012). Changes in forest stand dynamics can also indirectly affect nest availability by reducing or destroying nesting habitat for northern goshawks and other raptors whose nests are later used by *S. nebulosa*. Regenerating timber harvest also threatens the species because the densely growing young trees shade out the grasses and other understory vegetation used by rodents (Williams 2012). Forest fire suppression has led to intrusion of small conifer trees into meadows and other open areas, reducing foraging habitat in already small meadow areas. Because the species is at risk from predation by great horned owl in large open areas, clear cutting does not necessarily improve foraging habitat (Duncan 1997).

### **Management Recommendations**

As a Category C S&M species, the direction from the 2001 ROD is to manage high-priority sites to provide a reasonable assurance of species persistence. The *Conservation Assessment for Great Gray Owl (Strix nebulosa)* provides management considerations for the species (Williams 2012). The guidance includes retaining sufficient landscape-level habitat features; protecting and maintaining existing nest sites; minimizing disturbance around nest sites during the breeding season; and providing artificial nest structures. Habitat features that should be retained include open areas for foraging adjacent to stands of mature or old-growth trees for nesting and roosting; irregular borders to increase forest edge area; forested corridors between cut areas; forested stands around nest sites or potential nest sites; and hunting perches (large trees, large snags, or artificial platforms) in harvest patches.

### **7.2.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### **Species Distribution**

The distribution of *S. nebulosa* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table STNE-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that

encompass the project area), analysis (0.25- to 1-mile spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 376 observations from BLM and Forest Service geodatabases were converted into 230 sites in the NSO range (region); only observations with reproducing status confirmed were converted. Table STNE-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table STNE-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure STNE-1 displays the regional distribution of the species across BLM and NFS lands, and Figure STNE-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests on BLM and NFS lands within the currently known range of the species.

TABLE STNE-1

Number of <i>Strix nebulosa</i> Sites (2013)	
Location*	Number of Sites
Regional Area	230
Local Area	115
Analysis Area (Project Area)	11 (0)

Data Source: Processed BLM and Forest Service GIS data, Nov. 8, 2013

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1.

TABLE STNE-2

Distribution of <i>Strix nebulosa</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	174	96	8
Forest Service	43	11	1
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	20	13	3

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE STNE-3

Distribution of <i>Strix nebulosa</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	27	-	-
Adaptive Management Reserves (AMR)	-	-	-
Administratively Withdrawn (AW)	8	-	-
<b>Congressionally Reserved (CR)</b>	-	-	-
<b>Late Successional Reserve (LSR)</b>	<b>4</b>	<b>1</b>	<b>1</b>
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>12</b>	<b>6</b>	<b>4</b>
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	171	103	5
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations, some sites may occur in multiple allocations, and the allocations only apply to BLM and NFS lands. **Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

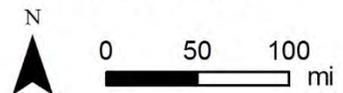




**Legend**

- Site
- Analysis Area
- LSOG Conifer/Mixed
- Conifer/Mixed Forests
- 1 Province\*
- Range
- 5th Field Watershed (Local)
- NSO Range (Regional)

**Figure STNE-2.**  
**Forests That May Provide**  
**Habitat For**  
***Strix nebulosa***



Regional Distribution

*S. nebulosa* has a somewhat limited distribution across three physiographic provinces in Oregon (Cascades West and East and Klamath Mountains) (see Figure STNE-1). Most sites are found in a large group in the southern Cascade Range and eastern Klamath Mountains. Other sites are scattered across the northern Cascade Range in Oregon. *S. nebulosa* appears to be well distributed in its range in the eastern Klamath Mountains and western Cascade Range in Oregon based on the relative abundance of sites and proximity of sites to one another in the mountain ranges.

Twenty of 230 sites are located on private lands (at least partially), and 217 sites are on BLM and NFS lands across the region (at least partially). Sites managed by the BLM Districts that encompass the project area include three sites in the Klamath Falls Resource Area of the Lakeview District, 170 sites in the Medford District, and one site in the Roseburg District. Sites managed by the National Forests that encompass the project area include one site on the Winema National Forest, 12 sites on the Rogue River National Forest, and two sites on the Umpqua National Forest. The remaining 28 sites on BLM and NFS lands are on the Deschutes and Willamette National Forests.

Across the NSO range, 16 sites are located on reserve lands managed by BLM and the Forest Service, including four in LSRs and 12 in Known Owl Activity Centers. This represents 7 percent of the total BLM- and Forest Service-managed sites in the region. The remaining BLM- and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*S. nebulosa* is less common in LSOG forests based on available data (110 of 230 total sites are in LSOG), but it is fairly common in younger forests with suitable nesting trees and nearby meadows or open areas for foraging. Based on current site locations, the species is found in coniferous and mixed hardwood-coniferous forests across a wide elevation range, but is only found in the Cascade Range and Klamath Mountains in Oregon. Coniferous and mixed hardwood-coniferous forests, including the LSOG component of these forests, within this range could provide habitat for *S. nebulosa* and support additional sites. These forests encompass an estimated 7.2 million acres on BLM and NFS lands in the species’ range, including an estimated 3.4 million acres in reserve land allocations (48 percent of the forests; Table STNE-4). Of this acreage, an estimated 2.6 million acres are LSOG (see Figure STNE-2), including 1.4 million acres in reserve land allocations (53 percent of the forests). Coniferous and mixed hardwood-coniferous forests are widespread across Oregon, and LSOG forests are somewhat widespread

TABLE STNE-4

Extent of Forests that Could Provide Habitat for <i>Strix nebulosa</i> on BLM and NFS Lands*				
Location	Coniferous/Mixed Forests		LSOG Coniferous/Mixed Forests	
	Total	Reserves	Total	Reserves
Regional Area	7,198,200	3,433,650	2,580,280	1,374,080
Local Area	453,290	141,660	134,380	51,560
Project Area	1,170	430	260	140

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

## Local Distribution

Within the local area, *S. nebulosa* is distributed across five 5th field watersheds that overlap the project area (see Table STNE-5 and Figure STNE-3). The sites are primarily in the Cascade Range as part of the larger group of regional sites, with a few scattered sites in the Klamath Mountains. Many regional sites are located within 30 miles to the south and southeast.

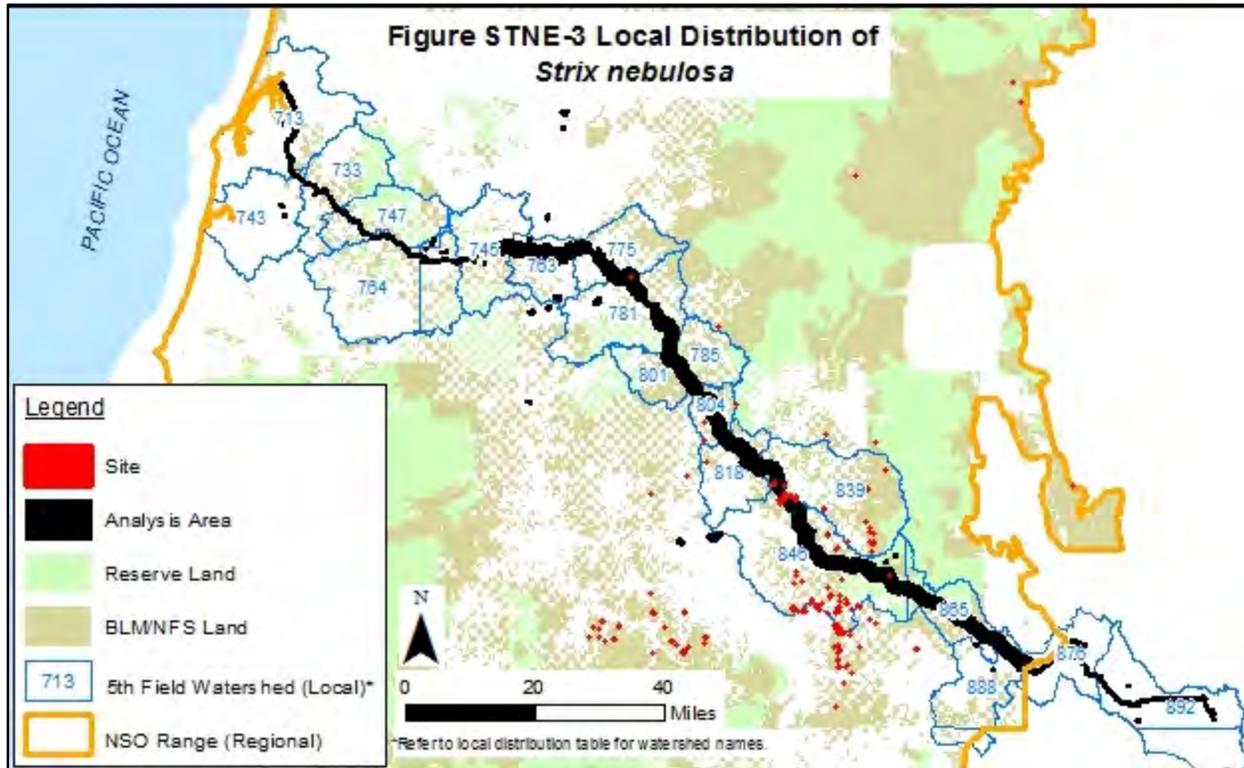
Of the 115 sites in the local area, 107 sites are on BLM and NFS lands. These sites are located on lands designated as Other (Matrix) and LSR. Thirteen sites are at least partially on private lands. Of the 107 sites in the local area on BLM and NFS lands, seven sites are on reserve lands, representing 7 percent of the sites. These sites are in LSRs in the Big Butte and Little Butte Creek watersheds.

Coniferous and mixed hardwood-coniferous forests encompass approximately 453,290 acres on BLM and NFS lands in the local area, including 141,660 acres in reserve land allocations (31 percent of the forests). Of this acreage, an estimated 134,380 acres are LSOG, including 51,560 acres in reserve land allocations (38 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, particularly in the Cascade Range and Klamath Mountains, based on the number of sites in the local area, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures STNE-2 and STNE-3).

TABLE STNE-5

Distribution of <i>Strix nebulosa</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	37	6
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	74	1
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	1	-
South Umpqua River (781)	1	-
Spencer Creek (865)	-	-
Trail Creek (804)	2	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, Nov. 8, 2013; HUC5 Watershed layer, Aug. 23, 2011



### Analysis/Project Area Distribution

The analysis area contains 11 sites of *S. nebulosa*, but none are located in the project area. The analysis area sites are distributed across three 5<sup>th</sup> field watersheds, with one site in the South Umpqua River watershed in the Klamath Mountains, four sites in the Little Butte Creek watershed in the Cascade Range, and six sites in the Big Butte Creek watershed in the Cascade Range. Many sites are also located within the vicinity of the analysis area (see Local Distribution discussion above), and the analysis area sites are part of a large group of sites in southern Oregon.

Eight sites are on BLM-managed lands in the Medford and Roseburg Districts, including five sites at least partially on lands designated as Other (Matrix) and four sites at least partially in Known Owl Activity Centers (at least partially). One site is on Forest Service-managed lands designated as LSR on the Rogue River National Forest. One site is partially on private land and partially on BLM land. Two other sites are on private lands in the analysis area, but these sites are not managed by BLM or the Forest Service.

Surveys for the PCGP Project resulted in 51 detections of the species near the project area (Siskiyou BioSurvey LLC 2008, 2011c). An estimated four of these recorded observations in combination with 11 other observations in agency databases comprise the 11 sites in the analysis area; the other detections are in sites outside the analysis area or are not considered sites (e.g., not active breeding pairs). One site is west of MP 86.6, six sites are near MP 134, one site is east of MP 136.9, and one site is east of MP 162.4. Two other sites on private lands are west of MP 137.3.

**Project Impacts**

Analysis

The PCGP Project could affect nine sites out of the 217 sites on BLM- and Forest Service-managed lands in the region, representing approximately 4 percent of the sites (or 11 sites on all lands out of 230 total sites on all lands in the NSO range). Two sites are on private lands and are not subject to BLM or Forest Service management; therefore, they are not considered in this analysis. The sites on BLM- and Forest Service-managed lands could be indirectly affected by activities within the project area, but no direct impacts are anticipated (e.g., removal of active nest trees or nests). Table STNE-6 presents an overview of the anticipated effects to each site. This discussion presents an overview of the types of impacts that would be expected at the sites based on the features of the PCGP Project and that could affect site persistence.

TABLE STNE-6

Overview of Impacts to <i>Strix nebulosa</i> Sites			
Site Location	Source of Impacts	Distance to Disturbance	Individuals Likely to Persist?
West of MP 86.6 (1 site)	Corridor, TEWA, UCSAs, Blasting	920 feet (0.17 mile)	No
West of MP 133.7-134.3 (5 sites)	Blasting	2,900-5,200 feet (0.55-0.99 mile)	No
East of MP 134.6 (1 site)	Blasting	4,320 feet (0.8 mile)	No
East of MP 136.8 (1 site)	Corridor, TEWAs, UCSAs	1,080 feet (0.21 mile)	No
East of MP 162.4 (1 site)	Corridor, TEWAs, UCSAs, Blasting	1,300 feet (0.24 mile)	No

Notes: MP = milepost; TEWA = Temporary Extra Work Area; UCSA = Uncleared Storage Area

Of the nine sites in the analysis area, three sites may be subject to indirect effects from construction activities in the corridor and associated work and storage areas, and eight sites may be subject to indirect effects from potential blasting along the corridor. All sites are located more than 900 feet from the edge of the construction corridor, and the intensity of potential disturbances would decrease with distance from the project area (e.g., high noise levels would attenuate with increased distance from the source). In addition, the area around each nest site and between the nest sites and the project area is heavily forested, which would mask noise levels and reduce disturbance-related effects associated with the PCGP Project.

Activities within the corridor and TEWAs would result in extensive noise disturbance during vegetation clearing, grading, and pipeline installation. These activities would take place within a 0.25-mile radius of three of the sites, and although they would be more than 300 feet away from the nest sites, disturbance during the nesting season could result in nest abandonment and loss of young. Blasting may be necessary along segments of the corridor that contain hard, non-rippable bedrock (e.g., volcanic and metavolcanic rocks) and could result in noise levels up to 92 decibels at 200 feet from the source (Michael Minor & Associates 2008). Helicopter use could also result in high noise levels of 92 decibels up to 700 feet from the helicopter. These activities would also result in disturbance to nesting owls if implemented during the nesting season, which could lead to nest abandonment and loss of young. Impacts to nest sites during the nesting season could result in nest failure, which would affect the persistence of great gray owl in the nine sites.

Across the project area, the PCGP Project would remove an estimated 920 acres of coniferous and mixed hardwood-coniferous forests, including 180 acres of LSOG forests. These impacts would result in a reduction of nesting habitat that may be suitable for *S. nebulosa*. Within this impact area, about 600 acres (about 65 percent) of the forests would be restored to forests or

shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential nesting habitat, although some of the restored areas may provide foraging habitat for the species. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 190 acres of coniferous and mixed forests. The corridor could, however, provide a foraging area for the owl. The loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the nine sites as a result of the PCGP Project, 98 sites of *S. nebulosa* would remain on BLM and NFS lands in the local area, including two in reserves, and 208 sites, including 11 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 11 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 5 percent of the remaining *S. nebulosa* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *S. nebulosa* is a Category C (uncommon) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category C species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information, however, since the species was listed in the 2001 ROD indicates that the species appears to be more common than previously documented, as noted below:
  - *S. nebulosa* has a somewhat limited distribution across three physiographic provinces and one state in the region, but a moderate-high number of overall sites (217 on BLM and NFS lands). The species appears to be well distributed in the western Cascade Range and eastern Klamath Mountains in Oregon, but it has a more scattered distribution in other parts of its range in Oregon. The currently known number of sites on BLM and NFS lands is an increase of 99 sites on BLM and NFS lands since 2007, with some sites documented during the PCGP Project surveys.
  - An estimated 7 percent of the sites (16 sites) are in reserves.
- Coniferous and mixed hardwood-coniferous forests (general habitat for the species) are widely distributed across the species' range and encompass approximately 7.2 million acres on BLM and NFS lands with an estimated 47 percent in reserves. A subcomponent of these forests likely provides habitat for *S. nebulosa*.

- The PCGP Project would affect nine of 217 BLM- and Forest Service-managed sites of *S. nebulosa*, representing approximately 5 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the nine sites, a moderate-high number of sites (208) would continue to be documented on BLM and NFS lands in the region with a somewhat limited distribution across Oregon. Many sites (98 sites) would remain in the local vicinity of the analysis area; these sites would be distributed across four 5<sup>th</sup> field watersheds. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would affect site persistence at five sites in reserves, and the percentage of sites in reserves would remain about the same (5 percent). Of the remaining sites, 11 are in LSRs where management actions are restricted to those activities that benefit LSOG forests.
- The PCGP Project would result in a permanent loss of an estimated 190 acres of coniferous and mixed hardwood-coniferous forests (less than 1 percent of the total acreage in the species' range). An estimated 3.4 million acres (48 percent) of the forests and 1.4 million acres (53 percent) of LSOG forests would remain in reserves in the species' range.
- The remaining forests could support additional populations of *S. nebulosa*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category C species for which pre-disturbance surveys are practical and have been conducted in parts of the NSO range, and it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during pre-disturbance and other surveys, including surveys associated with the PCGP Project.

#### 7.2.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *S. nebulosa* at nine sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 208 sites would remain on BLM and NFS lands across the region, and 98 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project would affect site persistence of *S. nebulosa* at nine sites, these sites are part of the many sites in the Klamath Mountains and Cascade Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its currently known distribution and range. *S. nebulosa* would persist in the region without considering the nine sites as part of the population.
- The PCGP Project would remove approximately 920 acres of coniferous and mixed hardwood-coniferous forests and 180 acres of LSOG forests (a negligible amount of the forests). An estimated 65 percent of the forests would be restored to similar conditions or shrublands, and a permanent unforested corridor would remain across the project area, which could provide foraging habitat for the owl. An estimated 3.4 million acres (48 percent) of the forests and 1.4 million acres (53 percent) of LSOG forests would remain

in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2007.

- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is relatively common, despite a somewhat limited distribution.

The PCGP Project would not be able to avoid indirect impacts to all *S. nebulosa* sites in the analysis area, although some nest sites within the sites may persist following project implementation. Based on the above conclusions, avoidance of impacts to the nine *S. nebulosa* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. The applicant shall prepare and implement a monitoring plan that describes specific protocols to monitor the species and adjacent habitat near affected sites over the long term, as specified by the agency responsible for management of the sites. The monitoring plan shall be approved by the BLM and Forest Service.

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ATTACHMENT A

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Survey and Manage Species List



**Table A-1. 2001 Survey and Manage Species List**

Species	Category	Evaluated in Document?
<b>Fungi</b>		
<i>Acanthophysium farlowii</i>	B	No
<i>Albatrellus avellaneus</i>	B	No
<i>Albatrellus caeruleoporus</i>	B	No
<b><i>Albatrellus ellisii</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Albatrellus flettii</i></b>	<b>B</b>	<b>Yes</b>
<i>Alpova alexsmithii</i>	B	No
<i>Alpova olivaceotinctus</i>	B	No
<i>Arcangeliella camphorata</i>	B	No
<b><i>Arcangeliella crassa</i></b>	<b>B</b>	<b>Yes</b>
<i>Arcangeliella lactarioides</i>	B	No
<i>Asterophora lycoperdoides</i>	B	No
<i>Asterophora parasitica</i>	B	No
<i>Baeospora myriadophylla</i>	B	No
<i>Balsamia nigrens</i>	B	No
<i>Boletus haematinus</i>	B	No
<b><i>Boletus pulcherrimus</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Bondarzewia mesenterica</i></b>	<b>B</b>	<b>Yes</b>
<i>Bridgeoporus nobilissimus</i>	A	No
<b><i>Cantharellus subalbidus</i></b>	<b>D</b>	<b>Yes</b>
<i>Catathelasma ventricosa</i>	B	No
<i>Chalciporus piperatus</i>	D	No
<i>Chamonixia caespitosa</i>	B	No
<b><i>Choiromyces alveolatus</i></b>	<b>B</b>	<b>Yes</b>
<i>Choiromyces venosus</i>	B	No
<b><i>Chromosera cyanophylla (Mycena lilacifolia)</i></b>	<b>B</b>	<b>Yes</b>
<i>Chroogomphus oculatus</i>	B	No
<i>Chrysomphalina grossula</i>	B	No
<b><i>Clavariadelphus ligula</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Clavariadelphus occidentalis</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Clavariadelphus sachalinensis</i></b>	<b>B</b>	<b>Yes</b>
<i>Clavariadelphus subfastigiatus</i>	B	No
<b><i>Clavariadelphus truncatus</i></b>	<b>B</b>	<b>Yes</b>
<i>Clavulina castanopes var. lignicola</i>	B	No

Species	Category	Evaluated in Document?
<i>Clitocybe senilis</i>	B	No
<i>Clitocybe subditopoda</i>	B	No
<b><i>Collybia bakerensis</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Collybia racemosa</i></b>	<b>B</b>	<b>Yes</b>
<i>Cordyceps capitata</i>	B	No
<i>Cordyceps ophioglossoides</i>	B	No
<i>Cortinarius barlowensis</i>	B	No
<i>Cortinarius boulderensis</i>	B	No
<i>Cortinarius cyanites</i>	B	No
<i>Cortinarius depauperatus</i>	B	No
<i>Cortinarius magnivelatus</i>	B	No
<b><i>Cortinarius olympianus</i></b>	<b>B</b>	<b>Yes</b>
<i>Cortinarius speciosissimus</i>	B	No
<i>Cortinarius tabularis</i>	B	No
<i>Cortinarius umidicola</i>	B	No
<i>Cortinarius valgus</i>	B	No
<i>Cortinarius variipes</i>	B	No
<i>Cortinarius verrucisporus</i>	B	No
<i>Cortinarius wiebeae</i>	B	No
<b><i>Craterellus tubaeformis</i></b>	<b>D</b>	<b>Yes</b>
<i>Cudonia monticola</i>	B	No
<i>Cyphellostereum laeve</i>	B	No
<i>Dermocybe humboldtensis</i>	B	No
<i>Destuntzia fusca</i>	B	No
<i>Destuntzia rubra</i>	B	No
<i>Dichostereum boreale</i>	B	No
<i>Elaphomyces anthracinus</i>	B	No
<i>Elaphomyces subviscidus</i>	B	No
<i>Endogone acrogena</i>	B	No
<i>Endogone oregonensis</i>	B	No
<i>Entoloma nitidum</i>	B	No
<i>Fayodia bisphaerigera</i>	B	No
<i>Fevansia aurantiaca</i>	B	No
<i>Galerina atkinsonia</i>	B	No

Species	Category	Evaluated in Document?
<i>Galerina cerina</i>	B	No
<i>Galerina heterocystis</i>	E	No
<i>Galerina sphagnicola</i>	E	No
<b><i>Galerina vittaeformis</i></b>	<b>B</b>	<b>Yes</b>
<i>Gastroboletus imbellus</i>	B	No
<i>Gastroboletus ruber</i>	B	No
<b><i>Gastroboletus subalpinus</i></b>	<b>B</b>	<b>Yes</b>
<i>Gastroboletus turbinatus</i>	B	No
<i>Gastroboletus vividus</i>	B	No
<i>Gastrosuillus amaranthii</i>	E	No
<i>Gastrosuillus umbrinus</i>	B	No
<i>Gautieria magnicellaris</i>	B	No
<i>Gautieria otthii</i>	B	No
<i>Gelatinodiscus flavidus</i>	B	No
<i>Glomus radiatus</i>	B	No
<i>Gomphus bonarii</i>	B	No
<b><i>Gomphus clavatus</i></b>	<b>B</b>	<b>Yes</b>
<i>Turbinellus (Gomphus) floccosus (CA)</i>	F	No
<b><i>Gomphus kauffmanii</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Gymnomyces abietis</i></b>	<b>B</b>	<b>Yes</b>
<i>Gymnomyces nondistincta</i>	B	No
<i>Gymnopilus punctifolius</i>	B	No
<i>Gyromitra californica</i>	B	No
<b><i>Gyromitra esculenta</i></b>	<b>F</b>	<b>Yes</b>
<b><i>Gyromitra infula</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Gyromitra melaleucoides</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Gyromitra montana</i></b>	<b>F</b>	<b>Yes</b>
<i>Hebeloma olympianum</i>	B	No
<i>Helvella crassitunicata</i>	B	No
<i>Helvella elastica</i>	B	No
<b><i>Helvella maculata</i></b>	<b>B</b>	<b>Yes</b>
<i>Hydnotrya inordinata</i>	B	No
<i>Hydnotrya subnix</i>	B	No
<b><i>Hydnum umbilicatum</i></b>	<b>B</b>	<b>Yes</b>

Species	Category	Evaluated in Document?
<i>Hydropus marginellus</i>	B	No
<b><i>Hygrophorus caeruleus</i></b>	<b>B</b>	<b>Yes</b>
<i>Hygrophorus karstenii</i>	B	No
<i>Hygrophorus vernalis</i>	B	No
<i>Hypomyces luteovirens</i>	B	No
<b><i>Leucogaster citrinus</i></b>	<b>B</b>	<b>Yes</b>
<i>Leucogaster microsporus</i>	B	No
<i>Macowanites chlorinosmus</i>	B	No
<i>Macowanites lymanensis</i>	B	No
<i>Macowanites mollis</i>	B	No
<i>Marasmius applanatipes</i>	B	No
<i>Martellia fragrans</i>	B	No
<i>Martellia idahoensis</i>	B	No
<i>Mycena hudsoniana</i>	B	No
<i>Mycena monticola</i>	B	No
<b><i>Mycena overholtsii</i></b>	<b>B</b>	<b>Yes</b>
<i>Mycena quinaultensis</i>	B	No
<i>Mycena tenax</i>	B	No
<i>Mythicomyces corneipes</i>	B	No
<i>Neolentinus adhaerens</i>	B	No
<i>Neolentinus kauffmanii</i>	B	No
<b><i>Neournula pouchetii</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Nivatogastrium nubigenum</i></b>	<b>B</b>	<b>Yes</b>
<i>Octaviania cyanescens</i>	B	No
<i>Octaviania macrospora</i>	B	No
<i>Octavianina papyracea</i>	B	No
<i>Otidea leporina</i>	B	No
<b><i>Otidea onotica</i></b>	<b>F</b>	<b>Yes</b>
<i>Otidea smithii</i>	B	No
<b><i>Phaeocollybia attenuata</i></b>	<b>D</b>	<b>Yes</b>
<i>Phaeocollybia californica</i>	B	No
<i>Phaeocollybia dissiliens</i>	B	No
<b><i>Phaeocollybia fallax</i></b>	<b>D</b>	<b>Yes</b>
<i>Phaeocollybia gregaria</i>	B	No

Species	Category	Evaluated in Document?
<b><i>Phaeocollybia kauffmanii</i></b>	<b>D</b>	<b>Yes</b>
<b><i>Phaeocollybia olivacea</i></b>	<b>B</b>	<b>Yes</b>
<i>Phaeocollybia oregonensis</i>	B	No
<b><i>Phaeocollybia piceae</i></b>	<b>B</b>	<b>Yes</b>
<i>Phaeocollybia pseudofestiva</i>	B	No
<b><i>Phaeocollybia scatesiae</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Phaeocollybia sipei</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Phaeocollybia spadicea</i></b>	<b>B</b>	<b>Yes</b>
<i>Phellodon atratus</i>	B	No
<i>Pholiota albivelata</i>	B	No
<b><i>Pithya vulgaris</i></b>	<b>D</b>	<b>Yes</b>
<b><i>Plectania melastoma</i></b>	<b>F</b>	<b>Yes</b>
<b><i>Plectania milleri</i></b>	<b>B</b>	<b>Yes</b>
<i>Podostroma alutaceum</i>	B	No
<b><i>Polyzellus multiplex</i></b>	<b>B</b>	<b>Yes</b>
<i>Pseudaleuria quinaultiana</i>	B	No
<i>Ramaria abietina</i>	B	No
<i>Ramaria amyloidea</i>	B	No
<b><i>Ramaria araiospora</i></b>	<b>B</b>	<b>Yes</b>
<i>Ramaria aurantiisiccescens</i>	B	No
<i>Ramaria botryis</i> var. <i>aurantiiramosa</i>	B	No
<b><i>Ramaria celerivirescens</i></b>	<b>B</b>	<b>Yes</b>
<i>Ramaria claviramulata</i>	B	No
<i>Ramaria concolor</i> f. <i>marrii</i>	B	No
<i>Ramaria concolor</i> f. <i>tsugina</i>	B	No
<i>Ramaria conjunctipes</i> var. <i>sparsiramosa</i>	B	No
<i>Ramaria coulterae</i>	B	No
<i>Ramaria cyaneigranosa</i>	B	No
<i>Ramaria gelatiniaurantia</i>	B	No
<i>Ramaria gracilis</i>	B	No
<i>Ramaria hilaris</i> var. <i>olympiana</i>	B	No
<i>Ramaria largentii</i>	B	No
<i>Ramaria lorithamnus</i>	B	No
<i>Ramaria maculatipes</i>	B	No

Species	Category	Evaluated in Document?
<i>Ramaria rainierensis</i>	B	No
<i>Ramaria rubella</i> var. <i>blanda</i>	B	No
<i>Ramaria rubribrunnescens</i>	B	No
<b><i>Ramaria rubrievanescens</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Ramaria rubripermanens</i></b>	<b>B</b>	<b>Yes</b>
<i>Ramaria spinulosa</i> var. <i>diminutiva</i>	B	No
<b><i>Ramaria stuntzii</i></b>	<b>B</b>	<b>Yes</b>
<i>Ramaria suecica</i>	B	No
<i>Ramaria thiersii</i>	B	No
<i>Ramaria verlotensis</i>	B	No
<i>Rhizopogon abietis</i>	B	No
<i>Rhizopogon atroviolaceus</i>	B	No
<i>Rhizopogon brunneiniger</i>	B	No
<i>Rhizopogon chamaleontinus</i>	B	No
<i>Rhizopogon elliposporus</i>	B	No
<i>Rhizopogon evadens</i> var. <i>subalpinus</i>	B	No
<i>Rhizopogon exiguus</i>	B	No
<i>Rhizopogon flavofibrillosus</i>	B	No
<i>Rhizopogon inquinatus</i>	B	No
<b><i>Rhizopogon truncatus</i></b>	<b>D</b>	<b>Yes</b>
<i>Rhodocybe speciosa</i>	B	No
<i>Rickenella swartzii</i>	B	No
<i>Russula mustelina</i>	B	No
<i>Sarcodon fuscoindicus</i>	B	No
<b><i>Sarcodon imbricatus</i></b>	<b>B</b>	<b>Yes</b>
<i>Sarcosoma latahense</i>	B	No
<i>Sarcosoma mexicanum</i> (WA, CA, and Curry and Josephine Counties, OR)	F	No
<b><i>Sarcosphaera coronaria</i> (<i>S. exima</i>)</b>	<b>B</b>	<b>Yes</b>
<b><i>Sedecula pulvinata</i></b>	<b>B</b>	<b>Yes</b>
<i>Sowerbyella rhenana</i>	B	No
<b><i>Sparassis crispa</i></b>	<b>D</b>	<b>Yes</b>
<b><i>Spathularia flavida</i></b>	<b>B</b>	<b>Yes</b>
<i>Stagnicola perplexa</i>	B	No
<i>Thaxterogaster pavelekii</i>	B	No

Species	Category	Evaluated in Document?
<b><i>Tremiscus (Guepinia) helvelloides</i></b>	<b>B</b>	<b>Yes</b>
<i>Tricholoma venenatum</i>	B	No
<i>Tricholomopsis fulvescens</i>	B	No
<i>Tuber asa</i>	B	No
<i>Tuber pacificum</i>	B	No
<i>Tylophilus porphyrosporus</i>	D	No
<b>Lichens</b>		
<i>Bryoria pseudocapillaris</i>	B	No
<i>Bryoria spiralifera</i>	B	No
<i>Bryoria subcana</i>	B	No
<b><i>Bryoria tortuosa</i> (WA Olympic Peninsula, Western Lowlands, and Western Cascades; OR Western Cascades, Coast Range, Willamette Valley; and CA Coast Range)</b>	<b>A</b>	<b>Yes</b>
<b><i>Bryoria tortuosa</i> (WA Eastern Cascades; OR Eastern Cascades and Klamath; CA Klamath and Cascades)</b>	<b>D<sup>1</sup></b>	<b>Yes</b>
<i>Buellia oidalea</i>	E	No
<i>Calicium abietinum</i>	B	No
<i>Calicium adspersum</i>	E	No
<b><i>Calicium glaucellum</i></b>	<b>F</b>	<b>Yes</b>
<b><i>Calicium viride</i></b>	<b>F</b>	<b>Yes</b>
<i>Cetrelia cetrarioides</i>	E	No
<b><i>Chaenotheca chrysocephala</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Chaenotheca ferruginea</i></b>	<b>B</b>	<b>Yes</b>
<b><i>Chaenotheca furfuracea</i></b>	<b>F</b>	<b>Yes</b>
<b><i>Chaenotheca subroscida</i></b>	<b>E</b>	<b>Yes</b>
<i>Chaenothecopsis pusilla</i>	E	No
<i>Cladonia norvegica</i>	B	No
<i>Collema nigrescens</i> (WA and OR, outside OR Klamath)	F	No
<b><i>Dendriscoaulon intricatulum</i></b>	<b>B</b>	<b>Yes</b>
<i>Dermatocarpon luridum</i>	B	No
<b><i>Fuscopannaria (Pannaria) saubinetii</i></b>	<b>F</b>	<b>Yes</b>
<i>Heterodermia sitchensis</i>	E	No
<i>Hypogymnia duplicata</i>	A	No
<i>Hypogymnia oceanica</i>	F	No
<i>Hypogymnia vittata</i>	E	No

Species	Category	Evaluated in Document?
<i>Hypotrachyna revoluta</i>	E	No
<i>Leptogium burnetiae</i> var. <i>hirsutum</i>	A	No
<i>Leptogium cyanescens</i>	A	No
<i>Leptogium rivale</i>	B	No
<b><i>Leptogium teretiusculum</i></b>	<b>E</b>	<b>Yes</b>
<i>Lobaria linita</i>	A	No
<i>Lobaria oregana</i> (CA)	A	No
<i>Microcalicium arenarium</i>	B	No
<i>Nephroma bellum</i>	F	No
<i>Nephroma isidiosum</i>	E	No
<i>Nephroma occultum</i>	B	No
<i>Niebla cephalota</i>	A	No
<i>Pannaria rubiginosa</i>	E	No
<b><i>Peltigera pacifica</i></b>	<b>E</b>	<b>Yes</b>
<i>Platismatia lacunosa</i>	C	No
<i>Pseudocyphellaria perpetua</i> (sp. 1)	B	No
<i>Pseudocyphellaria rainierensis</i>	A	No
<i>Pyrrhospora quernea</i>	E	No
<i>Ramalina pollinaria</i>	E	No
<b><i>Ramalina thrausta</i></b>	<b>A</b>	<b>Yes</b>
<i>Stenocybe clavata</i>	E	No
<i>Teloschistes flavicans</i>	A	No
<i>Tholurna dissimilis</i> (south of the Columbia River)	B	No
<i>Usnea hesperina</i>	B	No
<b><i>Usnea longissima</i> (Curry, Josephine, and Jackson Counties, OR; CA)</b>	<b>A</b>	<b>Yes</b>
<i>Usnea longissima</i> (Outside Curry, Josephine, and Jackson Counties, OR; WA)	F	No
<b>Mosses and Liverworts</b>		
<i>Brotherella roellii</i>	E	No
<b><i>Buxbaumia viridis</i></b>	<b>D<sup>1</sup></b>	<b>Yes</b>
<i>Diplophyllum albicans</i>	D	No
<i>Diplophyllum plicatum</i>	B	No
<i>Encalypta brevicolla</i> var. <i>crumiana</i>	B	No
<i>Herbertus aduncus</i>	B	No

Species	Category	Evaluated in Document?
<i>Iwatsukiella leucotricha</i>	B	No
<i>Kurzia makinoana</i>	B	No
<i>Marsupella emarginata</i> var. <i>aquatica</i>	B	No
<i>Orthodontium gracile</i>	B	No
<i>Ptilidium californicum</i> (CA)	A	No
<i>Racomitrium aquaticum</i>	B	No
<i>Rhizomnium nudum</i>	B	No
<i>Schistostega pennata</i>	A	No
<i>Tetraphis geniculata</i>	A	No
<i>Tritomaria exsectiformis</i>	B	No
<i>Tritomaria quinquedentata</i>	B	No
<b>Vascular Plants</b>		
<i>Arceuthobium tsugense mertensiana</i> (WA)	F	No
<i>Bensoniella oregana</i> (CA)	A	No
<i>Botrychium minganense</i> (OR and CA)	A	No
<i>Botrychium montanum</i>	A	No
<i>Coptis asplenifolia</i>	A	No
<i>Coptis trifolia</i>	A	No
<i>Corydalis aquae-gelidae</i>	C	No
<b><i>Cypripedium fasciculatum</i></b>	<b>C</b>	<b>Yes</b>
<b><i>Cypripedium montanum</i></b>	<b>C</b>	<b>Yes</b>
<b><i>Eucephalus vialis</i></b>	<b>A</b>	<b>Yes</b>
<i>Galium kamtschaticum</i> (WA Western Cascades (south of Snoqualmie Pass), Olympic Peninsula, and Eastern Cascades; OR Western Cascades)	A	No
<i>Platanthera orbiculata</i> var. <i>orbiculata</i>	C	No
<b>Mollusks</b>		
<i>Ancotrema voyanum</i>	E <sup>3,4</sup>	No
<i>Cryptomastix devia</i>	A	No
<i>Cryptomastix hendersoni</i>	A	No
<b><i>Deroceas hesperium</i></b>	<b>B<sup>4</sup></b>	<b>Yes</b>
<i>Fluminicola</i> n. sp. 1	A <sup>2</sup>	No
<i>Fluminicola</i> n. sp. 2	A	No
<i>Fluminicola</i> n. sp. 3	A <sup>2</sup>	No
<i>Fluminicola</i> n. sp. 11	A <sup>2</sup>	No

Species	Category	Evaluated in Document?
<i>Fluminicola n. sp. 14</i>	A	No
<i>Fluminicola n. sp. 15</i>	A	No
<i>Fluminicola n. sp. 16</i>	A	No
<i>Fluminicola n. sp. 17</i>	A	No
<i>Fluminicola n. sp. 18</i>	A	No
<i>Fluminicola n. sp. 19</i>	A <sup>2</sup>	No
<i>Fluminicola n. sp. 20</i>	A <sup>2</sup>	No
<i>Fluminicola seminalis</i>	A <sup>2</sup>	No
<i>Helminthoglypta hertleini</i>	B <sup>4</sup>	No
<i>Helminthoglypta talmadgei</i>	A	No
<i>Hemphillia burringtoni</i>	A	No
<i>Hemphillia glandulosa</i>	C	No
<i>Hemphillia malonei</i>	C	No
<i>Hemphillia pantherina</i>	B <sup>4</sup>	No
<i>Juga (o) n. sp. 2</i>	A	No
<i>Juga (o) n. sp. 3</i>	A	No
<i>Lyogyrus n. sp. 1</i>	A	No
<i>Lyogyrus n. sp. 2</i>	A	No
<i>Lyogyrus n. sp. 3</i>	A	No
<i>Megomphix hemphilli</i> (North of south boundary of Lincoln, Benton, and Linn Counties, OR)	A	No
<i>Megomphix hemphilli</i> (South of south boundary of Lincoln, Benton, and Linn Counties, OR)	F <sup>5</sup>	No
<b><i>Monadenia chaceana</i></b>	<b>B<sup>4</sup></b>	<b>Yes</b>
<i>Monadenia churchi</i>	F <sup>5</sup>	No
<i>Monadenia fidelis minor</i>	A	No
<i>Monadenia fidelis klamathica</i>	B <sup>3,4</sup>	No
<i>Mondadenia fidelis ochromphalus</i>	B <sup>3,4</sup>	No
<i>Monadenia troglodytes troglodytes</i>	A	No
<i>Monadenia troglodytes wintu</i>	A	No
<i>Oreohelix n. sp.</i>	A	No
<i>Pristiloma arcticum crateris</i>	B <sup>2,4</sup>	No
<i>Prophysaon coeruleum</i> (CA and WA)	A	No
<i>Trilobopsis roperi</i>	A	No
<i>Trilobopsis tehamana</i>	A	No

Species	Category	Evaluated in Document?
<i>Vertigo n. sp.</i>	A	No
<i>Vespericola pressleyi</i>	A	No
<i>Vespericola shasta</i>	A	No
<i>Vorticifex klamathensis sinitsini</i>	E	No
<i>Vorticifex n. sp. 1</i>	E	No
<b>Vertebrates</b>		
<b>Arborimus longicaudus (Mesic, North Mesic and Xeric Zones)</b>	<b>C</b>	<b>Yes</b>
<i>Hydromantes shastae</i>	A	No
<i>Plethodon elongatus</i>	D <sup>1</sup>	No
<i>Plethodon larselli</i>	A	No
<i>Plethodon stormi</i>	C	No
<i>Plethodon vandykei</i> (Cascade population)	A	No
<b>Strix nebulosa</b>	<b>C</b>	<b>Yes</b>
<b>Others</b>		
Canopy herbivores (south range)	F	No
Coarse wood chewers (south range)	F	No
Litter and soil dwelling species (south range)	F	No
Understory and forest gap herbivores (south range)	F	No

Source: U.S. Forest Service and U.S. Bureau of Land Management Survey and Manage Species List, 2001 Record of Decision Notes:

<sup>1</sup> Although Pre-Disturbance Surveys are deemed practical for this species, continuing pre-disturbance surveys is not necessary in order to meet management objectives.

<sup>2</sup> For these species, until Management Recommendations are written, the following language will be considered part of the Management Recommendation: "Known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted."

<sup>3</sup> For these species, until Management Recommendations are written, the language "known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted" is the Management Recommendation and no other recommendations are imposed at this time.

<sup>4</sup> Based upon direction contained in the ROD, equivalent-effort pre-disturbance surveys are required for these mollusk species.

<sup>5</sup> Based upon direction contained in the ROD, these two mollusk species require management of sites unknown as of 9/30/99.



## ATTACHMENT B

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Glossary



## Glossary

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*Note: Most of these terms are incorporated from the 1994 ROD, 2001 ROD, or 2007 Final SEIS and adapted or expanded as appropriate to fit this report. New terms or modifications from previous agency glossary terms are underlined.*

**Analysis Area** – The spatial buffer used in GIS to identify potentially affected sites.

- Analysis Area buffer for fungi, mollusks, lichens, bryophytes and vascular plants is 50 meters.
- Analysis Area buffer for great gray owls is ¼ mile from the project area except where blasting may take place; the buffer around potential blasting areas is 1 mile.
- Analysis Area buffer for red tree voles is 100 meters.

The intent is to ensure that recorded observations of species that could be indirectly affected by the PCGP Project are considered as part of the group of potentially affected sites in the analysis. As an example, using this definition for fungi, bryophytes, lichens and vascular plants, any observation that is within 100 meters of the project area would fall within a site evaluated in the analysis. This is consistent with other definitions of indirect effects for the PCGP Project.

**Bryophytes** – Plants of the phylum Bryophyta, including mosses, liverworts, and hornworts; characterized by the lack of true roots, stems, and leaves (USDA and USDI 1994).

**Bureau of Land Management (BLM)** – An agency within the United States Department of the Interior that administers a portion of America’s public lands.

**Category** – Groupings of species by relative rarity, practicality of pre-disturbance surveys, and information status. Management direction is generally the same for all species within a category and differs between categories.

**Direct effect or impact** – Direct effects are those that occur at the time and place that a project is implemented. For purposes of the analysis contained in this document, a direct effect is one that takes place within the project area as a direct result of the construction activities associated with establishment of the construction corridor, TEWAs, UCSAs, or other project features.

**Effects** – Effects, impacts, and consequences are synonymous. Effects may be direct, indirect, or cumulative and may fall in one of these categories: aesthetic, historic, cultural, economic, social, health, or ecological (such as effects on natural resources and on the components, structures, and functioning of affected ecosystems) (USDA and USDI 1994). Effects may be direct or indirect (refer to those definitions) and address how the project would affect Survey and Manage species.

**Element Occurrence** – An element occurrence is an area of land and/or water in which a species or ecological community is, or was, present. An occurrence should have practical conservation value for the species or ecological community as evidenced by historical or potential continued presence and/or regular recurrence at a given location. For species, the occurrence often corresponds with the local population, but when appropriate may be a portion of a population (e.g., long distance dispersers) or a group of nearby populations (e.g., metapopulation). This definition is based on the NatureServe definition of “Occurrence.”

**Endemic or endemism** – Unique to a specific locality or the condition of being unique to a specific locality.

**Equivalent-effort surveys** – Pre-disturbance surveys for species whose characteristics, such as small size or irregular fruiting, prevent it from being consistently located during site-specific surveys. These surveys are conducted similar to practical surveys (to the same intensity and effort), according to written Survey Protocols, and during the times when the likelihood of detecting the species is highest. The difference between equivalent-effort and practical surveys is that equivalent-effort surveys are not expected to meet the description of “likely to determine the presence” of a species because the characteristics of these species make finding sites less certain.

**Fifth-field watershed** – The standard sized watershed used for research and projects by the BLM and Forest Service. A watershed is the area of land where all surface and groundwater drains into the same body of water, such as a river, wetland, or the ocean. Since the term “watershed” can be used for drainage areas of any size, the U.S. Geological Survey has divided watersheds into distinct units, or “fields,” based on size.

**Forest Service** – An agency within the United States Department of Agriculture that administers a portion of America’s public lands.

**Fungi** – Saprophytic and parasitic spore-producing organisms usually classified as plants that lack chlorophyll and include molds, rusts, mildews, smuts, mushrooms, and yeasts.

**GeoBOB (Geographic Biotic Observations)** – A relational geodatabase used by the Oregon and Washington offices of the BLM, which stores spatial and attribute data on species of interest to the BLM and Region 6 of the Forest Service. This database currently holds legacy Survey and Manage species locations for both the BLM and the Forest Service. The data on Survey and Manage species on lands administered by the Forest Service are being moved to the Forest Service databases.

**Habitat** – Place or environment where a plant or animal naturally or normally lives and grows.

**High-priority sites** – A site or group of sites deemed necessary for species persistence. The high-priority sites may be identified as specific locations, sites meeting specific criteria, or as a distribution of populations or sites over a geographic area that may change over time. High-priority sites are designated through the Management Recommendations for the species. High-priority sites are generally a subset of known sites; however, in some cases, all known sites may be determined to be high-priority sites. Management of high-priority sites is necessary to ensure species persistence.

**Historic distribution** – The distribution of a species as determined by its habitat associations and by the frequency, magnitude, and patterns of natural and human-caused disturbance and ecological processes characteristic of the Northwest Forest Plan area before European settlement. Historical distribution should be estimated over a long-enough period of time to encompass the limits of variability resulting from disturbance and ecological processes.

**Indirect effect or impact** – Indirect effects are those caused by a project that are reasonably foreseeable (i.e. not speculative in nature), but that occur later in time or are farther removed in

distance. For purposes of the analysis contained in this document, an indirect effect is one that changes the microclimate or results in other impacts (e.g., noise disturbance) outside of the project area, but within a reasonable distance of the project area (e.g., 100 meters for fungi, lichens, bryophytes, and vascular plants).

**Known site** – Historic and current location of a species reported by a credible source, available to field offices, and that does not require additional species verification or survey by the Agency to locate the species. Known sites include those known prior to the signing of the Northwest Forest Plan Record of Decision (USDA and USDI 1994), as well as sites located in the future. Known sites can be based on any documented and credible source (such as herbaria/museum records, published documents, Agency records, species expert records, and documented public information). Historic locations where it can be demonstrated that the species and its habitat no longer occur do not have to be considered known sites. A credible source is a professional or amateur person who has academic training and/or demonstrated expertise in identification of the taxon of interest sufficient for the Agency to accept the identification as correct. These can include Agency staff and private individuals. This term is only used in reference to background information compiled for each species and is not specifically used for the persistence evaluation; refer to “site” below.

The known site identification should be precise enough to locate the species by geographic coordinates, maps, or descriptions sufficient to design specific management actions or to be located by other individuals. Also see “site” for description of size or components.

**Land allocation** – Commitment of a given area of land or a resource to one or more specific uses (such as campgrounds or Wilderness). In the Northwest Forest Plan, one of the seven allocations of Congressionally Withdrawn Areas, Late-Successional Reserves, Adaptive Management Areas, Managed Late-Successional Reserves, Administratively Withdrawn Areas, Riparian Reserves, or Matrix.

**Late-successional forest** – Forest stand consisting of trees, structural attributes, supporting biological communities, and processes associated with old-growth and/or mature forests (USDA and USDI 1994). Forest seral stages that include mature and old-growth age classes (USDA and USDI 1994). Age is not necessarily a defining characteristic but has been used as a proxy or indicator in some usages. Minimum ages are typically 80 to 130 years, more or less, depending on the site quality, species, rate of stand development, and other factors.

**Late-Successional Reserves (LSR)** – Land allocation under the Northwest Forest Plan with the objective to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest related species, including the northern spotted owl. Limited stand management is permitted, subject to review by the Regional Ecosystem Office (USDA and USDI 1994).

**Lichens** – Complex thallophytic plants comprised of an alga and a fungus growing in symbiotic association on a solid surface (such as a rock or tree).

**Local area** – The local area was defined as the following 19 5<sup>th</sup> field watersheds that overlap the PCGP Project area (presented alphabetically in this report): Big Butte Creek, Coos Bay Frontal, East Fork Coquille River, Elk Creek-South Umpqua, Klamath River-John C. Boyle Reservoir,

Lake Ewauna-Upper Klamath River, Little Butte Creek, Lower Coquille River, Lower Lost River, Middle Fork Coquille River, Middle South Umpqua River, Myrtle Creek, North Fork Coquille River, Olalla Creek-Lookingglass Creek, Rogue River-Shady Cove, South Umpqua River, Spencer Creek, Trail Creek, Upper Cow Creek.

**Management Recommendation** – An interagency document that addresses how to manage known sites and that provide guidance to Agency efforts in conserving Survey and Manage species. They describe the habitat parameters that will provide for maintaining the taxon at that site. They may also identify high-priority sites for uncommon species or provide other information to support management direction. (The proposed LMP amendment associated with this project waives application of management recommendations.)

**Management requirement** – Minimum standards for resource protection, vegetation manipulation, silvicultural practices, even-aged management, riparian areas, wildlife population viability, soil and water protection, and diversity to be met in accomplishing National Forest System goals and objectives (36 CFR 219 National Forest Management Act Regulations).

**Matrix** – Federal lands outside of reserves, withdrawn areas, Managed Late-Successional Areas, and Adaptive Management Areas (USDA and USDI 1994).

**Mature forest** – A subset of late-successional forests. Mature forests are characterized by the onset of slowed height growth, crown expansion, heavier limbs, gaps, some mortality in larger trees, and appearance of more shade-tolerant species or additional crown layers. In Douglas-fir west of the Cascades, this stage typically begins between 80 and 130 years, depending on site conditions and stand history (adapted from USDA and USDI 1994, pp. B-2 and B-3).

**Mollusks** – Invertebrate animals (such as slugs, snails, clams, or squids) that have a soft unsegmented body usually enclosed in a calcareous shell.

**Northern spotted owl (NSO)** – A bird listed as threatened under the Endangered Species Act in Washington, Oregon, and California. The Northwest Forest Plan created a forest reserve-based system to conserve and manage lands for the northern spotted owl.

**Northwest Forest Plan** – Coordinated ecosystem management direction incorporated into land management plans for lands administered by the Bureau of Land Management and the Forest Service within the range of the northern spotted owl. In April 1993, President Clinton directed his cabinet to craft a balanced, comprehensive, and long-term policy for management of over 24 million acres of public land within the range of the northern spotted owl. A Forest Ecosystem Management Assessment Team (FEMAT) was chartered to develop a series of options. These options were modified in response to public comment and additional analysis and then analyzed in a Final Supplemental Environmental Impact Statement. A Record of Decision was signed on April 13, 1994, by the Secretaries of the Department of Agriculture and the Department of Interior to adopt *Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA and USDI 1994). The Record of Decision, including the *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* is referred to as the “Northwest Forest Plan.” The Northwest Forest Plan is not a “plan” in the agency planning regulations sense; the term instead refers collectively to the 1994

amendment to existing agency unit plans or to the specific standards and guidelines for late successional species incorporated into subsequent administrative unit plans.

**Observation or record observation** – The points or polygons where individuals or small groups of a given species were located as entered into the NRIS and GeoBOB databases. Unless other information exists to the contrary, this constitutes “best available information” about the actual locations of the species in question.

**Old-growth forest** – An ecosystem distinguished by old trees and related structural attributes. Old-growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of canopy layers, species, composition, and ecosystem function. More specific parameters applicable to various species are available in the USFS, Region 6, 1993 Interim Old Growth Definitions (USDA Forest Service Region 6, 1993). The Northwest Forest Plan SEIS and FEMAT describe old-growth forest as a forest stand usually at least 180 to 220 years old with moderate-to-high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground (USDA and USDI 1994).

**Oregon Biodiversity Information Center (ORBIC)** – ORBIC is part of the Oregon State University Institute for Natural Resources in the Research Office. Their mission is to identify the plant, animal, and ecological community resources of Oregon. As part of the Natural Heritage Network and NatureServe, the ORBIC contributes to an understanding of global biodiversity and provides tools for managers and the public to better protect vanishing species and communities.

**Pacific Connector Gas Pipeline Project (PCGP Project)** – The construction, operation, maintenance and termination of a 230-mile-long, 36-inch diameter high pressure natural gas pipeline that would extend from interconnections with other interstate pipelines near Malin, Oregon to the proposed Jordan Cove natural gas liquefaction and terminal at Coos Bay, Oregon.

**Persistence (as in persistence objective for a species)** – An abbreviated expression of the species management objectives for these standards and guidelines. Generally the persistence objective for vertebrates is based on the Forest Service viability provision in the regulations implementing the National Forest Management Act. For non-vertebrates, it is a similar standard to the extent practicable. See “Species Persistence Objective” in these standards and guidelines for more details. Use in standards and guidelines such as “..sites not needed for persistence” includes an understood “reasonable assurance of” or “to the extent practicable.”

“...the Forest Service must use common sense and apply its fish and wildlife expertise in implementing these requirements.” (NWFP ROD, Forest Service and BLM 1994)

**Persistence (as in persistence at a site)** – Continued occupancy by a species at a known site.

**Physiographic province** – A geographic area having a similar set of biophysical characteristics and processes due to effects of climate and geology that result in patterns of soils and broad-scale plant communities. Habitat patterns, wildlife distributions, and historical land use patterns may

differ significantly from those of adjacent provinces (USDA and USDI 1994) (See Figure 1 in the standards and guidelines).

