Exhibit P

Fish and Wildlife Habitats and Species

Sams Valley Reinforcement Projects
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Prepared for

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Attachment P-2. Biological Assessment

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Attachment P-4. Habitat Mitigation Plan

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Attachment P-6. Avian Protection Plan

Acronyms and Abbreviations

BLM	Bureau of Land Management
EA	Environmental Assessment
EFSC	Energy Facility Siting Council
NRF	nesting, roosting, and foraging
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
ORBIC	Oregon Biodiversity Information Center
PacifiCorp	PacifiCorp dba Pacific Power
Project	Sams Valley Reinforcement Project
Request	Written Request for Amendment #4 Eugene–Medford 500 kV Transmission Line
USGS	U.S. Geological Survey

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1.0 Introduction

The Energy Facility Siting Council (EFSC; Council) previously approved the Eugene-Medford 500 kV Transmission Line Project and found that PacifiCorp dba Pacific Power (PacifiCorp) appropriately identified information about fish and wildlife. In this Request for Amendment No. 4, PacifiCorp seeks to expand the EFSC-certificated facility boundary to include the Grants Pass-Sams Valley Transmission Line and the Sams Valley Substation for the Sams Valley Reinforcement Projects (Project). The analysis in this exhibit focuses on the Project described in the *Written Request for Amendment #4 Eugene–Medford 500 kV Transmission Line* (Request).

Exhibit P provides information about the fish and wildlife habitats and species that could be affected by the Project; threatened and endangered species are addressed in Exhibit Q.

1.1 Analysis Area

In accordance with Oregon Administrative Rule (OAR) 345-001-0010(59)(c), the Analysis Area for fish and wildlife habitat and species consists of the Site Boundary and the area 0.5 miles from the Site Boundary. The Site Boundary is defined in the Request, pursuant to OAR 345-021-0010(1)(a) and (b).

2.0 Site Certificate Condition Compliance

PacifiCorp recommends the following new conditions for this resource:

- **Fish and Wildlife Condition 1:** Prior to construction, the certificate holder shall submit a Reclamation and Revegetation Plan to the Department.
- **Fish and Wildlife Condition 2:** Prior to construction, the certificate holder shall submit a Noxious Weed Plan to the Department.
- **Fish and Wildlife Condition 3**: Prior to construction, the site certificate holder shall submit a final Fish and Wildlife Habitat Mitigation Plan to the Department.
- **Fish and Wildlife Condition 4:** Prior to construction, the certificate holder shall instruct all construction personnel on the protection of sensitive natural resources. During construction, the certificate holder shall flag sensitive natural resources as restricted work zones.
- **Fish and Wildlife Condition 5:** During construction, the certificate holder shall employ a speed limit of 25 miles per hour on facility access roads, unless the applicable land-management agency or landowner has designated an alternative speed limit.
- **Fish and Wildlife Condition 6:** During construction and operation, the certificate holder shall restrict activities that may disturb occupied nests of raptor species, during nesting

season. Upon request by the certificate holder, the Department may provide exceptions to this restriction. The certificate holder's request must include a justification for the request, including any actions the certificate holder will take to avoid, minimize, or mitigate impacts to the raptor and its nest.

3.0 Description of Biological and Botanical Surveys Performed – OAR 345-021-0010(1)(p)(A)

OAR 345-021-0010(1)(p) Information about the fish and wildlife habitat and the fish and wildlife species, other than the species addressed in subsection (q) that could be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0060. The applicant shall include:

OAR 345-021-0010(1)(p)(A) A description of biological and botanical surveys performed that support the information in this exhibit, including a discussion of the timing and scope of each survey.

3.1 Information Review

Biological reviews were performed in support of the Project's Environmental Assessment (EA) prepared by the BLM (2016). The biological review and survey reports and the northern spotted owl survey summary memorandum are included in this exhibit as Attachment P-1; and the biological assessment prepared by the BLM is included here as Attachment P-2. Information presented in the EA and Attachments P-1 and P-2 has been used to inform this exhibit. However, the area evaluated for biological resources in the EA and Attachments P-1 and P-2 does not match the Analysis Area for Exhibit P; therefore, additional data were reviewed to describe the biological resources within the Analysis Area including an updated Oregon Biodiversity Information Center (ORBIC) data request (ORBIC 2017), review of fish distribution presented in StreamNet data (StreamNet 2012), and U.S. Geological Survey (USGS) Gap Analysis Program National Landcover Database (USGS 2011).