**Practical surveys (relative to surveys prior to habitat-disturbing activities)** – Surveys are practical if characteristics of the species (such as size, regular fruiting) and identifying features result in being able to reliably locate the species, if the species is present, within one or two field seasons and with a reasonable level of effort.

Characteristics determining practicality of surveys include: individual species must be of sufficient size to be detectable; the species must be readily distinguishable in the field or with no more than simple laboratory or office examination for verification of identification; and the surveys must not pose a health and safety risk. See additional detail in the standards and guidelines.

**Potentially affected site** – A “site” as created by the FME process that is clipped by the spatial buffer used for the Analysis Area is considered as a potentially affected site and is included in the analysis.

**Project area (or PCGP Project area)** –

- Construction clearing. This is the 95 foot (average) corridor.
- Temporary Extra Work Areas (TEWAs). These are cleared areas used in construction.
- Uncleared Storage Areas (UCSAs). These are areas that are not cleared and are used to store rocks and stumps. The material may or may not be returned to the corridor after construction.
- Roads that may be constructed or reconstructed for the project.

**Proportion of sites or habitat in reserves** – The proportion of sites and habitat in reserve land allocations was calculated using GIS to obtain a percentage of the sites or habitat on Forest Service and BLM lands that are protected by the regionally mapped reserves (see definition of “Reserves”).

**Range of the northern spotted owl or NSO range** – Area generally comprised of lands in western portions of Washington, Oregon, and northern California (see Province Map, Figure 1) (USDA and USDI 1994). As part of the Northwest Forest Plan, Forest Service and BLM adopted standards and guidelines for the management of habitat for late-successional and old-growth forest associated species within this range.

**Rare** – A species is considered to be rare when: there are a low number of extant known sites with low numbers of individuals present at each site and populations are not well-distributed within its natural range. “Low” numbers and “not well distributed” are relative terms that must be considered in the context of other criteria such as distribution of habitat, fecundity, and so forth. See complete list of criteria under “Relative Rarity” in the standards and guidelines.

**Record of Decision** – A document separate from, but associated with, an environmental impact statement that: states the management decision, states the reason for that decision, identifies all alternatives including the environmentally preferable and selected alternatives, and also states whether all practicable measures to avoid environmental harm from the selected alternative have been adopted, and if not, why not (USDA and USDI 1994).

**Region or regional area (in the Persistence Evaluation)** – The region is bounded by the NSO range, as defined above.

**Reserves or reserve lands** – Forest Service and BLM lands with a land allocation of Congressionally Reserved, Late Successional Reserve, Managed Late Successional Area (i.e., Marbled Murrelet Area and Known Owl Activity Centers), or Riparian Reserves. Reserves help to protect and enhance conditions of late-successional and old-growth forest ecosystems. Stand management actions are either prohibited or limited within these allocations. The likelihood of maintaining a connected, viable late-successional ecosystem was found to be directly related to the amount of late-successional forest in reserve status.

**Riparian Reserves** – Areas along live and intermittent streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving, for example, as dispersal habitat for certain terrestrial species. The extent of Riparian Reserves is defined by the National Forest and BLM District land and resource management plans. Because regionally mapped Riparian Reserves were not available for the analysis, the National Hydrography Dataset was used to define Riparian Reserves across the region and was clipped to the land allocation of Other (Matrix).

**Site (as in occupied site)** – The location where a specimen or population of the target species (taxonomic entry) was located, observed, or presumed to exist (occasionally used as a local option to pre-disturbance surveys for certain vertebrates) based on indicators described in the Survey Protocol or Management Recommendations. Also, the polygon described by connecting nearby or functionally contiguous detections at the same location.

**Site (as used in manage known sites)** – The occupied site plus any buffer needed to maintain the habitat parameters described in the Management Recommendations.

**Site (as in FME site)** – Site is a spatial polygon where a species is known to occur and is based on definitions of sites used for the purposes of the Annual Species Reviews and estimates of regional populations. According to the 2001 ROD, for a variety of reasons relative to site management and the species biology, the definition of a “site” or record for entry into the agency geodatabases varies by taxa group. The most striking example was for terrestrial mollusks. For these species, a site was defined as all locations within 30 feet of each other, so individual records in the ISMS database could be as close together as 31 feet. For other species, the distance between locations to define sites was 100 meters. (Page 71, 2001 ROD).

The FME tool (see FME Data Process in Attachment C) applies a spatial buffer to the observation data, as described in the NRIS or GeoBOB databases, using certain criteria for some species. Wherever the original observation occurs on BLM or NFS lands the FME tool dissolves overlaps in spatial buffers to create a discrete polygon that defines a site as described using the definition on page 71 of the ROD. The following buffers were applied to the different taxa groups:

- Buffers for fungi, lichens, bryophytes, vascular plants, and red tree voles are 50 meters.
- No buffer is applied to mollusks or great gray owls because the original data already include a 10-meter buffer around the original point data.

**Standards and guidelines** – The rules and limits governing actions, as well as the principles specifying the environmental conditions or levels to be achieved and maintained (USDA and USDI 1994).

**Survey and Manage** – Mitigation measure adopted as a standard and guideline within the Northwest Forest Plan Record of Decision and replaced with the 2001 standards and guidelines that are intended to mitigate impacts of land management efforts on those species that are closely associated with late-successional or old-growth forests whose long-term persistence is a concern. These measures apply to all land allocations and require land managers to take certain actions relative to species of plants and animals, particularly some amphibians, bryophytes, lichens, mollusks, vascular plants, fungi, and arthropods, which are rare or about which little is known. These actions include: (1) manage known sites; (2) survey prior to ground-disturbing activities; (3) conduct extensive and general regional (strategic) surveys.

**Uncommon (species)** – Species that does not meet the definition for rare, but where concerns for its persistence remain. See criteria under “Relative Rarity” in the standards and guidelines.

**Vascular plants** – Plants that contain conducting or vascular tissue. They include seed-bearing plants (flowering plants and trees) and spore-bearing plants (ferns, horsetails, and clubmosses).

**Vertebrates** – A species that has a backbone or spinal column (includes fishes, amphibians, reptiles, birds, and mammals, all of which have a segmented bony or cartilaginous spinal column)

**Viability** – Ability of a wildlife or plant population to maintain sufficient size to persist over time in spite of normal fluctuations in numbers, usually expressed as a probability of maintaining a specific population for a specified period (USDA and USDI 1994).

**Viability Provision** – A provision contained in the National Forest System Land and Resource Management Planning Regulation of 1982, pursuant to the National Forest Management Act. This provision is found in 36 CFR 219.19 and reads as follows: “Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native 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. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.”

**Viable population** – A wildlife or plant population that contains an adequate number of reproductive individuals appropriately distributed in the planning area to ensure the long-term existence of the species (USDA and USDI 1994).

**Well distributed** – Distribution sufficient to permit normal biological function and species interactions, considering life history characteristics of the species and the habitats for which it is specifically adapted. For purposes of this report, a species is considered to be well distributed in at least part of its range in the NSO range if sites are relatively abundant, mostly clustered, and widespread across potentially suitable habitat.

ATTACHMENT C

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Spatial Analysis Process for Persistence Evaluation



## Spatial Analysis Process for Persistence Evaluation

This attachment presents additional details on the spatial analysis process used to evaluate the persistence of the Survey and Manage (S&M) species that could be affected by the Pacific Connector Gas Pipeline Project (PCGP Project). The overall process entailed identification of appropriate spatial data sources to use; collection of the data; processing of the data to fit the needs of the analysis; and analysis of the data to describe distribution patterns, abundance of the S&M species, and effects of the PCGP Project on the S&M species.

### *Spatial Data Sources*

The key spatial data sources used for the persistence evaluation are listed in Table C-1 below. These data were collected from a variety of sources, including the U.S. Forest Service (Forest Service), U.S. Bureau of Land Management (BLM), U.S. Geological Survey, State of Oregon, and Oregon State University. The primary site data used for the analysis were provided by the Forest Service and BLM and were a product of the Feature Manipulation Extraction (FME) tool; additional details on the use of this tool can be obtained from the agencies upon request. Sample images of the site polygons, observation data associated with those polygons, analysis area boundaries, and red tree vole Habitat Areas are depicted in Figures C-1 through C-3 following the table.

Table C-1

**List of Key Spatial Data**

File Name	Type of Information	Source	Use in Analysis
<b>General Data</b>			
NSR_NWFP_Bndry.shp	Boundary of the NSO range	Forest Service	Regional area boundary
Provinces.shp	Physiographic provinces as defined in the 2001 ROD	Regional Ecosystem Office	Province boundaries used for discussion of species' distribution
NSR_HUC5_Crossed.shp	5 <sup>th</sup> field watershed boundaries for those watersheds that encompass the project area	Edge/NSR	Local area boundary
NSR_Lands_NWFP.shp	Land ownership	BLM/NSR	Distribution of sites across different ownerships
nwfp_lua_2009_2013.shp	Land use allocations per 2001 ROD; includes regional dataset combined with local Forests and BLM Districts data in Oregon	Regional Ecosystem Office; local BLM/Forest Service offices	Distribution of sites across different land allocations
NHD_Other_2013.shp	National Hydrography Dataset intersected with the Other (Matrix) land allocation from the 2013 land use data	NSR/USGS	Distribution of sites in Riparian Reserves, regionally mapped
Reserves_NWFP_2013_FS_BLM.shp	Reserves combined from land allocation data and Riparian Reserve data	NSR	Distribution of sites in Reserves
FSForests_ROW.shp	National Forest boundaries that encompass the project area	Forest Service	Distribution of sites in the National Forests

Table C-1

**List of Key Spatial Data**

<b>File Name</b>	<b>Type of Information</b>	<b>Source</b>	<b>Use in Analysis</b>
BLMDistricts_ROW.shp	BLM Districts that encompass the project area	BLM	Distribution of sites in the BLM Districts
mr200_spsz_2006.grd	Vegetation data (forest cover, structure, age) for 15-year monitoring report	Forest Service and Oregon State University	Habitat (coniferous, mixed hardwood-coniferous, or hardwood forests)
LSOG.shp	Late-successional and old-growth forests, as mapped for the 15-year monitoring report	Forest Service and Oregon State University	LSOG habitat and distribution of sites in LSOG forests
contour_100X.shp (ce, w, sw, nw, n, s)	100-foot contours for Oregon	State of Oregon	Contours used for habitat data processing and elevation of sites
n39w123.grd – n49w125.grd	Digital Elevation Models for parts of CA, OR, and WA	U.S. Geological Survey	DEMs converted to contour data and used for habitat data processing and elevation of sites
<b>Project-Related Data</b>			
Analysis_Area_50m_0913.shp	50-meter buffer of project area	NSR	Analysis area used for fungi, lichens, bryophytes, plants, and mollusks
Analysis_Area_RTV_100m_0913.shp	100-meter buffer of project area	NSR	Analysis area used for red tree vole
Analysis_Area_STNE_0913.shp	0.25-mile and 1-mile buffer (combined) of project area	NSR	Analysis area used for great gray owl
Combined_ROW_Roads_0913.shp	Combined project area data (roads and corridor with associated features)	NSR	Project area boundary
Construction_Right_of_Way (geodatabase feature)	PCGP Project features	Edge	Project features that could affect sites
Roads_disturbance_poly_v032113.shp	PCGP Project Transportation Management Plan	Edge/NSR	Roads that could affect sites
Milepost_100th_Proposed_Route_2013_4_29_2013 (geodatabase feature)	Mileposts along construction corridor for PCGP Project	Edge	Milepost numbers for locations of sites in or near project area
contour_10.shp	20-foot contours around the project area	Edge	Elevation and topography around sites in and near the project area
<b>Species Data</b>			
SMKnownSites_2013 in SurveyManageKnownSites-Nov2013.mdb	FME site output for all species	Forest Service and BLM	"Sites" for each species (note species removed from 2001 list were not included)
SelectSpp_Sites_dissolve.shp; SelectSpp_Sites_dissolve_0414.shp; CAGL_Sites_0414.shp	Sites created using same criteria as for FME	NSR	"Sites" for species that had been removed from 2001 list
ARLO_Habitat_Areas_1113.shp	Habitat Areas for red tree vole	NSR	Habitat Areas for analysis of impacts to red tree vole

Figure C-1: Sample Site and Observation Data

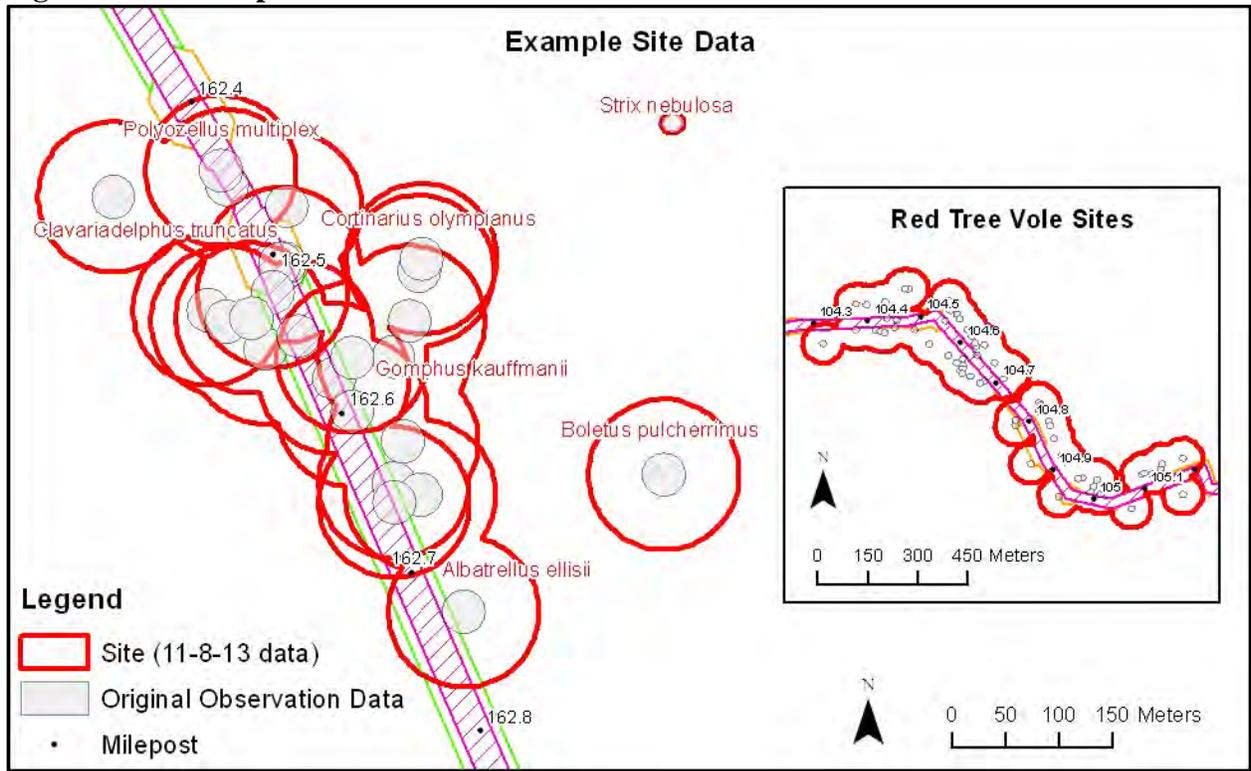
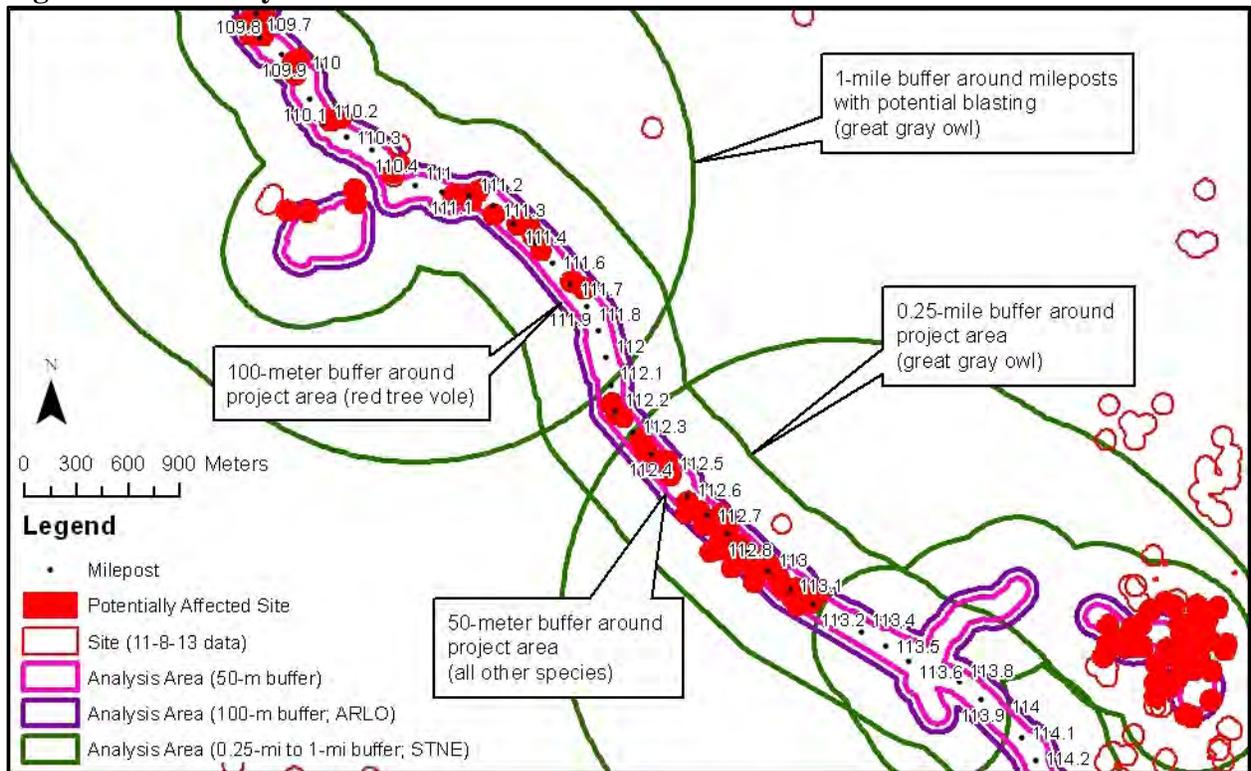
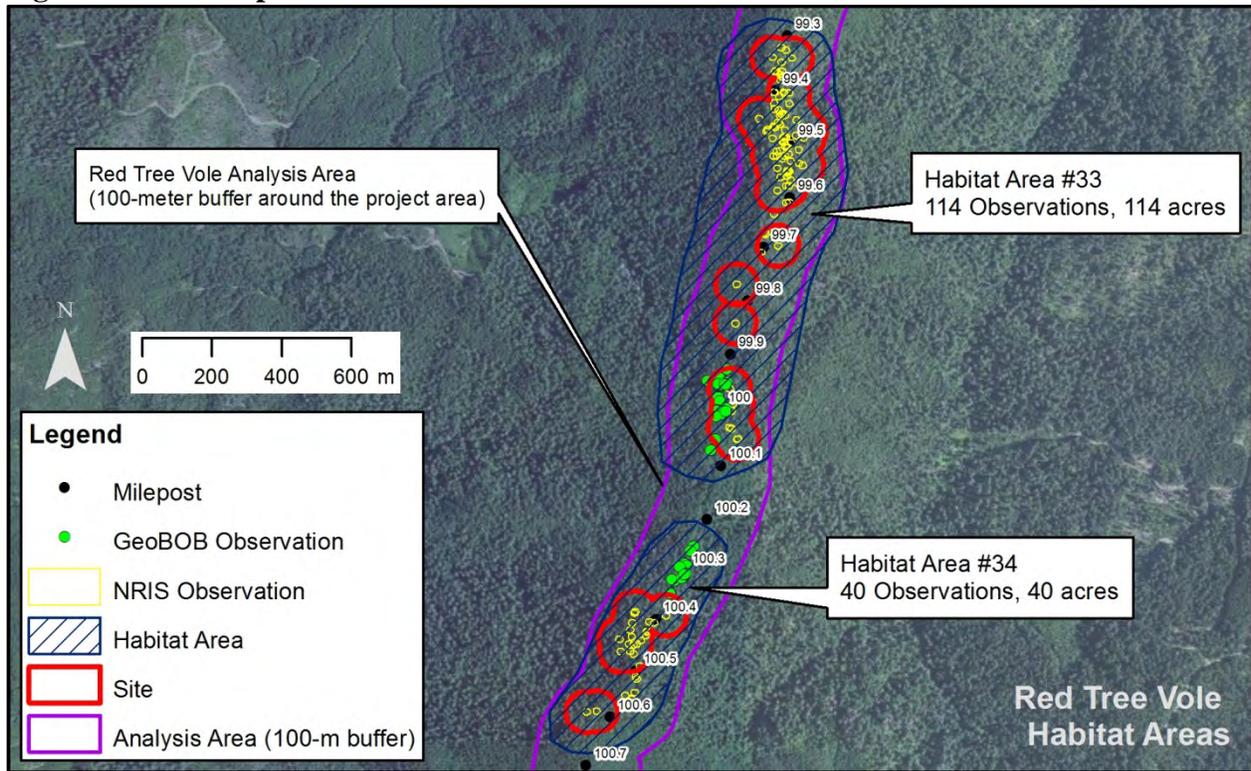


Figure C-2: Analysis Area Boundaries



**Figure C-3: Sample Habitat Area Data for Red Tree Vole**



**Data Processing**

The data obtained in Table C-1, as well as other necessary data (e.g., state and county boundaries), were processed to support the persistence evaluation. All datasets that covered an extent greater than the range of the northern spotted owl (NSO) were clipped to the “NSR\_NWFP\_Bndry” shapefile. For the species data (sites), a Select by Location process was run to extract out only those sites within the NSO range; this resulted in a smaller subset of the data. Other specific processes that were run are detailed below.

**Lands Data Processing**

The land ownership and allocation data were processed to produce subsets of the data for analysis purposes, as follows:

- A Select by Attributes process was used for the “NSR\_Lands\_NWFP” shapefile to select those lands with an “NSR\_Own” attribute of “USFS” or “BLM” or “US Forest Service” or “Bureau of Land Management” and produce a layer with only National Forest System and BLM lands (NSR\_Lands\_NWFP\_FS\_BLM.shp).
- A reserve lands layer was produced from a subset of the “nwfp\_lua\_2009\_2013” shapefile combined with the subset of the National Hydrography Dataset. A Select by Attributes process was used for the “nwfp\_lua\_2009\_2013” shapefile to extract only those features with reserve land allocations (LUA = CR, LSR, LSR3, or LSR4). The National Hydrography Dataset was clipped to the features with the “Other” attribute in the land allocation dataset (LUA = Other) to produce the regionally mapped Riparian Reserves (NHD\_Other\_2013.shp). These datasets were merged to produce the regional

reserve lands (Reserves\_NWFP\_2013.shp). Because the land allocation data included Congressionally Reserved features on National Park Service and U.S. Fish and Wildlife Service lands, the data were further clipped using the “NSR\_Lands\_NWFP\_FS\_BLM” shapefile to produce reserve lands only on National Forest System and BLM lands (Reserves\_NWFP\_2013\_FS\_BLM.shp).

- The regional National Forest System and BLM lands and reserve lands layers were clipped to the local area boundary (NSR\_HUC5\_Crossed.shp) to estimate the extent of these lands in the local area.
- National Forest and BLM District boundaries obtained from the respective agencies were processed to create layers depicting only the National Forest System and BLM lands in each management unit. The “FSForests\_ROW” shapefile was intersected with the “NSR\_Lands\_NWFP\_FS\_BLM” shapefile to produce the “FSForests\_ROW\_FSland” shapefile; the “BLMDistricts\_ROW” shapefile was also intersected with the “NSR\_Lands\_NWFP\_FS\_BLM” shapefile to produce the “BLMDistricts\_ROW\_BLMland” shapefile.

### Project Data Processing

The project data obtained from Edge and the project applicant were combined and buffered for use in the analysis. The following steps were used to process the data:

- The project features (Construction\_Right\_of\_Way) and roads (Road\_disturbance\_poly\_v032113.shp) layers were merged and dissolved to produce a project area boundary (Combined\_ROW\_Roads\_0913.shp). This boundary was also used to clip the National Forest System and BLM lands layer and produce the extent of these lands in the project area (Combined\_ROW\_Roads\_0913\_BLM\_FS.shp).
- The project area was buffered to create analysis area boundaries for the S&M species. The analysis area for all species except great gray owl and red tree vole was established by creating a 50-meter buffer around the project area. For red tree vole, the project area was buffered by 100 meters. For great gray owl, a 1-mile buffer was established around potential blasting areas based on mileposts (Milepost\_100th\_Proposed\_Route\_2013\_4\_29\_2013) where blasting may be necessary; this layer was merged with a 0.25-mile buffer around the project area to produce the analysis area for great gray owl. Figure C-2 displays the three analysis areas.

### Site Data Processing

The site data produced by the FME tool was processed for the analysis to identify those sites that could be affected by the PCGP Project (potentially affected sites) and to estimate the extent of impacts to the sites. The following steps were used to process the site data:

- A Select by Location process was used to extract out the sites that intersect, or fall within, the analysis area appropriate for the species (50-meter buffer of the project area for fungi, lichens, bryophytes, plants, and mollusks; 100-meter buffer of the project area for red tree vole; and 0.25–1-mile buffer of the project area for great gray owl). The extracted sites using the 50-meter analysis area were imported into the FME geodatabase of the original site data and labeled as “SMKnownSites\_2013\_AnalysisArea50m.” For the species that had been removed from the 2001 list, the sites were selected from the

“SelectSpp\_Sites\_dissolve” layer, then exported as a shapefile (SelectSpp\_Sites\_AnalysisArea). The extracted red tree vole and great gray owl sites were also imported into the FME geodatabase (SMKnownSites\_2013\_STNE\_AnalysisArea and SMKnownSites\_2013\_RTV\_AnalysisArea100m).

- For the non-vertebrate species, the analysis area sites layers were queried for the species, then the selected sites were clipped to the project area and intersected with the project features and road layers. The acreage of each clipped or intersected site was calculated to estimate the extent of the site subject to impacts. The resulting layers were labeled with the species’ alpha code and part of the clipped or intersected file’s name (e.g., alel\_project\_clip, alel\_project\_inter, alel\_road\_inter). Figure C-4 displays the processes used to analyze site impacts. The STNE analysis area data were not subject to these processes because none of the sites overlapped the project area.
- For red tree vole (ARLO), the analysis area sites were further modified to create Habitat Areas using guidance from the species’ Management Recommendations. Each site was reviewed in ArcGIS with the locations of original observations (active and inactive nest sites) from GeoBOB and NRIS and aerial photography, and the sites were manually modified to create polygons that encompass all nest sites (active and inactive, per the guidance) and an appropriate habitat area (i.e., potentially suitable habitat of older forests, as visible on the aerial imagery) around those sites using the guidance (i.e., 1 acre per nest site if more than 10 nests; 10 acres for less than 10 nests; consider site potential tree distance of about 200 feet a nest site and the perimeter of the polygon; and combine overlapping Habitat Areas or include nest sites within 330 feet of one another, whether active or inactive). The “ARLO\_Habitat\_Areas\_1113” shapefile was then processed as with the other analysis area site data to estimate the extent and types of impacts to each Habitat Area. Figure C-3 displays examples of the Habitat Areas.

### Habitat Mapping

Raster data (mr200\_sppsz\_2006.grd) with forest cover, structure, and age were obtained from the Forest Service and Oregon State University, LEMMA group, and were the same data used for the Northwest Forest Plan 15-year monitoring report. In support of that report, the raster was processed to produce a shapefile depicting the extent of LSOG forests across the NSO range. The shapefile was also used for this report to produce the LSOG subset of forests for each species and determine the number of sites found in LSOG forests. The forest cover raster was processed using the following steps to produce a regional forest coverage layer and map and estimate the extent of forests that could provide habitat for each species:

- The raster was first reclassified using the “FORTYPBA” attribute, which describes the forest type based on the dominant tree species using alpha codes from the 2000 PLANTS database.
- The resulting raster (mr200\_fortest) was further classified by coniferous (code of “1” based on dominant plants that are only conifer species), mixed hardwood-coniferous (code of “2” based on dominant plants that are conifer and hardwood species), and hardwood (code of “3” based on dominant plants that are only hardwood species) forests by adding a new attribute column, then the raster was clipped to the CA, OR, and WA extents of the NSO range to produce three smaller rasters to work with.

- The resulting rasters were converted to shapefiles using the new attribute column for forest type (1, 2, or 3) and clipped to the extent of Forest Service and BLM lands (NSR\_Lands\_NWFP\_FS-BLM.shp) to only display and use the extent of forests on those lands subject to the Northwest Forest Plan Standards and Guidelines. The acreage of each forest type was also calculated. These layers provided the extent of coniferous, mixed hardwood-coniferous, and hardwood forests across the region (NSO range).
- The OR forest layer (mr200\_fortyp\_or\_FS\_BLM.shp) was further clipped to the local (NSR\_HUC5\_Crossed.shp) and project (Combined\_ROW\_Roads\_0913.shp) areas to calculate the extent of all forests at those scales. It was also intersected with the project features layer to estimate the extent of impacts to the forests from each activity type in the project area.
- For species that had elevation limits, the forest layers were further processed according to the elevation criteria. Figure C-5 displays the process used to select out the appropriate elevation limit using the DEMs (converted into feet) and intersect the elevation layer with the forest layer to generate a new shapefile of any forest type above or below a specified elevation limit (e.g., coniferous and mixed hardwood-coniferous forests below 6,000 feet above mean sea level) for each state. Acreages were calculated for these layers to produce an estimate of the regional extent of the forests. The OR forest layer was further processed, as with the general forest layer, to produce estimates at the local and project area scales and estimate the extent of impacts to the forests (refer to Figure C-6).
- For species with narrower ranges than the regional area (e.g., only found in a few provinces in the NWFP area), the regional forest layer was clipped to the range boundary. Range boundaries were created using the province or county data or a combination of the two datasets, depending on where the species' known range extends based on available information and site locations.
- These datasets were used to map forests that could provide habitat for each species according to the background information collected on the species. The background information was supplemented with the locations of sites at various elevations and in the different forests using a Select by Location process to select the forest type and elevation contours that intersected the sites. The spatial information was used as a general reference to supplement the published information on each species.

### ***Spatial Analysis Steps***

Once the spatial data were processed, the data were used to describe information on each species in terms of their spatial distributions and anticipated effects associated with the PCGP Project, as detailed below.

### **Species Distributions**

The distribution patterns of each species was described at three scales (regional, local, and analysis areas) using the GIS data. The following steps detail the processes used to obtain information on the species' distributions:

- The data listed in Table C-1, as modified by the data processes discussed above, were uploaded into ArcGIS.

- A definition query was set for the site data (SMKnownSites\_2013\_NWFP, SelectSpp\_Sites\_dissolve, SMKnownSites\_2013\_AnalysisArea50m, SelectSpp\_Sites\_AnalysisArea, SMKnownSites\_2013\_STNE\_AnalysisArea, and SMKnownSites\_2013\_RTV\_AnalysisArea100m) for the species in question.
- The site data were queried for number of sites in the regional, local, analysis, and project areas (i.e., total feature count for regional and analysis areas data; Select by Location for sites that intersect the NSR\_HUC5\_Crossed.shp and Combined\_ROW\_Roads\_0913.shp).
- The site data were queried for number of sites in each land ownership (Forest Service, BLM, National Park Service, U.S. Fish and Wildlife Service, or Other) and across each scale (regional, local, and analysis areas). A Select by Attributes process was first used on the “NSR\_Lands\_NWFP” shapefile for the “NSR\_Own” attribute to select the land owner, then the Select by Location process was used to select sites that intersect the selected land ownership features.
- Using the same processes as for the land ownership data, the site data were queried for number of sites in each land use allocation (LUA = AMA, AMR, AW, CR, LSR, LSR3, LSR4, MLSA, ND, Other in nwfp\_lua\_2009\_2013.shp) and in Riparian Reserves (NHD\_Other\_2013.shp) across each scale.
- The distribution of the sites across the physiographic provinces was assessed by using the Select by Location process for the “Provinces” shapefile to select provinces that intersect the sites.
- The number of sites on BLM and National Forest System lands and in reserve land allocations across the three scales (regional, local, and analysis areas) was counted by using a Select by Location on the site layer to select sites that intersect the “NSR\_Lands\_NWFP\_FS\_BLM” shapefile and “Reserves\_NWFP\_2013\_FS\_BLM” shapefile. The selection started with the regional sites, and those sites within the local and analysis areas were reselected.
- The site data were queried for number of sites on BLM and National Forest System lands within the BLM Districts and National Forests that encompass the project area. A Select by Attributes process was first used on the “BLMDistricts\_ROW\_BLMland” and “FSForests\_ROW\_FSland” shapefiles for the “SUBJ\_DOB” or “FORESTNAME” attribute, respectively, to select the District or Forest name, then the Select by Location process was used to select sites that intersect the selected features.
- The locations of sites in or near the project area were identified using the mileposts associated with the construction corridor.
- The extent of potential habitat for each species was calculated using the processed habitat data and presented in a map with the sites to portray the distribution of sites across the habitat. When appropriate, range boundaries were also displayed on the habitat maps.
- Maps were produced to display the distribution of sites across the regional and local areas on BLM and National Forest System lands and reserve lands within those lands.

### Analysis of PCGP Project Impacts on Sites

Two levels of analysis were conducted using the GIS data, depending on the potential for concern for the species' persistence in the NSO range. For all species, an initial analysis was conducted using the steps below:

- Sites, as produced by the FME tool, that could be affected by the PCGP Project, either directly or indirectly, were identified by selecting those sites that fall within, either partially or entirely, the analysis area for the species. These sites are contained in the analysis area site layers (SMKnownSites\_2013\_AnalysisArea50m, SMKnownSites\_2013\_STNE\_AnalysisArea, and SMKnownSites\_2013\_RTV\_AnalysisArea100m geodatabase feature classes and SelectSpp\_Sites\_AnalysisArea.shp).
- The direct impacts to the sites were calculated in acres using the processed site data (SPECIES\_project\_clip.shp, SPECIES\_project\_inter.shp, and SPECIES\_road\_inter.shp). The intersected layers provided details by feature of the PCGP Project that would cause the impact (e.g., FEATURE = Construction Right-of-Way).
- The estimated acreage of impacts to potential habitat was calculated using the processed habitat data (habitat data clipped to and intersected with the project area). The estimated amount of forests to be restored within the project area was also calculated using the intersected data (44 percent of the Construction Right-of-Way impacts and 100 percent of the Temporary Extra Work Areas impacts).

If the level of project-related impacts appeared to create a concern for species persistence, the following steps were used to conduct a closer analysis of the anticipated impacts and assess the potential for site persistence at each affected site:

- The original observation data from GeoBOB and NRIS were uploaded into ArcGIS and viewed with the analysis area site data, the PCGP Project data, contour data, and aerial imagery (BING basemaps provided through ArcGIS) to determine proximity of the observation to the project area and potential for impacts (direct or indirect).
- A map was produced of the analysis area sites to display the observation and other useful data that were used to assess impacts.
- If the impacts would still create a concern for species persistence in the NSO range, a potential route modification was determined using the GIS data and mileposts.

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Figure C-4: Example Model for Survey and Manage Site Data Processing

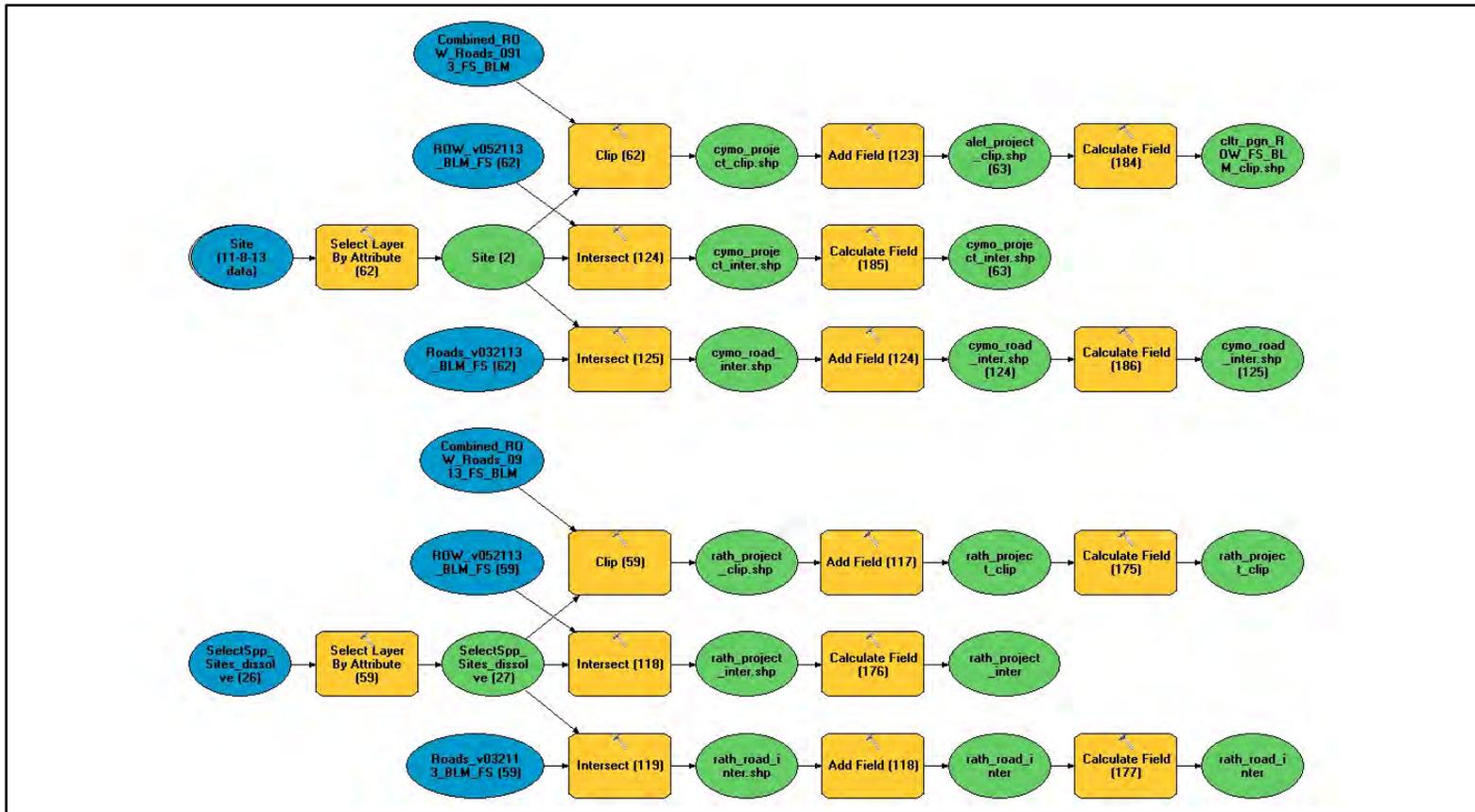


Figure C-5: Example Model for Forest Data Processing by Elevation

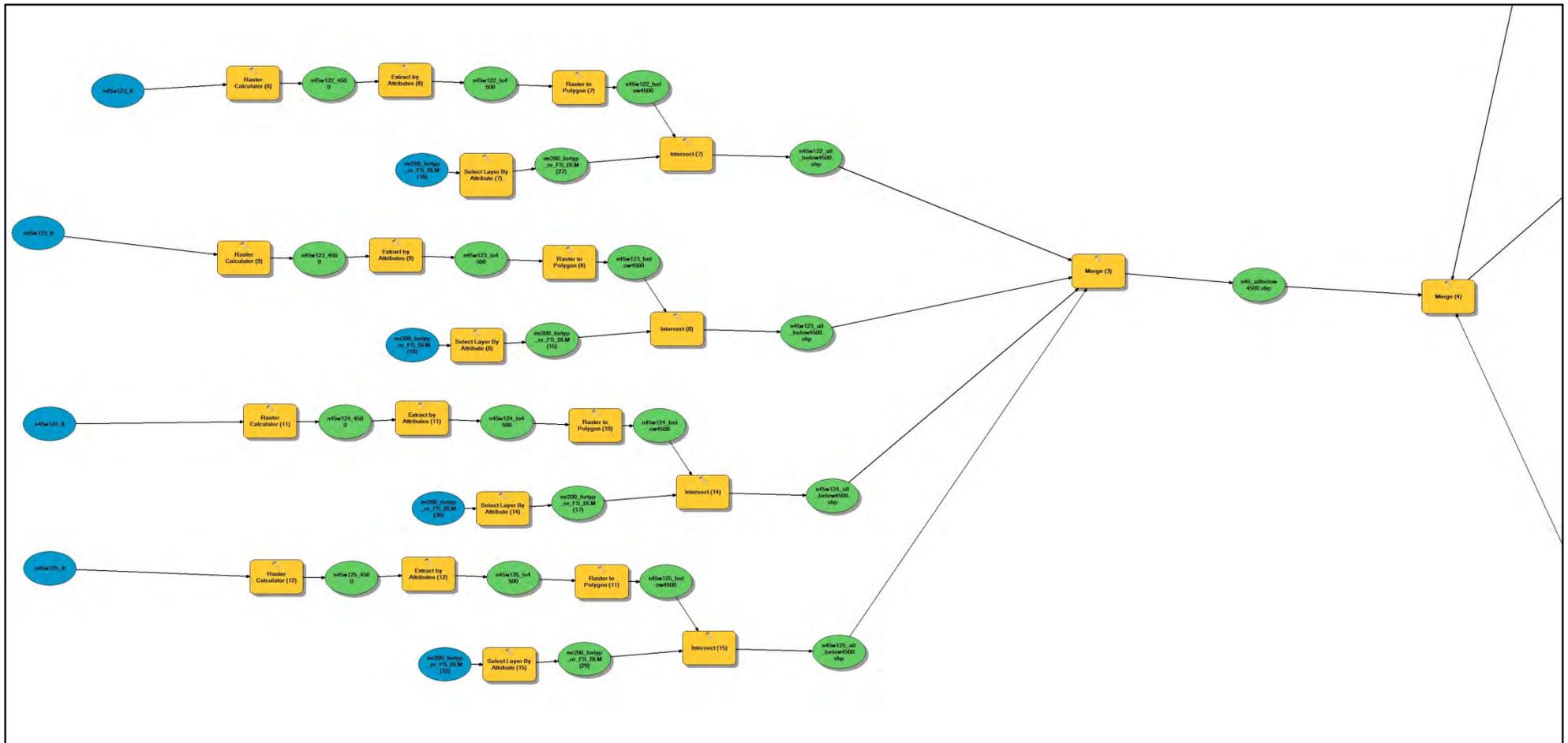
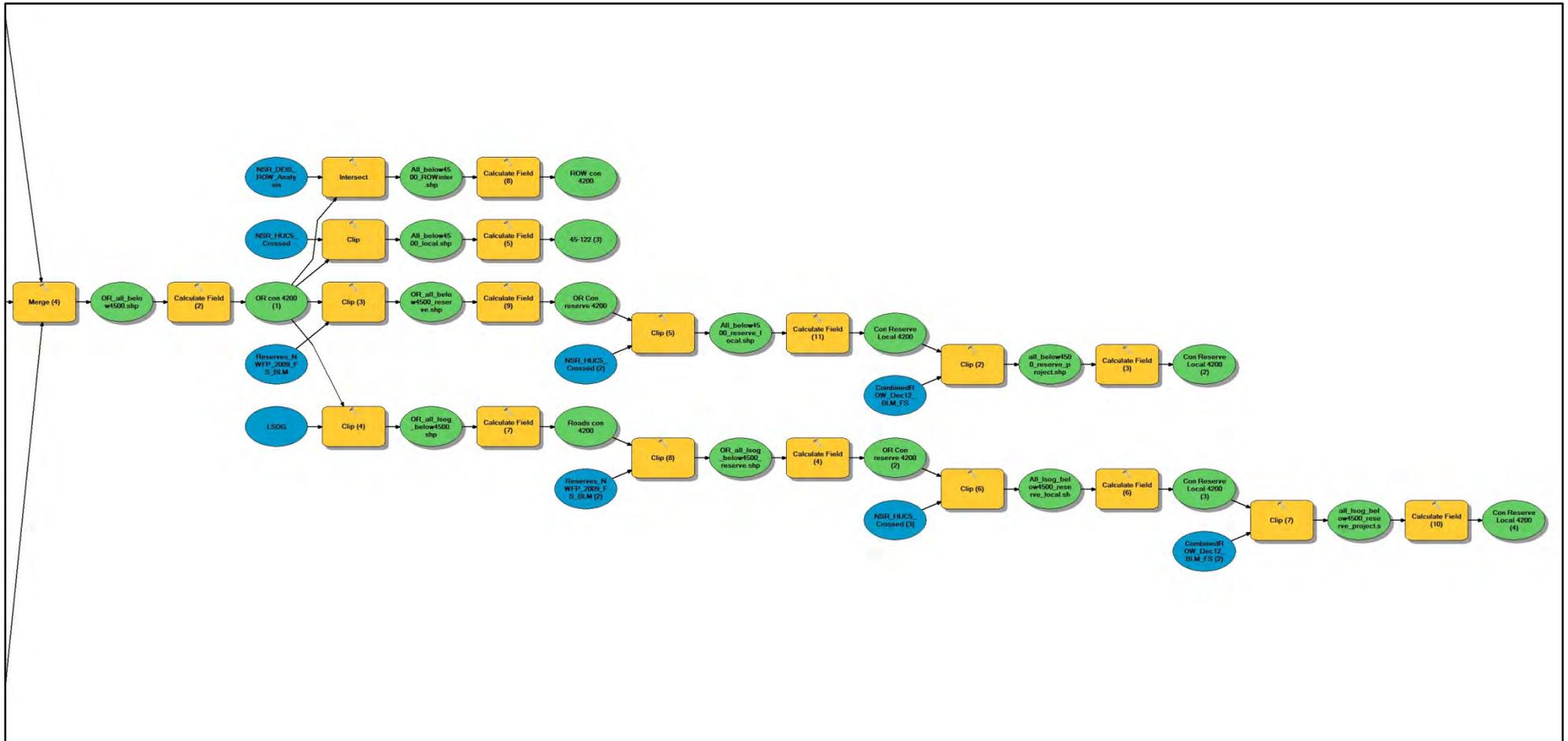


Figure C-6: Example Model for Forest Data Processing by Elevation in Oregon



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

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**Supplement to Appendix K. - Survey and Manage Species  
Persistence Evaluation for *Otidea smithii* and *Tricholoma  
venenatum***

**Pacific Connector Gas Pipeline**

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

**Draft**

*Pending Approval by:*

U.S.D.A. Forest Service and U.S. Bureau of Land Management  
for submission to the Federal Energy Regulatory Commission  
FERC Docket PF12-17-000, BLM Case File OR-63542

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**August 2015**



## 1.0 INTRODUCTION

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Pacific Connector Gas Pipeline, LP has conducted additional surveys for Survey and Manage (S&M) species since the initial persistence evaluation was conducted for the Pacific Connector Gas Pipeline Project (PCGP Project) in support of the draft environmental impact statement (EIS), which was published in November 2014. As a result of these surveys, two S&M fungi species were observed that were not previously evaluated and that have a relatively low number of total sites in the range of the northern spotted owl (NSO). These species, *Otidea smithii* and *Tricholoma venenatum*, were observed near three proposed pipeline route modifications (minor realignments). Because of the concern for these two species, the U.S. Department of the Interior Bureau of Land Management (BLM) and U.S. Department of Agriculture Forest Service (Forest Service) conducted a persistence evaluation for each one using the analysis methodology described in Appendix K to the EIS and data for the PCGP Project dated February 26, 2015, which incorporates several minor modifications to the pipeline route described in the draft EIS. This supplement to Appendix K of the EIS presents the results of the persistence evaluation for the two fungi species. It also clarifies the responsibility for BLM and the Forest Service with respect to development and implementation of a comprehensive monitoring plan for S&M species in response to comments on the draft EIS. The BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor affected S&M species sites and habitat adjacent to the sites over the long term.

## 2.0 FUNGI

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### 2.1 OTIDEA SMITHII

*O. smithii* is a cup fungus in the Pyronemataceae family (formerly Otideaceae) and does not have a common name.

#### 2.1.1 Regulatory Status and Ranking

The 2001 ROD identifies *O. smithii* as a Category B (rare) species. The ORBIC evaluated *O. smithii* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be imperiled because of rarity or other factors that make it vulnerable to extinction within its global range and in Oregon (G2, S2, respectively). The species is on the ORBIC List 3. It is not considered a BLM or Forest Service Sensitive species in Oregon, but it is a Strategic species.

#### 2.1.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

### **Life History**

*O. smithii* is a cup fungus and saprobe that fruits from August through December (Castellano et al. 1999, Holthausen et al. 1994). It may form symbiotic associations with the fine root systems of plants and grow into the soil matrix (Cushman and Huff 2007). Cup fungi, including *O. smithii*, are presumed to be dependent on wind and possibly on animals, particularly arthropods, for dispersal of spores (Castellano and O'Dell 1997).

### **Range**

*O. smithii* is thought to be endemic to the Pacific Northwest, where it has been found in British Columbia, Idaho, Washington, Oregon, and California (Castellano and O'Dell 1997, ORBIC 2004). *O. smithii* may also be found in India, pending verification of several collections of a fungus there with similar characteristics (ORBIC 2004, Farr and Rossman 2015). The currently known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across the Pacific Northwest. Local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### **Population Status**

The ORBIC (2004) reported *O. smithii* from an estimated 11 element occurrences in the Pacific Northwest in 2004. Most of these occurrences were in Oregon (6) and Washington (4), with only one reported in California (ORBIC 2004). The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). Molina (2008) reported five new sites of *O. smithii* in the NSO range between 1998–2006, and 10 total sites were documented by 2006, including two in reserves or protected areas. In the 2007 Final SEIS (USDA and USDI 2007), the BLM and Forest Service reported a total of 13 sites, including 12 on federal lands.

Pre-disturbance surveys are not practical for Category B species, but equivalent-effort surveys were conducted during 2014–2015 in old-growth stands in portions of the PCGP Project area not previously surveyed to comply with the Standards and Guidelines for Category B species where strategic surveys are not complete (Siskiyou BioSurvey LLC 2015). These surveys targeted all Category B species, including *O. smithii*, and resulted in one new observation of *O. smithii*. *O. smithii* has not been found in high numbers during past survey efforts, although limited fungi surveys have been conducted across the NSO range, and more survey effort may locate additional populations of the species. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### **Habitat**

Little information is known about specific habitat requirements of *O. smithii*. Based on data available in 1994, *O. smithii* grows on conifer duff in moist to wet late-successional forest stands (Holthausen et al. 1994). It has also been found on exposed soil, moss, litter, and humus under conifer and hardwood trees, such as black cottonwood (*Populus trichocarpa*), Douglas-fir,

ponderosa pine, bigleaf maple, Oregon white oak, and western hemlock (Cushman and Huff 2007). It grows solitary to gregarious (Castellano et al. 1999). Based on available information, *O. smithii* likely prefers specific microclimate conditions of LSOG forests.

### ***Threats***

Threats to *O. smithii* are presumably those actions that disrupt stand conditions necessary for its survival, particularly damage to overstory trees and disturbance to soil, litter, and duff (Castellano and O'Dell 1997). Fire is a major threat because of the disruption to microclimate habitat conditions that affect soil moisture and the species' association with trees. Typical threats to fungi species in coniferous and mixed hardwood-coniferous forests include: heavy logging that removes overstory trees and causes disturbance to soils, development, hot fires, and heavy thinning for fire management (ORBIC 2004).

### ***Management Recommendations***

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *O. smithii* with several other species (Group 22 of Castellano and O'Dell 1997). The primary guidance is to maintain habitat conditions at all known sites by retaining old-growth forest structure and soil conditions and avoid disturbance from fire, logging, and construction activities until additional data is collected on taxon viability. Known sites on federal land should be managed to include an area that is large enough to maintain the habitat and associated microclimate of the population. The 2007 Conservation Assessment for Fungi (Cushman and Huff 2007) provides the following management considerations for *O. smithii*:

- As a litter saprobe, *O. smithii* may form symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible. Additional specific guidance may be under development.

### **2.1.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### ***Species Distribution***

The distribution of *O. smithii* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table OTSM-1 presents the total number of sites in the regional (NSO range), local (19 5th field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 13 observations from BLM and Forest Service geodatabases were converted into 12 sites in the

NSO range (region). Table OTSM-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table OTSM-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure OTSM-1 displays the regional distribution of the species across BLM and NFS lands, and Figure OTSM-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 4,000 feet on BLM and NFS lands within the currently known range of the species.

TABLE OTSM-1

Number of <i>Otidea smithii</i> Sites (2015)	
Location*	Number of Sites
Regional Area	12
Local Area	2
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, Mar. 2015

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1.

TABLE OTSM-2

Distribution of <i>Otidea smithii</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	6	2	1
Forest Service	5	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	2	-	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE OTSM-3

Distribution of <i>Otidea smithii</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	2	-	-
Adaptive Management Reserves (AMR)	-	-	-
Administratively Withdrawn (AW)	-	-	-
<b>Congressionally Reserved (CR)</b>	-	-	-
<b>Late Successional Reserve (LSR)</b>	<b>2</b>	-	-
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>1</b>	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	1	-	-
Other (Matrix, Riparian Reserve, Other)	6	2	1
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: **Bolded** allocations are designated reserve areas. Columns are not additive because some sites occur on in multiple land allocations.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*O. smithii* is somewhat widely distributed across five physiographic provinces in Washington (Western Cascades), Oregon (Coast Range, Cascades West, and Klamath Mountains), and California (Coast), despite a low overall number of sites (see Figure OTSM-1). Most sites are found along the Cascade Range, with scattered sites in the Coast Range and Klamath Mountains. A few of the sites are clustered and near other sites in the Cascade Range, but most sites appear isolated in the region. *O. smithii* does not appear to be well distributed within its range in the NSO range.

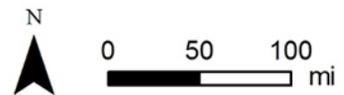




**Legend**

- |  |   |
|--|---|
|  Site                         |  Province*                   |
|  Analysis Area                |  Range                       |
|  LSOG Forests Below 4,000 ft  |  5th Field Watershed (Local) |
|  Conifer/Mixed Below 4,000 ft |  NSO Range (Regional)        |

**Figure OTSM-2.**  
**Forests That May Provide**  
**Habitat For**  
***Otidea smithii***



Two of the 12 sites are at least partially located on State-managed or other lands, and 11 sites are at least partially on BLM or NFS lands across the region. Sites managed by the BLM Districts that encompass the project area include two sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include one site on the Rogue River National Forest. Sites managed by other BLM Districts and National Forests include one site in the Arcata District, three sites in the Salem District, two sites on the Gifford Pinchot National Forest, one site on the Mount Hood National Forest, and one site on the Siuslaw National Forest.

Across the NSO range, three sites are located on reserve lands (LSRs) managed by the Forest Service. This represents 27 percent of the total BLM- and Forest Service-managed sites in the region. The remaining BLM and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*O. smithii* is primarily found in LSOG forests based on available data (11 of 12 total sites are in LSOG) and may be restricted to specific microclimate conditions of these forests. Based on current site locations, the species is found in coniferous and mixed hardwood-coniferous forests between about sea level and 4,000 feet msl and has only been found in part of the NSO range. LSOG coniferous and mixed hardwood-coniferous forests within the western Cascade Range in Washington and Oregon, Coast Range in Oregon and California, and Klamath Mountains in Oregon could provide habitat for *O. smithii* and support additional sites. These forests encompass an estimated 3.0 million acres on BLM and NFS lands (see Figure OTSM-2 and Table OTSM-4), including 1.8 million acres in reserve land allocations (60 percent of the forests). LSOG forests below 4,000 feet msl are somewhat widespread across the region, particularly along the Cascade Range and Klamath Mountains. Younger coniferous forests may provide habitat for the species as they mature and develop suitable habitat conditions over time, and these forests are more widespread across the species' range (see Figure OTSM-2 and Table OTSM-4).

TABLE OTSM-4

Location	Coniferous/Mixed Forests below 4,000 feet		LSOG Forests below 4,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	7,409,750	3,879,370	3,012,290	1,818,800
Local Area	425,530	137,850	143,840	60,620
Project Area	920	220	170	80

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *O. smithii* is found in three 5<sup>th</sup> field watersheds (Middle South Umpqua River, Myrtle Creek, and Olalla Creek-Loogkingglass Creek) that overlap the project area (see Table OTSM-5 and Figure OTSM-3). The two sites are on BLM lands managed by the Roseburg District. Both sites are on land designated as Other (Matrix); no local sites are in reserves. These sites are in the western Cascade Range and Klamath Mountains and are within 20 miles of one another. Connectivity may be available between the local sites based on the

extent of forests that may provide suitable habitat, and animals could transport spores across suitable habitat within the local area. Other sites in the region are further away to the north and south and may not provide dispersal opportunities into the local area.

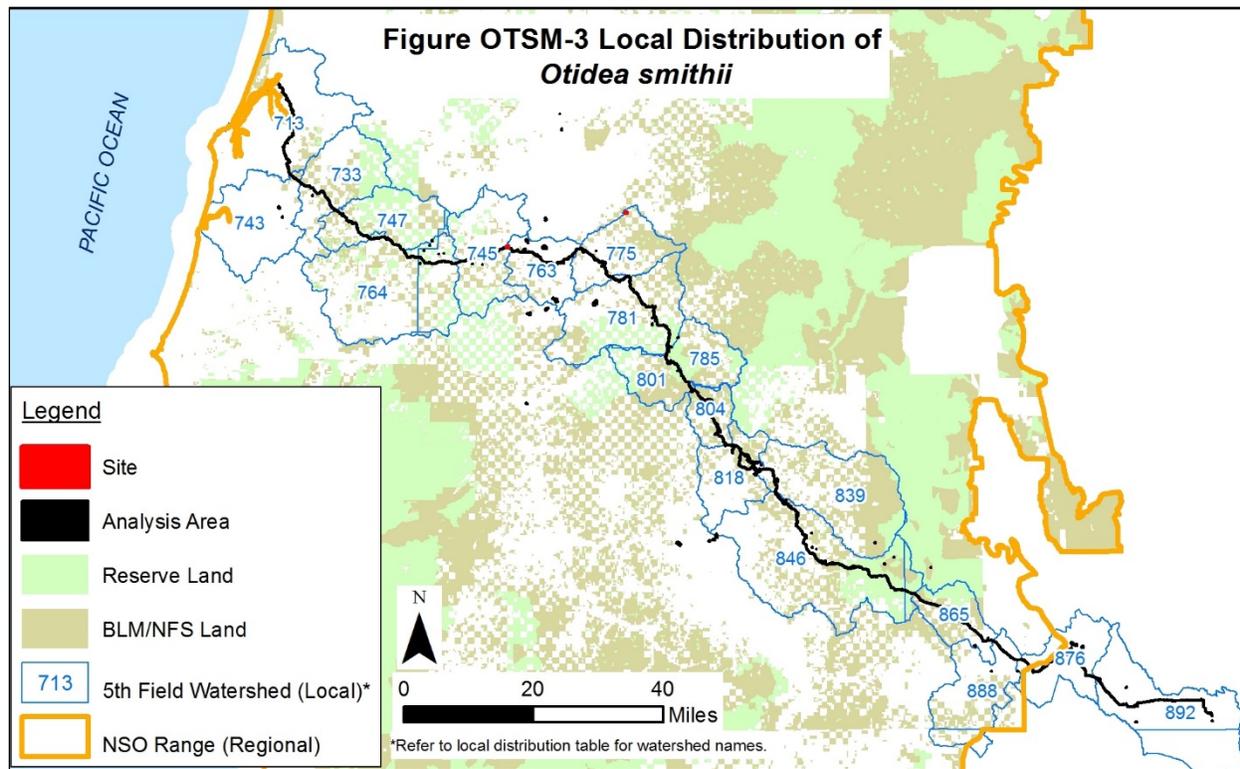
TABLE OTSM-5

**Distribution of *Otidea smithii* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	1*	-
Myrtle Creek (775)	1	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	1*	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, Mar. 2015; HUC5 Watershed layer, Aug. 23, 2011

\*Note: Site counts are not additive because one site is in the Middle South Umpqua River and Olalla Creek-Lookingglass Creek watersheds.



LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl encompass approximately 143,840 acres on BLM and NFS lands in the local area, including 60,620 acres in reserve land allocations (42 percent of the forests). Forests that may provide suitable habitat are found in portions of the Cascade Range and Klamath Mountains (see Figure OTSM-2), and other sites may be located in the mountain ranges in areas that have not been previously surveyed.

Analysis/Project Area Distribution

The analysis and project areas contain one site of *O. smithii*. This site is on BLM land designated as Other (Matrix) in the Middle South Umpqua River and Olalla Creek-Lookingglass Creek watersheds, as described in the Local Distribution discussion above.

Surveys for the PCGP Project resulted in one observation of *O. smithii* in the survey area during fall 2014 (Siskiyou BioSurvey LLC 2014). This recorded observation was near MP 61.3 and comprises the single site in the analysis area.

***Project Impacts***

Analysis

The PCGP Project would affect one site out of the 11 BLM- and Forest Service-managed sites in the region, representing approximately 9 percent of the sites (or one out of 12 total sites on all lands in the NSO range). Table OTSM-6 presents an overview of the features of the PCGP Project that would affect the *O. smithii* site. The construction corridor and associated work and storage areas would affect approximately 0.4 acre (14 percent) of the site (the site encompasses approximately 2.8 acres) (see Figure OTSM-4). Measures outlined in Chapter 1 would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *O. smithii* in and near the project area. Due to the low number of overall sites of *O. smithii*, the effects on one site could potentially alter the distribution of the species in the NSO range if site persistence is affected. This discussion presents a detailed analysis of the features of the PCGP Project that could affect site persistence.

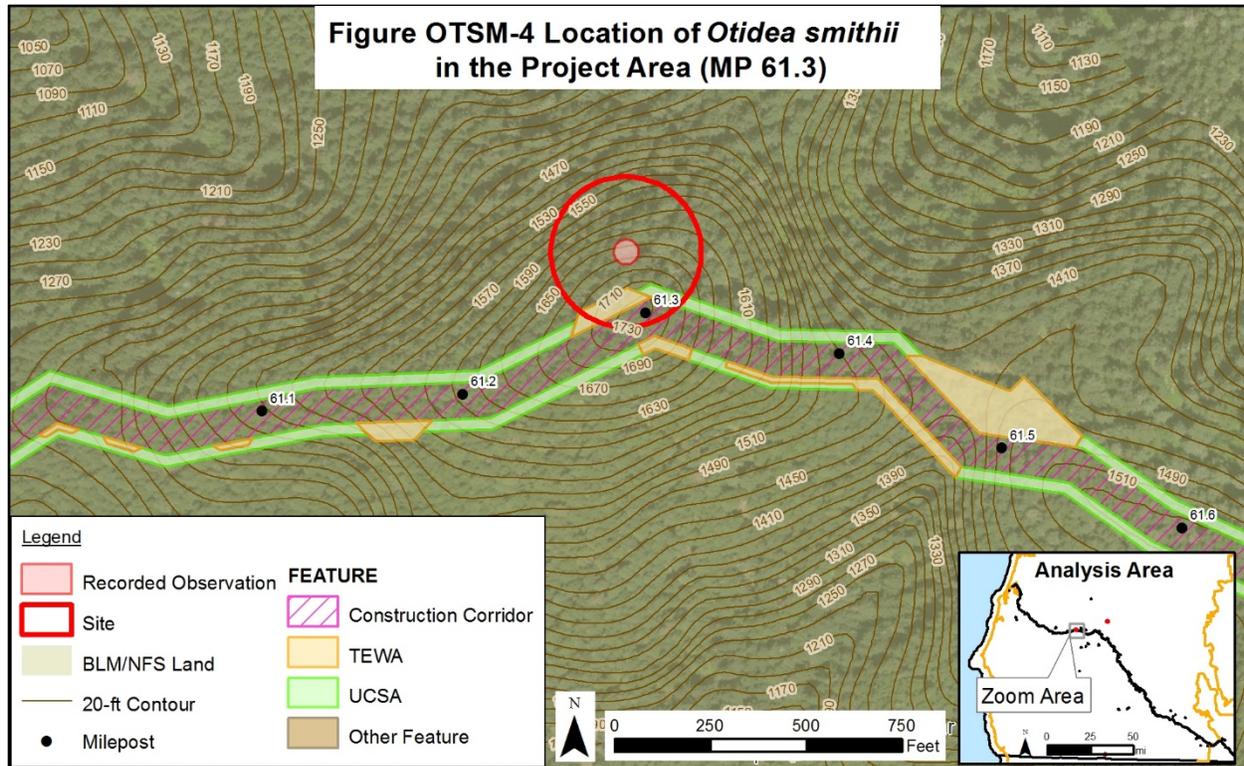
TABLE OTSM-6

Impacts to <i>Otidea smithii</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.2 ac
Temporary Extra Work Area (TEWA)	1	0.2 ac
Uncleared Storage Area (UCSA)	1	0.07 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because the site would be subject to impacts from multiple project activities.

The PCGP Project would result in ground disturbance and vegetation removal in the southern half of the site near MP 61.3. The recorded observation of the species is along the northern side of the project area and may be avoided by activities within the corridor and adjacent TEWA and UCSA (see Figure OTSM-4). However, the species would be subject to indirect effects associated with the PCGP Project based on the proximity of project activities to the observation.



Establishment of the construction corridor and a TEWA would disturb vegetation and soils within 100 feet around the recorded observation in the site. The area in the site is heavily forested, and the establishment of the corridor could modify microclimate conditions around the recorded observation. The removal of forests and woody debris could negatively affect *O. smithii* in adjacent areas by removing its habitat and affecting its association with the woody debris or tree roots, affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions within 100 feet of the observation as a result of the corridor and TEWA would likely make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Material storage within a UCSA would disturb understory habitat within the site, which could modify microhabitats near extant individual(s), potentially making the habitat no longer suitable for the species.

Based on this analysis, *O. smithii* is not likely to persist at the site following project implementation. This site is one of two sites in the local area. It may be important for dispersal of the species in the local area and between other sites to the north and south in the Cascade Range, Klamath Mountains, and Coast Range. If the species does not persist at this site, *O. smithii* would still be found in Oregon, but opportunities for dispersal into other portions of the NSO range may be limited.

Across the project area, the PCGP Project would remove an estimated 110 acres of LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl. These impacts would result in a reduction of habitat that may be suitable for *O. smithii*. Within this impact area, about

85 acres (77 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, but the restored areas would not return to LSOG conditions for more than 80 years and would not likely provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would also remain across the project area and would not provide habitat for the species. The permanent loss of LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl represents less than 1 percent of the total estimated area of these forests across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the one site as a result of the PCGP Project, one site of *O. smithii* would remain on BLM land in the local area, and 10 sites, including three sites in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and management recommendations for the species with regard to agency-related actions. The three sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for the land allocations. Based on these site counts, approximately 30 percent of the remaining *O. smithii* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *O. smithii* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information, however, since the species was listed in the 2001 ROD indicates that more information on the species' distribution is available, as noted below:
  - *O. smithii* has a somewhat wide distribution across five provinces and three states in the region and a low number of overall sites (11 on BLM and NFS lands). The species' distribution is limited to the Cascade Range, Coast Range, and Klamath Mountains, and sites are scattered across its range. The currently known number of sites on BLM and NFS lands is about the same number of sites documented in 2006, with one site documented during the PCGP Project surveys.
  - An estimated 27 percent of the sites (three sites) are in reserves, which is an increase of one site in reserves since 2006 per Molina (2008).
- LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl (general habitat for the species) have a somewhat wide distribution across the species' range and encompass approximately 3.0 million acres on BLM and NFS lands with an estimated 60 percent in reserves. *O. smithii* is likely restricted to a subcomponent of LSOG coniferous

and mixed hardwood-coniferous forests based on available information on its habitat and life history requirements.

- The PCGP Project would affect one of 11 BLM- and Forest Service-managed sites of *O. smithii*, representing approximately 9 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the sites, a low number of sites (10) would continue to be documented on BLM and NFS lands in the region, with seven sites in Oregon, two sites in Washington, and one site in California. One site would remain in the local area. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project could be modified as a result of reduced dispersal opportunities and the reduction of sites on BLM and NFS lands.
- The PCGP Project would not affect site persistence at any sites in reserves, and the percentage of sites in reserves would be about the same (30 percent). The three sites in reserves are in LSRs where management actions are restricted to those activities that benefit LSOG forests.
- The PCGP Project would result in the permanent loss of an estimated 110 acres of LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 1.8 million acres (60 percent) of LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet would remain in reserves in the species' range. Suitable habitat for *O. smithii* includes a subcomponent of these forests, which may be limited based on the low number of currently known sites.
- The remaining forests could support additional populations of *O. smithii*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites may exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

#### 2.1.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *O. smithii* at one site and could modify the distribution of the species within the range of the NSO. The remaining sites may not provide a reasonable assurance of species persistence because:

- With project implementation, 10 sites would remain on BLM and NFS lands across the region, and one site would remain in the local area. The low overall number of sites indicates that each site may be important for the persistence of the species in the NSO range, and the low number of sites in the local area indicates that the site may be important for dispersal opportunities in the local area and between sites in the Cascade Range, Coast Range, and Klamath Mountains. The species' distribution and range within the NSO range could be modified if site persistence is affected.
- The PCGP Project would remove approximately 110 acres of LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl (a negligible amount of the forests). Although an estimated 77 percent of these forests would be restored following

project implementation, they would not likely provide habitat for the species during the life of the project. About 1.8 million acres (60 percent) of LSOG coniferous and mixed hardwood-coniferous forests below 4,000 feet msl would remain in reserves (negligible change with project implementation). Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 1998.

- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is not likely to affect the remaining sites based on their somewhat wide distribution, although clusters of sites could be affected in the Cascade Range.

Based on these conclusions, the one *O. smithii* site in the analysis area is necessary for the persistence of the species in the NSO range, and the PCGP Project must avoid impacts to the site. To avoid impacts to the site near MP 61.3, the segment of the construction corridor between MP 61.2 and MP 61.4, along with associated TEWAs and UCSAs, should be moved at least 110 feet (33 meters) to the south of the currently proposed alignment, such that all of the work area is shifted outside the site boundaries (see Figure OTSM-4). In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the sites and adjacent habitat over the long term.

## 2.2 TRICHOLOMA VENENATUM

*Tricholoma venenatum* is a rare gilled mushroom species in the Tricholomataceae family and does not have a common name.

### 2.2.1 Regulatory Status and Ranking

The 2001 ROD identifies *T. venenatum* as a Category B (rare) species. The ORBIC evaluated *T. venenatum* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004), but it was not re-evaluated in the most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2004, the species had an unknown rank within its global range (GUQ) and was not found in Oregon (no State rank). The species is not currently on the ORBIC Lists. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

### 2.2.2 Background Information

This section presents background information on the species based on published documents and other relevant sources and includes information available prior to the initial PCGP Project analysis (i.e., December 2012). Site counts, for example, are presented in this section using previously published estimates, and current site counts, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*T. venenatum* is a mycorrhizal fungus that depends on host trees for nutrients (carbohydrates) (Castellano and O'Dell 1997). It fruits in November in association with the roots of Pinaceae

species (Castellano et al. 1999). *T. venenatum* is presumed to be dependent on wind (and possibly arthropods) for dispersal of spores (Castellano and O'Dell 1997).

### **Range**

*T. venenatum* is found in eastern and western North America (ORBIC 2004; Castellano et al. 1999). It has been found in Michigan (where it was originally described), the Olympic Peninsula in Washington, and the Sierra Nevada of California (Castellano et al. 1999). The currently known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across eastern and western North America. Local and regional distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### **Population Status**

The ORBIC (2004) reported *T. venenatum* from at least five element occurrences in North America in 2004, but the number of occurrences in the NSO range was not known. One occurrence, consisting of seven collections, was reported in the Sierra Nevada in California; this occurrence is considered relatively stable (ORBIC 2004). The species was found in one location during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). Molina (2008) documented one new site of *T. venenatum* in the NSO range between 1998–2006; this site was the only site documented by 2006 and it was in a reserve or protected area. In the 2007 Final SEIS (USDA and USDI 2007), the BLM and Forest Service did not report any sites of the species.

Pre-disturbance surveys are not practical for Category B species, but equivalent-effort surveys were conducted during 2014–2015 in old-growth stands in portions of the PCGP Project area not previously surveyed to comply with the Standards and Guidelines for Category B species where strategic surveys are not complete (Siskiyou BioSurvey LLC 2015). These surveys targeted all Category B species, including *T. venenatum*, and resulted in five new observations of individuals or populations of *T. venenatum*. *T. venenatum* has not been found in high numbers during past survey efforts, although limited fungi surveys have been conducted across the NSO range, and more survey effort may locate additional populations of the species. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### **Habitat**

*T. venenatum* is found in coniferous and possibly mixed hardwood-coniferous forests associated with various Pinaceae species in western North America (ORBIC 2004). In eastern North America, it is generally found in hardwood forests. Based on data available in 1994, this species was presumed to require diverse older forests with a well-developed humus/litter layer and associated woody debris (Holthausen et al. 1994).

### ***Threats***

Primary threats to *T. venenatum* are those that affect its host trees, such as hot fires, road construction, other development, and clear-cutting (ORBIC 2004; Castellano and O'Dell 1997). Other threats to forest habitat, such as drought or insect infestations, and degraded air quality can also threaten the species. Other specific threats to the species are not known.

### ***Management Recommendations***

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *T. venenatum* with several other species (Group 16 of Castellano and O'Dell 1997). The primary guidance is to maintain habitat conditions at known sites by retaining forest structure and soil conditions and avoid disturbance at known sites until additional data is collected on taxon viability. The known locations of the species on federal land should be managed to include an area that is large enough to maintain the habitat and associated microclimate of the population. The 2007 Conservation Assessment for Fungi (Cushman and Huff 2007) provides the following management considerations for *T. venenatum*:

- As a mycorrhizal species, *T. venenatum* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. To provide a reasonable assurance of the continued persistence of occupied sites consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

### **2.2.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' currently known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### ***Species Distribution***

The distribution of *T. venenatum* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table TRVE-1 presents the total number of sites in the regional (NSO range), local (19 5th field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area), and project areas (PCGP Project corridor, associated work areas, and roads). An estimated 34 observations from BLM and Forest Service geodatabases were converted into 25 sites in the NSO range (region). Table TRVE-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table TRVE-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure TRVE-1 displays the regional distribution of the species across BLM and NFS lands, and Figure TRVE-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 4,000 feet on BLM and NFS lands within the currently known range of the species.

TABLE TRVE-1

Number of <i>Tricholoma venenatum</i> Sites (2015)	
Location*	Number of Sites
Regional Area	25
Local Area	6
Analysis Area (Project Area)	2 (2)

Data Source: Processed BLM and Forest Service GIS data, July 2015

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1.

TABLE TRVE-2

Distribution of <i>Tricholoma venenatum</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	18	5	1
Forest Service	7	2	2
NPS	1	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	3	1	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE TRVE-3

Distribution of <i>Tricholoma venenatum</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	-	-	-
Adaptive Management Reserves (AMR)	-	-	-
Administratively Withdrawn (AW)	1	-	-
<b>Congressionally Reserved (CR)</b>	-	-	-
<b>Late Successional Reserve (LSR)</b>	<b>5</b>	<b>2</b>	<b>2</b>
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	18	4	-
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: **Bolded** allocations are designated reserve areas.

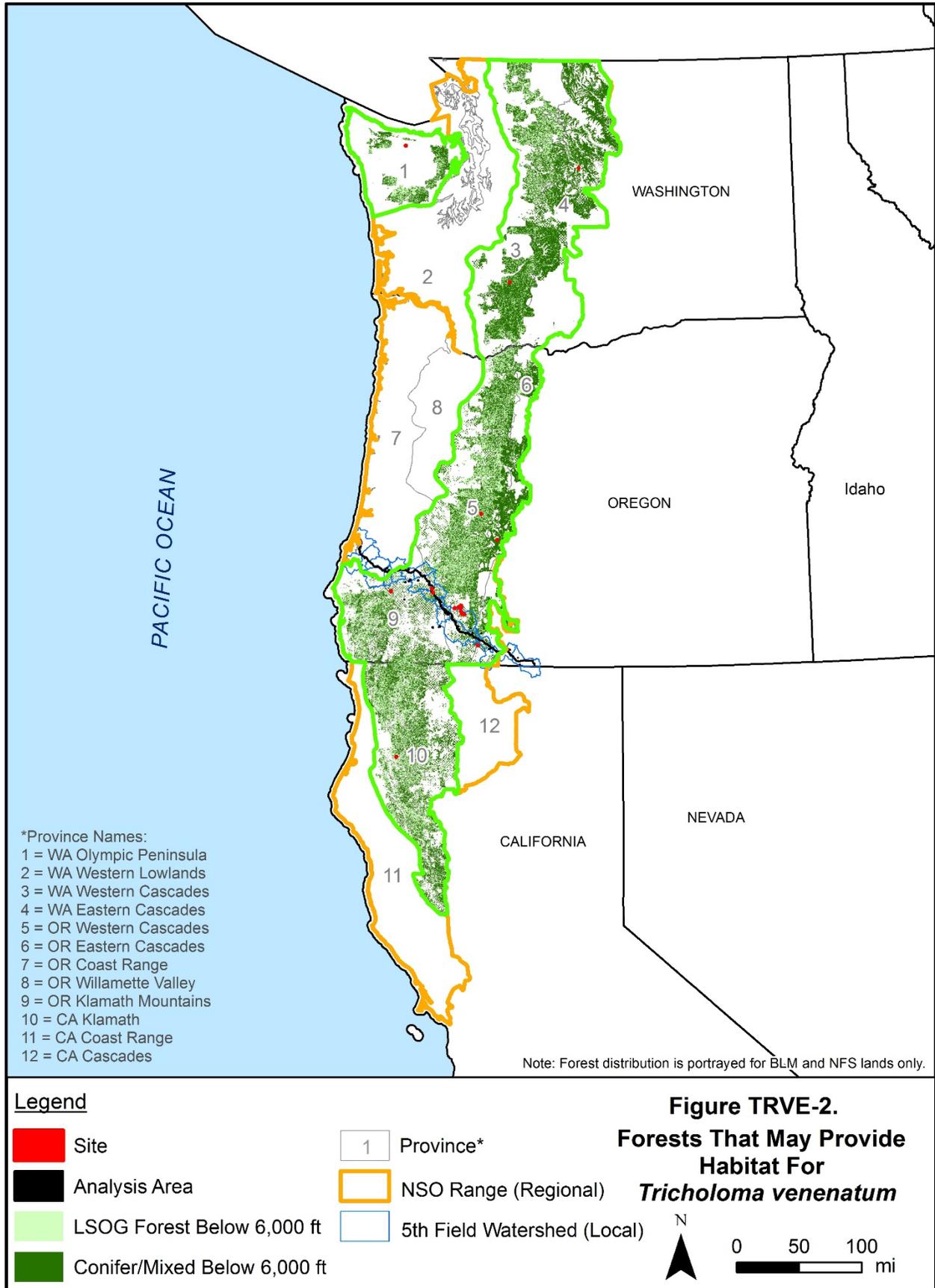
\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*T. venenatum* has a somewhat wide distribution across seven physiographic provinces in Washington (Eastern and Western Cascades, Olympic Peninsula), Oregon (Klamath Mountains and Cascades East and West), and California (Klamath) (see Figure TRVE-1). Sites are scattered across the species' range, with a group of sites in southern Oregon. Due to the scattered distribution of the sites, *T. venenatum* does not appear to be well distributed within its range in the NSO range.

Of the 25 sites in the region, 24 sites are at least partially located on NFS or BLM lands, and one site is on NPS land. Three sites are at least partially located on private or other lands. Sites managed by the BLM Districts that encompass the project area include one site in the Roseburg District (site is partially on BLM and NFS lands), 15 sites in the Medford District, and two in the Klamath Falls Resource Area of the Lakeview District. Sites managed by the National Forests that encompass the project area include two sites (one site is also on BLM land in the Roseburg District) on the Umpqua National Forest. The remaining five sites on NFS land are on the Deschutes, Gifford-Pinchot, Shasta-Trinity, Wenatchee, and Willamette National Forests.





Across the NSO range, five sites are located in LSRs managed by the BLM and Forest Service, representing 21 percent of the total BLM and Forest Service-managed sites in the region. The other BLM and Forest Service-managed sites on other land allocations receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The NPS site, while not covered by the S&M Standards and Guidelines, also likely receives some degree of protection based on National Park management.

*T. venenatum* is primarily found in LSOG forests based on available data (21 of 25 sites are in LSOG) and may be restricted to specific microclimate conditions of these forests. Based on current site locations, the species is found in coniferous forests between about 1,200 and 5,300 feet msl and has only been found in part of the NSO range. LSOG coniferous and mixed hardwood-coniferous forests below about 6,000 feet msl within the Cascade Range in Washington and Oregon, Klamath Mountains in Oregon and California, and Olympic Peninsula in Washington could provide habitat for *T. venenatum* and support additional sites. These forests encompass an estimated 5.2 million acres on BLM and NFS lands (see Figure TRVE-2 and Table TRVE-4), including 3.2 million acres in reserve land allocations (61 percent of the forests). LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl are somewhat limited across the species' range. Younger coniferous and mixed hardwood-coniferous forests may provide habitat for the species as they mature and develop suitable habitat conditions over time, and these forests are more widespread across the species' range (see Figure TRVE-2 and Table TRVE-4).

TABLE TRVE-4

Location	Extent of Forests that Could Provide Habitat for <i>Tricholoma venenatum</i> on BLM and NFS Lands*			
	Coniferous/Mixed Forests below 6,000 feet		LSOG Forests below 6,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	15,869,750	8,855,640	5,185,140	3,171,860
Local Area	441,530	132,330	132,360	49,380
Project Area	1,190	440	250	140

Data Source: GNN vegetation data from Moerur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *T. venenatum* is found in four 5th field watersheds (Big Butte Creek, Elk Creek-South Umpqua, South Umpqua River, and Upper Cow Creek) that overlap the project area (see Table TRVE-5 and Figure TRVE-3). The South Umpqua River and Upper Cow Creek/Elk Creek-South Umpqua sites are located in the Klamath Mountains and are within approximately 4 miles of one another. The Big Butte Creek site is located in the western Cascade Range more than 20 miles to the east of the other sites. Across these watersheds, some level of connectivity appears to be available between sites based on the extent of LSOG coniferous and mixed hardwood-coniferous forests, and opportunities for dispersal likely exist within the local area. Limited connectivity appears available between the local sites and other sites in the region based on the distance between the sites.

All six of the sites in the local area are on BLM or NFS lands, including five sites on BLM land and two sites on NFS land (one site is on BLM and NFS lands). One site is partially on private

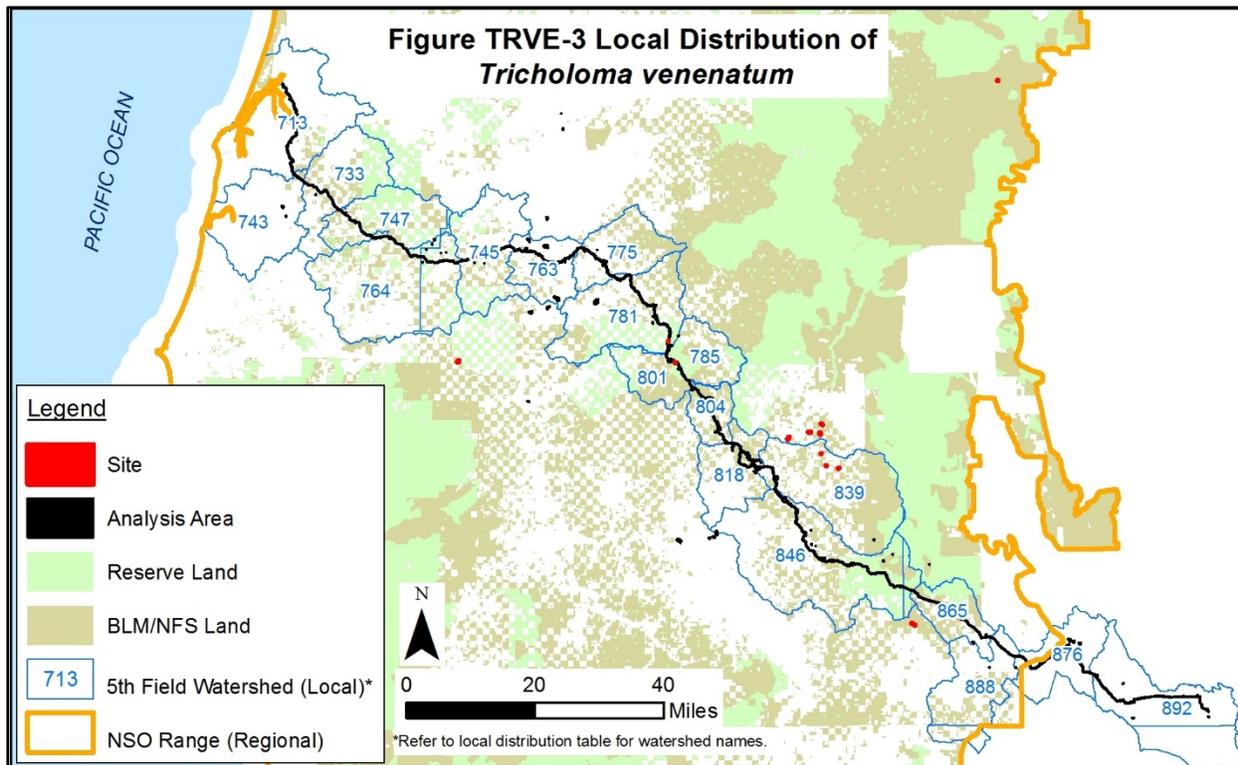
land. Two sites are located on reserve lands designated as LSR, which represents 33 percent of the sites in the local area. The other sites are located on land designated as Other (Matrix).

TABLE TRVE-5

Distribution of <i>Tricholoma venenatum</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	4	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	1*	1
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	1	1
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	1*	1

Data Sources: Processed BLM and Forest Service GIS data, July 2015; HUC5 Watershed layer, Aug. 23, 2011

\*Note: Site counts are not additive because one site is in the Upper Cow Creek and Elk Creek-South Umpqua watersheds.



LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl encompass approximately 132,360 acres on BLM and NFS lands in the local area, including 49,380 acres in reserve land allocations (37 percent of the forests). Forests that may provide suitable habitat are

found in portions of the Cascade Range and Klamath Mountains (see Figure TRVE-2), and other sites may be located in the mountain ranges in areas that have not been previously surveyed.

Analysis/Project Area Distribution

The analysis and project areas contain two sites of *T. venenatum*. These sites are in LSRs on BLM and NFS lands in the South Umpqua River and Upper Cow Creek watersheds, as described in the Local Distribution discussion above.

Surveys for the PCGP Project resulted in two observations of *T. venenatum* in the survey area during fall 2014 (Siskiyou BioSurvey LLC 2014). These recorded observations were between MP 100.4 and 104.9 and comprise the two sites in the analysis area.

**Project Impacts**

Analysis

The PCGP Project would affect two sites out of the 24 sites on BLM and Forest Service-managed lands in the region, representing approximately 8 percent of the sites (or two out of 25 total sites). Table TRVE-6 presents an overview of the features of the PCGP Project that would affect the *T. venenatum* sites. The construction corridor and associated work and storage areas would affect approximately 2.7 acres (46 percent) of the sites (the sites encompass approximately 5.6 acres), with some sites experiencing greater impacts than others (see Figures TRVE-4 and TRVE-5). Measures outlined in Chapter 1 would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *T. venenatum* in and near the project area. Due to the relatively low number of overall sites and scattered distribution of *T. venenatum*, the effects on two sites could potentially alter the distribution of the species in the NSO range if site persistence is affected. This discussion presents a detailed analysis of the features of the PCGP Project that could affect site persistence.

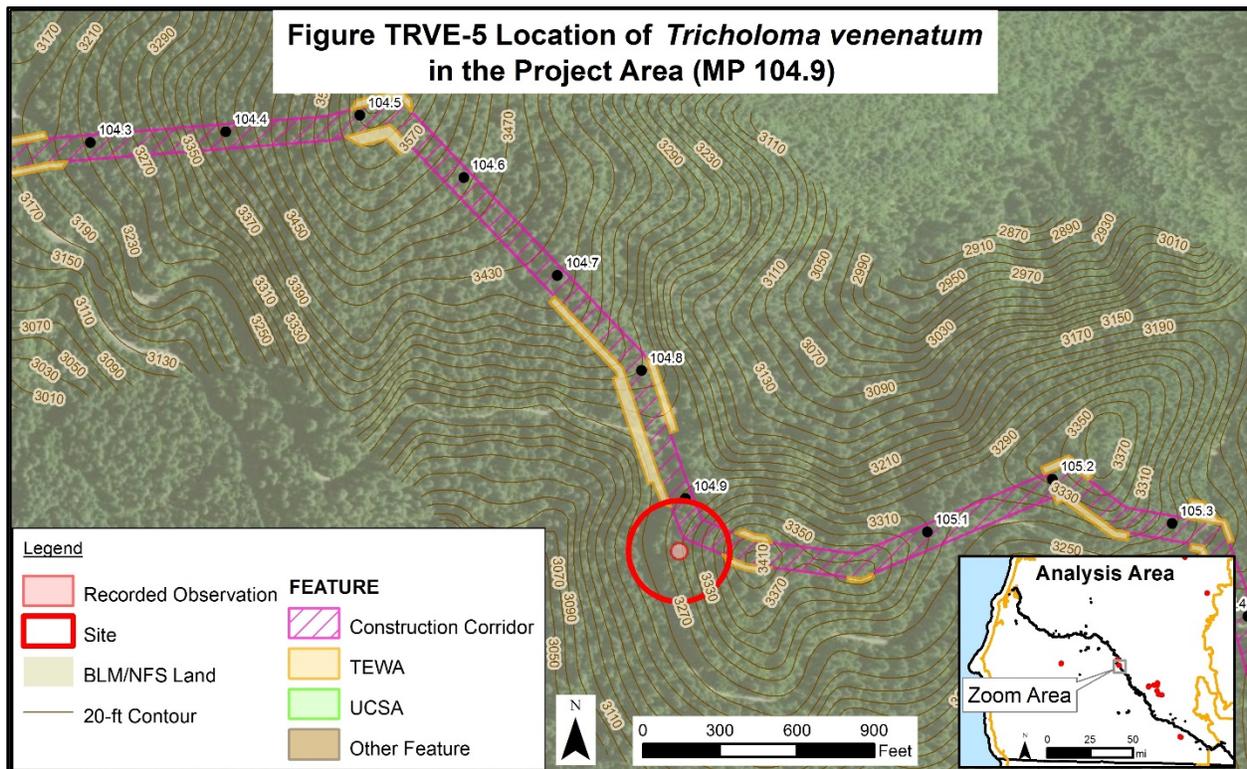
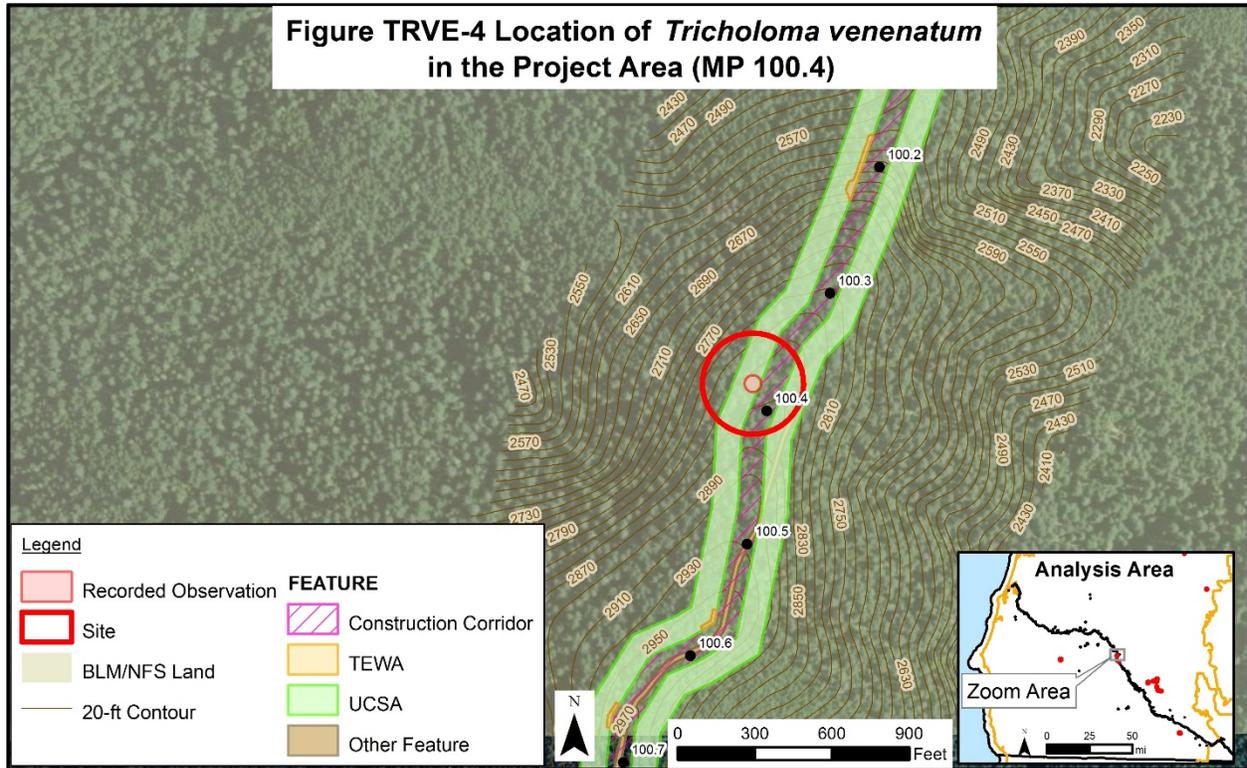
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Impacts to <i>Tricholoma venenatum</i> Sites on BLM and NFS Lands in the Project Area		
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Temporary Extra Work Area (TEWA)	1	0.02 ac
Uncleared Storage Area (UCSA)	1	1.3 ac
Roads (TMP)	1	0.02 ac
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because some sites would be subject to impacts from multiple project activities.

The PCGP Project would result in ground disturbance and vegetation removal in two sites in the analysis area (Table TRVE-6). The site near MP 100.4 has one recorded observation in the project area, which would likely be removed by project activities. The site is in an area that is heavily forested. The site near MP 104.9 also has one recorded observation, which is outside the project area and is unlikely to be removed by project activities. The area in and around the second site appears to be heavily forested, and a road passes through the western portion of the site (see Figures TRVE-4 and TRVE-5).



Establishment of the construction corridor would disturb vegetation and soils near the recorded observations within the sites and could result in removal of individuals. In addition, the establishment of the corridor could modify microclimate conditions around the recorded

observations at each site. The removal of forests and host trees and disturbance to soil in both sites would negatively affect *T. venenatum* by removing its habitat, disturbing the roots of host trees, and affecting its mycorrhizal association with the trees, affecting site persistence. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years and would not provide habitat for the species during the life of the project. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would also not provide habitat for the species during the life of the project. Material storage within a UCSA in the site at MP 100.4 could damage fruiting bodies and would disturb understory habitat within the site, which could also modify microhabitats, potentially making the habitat no longer suitable for the species.

Based on this analysis, *T. venenatum* may not persist at the sites following project implementation. These sites are part of a group of sites in southern Oregon. Both sites may be important for dispersal of the species between other sites in the local area and to areas outside the local area. However, if the species does not persist at the sites, *T. venenatum* would still be found in southern Oregon, where an estimated 17 sites would remain in the Klamath Mountains and Cascade Range.

Across the project area, the PCGP Project would remove an estimated 180 acres of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl. These impacts would result in a reduction of habitat that may be suitable for *T. venenatum*. Within this impact area, about 130 acres (72 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, but the restored areas would not return to LSOG conditions for more than 80 years and would not likely provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would also remain across the project area and would not provide habitat for the species. The permanent loss of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl represents less than 1 percent of the total estimated area of these forests across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the two sites as a result of the PCGP Project, four sites of *T. venenatum* would remain on BLM lands in the local area, with no sites in reserves, and 22 sites, including three sites in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and management recommendations for the species with regard to agency-related actions. The three sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for the land allocation. Based on these site counts, approximately 14 percent of the remaining *T. venenatum* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the

persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *T. venenatum* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates that the species appears to be more common than previously documented, as noted below:
  - *T. venenatum* has a somewhat wide distribution across seven provinces and three states in the region and a low-moderate number of overall sites (24 on BLM and NFS lands). The species' distribution is limited to the Cascade Range, Klamath Mountains, and Olympic Peninsula, and sites are scattered across its range. The current known number of sites on BLM and NFS lands is an increase of 23 sites since 2006, with some sites documented during the PCGP Project surveys.
  - An estimated 21 percent of the sites (five sites) are in reserves, which is an increase of four sites in reserves since 2006 per Molina (2008).
- LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (general habitat for the species) have a somewhat wide distribution across the species' range and encompass approximately 5.2 million acres on BLM and NFS lands with an estimated 61 percent in reserves. *T. venenatum* is likely restricted to a subcomponent of LSOG coniferous and mixed hardwood-coniferous forests based on available information on its habitat and life history requirements.
- The PCGP Project would affect two of 24 BLM- and Forest Service-managed sites of *T. venenatum*, representing approximately 8 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the sites, a low-moderate number of sites (22) would continue to be documented on BLM and NFS lands in the region. Four sites would remain in the local area. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.
- The PCGP Project would affect site persistence at two sites in LSRs, which would reduce the percentage of sites in reserves to 14 percent. The remaining three sites in reserves are in LSRs where management actions are restricted to those activities that benefit LSOG forests.
- The PCGP Project would result in the permanent loss of an estimated 180 acres of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 3.2 million acres (61 percent) of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet would remain in reserves in the species' range. Suitable habitat for *T. venenatum* includes a subcomponent of these forests.
- The remaining forests could support additional populations of *T. venenatum*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however,

it is reasonable to conclude that additional sites may exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

#### 2.2.4 Conclusions

If implemented as proposed, the PCGP Project would likely affect site persistence of *T. venenatum* at two sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 22 sites would remain on BLM and NFS lands across the region, and four sites would remain in the local area, with several other sites in southern Oregon. Although the PCGP Project would affect site persistence of *T. venenatum* at two sites, the sites are part of a group of sites in the Klamath Mountains and Cascade Range in southern Oregon. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *T. venenatum* would persist in the region without considering the site as part of the population.
- The PCGP Project would remove approximately 180 acres of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (a negligible amount of the forests). Although an estimated 72 percent of these forests would be restored following project implementation, they would not likely provide habitat for the species during the life of the project. About 3.2 million acres (61 percent) of LSOG coniferous and mixed hardwood-coniferous forests below 6,000 feet msl would remain in reserves (negligible change with project implementation). Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2006.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is not likely to affect the remaining sites in the region based on their scattered distribution.

The PCGP Project would not be able to avoid impacts to the two *T. venenatum* sites in the analysis area, although some individuals within the sites may persist following project implementation. Based on the above conclusions, avoidance of the *T. venenatum* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *T. venenatum* sites affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

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

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**Supplement Attachment to Appendix K. Survey and Manage  
Species Persistence Evaluation – Blue Ridge Alternative**

**Pacific Connector Gas Pipeline**

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

**Draft**

*Pending Approval by:*

U.S.D.A. Forest Service and U.S. Bureau of Land Management  
for submission to the Federal Energy Regulatory Commission  
FERC Docket PF12-17-000, BLM Case File OR-63542

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**August 2015**



## Summary

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This supplemental report analyzes the impacts of the Pacific Connector Gas Pipeline Project (PCGP Project) with the Blue Ridge alternative on Survey and Manage (S&M) species on U.S. Bureau of Land Management (BLM) and National Forest System (NFS) lands in southern Oregon. The purpose of this report is to supplement the previously prepared S&M persistence evaluation report for the PCGP Project as part of the environmental impact statement (Appendix K to the EIS). The methodology and project details presented in Appendix K are incorporated herein by reference; additional details on the Blue Ridge alternative are described in Chapter 1 of this supplemental report. The S&M species evaluated in this report are those that could be affected by the Blue Ridge alternative.

Based on the analyses presented in this report, the conclusions summarized below were made for the 12 S&M species from the 2001 S&M list that could be affected by the PCGP Project with the Blue Ridge alternative.

The species listed below appear to be more common than previously documented or are relatively common across the range of the northern spotted owl (NSO) based on new information available from surveys for the PCGP Project and/or other sources since the species were listed in the 2001 S&M ROD. For these species, the PCGP Project with the Blue Ridge alternative would affect individuals or habitat at one or more sites and could affect site persistence, but the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence:

### Fungi:

*Cantharellus subalbidus*

*Phaeocollybia spadicea*

*Phaeocollybia dissiliens*

*Ramaria stuntzii*

### Lichens:

*Cetrelia cetrarioides*

*Pseudocyphellaria perpetua*

*Chaenotheca chrysocephala*

*Stenocybe clavata*

*Platismatia lacunosa*

The species listed below are not necessarily more common than previously documented despite new information available from pre-disturbance surveys for the PCGP Project and/or other sources since the species were listed in the 2001 S&M ROD. For these species, the PCGP Project with the Blue Ridge alternative would affect individuals or habitat at one or more sites and could affect site persistence, but the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence:

### Lichens:

*Bryoria subcana*

*Ramalina thrausta*

*Hypotrachyna revoluta*



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## List of Acronyms/Abbreviations

### *Commonly Used:*

BLM	U.S. Bureau of Land Management
feet msl	feet above mean sea level
EIS	environmental impact statement
Forest Service	U.S. Department of Agriculture, Forest Service
LSOG	late-successional and old-growth
LSR	Late Successional Reserve
MP	mile post
NFS	National Forest System
NSO	northern spotted owl
ORBIC	Oregon Biodiversity Information Center
PCGP Project	Pacific Connector Gas Pipeline Project
ROD	Record of Decision
S&M	Survey and Manage
TEWA	temporary extra work area
UCSA	uncleared storage area
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior

### *Species Abbreviations:*

BRSU	<i>Bryoria subcana</i>
CASU	<i>Cantharellus subalbidus</i>
CECE	<i>Cetrelia cetrarioides</i>
CHCH	<i>Chaenotheca chrysocephala</i>
HYRE	<i>Hypotrachyna revoluta</i>
PHDI	<i>Phaeocollybia dissiliens</i>
PHSP	<i>Phaeocollybia spadicea</i>
PLLA	<i>Platismatia lacunosa</i>
PSPE	<i>Pseudocyphellaria perpetua</i>
RAST	<i>Ramaria stuntzii</i>
RATH	<i>Ramalina thrausta</i>
STCL	<i>Stenocybe clavata</i>



## 1.0 INTRODUCTION

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This report is a supplement to the Survey and Manage (S&M) Species Persistence Evaluation prepared for the Pacific Connector Gas Pipeline Project (PCGP Project) in support of the environmental impact statement (EIS). The purpose of this supplemental report is to analyze the impacts of the Blue Ridge alternative on S&M species on U.S. Department of Interior (USDI), Bureau of Land Management (BLM) lands in southern Oregon. This report is intended to be used with the previously prepared report (Appendix K to the EIS) to support agency decisions.

Appendix K to the EIS contains a description of the PCGP Project, a discussion of the regulatory environment, and an overview of the methodology used for the persistence evaluation. The methods and data used for this evaluation are essentially the same as described in Appendix K, with the inclusion of 2012 and 2014 survey data along the Blue Ridge alternative. The project proponent continues to conduct surveys for S&M species along the proposed pipeline route and the Blue Ridge alternative route, and the data on species observations from 2015 surveys are not currently available. This report will be updated to incorporate the results of those surveys prior to decisions made by the BLM and U.S. Department of Agriculture (USDA), Forest Service (Forest Service). For species previously evaluated in Appendix K, this report contains only the persistence evaluation section, which includes an updated discussion of the species' distribution and incorporates the Blue Ridge analysis area (50-meter buffer around the alternative route and associated work areas) in the distribution and analysis sections. Background information from Appendix K is incorporated by reference. The analysis considers the impacts on the species across the PCGP Project, including the Blue Ridge alternative and excluding the original route segment that would not be used (i.e., any sites along the original segment would no longer be affected). For species not previously evaluated, this report contains a discussion of the species' regulatory status, background information, distribution, and persistence evaluation. The analysis addresses the overall effects of the PCGP Project with the Blue Ridge alternative on the species.

The Blue Ridge alternative is a 14-mile long alternate pipeline route that begins near Mile Post (MP) 11.29 and extends to MP 21.77 along the proposed PCGP Project alignment evaluated in the Draft EIS. Roads that would be used for access to and along the route are still being refined; these roads are not specifically analyzed in this supplemental report. This alternative crosses BLM land in the Coos Bay District, but does not cross National Forest System (NFS) land. The alternative crosses two watersheds, Coos Bay Frontal and North Fork Coquille River, in southwestern Oregon. The Blue Ridge analysis area encompasses approximately 830 acres, including 430 acres of BLM lands (Table INTRO-1). The analysis area for the PCGP Project with the Blue Ridge alternative encompasses a total of 17,635 acres, including 5,620 acres of BLM and NFS lands. Implementation of this alternative would remove the original route segment from MP 11.29–21.77 from the project.

Table INTRO-1

BLM and NFS Lands in Analysis and Project Areas with Blue Ridge Alternative				
Lands	Analysis Area*	Project Area	Blue Ridge Analysis Area	Blue Ridge Project Area
BLM	3,625	1,130	430	130
NFS	1,995	625	0	0
<b>Total BLM and NFS Lands</b>	<b>5,620</b>	<b>1,755</b>	<b>430</b>	<b>130</b>
<b>Total All Lands</b>	<b>17,635</b>	<b>6,150</b>	<b>830</b>	<b>245</b>

Data source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Note: Areas are presented in acres.

\*Analysis area is the 50-meter buffer of the project area, including the Blue Ridge alternative, used for fungi and lichens.



## 2.0 FUNGI

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### 2.1 CANTHARELLUS SUBALBIDUS

Background information for *Cantharellus subalbidus* is presented in Appendix K to the EIS. This section describes the distribution of the species using updated data and evaluates the impacts of the PCGP Project with the Blue Ridge alternative on the species.

#### 2.1.1 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the range of the northern spotted owl (NSO) based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *C. subalbidus* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table CASU-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 605 observations from BLM and Forest Service geodatabases were converted into 309 sites in the NSO range (region). Table CASU-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table CASU-3 presents the total number of sites within each land use allocation defined in the 1994 Record of Decision (ROD) across the regional, local, and analysis areas. Figure CASU-1 displays the regional distribution of the species across BLM and NFS lands, and Figure CASU-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and late-successional and old-growth (LSOG) forests on BLM and NFS lands.

TABLE CASU-1

Number of <i>Cantharellus subalbidus</i> Sites (2015)	
Location*	Number of Sites
Regional Area	309
Local Area	13
Analysis Area (Project Area)	2 (2)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.