3.2 Field Surveys

Field surveys were performed in 2015 and 2016 in support of the Project's EA, and reports detailing the methods and results are included as Attachment P-1. The surveys covered rare plants, verification of land cover classifications in support of rare plant surveys, wetland and water resources characterization, northern spotted owl (*Strix occidentalis caurina*) habitat suitability, and golden eagle (*Aquila chrysaetos*) habitat suitability. The rare plant surveys and northern spotted owl habitat suitability assessment provide information to support Exhibit Q, and the wetland and water resources characterization provides information to support Exhibit J. The golden eagle habitat suitability assessment provides information to support the avoidance and mitigation section of this exhibit (Section 8.0).

The objective of the golden eagle habitat assessment was to conduct a desktop review of the Project and surrounding area to determine if any nesting habitat was available to support golden eagles. Areas that appeared to have the potential to support golden eagle nests were further evaluated in the field. A desktop review of potential eagle nesting habitat was completed by looking at the Project using ArcMap 10.2 aerial imagery and topographic maps to identify areas that may be suitable for nesting golden eagles. Within the Site Boundary, nesting habitat was considered to be not well-suited for golden eagles. Field review confirmed the limited nesting suitability for golden eagles within the Site Boundary, and identified suitable nesting substrate for golden eagles within the Analysis Area consisting of escarpment and cliff habitat at Lower Table Rock.

4.0 Identification and Description of Habitat – OAR 345-021-0010(1)(p)(B)(C)

OAR 345-021-0010(1)(p)(B) Identification of all fish and wildlife habitat in the analysis area, classified by the general fish and wildlife habitat categories as set forth in OAR 635-415-0025 and the sage-grouse specific habitats described in the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-140-0000 through -0025 (core, low density, and general habitats), and a description of the characteristics and condition of that habitat in the analysis area, including a table of the areas of permanent disturbance and temporary disturbance (in acres) in each habitat category and subtype.

OAR 345-021-0010(1)(p)(C) A map showing the locations of the habitat identified in (B).

4.1 ODFW Habitat Categorization

The Oregon Department of Fish and Wildlife (ODFW) Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0015) provides a framework for assigning one of six category types to habitats based on the relative importance of these habitats to fish and wildlife species. The definition of each category type, as well as example of each category type within the Analysis Area, is shown in Table P-1.

Table P-1. ODFW Habitat Categorization

ODFW Habitat Category	Definition[1]	Examples of ODFW Habitat Categories within Analysis Area
1	Irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic province or site-specific basis, depending on the individual species, population or unique assemblage.	• Designated critical habitat for the northern spotted owl, as defined by the USFWS (2012) • State Sensitive raptor nests currently occupied by a breeding pair

Table P-1. ODFW Habitat Categorization

ODFW Habitat Category	Definition[1]	Examples of ODFW Habitat Categories within Analysis Area
2	Essential habitat for a fish or wildlife species, population, or unique assemblage of species and is limited either on a physiographic province or site-specific basis depending on the individual species, population or unique assemblage.	• Wetlands[2] • Waterbodies that support native fish species[3] • Northern spotted owl nesting, roosting, and foraging habitat Attachment P-2)
3	Essential habitat for fish and wildlife, or important habitat for fish and wildlife that is limited either on a physiographic province or site-specific basis, depending on the individual species or population.	• Northern spotted owl capable and dispersal habitat (Attachment P-2)
4	Important habitat for fish and wildlife species.	• Native upland cover types (cover types that are not developed, cultivated crops, or pastures) • Hay/pasture cover types
5	Habitat for fish and wildlife having high potential to become either essential or important habitat.	• Existing ROW
6	Habitat that has low potential to become essential or important habitat for fish and wildlife.	• Developed land cover types and cultivated crops

1. Source: OAR 635-415-0025.
2. A Category 2 wetland is dominated by native vegetation. PacifiCorp assumes that all wetland land cover types are Category 2 until additional information becomes available to justify categorizing them otherwise.
3. PacifiCorp assumes that all waterbodies support native fish species.