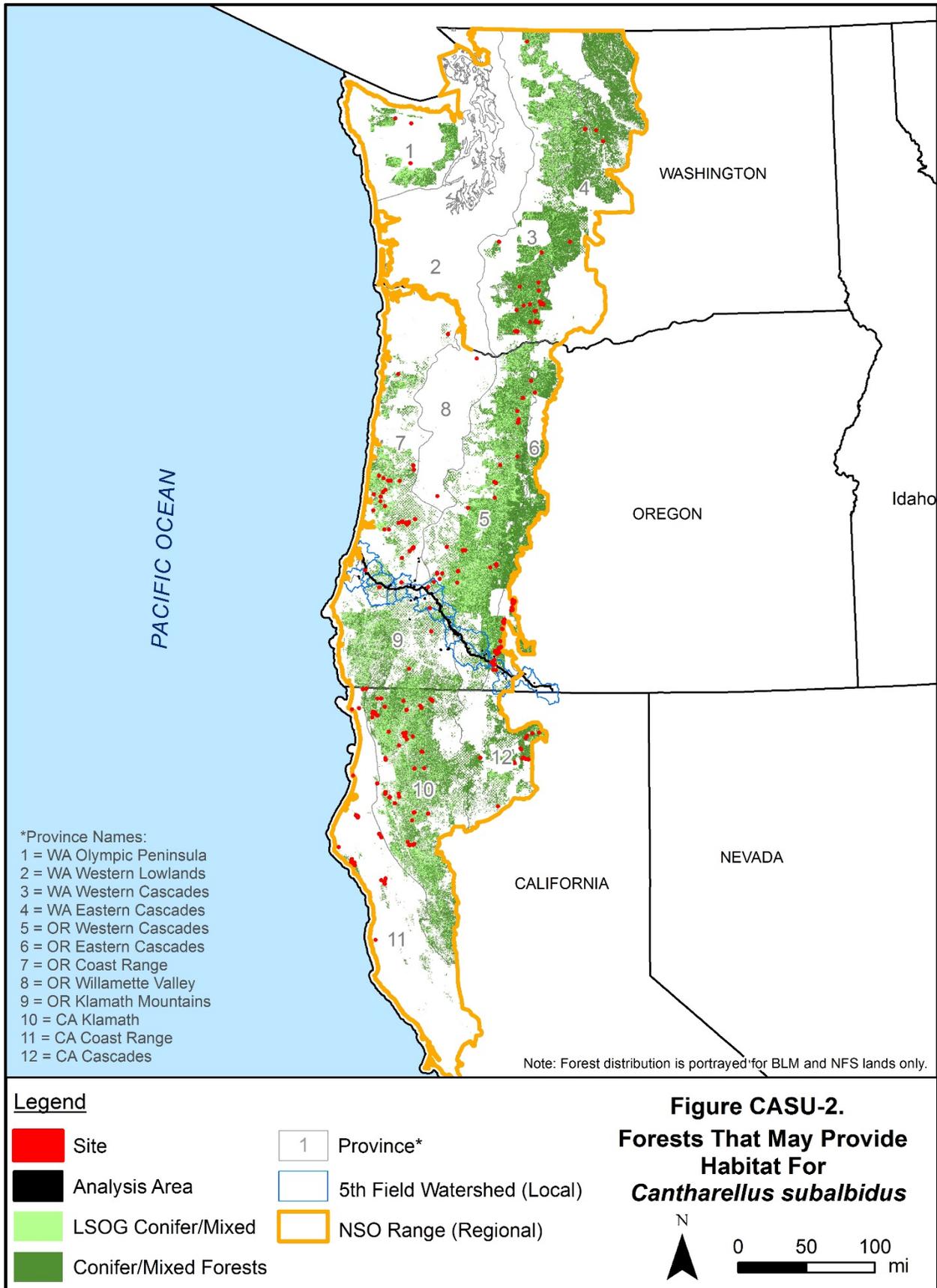


TABLE CASU-2

Distribution of <i>Cantharellus subalbidus</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	66	7	1
Forest Service	227	6	1
NPS	3	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	22	2	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE CASU-3

Distribution of <i>Cantharellus subalbidus</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	14	-	-
Adaptive Management Reserves (AMR)	-	-	-
Administratively Withdrawn (AW)	11	-	-
<b>Congressionally Reserved (CR)</b>	<b>17</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>129</b>	<b>3</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>2</b>	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>3</b>	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	5	-	-
Other (Matrix, Riparian Reserve, Other)	126	10	2
<b>Riparian Reserve**</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*C. subalbidus* is widely distributed across 11 physiographic provinces in Washington (Western and Eastern Cascades and Olympic Peninsula), Oregon (Coast Range, Cascades East and West, Willamette Valley, and Klamath Mountains), and California (Coast, Cascades, and Klamath). Sites are widely distributed along the Coast Range, Klamath Mountains, and Cascade Range, and many sites are clustered or relatively close to one another in groups. Scattered sites are located in other outlying areas. *C. subalbidus* appears to be well distributed in the Coast Range, Klamath Mountains, and Cascade Range where sites are widely distributed in many clusters across the mountain ranges.

Twenty-two of 309 sites are located on private, state, or other lands (at least partially); three sites are on NPS lands (Olympic National Park); and 293 sites are on BLM and NFS lands across the region (at least partially). Sites managed by the BLM Districts that encompass the project area include two sites in the Klamath Falls Resource Area of the Lakeview District, six sites in the Coos Bay District, two sites in the Medford District, and 23 sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include 78 sites on the Winema National Forest and 10 sites on the Umpqua National Forest. The other 172 sites on BLM and NFS lands are in the Arcata, Eugene, and Salem Districts and on the Gifford Pinchot, Klamath, Modoc, Mt. Baker-Snoqualmie, Mt. Hood, Shasta-Trinity, Siuslaw, Six Rivers, Wenatchee, and Willamette National Forests.

Across the NSO range, 149 sites are located on reserve lands managed by BLM and the Forest Service, including 129 in LSRs, two in Marbled Murrelet Areas, three in Known Owl Activity Centers, and 17 in Congressionally Reserved areas (two sites are in two types of reserves). This

represents 51 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The three NPS sites, while not covered by the S&M Standards and Guidelines, also likely receive some degree of protection based on National Park management.

*C. subalbidus* is more commonly found in LSOG forests based on available data (239 of 309 total sites are in LSOG), but it is somewhat common in non-LSOG forests. Based on current site locations, the species is found primarily in coniferous and mixed hardwood-coniferous forests below about 7,000 feet above mean sea level (feet msl) and has been documented in most of the NSO range. Coniferous and mixed hardwood-coniferous forests, including the LSOG component of these forests, across the NSO range could provide habitat for *C. subalbidus* and support additional sites. These forests encompass an estimated 19.2 million acres on BLM and NFS lands in the region, including an estimated 12.5 million acres in reserve land allocations (65 percent of the forests; Table CASU-4). Of this acreage, an estimated 6.1 million acres are LSOG (see Figure CASU-2), including 3.8 million acres in reserve land allocations (62 percent of the forests). Although coniferous and mixed hardwood-coniferous forests are widespread across the region, LSOG forests are less common and are primarily found in the main mountain ranges.

TABLE CASU-4

Extent of Forests that Could Provide Habitat for <i>Cantharellus subalbidus</i> on BLM and NFS Lands*				
Location	Coniferous/Mixed Forests		LSOG Coniferous/Mixed Forests	
	Total	Reserves	Total	Reserves
Regional Area	19,231,940	12,513,460	6,067,930	3,753,060
Local Area	1,305,640	201,250	183,900	81,350
Project Area	1,430	490	320	150

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *C. subalbidus* is found in six 5<sup>th</sup> field watersheds that overlap the project area (see Table CASU-5 and Figure CASU-3). The sites are scattered across the local area, with a large cluster in the Spencer Creek watershed in the eastern Cascade Range. Across these watersheds, multiple avenues of connectivity appear to be available between sites based on the extent of coniferous and mixed forests, and opportunities for dispersal exist within the local area and to nearby regional areas. Several regional sites are located in the vicinity of the local area sites.

All of the 13 sites in the local area are at least partially on BLM and NFS lands, with two sites partially on private land. Most of the local sites are on land designated as Other (Matrix); three sites are in LSRs, representing 23 percent of the BLM- and Forest Service-managed sites. The sites in LSRs are distributed across three watersheds (Table CASU-5).

Coniferous and mixed hardwood-coniferous forests encompass approximately 1.3 million acres on BLM and NFS lands in the local area, including 201,250 acres in reserve land allocations (15 percent of the forests). Of this acreage, an estimated 183,900 acres are LSOG, including 81,350 acres in reserve land allocations (44 percent of the forests). Other sites may also exist in the

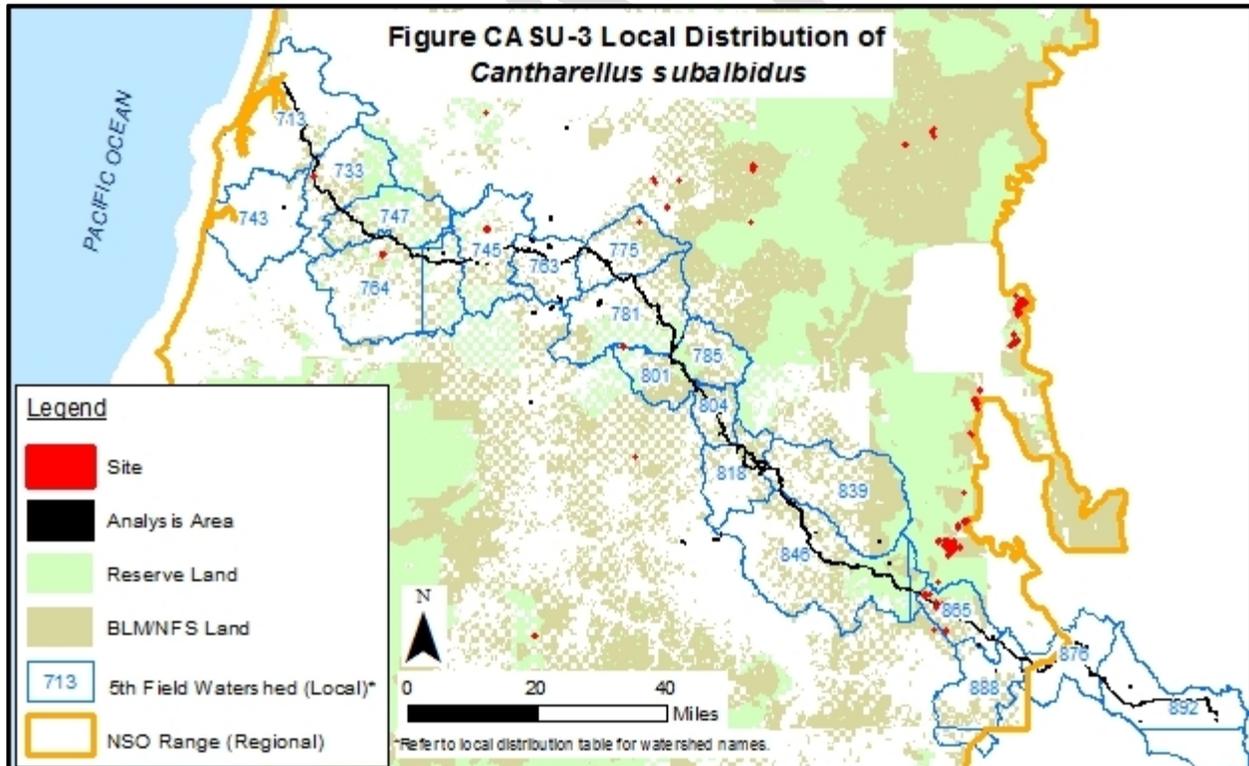
local area where surveys have not been completed, based on the number of sites in the local area, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures CASU-2 and CASU-3).

TABLE CASU-5

**Distribution of *Cantharellus subalbidus* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	1	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	2	-
North Fork Coquille River (733)	1	-
Olalla Creek-Lookingglass Creek (745)	1	1
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	7	1
Trail Creek (804)	-	-
Upper Cow Creek (801)	1	1

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Analysis/Project Area Distribution

The analysis and project areas contain two sites of *C. subalbidus*. One site is on Forest Service-managed land (Winema National Forest) designated as Other (Matrix) in the Spencer Creek watershed. The other site is on BLM-managed land designated as Other (Matrix) in the North Fork Coquille River watershed. Several sites are located within the immediate vicinity of the site (see Local Distribution discussion above).

Surveys for the PCGP Project resulted in two total observation of the species in two locations near the project area between 2010 and 2012 (Siskiyou BioSurvey LLC 2012). However, neither of these recorded observations falls within the analysis area. The recorded observations of the species in the analysis area are from agency databases and were recorded between 1997 and 2000. The sites are near Blue Ridge MP 23.7 and between MPs 172 and 172.1.

**Project Impacts**

Analysis

The PCGP Project with the Blue Ridge alternative would affect two sites out of the 293 sites on BLM- and Forest Service-managed lands in the region, representing less than 1 percent of the sites (or two out of 309 total sites on all lands in the NSO range). Table CASU-6 presents an overview of the features of the PCGP Project that would affect the *C. subalbidus* site. The construction corridor and associated storage areas would affect approximately 1.5 acres of two sites (about 27 percent of the sites). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *C. subalbidus* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE CASU-6

Impacts to <i>Cantharellus subalbidus</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	2	1.0 ac
Temporary Extra Work Area (TEWA)	1	0.2 ac
Uncleared Storage Area (UCSA)	2	0.3 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site counts are not additive because the sites would be subject to impacts from multiple project activities.

Vegetation removal and grading activities in the construction corridor would disturb about 1.0 acre of vegetation and soils in two sites and could remove individuals of *C. subalbidus*. Disturbance in a TEWA would result in similar impacts on 0.2 acre of one site. The establishment of the corridor could modify microclimate conditions in the site after the corridor is established. The removal of forests and host trees and disturbance to soil could negatively affect *C. subalbidus* in adjacent areas by removing its habitat, disturbing soil or duff around trees or roots of trees, and affecting its mycorrhizal association with the trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWA could make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing

vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 0.3 acre of understory habitat in two sites, which could modify microhabitats near extant populations or individuals, potentially making the habitat no longer suitable for the species.

Along the Blue Ridge alternative, one site would be affected by activities in the construction corridor (0.3 acre of the site) and adjacent UCSA (0.1 acre of the site), as described above. These activities would disturb about 13 percent of the site (the site encompasses 2.7 acres). Habitat conditions in the site could be modified as a result of changes to humidity and microclimate conditions, potentially making the habitat unsuitable for the species. Based on available data, implementation of the Blue Ridge alternative would increase impacts on *C. subalbidus* by affecting site persistence at one site along the alternative route in addition to the one site affected by another segment of the PCGP Project.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 1,130 acres of coniferous and mixed hardwood-coniferous forests, including 240 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *C. subalbidus*. Within this impact area, about 750 acres (about 67 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of an estimated 240 acres of coniferous and mixed hardwood-coniferous forests. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests across the NSO range.

### Discussion

Assuming site persistence cannot be maintained at the two sites as a result of the PCGP Project with the Blue Ridge alternative, 11 sites of *C. subalbidus* would remain on BLM and NFS lands in the local area, with three in reserves, and 291 sites, including 149 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 149 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 51 percent of the remaining *C. subalbidus* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *C. subalbidus* is a Category D (uncommon) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category D species are not likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates the species appears to be more common than previously documented, as noted below:
  - This species was removed from the S&M Standards and Guidelines in Oregon via the 2001 Annual Species Review, as a result of new information that demonstrated this species did not meet all of the basic criteria for S&M. The species remained on the list as Category D in Washington and California.
  - *C. subalbidus* has a wide distribution across 11 physiographic provinces and three states in the region and a moderate-high number of overall sites (293 on BLM and NFS lands). The species is well distributed in the Coast Range, Klamath Mountains, and Cascade Range. The current known number of sites on BLM and NFS lands is an increase of about 19 sites since 2007, which includes a couple of sites documented during the PCGP Project surveys.
  - An estimated 51 percent of the sites (149 sites) are in reserves, which is an increase in the number of sites in reserves since 2006 per Molina (2008).
- Coniferous and mixed hardwood-coniferous forests (general habitat for the species) are widely distributed across the region and encompass approximately 19.2 million acres on BLM and NFS lands with an estimated 65 percent in reserves. A subcomponent of these forests likely provides habitat for *C. subalbidus*.
- The PCGP Project with the Blue Ridge alternative would affect two of 293 BLM- and Forest Service-managed sites of *C. subalbidus*, representing less than 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the sites, a moderate-high number of sites (291) would continue to be documented on BLM and NFS lands in the region with a wide distribution across the NSO range. Eleven sites would remain in the local vicinity of the analysis area. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 134 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and 17 sites are at least partially in Congressionally Reserved areas where management activities that may adversely affect *C. subalbidus* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 240 acres of coniferous and mixed hardwood-coniferous forests (less than 1 percent of the total regional acreage). An estimated 12.5 million acres (65 percent) of the forests and 3.8 million acres (62 percent) of LSOG forests would remain in reserves in the NSO range.
- The remaining forests could support additional populations of *C. subalbidus*, although the potential for the habitat to be occupied varies based on the distribution of sites and the

species' specific habitat requirements. This is a Category D species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

### 2.1.1 Conclusions

If implemented as proposed, the PCGP Project with the Blue Ridge alternative would likely affect site persistence of *C. subalbidus* at two sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 291 sites would remain on BLM and NFS lands across the region, and 11 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *C. subalbidus* at two sites, these sites are in the Coast Range and eastern Cascade Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *C. subalbidus* would persist in the region without considering the sites as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 1,130 acres of coniferous and mixed hardwood-coniferous forests and 240 acres of LSOG forests (a negligible amount of the forests). An estimated 67 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 12.5 million acres (65 percent) of coniferous and mixed forests and 3.8 million acres (62 percent) of LSOG forests would remain in reserves in the NSO range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 1998.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is widely distributed.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the two *C. subalbidus* sites in the analysis area, although some individuals within the sites may persist following project implementation. Based on the above conclusions, avoidance of the *C. subalbidus* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *C. subalbidus* sites affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the sites and adjacent habitat over the long term.

## 2.2 PHAEOCOLLYBIA DISSILIENS

*Phaeocollybia dissiliens* is a gilled mushroom species in the Cortinariaceae family and does not have a common name.

### 2.2.1 Regulatory Status and Ranking

The 2001 ROD identifies *P. dissiliens* as a Category B (rare) species. The Oregon Biodiversity Information Center (ORBIC) evaluated *P. dissiliens* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in the most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was considered to be between imperiled because of rarity or other factors that make it vulnerable to extinction and rare, uncommon, or threatened, but not immediately imperiled, within its global range and in Oregon (G2G3, S2S3, respectively). It is on the ORBIC List 3. It is considered a BLM and Forest Service Strategic species in Oregon.

### 2.2.2 Background Information

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

Little is known about the autecology or reproductive biology of *P. dissiliens*. It is a mycorrhizal fungus that depends on host trees for nutrients (carbohydrates) (ORBIC 2004). It forms symbiotic associations with the roots of conifer and hardwood trees to obtain minerals, water, and nutrients (Lau and Dewey 2013, Castellano et al. 1999). The ORBIC (2004) indicated that the mushroom appears to grow slowly and may be less dependent on spore dispersal (e.g., via wind or animals) than on associations with its mycorrhizal partners. It fruits in October and November (Castellano et al. 1999).

#### *Range*

*P. dissiliens* is endemic to Oregon. Based on data available in 2013, its range included the Coast Range, western Cascade Range, and Klamath Mountains (Lau and Dewey 2013). Within its range in 2004, *P. dissiliens* had a spotty distribution and appeared to be restricted to fairly complex habitats (ORBIC 2004). The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations limited to the Pacific Northwest. It may have had more abundant local distributions across its range, but habitat modifications and other environmental factors, as discussed under Threats below, have likely reduced available habitat and may have further restricted the species' distribution.

#### *Population Status*

The ORBIC (2004) reported *P. dissiliens* from an estimated 22 element occurrences in Oregon. In 2004, *P. dissiliens* appeared to be stable in its range, and recent surveys had extended the known range considerably (ORBIC 2004). The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). Molina (2008) documented 14 new sites of *P. dissiliens* in the NSO range between 1998 and 2006, and 22 total

sites were documented by 2006, including eight in reserves or protected areas. In the 2007 Final SEIS (USDA and USDI 2007), the BLM and Forest Service reported 20 sites on federal lands and 22 total sites on all lands in the NSO range.

Pre-disturbance surveys are not practical for Category B species, but equivalent-effort surveys were conducted during 2010–2012 in old-growth stands in the PCGP Project area and within 100 feet of the project area to comply with the Standards and Guidelines for Category B species where strategic surveys are not complete (Siskiyou BioSurvey LLC 2012). These surveys targeted all Category B species, including *P. dissiliens*, and did not result in any new observations of the species. However, based on the increased number of sites since 1998 with increased surveys (almost 3-fold increase between 1998 and 2006 per Molina 2008 records), more survey effort may locate additional populations in Oregon. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### **Habitat**

*P. dissiliens* occurs on the soil, litter, and humus of coniferous and mixed hardwood-coniferous forests up to an elevation of 2,500 feet msl (Lau and Dewey 2013). It is typically found in association with Pacific fir, Sitka spruce, Douglas-fir, and western hemlock. Other associated trees include western red cedar, bigleaf maple, red alder, and California laurel. Based on available information, *P. dissiliens* may prefer specific microclimate conditions of LSOG forests, but it is not likely restricted to these forests.

### **Threats**

Threats to *P. dissiliens* are those that affect its host tree and disturb the soil, such as road and trail construction, logging, fire management activities, and recreational activities (Castellano and O'Dell 1997). Other threats may include hot fires and development (ORBIC 2004). Other specific threats to the species are not currently known.

### **Management Recommendations**

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *P. dissiliens* with several other species (Group 8 of Castellano and O'Dell 1997). The primary guidance is to maintain habitat and microclimate conditions at all known sites by retaining LSOG conditions; minimizing soil disturbance at or around known sites; and limiting disruption to host populations, particularly from fire and logging. The known locations of the species on federal land should be managed to include an area that is large enough to maintain the habitat and associated microclimate. The 2013 Conservation Assessment for Fungi (Lau and Dewey 2013) provides the following management considerations for *P. dissiliens*:

- As a mycorrhizal species, *P. dissiliens* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

### 2.2.3 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species’ current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *P. dissiliens* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table PHDI-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 84 observations from BLM and Forest Service geodatabases were converted into 44 sites in the NSO range (region). Table PHDI-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table PHDI-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure PHDI-1 displays the regional distribution of the species across BLM and NFS lands, and Figure PHDI-2 displays the species’ regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 3,000 feet msl on BLM and NFS lands within the current known range of the species.

TABLE PHDI-1

Number of <i>Phaeocollybia dissiliens</i> Sites (2015)	
Location*	Number of Sites
Regional Area	44
Local Area	11
Analysis Area (Project Area)	1 (0)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015

\*Definitions of locations are provided in Chapter 1 of Appendix K and this supplement.

TABLE PHDI-2

Distribution of <i>Phaeocollybia dissiliens</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	39	11	1
Forest Service	2	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	12	4	1

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



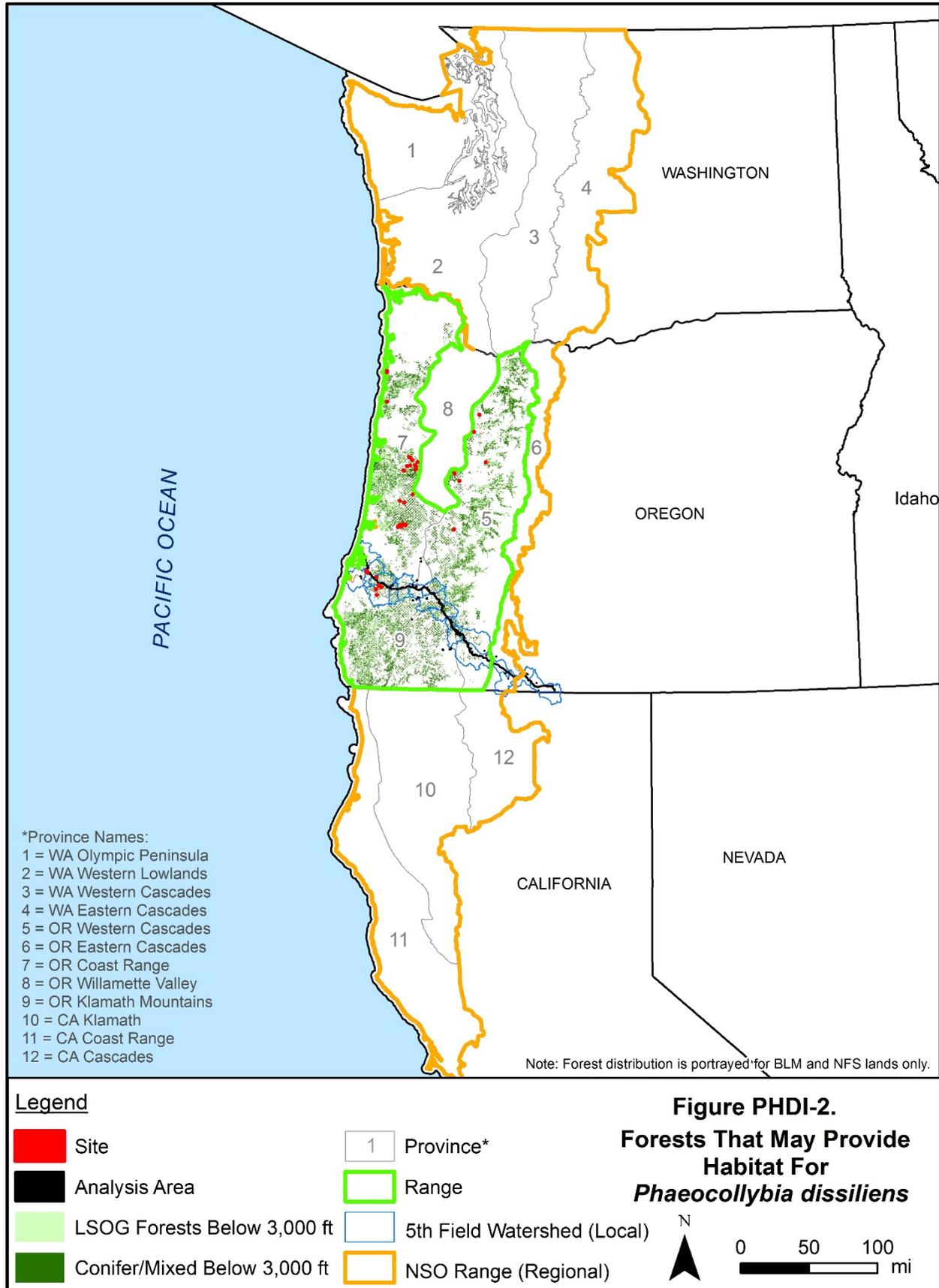


TABLE PHDI-3

Distribution of *Phaeocollybia dissiliens* Across 1994 ROD Land Allocations

Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	1	-	-
Adaptive Management Reserves (AMR)	1	-	-
Administratively Withdrawn (AW)	-	-	-
<b>Congressionally Reserved (CR)</b>	-	-	-
<b>Late Successional Reserve (LSR)</b>	<b>12</b>	<b>1</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>1</b>	<b>1</b>	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	28	10	1
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*P. dissiliens* has a somewhat limited distribution across three physiographic provinces in Oregon (Coast Range, Cascades West, and Klamath Mountains). Several groups of sites are located in the Coast Range, and several scattered sites are located in the western Cascade Range. *P. dissiliens* appears to be well distributed in the Coast Range based on the clusters or groups of sites distributed across the mountain range.

Of the 44 sites in the region, 41 sites are at least partially on BLM and NFS lands and 12 sites are at least partially on private, state, or other lands. Sites managed by the BLM Districts that encompass the project area include 18 sites in the Coos Bay District. The other 23 sites on BLM and NFS lands are in the Eugene and Salem Districts and on the Siuslaw and Willamette National Forests.

Across the NSO range, 13 sites are located on reserve lands managed by BLM and the Forest Service, including 12 in LSRs and one in a Marbled Murrelet Area. This represents 32 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*P. dissiliens* is more commonly found in LSOG forests based on available data (29 of 44 total sites are in LSOG), but it is not likely restricted to LSOG conditions based on available information. Based on current site locations, the species is found primarily in coniferous and mixed hardwood-coniferous forests below about 2,300 feet msl and has only been documented in parts of Oregon. Coniferous and mixed hardwood-coniferous forests, including the LSOG component of these forests, below 3,000 feet msl in the Coast Range, Klamath Mountains, and western Cascade Range in Oregon could provide habitat for *P. dissiliens* and support additional sites. These forests encompass an estimated 3.9 million acres on BLM and NFS lands in the region, including an estimated 2.0 million acres in reserve land allocations (51 percent of the forests; Table PHDI-4). Of this acreage, an estimated 1.7 million acres are LSOG (see Figure PHDI-2), including 1.0 million acres in reserve land allocations (60 percent of the forests). These forests are widespread across the species' range, but the species is likely restricted to a component of the forests that provides suitable local conditions.

TABLE PHDI-4

Extent of Forests that Could Provide Habitat for <i>Phaeocollybia dissiliens</i> on BLM and NFS Lands*				
Location	Coniferous/Mixed Forests below 3,000 feet		LSOG Forests below 3,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	3,859,010	1,972,230	1,669,360	1,006,920
Local Area	332,770	118,560	114,000	52,550
Project Area	780	170	140	60

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

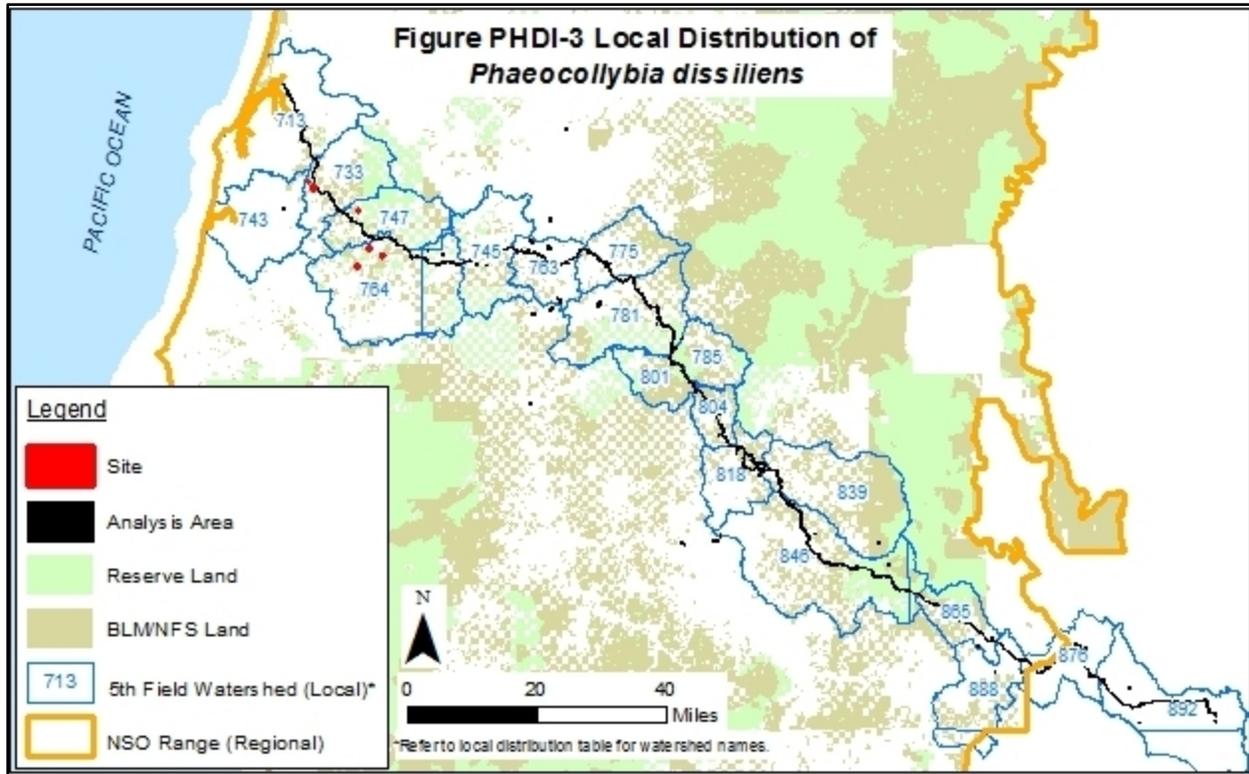
Within the local area, *P. dissiliens* is found in three 5<sup>th</sup> field watersheds that overlap the project area (see Table PHDI-5 and Figure PHDI-3). The sites in several clusters or small groups and are near one another in the western portion of the local area. Across the watersheds, multiple avenues of connectivity appear to be available between sites based on the extent of coniferous and mixed forests, and opportunities for dispersal exist within the local area and to nearby regional areas. Several groups of regional sites are located north of the local area sites in the Coast Range.

All of the 11 sites in the local area are at least partially on BLM lands, with four sites partially on private lands. Most of the local sites are on land designated as Other (Matrix); two sites are in LSRs, representing 18 percent of the BLM-managed sites. The sites in LSRs are in one watershed (Table PHDI-5).

TABLE PHDI-5

Distribution of <i>Phaeocollybia dissiliens</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	1	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	4	2
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	6	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Coniferous and mixed hardwood-coniferous forests below 3,000 feet msl encompass approximately 332,770 acres on BLM and NFS lands in the local area, including 118,560 acres in reserve land allocations (36 percent of the forests). Of this acreage, an estimated 114,000 acres are LSOG, including 52,550 acres in reserve land allocations (46 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the number of sites in the local area and nearby regional area and the extent of forests that may provide suitable habitat (see Figures PHDI-2 and PHDI-3).

#### Analysis/Project Area Distribution

The analysis area contains one site of *P. dissiliens*, but no sites are in the project area. The analysis area site is partially on BLM-managed land (Coos Bay District) designated as Other (Matrix) in the North Fork Coquille River watershed. Several sites are located within the immediate vicinity of the site, including in the same watershed (see Local Distribution discussion above).

Surveys for the PCGP Project did not result in any observation of the species. The recorded observation of the species in the analysis area is from agency databases and was recorded in 2012. The site is located near Blue Ridge MP 24.9.

#### ***Project Impacts***

##### Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 41 sites on BLM- and Forest Service-managed lands in the region, representing approximately 2 percent of the sites (or one out of 44 total sites on all lands in the NSO range). The PCGP

Project would not result in any direct effects on *P. dissiliens* sites, but one site could be indirectly affected by activities related to the construction corridor and associated work areas. Measures outlined in Chapter 1 of Appendix K would be implemented to minimize vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *P. dissiliens* near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

The *P. dissiliens* site in the analysis area could be indirectly affected by activities within the corridor and TEWAs associated with the Blue Ridge alternative, but direct effects on the site are not anticipated. The establishment of the corridor could modify microclimate conditions near the site after the corridor is established. The removal of forests could negatively affect *P. dissiliens* in nearby areas by removing its habitat, reducing the complexity of the habitat, and reducing opportunities for dispersal, potentially affecting site persistence even though the site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 590 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl, including 100 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *P. dissiliens*. Within this impact area, about 360 acres (about 61 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of an estimated 120 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, 10 sites of *P. dissiliens* would remain on BLM lands in the local area, with two in reserves, and 40 sites, including 13 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 13 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 33 percent of the remaining *P. dissiliens* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of

compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *P. dissiliens* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates the species appears to be more common than previously documented, as noted below:
  - *P. dissiliens* has a somewhat limited distribution across three physiographic provinces in one state in the region and a moderate-high number of overall sites (41 on BLM and NFS lands). The species is well distributed in the Coast Range of Oregon. The current known number of sites on BLM and NFS lands is an increase of about 21 sites since 2007.
  - An estimated 32 percent of the sites (13 sites) are in reserves, which is an increase in the number of sites in reserves since 2006 per Molina (2008).
- Coniferous and mixed hardwood-coniferous forests below 3,000 feet msl (general habitat for the species) are widely distributed across the species’ range and encompass approximately 3.9 million acres on BLM and NFS lands with an estimated 51 percent in reserves. A subcomponent of these forests likely provides habitat for *P. dissiliens*.
- The PCGP Project with the Blue Ridge alternative would affect one of 41 BLM- and Forest Service-managed sites of *P. dissiliens*, representing approximately 2 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (40) would continue to be documented on BLM and NFS lands in the region with a wide distribution across Oregon. Ten sites would remain in the local vicinity of the analysis area. The distribution of sites and extent of the species’ range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 13 sites are in LSRs where management actions are restricted to those activities that benefit LSOG forests.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 120 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl (less than 1 percent of the total regional acreage). An estimated 2.0 million acres (51 percent) of the forests and 1.0 million acres (60 percent) of LSOG forests would remain in reserves in the species’ range.
- The remaining forests could support additional populations of *P. dissiliens*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species’ specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have

not been discovered based on the increased number of sites documented during strategic and other surveys.

#### 2.2.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *P. dissiliens* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 40 sites would remain on BLM and NFS lands across the region, and 10 sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *P. dissiliens* at one site, this site is in the Coast Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *P. dissiliens* would persist in the region without considering the site as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 590 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl and 100 acres of LSOG forests (a negligible amount of the forests). An estimated 61 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 2.0 million acres (51 percent) of coniferous and mixed forests below 3,000 feet msl and 1.0 million acres (60 percent) of LSOG forests would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 1998.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is distributed across Oregon.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *P. dissiliens* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *P. dissiliens* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *P. dissiliens* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

### 2.3 PHAEOLLYBIA SPADICEA

Background information for *Phaeocollybia spadicea* is presented in Appendix K to the EIS. This section describes the distribution of the species using updated data and evaluates the impacts of the PCGP Project with the Blue Ridge alternative on the species.

### 2.3.1 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species’ current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *P. spadicea* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table PHSP-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 262 observations from BLM and Forest Service geodatabases were converted into 126 sites in the NSO range (region). Table PHSP-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table PHSP-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure PHSP-1 displays the regional distribution of the species across BLM and NFS lands, and Figure PHSP-2 displays the species’ regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 4,500 feet msl on BLM and NFS lands.

TABLE PHSP-1

<b>Number of <i>Phaeocollybia spadicea</i> Sites (2015)</b>	
<b>Location*</b>	<b>Number of Sites</b>
Regional Area	126
Local Area	31
Analysis Area (Project Area)	1 (0)
Data Source: Processed BLM and Forest Service GIS data, June 23, 2015	
*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.	

TABLE PHSP-2

<b>Distribution of <i>Phaeocollybia spadicea</i> Across Federal, Private, and Other Lands</b>			
<b>Land Ownership</b>	<b>Regional Sites</b>	<b>Local Sites</b>	<b>Analysis Area Sites</b>
BLM	80	30	1
Forest Service	26	-	-
NPS	4	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	31	4	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
 Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



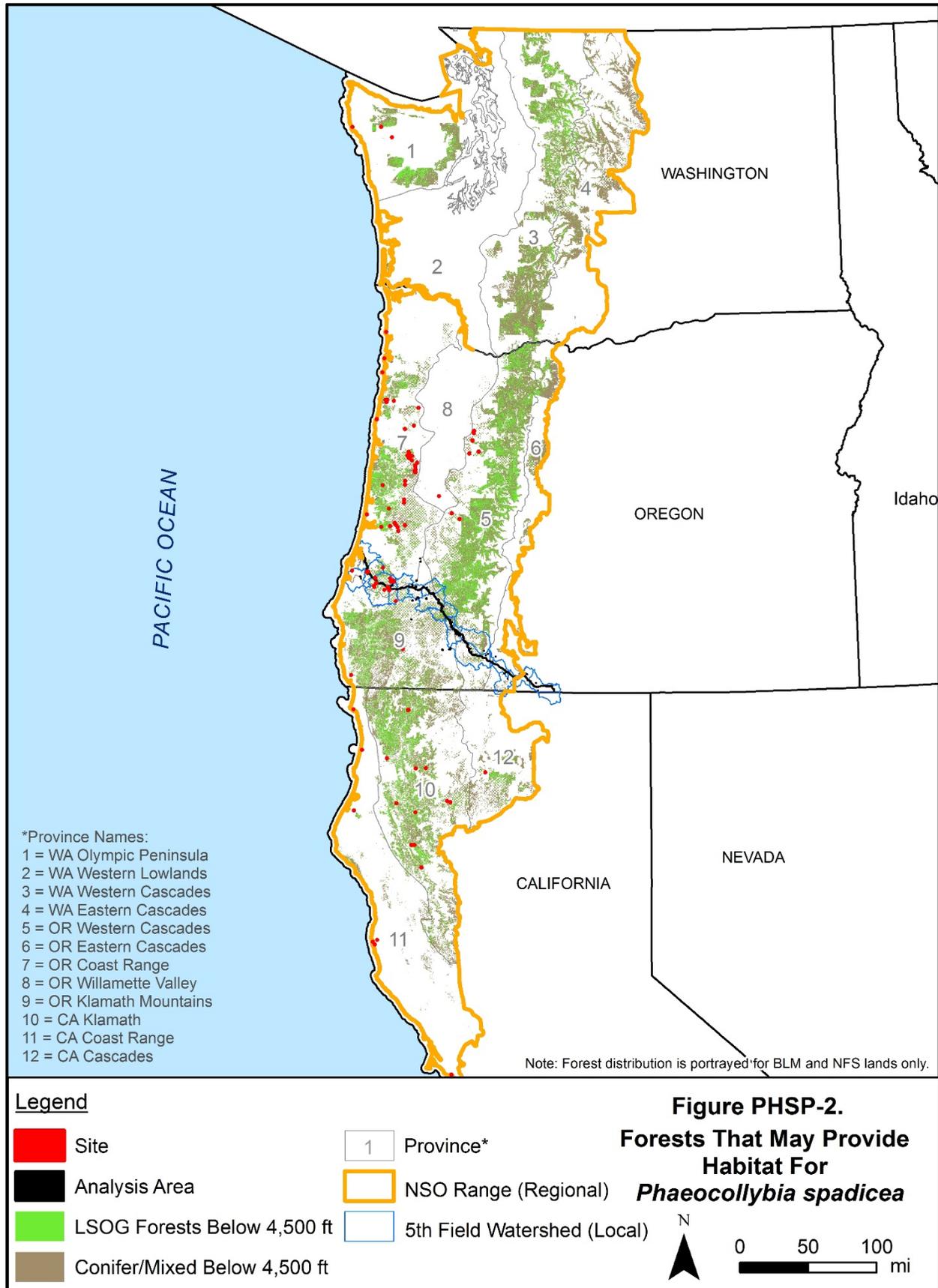


TABLE PHSP-3

Distribution of *Phaeocollybia spadicea* Across 1994 ROD Land Allocations

Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	1	-	-
Adaptive Management Reserves (AMR)	6	-	-
Administratively Withdrawn (AW)	-	-	-
<b>Congressionally Reserved (CR)</b>	<b>1</b>	<b>-</b>	<b>-</b>
<b>Late Successional Reserve (LSR)</b>	<b>46</b>	<b>4</b>	<b>-</b>
<b>Marbled Murrelet Area (LSR3)</b>	<b>1</b>	<b>-</b>	<b>-</b>
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>1</b>	<b>-</b>	<b>-</b>
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	1	-	-
Other (Matrix, Riparian Reserve, Other)	52	26	1
<b>Riparian Reserve</b>	<b>-</b>	<b>-</b>	<b>-</b>

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

Regional Distribution

*P. spadicea* has a wide distribution across eight physiographic provinces in Washington (Olympic Peninsula), Oregon (Coast Range, Willamette Valley, Klamath Mountains, and Cascades West), and California (Coast, Klamath, and Cascades). Most sites are found along the Coast Range in Oregon, where the sites tend to be clustered or relatively close to one another. Scattered sites are found in other areas outside the Coast Range, with a couple of groups of sites in the Klamath Mountains and western Cascade Range. *P. spadicea* appears to be well distributed in the Coast Range in Oregon based on the proximity of sites to one another, which provides opportunities for dispersal, and distribution of sites across forests that may provide suitable habitat in the mountain range.

Of the 126 sites in the region, 31 sites are located on private or other lands (at least partially), four sites are on NPS lands (Olympic and Redwood National Parks), and 106 sites are on BLM and NFS lands (at least partially). Sites managed by the BLM Districts that encompass the project area include 37 sites in the Coos Bay District and one site in the Roseburg District. Sites managed by the National Forests that encompass the project area include two sites on the Rogue River National Forest. The other 66 sites on BLM and NFS lands are in the Arcata, Salem, and Eugene Districts and on the Klamath, Shasta-Trinity, Siuslaw, and Six Rivers National Forests.

Across the NSO range, 49 sites are located on reserve lands managed by BLM and the Forest Service, including 46 in LSRs, one in a Marbled Murrelet Area, one in a Known Owl Activity Center, and one in a Congressionally Reserved Area. This represents 46 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The four NPS sites, while not covered by the S&M Standards and Guidelines, also likely receive some degree of protection based on National Park management.

*P. spadicea* is more commonly found in LSOG forests based on available data (106 of 126 total sites are in LSOG), but it is also found in non-LSOG forests and may not be restricted to LSOG conditions based on available information on its life history and habitat requirements. Based on current site locations, the species is primarily found in coniferous and mixed hardwood-coniferous forests below about 4,500 feet msl and has been documented in most of the NSO

range. Coniferous and mixed hardwood-coniferous forests below 4,500 feet msl, including the LSOG component of these forests, across the NSO range could provide habitat for *P. spadicea* and support additional sites. These forests encompass an estimated 14.6 million acres on BLM and NFS lands in the region, including an estimated 7.5 million acres in reserve land allocations (51 percent of the forests; Table PHSP-4). Of this acreage, an estimated 5.1 million acres are LSOG (see Figure PHSP-2), including 3.1 million acres in reserve land allocations (60 percent of the forests). Although coniferous and mixed forests below 4,500 feet msl are widespread across the NSO range, LSOG forests are less common and are primarily found in the main mountain ranges.

TABLE PHSP-4

Extent of Forests that Could Provide Habitat for <i>Phaeocollybia spadicea</i> on BLM and NFS Lands*				
Location	Coniferous/Mixed Forests below 4,500 feet		LSOG Forests below 4,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	14,636,690	7,516,260	5,134,680	3,103,420
Local Area	510,900	153,180	154,780	63,730
Project Area	1,120	290	230	80

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *P. spadicea* is found in four 5<sup>th</sup> field watersheds that overlap the project area (see Table PHSP-5 and Figure PHSP-3). The sites are clustered and relatively close to one another in the Coast Range and Klamath Mountains in the western portion of the local area. Several sites are located to the north in the Coast Range and further south in the Klamath Mountains. Multiple avenues of connectivity appear to be available between sites in the local area based on the extent of coniferous and mixed hardwood-coniferous forests, and opportunities for dispersal exist between the watersheds and to nearby regional areas.

Of the 31 sites in the local area, 30 sites are at least partially on BLM lands and four sites are at least partially on private lands. Most of the local sites are on land designated as Other (Matrix); four sites are on reserve lands, representing 13 percent of the BLM-managed sites. The four sites on reserve lands are in the Middle Fork and North Fork Coquille River watersheds (Table PHSP-5).

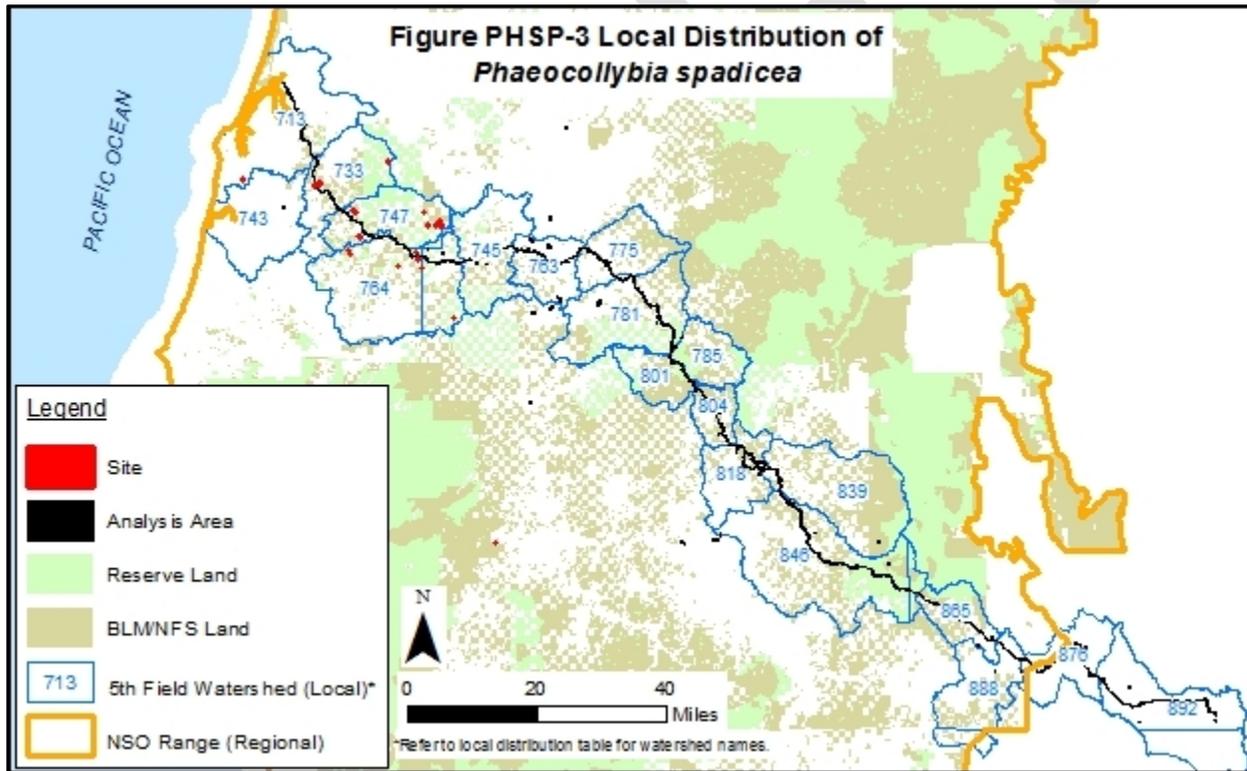
Coniferous and mixed hardwood-coniferous forests below 4,500 feet msl encompass approximately 510,900 acres on BLM and NFS lands in the local area, with 153,180 acres in reserve land allocations (30 percent of the forests). Of this acreage, an estimated 154,780 acres are LSOG, including 63,730 acres in reserves (41 percent of the forests). Other sites may also exist in the local area, particularly in the Coast Range, where surveys have not been completed, based on the number of sites in the local area, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures PHSP-2 and PHSP-3).

TABLE PHSP-5

**Distribution of *Phaeocollybia spadicea* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	1	-
East Fork Coquille River (747)	16	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	8	3
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	6	1
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Analysis/Project Area Distribution

The analysis area contains one site of *P. spadicea*, and no sites are located in the project area. The site is on BLM-managed land (Coos Bay District) designated as Other (Matrix) in the North Fork Coquille River watershed. This site is part of a group of sites in the Coast Range where the species appears to be well distributed, and several sites are located within the immediate vicinity of the site (see Local Distribution discussion above).

Surveys for the PCGP Project did not result in any observations of the species (Siskiyou BioSurvey LLC 2012). The recorded observation of the species in the analysis area is from agency databases and was recorded in 2012. The site is located near Blue Ridge MP 24.9.

### ***Project Impacts***

#### Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 106 sites on BLM- and Forest Service-managed lands in the region, representing approximately 1 percent of the sites (or one out of 126 total sites on all lands in the NSO range). The PCGP Project would not result in any direct effects on *P. spadicea* sites, but one site could be indirectly affected by activities related to the construction corridor and associated work areas. Measures outlined in Chapter 1 of Appendix K would be implemented to minimize vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *P. spadicea* near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

The *P. spadicea* site in the analysis area could be indirectly affected by activities within the corridor and TEWAs associated with the Blue Ridge alternative, but direct effects on the site are not anticipated. The establishment of the corridor could modify microclimate conditions near the site after the corridor is established. The removal of forests could negatively affect *P. spadicea* in nearby areas by removing its habitat, reducing the complexity of the habitat, and reducing opportunities for dispersal, potentially affecting site persistence even though the site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Based on available data, implementation of the Blue Ridge alternative would avoid impacts on one site of *P. spadicea* along the originally proposed route (near MP 21.5), but could affect site persistence at one site along the alternative route.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 880 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl, including 170 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *P. spadicea*. Within this impact area, about 570 acres (about 65 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 180 acres of coniferous and mixed forests below 4,500 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed forests below 4,500 feet msl across the NSO range.

## Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, 29 sites of *P. spadicea* would remain on BLM lands in the local area, including four in reserves, and 105 sites, including 49 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 49 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 47 percent of the remaining *P. spadicea* sites on BLM and NFS lands in the NSO range would be protected in reserves.

## **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *P. spadicea* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates the species appears to be more common than previously documented, as noted below:
  - This species was removed from the S&M Standards and Guidelines via the 2001 Annual Species Review, as a result of new information that demonstrated this species did not meet all of the basic criteria for S&M.
  - *P. spadicea* has a wide distribution across eight physiographic provinces and three states in the region and a moderate-high number of overall sites (106 on BLM and NFS lands). The species appears to be well distributed in the Coast Range in Oregon. The current known number of sites on BLM and NFS lands is an increase of about 41 sites since 2007.
  - An estimated 46 percent of the sites (49 sites) are in reserves, which is an increase of about 13 sites in reserves since 2006 per Molina (2008).
- Coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (general habitat for the species) are widespread across the NSO range and encompass approximately 14.6 million acres on BLM and NFS lands with an estimated 51 percent in reserves. A subcomponent of these forests likely provides habitat for *P. spadicea*.
- The PCGP Project with the Blue Ridge alternative would affect one of the 106 BLM- and Forest Service-managed sites of *P. spadicea*, representing approximately 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be

maintained at the site, a moderate-high number of sites (105) would continue to be documented on BLM and NFS lands in the region with a wide distribution across Washington, Oregon, and California. Many sites (29 sites) would remain in the local vicinity of the analysis area; these sites would continue to be distributed across four 5<sup>th</sup> field watersheds. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.

- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 48 sites are in LSRs where management actions are restricted to those activities that benefit LSOG forests and one site is in a Congressional Reserve where management activities that may adversely affect *P. spadicea* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 180 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (less than 1 percent of the total acreage in the NSO range). An estimated 7.5 million acres (51 percent) of coniferous and mixed forests and 3.1 million acres (60 percent) of LSOG forests below 4,500 feet msl would remain in reserves in the NSO range.
- The remaining forests could support additional populations of *P. spadicea*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys.

### 2.3.2 Conclusions

If implemented as proposed, the PCGP Project with the Blue Ridge alternative would likely affect site persistence of *P. spadicea* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 105 sites would remain on BLM and NFS lands across the region, and 29 sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *P. spadicea* at one site, the site is part of the many sites in the Coast Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *P. spadicea* would persist in the region without considering the single site as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 880 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl and 170 acres of LSOG forests (a negligible amount of the forests). An estimated 65 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 7.5 million acres (51 percent) of coniferous and mixed hardwood-coniferous forests and 3.1 million acres (60 percent) of LSOG forests below 4,500 feet msl would remain in reserves in the NSO

range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 1998.

- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is widely distributed.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *P. spadicea* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *P. spadicea* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *P. spadicea* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

## 2.4 RAMARIA STUNTZII

Background information for *Ramaria stuntzii* is presented in Appendix K to the EIS. This section describes the distribution of the species using updated data and evaluates the impacts of the PCGP Project with the Blue Ridge alternative on the species.

### 2.4.1 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *R. stuntzii* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table RAST-1 presents the total number of sites in the regional (NSO range), local (19 5th field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 297 observations from BLM and Forest Service geodatabases were converted into 131 sites in the NSO range (region). Table RAST-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table RAST-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure RAST-1 displays the regional distribution of the species across BLM and NFS lands, and Figure RAST-2 displays the species' regional distribution with the extent of

coniferous and mixed hardwood-coniferous forests and LSOG forests below 6,000 feet msl on BLM and NFS lands within the currently known range of the species.

TABLE RAST-1

Number of <i>Ramaria stuntzii</i> Sites (2015)	
Location*	Number of Sites
Regional Area	131
Local Area	20
Analysis Area (Project Area)	2 (1)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015  
 \*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE RAST-2

Distribution of <i>Ramaria stuntzii</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	70	20	2
Forest Service	57	-	-
NPS	1	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	12	4	2

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
 Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE RAST-3

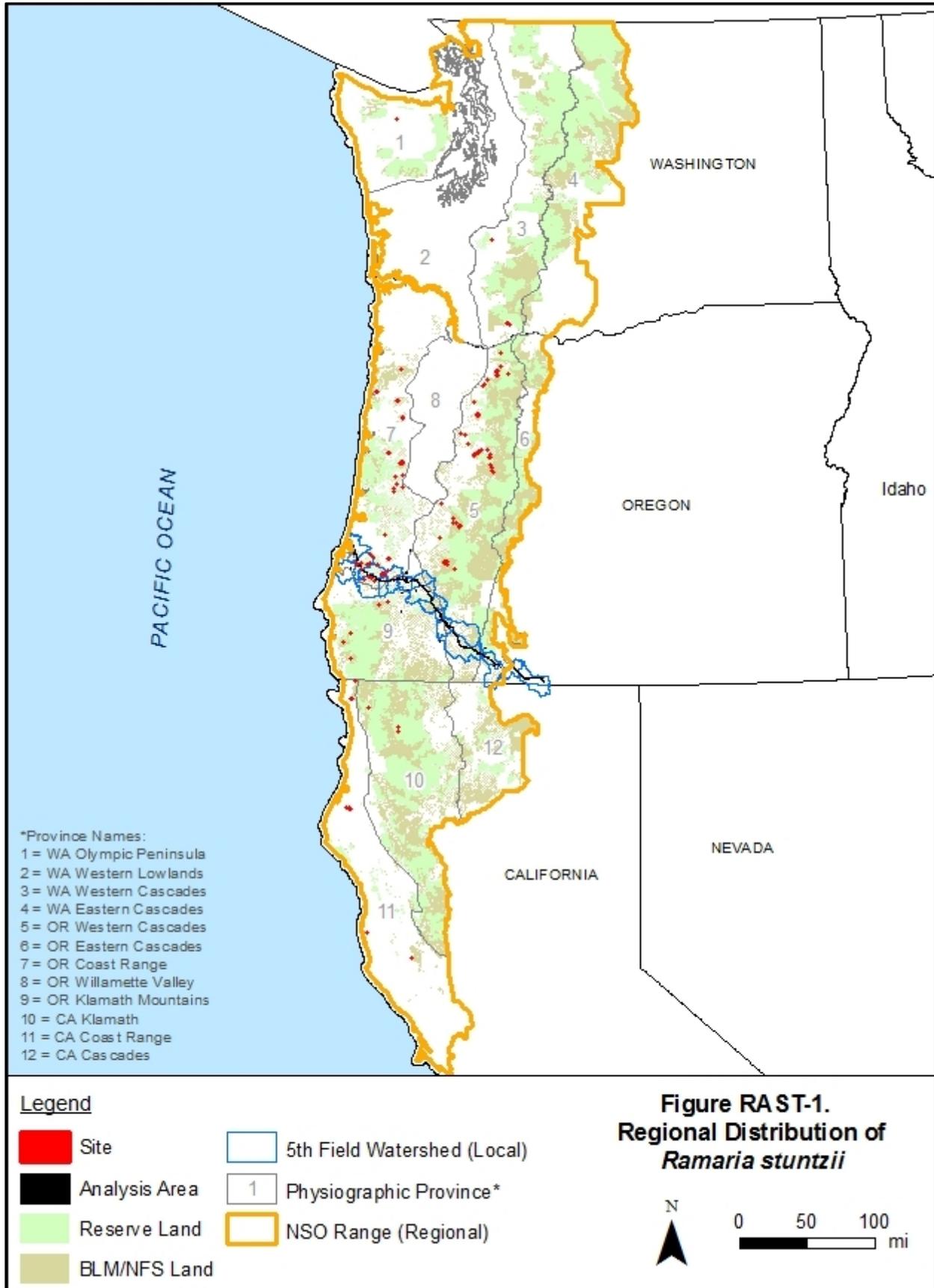
Distribution of <i>Ramaria stuntzii</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	17	-	-
Adaptive Management Reserves (AMR)	5	-	-
Administratively Withdrawn (AW)	1	-	-
<b>Congressionally Reserved (CR)</b>	<b>3</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>35</b>	<b>7</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>2</b>	<b>1</b>	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>2</b>	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	4	-	-
Other (Matrix, Riparian Reserve, Other)	63	13	2
<b>Riparian Reserve</b>	-	-	-

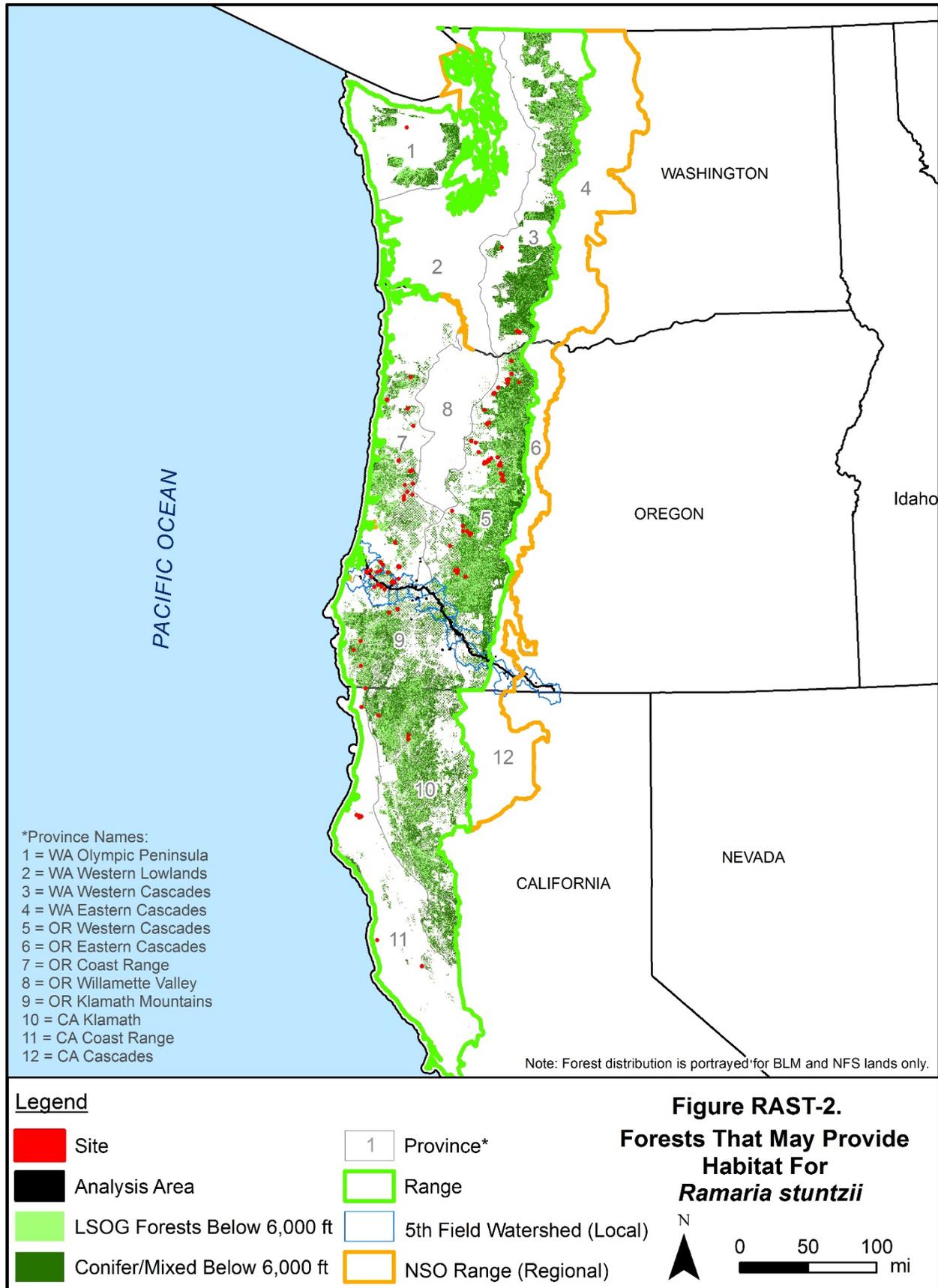
Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0  
 Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.  
**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*R. stuntzii* is somewhat widely distributed across seven physiographic provinces in Washington (Western Cascades and Olympic Peninsula), Oregon (Coast Range, Cascades West, and Klamath Mountains), and California (Coast and Klamath) (see Figure RAST-1). Most sites are found along the western Cascade Range and Coast Range in Oregon, where the sites tend to be clustered or relatively close to one another in groups. Scattered sites are located in the Coast Range in California and in the Klamath Mountains in Oregon, with a single site in northwestern Washington. A large group of sites is found in the southern Coast Range in Oregon. *R. stuntzii* is less abundant outside the Cascade Range and Coast Range based on current site locations. *R. stuntzii* appears to be well distributed in the Coast Range and western Cascade Range in Oregon based on the relative abundance and size of sites, proximity of sites to one another, and distribution of sites across forests that may provide suitable habitat in the mountain ranges.





Twelve of 131 sites are located on private or state lands (at least partially), one site is on NPS land (Olympic National Park), and 127 sites are on BLM and NFS lands across the region (at least partially). Sites managed by the BLM Districts that encompass the project area include 23 sites in the Coos Bay District, two sites in the Medford District, and three sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include three sites on the Rogue River National Forest and 14 sites on the Umpqua National Forest. The other 82 sites on BLM and NFS lands are in the Arcata, Eugene, and Salem Districts and on the Gifford Pinchot, Mt. Hood, Siuslaw, Six Rivers, and Willamette National Forests.

Across the NSO range, 42 sites are located on reserve lands managed by BLM and the Forest Service, including 35 in LSRs, two in Marbled Murrelet Areas, two in Known Owl Activity Centers, and three in Congressionally Reserved areas. This represents 33 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The NPS site, while not covered by the S&M Standards and Guidelines, also likely receives some degree of protection based on National Park management.

*R. stuntzii* is more commonly found in LSOG forests based on available data (123 of 131 total sites are in LSOG), but it has also been found in younger forests near LSOG stands. Based on current site locations, the species is found in coniferous and mixed hardwood-coniferous forests below about 5,300 feet msl and has only been documented in the western part of the NSO range. Coniferous and mixed hardwood-coniferous forests below 6,000 feet msl, including the LSOG component of these forests, in most of the NSO range, excluding the eastern Cascade Range in Oregon and Washington and Cascade Range in California, could provide habitat for *R. stuntzii* and support additional sites. These forests encompass an estimated 13.7 million acres on BLM and NFS lands, including an estimated 7.6 million acres in reserve land allocations (56 percent of the forests; Table RAST-4). Of this acreage, an estimated 5.3 million acres are LSOG (see Figure RAST-2), including 3.3 million acres in reserve land allocations (62 percent of the forests). Although coniferous and mixed hardwood-coniferous forests below 6,000 feet msl are somewhat widespread across the western part of the NSO range, LSOG forests are less common.

TABLE RAST-4

Extent of Forests that Could Provide Habitat for *Ramaria stuntzii* on BLM and NFS Lands\*

Location	Coniferous and Mixed Forests below 6,000 feet		LSOG Forests below 6,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	13,707,530	7,624,230	5,329,960	3,322,720
Local Area	520,780	179,810	173,050	75,990
Project Area	1,330	490	300	150

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *R. stuntzii* is distributed across four 5<sup>th</sup> field watersheds that overlap the project area (see Table RAST-5 and Figure RAST-3). All of the sites are near one another in the western portion of the local area. A large cluster of sites and several scattered sites are located in the regional area within about 20 miles to the north and south in the Coast Range. Across the watersheds, multiple avenues of connectivity appear to be available between sites based on the extent of coniferous and mixed forests, and opportunities for dispersal exist within the local area and to nearby regional areas.

All of the 20 sites in the local area are on BLM lands (at least partially). These sites are located on lands designated as Other (Matrix), LSR, and Marbled Murrelet Area. Four sites are partially on private lands. Of the 20 sites in the local area, eight sites are on reserve lands, representing 45 percent of the sites. The distribution of these reserve sites across the watersheds is depicted on Table RAST-5 and in Figure RAST-3.

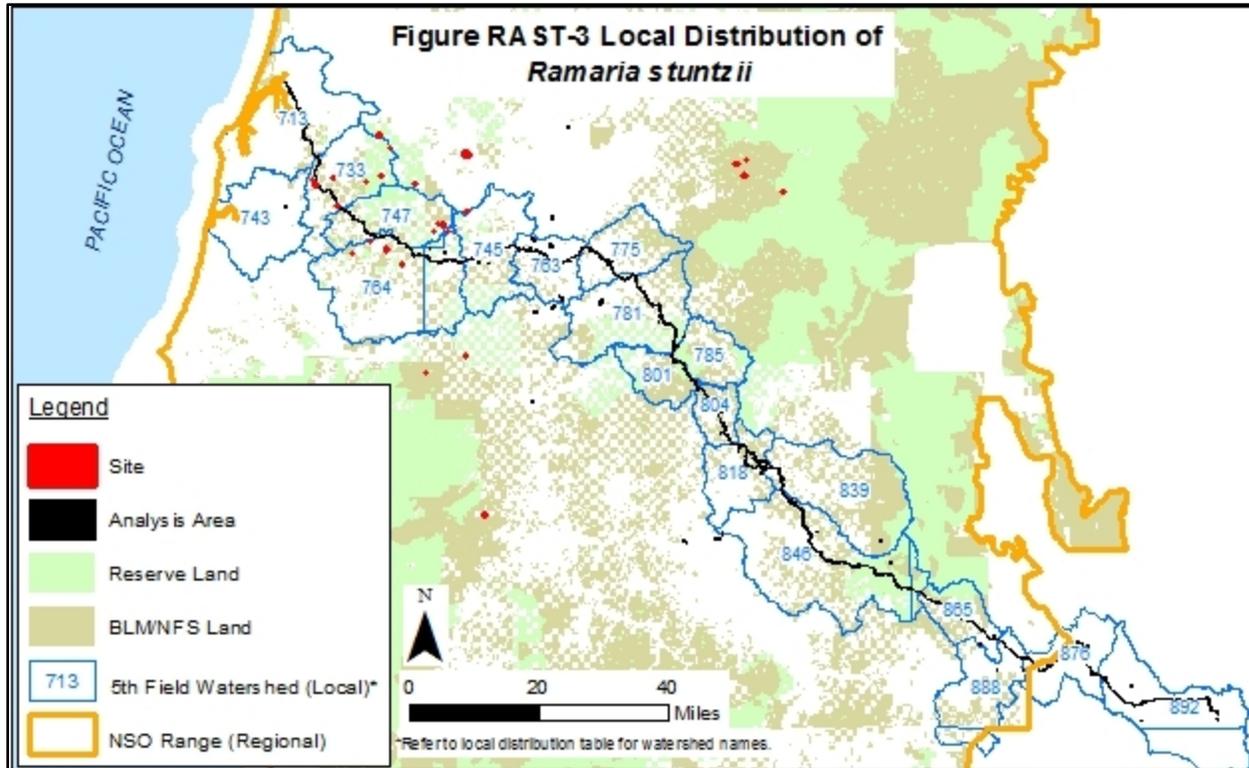
Coniferous and mixed hardwood-coniferous forests below 6,000 feet msl encompass approximately 520,780 acres on BLM and NFS lands in the local area, with 179,810 acres in reserve land allocations (35 percent of the forests). Of this acreage, an estimated 173,050 acres are LSOG, including 75,990 acres in reserves (44 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the number and distribution of sites in the region and the extent of forests that may provide suitable habitat (see Figures RAST-2 and RAST-3).

TABLE RAST-5

**Distribution of *Ramaria stuntzii* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	5	1
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	5	3
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	9	3
Olalla Creek-Lookingglass Creek (745)	1	1
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



### Analysis/Project Area Distribution

The analysis area contains two sites of *R. stuntzii*, and the project area contains one site. The sites are in the North Fork Coquille River watershed and are partially on BLM land and partially on private land. Both sites are on land designated as Other (Matrix). Several other sites exist in the immediate vicinity of the analysis area (see Local Distribution discussion above).

Surveys for the PCGP Project resulted in 10 total observations of *R. stuntzii* in one location in the survey area during 2010 (Siskiyou BioSurvey LLC 2012). These observations comprise one of the sites in the analysis area, which is near MP 27.3. Records from agency geodatabases comprise the other site in the analysis area, which is near Blue Ridge MP 24.9.

### ***Project Impacts***

#### Analysis

The PCGP Project with the Blue Ridge alternative would affect two sites out of the 127 sites on BLM- and Forest Service-managed lands in the region, representing approximately 2 percent of the sites (or one out of 131 total sites on all lands in the NSO range). Table RAST-6 presents an overview of the features of the PCGP Project that would affect the *R. stuntzii* site. The construction corridor and associated work and storage areas would affect approximately 0.1 acre within one site (about 1 percent of all sites in the analysis area). One site could be indirectly affected by the construction corridor and TEWAs associated with the Blue Ridge alternative, but would not be subject to direct effects. Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *R. stuntzii* in and near the

project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE RAST-6

Impacts to <i>Ramaria stuntzii</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.1 ac
Temporary Extra Work Area (TEWA)	1	<0.01 ac
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the main PCGP Project alignment. Site counts are not additive because the site would be subject to impacts from multiple project activities.

Along the main PCGP Project alignment, vegetation removal and grading activities in the construction corridor would disturb about 0.1 acre of vegetation and soils within one site and could remove individuals of *R. stuntzii*. Disturbance in a TEWA would result in similar impacts on less than 0.01 acre within the site. The establishment of the corridor could modify microclimate conditions in the site after the corridor is established. The removal of forests and host trees and disturbance to soil could negatively affect *R. stuntzii* in adjacent areas by removing its habitat, disturbing soil or duff around trees or roots of trees, and affecting its mycorrhizal association with the trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWA could make habitat within the site no longer suitable for the species. Establishment of the corridor and use of TEWAs associated with the Blue Ridge alternative could also modify microclimate conditions near one site, potentially affecting site persistence even though the site would not be directly affected. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Based on available data, implementation of the Blue Ridge alternative would increase impacts on *R. stuntzii* by affecting site persistence at one site along the alternative route in addition to the one site affected by another segment of the PCGP Project.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 1,040 acres of coniferous and mixed hardwood-coniferous forests below 6,000 feet msl, including 220 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *R. stuntzii*. Within this impact area, about 690 acres (about 66 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 220 acres of coniferous and mixed hardwood-coniferous forests below 6,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed forests below 6,000 feet msl across the species' range.

## Discussion

Assuming site persistence cannot be maintained at the two sites as a result of the PCGP Project with the Blue Ridge alternative, 18 sites of *R. stuntzii* would remain on BLM lands in the local area, with eight in reserves, and 125 sites, including 42 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 42 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 34 percent of the remaining *R. stuntzii* sites on BLM and NFS lands in the NSO range would be protected in reserves.

## **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *R. stuntzii* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates that the species appears to be more common than previously documented, as noted below:
  - *R. stuntzii* has a somewhat wide distribution across seven physiographic provinces and three states in the region and a moderate-high number of overall sites (127 on BLM and NFS lands). The species is well distributed in the Coast Range and western Cascade Range in Oregon, but has a scattered distribution in other areas. The current known number of sites on BLM and NFS lands is an increase of 31 sites since 2007, with some sites documented during the PCGP Project surveys.
  - An estimated 33 percent of the sites (42 sites) are in reserves, which is an increase of about four sites in reserves since 2006 per Molina (2008).
- Coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (general habitat for the species) are widely distributed across the western part of the NSO range and encompass approximately 13.7 million acres on BLM and NFS lands with an estimated 56 percent in reserves. A subcomponent of these forests likely provides habitat for *R. stuntzii*.
- The PCGP Project with the Blue Ridge alternative would affect two of 127 BLM- and Forest Service-managed sites of *R. stuntzii*, representing approximately 2 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the sites, a moderate-high number of sites (125) would continue to be

documented on BLM and NFS lands in the region with a somewhat wide distribution across parts of Washington, Oregon, and California. Several sites (18 sites) would remain in the local vicinity of the analysis area; these sites would continue to be distributed across four 5<sup>th</sup> field watersheds. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.

- The PCGP Project would not affect site persistence at any sites in reserves, and the percentage of sites in reserves would be about the same (34 percent). Of the remaining sites, 39 sites are in LSRs where management actions are restricted to those activities that benefit LSOG forests and three sites are in Congressionally Reserved areas where management activities that may adversely affect *R. stuntzii* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 220 acres of coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 7.6 million acres (56 percent) of coniferous and mixed forests and 3.3 million acres (62 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *R. stuntzii*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO, particularly in the Coast Range and Cascade Range, that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

#### 2.4.2 Conclusions

If implemented as proposed, the PCGP Project with the Blue Ridge alternative would likely affect site persistence of *R. stuntzii* at two sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 125 sites would remain on BLM and NFS lands across the region, and 18 sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *R. stuntzii* at two sites, these sites are part of a large group of sites in the Coast Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *R. stuntzii* would persist in the region without considering the sites as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 1,040 acres of coniferous and mixed hardwood-coniferous forests and 220 acres of LSOG coniferous and mixed forests below 6,000 feet msl (a negligible amount of the forests). An estimated 66 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 7.6 million acres (56 percent) of coniferous and mixed forests and 3.3

million acres (62 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 1998.

- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is somewhat widely distributed.

The PCGP Project with the Blue Ridge alternative would not be able to avoid the two *R. stuntzii* sites in the analysis area, although some individuals within the sites may persist following project implementation. Based on the above conclusions, avoidance of the *R. stuntzii* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for *R. stuntzii* sites affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the sites and adjacent habitat over the long term.

DRAFT



## 3.0 LICHENS

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### 3.1 BRYORIA SUBCANA

*Bryoria subcana* is a fruticose lichen in the Parmeliaceae family and is commonly known as horsehair lichen.

#### 3.1.1 Regulatory Status and Ranking

The 2001 ROD identifies *B. subcana* as a Category B (rare) species. The ORBIC evaluated *B. subcana* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was between rare, uncommon, or threatened, but not immediately imperiled, and not rare and apparently secure globally, but with cause for long-term concern, within its global range (G3G4) and was imperiled because of rarity or other factors that make it vulnerable to extirpation in Oregon (S2). The species is on the ORBIC List 2. It is considered a BLM and Forest Service Sensitive species in Oregon.

#### 3.1.2 Background Information

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*B. subcana* is a fruticose lichen that is typically found hanging on branches of conifer and hardwood trees in coastal areas (Glavich 2013). Asexual reproduction through thallus fragmentation and the use of soridea is the main form of reproduction for this species. Soredia are dispersed by wind or animals over long distances, and thallus fragments disperse over shorter distances. It has a moderate rate of growth and reproduction, so that reduced populations can recover through natural recolonization over a period of several years (ORBIC 2004).

#### *Range*

*B. subcana* has been found in western and eastern North America and Great Britain (ORBIC 2004). In western North America, it is primarily found within about 30 miles of the coast from Alaska to central California. The species has been reported in the Adirondack Mountains in New York (Shmull et al. 2002). Within the range of the NSO, *B. subcana* is found along the coast and in the Cascade Range in Washington, Oregon, and California. The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across western and eastern North America and northern Europe. Regional and local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### **Population Status**

The ORBIC (2004) reported *B. subcana* from less than 30 element occurrences in western North America and note that the species is sparse across its global range. In western North America, Oregon had the highest number of occurrences at 11, with fewer in Washington (7) and California (3) (ORBIC 2004). The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 22 sites on federal lands and 23 total sites on all lands in the NSO range.

For the PCGP Project and Blue Ridge alternative, surveys for S&M lichens were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011) and in 2012 and 2014 within 50–200 feet on either side of the alternative construction corridor route. These surveys targeted Category A, B, and C lichens and other special-status lichens, including *B. subcana*, and resulted in one observation of a population of *B. subcana* near the Blue Ridge route. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### **Habitat**

*B. subcana* is found in high humidity mixed hardwood-coniferous forests up to about 4,400 feet msl (Glavich 2013). The lichen grows on the bark and wood of conifer or hardwood trees. The most common host trees are Sitka spruce, western hemlock, Douglas-fir, and noble fir. *B. subcana* seems to prefer sun-exposed Douglas-fir trees at least 100 years old in the Coast Range near Coos Bay, where it has the largest density of occurrences. Typical of other lichens, *B. subcana* becomes most abundant in older forests, but it may be found in lower densities in younger forests. Based on available information, *B. subcana* may prefer specific microclimate conditions of LSOG forests, but it is not likely restricted to these forests.

### **Threats**

As with other *Bryoria* species, threats to *B. subcana* are those actions that alter stand conditions and habitat integrity, such as damage to colonized bark or wood, alterations to light and moisture, air pollution, and climate change (Glavich 2013). Other threats include timber harvest in coastal forests that prevents the development of LSOG forests, disturbance to soils and trees from recreational activities, and development.

### **Management Recommendations**

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *B. subcana* in 2000 and updated in 2013 (Glavich 2013). The guidance includes:

- Develop practices to route human use away from habitat areas.
- Manage fire in species habitat areas, with emphasis on prevention.
- Restrict removal of trees, shrubs, or other vegetation from species habitat areas, except when removal will not harm habitat integrity.

- Consider opportunities for managing sites during Forest Plan and Resource Management Plan revisions, such as administratively withdrawn designations, or by prescribing special standards and guidelines.

### 3.1.3 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species’ current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *B. subcana* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table BRSU-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 63 observations from BLM and Forest Service geodatabases were converted into 33 sites in the NSO range (region). Table BRSU-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table BRSU-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure BRSU-1 displays the regional distribution of the species across BLM and NFS lands, and Figure BRSU-2 displays the species’ regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 4,500 feet msl on BLM and NFS lands within the current known range of the species.

TABLE BRSU-1

Number of <i>Bryoria subcana</i> Sites (2015)	
Location*	Number of Sites
Regional Area	33
Local Area	9
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE BRSU-2

Distribution of <i>Bryoria subcana</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	20	9	1
Forest Service	11	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	8	2	1

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



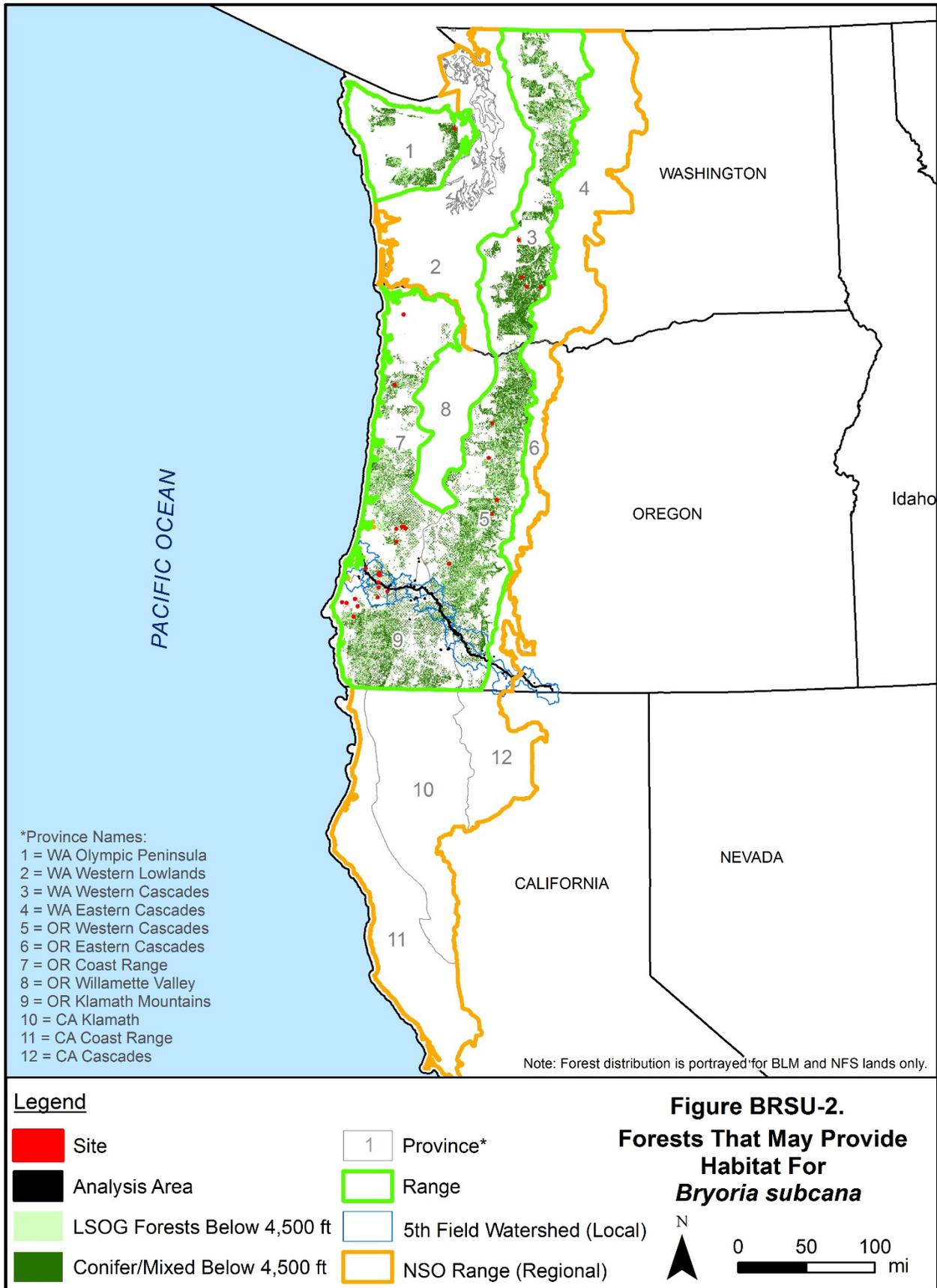


TABLE BRSU-3

Distribution of <i>Bryoria subcana</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	4	-	-
Adaptive Management Reserves (AMR)	-	-	-
Administratively Withdrawn (AW)	-	-	-
<b>Congressionally Reserved (CR)</b>	<b>1</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>12</b>	<b>4</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>4</b>	<b>2</b>	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	14	5	1
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*B. subcana* has a somewhat wide distribution across five physiographic provinces in Washington (Western Cascades, Olympic Peninsula) and Oregon (Coast Range, Cascades West, and Klamath Mountain). Most of the sites are found in southern Oregon in the Klamath Mountains and southern Coast Range, where sites are clustered and relatively close to one another in groups. Scattered sites are located in the western Cascade Range in Washington and Oregon. *B. subcana* does not appear to be well distributed across its range based on the scattered distribution of groups of sites and individual sites that appear somewhat isolated from other sites.

Of the 33 sites in the region, 31 sites are on BLM and NFS lands (at least partially) and eight sites are located on private or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include 19 sites in the Coos Bay District and one site in the Roseburg District. Sites managed by the National Forests that encompass the project area include one site on the Rogue River National Forest. The other 10 sites on NFS lands are on the Gifford Pinchot, Olympic, Siuslaw, and Willamette National Forests.

Across the NSO range, 16 sites are located on reserve lands managed by BLM and the Forest Service, including 12 in LSRs (at least partially), one in a Congressionally Reserved area, and four in Marbled Murrelet Areas (at least partially). This represents 52 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*B. subcana* is more commonly found in LSOG forests based on available data (25 of 33 total sites are in LSOG), but it is also found in younger forests with high humidity. Based on current site locations, the species is found in coniferous and mixed hardwood-coniferous forest types below about 4,300 feet msl and has been documented in part of the NSO range. Coniferous and mixed hardwood-coniferous forests below 4,500 feet msl, including the LSOG component of these forests, in the western Cascade Range in Washington and Oregon, Coast Range and Klamath Mountains in Oregon, and Olympic Peninsula in Washington could provide habitat for *B. subcana* and support additional sites. These forests encompass an estimated 8.8 million acres on BLM and NFS lands in the species' range, including an estimated 4.8 million acres in reserve land allocations (54 percent of the forests; Table BRSU-4). Of this acreage, an estimated 3.6

million acres are LSOG (see Figure BRSU-2), including 2.2 million acres in reserve land allocations (62 percent of the forests). These forests are widespread across the species’ range, but the species is likely restricted to a component of the forests that provides high humidity and suitable local conditions.

TABLE BRSU-4

**Extent of Forests that Could Provide Habitat for *Bryoria subcana* on BLM and NFS Lands\***

Location	Conifer/Mixed Forests below 4,500 feet		LSOG Forests below 4,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	8,784,300	4,772,900	3,596,760	2,238,920
Local Area	456,860	145,080	151,360	62,690
Project Area	1120	290	230	80

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

**Local Distribution**

Within the local area, *B. subcana* is distributed across three 5<sup>th</sup> field watersheds that overlap the project area (see Table BRSU-5 and Figure BRSU-3). All local sites are relatively close to one another in the North Fork, East Fork, and Middle Fork Coquille River watersheds. The sites appear to have some level of connectivity between them and others in the nearby Klamath Mountains and Coast Range.

All of the nine sites in the local area are at least partially on BLM and NFS lands, and two sites are at least partially on private lands. The sites are located on lands designated as Other (Matrix), LSR, and Marbled Murrelet Area. Of the nine sites in the local area, five sites are on reserve lands, representing 56 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table BRSU-5 and on Figure BRSU-3.

Coniferous and mixed hardwood-coniferous forests below 4,500 feet msl encompass approximately 456,860 acres on BLM and NFS lands in the local area, with 145,080 acres in reserve land allocations (32 percent of the forests). Of this acreage, an estimated 151,360 acres are LSOG, including 62,690 acres in reserve land allocations (41 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the distribution of sites in the local and nearby regional areas and extent of forests that may provide suitable habitat (see Figures BRSU-2 and BRSU-3).

TABLE BRSU-5

**Distribution of *Bryoria subcana* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	-	-
East Fork Coquille River (747)	5*	5**
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	4*	1
Middle South Umpqua River (763)	-	-

TABLE BRSU-5

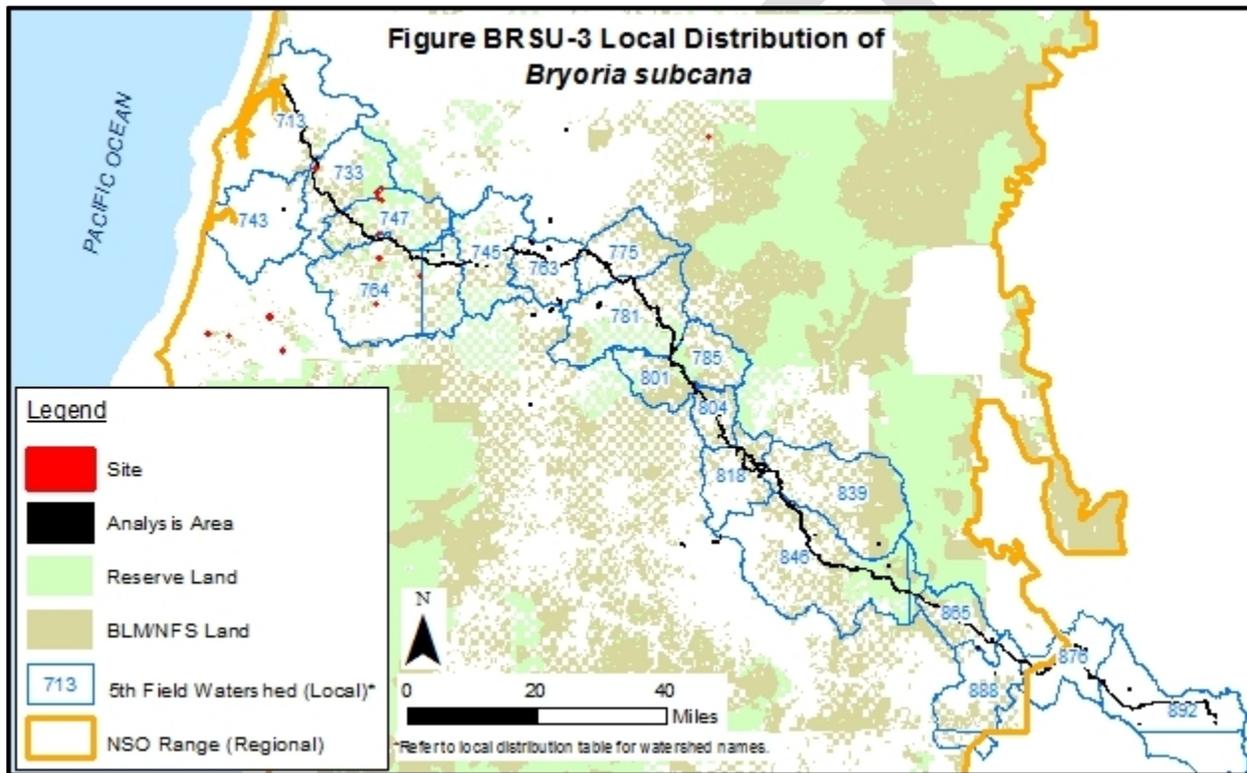
**Distribution of *Bryoria subcana* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	4	3**
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011  
 Note: Site counts are not additive because some sites occur in multiple watersheds and the counts overlap, as noted below:

\*One site in a reserve is in the Middle Fork and East Fork Coquille River watersheds.

\*\*Three sites in reserves are in the North Fork and East Fork Coquille River watersheds.



Analysis/Project Area Distribution

The analysis and project areas contain one site of *B. subcana*. This site is on BLM-managed land designated as Other (Matrix) in the North Fork Coquille River watershed. The site is partially on private land. The nearest site is located approximately 10 miles to the east of the site.

Surveys for the PCGP Project resulted in one observation of the species in one location near the Blue Ridge alternative in 2012. The one observation comprises the single site in the analysis area. The site is near Blue Ridge MP 21.9.

**Project Impacts**

Analysis

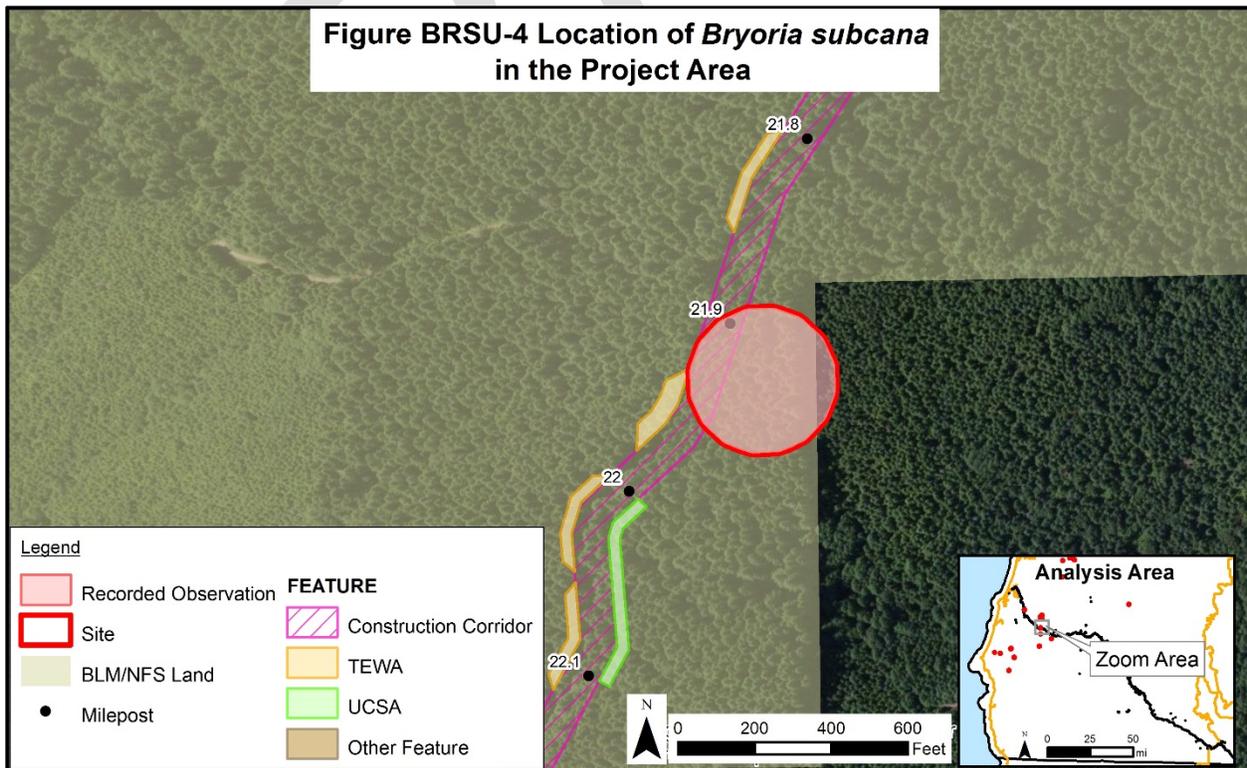
The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 31 sites of *B. subcana* on BLM and NFS lands in the region, representing approximately 3 percent of the sites (or one out of 33 total sites on all lands in the NSO range). Table BRSU-6 presents an overview of the features of the PCGP Project that would affect the *B. subcana* sites. The construction corridor would affect approximately 0.5 acre (14 percent) of the site (the site encompasses approximately 2.7 acres) (see Figure BRSU-4). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *B. subcana* in and near the project area. Based on the number of overall sites of *B. subcana*, the effects on one site could potentially alter the distribution of the species in the NSO range if site persistence is affected. This discussion presents a detailed analysis of the features of the PCGP Project with the Blue Ridge alternative that could affect site persistence.

TABLE BRSU-6

Impacts to <i>Bryoria subcana</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.5 ac
Temporary Extra Work Area (TEWA)	-	-
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the Blue Ridge alternative.



The Blue Ridge alternative would result in ground disturbance and vegetation removal in the western third of the site near MP 21.9. The recorded observation of the species is just east of the project area and may be avoided by activities within the corridor (see Figure BRSU-4). However, the species would be subject to indirect effects associated with the Blue Ridge alternative based on the proximity of project activities to the observation.

Establishment of the construction corridor would disturb vegetation and soils within 200 feet around the recorded observation in the site. The area in the site is heavily forested, and the establishment of the corridor could modify microclimate conditions around the recorded observation. The removal of trees and woody debris could negatively affect *B. subcana* in adjacent areas by removing its habitat and affecting its association with the trees, affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions within 200 feet of the observation as a result of the corridor would likely make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project.

Based on this analysis, *B. subcana* is not likely to persist at the site following project implementation. This site is one of nine sites in the local area and part of a large group of sites in southwestern Oregon, where most sites are located. It may be important for dispersal of the species in areas near the coast. However, with the Blue Ridge alternative, if the species does not persist at this site, *B. subcana* would still be found in southwestern Oregon with continued opportunities for dispersal in the local and nearby regional areas.

Across the project area, the PCGP Project would remove an estimated 880 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl, including 170 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *B. subcana*. Within this impact area, about 570 acres (about 65 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 180 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 4,500 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, eight sites of *B. subcana* would remain on BLM and NFS lands in the local area, including five in reserves, and 30 sites, including 16 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 16 sites in reserves are assumed to have additional protections by the NWFPP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 53 percent of the remaining *B. subcana* on BLM and NFS lands in the NSO range would be protected in reserves.

## Summary

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *B. subcana* is a Category B (rare) species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species, as noted below:
  - *B. subcana* has a somewhat wide distribution across five physiographic provinces in two states and a moderate-high number of overall sites (31 on BLM and NFS lands). Despite its distribution, the species does not appear to be well distributed in its range in the NSO range. The current known number of sites on BLM and NFS lands is an increase of about nine sites since 2007.
  - An estimated 52 percent of the sites (16 sites) are in reserves.
- Coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (general habitat for the species) are widely distributed across the species’ range and encompass approximately 8.8 million acres on BLM and NFS lands with an estimated 54 percent in reserves. A subcomponent of these forests likely provides habitat for *B. subcana*.
- The PCGP Project with the Blue Ridge alternative would affect one of 31 BLM- and Forest Service-managed sites of *B. subcana*, representing approximately 3 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (30) would continue to be documented on BLM and NFS lands in the region with a somewhat wide distribution across Washington and Oregon. Several sites (eight sites) would remain in the local vicinity of the analysis area with several other sites in the nearby Klamath Mountains and Coast Range. The distribution of sites and extent of the species’ range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.
- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 16 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and one site is at least partially in a Congressionally Reserved area where management activities that may adversely affect *B. subcana* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 180 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (less than 1 percent of the total regional acreage). An estimated 4.8 million acres (54 percent) of coniferous and mixed forests and 2.2 million acres (62 percent) of LSOG forests below 4,500 feet msl would remain in reserves in the species’ range.

- The remaining forests could support additional populations of *B. subcana*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during pre-disturbance, strategic, and other surveys.

### 3.1.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *B. subcana* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 30 sites would remain on BLM and NFS lands across the region, and eight sites would remain on BLM and NFS lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *B. subcana* at one site, the site is part of a group of sites in the Klamath Mountains and Coast Range in southwestern Oregon. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *B. subcana* would persist in the region without considering the site as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 880 acres of coniferous and mixed hardwood-coniferous forests below 4,500 feet msl and 170 acres of LSOG forests (a negligible amount of the forests). An estimated 65 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 4.8 million acres (54 percent) of coniferous and mixed forests and 2.2 million acres (62 percent) of LSOG forests below 4,500 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect the overall distribution of the species because it is distributed across five physiographic provinces.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *B. subcana* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *B. subcana* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *B. subcana* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

## 3.2 CETRELIA CETRARIOIDES

*Cetrelia cetrarioides* is an epiphytic lichen in the Parmeliaceae family and is commonly known as speckled rag lichen, sea-storm lichen, or giant shield lichen.

### 3.2.1 Regulatory Status and Ranking

The 2001 ROD identifies *C. cetrarioides* as a Category E (rare) species. The ORBIC evaluated *C. cetrarioides* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and in the 2007 *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2007). The species was dropped from the assessment in 2007 because it was considered too common. In 2004, the species was between not rare and apparently secure, but with cause for long-term concern, and widespread, abundant, and secure within its global range (G4G5) and was between imperiled because of rarity or other factors that make it vulnerable to extirpation and rare, uncommon, or threatened, but not immediately imperiled, in Oregon (S2S3). The species was removed from the ORBIC lists in 2007. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

### 3.2.2 Background Information

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*C. cetrarioides* is a riparian and epiphytic lichen that is typically found on the bark of conifer and hardwood trees in riparian areas (Helliwell 2007a). Asexual reproduction through the use of soridea is the main form of reproduction for this species. Soredia are dispersed by wind or animals over long distances.

#### *Range*

*C. cetrarioides* has been found in western and eastern North America, Europe, and Asia (Helliwell 2007a). In western North America, it occurs in coastal areas from Alaska to Oregon. In eastern North America, it is found in the Appalachian Mountains. Its range in Eurasia extends from most of Europe to China and the Russian Far East. Within the range of the NSO, *C. cetrarioides* is found from the west side of the Cascade Range to the coast in Washington and Oregon. The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across western and eastern North America, Europe, and Asia. Regional and local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### **Population Status**

The ORBIC (2004) reported *C. cetrarioides* from an estimated 52 element occurrences in the Pacific Northwest, including 32 in Oregon and 20 in Washington. It was noted as being common in Europe. The species was found in two locations during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 58 sites on federal lands and 96 total sites on all lands in the NSO range.

For the PCGP Project and Blue Ridge alternative, surveys for S&M lichens were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011) and in 2012 and 2014 within 50–200 feet on either side of the alternative construction corridor route. These surveys targeted Category A, B, and C lichens and other special-status lichens and resulted in one observation of a population of *C. cetrarioides* near the Blue Ridge route. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### **Habitat**

*C. cetrarioides* is typically found in moist riparian and valley bottom forests with hardwood (e.g., red alder, maple) and conifer trees (e.g., Douglas-fir) (Helliwell 2007a). The lichen grows on the bark of tree trunks and occasionally on mossy rocks. The most common host tree is red alder. Typical of other riparian lichens, *C. cetrarioides* requires high humidity and direct moisture and grows in higher densities on older, large trees (Holthausen et al. 1994). The lichen is also more common at mid- to low elevations. Based on available information, *C. cetrarioides* is not likely restricted to specific microclimate conditions of LSOG forests as much as it is restricted to high moisture habitats.

### **Threats**

As with other riparian lichens, threats to *C. cetrarioides* are those actions that remove host trees or degrade habitat (Helliwell 2007a). Because of their humidity requirements, air pollution is also a threat to riparian lichens (Holthausen et al. 1994). Other threats include human development, tree thinning in riparian stands, and other disturbance in riparian reserves.

### **Management Recommendations**

For Category E S&M species, the direction from the 2001 ROD is to manage all known sites until a determination can be made regarding which S&M category, if any, the species should be assigned to (USDA and USDI 2001). No management recommendations have been developed for *C. cetrarioides*.

### **3.2.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

**Species Distribution**

The distribution of *C. cetrarioides* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table CECE-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 272 observations from BLM and Forest Service geodatabases were converted into 128 sites in the NSO range (region). Table CECE-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table CECE-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure CECE-1 displays the regional distribution of the species across BLM and NFS lands, and Figure CECE-2 displays the species’ regional distribution with the extent of coniferous, mixed hardwood-coniferous, and hardwood forests and LSOG forests below 6,500 feet msl on BLM and NFS lands within the current known range of the species.

TABLE CECE-1

Number of <i>Cetrelia cetrarioides</i> Sites (2015)	
Location*	Number of Sites
Regional Area	128
Local Area	3
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015  
 \*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE CECE-2

Distribution of <i>Cetrelia cetrarioides</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	22	3	1
Forest Service	62	-	-
NPS	2	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	48	-	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
 Notes: Columns are not additive because some sites occur on lands in multiple ownerships.



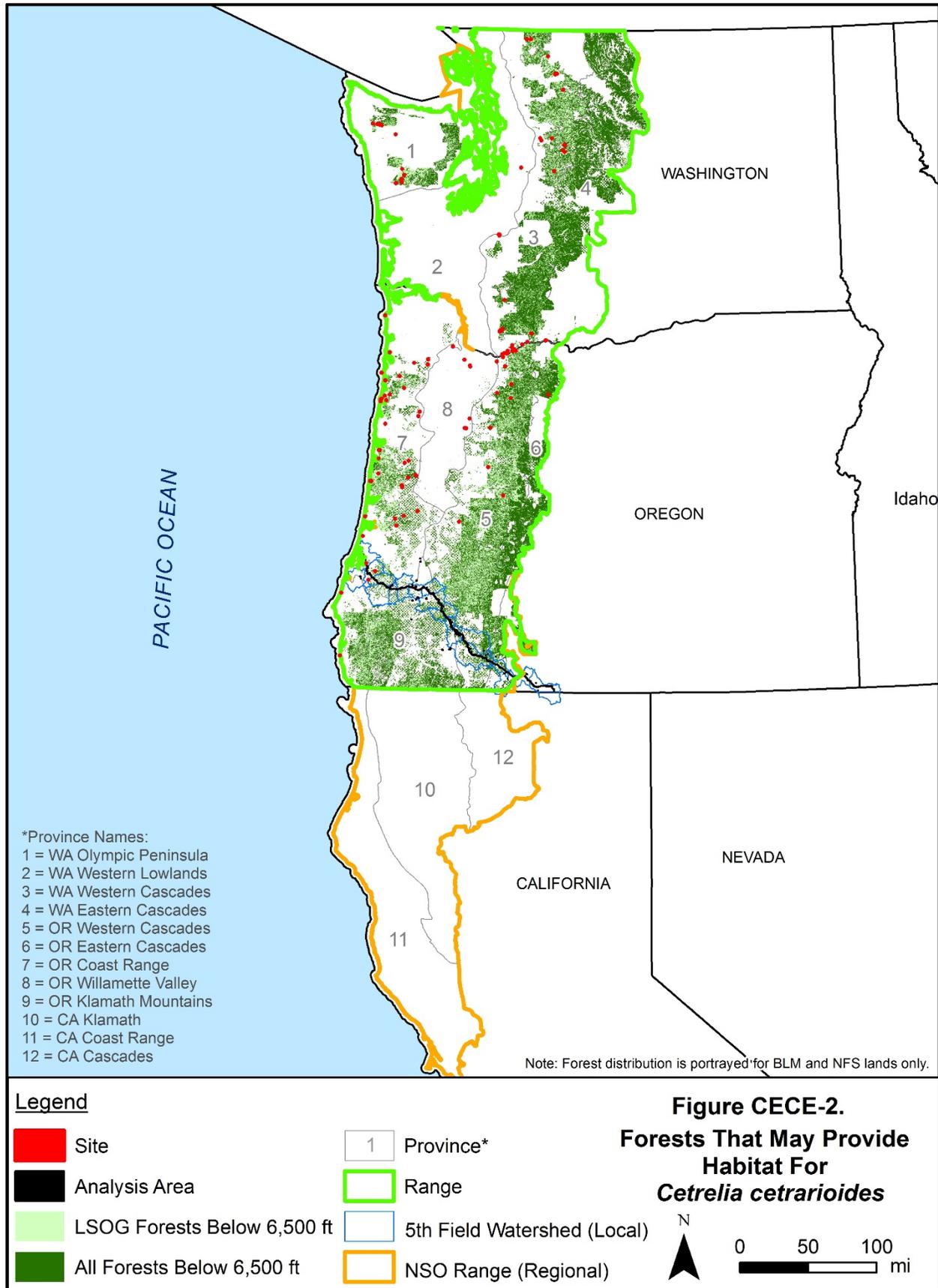


TABLE CECE-3

Distribution of <i>Cetrrelia cetrarioides</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	11	-	-
Adaptive Management Reserves (AMR)	6	-	-
Administratively Withdrawn (AW)	10	-	-
<b>Congressionally Reserved (CR)</b>	<b>4</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>21</b>	-	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>1</b>	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>1</b>	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	38	3	1
<b>Riparian Reserve**</b>	<b>1</b>	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).

### Regional Distribution

*C. cetrarioides* has a wide distribution across nine physiographic provinces in Washington (Western Cascades, Eastern Cascades, Olympic Peninsula, and Western Lowlands) and Oregon (Coast Range, Cascades West and East, Willamette Valley, and Klamath Mountain). Most of the sites are found in the Coast Range and western Cascade Range, where many sites are clustered and relatively close to one another in groups. Scattered sites are located in other areas of Washington and Oregon. *C. cetrarioides* appears to be well distributed in the Coast Range in Oregon and western Cascade Range in Oregon and Washington based on the distribution and abundance of sites and proximity of sites to one another.

Of the 128 sites in the region, 84 sites are on BLM and NFS lands (at least partially), two are on National Park Service land, and 48 sites are located on private or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include seven sites in the Coos Bay District. The other 77 sites on BLM and NFS lands are in the Eugene and Salem Districts and on the Gifford Pinchot, Mt. Baker-Snoqualmie, Mt. Hood, Olympic, Siuslaw, and Willamette National Forests.

Across the NSO range, 26 sites are located on reserve lands managed by BLM and the Forest Service, including 21 in LSRs (at least partially), four in Congressionally Reserved areas (at least partially), one in a Marbled Murrelet Area, and one in a Known Owl Activity Center. This represents 31 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The two NPS sites, while not covered by the S&M Standards and Guidelines, also likely receive some degree of protection based on National Park management.