4.2 Description of Fish and Wildlife Habitat in the Analysis Area

The Analysis Area is in the Klamath Mountains Level III Ecoregion in southwestern Oregon, which supports a mosaic of both northern Californian and Pacific Northwestern conifers and hardwoods (Thorson et al. 2003). Within the Klamath Mountains Level II Ecoregion, the Analysis Area is in the following Level IV Ecoregions: The Rogue/Illinois Valleys (78a), the Oak Savanna Foothills (78b), and the Inland Siskiyou (78e) (Thorson et al. 2003).

The Rogue/Illinois Valleys ecoregion supports Oregon white oak and California black oak woodland, ponderosa pine, and grassland with little original vegetation remaining (Thorson et al. 2003). Remnants of oak savanna, prairie vegetation, and seasonal ponds persist on the mesa tops of the Table Rocks north of Medford; elsewhere, land uses include orchards, cropland, and pastureland (Thorson et al. 2003). The Oak Savanna Foothills ecoregion borders the Rogue and Illinois river valleys; the driest area east of Medford is dominated by oak woodlands, grassland–savanna, ponderosa pine, and Douglas-fir while the wetter foothills flanking the Illinois Valley support Douglas-fir, madrone, and incense cedar (Thorson et al. 2003). The forested Inland Siskiyou ecoregion is higher and more mountainous than neighboring foothill and valley

ecoregions. Forest cover in the Inland Siskiyou is a diverse and multi-layered mix of conifers, broadleaf evergreens, and deciduous trees and shrubs (Thorson et al. 2003).

Based on land cover data from the USGS (2011), the Analysis Area contains 15 different cover types. Descriptions of each cover type, acres of cover type within the Analysis Area and Site Boundary, and the ODFW habitat category type for each cover type are presented in Table P-2. Wetlands and waters are classified as Category 2 (essential and limited) habitat because the reduction in habitat quality or quantity would result in the depletion of fish or wildlife species. Native upland land cover types are classified as Category 4 (important) habitat because they contribute to sustaining fish and wildlife populations within the Klamath Mountains Ecoregion. Cultivated crops and developed cover types are classified as Category 6 habitat because they have low potential of becoming essential or important habitat in the future.

Table P-2. Land Cover Types, Descriptions, and Habitat Categorization

Cover Types	Description[1]	Acres in Analysis Area	Acres in Site Boundary	ODFW Habitat Category
Shrub/Scrub	Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.	6,187.1	216.5	4
Herbaceous	Areas dominated by gramanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.	1,533.3	98.0	4
Hay/Pasture	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.	1,908.5	76.4	4
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.	1,195.3	26.4	6

Table P-2. Land Cover Types, Descriptions, and Habitat Categorization

Cover Types	Description[1]	Acres in Analysis Area	Acres in Site Boundary	ODFW Habitat Category
Evergreen Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.	1,924.5	23.9	4
Mixed Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.	1,364.1	18.2	4
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.	587.1	9.4	6
Cultivated Crops	Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.	590.9	6.0	6
Woody Wetlands	Areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	325.3	4.7	2
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil. Within the Analysis Area, the open water land cover type is mostly associated with the Rogue River and adjacent ponds. Categorization assumes that all waterbodies contain native fish species.	270.7	2.5	2
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.	57.5	2.2	6
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.	268.5	2.3	6

Table P-2. Land Cover Types, Descriptions, and Habitat Categorization

Cover Types	Description[1]	Acres in Analysis Area	Acres in Site Boundary	ODFW Habitat Category
Emergent Herbaceous Wetlands	Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	194.7	0.9	2
Barren Land	Areas of bedrock, desert pavement scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.	18.7	0.0	4
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.	6.0	0.0	4
Total		**16,432.2**	**461.2**	**NA**