*C. cetrarioides* is more commonly found in LSOG forests based on available data (96 of 128 total sites are in LSOG), but it is also found in non-LSOG forests and is more likely restricted to high humidity forests. Based on current site locations, the species is found in all forest types below about 6,400 feet msl and has been documented in part of the NSO range. Coniferous,

mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl, including the LSOG component of these forests, in Washington and Oregon could provide habitat for *C. cetrarioides* and support additional sites. These forests encompass an estimated 14.7 million acres on BLM and NFS lands in the species’ range, including an estimated 8.3 million acres in reserve land allocations (56 percent of the forests; Table CECE-4). Of this acreage, an estimated 4.6 million acres are LSOG (see Figure CECE-2), including 2.9 million acres in reserve land allocations (62 percent of the forests). These forests are widespread across the species’ range, but the species is likely restricted to a component of the forests that provides high humidity and suitable local conditions.

TABLE CECE-4

Extent of Forests that Could Provide Habitat for <i>Cetrelia cetrarioides</i> on BLM and NFS Lands*				
Location	All Forests below 6,500 feet		LSOG Forests below 6,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	14,694,420	8,274,180	4,595,240	2,848,020
Local Area	615,950	204,040	186,640	81,430
Project Area	1,560	510	330	160

Data Source: GNN vegetation data from Moerur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

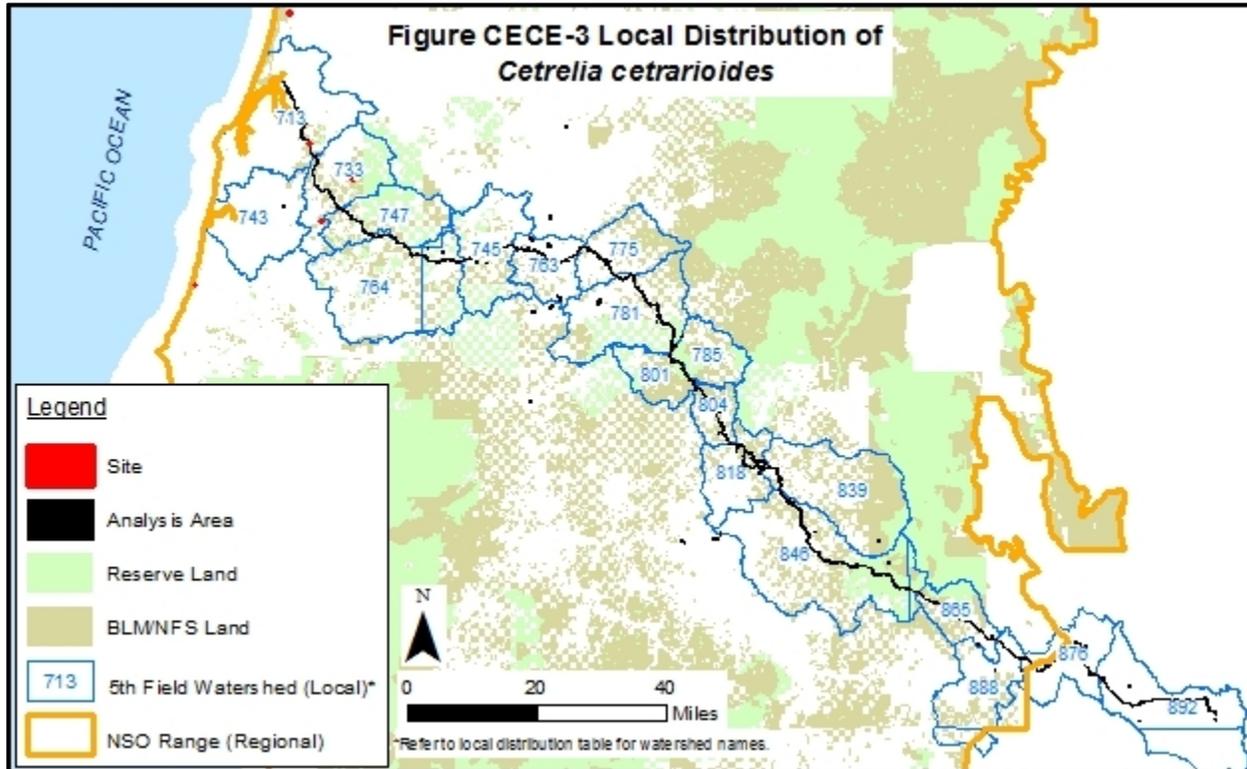
Within the local area, *C. cetrarioides* is distributed across two 5<sup>th</sup> field watersheds that overlap the project area (see Table CECE-5 and Figure CECE-3). The three local sites are relatively close to one another on BLM-managed lands in the North Fork Coquille River and Coos Bay Frontal watersheds. All local sites are on lands designated as Other (Matrix); none are on reserve lands. The sites appear to have some level of connectivity between them and others in the nearby Klamath Mountains and Coast Range.

TABLE CECE-5

Distribution of <i>Cetrelia cetrarioides</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	1	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	2	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011

Coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl encompass approximately 615,950 acres on BLM and NFS lands in the local area, with 204,040 acres in reserve land allocations (33 percent of the forests). Of this acreage, an estimated 186,640 acres are LSOG, including 81,430 acres in reserve land allocations (44 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the distribution of sites in the local and nearby regional areas and extent of forests that may provide suitable habitat (see Figures CECE-2 and CECE-3).



### Analysis/Project Area Distribution

The analysis and project areas contain one site of *C. cetrarioides*. This site is on BLM-managed land designated as Other (Matrix) in the Coos Bay Frontal watershed. The nearest site is located approximately 17 miles to the southeast of the site.

Surveys for the PCGP Project resulted in one observation of the species in one location near the Blue Ridge alternative in 2014. The one observation comprises the single site in the analysis area. The site is near Blue Ridge MP 17.6.

### ***Project Impacts***

#### Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 84 sites of *C. cetrarioides* on BLM and NFS lands in the region, representing approximately 1 percent of the sites (or one out of 128 total sites on all lands in the NSO range). Table CECE-6 presents an overview of the features of the PCGP Project that would affect the *C. cetrarioides* sites. The construction corridor would affect approximately 0.9 acre (33 percent) of the site (the

site encompasses approximately 2.7 acres) (see Figure CECE-4). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *C. cetrarioides* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE CECE-6

Impacts to <i>Cetrelia cetrarioides</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.5 ac
Temporary Extra Work Area (TEWA)	1	0.1 ac
Uncleared Storage Area (UCSA)	1	0.3 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the Blue Ridge alternative. Site counts are not additive because the site would be subject to impacts from multiple project activities.

Along the Blue Ridge alternative, vegetation removal and grading activities in the construction corridor would disturb about 0.5 acres of vegetation and soils within the site and could result in the removal of *C. cetrarioides* populations or individuals on trees that are removed. Disturbance in the TEWAs would result in similar impacts on about 0.1 acre within the site. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and host trees could negatively affect *C. cetrarioides* in adjacent areas by removing its habitat and potential host trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 0.3 acre of understory habitat in the site, which could modify microhabitats near extant populations or individuals, potentially making the habitat unsuitable for the species, but individuals on trees are not likely to be removed or disturbed.

Across the project area, the PCGP Project would remove an estimated 1,230 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl, including 250 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *C. cetrarioides*. Within this impact area, about 810 acres (about 66 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat. A permanent unforested corridor would also remain across the project area, resulting in a permanent loss of about 260 acres of coniferous, mixed, and hardwood forests below 6,500 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 6,500 feet msl across the species' range.

Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, two sites of *C. cetrarioides* would remain on BLM lands in the local area, and 83 sites, including 26 in reserves, would remain on BLM and NFS lands in the

NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 26 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 31 percent of the remaining *C. cetrarioides* on BLM and NFS lands in the NSO range would be protected in reserves.

### Summary

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *C. cetrarioides* is a Category E (rare) species throughout the NSO range. Per the 2001 ROD, information on Category E species is insufficient to determine what level of management is needed for reasonable assurance of species persistence. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates that the species appears to be more common than previously documented, as noted below:
  - *C. cetrarioides* has a wide distribution across nine physiographic provinces in two states and a moderate-high number of overall sites (84 on BLM and NFS lands). The species appears to be well distributed in the Coast Range and western Cascade Range. The current known number of sites on BLM and NFS lands is an increase of about 26 sites since 2007.
  - An estimated 31 percent of the sites (26 sites) are in reserves.
- Coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl (general habitat for the species) are widespread across the species’ range and encompass approximately 14.7 million acres on BLM and NFS lands with an estimated 56 percent in reserves. *C. cetrarioides* is likely restricted to a subcomponent of these forests based on available information on its habitat and life history requirements.
- The PCGP Project with the Blue Ridge alternative would affect one of 84 BLM- and Forest Service-managed sites of *C. cetrarioides*, representing approximately 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (83) would continue to be documented on BLM and NFS lands in the region with a wide distribution across Washington and Oregon. Some sites (two sites) would remain in the local vicinity of the analysis area with several other sites in the nearby Klamath Mountains and Coast Range. The distribution of sites and extent of the species’ range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.

- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 23 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and four sites are at least partially in Congressionally Reserved areas where management activities that may adversely affect *C. cetrarioides* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 260 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl (less than 1 percent of the total regional acreage). An estimated 8.3 million acres (56 percent) of all forests and 2.8 million acres (62 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *C. cetrarioides*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category E species for which pre-disturbance surveys are not applicable and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during pre-disturbance, strategic, and other surveys.

### 3.2.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *C. cetrarioides* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 83 sites would remain on BLM and NFS lands across the region, and two sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *C. cetrarioides* at one site, the site is part of a group of sites in the Klamath Mountains and Coast Range in western Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *C. cetrarioides* would persist in the region without considering the site as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 1,230 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 6,500 feet msl (a negligible amount of the forests). Although an estimated 66 percent of these forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 8.3 million acres (56 percent) of all forests and 2.8 million acres (62 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect the overall distribution of the species because it is widely distributed across Oregon and Washington.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *C. cetrarioides* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *C. cetrarioides* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *C. cetrarioides* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

### 3.3 CHAENOTHECA CHRYSOCEPHALA

Background information for *Chaenotheca chrysocephala* is presented in Appendix K to the EIS. This section describes the distribution of the species using updated data and evaluates the impacts of the PCGP Project with the Blue Ridge alternative on the species.

#### 3.3.1 Persistence Evaluation

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### *Species Distribution*

The distribution of *C. chrysocephala* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1. Table CHCH-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 406 observations from BLM and Forest Service geodatabases were converted into 224 sites in the NSO range (region). Table CHCH-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table CHCH-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure CHCH-1 displays the regional distribution of the species across BLM and NFS lands, and Figure CHCH-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 6,000 feet msl on BLM and NFS lands.

TABLE CHCH-1

Number of <i>Chaenotheca chrysocephala</i> Sites (2015)	
Location*	Number of Sites
Regional Area	224
Local Area	88
Analysis Area (Project Area)	14 (14)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE CHCH-2

Distribution of *Chaenotheca chrysocephala* Across Federal, Private, and Other Lands

Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	181	88	14
Forest Service	42	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	43	18	5

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE CHCH-3

Distribution of *Chaenotheca chrysocephala* Across 1994 ROD Land Allocations

Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	38	-	-
Adaptive Management Reserves (AMR)	29	-	-
Administratively Withdrawn (AW)	5	-	-
<b>Congressionally Reserved (CR)</b>	<b>4</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>31</b>	<b>9</b>	<b>2</b>
<b>Marbled Murrelet Area (LSR3)</b>	<b>5</b>	<b>5</b>	<b>3</b>
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>1</b>	<b>1</b>	<b>1</b>
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	118	78	12
<b>Riparian Reserve**</b>	<b>1</b>	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

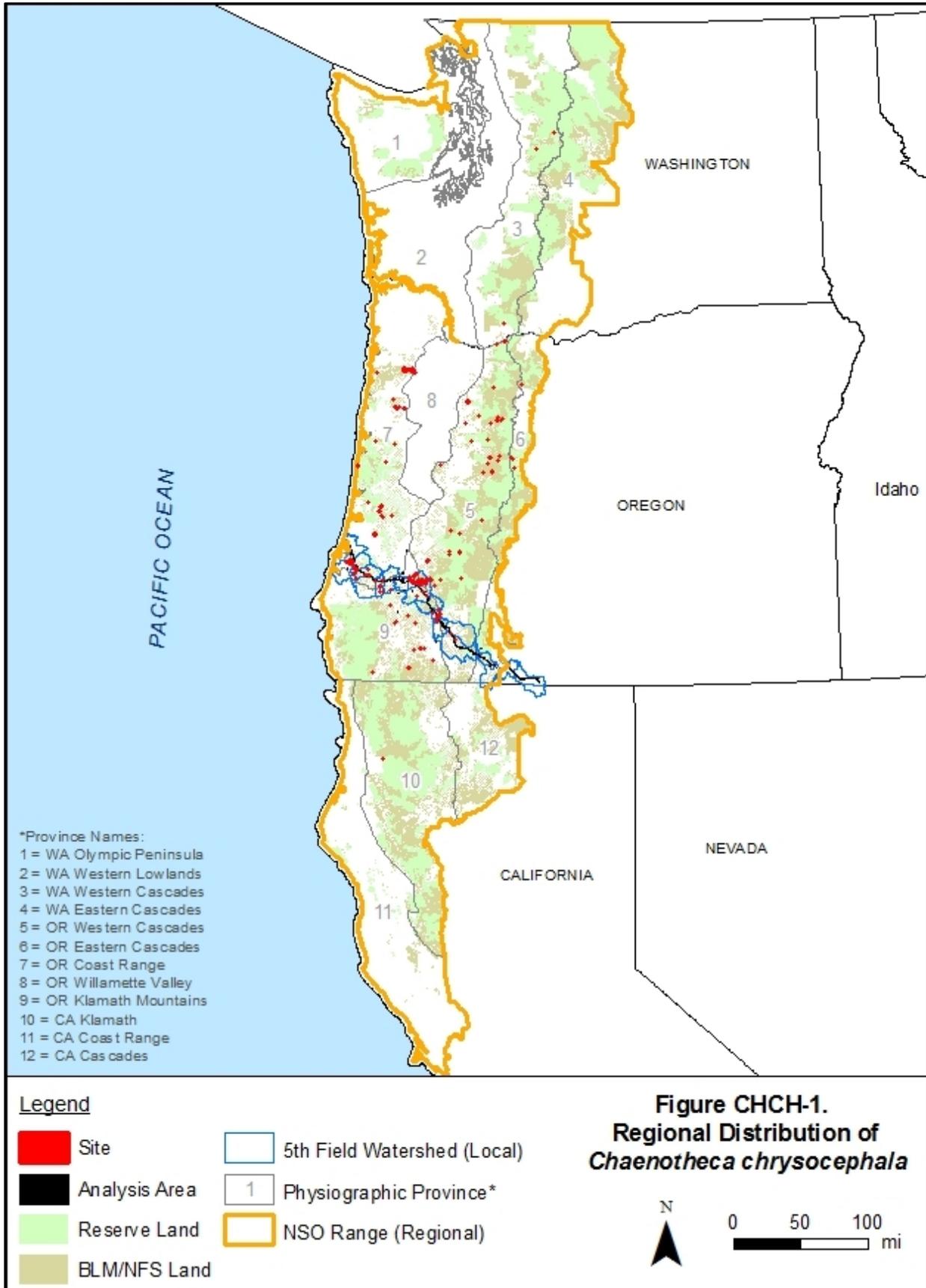
**Bolded** allocations are designated reserve areas.

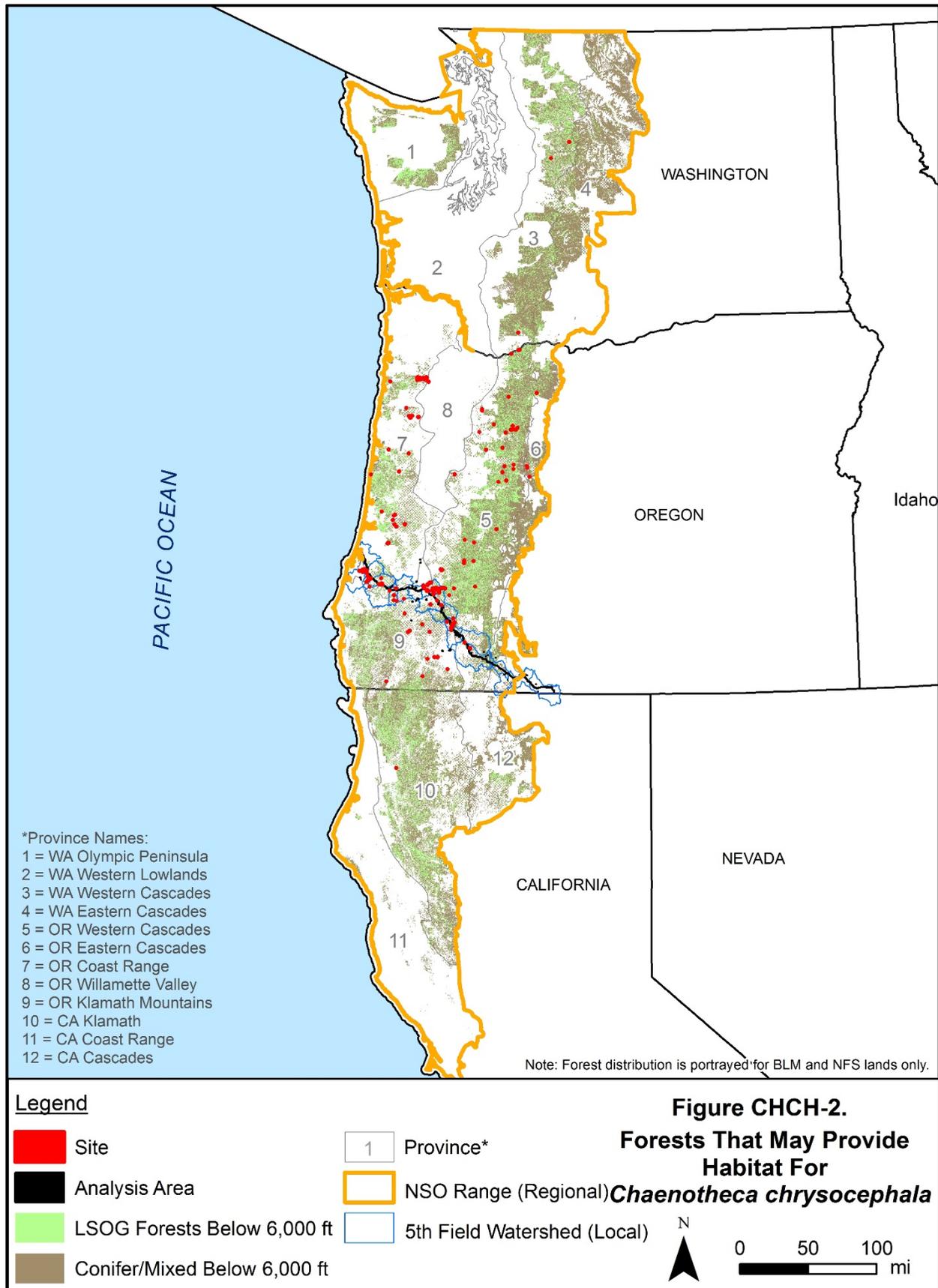
\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).

Regional Distribution

*C. chrysocephala* is somewhat widely distributed across seven physiographic provinces in Washington (Western Cascades), Oregon (Coast Range, Cascades West and East, Willamette Valley, and Klamath Mountains), and California (Klamath) (see Figure CHCH-1). Most sites are found along the Coast Range, Klamath Mountains, and western Cascade Range in Oregon, where many sites are clustered and near other sites. Sites are scattered in other areas, with a few apparently isolated sites in California and Washington. Many opportunities for dispersal between sites in the Cascade Range, Coast Range, and Klamath Mountains appear to exist based on the proximity of sites to one another and the extent of forests that may provide suitable habitat. *C. chrysocephala* appears to be well distributed in its range in Oregon based on the abundance of sites, proximity of sites to one another, and distribution of sites across forests that may provide suitable habitat in the mountain ranges.





Of the 224 sites in the region, 43 sites are located on private lands (at least partially) and 222 sites are at least partially on BLM and NFS lands. Sites managed by the BLM Districts that encompass the project area include 45 sites in the Coos Bay District, 28 sites in the Medford District, and 45 sites in the Roseburg District (one site is partially on the Umpqua National Forest). Sites managed by the National Forests that encompass the project area include one site on the Rogue River National Forest and eight sites on the Umpqua National Forest (one site is partially in the Roseburg District). The other 96 sites on BLM and NFS lands are in the Eugene and Salem Districts and on the Deschutes, Gifford Pinchot, Mt. Baker-Snoqualmie, Mt. Hood, Siskiyou, Siuslaw, Six Rivers, and Willamette National Forests.

Across the NSO range, 41 sites are located on reserve lands managed by BLM and the Forest Service, including 31 in LSRs (at least partially), five in Marbled Murrelet Areas, one in a Known Owl Activity Center, four in Congressionally Reserved areas (at least partially), and one in a Riparian Reserve. This represents approximately 19 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*C. chrysocephala* is more commonly found in LSOG forests based on available data (197 of 224 total sites are in LSOG), but it is also found in non-LSOG forests and has been documented in young stands and edge habitats. Based on current site locations, the species is found primarily in coniferous and mixed-hardwood coniferous forests below about 5,300 feet msl and has been documented in most of the NSO range. Coniferous and mixed hardwood-coniferous forests below 6,000 feet msl, including the LSOG component of these forests, across the NSO range could provide habitat for *C. chrysocephala* and support additional sites. These forests encompass an estimated 18.1 million acres on BLM and NFS lands in the region, including an estimated 9.9 million acres in reserve land allocations (55 percent of the forests; Table CHCH-4). Of this acreage, an estimated 5.9 million acres are LSOG (see Figure CHCH-2), including 3.7 million acres in reserve land allocations (62 percent of the forests). Although coniferous and mixed hardwood-coniferous forests below 6,000 feet msl are widespread across the region, LSOG forests are less common and are primarily found in the main mountain ranges.

TABLE CHCH-4

Extent of Forests that Could Provide Habitat for <i>Chaenotheca chrysocephala</i> on BLM and NFS Lands*				
Location	Coniferous/Mixed Forests below 6,000 feet		LSOG Forests below 6,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	18,066,540	9,909,630	5,912,860	3,650,600
Local Area	570,840	192,010	182,040	79,240
Project Area	1,430	500	330	150

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *C. chrysocephala* is distributed across 10 5<sup>th</sup> field watersheds that overlap the project area (see Table CHCH-5 and Figure CHCH-3). The sites tend to be clustered or in small groups in most of the watersheds. Most of the sites appear to have some level of connectivity between them and others in the regional area, with multiple opportunities for

dispersal, based on the extent of coniferous and mixed hardwood-coniferous forests in the watersheds and region.

All of the 88 sites in the local area are at least partially on BLM lands (none are on NFS lands), and 18 sites are partially on private lands. The sites on BLM lands are located on lands designated as LSR, Marbled Murrelet Area, Known Owl Activity Center, and Other (Matrix). Of the 88 sites in the local area, 15 sites are on reserve lands, representing 17 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table CHCH-5 and on Figure CHCH-3. These sites are in LSRs and are distributed across five of the watersheds.

Coniferous and mixed hardwood-coniferous forests below 6,000 feet msl encompass approximately 570,840 acres on BLM and NFS lands in the local area, with 192,010 acres in reserve land allocations (34 percent of the forests). Of this acreage, an estimated 182,040 acres are LSOG, including 79,240 acres in reserves (44 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the number and distribution of sites in the regional and local areas and the extent of forests that may provide suitable habitat (see Figures CHCH-2 and CHCH-3).

TABLE CHCH-5

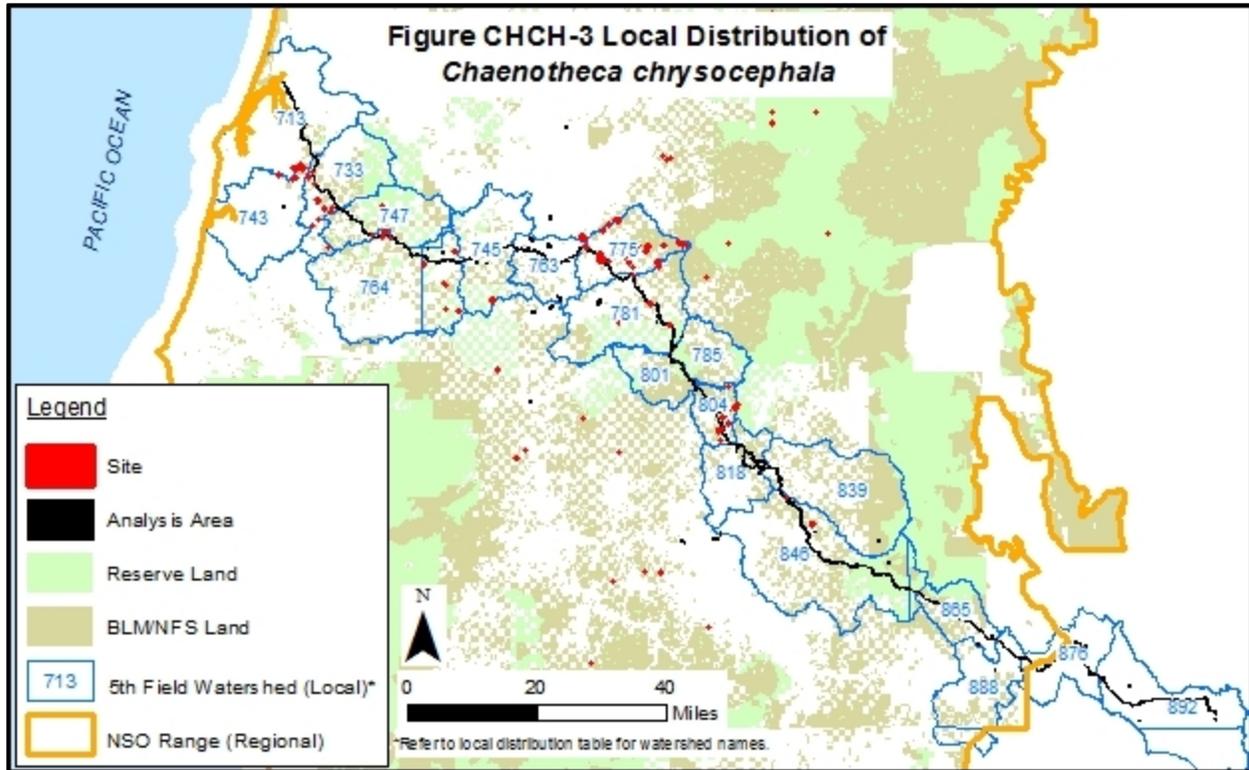
Distribution of <i>Chaenotheca chrysocephala</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	13*	-
East Fork Coquille River (747)	4**	3
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	4	-
Lower Coquille River (743)	5*	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	13**	8
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	21***	1
North Fork Coquille River (733)	11	-
Olalla Creek-Lookingglass Creek (745)	1	1
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	7***	4
Spencer Creek (865)	-	-
Trail Creek (804)	13	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011  
Note: Site counts are not additive because some sites occur in multiple watersheds and the counts overlap, as noted below:

\*One site is in the Coos Bay Frontal and Lower Coquille River watersheds.

\*\*One site is in the East Fork Coquille River and Middle Fork Coquille River watersheds.

\*\*\*One site is in the Myrtle Creek and South Umpqua River watersheds.



### Analysis/Project Area Distribution

The analysis and project areas contain 14 sites of *C. chrysocephala*, all of which are at least partially on BLM lands. Five sites are partially on private lands. Twelve sites on BLM lands are at least partially located on lands designated as Other (Matrix), and six sites are at least partially within LSRs. The analysis area sites are in seven watersheds: Myrtle Creek and South Umpqua River watersheds in the Roseburg District, Little Butte Creek and Trail Creek watersheds in the Medford District, and East Fork, Middle Fork, and North Fork Coquille River watersheds in the Coos Bay District. Several sites are located within the immediate vicinity of the analysis area (see Local Distribution discussion above).

Surveys for the PCGP Project and Blue Ridge alternative resulted in multiple observations of the species in about 31 locations along the originally proposed route (Edge Environmental 2013) and one observation of the species along the Blue Ridge route. These recorded observations comprise the 14 sites in the analysis area. Within the project area, one site is located near Blue Ridge MP 22.9, three sites are located between MPs 35.3 and 38.9, eight sites are located between MPs 75.6 and 97.8, one site is near MP 118.9, and one site is located near MP 137.

### ***Project Impacts***

#### Analysis

The PCGP Project with the Blue Ridge alternative would affect 14 sites out of the 222 sites on BLM- and Forest Service-managed lands in the region, representing approximately 6 percent of the sites (or 14 out of 224 total sites on all lands in the NSO range). Table CHCH-6 presents an overview of the features of the PCGP Project that would affect the *C. chrysocephala* sites. The construction corridor and associated work and storage areas would affect approximately 40.6

acres within the sites (about 12 percent of the sites). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *C. chrysocephala* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE CHCH-6

Impacts to <i>Chaenotheca chrysocephala</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	12	18.0 ac
Temporary Extra Work Area (TEWA)	11	6.4 ac
Uncleared Storage Area (UCSA)	8	15.3 ac
Roads (TMP)	1	0.9 ac
Other Minimal Disturbance Activity	1	0.1 ac

ac = acres

Note: Site counts are not additive because some sites would be subject to impacts from multiple project activities.

Vegetation removal and grading activities in the construction corridor would disturb about 18.0 acres of vegetation and soils within 12 sites and could result in the removal of *C. chrysocephala* populations or individuals on trees that are removed. Disturbance in the TEWAs would result in similar impacts on about 6.4 acres within 11 sites. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and host trees could negatively affect *C. chrysocephala* in adjacent areas by removing its habitat and potential host trees, potentially affecting site persistence even if the entire site is not disturbed, although the species may be resilient to edge effects at some sites. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the sites no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 15.3 acres of understory habitat in eight sites, which could modify microhabitats near extant populations or individuals, potentially making the habitat unsuitable for the species, but individuals on trees are not likely to be removed or disturbed. Road improvements and establishment would disturb approximately 0.9 acre within one site and could remove habitat and extant populations or individuals of *C. chrysocephala*. Hydrostatic testing would take place on less than 0.1 acre of one site and is not likely to affect individuals or populations of the species because it would be done after the pipeline is installed and would not affect trees.

Along the Blue Ridge alternative, one site would be affected by activities in the construction corridor (0.1 acre of the site) and adjacent UCSA (0.2 acre of the site), as described above. These activities would disturb about 11 percent of the site (the site encompasses 2.7 acres). Habitat conditions in the site could be modified as a result of changes to humidity and microclimate conditions, potentially making the habitat unsuitable for the species. Based on available data, implementation of the Blue Ridge alternative would avoid impacts on two sites of *C. chrysocephala* along the originally proposed route, but could affect site persistence at one site along the alternative route.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 1,130 acres of coniferous and mixed hardwood-coniferous forests below 6,000 feet

msl, including 250 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *C. chrysocephala*. Within this impact area, about 760 acres (about 67 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some of the restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 250 acres of coniferous and mixed hardwood-coniferous forests below 6,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed forests below 6,000 feet msl across the NSO range.

### Discussion

Assuming site persistence cannot be maintained at the 14 sites as a result of the PCGP Project with the Blue Ridge alternative, 74 sites of *C. chrysocephala* would remain on BLM lands in the local area, including nine in reserves, and 208 sites, including 35 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 35 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 17 percent of the remaining *C. chrysocephala* on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *C. chrysocephala* is a Category B (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates that the species appears to be more common than previously documented, as noted below:
  - *C. chrysocephala* has a somewhat wide distribution across seven physiographic provinces and three states in the region and a moderate-high number of overall sites (222 on BLM and NFS lands). The species appears to be well distributed in its range in Oregon, but has a spotty distribution in California and Washington. The current known number of sites on BLM and NFS lands is an increase of about 197 sites on BLM and NFS lands since 2007, with many sites documented during the PCGP Project surveys.
  - An estimated 19 percent of the sites (41 sites) are in reserves.

- Coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (general habitat for the species) are widely distributed across the region and encompass approximately 18.1 million acres on BLM and NFS lands with an estimated 55 percent in reserves. A subcomponent of these forests likely provides habitat for *C. chrysocephala*.
- The PCGP Project with the Blue Ridge alternative would affect 14 of 222 BLM- and Forest Service-managed sites of *C. chrysocephala*, representing approximately 6 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the 14 sites, a moderate-high number of sites (208) would continue to be documented on BLM and NFS lands in the region with a somewhat wide distribution across Oregon and a lower abundance in Washington and California. Many sites (74 sites) would remain in the local vicinity of the analysis area with many other sites in the nearby Klamath Mountains and Coast Range. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.
- The PCGP Project with the Blue Ridge alternative would affect site persistence at six sites in LSRs, but the proportion of sites in reserves would remain about the same (17 percent). Of the remaining sites, 31 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and four sites are at least partially in Congressionally Reserved areas where management activities that may adversely affect *C. chrysocephala* are unlikely. One site is at least partially in a Riparian Reserve, where management actions are restricted to those activities that benefit the conservation of aquatic and riparian-dependent terrestrial resources.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 250 acres of coniferous and mixed hardwood-coniferous forests below 6,000 feet msl (less than 1 percent of the total regional acreage). An estimated 9.9 million acres (55 percent) of coniferous and mixed forests and 3.7 million acres (62 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the NSO range.
- The remaining forests could support additional populations of *C. chrysocephala*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

### 3.3.2 Conclusions

If implemented as proposed, the PCGP Project with the Blue Ridge alternative would likely affect site persistence of *C. chrysocephala* at 14 sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 208 sites would remain on BLM and NFS lands across the region, and 74 sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *C. chrysocephala* at 14 sites, these sites are part of several sites in the Klamath Mountains, Coast Range, and Cascade Range in Oregon where the species is well distributed. The species'

distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *C. chrysocephala* would persist in the region without considering the 14 sites as part of the population.

- The PCGP Project with the Blue Ridge alternative would remove approximately 1,130 acres of coniferous and mixed hardwood-coniferous forests and 250 acres of LSOG coniferous and mixed forests below 6,000 feet msl (a negligible amount of the forests). An estimated 67 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 9.9 million acres (55 percent) of coniferous and mixed forests and 3.7 million acres (62 percent) of LSOG forests below 6,000 feet msl would remain in reserves in the NSO range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2007.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is distributed across three states.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to all *C. chrysocephala* sites in the analysis area, although some individuals or populations within the sites may persist following project implementation. Based on the above conclusions, avoidance of the 14 *C. chrysocephala* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for *C. chrysocephala* sites affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the sites and adjacent habitat over the long term.

### **3.4 HYPOTRACHYNA REVOLUTA**

*Hypotrachyna revoluta* is a foliose lichen in the Parmeliaceae family and is commonly known as gray loop lichen.

#### **3.4.1 Regulatory Status and Ranking**

The 2001 ROD identifies *H. revoluta* as a Category E (rare) species. The ORBIC evaluated *H. revoluta* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was between rare, uncommon, or threatened, but not immediately imperiled, and not rare and apparently secure globally, but with cause for long-term concern, within its global range (G3G4) and was rare, uncommon, or threatened, but not immediately imperiled, in Oregon (S3). The species is on the ORBIC List 2. It is considered a BLM and Forest Service Sensitive species in Oregon.

#### **3.4.2 Background Information**

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the

analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

### ***Life History***

*H. revoluta* is a small foliose lichen that is typically found growing on branches of trees and shrubs or on bare rock (Helliwell 2007b). Asexual reproduction through thallus fragmentation and the use of soridea is the main form of reproduction for this species. Soredia are dispersed by wind or animals over long distances, and thallus fragments disperse over shorter distances. It has a moderate rate of growth and reproduction, so that reduced populations can recover through natural recolonization over a period of several years (ORBIC 2004).

### ***Range***

*H. revoluta* has been found across North America, South America, Asia, and Europe (ORBIC 2004). In the Pacific Northwest, it is primarily found within about 50 miles of the coast in Washington and Oregon. The species is also found in the Appalachian Mountains of eastern North America, various states in the Midwest, China, and various countries in Europe and South America. The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across North America, South America, Europe, and Asia. Regional and local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### ***Population Status***

The ORBIC (2004) reported *H. revoluta* from less than 10 element occurrences in the Pacific Northwest, including four in Oregon, two in Washington, and an unknown number in California along an estimated 250 miles of the coast. The species is considered more common in other parts of North America and some other countries. The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 12 sites on federal lands and 21 total sites on all lands in the NSO range.

For the PCGP Project and Blue Ridge alternative, surveys for S&M lichens were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011) and in 2012 and 2014 within 50–200 feet on either side of the alternative construction corridor route. These surveys targeted Category A, B, and C lichens and other special-status lichens and resulted in two observations of populations of *H. revoluta* near the Blue Ridge route. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### ***Habitat***

*H. revoluta* is found in coastal mixed hardwood-coniferous forests up to about 1,500 feet msl in the Pacific Northwest based on species occurrences available in 2007 (Helliwell 2007b). More recent data indicate the species may be found at higher elevations, as discussed in the following section. Stand conditions vary from open dunes with scattered trees and shrubs to dense canopy conifer and hardwood stands (Helliwell 2007b). The most common host trees are Sitka spruce, western hemlock, and red alder. Stand age also varies and includes young stands with sufficient moisture and older stands with bryophyte-dominated trees. Based on available information, *H. revoluta* may prefer specific microclimate conditions of LSOG forests, but it is not likely restricted to these forests.

### ***Threats***

As with other coastal lichens, threats to *H. revoluta* are those actions that alter stand conditions and habitat integrity, such as introduction of invasive plants, alterations to light and moisture, air pollution, and climate change (Helliwell 2007b). Other threats include timber harvest in coastal forests, development, and grazing.

### ***Management Recommendations***

For Category E S&M species, the direction from the 2001 ROD is to manage all known sites until a determination can be made regarding which S&M category, if any, the species should be assigned to (USDA and USDI 2001). No management recommendations have been developed for *H. revoluta*.

### **3.4.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### ***Species Distribution***

The distribution of *H. revoluta* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table HYRE-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 94 observations from BLM and Forest Service geodatabases were converted into 48 sites in the NSO range (region). Table HYRE-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table HYRE-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure HYRE-1 displays the regional distribution of the species across BLM and NFS

lands, and Figure HYRE-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 6,500 feet msl on BLM and NFS lands within the current known range of the species.

TABLE HYRE-1

Number of <i>Hypotrachyna revoluta</i> Sites (2015)	
Location*	Number of Sites
Regional Area	48
Local Area	23
Analysis Area (Project Area)	2 (2)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015  
 \*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE HYRE-2

Distribution of <i>Hypotrachyna revoluta</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	24	20	2
Forest Service	4	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	21	5	2

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
 Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

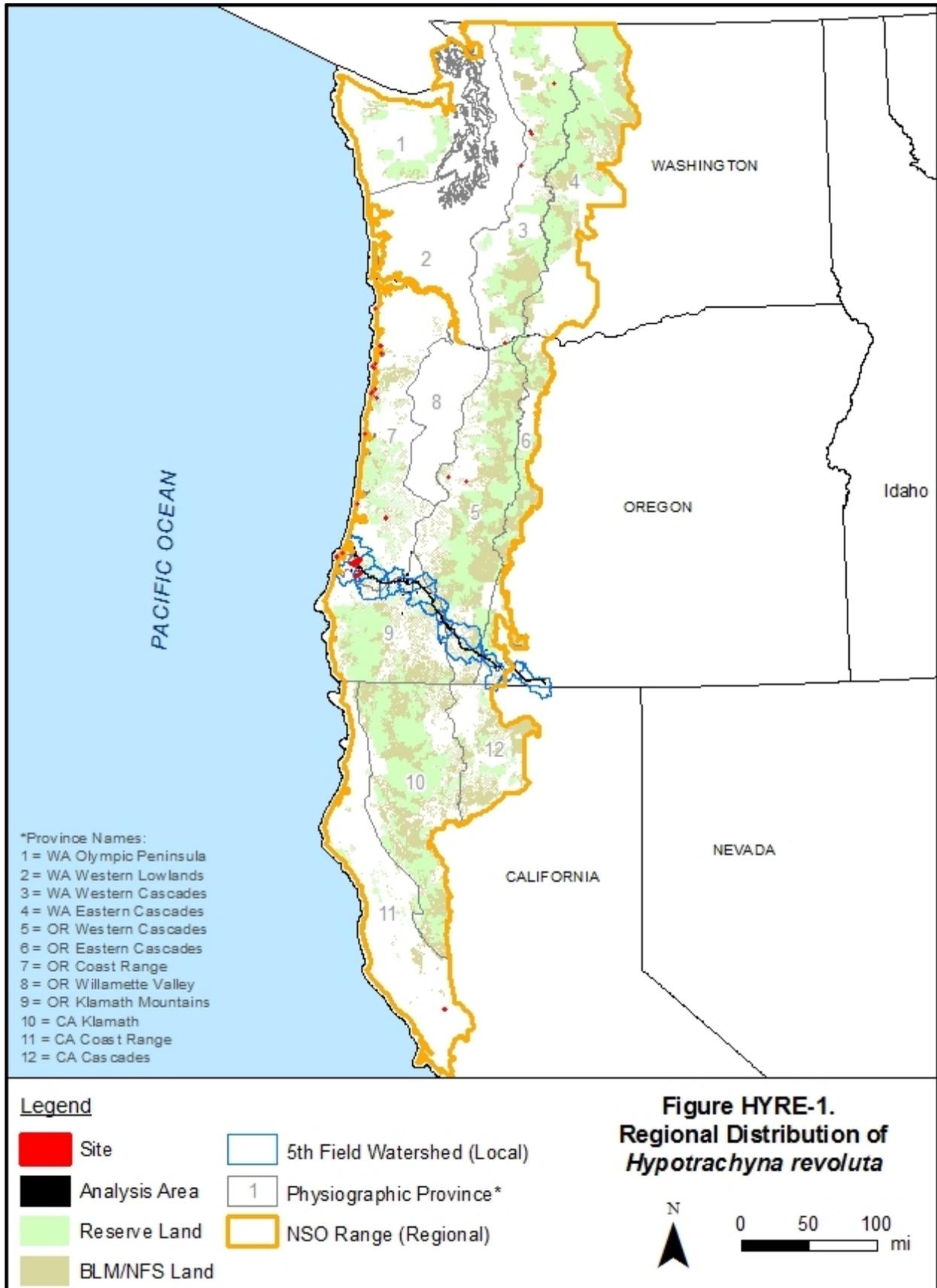
TABLE HYRE-3

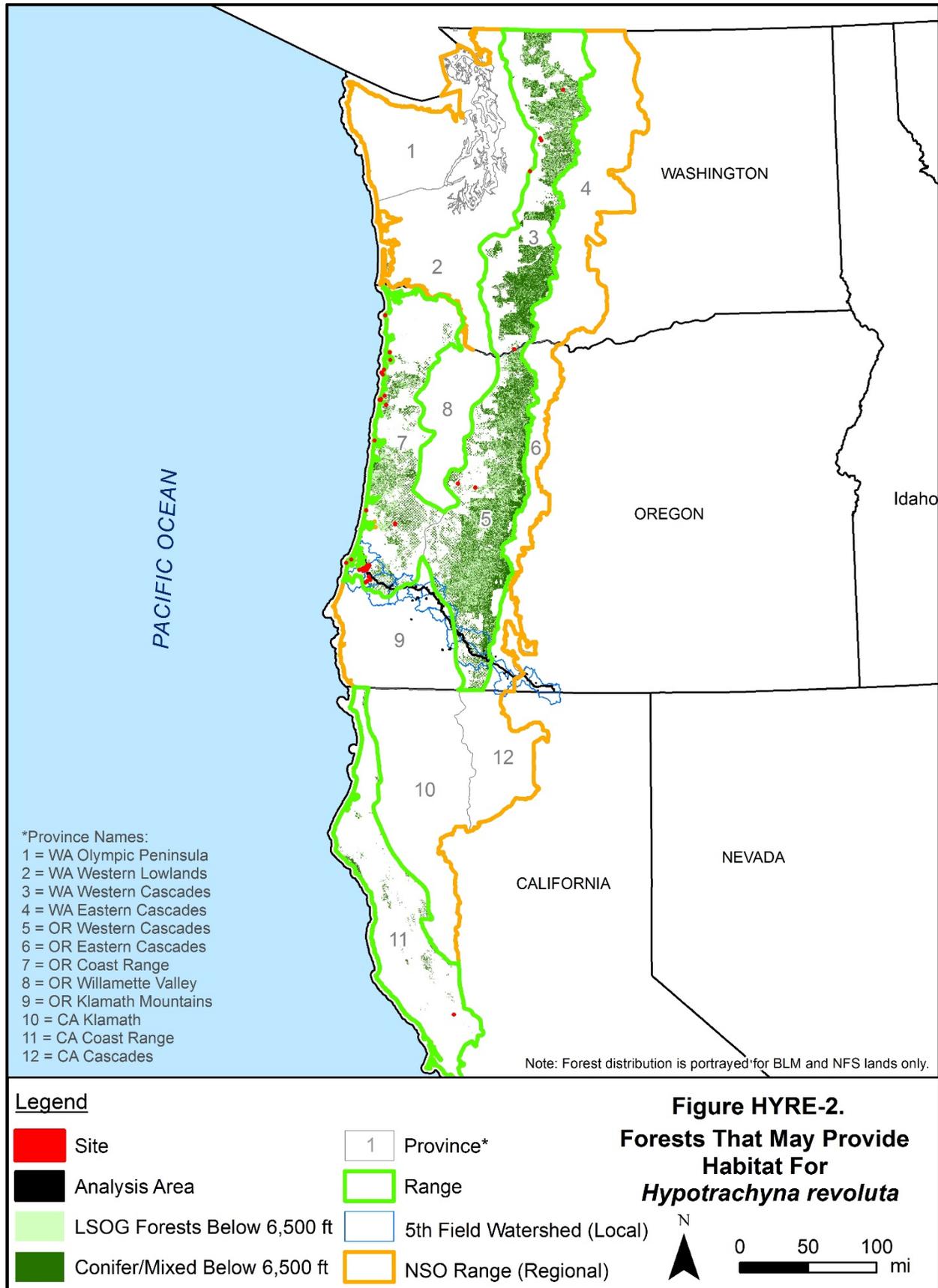
Distribution of <i>Hypotrachyna revoluta</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	1	-	-
Adaptive Management Reserves (AMR)	2	-	-
Administratively Withdrawn (AW)	1	-	-
<b>Congressionally Reserved (CR)</b>	<b>1</b>	-	-
<b>Late Successional Reserve (LSR)</b>	-	-	-
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	23	20	2
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0  
 Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.  
**Bolded** allocations are designated reserve areas.  
 \*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*H. revoluta* has a somewhat limited distribution across four physiographic provinces in Washington (Western Cascades), Oregon (Coast Range and Cascades West), and California (Coast). A large cluster of sites is found in the southern Coast Range in Oregon. Scattered sites are located in other areas. *H. revoluta* does not appear to be well distributed across its range based on the scattered distribution of sites and several sites that appear somewhat isolated from other sites.





Of the 48 sites in the region, 28 sites are on BLM and NFS lands (at least partially) and 21 sites are located on private or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include 22 sites in the Coos Bay District. The other six sites on BLM and NFS lands are in the Eugene District and on the Mt. Baker-Snoqualmie and Siuslaw National Forests.

Across the NSO range, one site is located in a Congressionally Reserved area managed by the Forest Service. This represents 4 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*H. revoluta* is more commonly found in LSOG forests based on available data (36 of 48 total sites are in LSOG), but it has also been documented in younger stands with sufficient moisture. Based on current site locations, the species is found primarily in coniferous and mixed hardwood-coniferous forest types below about 6,500 feet msl and has been documented in part of the NSO range. Coniferous and mixed hardwood-coniferous forests below 6,500 feet msl, including the LSOG component of these forests, in the western Cascade Range in Washington and Oregon and Coast Range in Oregon and California could provide habitat for *H. revoluta* and support additional sites. These forests encompass an estimated 8.2 million acres on BLM and NFS lands in the species’ range, including an estimated 4.5 million acres in reserve land allocations (55 percent of the forests; Table HYRE-4). Of this acreage, an estimated 3.2 million acres are LSOG (see Figure HYRE-2), including 2.0 million acres in reserve land allocations (61 percent of the forests). These forests are widespread across the species’ range, but the species is likely restricted to a subcomponent of the forests.

TABLE HYRE-4

Location	Conifer/Mixed Forests below 6,500 feet		LSOG Forests below 6,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	8,200,620	4,479,750	3,237,720	1,965,520
Local Area	356,330	118,480	117,830	52,490
Project Area	750	310	160	90

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *H. revoluta* is distributed across four 5<sup>th</sup> field watersheds that overlap the project area (see Table HYRE-5 and Figure HYRE-3). All local sites are relatively close to one another in the North Fork, East Fork, and Lower Coquille River and Coos Bay Frontal watersheds. The sites are the largest group of sites in the species’ range and may have some level of connectivity between them and others in the nearby Coast Range.

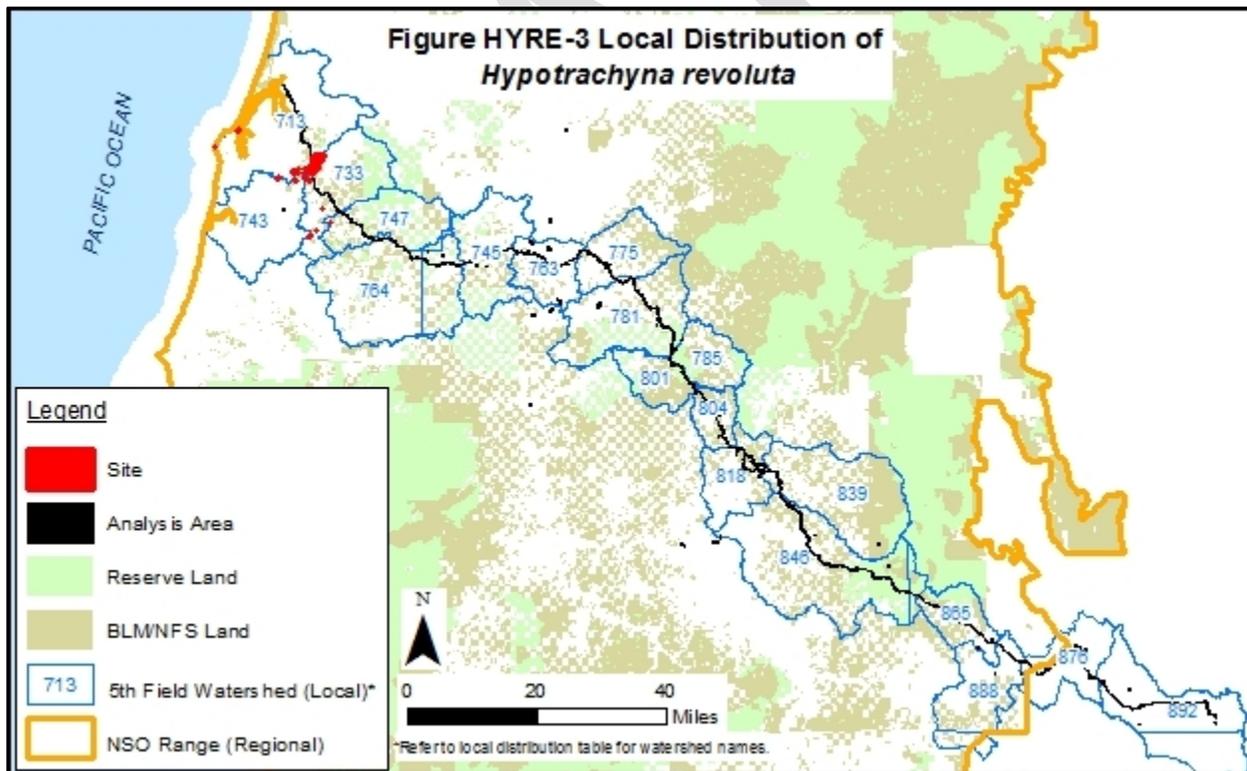
Of the 23 sites in the local area, 20 sites are at least partially on BLM lands and five sites are at least partially on private lands. All BLM-managed sites are located on lands designated as Other (Matrix). No sites are on reserve lands.

TABLE HYRE-5

**Distribution of *Hypotrachyna revoluta* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	11*	-
East Fork Coquille River (747)	1	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	9*	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	-	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	7**	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011  
 Note: Site counts are not additive because some sites occur in multiple watersheds and the counts overlap, as noted below:  
 \*Four sites are in the Coos Bay Frontal and Lower Coquille River watersheds.  
 \*\*One site in the Coos Bay Frontal and Lower Coquille River watersheds is also in the North Fork Coquille River watershed.



Coniferous and mixed hardwood-coniferous forests below 6,500 feet msl encompass approximately 356,330 acres on BLM and NFS lands in the local area, with 118,480 acres in reserve land allocations (33 percent of the forests). Of this acreage, an estimated 117,830 acres are LSOG, including 52,490 acres in reserve land allocations (45 percent of the forests). Other

sites may also exist in the local area where surveys have not been completed, based on the distribution of sites in the local and nearby regional areas and extent of forests that may provide suitable habitat (see Figures HYRE-2 and HYRE-3).

Analysis/Project Area Distribution

The analysis and project areas contain two sites of *H. revoluta*. These sites are on BLM-managed land designated as Other (Matrix). One site is in the North Fork Coquille River watershed, and the other site is in three watersheds (North Fork and Lower Coquille River and Coos Bay Frontal). The sites are partially on private land. The nearest sites are located within a few hundred feet to the southwest of the sites in the same watersheds.

Surveys for the PCGP Project and Blue Ridge alternative resulted in multiple observations of the species in two locations near the Blue Ridge alternative in 2011 and 2014. The observations comprise the two sites in the analysis area. The sites are near Blue Ridge MP 19.7-22.1 and MP 23.

**Project Impacts**

Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect two sites out of the 28 sites of *H. revoluta* on BLM and NFS lands in the region, representing approximately 7 percent of the sites (or two out of 48 total sites on all lands in the NSO range). Table HYRE-6 presents an overview of the features of the PCGP Project that would affect the *H. revoluta* sites. The construction corridor and associated work and storage areas would affect approximately 38.6 acres (2 percent) of the sites (see Figure HYRE-4). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *H. revoluta* in and near the project area. Based on the number of sites of *H. revoluta* on BLM and NFS lands, the effects on two sites could potentially alter the distribution of the species in the NSO range if site persistence is affected. This discussion presents a detailed analysis of the features of the PCGP Project with the Blue Ridge alternative that could affect site persistence.

TABLE HYRE-6

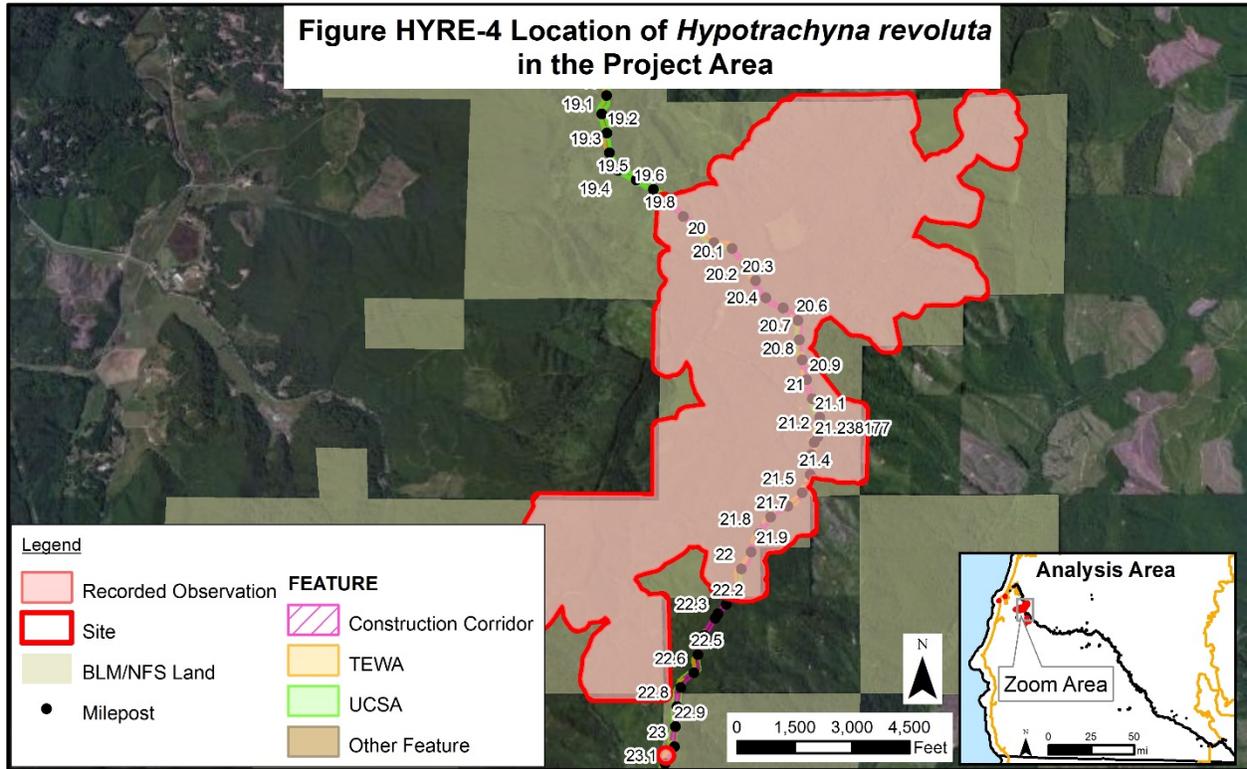
Impacts to <i>Hypotrachyna revoluta</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	2	29.5 ac
Temporary Extra Work Area (TEWA)	2	6.2 ac
Uncleared Storage Area (UCSA)	2	2.9 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the Blue Ridge alternative. Site counts are not additive because some sites would be subject to impacts from multiple project activities.

The Blue Ridge alternative would result in ground disturbance and vegetation removal across the middle of two sites. One site extends from MP 19.7 to 22.1 and encompasses multiple observations of the species. The other site at MP 23 is a single observation. Recorded observations of the species in the project area may be removed during vegetation removal activities (see Figure HYRE-4). In addition, the species could be subject to indirect effects

associated with the Blue Ridge alternative based on the proximity of project activities to other nearby observations.



The land in both sites is heavily forested, and the establishment of the construction corridor could modify microclimate conditions in the sites. The construction corridor would generally follow a road that passes through the larger site, and although vegetation removal and ground-disturbing activities would take place through the middle of the site, the level of disturbance would affect less than 2 percent of the site (37.2 acres out of 2,077 acres). *H. revoluta* may also be somewhat resilient to edge effects based on its presence in open stands. The removal of trees and understory rocks and debris in the smaller site at MP 23 could negatively affect *H. revoluta* by removing its habitat and affecting its association with the trees and rocks, affecting site persistence even if the entire site is not disturbed. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and may provide habitat for the species during the life of the project.

Based on this analysis, *H. revoluta* is not likely to persist at the site at MP 23 following project implementation, but it is expected to persist at the site at MP 19.7-22.1. These sites are part of a large group of sites in southwestern Oregon, where the most sites are located. If the species does not persist at one of the two sites in the project area, *H. revoluta* would still be found in southwestern Oregon with continued opportunities for dispersal in the local and nearby regional areas.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 620 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl,

including 130 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *H. revoluta*. Within this impact area, about 400 acres (about 65 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 130 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 6,500 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at one of the two sites as a result of the Blue Ridge alternative, 19 sites of *B. subcana* would remain on BLM lands in the local area, and 27 sites, including one in a reserve, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The one site in a reserve is assumed to have additional protections by the NWFP Standards and Guidelines in place for the land allocation. Based on these site counts, approximately 4 percent of the remaining *H. revoluta* on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *H. revoluta* is a Category E (rare) species throughout the NSO range. Per the 2001 ROD, information on Category E species is insufficient to determine what level of management is needed for reasonable assurance of species persistence. New information since the species was listed in the 2001 ROD has increased the availability of information on the species, as noted below:
  - *H. revoluta* has a somewhat limited distribution across four physiographic provinces in three states and a moderate-high number of overall sites (28 on BLM and NFS lands). The species does not appear to be well distributed in its range in the NSO range. The current known number of sites on BLM and NFS lands is an increase of about 16 sites since 2007.
  - An estimated 4 percent of the sites (one site) are in reserves.
- Coniferous and mixed hardwood-coniferous forests below 6,500 feet msl (general habitat for the species) are widely distributed across the species' range and encompass approximately 8.2 million acres on BLM and NFS lands with an estimated 55 percent in reserves. A subcomponent of these forests likely provides habitat for *H. revoluta*.

- The PCGP Project with the Blue Ridge alternative would affect two of 28 BLM- and Forest Service-managed sites of *H. revoluta*, representing approximately 7 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at one of the two sites, a moderate-high number of sites (27) would continue to be documented on BLM and NFS lands in the region with a distribution across Washington, Oregon, and California. Several sites (19 sites) would remain in the local vicinity of the analysis area with some other sites in the nearby Coast Range. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.
- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, one site is at least partially in a Congressionally Reserved area where management activities that may adversely affect *H. revoluta* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 130 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl (less than 1 percent of the total regional acreage). An estimated 3.2 million acres (55 percent) of coniferous and mixed forests and 2.0 million acres (61 percent) of LSOG forests below 6,500 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *H. revoluta*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category E species for which pre-disturbance surveys are not applicable and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during pre-disturbance, strategic, and other surveys.

#### 3.4.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *H. revoluta* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 27 sites would remain on BLM and NFS lands across the region, and 19 sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *H. revoluta* at one site, the site is part of a group of sites in the Coast Range in southwestern Oregon. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *H. revoluta* would persist in the region without considering the site as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 620 acres of coniferous and mixed hardwood-coniferous forests below 6,500 feet msl and 130 acres of LSOG forests (a negligible amount of the forests). An estimated 65 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 3.2 million acres (55 percent) of coniferous and mixed forests and 2.0 million acres (61 percent) of LSOG

forests below 6,500 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists.

- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect the overall distribution of the species because it is distributed across four physiographic provinces.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the two *H. revoluta* sites in the analysis area, although individuals within one of the sites are expected to persist following project implementation. Based on the above conclusions, avoidance of the *H. revoluta* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *H. revoluta* sites affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the sites and adjacent habitat over the long term.

### **3.5 PLATISMATIA LACUNOSA**

*Platismatia lacunosa* is an epiphytic lichen in the Parmeliaceae family and is commonly known as crinkled rag lichen.

#### **3.5.1 Regulatory Status and Ranking**

The 2001 ROD identifies *P. lacunosa* as a Category C (uncommon) species. The ORBIC evaluated *P. lacunosa* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and in its 2007 update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2007), but did not evaluate it in its most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2007, the species was between rare, uncommon, or threatened, but not immediately imperiled, and not rare and apparently secure globally, but with cause for long-term concern, within its global range (G3G4) and was rare, uncommon, or threatened, but not immediately imperiled, in Oregon (S3). The species is on the ORBIC List 4. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

#### **3.5.2 Background Information**

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### ***Life History***

*P. lacunosa* is an epiphytic foliose lichen that is typically found hanging on branches of conifer and hardwood trees in coastal areas (Ponzetti 2006). Asexual reproduction through thallus fragmentation is the main form of reproduction for this species. Soredia are absent, and

apothecia may or may not be present. It has a moderate rate of growth and reproduction, so that reduced populations can recover through natural recolonization over a period of several years (ORBIC 2004).

### **Range**

*P. lacunosa* has been found along the western coast of North America from Alaska to California (ORBIC 2004, Ponzetti 2006). In the Pacific Northwest, it is found west of the Cascade Range crest. The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across coastal western North America. Local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

### **Population Status**

The ORBIC (2004) reported *P. lacunosa* from an estimate 90 element occurrences in the Pacific Northwest. Oregon had the highest number of occurrences at 68, with fewer in Washington (18) and California (2) (ORBIC 2004). The species was found in 21 locations during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 74 sites on federal lands and 159 total sites on all lands in the NSO range.

For the PCGP Project and Blue Ridge alternative, surveys for S&M lichens were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011) and in 2012 and 2014 within 50–200 feet on either side of the alternative construction corridor route. These surveys targeted Category A, B, and C lichens and other special-status lichens, including *P. lacunosa*, and resulted in one observation of a population of *P. lacunosa* near the Blue Ridge route. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### **Habitat**

*P. lacunosa* is found in wet Douglas-fir forests, foggy coastal and valley forests, and riparian coniferous and hardwood forests up to about 3,500 feet msl (Holthausen et al. 1994, Ponzetti 2006). The lichen grows on the boles and branches of conifer or hardwood trees (Ponzetti 2006). The most common host trees are red alder, and other host trees include western hemlock, Sitka spruce, cherry, vine maple, and big-leaf maple. It is occasionally found on rocks in coastal forests. Typical of other lichens, *P. lacunosa* becomes most abundant in older forests, but it may be found in lower densities in younger forests (Holthausen et al. 1994). Based on available information, *P. lacunosa* may prefer specific microclimate conditions of LSOG forests, but it is not likely restricted to these forests.

**Threats**

As with other riparian lichens, threats to *P. lacunosa* are those actions that alter stand conditions and habitat integrity, such as damage to colonized bark or wood, alterations to light and moisture, air pollution, and climate change (Ponzetti 2006). Other threats include tree thinning in riparian reserves.

**Management Recommendations**

As a Category C S&M species, the direction from the 2001 ROD to manage high-priority sites to provide a reasonable assurance of species persistence (USDA and USDI 2001). Management recommendations have not been developed for *P. lacunosa*.

**3.5.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species’ current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

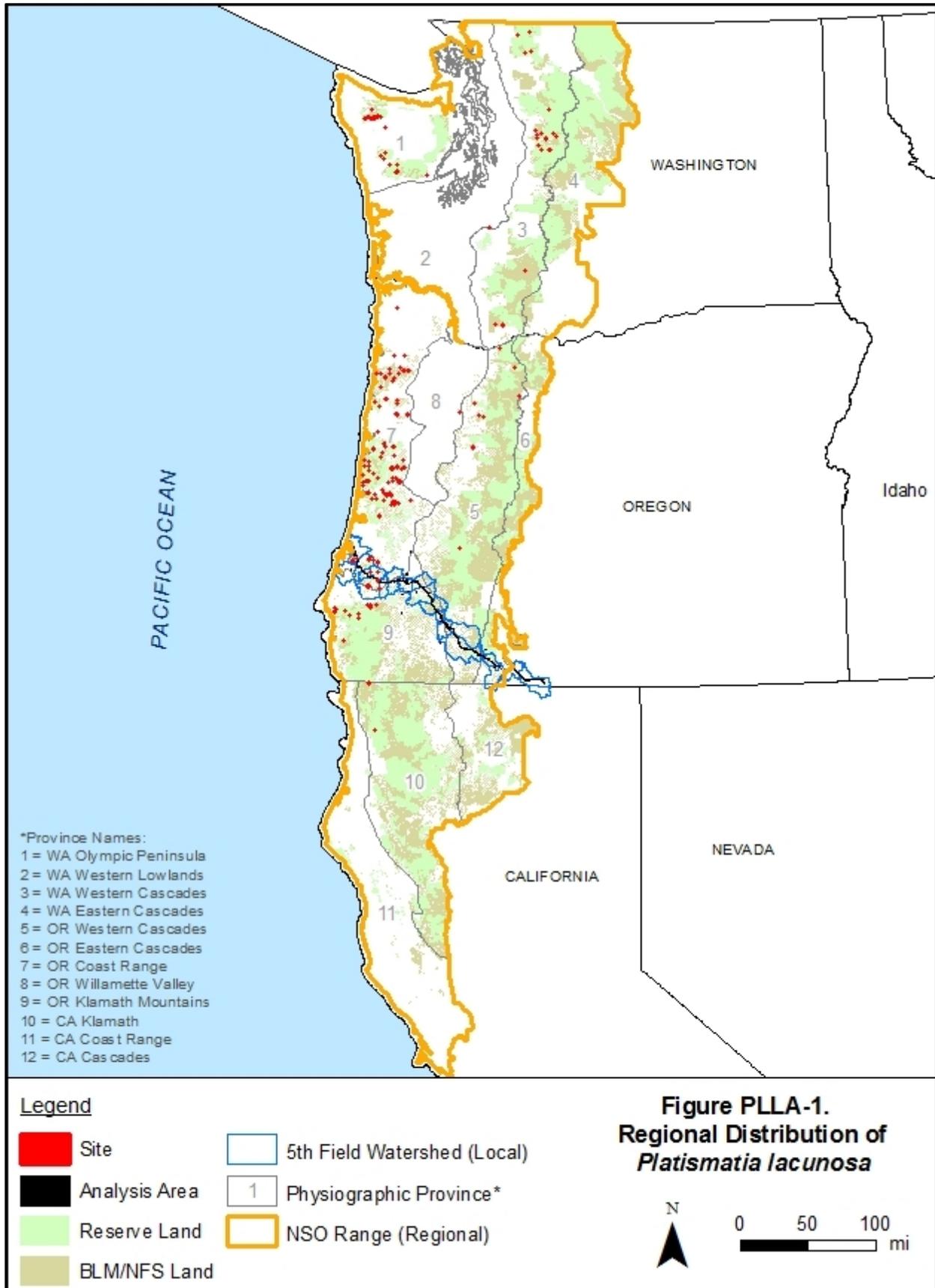
**Species Distribution**

The distribution of *P. lacunosa* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table PLLA-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 422 observations from BLM and Forest Service geodatabases were converted into 197 sites in the NSO range (region). Table PLLA-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table PLLA-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure PLLA-1 displays the regional distribution of the species across BLM and NFS lands, and Figure PLLA-2 displays the species’ regional distribution with the extent of coniferous, mixed hardwood-coniferous, and hardwood forests and LSOG forests below 4,000 feet msl on BLM and NFS lands within the current known range of the species.

TABLE PLLA-1

<b>Number of <i>Platismatia lacunosa</i> Sites (2015)</b>	
<b>Location*</b>	<b>Number of Sites</b>
Regional Area	197
Local Area	12
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015  
 \*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.



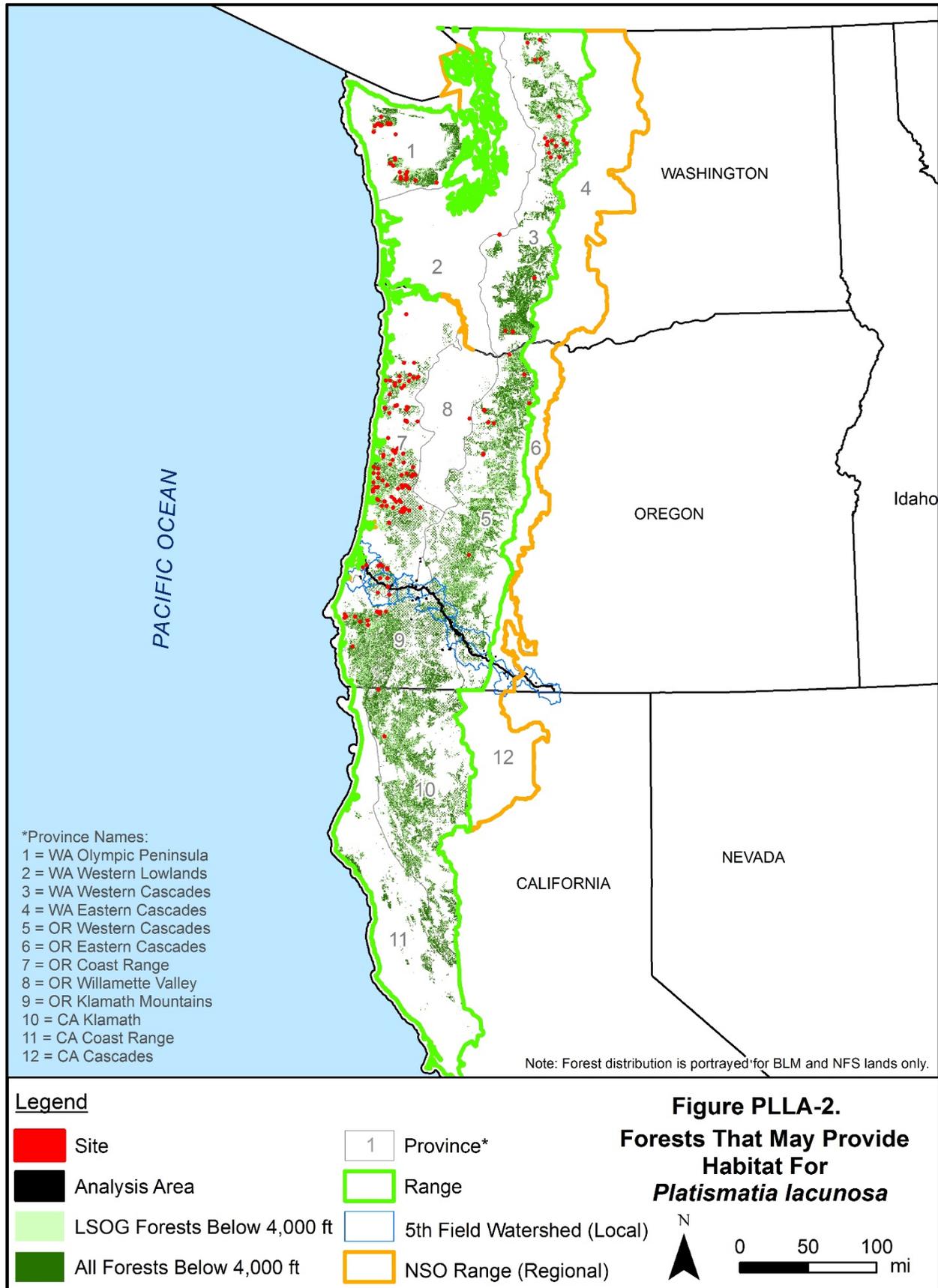


TABLE PLLA-2

Distribution of <i>Platismatia lacunosa</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	71	10	1
Forest Service	114	-	-
NPS	1	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	25	4	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE PLLA-3

Distribution of <i>Platismatia lacunosa</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	19	-	-
Adaptive Management Reserves (AMR)	16	-	-
Administratively Withdrawn (AW)	4	-	-
<b>Congressionally Reserved (CR)</b>	<b>11</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>111</b>	<b>9</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>3</b>	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	34	1	1
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*P. lacunosa* has a wide distribution across eight physiographic provinces in Washington (Western Cascades, Western Lowlands, and Olympic Peninsula), Oregon (Coast Range, Cascades West, Willamette Valley, and Klamath Mountain), and California (Klamath). Most of the sites are found in the Coast Range of Oregon, and several large clusters or groups of sites are found in the Olympic Peninsula and western Cascade Range in Washington and Klamath Mountains in Oregon. Scattered sites are located in other areas. *P. lacunosa* appears to be well distributed across its range in the Coast Range and Klamath Mountains in Oregon based on the distribution of sites in large clusters and proximity of sites to one another.

Of the 197 sites in the region, 185 sites are on BLM and NFS lands (at least partially) and 25 sites are located on private or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include 15 sites in the Coos Bay District and one site in the Medford District. Sites managed by the National Forests that encompass the project area include 11 sites on the Rogue River National Forest and one site on the Umpqua National Forest. The other 157 sites on BLM and NFS lands are in the Eugene and Salem Districts and on the Gifford Pinchot, Mt. Baker-Snoqualmie, Mt. Hood, Olympic, Siuslaw, Six Rivers, and Willamette National Forests.

Across the NSO range, 121 sites are located on reserve lands managed by BLM and the Forest Service, including 111 in LSRs (at least partially), 11 in Congressionally Reserved areas (at least partially), and three in Marbled Murrelet Areas (at least partially). This represents 65 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and

Guidelines and other land management plan components. The NPS site, while not covered by the S&M Standards and Guidelines, also likely receives some degree of protection based on National Park management.

*P. lacunosa* is more commonly found in LSOG forests based on available data (169 of 197 total sites are in LSOG), but it is also found in non-LSOG forests, including younger riparian forests. Based on current site locations, the species is found in all forest types below about 3,600 feet msl and has been documented in part of the NSO range. Coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl, including the LSOG component of these forests, in Washington and Oregon, excluding the eastern Cascade Range, and the Coast Range and Klamath Mountains in California could provide habitat for *P. lacunosa* and support additional sites. These forests encompass an estimated 10.8 million acres on BLM and NFS lands in the species' range, including an estimated 5.6 million acres in reserve land allocations (52 percent of the forests; Table PLLA-4). Of this acreage, an estimated 4.2 million acres are LSOG (see Figure PLLA-2), including 2.5 million acres in reserve land allocations (61 percent of the forests). These forests are widespread across the species' range, but the species is likely restricted to a component of the forests that provides high humidity and suitable local conditions.

TABLE PLLA-4

Extent of Forests that Could Provide Habitat for <i>Platismatia lacunosa</i> on BLM and NFS Lands*				
Location	All Forests below 4,000 feet		LSOG Forests below 4,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	10,805,120	5,633,500	4,194,350	2,544,170
Local Area	463,800	145,530	146,960	61,630
Project Area	1,110	850	240	80

Data Source: GNN vegetation data from Moerur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

### Local Distribution

Within the local area, *P. lacunosa* is distributed across four 5<sup>th</sup> field watersheds that overlap the project area (see Table PLLA-5 and Figure PLLA-3). All local sites are relatively close to one another in the North Fork, East Fork, and Middle Fork Coquille River and Coos Bay Frontal watersheds. The sites appear to have some level of connectivity between them and others in the nearby Klamath Mountains and Coast Range.

Of the 12 sites in the local area, 10 sites are at least partially on BLM lands, and four sites are at least partially on private lands. The sites are located on lands designated as Other (Matrix) and LSR. Of the 10 sites on BLM lands in the local area, nine sites are on reserve lands, representing 90 percent of the sites. The distribution of these reserve sites across the watersheds is depicted in Table PLLA-5 and on Figure PLLA-3.

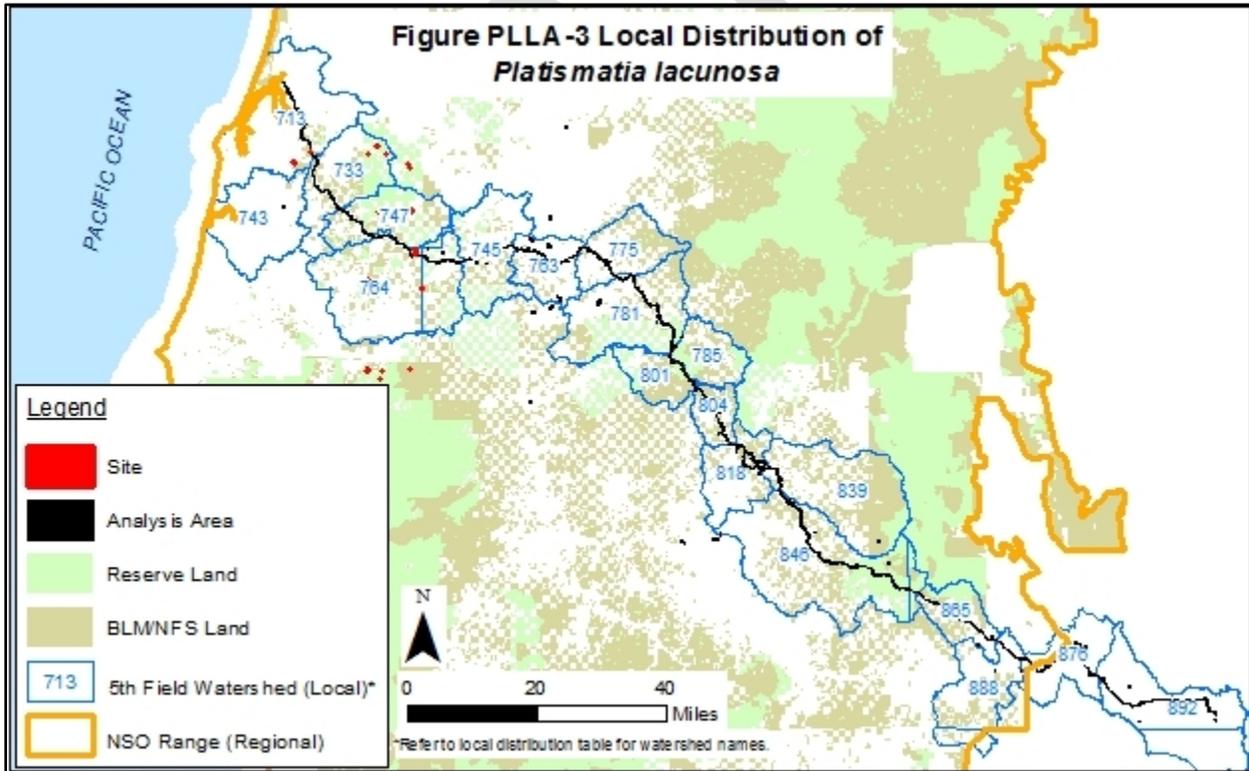
Coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl encompass approximately 463,800 acres on BLM and NFS lands in the local area, with 145,530 acres in reserve land allocations (31 percent of the forests). Of this acreage, an estimated 146,960 acres are LSOG, including 61,630 acres in reserve land allocations (42 percent of the forests). Other sites may also exist in the local area where surveys have not been completed, based on the

distribution of sites in the local and nearby regional areas and extent of forests that may provide suitable habitat (see Figures PLLA-2 and PLLA-3).

TABLE PLLA-5

Distribution of <i>Platismatia lacunosa</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	2	-
East Fork Coquille River (747)	2	2
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	5	4
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	3	3
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Analysis/Project Area Distribution

The analysis and project areas contain one site of *P. lacunosa*. This site is on BLM-managed land designated as Other (Matrix) in the Coos Bay Frontal watershed. The nearest site is located approximately 3 miles to the southeast of the site, and several other sites are located east and southeast of the site (see Local Distribution discussion above).

Surveys for the PCGP Project and Blue Ridge alternative resulted in one observation of the species in one location near the Blue Ridge alternative in 2014. The one observation comprises the single site in the analysis area. The site is near Blue Ridge MP 19.

**Project Impacts**

Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 185 sites of *P. lacunosa* on BLM and NFS lands in the region, representing less than 1 percent of the sites (or one out of 197 total sites on all lands in the NSO range). Table PLLA-6 presents an overview of the features of the PCGP Project that would affect the *P. lacunosa* sites. The construction corridor and associated work and storage areas would affect approximately 1.4 acres (52 percent) of the site (the site encompasses approximately 2.7 acres). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *P. lacunosa* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE PLLA-6

Impacts to <i>Platismatia lacunosa</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	1	0.8 ac
Temporary Extra Work Area (TEWA)	1	0.2 ac
Uncleared Storage Area (UCSA)	1	0.4 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the Blue Ridge alternative. Site counts are not additive because the site would be subject to impacts from multiple project activities.

Along the Blue Ridge alternative, vegetation removal and grading activities in the construction corridor would disturb about 0.8 acre of vegetation and soils in one site and could result in the removal of *P. lacunosa* populations or individuals on trees that are removed. Disturbance in the TEWAs would result in similar impacts on about 0.2 acre in the site. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and host trees could negatively affect *P. lacunosa* in adjacent areas by removing its habitat and potential host trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not likely provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 0.4 acre of understory habitat in the

site, which could modify microhabitats near extant populations or individuals, potentially making the habitat unsuitable for the species, but individuals on trees are not likely to be removed or disturbed.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 870 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl, including 190 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *P. lacunosa*. Within this impact area, about 540 acres (about 62 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 170 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 4,000 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, nine sites of *P. lacunosa* would remain on BLM lands in the local area, all of which are in reserves, and 184 sites, including 121 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 121 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 66 percent of the remaining *P. lacunosa* on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *P. lacunosa* is a Category C (uncommon) species throughout the NSO range. Per the 2001 ROD, all known sites of Category C species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates that the species appears to be more common than previously documented, as noted below:
  - *P. lacunosa* has a wide distribution across eight physiographic provinces in three states and a moderate-high number of overall sites (185 on BLM and NFS lands). The species appears to be well distributed in the Coast Range and Klamath

Mountains in Oregon. The current known number of sites on BLM and NFS lands is an increase of about 111 sites since 2007.

- An estimated 65 percent of the sites (121 sites) are in reserves.
- Coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl (general habitat for the species) are widely distributed across the species' range and encompass approximately 10.8 million acres on BLM and NFS lands with an estimated 52 percent in reserves. A subcomponent of these forests likely provides habitat for *P. lacunosa*.
- The PCGP Project with the Blue Ridge alternative would affect one of 185 BLM- and Forest Service-managed sites of *P. lacunosa*, representing less than 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (184) would continue to be documented on BLM and NFS lands in the region with a wide distribution across Washington, Oregon, and California. Several sites (nine sites) would remain in the local vicinity of the analysis area with several other sites in the nearby Klamath Mountains and Coast Range. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.
- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 114 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and 11 sites are at least partially in Congressionally Reserved areas where management activities that may adversely affect *P. lacunosa* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 170 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl (less than 1 percent of the total regional acreage). An estimated 4.2 million acres (52 percent) of coniferous, mixed, and hardwood forests and 2.5 million acres (61 percent) of LSOG forests below 4,000 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *P. lacunosa*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category C species for which pre-disturbance surveys are practical and have been conducted in many areas; thus, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during surveys.

### 3.5.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *P. lacunosa* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 184 sites would remain on BLM and NFS lands across the region, and nine sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *P. lacunosa* at one

site, the site is part of a group of sites in the Klamath Mountains and Coast Range in southwestern Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *P. lacunosa* would persist in the region without considering the site as part of the population.

- The PCGP Project with the Blue Ridge alternative would remove approximately 870 acres of coniferous, mixed hardwood-coniferous, and hardwood forests below 4,000 feet msl and 190 acres of LSOG forests (a negligible amount of the forests). An estimated 62 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 4.2 million acres (52 percent) of coniferous, mixed, and hardwood forests and 2.5 million acres (61 percent) of LSOG forests below 4,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect the overall distribution of the species because it is widely distributed across eight physiographic provinces.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *P. lacunosa* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *P. lacunosa* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *P. lacunosa* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

### 3.6 PSEUDOCYPHELLARIA PERPETUA

*Pseudocyphellaria perpetua* is a cyanolichen in the Lobariaceae family and does not have a common name. It is a relatively newly identified species (Miadlikowska 2002) and has been misnamed *P. mougeotiana* in planning documents in the Pacific Northwest.

#### 3.6.1 Regulatory Status and Ranking

The 2001 ROD identifies *P. perpetua* as a Category B (rare) species. The ORBIC evaluated *P. perpetua* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened, and Endangered Species of Oregon* (ORBIC 2013). In 2013, the species was not rare and apparently secure globally, but with cause for long-term concern, within its global range (G4) and was rare, uncommon, or threatened, but not immediately imperiled, in Oregon (S3). The species is on the ORBIC List 4. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

### 3.6.2 Background Information

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*P. perpetua* is a nitrogen-fixing cyanolichen that is typically found on fallen branches or in the canopy of conifer and hardwood trees in coastal areas (Leshner et al. 2003). Asexual reproduction through the use of soridia is the main form of reproduction for this species. Soridia are dispersed by wind or animals over long distances. Reproduction is slow (ORBIC 2004).

#### *Range*

*P. perpetua* has been found in western and eastern North America and the Far East of Russia (ORBIC 2004). In North America, it has been documented in Oregon, the Great Smoky Mountains, and Nova Scotia, Canada (ORBIC 2004). Within the range of the NSO, *P. perpetua* is found along the Oregon coast. The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across western and eastern North America and eastern Russia. Regional and local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

#### *Population Status*

The ORBIC (2004) reported *P. perpetua* from a few element occurrences in Oregon and note that the only large populations in the United States were in the Cape Perpetua area. The species was not found during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported 48 sites on federal lands and 54 total sites on all lands in the NSO range.

For the PCGP Project and Blue Ridge alternative, surveys for S&M lichens were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011) and in 2012 and 2014 within 50–200 feet on either side of the alternative construction corridor route. These surveys targeted Category A, B, and C lichens and other special-status lichens, including *P. perpetua*, and resulted in one observation of a population of *P. perpetua* near the Blue Ridge route. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

#### *Habitat*

*P. perpetua* is found in coastal coniferous and mixed hardwood-coniferous forests (Leshner et al. 2003). The lichen grows on the twigs and branches of conifer or hardwood trees and can be

found in the upper to mid-canopy or on fallen branches. The most common host trees are Sitka spruce, western hemlock, Douglas-fir, and lodgepole pine. It has been found in riparian old-growth forests, dune forests, and closed coniferous forests. Based on available information, *P. perpetua* may prefer specific microclimate conditions of LSOG forests, but it is not likely restricted to these forests.

### **Threats**

As with other nitrogen-fixing species, threats to *P. perpetua* are those actions that remove colonized substrate, alter microclimate, and cause air pollution or air quality degradation (Leshner et al. 2003). Other threats include timber harvest in coastal forests, disturbance to forests from recreational activities, and collection of specimens.

### **Management Recommendations**

As a Category B S&M species, the direction from the 2001 ROD is to manage all known sites and reduce the inadvertent loss of undiscovered sites (USDA and USDI 2001). Management recommendations were developed for *P. perpetua* in 2000 and updated in 2003 (Leshner et al. 2003). The guidance includes:

- Maintain known sites of *P. perpetua* by allowing existing habitat conditions to persist and evolve naturally.
- Restrict collecting of voucher specimens to litterfall only and deposit in accredited herbarium.
- Minimize air pollution impacts to the site.

### **3.6.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### **Species Distribution**

The distribution of *P. perpetua* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table PSPE-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 201 observations from BLM and Forest Service geodatabases were converted into 86 sites in the NSO range (region). Table PSPE-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table PSPE-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure PSPE-1 displays the regional distribution of the species across BLM and NFS

lands, and Figure PSPE-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 3,000 feet msl on BLM and NFS lands within the current known range of the species.

TABLE PSPE-1

Number of <i>Pseudocyphellaria perpetua</i> Sites (2015)	
Location*	Number of Sites
Regional Area	86
Local Area	4
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015  
 \*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE PSPE-2

Distribution of <i>Pseudocyphellaria perpetua</i> Across Federal, Private, and Other Lands			
Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	36	4	1
Forest Service	42	-	-
NPS	2	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	11	1	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
 Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

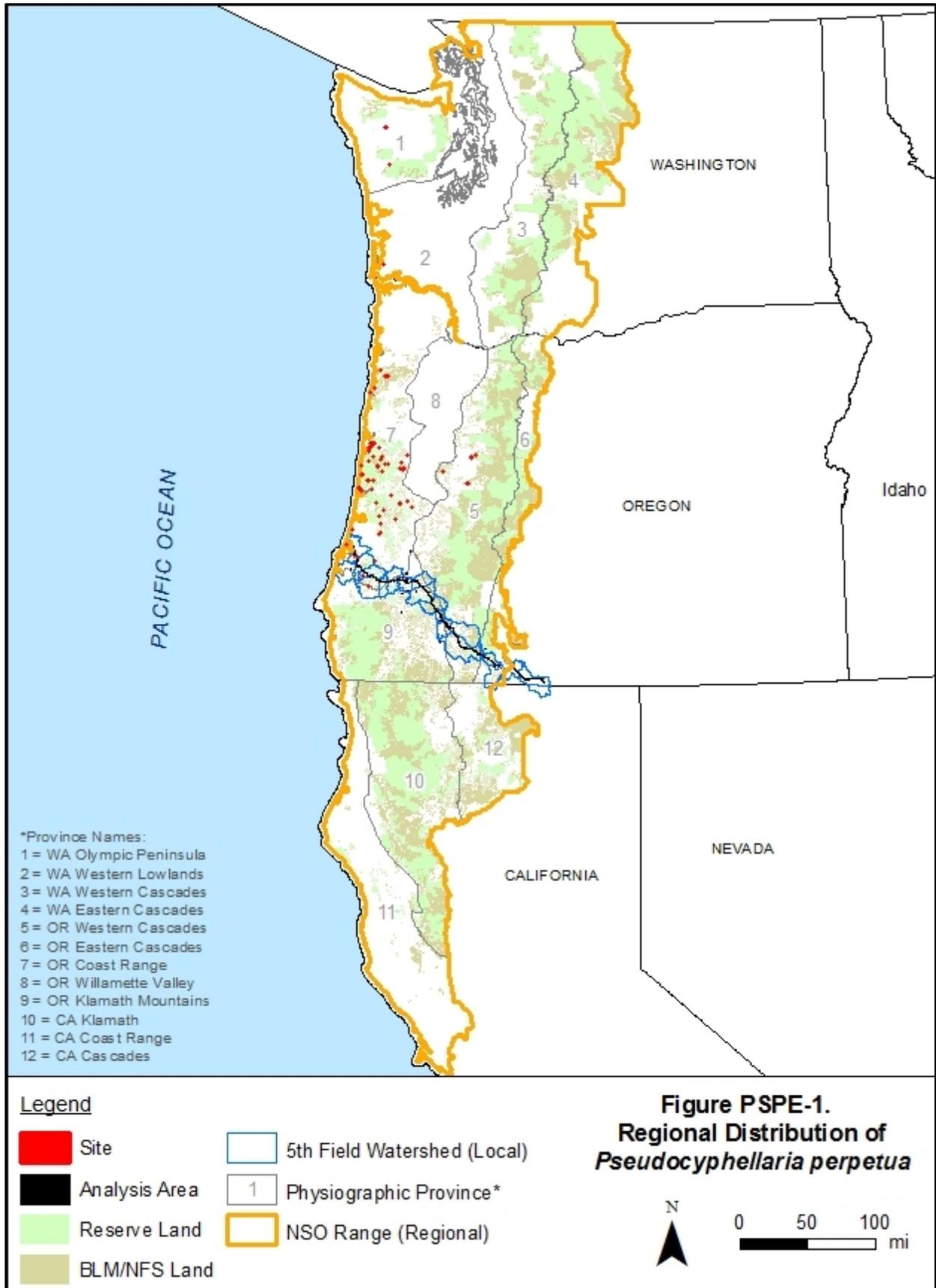
TABLE PSPE-3

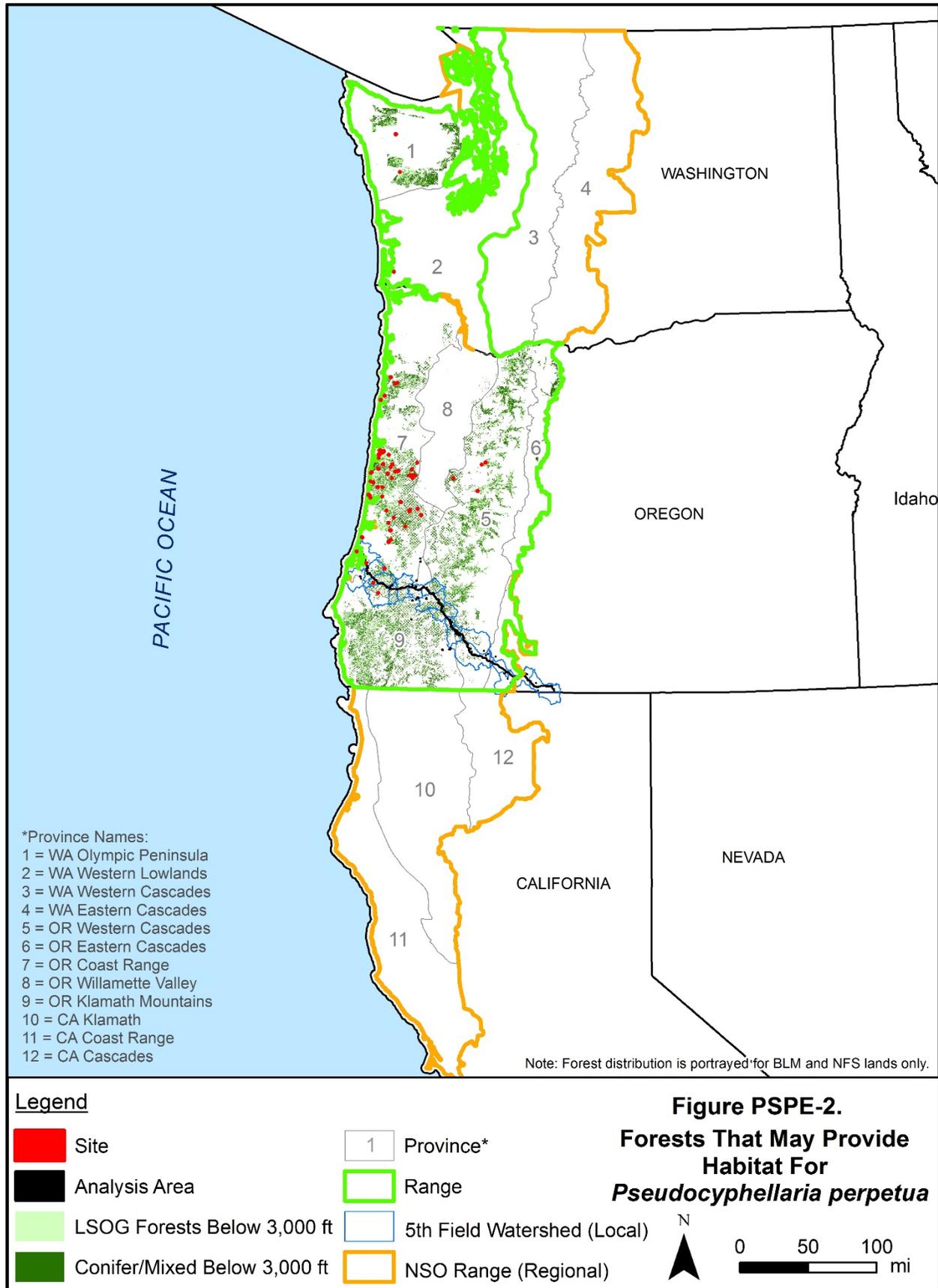
Distribution of <i>Pseudocyphellaria perpetua</i> Across 1994 ROD Land Allocations			
Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	3	-	-
Adaptive Management Reserves (AMR)	2	-	-
Administratively Withdrawn (AW)	2	-	-
<b>Congressionally Reserved (CR)</b>	<b>3</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>50</b>	<b>1</b>	-
<b>Marbled Murrelet Area (LSR3)</b>	<b>2</b>	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	18	3	1
<b>Riparian Reserve</b>	-	-	-

Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0  
 Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.  
**Bolded** allocations are designated reserve areas.  
 \*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

Regional Distribution

*P. perpetua* has a somewhat wide distribution across five physiographic provinces in Washington (Olympic Peninsula and Western Lowlands) and Oregon (Coast Range, Cascades West, and Klamath Mountain). Most of the sites are found in the Coast Range in Oregon, where many sites are clustered and relatively close to one another in groups. Scattered sites are located in other areas of Washington and Oregon. *P. perpetua* appears to be well distributed in the Coast Range in Oregon based on the abundance and size of sites, proximity of sites to one another, and distribution of the species across forests that may provide suitable habitat in the mountain ranges.





Of the 86 sites in the region, 78 sites are on BLM and NFS lands (at least partially), two sites are on National Park Service land, and 11 sites are located on private or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include 14 sites in the Coos Bay District. The other 64 sites on BLM and NFS lands are in the Eugene and Salem Districts and on the Olympic, Siuslaw, and Willamette National Forests.

Across the NSO range, 54 sites are located on reserve lands managed by BLM and the Forest Service, including 50 in LSRs (at least partially), three in Congressionally Reserved areas (at least partially), and two in Marbled Murrelet Areas. This represents 69 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components. The two NPS sites, while not covered by the S&M Standards and Guidelines, also likely receive some degree of protection based on National Park management.

*P. perpetua* is more commonly found in LSOG forests based on available data (69 of 86 total sites are in LSOG), but it is also found in non-LSOG forests, particularly riparian forests. Based on current site locations, the species is found primarily in coniferous and mixed hardwood-coniferous forest types below about 2,600 feet msl and has been documented in part of the NSO range. Coniferous and mixed hardwood-coniferous forests below 3,000 feet msl in the Olympic Peninsula and Western Lowlands of Washington and western Cascade Range, Coast Range, Klamath Mountains, and Willamette Valley of Oregon could provide habitat for *P. perpetua* and support additional sites. These forests encompass an estimated 5.6 million acres on BLM and NFS lands in the species’ range, including an estimated 2.9 million acres in reserve land allocations (51 percent of the forests; Table PSPE-4). Of this acreage, an estimated 2.3 million acres are LSOG (see Figure PSPE-2), including 1.4 million acres in reserve land allocations (61 percent of the forests). These forests are widespread across the species’ range, but the species is likely restricted to a component of the forests that provides suitable local conditions.

TABLE PSPE-4

Extent of Forests that Could Provide Habitat for <i>Pseudocypbellaria perpetua</i> on BLM and NFS Lands*				
Location	Conifer/Mixed Forests below 3,000 feet		LSOG Forests below 3,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	5,579,730	2,861,410	2,338,030	1,419,340
Local Area	332,980	118,600	114,000	52,550
Project Area	780	170	140	60

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

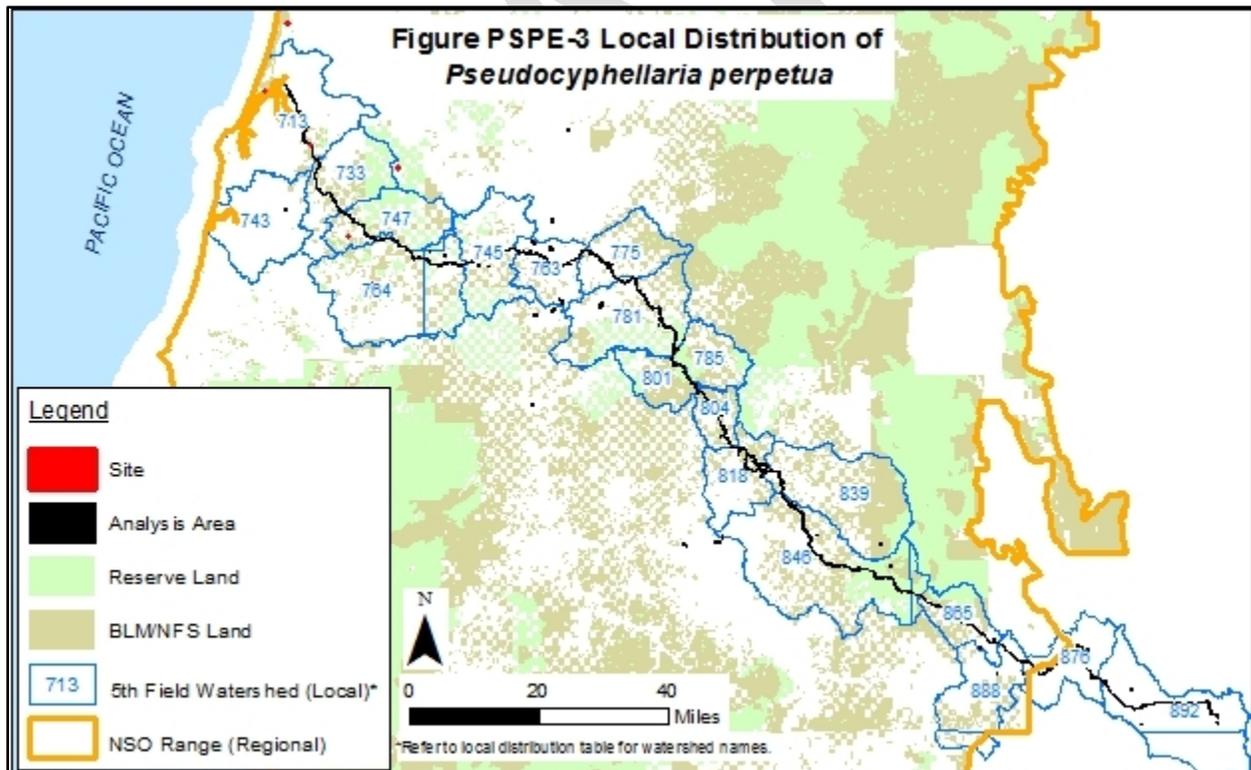
Within the local area, *P. perpetua* is distributed across three 5<sup>th</sup> field watersheds that overlap the project area (see Table PSPE-5 and Figure PSPE-3). The local sites are relatively close to one another in the East and Middle Fork Coquille River and Coos Bay Frontal watersheds. The sites appear to have some level of connectivity between them and others in the nearby Coast Range.

All of the four sites in the local area are on BLM lands, including three sites on lands designated as Other (Matrix) and one site in an LSR. One site is partially on private land. The site in an LSR is in the Middle Fork Coquille River watershed (Table PSPE-5).

TABLE PSPE-5

Distribution of <i>Pseudocypbellaria perpetua</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	2	-
East Fork Coquille River (747)	1	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	1	1
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Coniferous and mixed hardwood-coniferous forests below 3,000 feet msl encompass approximately 332,980 acres on BLM and NFS lands in the local area, with 118,600 acres in reserve land allocations (36 percent of the forests). Of this acreage, an estimated 114,000 acres are LSOG, including 52,550 acres in reserve land allocations (46 percent of the forests). Other

sites may also exist in the local area where surveys have not been completed, based on the distribution of sites in the local and nearby regional areas and extent of forests that may provide suitable habitat (see Figures PSPE-2 and PSPE-3).

Analysis/Project Area Distribution

The analysis and project areas contain one site of *P. perpetua*. This site is on BLM-managed land designated as Other (Matrix) in the Coos Bay Frontal watershed. The nearest sites are located within 15 miles to the northwest, southeast, and east of the site.

Surveys for the PCGP Project and Blue Ridge alternative resulted in one observation of the species in one location near the Blue Ridge alternative in 2014. The one observation comprises the single site in the analysis area. The site is near Blue Ridge MP 17.4.

**Project Impacts**

Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 78 sites of *P. perpetua* on BLM and NFS lands in the region, representing approximately 1 percent of the sites (or one out of 86 total sites on all lands in the NSO range). Table PSPE-6 presents an overview of the features of the PCGP Project that would affect the *P. perpetua* site. The construction corridor would affect approximately 0.8 acre (30 percent) of the site (the site encompasses approximately 2.7 acres). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *P. perpetua* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE PSPE-6

<b>Impacts to <i>Pseudocyphellaria perpetua</i> Sites on BLM and NFS Lands in the Project Area</b>		
<b>Project Activity</b>	<b>Number of Sites Affected</b>	<b>Area of Disturbance within Sites</b>
Construction Corridor	1	0.7 ac
Temporary Extra Work Area (TEWA)	1	0.1 ac
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the Blue Ridge alternative. Site counts are not additive because the site would be subject to impacts from multiple project activities.

Along the Blue Ridge alternative, vegetation removal and grading activities in the construction corridor would disturb about 0.7 acres of vegetation and soils within the site and could result in the removal of *P. perpetua* populations or individuals on trees that are removed. Disturbance in the TEWAs would result in similar impacts on about 0.1 acre within the site. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and host trees could negatively affect *P. perpetua* in adjacent areas by removing its habitat and potential host trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the site no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term

changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 590 acres of coniferous and mixed hardwood-coniferous hardwood forests below 3,000 feet msl, including 100 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *P. perpetua*. Within this impact area, about 360 acres (about 61 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 120 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of forests below 3,000 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, three sites of *P. perpetua* would remain on BLM lands in the local area, with one in a reserve, and 77 sites, including 54 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 54 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 70 percent of the remaining *P. perpetua* on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *P. perpetua* is a Category B (rare) species throughout the NSO range. Per the 2001 ROD, all known sites of Category B species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates the species appears to be more common than previously documented, as noted below:
  - *P. perpetua* has a somewhat wide distribution across five physiographic provinces in two states and a moderate-high number of overall sites (78 on BLM and NFS lands). The species appears to be well distributed in the Coast Range in Oregon.

The current known number of sites on BLM and NFS lands is an increase of about 30 sites since 2007.

- An estimated 69 percent of the sites (54 sites) are in reserves.
- Coniferous and mixed hardwood-coniferous forests below 3,000 feet msl (general habitat for the species) are widely distributed across the species' range and encompass approximately 5.6 million acres on BLM and NFS lands with an estimated 52 percent in reserves. A subcomponent of these forests likely provides habitat for *P. perpetua*.
- The PCGP Project with the Blue Ridge alternative would affect one of 78 BLM- and Forest Service-managed sites of *P. perpetua*, representing approximately 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (77) would continue to be documented on BLM and NFS lands in the region with a somewhat wide distribution across Oregon and Washington. Three sites would remain in the local vicinity of the analysis area. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the currently documented distribution and range.
- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, 52 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and three sites are at least partially in Congressionally Reserved areas where management activities that may adversely affect *P. perpetua* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 120 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl (less than 1 percent of the total regional acreage). An estimated 2.3 million acres (52 percent) of the forests and 1.4 million acres (61 percent) of LSOG forests would remain in reserves in the species' range.
- The remaining forests could support additional populations of *P. perpetua*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category B species for which pre-disturbance surveys are not practical and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during strategic and other surveys, including surveys associated with the PCGP Project.

### 3.6.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *P. perpetua* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 77 sites would remain on BLM and NFS lands across the region, and three sites would remain on BLM lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *P. perpetua* at one site, this site is in the Coast Range in Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation

would be similar to its currently known distribution and range. *P. perpetua* would persist in the region without considering the sites as part of the population.