1. Source: USGS 2011

Some of the cover types described in Table P-2 have the potential to support the northern spotted owl, a state-listed threatened species (ODFW 2017a). Effects of the Project on the northern spotted owl are addressed in Exhibit Q; however, habitat that supports the species influences the habitat categorization performed in Exhibit P. Category 1 northern spotted owl habitat occurs within the Analysis Area. Category 1 habitat corresponds with designated critical habitat from the USFWS (2012) and modifies land cover habitat categories to a Category 1. Nesting, roosting, and foraging (NRF) habitat as well as dispersal and capable habitat also occur within the Analysis Area (Attachment P-2); these habitats are defined and mapped in Attachment P-2. NRF modifies land cover habitat categories to a Category 2 habitat; dispersal and capable habitat modifies them to a Category 3 habitat. Cover types (except for wetlands, cultivated crops, and developed types) within the existing right-of-way (ROW) are modified to a Category 5 habitat because the current land use within the ROW excludes them from being considered essential or important habitat, but does maintain the habitat in a state that has high potential to become either essential or important habitat in the future. Table P-3 shows the acreage of each ODFW habitat category within the Analysis Area and Site Boundary and Attachment P-3 contains maps depicting the location of the habitat within the Analysis Area.

Table P-3. ODFW Habitat Categories within the Analysis Area and Site Boundary

ODFW Habitat Category	Acres in Analysis Area	Acres in Site Boundary
1	4.2	0.0
2	1,728.1	9.8
3	2,974.2	17.7
4	6,929.1	147.4
5	2,097.3	266.2
6	2,699.3	46.2
Total	**16,432.2**	**487.3**

All temporary and permanent disturbances by habitat category and land cover type are presented in Table P-4 and are used to inform the Habitat Mitigation Plan (Attachment P-4). PacifiCorp will update the habitat categorization during final design through the review of current land uses to more accurately depict on the ground conditions compared to what is available through the use of the existing land cover dataset from USGS (2011). PacifiCorp anticipates that many of the temporary and permanent disturbances currently being categorized as either a Category 3 or Category 4 habitat will ultimately be categorized as a Category 5 habitat.

Table P-4. Disturbance by Habitat Category and Land Cover Type

ODFW Habitat Category	Land Cover Type	Temporary Disturbance (acres)	Permanent Disturbance (acres)
1	Evergreen Forest	0.0	0.0
2	Evergreen Forest	0.2	0.1
	Mixed Forest	0.1	0.1
	Shrub/Scrub	0.5	0.2
	Emergent Herbaceous Wetlands	0.1	0.0
	Woody Wetlands	0.6	0.4
	Open Water	0.3	0.0
3	Evergreen Forest	0.7	0.9
	Mixed Forest	0.2	0.3
	Herbaceous	0.3	0.2
	Shrub/Scrub	4.2	3.0
4	Evergreen Forest	2.8	1.2
	Mixed Forest	1.7	1.1
	Herbaceous	15.3	3.8
	Shrub/Scrub	37.7	11.2

Table P-4. Disturbance by Habitat Category and Land Cover Type

ODFW Habitat Category	Land Cover Type	Temporary Disturbance (acres)	Permanent Disturbance (acres)
5[1]	Evergreen Forest	2.2	0.2
	Mixed Forest	1.8	0.3
	Herbaceous	24.8	5.8
	Shrub/Scrub	40.9	6.7
	Hay/Pasture	24.9	18.5
6	Cultivated Crops	2.2	0.4
	Developed[2]	13.1	5.3
Total		**174.6**	**59.7**

1. Category 5 represents the area that has undergone vegetation management associated with maintenance of the existing transmission line ROW.
2. Developed includes Developed – Open Space, and Developed, Low, Medium, and High Intensity.

5.0 Identification of State Sensitive Species and Site-Specific ODFW Issues – OAR 345-021-0010(1)(p)(D)

OAR 345-021-0010(1)(p)(D) Based on consultation with the Oregon Department of Fish and Wildlife (ODFW) and appropriate field study and literature review, identification of all State Sensitive Species that might be present in the analysis area and a discussion of any site-specific issues of concern to ODFW.