- The PCGP Project with the Blue Ridge alternative would remove approximately 590 acres of coniferous and mixed hardwood-coniferous forests below 3,000 feet msl and 100 acres of LSOG forests (a negligible amount of the forests). An estimated 61 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 2.3 million acres (52 percent) of coniferous and mixed forests below 3,000 feet msl and 1.4 million acres (61 percent) of LSOG forests would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2007.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect the overall distribution of the species because it is distributed across Oregon and Washington.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *P. perpetua* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *P. perpetua* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *P. perpetua* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

### **3.7 RAMALINA THRAUSTA**

Background information for *Ramalina thrausta* is presented in Appendix K to the EIS. This section describes the distribution of the species using updated data and evaluates the impacts of the PCGP Project with the Blue Ridge alternative on the species.

#### **3.7.1 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

#### ***Species Distribution***

The distribution of *R. thrausta* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table RATH-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field

watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 968 observations from BLM and Forest Service geodatabases were converted into 443 sites in the NSO range (region). Table RATH-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table RATH-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure RATH-1 displays the regional distribution of the species across BLM and NFS lands, and Figure RATH-2 displays the species' regional distribution with the extent of coniferous and mixed hardwood-coniferous forests and LSOG forests below 4,000 feet msl on BLM and NFS lands within the current known range of the species.

TABLE RATH-1

Number of <i>Ramalina thrausta</i> Sites (2015)	
Location*	Number of Sites
Regional Area	443
Local Area	83
Analysis Area (Project Area)	3 (2)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015

\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE RATH-2

Distribution of *Ramalina thrausta* Across Federal, Private, and Other Lands

Land Ownership	Regional Sites	Local Sites	Analysis Area Sites
BLM	300	77	3
Forest Service	121	3	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	99	16	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011

Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE RATH-3

Distribution of *Ramalina thrausta* Across 1994 ROD Land Allocations

Land Allocation	Regional Sites	Local Sites	Analysis Area Sites
Adaptive Management Area (AMA)	40	-	-
Adaptive Management Reserves (AMR)	1	-	-
Administratively Withdrawn (AW)	11	-	-
<b>Congressionally Reserved (CR)</b>	<b>4</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>187</b>	<b>38</b>	<b>1</b>
<b>Marbled Murrelet Area (LSR3)</b>	<b>7</b>	<b>2</b>	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	<b>14</b>	<b>5</b>	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	188	37	2
<b>Riparian Reserve**</b>	<b>6</b>	-	-

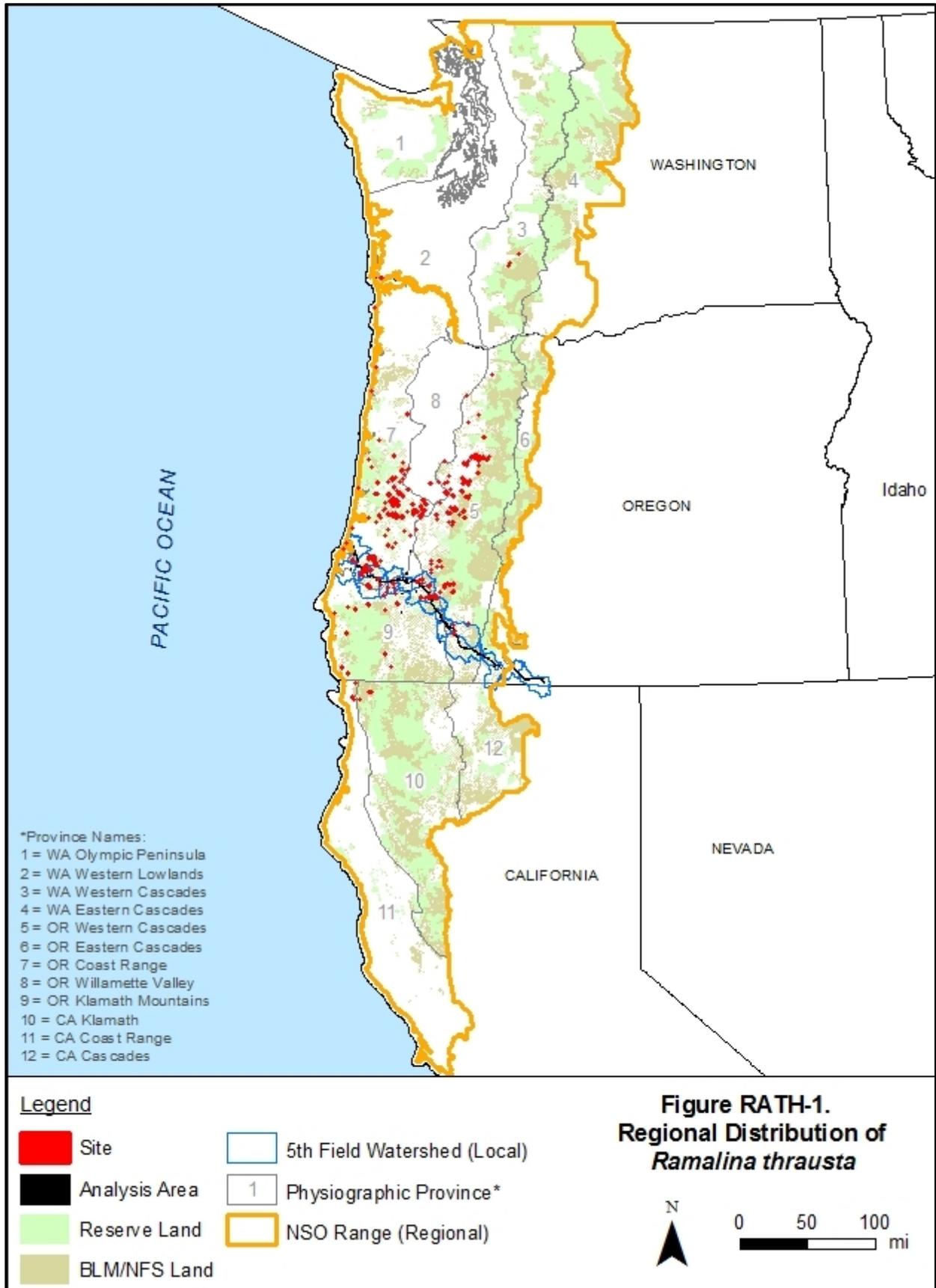
Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0

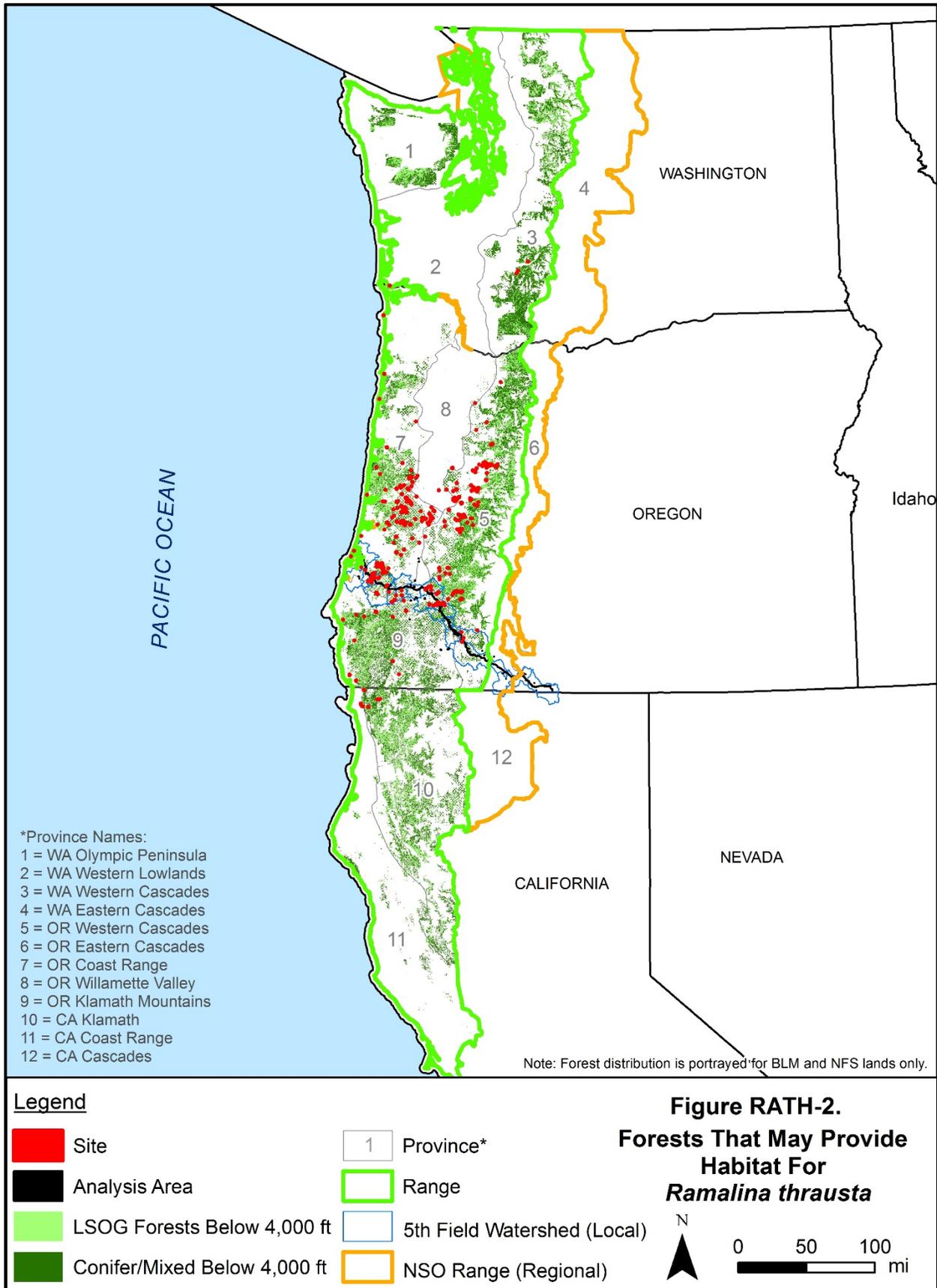
Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.

**Bolded** allocations are designated reserve areas.

\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

\*\*Sites in riparian reserves are also in the "Other" land allocation, but are shown separately for identification of sites in reserve areas. The number of sites in riparian reserves is underrepresented because it is based on regional data using the National Hydrography Dataset, and individual Districts and National Forests establish these reserves at the project or local level (such data is not available for the region).





### Regional Distribution

*R. thrausta* has a wide distribution across eight physiographic provinces in Washington (Western Lowlands and Western Cascades), Oregon (Coast Range, Cascades West, Willamette Valley, and Klamath Mountain), and California (Coast and Klamath). Most sites are found along the western Cascade Range, Klamath Mountains, and southern Coast Range in Oregon, where the sites tend to be clustered or relatively close to one another in groups. Scattered sites are located in the northern Coast Range in Oregon and the Western Lowlands in Washington, along with other outlying areas. The Coast Range and Klamath Mountains in California contain several clustered sites near the Oregon border. *R. thrausta* appears to be well distributed in its range in Oregon based on the abundance and size of sites, proximity of sites to one another, and distribution of sites across forests that may provide suitable habitat in the mountain ranges.

Of the 443 sites in the region, 420 sites are on BLM and NFS lands (at least partially) and 99 sites are located on private, state, or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include 82 sites in the Coos Bay District, 10 sites in the Medford District, and 68 sites in the Roseburg District. Sites managed by the National Forests that encompass the project area include seven sites on the Rogue River National Forest and 30 sites on the Umpqua National Forest. The other 224 sites on BLM and NFS lands are in the Salem and Eugene Districts and on the Gifford-Pinchot, Siuslaw, Six Rivers, and Willamette National Forests.

Across the NSO range, 210 sites are located on reserve lands managed by BLM and the Forest Service, including 187 in LSRs (at least partially), four in Congressionally Reserved areas (at least partially), seven in Marbled Murrelet Areas (at least partially), 14 in Known Owl Activity Centers (at least partially), and six in Riparian Reserves (at least partially). This represents 50 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*R. thrausta* is more commonly found in LSOG forests based on available data (365 of 443 total sites are in LSOG), but is also found in non-LSOG forests and may not be restricted to LSOG conditions based on available information on its life history and habitat requirements. Based on current site locations, the species is found in coniferous and mixed hardwood-coniferous forests up to about 3,300 feet msl and has been documented in the western portion of the NSO range. Coniferous and mixed hardwood-coniferous forests below 4,000 feet msl, including the LSOG components of these forests, in the western portion of the NSO range, excluding the eastern Cascade Range in Oregon and Washington and Cascade Range in California, could provide habitat for *R. thrausta* and support additional sites. These forests encompass an estimated 9.9 million acres on BLM and NFS lands in the region, including an estimated 5.2 million acres in reserve land allocations (53 percent of the forests; Table RATH-4). Of this acreage, an estimated 4 million acres are LSOG (see Figure RATH-2), including 2.5 million acres in reserve land allocations (61 percent of the forests). Although coniferous and mixed hardwood-coniferous forests below 4,000 feet msl are widespread across the species' range, LSOG forests are less common and are primarily found in the Cascade and Coast Ranges and Klamath Mountains.

TABLE RATH-4

**Extent of Forests that Could Provide Habitat for *Ramalina thrausta* on BLM and NFS Lands\***

Location	Coniferous/Mixed Forests below 4,000 feet		LSOG Forests below 4,000 feet	
	Total	Reserves	Total	Reserves
Regional Area	9,893,790	5,229,970	4,030,990	2,452,890
Local Area	425,530	137,850	143,840	60,620
Project Area	990	230	200	80

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species' specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

**Local Distribution**

Within the local area, *R. thrausta* is found in 10 5<sup>th</sup> field watersheds that overlap the project area (see Table RATH-5 and Figure RATH-3). The sites are clustered and near one another in the Coast Range, Klamath Mountains, and western Cascade Range in the western portion of the local area. A group of three sites in the Big Butte Creek and Little Butte Creek watersheds is separated from the rest of the local sites. In the western-most watersheds, multiple avenues of connectivity appear to be available between sites, and opportunities for dispersal exist within the local area and to nearby regional areas. Many regional sites are located to the north in the Coast Range and western Cascade Range and to the south in the Klamath Mountains.

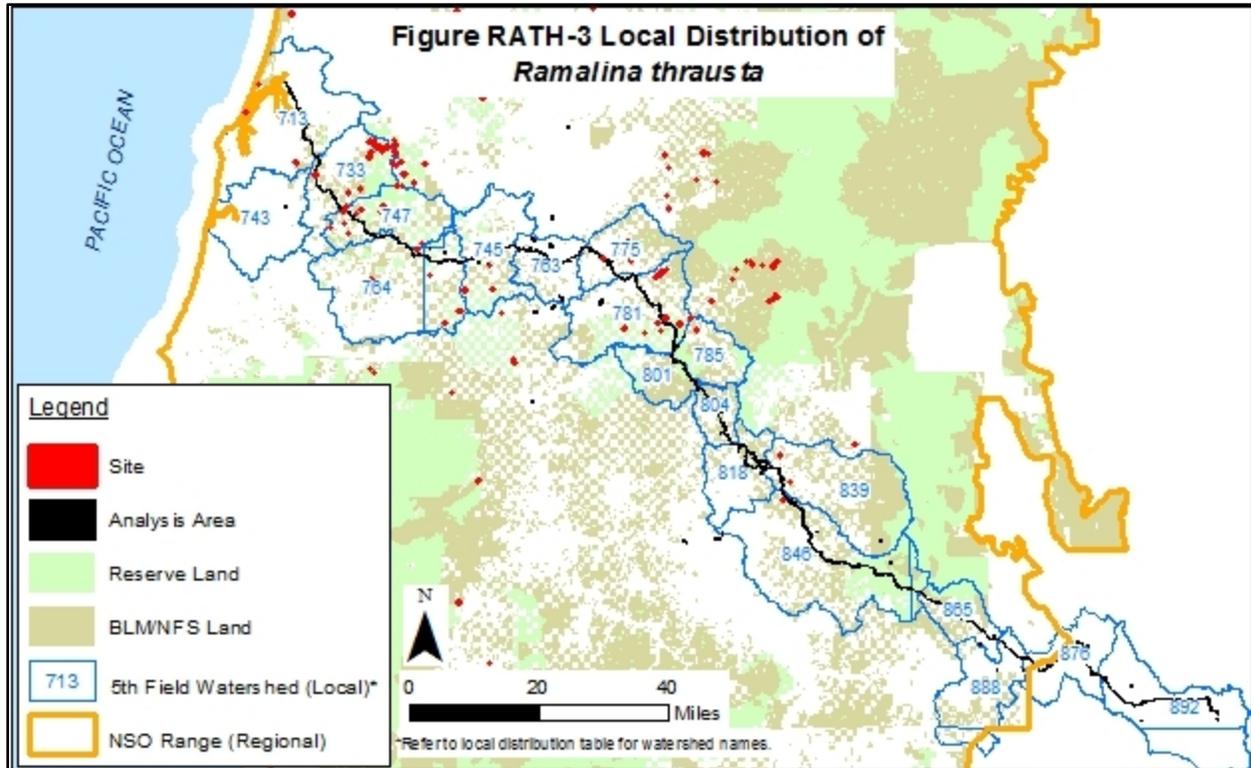
Of the 83 sites in the local area, 79 sites are at least partially on BLM or NFS lands, and 16 sites are at least partially on private lands. Of the sites on BLM and NFS lands, 37 sites are on land designated as Other (Matrix), and 44 sites are on reserve lands, including 38 sites in LSRs (at least partially), two in Marbled Murrelet Areas, and five in Known Owl Activity Centers (at least partially). The number of sites on reserve lands represents 56 percent of the BLM- and Forest Service-managed sites in the local area. Sites on reserve lands are located in six out of the 10 watersheds, with the majority of sites on reserve lands located in the North Fork Coquille River watershed (Table RATH-5).

TABLE RATH-5

**Distribution of *Ramalina thrausta* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	3	-
Coos Bay Frontal (713)	3	-
East Fork Coquille River (747)	11	3
Elk Creek-South Umpqua (785)	2	-
Klamath River-John C Boyle Reservoir (888)	-	-
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	1	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	7	6
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	10	3
North Fork Coquille River (733)	27	23
Olalla Creek-Lookingglass Creek (745)	3	2
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	16	7
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Coniferous and mixed hardwood-coniferous forests below 4,000 feet msl encompass approximately 425,530 acres, including 137,850 acres in reserve land allocations (32 percent of the forests). Of this acreage, an estimated 143,840 acres are LSOG, including 60,620 acres in reserve land allocations (42 percent of the forests). Other sites may also exist in the local area, particularly in the western portion, where surveys have not been completed, based on the number of sites in the local area, distribution of those sites, and the extent of forests that may provide suitable habitat (see Figures RATH-2 and RATH-3).

#### Analysis/Project Area Distribution

The analysis area contains three sites of *R. thrausta*, and the project area contains two sites. These sites are on BLM-managed lands in the Roseburg and Coos Bay Districts. One site is on land designated as LSR in the South Umpqua River watershed. Two sites are on land designated as Other (Matrix) in the North Fork Coquille River and Myrtle Creek watersheds. Many other sites are located in the nearby Klamath Mountains, Coast Range, and western Cascade Range (see Local Distribution discussion above).

Surveys for the PCGP Project and Blue Ridge alternative resulted in three observations of the species in three locations in and near the project area (Siskiyou BioSurvey LLC 2011). These recorded observations comprise the sites in the analysis area. The two sites in the project area are located at Blue Ridge MP 23.5 and at MP 78.3. The third site in the analysis area is west of MP 96.

**Project Impacts**

Analysis

The PCGP Project with the Blue Ridge alternative would affect three sites out of the 420 sites on BLM- and Forest Service-managed lands in the region, representing less than 1 percent of the sites (or three out of 443 total sites on all lands in the NSO range). Table RATH-6 presents an overview of the features of the PCGP Project that would affect the *R. thrausta* sites. The construction corridor and associated work and storage areas would affect approximately 2.8 acres within two sites (about 29 percent of all sites in the analysis area). One site could be indirectly affected by road improvements or TEWAs, but would not be subject to direct effects. Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *R. thrausta* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE RATH-6

Impacts to <i>Ramalina thrausta</i> Sites on BLM and NFS Lands in the Project Area		
Project Activity	Number of Sites Affected	Area of Disturbance within Sites
Construction Corridor	2	1.2 ac
Temporary Extra Work Area (TEWA)	1	0.2 ac
Uncleared Storage Area (UCSA)	2	1.4 ac
Roads (TMP)	-	-
Other Minimal Disturbance Activities	-	-

ac = acres

Note: Site counts are not additive because some sites would be subject to impacts from multiple project activities.

Vegetation removal and grading activities in the construction corridor would disturb about 1.2 acres of vegetation and soil within two sites and could result in the removal of *R. thrausta* populations or individuals. Disturbance in the TEWAs would result in similar impacts on about 0.2 acre within one site. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and host trees could negatively affect *R. thrausta* in adjacent areas by removing its habitat and potential host trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the sites no longer suitable for the species. Road improvements and TEWA use could also modify microclimate conditions near one site, potentially affecting site persistence even though the site would not be directly affected. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not likely provide habitat for the species during the life of the project. Material storage within UCSAs would disturb about 1.4 acres of understory habitat in two sites, which could modify microhabitats near extant individuals, potentially making the habitat no longer suitable for the species.

Along the Blue Ridge alternative, one site would be affected by activities in the construction corridor (0.2 acre of the site) and adjacent UCSAs (0.1 acre of the site), as described above. These activities would disturb about 11 percent of the site (the site encompasses 2.7 acres). Habitat conditions in the site could be modified as a result of changes to humidity and microclimate conditions, potentially making the habitat unsuitable for the species. Based on

available data, implementation of the Blue Ridge alternative would increase impacts on *R. thrausta* by affecting site persistence at one site along the alternative route in addition to the one site affected by another segment of the PCGP Project.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 780 acres of coniferous and mixed hardwood-coniferous forests below 4,000 feet msl, including 150 acres of LSOG forests. These impacts would result in a reduction of habitat that may be suitable for *R. thrausta*. Within this impact area, about 480 acres (about 62 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, resulting in a long-term reduction in potential habitat, although some restored areas may provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would remain across the project area, resulting in a permanent loss of about 160 acres of coniferous and mixed hardwood-coniferous forests below 4,000 feet msl. This loss of forests represents less than 1 percent of the total estimated area of coniferous and mixed hardwood-coniferous forests below 4,000 feet msl across the species' range.

### Discussion

Assuming site persistence cannot be maintained at the three sites as a result of the PCGP Project, 76 sites of *R. thrausta* would remain on BLM and NFS lands in the local area, including 43 in reserves, and 417 sites, including 209 in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The 209 sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 50 percent of the remaining *R. thrausta* sites on BLM and NFS lands in the NSO range would be protected in reserves.

### **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *R. thrausta* is a Category A (rare) S&M species throughout the NSO range. Per the 2001 ROD, all known sites of Category A species are likely to be necessary to provide reasonable assurance of species persistence in the range of the NSO. New information since the species was listed in the 2001 ROD has increased the availability of information on the species, as noted below:
  - This species was removed from the S&M Standards and Guidelines via the 2001 Annual Species Review, as a result of new information that demonstrated this species did not meet all of the basic criteria for S&M.
  - *R. thrausta* has a wide distribution across eight physiographic provinces and three states in the region and a moderate-high number of overall sites (420 on BLM and

NFS lands). The species appears to be well distributed in its range in Oregon. The current known number of sites on BLM and NFS lands is actually a decrease of sites documented since 2007, but is still moderate-high. Three sites were documented during PCGP Project surveys.

- An estimated 50 percent of the sites (210 sites) are in reserves.
- Coniferous and mixed hardwood-coniferous forests below 4,000 feet msl (general habitat for the species) are widespread across the species' range and encompass approximately 9.9 million acres on BLM and NFS lands with an estimated 53 percent in reserves. Most of the forests are found in the Cascade Range, Klamath Mountains, and Coast Range, where most sites are documented. A subcomponent of these forests likely provides habitat for *R. thrausta*.
- The PCGP Project with the Blue Ridge alternative would affect three of 420 BLM- and Forest Service-managed sites of *R. thrausta*, representing less than 1 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the sites, a moderate-high number of sites (417) would continue to be documented on BLM and NFS lands in the region with a wide distribution across Washington, Oregon, and California. Many sites (76 sites) would remain in the local vicinity of the analysis area; these sites would continue to be distributed across 10<sup>th</sup> field watersheds. The distribution of sites and extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.
- The PCGP Project would affect one site in an LSR, but the percentage of sites in reserves would be about the same (50 percent). Of the remaining sites, 207 sites are at least partially in LSRs where management actions are restricted to those activities that benefit LSOG forests and four sites are at least partially in Congressionally Reserved areas where management activities that may adversely affect *R. thrausta* are unlikely. Six other sites are at least partially in Riparian Reserves where management actions are restricted to those activities that benefit the conservation of aquatic and riparian-dependent terrestrial resources.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 160 acres of coniferous and mixed hardwood-coniferous forests below 4,000 feet msl (less than 1 percent of the total acreage in the species' range). An estimated 5.2 million acres (53 percent) of coniferous and mixed hardwood-coniferous forests and 2.5 million acres (61 percent) of LSOG forests below 4,000 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *R. thrausta*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category A species for which pre-disturbance surveys are practical and have been conducted in many areas; thus, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during surveys, including surveys associated with the PCGP Project.

### 3.7.2 Conclusions

If implemented as proposed, the PCGP Project with the Blue Ridge alternative would likely affect site persistence of *R. thrausta* at three sites; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 417 sites would remain on BLM and NFS lands across the region, and 76 sites would remain on BLM and NFS lands in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *R. thrausta* at three sites, these sites are part of the many sites in southern Oregon where the species is well distributed. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *R. thrausta* would persist in the region without considering the sites as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 780 acres of coniferous and mixed hardwood-coniferous forests and 150 acres of LSOG forests below 4,000 feet msl (a negligible amount of the forests). An estimated 62 percent of the forests would be restored to similar conditions or shrublands, but a permanent unforested corridor would remain across the project area. An estimated 5.2 million acres (53 percent) of coniferous and mixed hardwood-coniferous forests and 2.5 million acres (61 percent) of LSOG forests below 4,000 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2004.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect a significant portion of sites because the species is widely distributed.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the three *R. thrausta* sites in the analysis area, although some individuals within the sites may persist following project implementation. Based on the above conclusions, avoidance of the *R. thrausta* sites is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *R. thrausta* sites affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the sites and adjacent habitat over the long term.

### 3.8 STENOCYBE CLAVATA

*Stenocybe clavata* is a parasitic lichen in the Mycolaliciaceae family and is commonly known as Pacific stickpin.

#### 3.8.1 Regulatory Status and Ranking

The 2001 ROD identifies *S. clavata* as a Category E (rare) species. The ORBIC evaluated *S. clavata* in its 2004 *Survey and Manage Assessment* for BLM and Forest Service (ORBIC 2004) and again in its most recent update of *Rare, Threatened, and Endangered Species of Oregon*

(ORBIC 2013). In 2013, the species was rare, uncommon, or threatened, but not immediately imperiled, within its global range and in Oregon (G3, S3, respectively). The species is on the ORBIC List 4. It is not considered a BLM or Forest Service Sensitive or Strategic species in Oregon.

### 3.8.2 Background Information

This section presents background information on the species based on published documents and other relevant sources. Site counts, for example, are presented in this section using previously published estimates, and current site counts based on agency data, which are used for the analysis, are presented in the following section. This information is used to support the persistence evaluation in the following section and is updated with more recent information specifically used for the persistence evaluation.

#### *Life History*

*S. clavata* is parasitic or saprophytic on vascular plants, such as Douglas-fir and western hemlock (Tibell 1991). Like other *Stenocybe* species, it is a non-lichenized fungus, which means it does not contain symbiotic alga or cyanobacteria. *S. clavata* produces stalked apothecia, which may facilitate spore dispersal by wind or animals (Stone 2012). Its growth and dispersal rates are likely very slow.

#### *Range*

*S. clavata* is endemic to western North America (Stone 2012). Its range extends from Alaska to California along the Pacific Coast. Within the range of the NSO, *S. clavata* has been documented in Washington and Oregon and is expected to occur in the Klamath Mountains of California (ORBIC 2004). The current known range of the species within the NSO range based on 2015 data is presented below under the Species Distribution discussion.

Although information on the species' historic range is not known, its range was likely similar to the current range, with populations distributed across the Pacific Northwest. Local distributions across its range may have varied based on specific habitat conditions and have likely been affected by habitat modifications and other environmental factors, as discussed under Threats below.

#### *Population Status*

The ORBIC (2004) reported *S. clavata* from an estimated 100 element occurrences across its range. In the Pacific Northwest, it is most common in Oregon (more than 32 occurrences), with other possible occurrences in Washington and California. The species was found in four locations during Random Multi-Species surveys across the NSO range in 2001–2004 (USDA and USDI 2007). In the 2007 Final SEIS, the Forest Service and BLM reported seven sites on all lands in the NSO range (all sites were on federal lands).

For the PCGP Project and Blue Ridge alternative, surveys for S&M lichens were conducted between 2007–2010 in the PCGP Project area and within 50–200 feet on either side of the construction corridor (Siskiyou BioSurvey LLC 2008, 2011) and in 2012 and 2014 within 50–200 feet on either side of the alternative construction corridor route. These surveys targeted Category A, B, and C lichens and other special-status lichens and resulted in one observation of a

population of *S. clavata* near the Blue Ridge route. The current estimated number of sites and distribution of the species based on 2015 data are presented below under the Species Distribution discussion.

### ***Habitat***

*S. clavata* grows on the bark of conifer trees, primarily Douglas-fir, western hemlock, and Sitka spruce, in humid (coastal) or dry forests, rarely in intermediate forests, up to about 3,800 feet msl (Stone 2012, ORBIC 2004, Tibell 1991). It prefers old conifer trees, more than 200 years old, but has also been found on younger, 100-year-old trees (ORBIC 2004). Based on available information, *S. clavata* may be restricted to specific microclimate conditions of LSOG forests, although it may also be found in younger old forests.

### ***Threats***

The primary threat to *S. clavata* has been removal of old conifer trees (ORBIC 2004). Fire also destroys habitat, while pockets of unburned forest serve as refugia (Stone 2012). Fragmentation of old-growth forests can limit dispersal.

### ***Management Recommendations***

For Category E S&M species, the direction from the 2001 ROD is to manage all known sites until a determination can be made regarding which S&M category, if any, the species should be assigned to (USDA and USDI 2001). No management recommendations have been developed for *S. clavata*.

## **3.8.3 Persistence Evaluation**

This section presents the persistence evaluation for the species, which includes a discussion of the species' current known distribution within the NSO range based on new information on sites, an evaluation of the impacts of the PCGP Project with the Blue Ridge alternative on sites and habitat, a discussion of sites remaining in the NSO range following project implementation, and a summary of the factors considered in the persistence evaluation to support the conclusions in the following section.

### ***Species Distribution***

The distribution of *S. clavata* across the NSO range and in and near the project area is discussed below. This discussion is based on the recorded observations of the species stored in geodatabases maintained by BLM and Forest Service (Oregon/Washington regional offices) and converted into sites according to the methodology described in Chapter 1 of Appendix K. Table STCL-1 presents the total number of sites in the regional (NSO range), local (19 5<sup>th</sup> field watersheds that encompass the project area), analysis (50-meter spatial buffer around the project area, including the Blue Ridge alternative), and project areas (PCGP Project corridor, work areas, and roads with Blue Ridge alternative). An estimated 65 observations from BLM and Forest Service geodatabases were converted into 42 sites in the NSO range (region). Table STCL-2 presents the total number of sites on BLM and NFS land and other land ownerships across the regional, local, and analysis areas. Table STCL-3 presents the total number of sites within each land use allocation defined in the 1994 ROD across the regional, local, and analysis areas. Figure STCL-1 displays the regional distribution of the species across BLM and NFS lands, and Figure STCL-2 displays the species' regional distribution with the extent of

coniferous and mixed hardwood-coniferous forests and LSOG forests below 4,500 feet msl on BLM and NFS lands within the current known range of the species.

TABLE STCL-1

<b>Number of <i>Stenocybe clavata</i> Sites (2015)</b>	
<b>Location*</b>	<b>Number of Sites</b>
Regional Area	42
Local Area	2
Analysis Area (Project Area)	1 (1)

Data Source: Processed BLM and Forest Service GIS data, June 23, 2015  
\*Definitions of regional, local, analysis, and project areas are provided in Chapter 1 of Appendix K and this supplement.

TABLE STCL-2

<b>Distribution of <i>Stenocybe clavata</i> Across Federal, Private, and Other Lands</b>			
<b>Land Ownership</b>	<b>Regional Sites</b>	<b>Local Sites</b>	<b>Analysis Area Sites</b>
BLM	29	2	1
Forest Service	12	-	-
NPS	-	-	-
Fish and Wildlife Service	-	-	-
Other (Private, State, etc.)	5	-	-

Data Source: Merged land ownership data for CA, WA, and OR in NSO range, October 2011  
Notes: Columns are not additive because some sites occur on lands in multiple ownerships.

TABLE STCL-3

<b>Distribution of <i>Stenocybe clavata</i> Across 1994 ROD Land Allocations</b>			
<b>Land Allocation</b>	<b>Regional Sites</b>	<b>Local Sites</b>	<b>Analysis Area Sites</b>
Adaptive Management Area (AMA)	-	-	-
Adaptive Management Reserves (AMR)	28	-	-
Administratively Withdrawn (AW)	-	-	-
<b>Congressionally Reserved (CR)</b>	<b>1</b>	-	-
<b>Late Successional Reserve (LSR)</b>	<b>8</b>	-	-
<b>Marbled Murrelet Area (LSR3)</b>	-	-	-
<b>Northern Spotted Owl Activity Center (LSR4)*</b>	-	-	-
Managed Late Successional Area (MLSA)	-	-	-
Not Designated (ND)	-	-	-
Other (Matrix, Riparian Reserve, Other)	4	2	1
<b>Riparian Reserve</b>	-	-	-

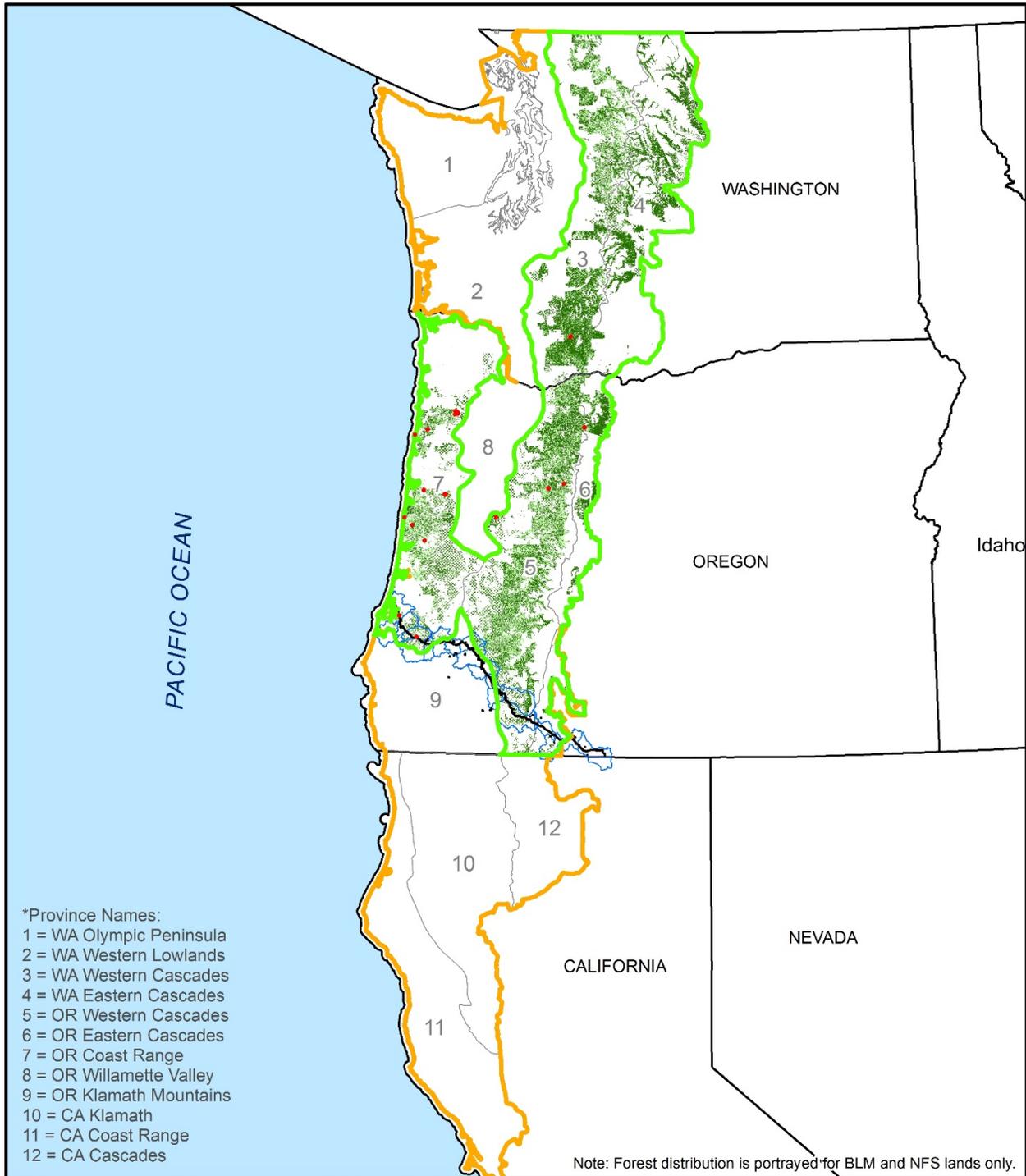
Data Sources: 1994 ROD land allocation data, December 2002; U.S. Geological Survey National Hydrography Dataset, v. 2.1.0  
Notes: Columns are not additive because of overlap between some allocations and some sites may occur in multiple allocations.  
**Bolded** allocations are designated reserve areas.  
\*Northern Spotted Owl Activity Center is currently referred to as Known Owl Activity Center (KOAC).

### Regional Distribution

*S. clavata* has a somewhat limited distribution across four physiographic provinces in Washington (Western Cascades) and Oregon (Coast Range and Cascades East and West). Most of the sites are found in the Coast Range in Oregon, where some sites are clustered in groups and others are scattered. Scattered sites are located in other areas of Washington and Oregon. *S. clavata* does not appear to be well distributed across its range based on the scattered distribution of groups of sites and individual sites that appear somewhat isolated from other sites.

Of the 42 sites in the region, 41 sites are on BLM and NFS lands (at least partially) and five sites are located on private or other lands (at least partially). Sites managed by the BLM Districts that encompass the project area include two sites in the Coos Bay District. The other 39 sites on BLM and NFS lands are in the Eugene and Salem Districts and on the Gifford Pinchot, Mt. Hood, Siuslaw, and Willamette National Forests.

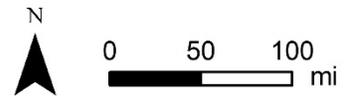




**Legend**

- |  |   |
|--|---|
|  Site                         |  Province*                   |
|  Analysis Area                |  Range                       |
|  LSOG Forests Below 4,500 ft  |  5th Field Watershed (Local) |
|  Conifer/Mixed Below 4,500 ft |  NSO Range (Regional)        |

**Figure STCL-2.**  
**Forests That May Provide**  
**Habitat For**  
***Stenocybe clavata***



Across the NSO range, nine sites are located on reserve lands managed by BLM and the Forest Service, including eight in LSRs and one in a Congressionally Reserved area. This represents 22 percent of the total BLM- and Forest Service-managed sites in the region. The other BLM- and Forest Service-managed sites receive some level of protection through the S&M Standards and Guidelines and other land management plan components.

*S. clavata* is primarily found in LSOG forests based on available data (38 of 42 total sites are in LSOG) and may be restricted to LSOG forests based on available information. Based on current site locations, the species is found in coniferous and mixed hardwood-coniferous forest types below about 4,100 feet msl and has been documented in part of the NSO range. LSOG coniferous and mixed hardwood-coniferous forests below 4,500 feet msl in the Coast Range in Oregon and Cascade Range in Oregon and Washington could provide habitat for *S. clavata* and support additional sites. These forests encompass an estimated 3.1 million acres on BLM and NFS lands in the species’ range, including an estimated 1.8 million acres in reserve land allocations (59 percent of the forests; Table STCL-4). LSOG forests are not as widespread as younger forests across the species’ range, and the species is likely restricted to a component of the forests that provides suitable local conditions.

TABLE STCL-4

Extent of Forests that Could Provide Habitat for <i>Stenocybe clavata</i> on BLM and NFS Lands*				
Location	Conifer/Mixed Forests below 4,500 feet		LSOG Forests below 4,500 feet	
	Total	Reserves	Total	Reserves
Regional Area	8,428,350	4,360,390	3,087,330	1,830,980
Local Area	302,210	82,530	96,100	38,930
Project Area	530	100	100	20

Data Source: GNN vegetation data from Moeur et al. 2011

Note: Areas are presented in acres. Regional area estimates are for a portion of the NSO range, as noted in the text, which is where the species is known to or may occur.

\*The acreage estimates are based on available data for forest types that have been mapped across the NSO range. The species’ specific habitat requirements are narrower than the general forest types, and potential habitat is actually a subcomponent of the forests and is much smaller.

Local Distribution

Within the local area, *S. clavata* is distributed across two 5<sup>th</sup> field watersheds that overlap the project area (see Table STCL-5 and Figure STCL-3). The two local sites are relatively close to one another on BLM-managed lands in the Middle Fork Coquille River and Coos Bay Frontal watersheds. Both sites are on land designated as Other (Matrix); no sites are on reserve lands. The sites appear to be somewhat isolated from others in the Coast Range.

LSOG coniferous and mixed hardwood-coniferous forests below 4,500 feet msl encompass approximately 96,100 acres are LSOG, including 38,930 acres in reserve land allocations (41 percent of the forests). Other sites may also exist in the local area where surveys have not been completed.

TABLE STCL-5

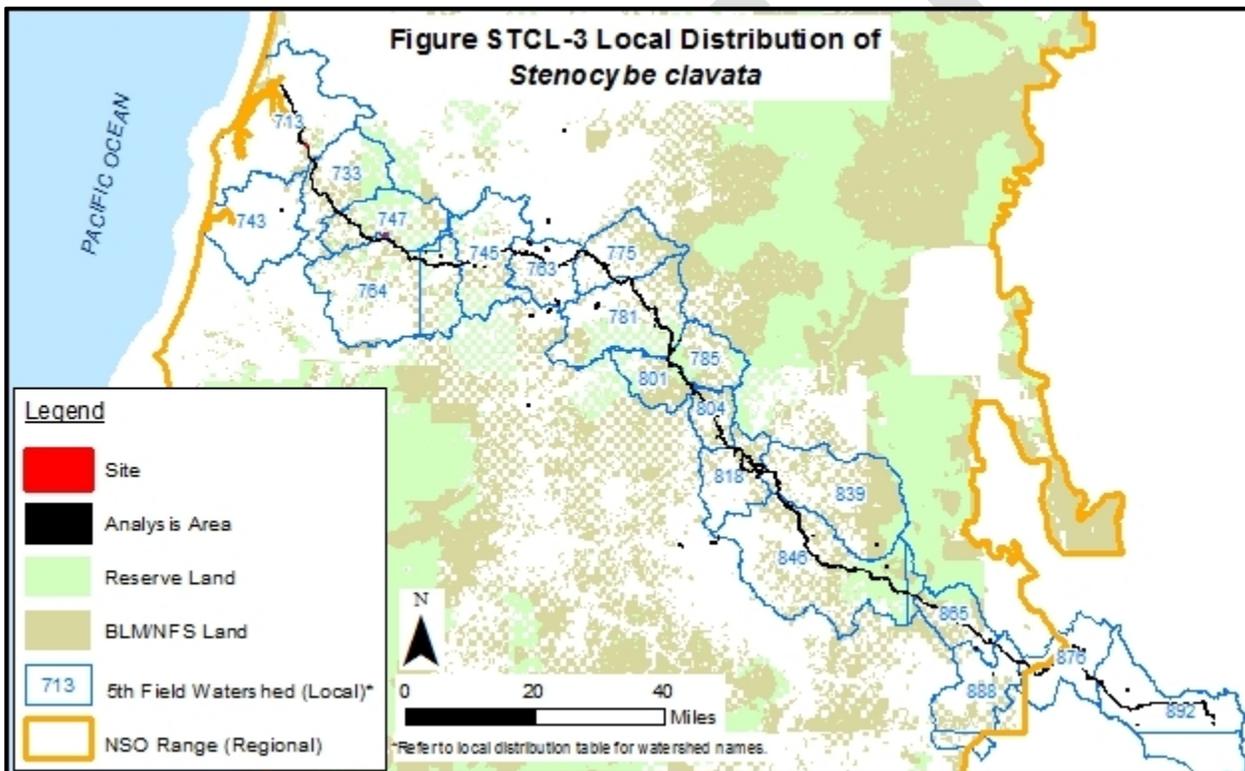
Distribution of <i>Stenocybe clavata</i> in Local 5th Field Watersheds		
Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Big Butte Creek (839)	-	-
Coos Bay Frontal (713)	1	-
East Fork Coquille River (747)	-	-
Elk Creek-South Umpqua (785)	-	-
Klamath River-John C Boyle Reservoir (888)	-	-

TABLE STCL-5

**Distribution of *Stenocybe clavata* in Local 5th Field Watersheds**

Watershed (HUC5 ID)	Number of Sites	Number of Sites on Reserve Lands
Lake Ewauna-Upper Klamath River (876)	-	-
Little Butte Creek (846)	-	-
Lower Coquille River (743)	-	-
Lower Lost River (892)	-	-
Middle Fork Coquille River (764)	1	-
Middle South Umpqua River (763)	-	-
Myrtle Creek (775)	-	-
North Fork Coquille River (733)	-	-
Olalla Creek-Lookingglass Creek (745)	-	-
Rogue River-Shady Cove (818)	-	-
South Umpqua River (781)	-	-
Spencer Creek (865)	-	-
Trail Creek (804)	-	-
Upper Cow Creek (801)	-	-

Data Sources: Processed BLM and Forest Service GIS data, June 23, 2015; HUC5 Watershed layer, Aug. 23, 2011



Analysis/Project Area Distribution

The analysis and project areas contain one site of *S. clavata*. This site is on BLM-managed land designated as Other (Matrix) in the Coos Bay Frontal watershed. The nearest site is located more than 15 miles to the southeast of the site.

Surveys for the PCGP Project and Blue Ridge alternative resulted in one observation of the species in one location near the Blue Ridge alternative in 2014. The one observation comprises the single site in the analysis area. The site is near Blue Ridge MP 17.4.

**Project Impacts**

Analysis

The PCGP Project, specifically the Blue Ridge alternative, would affect one site out of the 41 sites of *S. clavata* on BLM and NFS lands in the region, representing approximately 2 percent of the sites (or one out of 42 total sites on all lands in the NSO range). Table STCL-6 presents an overview of the features of the PCGP Project that would affect the *S. clavata* site. The construction corridor would affect approximately 1.2 acres (34 percent) of the site (the site encompasses approximately 3.5 acres). Measures outlined in Chapter 1 of Appendix K would be implemented to minimize soil and vegetation disturbance in the project area and restore areas following construction, which could minimize adverse impacts on *S. clavata* in and near the project area. This discussion presents an overview of the types of impacts associated with the PCGP Project features that could affect site persistence.

TABLE STCL-6

<b>Impacts to <i>Stenocybe clavata</i> Sites on BLM and NFS Lands in the Project Area</b>		
<b>Project Activity</b>	<b>Number of Sites Affected</b>	<b>Area of Disturbance within Sites</b>
Construction Corridor	1	1.0 ac
Temporary Extra Work Area (TEWA)	1	0.2 ac
Uncleared Storage Area (UCSA)	-	-
Roads (TMP)	-	-
Other Minimal Disturbance Activity	-	-

ac = acres

Note: Site impacts are only along the Blue Ridge alternative. Site counts are not additive because the site would be subject to impacts from multiple project activities.

Along the Blue Ridge alternative, vegetation removal and grading activities in the construction corridor would disturb about 1.0 acre of vegetation and soils in one site and could result in the removal of *S. clavata* populations or individuals on trees that are removed. Disturbance in the TEWAs would result in similar impacts on about 0.2 acre in the site. The establishment of the corridor could modify microclimate conditions around populations or individuals adjacent to the corridor. The removal of forests and host trees could negatively affect *S. clavata* in adjacent areas by removing its habitat and potential host trees, potentially affecting site persistence even if the entire site is not disturbed. In addition, modification of shading, moisture, and habitat conditions as a result of the corridor and TEWAs could make habitat within the sites no longer suitable for the species. Restored portions of the corridor and TEWAs would be dominated by early seral vegetation for approximately 30 years, which would result in long-term changes to habitat conditions. A portion of the corridor would be maintained in low-growing vegetation for pipeline maintenance and would not provide habitat for the species during the life of the project.

Across the project area, the PCGP Project with the Blue Ridge alternative would remove an estimated 80 acres of LSOG coniferous and mixed hardwood-coniferous forests below 4,500 feet msl. These impacts would result in a reduction of habitat that may be suitable for *S. clavata*. Within this impact area, about 60 acres (about 75 percent) of the forests would be restored to forests or shrublands in portions of the corridor and in TEWAs, but these areas would not return to LSOG conditions for more than 80 years and would not likely provide habitat for the species during the life of the PCGP Project. A permanent unforested corridor would also remain across the project area and would not provide habitat for the species. The permanent loss of LSOG forests below 4,500 feet msl represents less than 1 percent of the total estimated area of these forests across the species' range.

## Discussion

Assuming site persistence cannot be maintained at the single site as a result of the PCGP Project with the Blue Ridge alternative, one site of *S. clavata* would remain on BLM land in the local area, and 40 sites, including nine in reserves, would remain on BLM and NFS lands in the NSO range. The remaining sites could be affected by natural hazards (e.g., fire, drought), but they would be subject to the protections of the S&M Standards and Guidelines and applicable management recommendations with regard to agency-related actions. The nine sites in reserves are assumed to have additional protections by the NWFP Standards and Guidelines in place for those land allocations. Based on these site counts, approximately 23 percent of the remaining *S. clavata* on BLM and NFS lands in the NSO range would be protected in reserves.

## **Summary**

The NWFP ROD and the 2001 ROD do not prescribe a well-defined process for evaluating impacts to species persistence or viability from a proposed activity. The 2001 ROD states “instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision” (Standards and Guidelines, pg. 4). The BLM and Forest Service have embraced this approach for evaluating impacts of the PCGP Project on the persistence of affected S&M species in the NSO range. The preceding discussions present this evaluation, as summarized below:

- *S. clavata* is a Category E (rare) species throughout the NSO range. Per the 2001 ROD, information on Category E species is insufficient to determine what level of management is needed for reasonable assurance of species persistence. New information since the species was listed in the 2001 ROD has increased the availability of information on the species and indicates that the species appears to be more common than previously documented, as noted below:
  - *S. clavata* has a wide distribution across four physiographic provinces in two states and a moderate-high number of overall sites (41 on BLM and NFS lands). The species is fairly common in the Coast Range in Oregon, but does not appear to be well distributed across its range. The current known number of sites on BLM and NFS lands is an increase of about 34 sites since 2007.
  - An estimated 22 percent of the sites (nine sites) are in reserves.
- LSOG coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (general habitat for the species) have a somewhat limited distribution across the species’ range and encompass approximately 3.1 million acres on BLM and NFS lands with an estimated 59 percent in reserves. *S. clavata* is likely restricted to a subcomponent of LSOG forests based on available information on its habitat and life history requirements.
- The PCGP Project with the Blue Ridge alternative would affect one of 41 BLM- and Forest Service-managed sites of *S. clavata*, representing approximately 2 percent of the sites on BLM and NFS lands in the NSO range. Assuming site persistence cannot be maintained at the site, a moderate-high number of sites (40) would continue to be documented on BLM and NFS lands in the region with a somewhat limited distribution across parts of Washington and Oregon. One site would remain in the local vicinity of the analysis area with many other sites in the Coast Range. The distribution of sites and

extent of the species' range within the NSO range following implementation of the PCGP Project would be similar to the current documented distribution and range.

- The PCGP Project would not affect site persistence at any sites in reserves. Of the remaining sites, eight sites are in LSRs where management actions are restricted to those activities that benefit LSOG forests and one site is in a Congressionally Reserved area where management activities that may adversely affect *S. clavata* are unlikely.
- The PCGP Project with the Blue Ridge alternative would result in a permanent loss of an estimated 80 acres of LSOG coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (less than 1 percent of the total regional acreage). An estimated 1.8 million acres (59 percent) of LSOG forests below 4,500 feet msl would remain in reserves in the species' range.
- The remaining forests could support additional populations of *S. clavata*, although the potential for the habitat to be occupied varies based on the distribution of sites and the species' specific habitat requirements. This is a Category E species for which pre-disturbance surveys are not applicable and have not been extensively conducted; however, it is reasonable to conclude that additional sites exist in the range of the NSO that have not been discovered based on the increased number of sites documented during pre-disturbance, strategic, and other surveys.

### 3.8.4 Conclusions

If implemented as proposed, the PCGP Project, specifically the Blue Ridge alternative, would likely affect site persistence of *S. clavata* at one site; however, the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence because:

- With project implementation, 40 sites would remain on BLM and NFS lands across the region, and one site would remain on BLM land in the local area. Although the PCGP Project with the Blue Ridge alternative would affect site persistence of *S. clavata* at one site, the site is part of many sites in the Coast Range in southwestern Oregon where the species is fairly common. The species' distribution and range within the NSO range following project implementation would be similar to its current known distribution and range. *S. clavata* would persist in the region without considering the site as part of the population.
- The PCGP Project with the Blue Ridge alternative would remove approximately 80 acres of LSOG coniferous and mixed hardwood-coniferous forests below 4,500 feet msl (a negligible amount of the forests). Although an estimated 75 percent of these forests would be restored following project implementation, they would not likely provide habitat for the species during the life of the project. An estimated 1.8 million acres (59 percent) of LSOG forests below 4,500 feet msl would remain in reserves in the species' range. Other sites may be located in unsurveyed areas where suitable habitat exists based on the increased number of sites documented with increased surveys since 2007.
- The remaining sites are expected to continue to receive the protections of the S&M Standards and Guidelines under current land management plans for the foreseeable future. A single natural disturbance event or combination of events is unlikely to affect the overall distribution of the species based on its scattered distribution across two states.

The PCGP Project with the Blue Ridge alternative would not be able to avoid impacts to the *S. clavata* site in the analysis area, although some individuals within the site may persist following project implementation. Based on the above conclusions, avoidance of the *S. clavata* site is not necessary because the remaining sites in the NSO range would continue to provide a reasonable assurance of species persistence. Amendments to the land management plans that apply to affected sites would waive implementation of Management Recommendations for the *S. clavata* site affected by the PCGP Project. In addition, the BLM and Forest Service will prepare and implement a monitoring plan that describes specific protocols to monitor the site and adjacent habitat over the long term.

DRAFT



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