5.1 Identification of State Sensitive Species

This section addresses species that have been designated by Oregon as State Sensitive Species. State Sensitive Species are defined by ODFW as "naturally-reproducing fish and wildlife species, subspecies, or populations which are facing one or more threats to their populations and/or habitats" (OAR 635-100-0040). ODFW further defines State Sensitive Species as either Sensitive or Sensitive Critical. Sensitive species are defined as having small or declining populations, are at-risk, and/or are of management concern. Sensitive Critical means the species have current or legacy threats that are significantly impacting their abundance, distribution, diversity, and/or habitat; Sensitive Critical species may decline to the point of qualifying for threatened or endangered status if conservation actions are not taken (ODFW 2016).

Based on a review of the information described in Section 3.0, 30 State Sensitive Species have the potential to occur within the Analysis Area (Table P-5). Seven State Sensitive Species listed within the Klamath Mountains ecoregion by ODFW (2016) were eliminated from consideration in Exhibit

P because their known distribution or modeled habitat does not overlap with or is not in the vicinity of the Analysis Area. These include the coastal tailed frog (*Ascaphus truei*), northern red-legged frog (*Rana aurora*), southern torrent salamander (*Rhyacotriton variegatus*), Oregon vesper sparrow (*Pooecetes gramineus affinis*), western purple martin (*Progne subis arboricola*), Pacific marten (*Martes cuarina*), and Sierra Nevada red fox (*Vulpes vulpes necator*).

Based on the review of existing data described in Section 3.0, PacifiCorp has not identified any site-specific issues of concern with State Sensitive Species.

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Mammals					
Pallid bat *Antrozous pallidus*	S	Uncommon, found in arid regions in canyons of southwestern and eastern Oregon (ODFW 2017b).	During roosting periods, especially spring and early summer maternal roosting and winter hibernation roosting periods	There is potential for these species to occur based on presence of suitable habitat, including foraging habitat and potential roost sites, within the Analysis Area. ORBIC occurrences for fringed myotis, pallid bat, and Townsend's big-eared bat in the Analysis Area. ORBIC occurrence for long-legged myotis within 10 miles of the Analysis Area.	Roosting, foraging, and hibernacula
Townsend's big-eared bat *Corynorhinus townsendii*	SC	Townsend's big-eared bats rely on caves and mines for roosting, although they will also utilize buildings, bridges, and basal hollows of large trees. Such features largely determine their distribution. They occur in a wide range of habitats from deserts and grasslands to the moist conifer forests of the Pacific coast (Gervais 2017).			
Spotted bat *Euderma maculatum*	S	Rare, living in dry climates and often roosts on high cliffs (ODFW 2017b).			
Silver-haired bat *Lasionycteris noctivagans*	S	Primarily associated with coniferous forests, including juniper woodlands and mixed deciduous-coniferous forests; forages over ponds, streams, meadows, and roads (ODFW 2017b).			
Hoary bat *Lasiurus cinereus*	S	Roosts in branches of trees and is found throughout the region west of the Cascades (ODFW 2017b)			

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
California myotis *Myotis californicus*	SC	Found throughout Oregon except for the Columbia Basin; roosts in rock/cliffs, trees and buildings; hibernates in mines, caves, and buildings (ODFW 2017b).			
Fringed myotis *Myotis thysanodes*	S	Roosts in trees, snags, buildings, caves, rocks, cliffs, and bridges (ODFW 2017b).			
Long-legged myotis *Myotis volans*	S	Associated with montane coniferous forests as well as desert and riparian habitat (ODFW 2017b)			
Red tree vole *Arborimus longicaudus*	S	Mature and old-growth conifer forests and older mixed-age conifer forests; conifer or conifer-dominated mixed conifer-hardwood forests with superdominant conifer trees (Huff et al. 2012).	Breed throughout the year, but most litters are born February-September.	Mature conifer forests are limited within the Analysis Area; ORBIC occurrence within 1 mile of the Analysis Area.	Breeding, foraging
Ringtail *Bassariscus astutus*	S	Forested or brushy canyons with broken ledges and caves are preferred but the animals also range over lower mountain slopes some distance from rocks; nearby source of water is necessary. Small numbers are found in the foothills of the Rogue Valley (ODFW 1987).	Breeding (February – June) and care of altricial young (June-August).	Potential habitat exists within the Analysis Area. ORBIC occurrence within 5 miles of the Analysis Area.	Breeding, foraging

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Fisher *Pekania pennanti*	SC	Low- to mid-elevation coniferous and mixed conifer and hardwood forests with abundant physical structure (USFWS 2016).	Denning, March through June	Potential habitat estimated within or near the Analysis Area (USFWS 2016).	Denning, resting, foraging
Birds					
Grasshopper sparrow *Ammodramus savannarum perpallidus*	S	This species prefers open grasslands habitats of intermediate height (30 cm) with clumped vegetation interspersed with patch bare ground and sparse shrub cover; also uses pasture, hayland, Conservation Reserve Program fields, and reclaimed sites (Slater 2004).	During the reproductive and nesting periods from mid-May to early August	Potential habitat exists in open grassland and hay/pasture in the Analysis Area. ORBIC occurrence within 5 miles of the Analysis Area.	Breeding, foraging
Common nighthawk *Chordeiles minor*	S	Breeds and migrates at all elevations through the state. Nesting habitat is characterized by open landscapes with little ground cover such as gravel bars, sparse grasslands, or forest clearings (ODFW 2017b).	During the reproductive and nesting periods from early May through early July	Potential for the species to occur based on presence of suitable nesting sites and foraging habitat within the Analysis Area.	Breeding, foraging

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Yellow-breasted chat *Icteria virens*	SC	Inhabit lowland tangles and thickets along rivers and floodplains; an uncommon to common summer resident of the interior Rogue Valley (ODFW 2017b).	During the reproductive and nesting periods from early May through early July	Potential for the species to occur based on presence of suitable nesting sites and foraging habitat along riparian areas and upland scrub/shrub habitat within the Analysis Area.	Breeding, foraging
Lewis's woodpecker *Melanerpes lewis*	SC	Strongly associated with fire-maintained ponderosa pine forest. Open canopy forests of ponderosa pine at low to mid elevation and riparian corridors at low elevation; also oak woodlands, pinyon juniper woodlands, fir forests, and cottonwoods surrounded by agriculture (Abele et al. 2004).	During the reproductive and nesting periods from May to August	Potential for the species to occur in the oak and coniferous forest habitat in the Analysis Area. ORBIC occurrence within the Analysis Area.	Breeding, foraging
Acorn woodpecker *Melanerpes formicivorus*	S	A characteristic oak species due to its strong association with acorns. Can be found throughout oak habitats in the Klamath Mountains ecoregion.	During the reproductive and nesting periods from early May through early July	Potential habitat exists in the oak woodlands within the Analysis Area.	Breeding, foraging

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
White-headed woodpecker *Picoides albolarvatus*	SC	Associated with coniferous forests dominated by open ponderosa pine or dry mixed-conifer forests with a ponderosa pine component (Mellen-McLean et al. 2013).	During the reproductive and nesting periods from early May through August	Less likely to occur than the acorn woodpecker; however, potential habitat exists in ponderosa pine component of oak woodlands.	Breeding, foraging
Flammulated owl *Psiloscops flammeolus*	S	During the breeding season, typically occupies mid-elevation montane forest with seasonably temperate climates, primarily within forests of western yellow pine-ponderosa pine, Jeffrey pine, and Washoe pine-and submontane Douglas fir (Nelson et al. 2009).	During the reproductive and nesting periods from early May through July	Potential for the species to occur in ponderosa pine or Douglas fir components of oak woodlands; suitable nesting and foraging habitat within the Analysis Area.	Breeding, foraging
Great gray owl *Strix nebulosi*	S	In the western US, this species breeds in relatively dry, mature deciduous or coniferous forests; in southwestern Oregon they select oak/Pacific madrone and coniferous forest habitats (Williams 2012).	During reproductive and nesting periods from mid-March through mid-July	Potential for the species to occur in the oak and coniferous forest habitat in the Analysis Area. ORBIC occurrence within 5 miles of the Analysis Area.	Breeding, foraging
Reptiles					

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
California mountain kingsnake *Lampropeltis zonata*	S	Found in pine forests, oak woodlands, and in chaparral of southwestern Oregon valleys. Usually found in, under, or near rotting logs in open wooded areas near streams (ODFW 2017b). Winters are spent deep in rock crevices or within mammal burrows in a state of hibernacula.	Active from March through early November, breeding from April through early June.	Potential habitat exists in the oak woodlands and chaparral within the Analysis Area. ORBIC record within the Analysis Area.	Breeding, foraging, overwintering
Western pond turtle *Actinemys marmorata*	SC	Habitat includes permanent and intermittent waters of rivers, creeks, small lakes and ponds (including human-made stock ponds and sewage-treatment ponds), marshes, unlined irrigation canals, and reservoirs. Sometimes this turtle is found in brackish water. It often basks on logs, vegetation mats, or rocks. In the northern and central part of the range, most overwinter in upland habitats. Individuals commonly bask on land, near or way from water. Nesting sites are on sandy banks and bars or in fields or sunny spots up to a few hundred meters from water.	During hibernation (November–January) and nesting periods which occur April–August.	Potential for the species to occur based on presence of suitable terrestrial and aquatic habitat within the Analysis Area. ORBIC occurrence within the Analysis Area.	Breeding, foraging, overwintering
Amphibians					

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Western toad *Anaxyrus boreas*	S	During hibernation and non-breeding months, this species is associated with a wide variety of terrestrial habitats including deserts, grasslands, woodlands, forests, and chaparral provided breeding aquatic habitats are within migration distance. Breeding is a synchronous and communal event in pools of slow moving streams, desert springs, ponds, wetlands, marshes, reservoirs, stock ponds or shallow lakes areas. Use rodent burrows or subsurface refuge sites for hibernacula in the winter.	During winter hibernation months if hibernacula is disturbed. During terrestrial migration and aquatic breeding periods which occur January through October.	Potential for the species to occur based on presence of suitable terrestrial and aquatic habitat within the Analysis Area. ORBIC occurrence from Evans Creek, 5 miles north of the Analysis Area.	Breeding, foraging, hibernacula
Clouded salamander *Aneides ferreus*	S	Habitat includes moist coniferous forests; found in forest edge, forest clearings, talus, and burned over areas. Usually found under bark, in rotten logs, or in rock crevices. They may aggregate in moist decayed logs in summer when forest conditions become generally dry. Large (greater than 20 inches in diameter) down logs of mid-decay classes with sloughing bark provide the best microhabitats. Sometimes clouded salamanders climb high into trees. Egg deposition occurs in cavities in rotten logs, in rock crevices, under bark, among vegetation, or in trees.	During reproductive periods, which occur spring–early summer.	Potential for the species to occur based on presence of suitable habitat within the Analysis Area. ORBIC occurrence from Foot's Creek approximately 2 miles from the Analysis Area.	Breeding, foraging

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Del Norte salamander *Plethodon elongates*	S	Typically associated with older forests with a closed, multi-storied canopy (composed of both conifers and hardwoods), with a cool moist microclimate and rocky substrate. In inland sites this species is a surface rock obligate (Ollivier and Welsh 1999).	During reproductive periods, which occur in fall and spring	Potential habitat is limited in the Analysis Area. ORBIC occurrences within 10 miles of the Analysis Area.	Breeding, foraging
Siskiyou Mountains salamander *Plethodon stormi*	SC	Occupies forests in Oregon with similar environmental conditions to those described for Del Norte salamander (Ollivier et al. 2001).	During reproductive periods, which occur spring–fall	Potential habitat is limited in the Analysis Area. ORBIC occurrences within 5 miles of the Analysis Area.	Breeding, foraging
Foothill yellow-legged frog *Rana boylii*	SC	Occur in shallow stream margins adjacent to low gradient riffles in alluvial stream reaches. Breeding occurs in larger streams with smaller streams used for foraging or dispersal (Olson and Davis 2009).	During reproductive periods, which occur in spring when high water flows have subsided	Potential habitat exists in stream habitat in the Analysis Area. ORBIC occurrence from Evans Creek, 3 miles north of the Analysis Area.	Breeding, foraging, and dispersal
Fish					

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Pacific lamprey *Entosphenus tridentatus*	S	Anadromous species that migrates from the Pacific Ocean to spawning habitat. Associated spawning habitat includes stream riffles with sand, gravel or rock bottom depressions. Ammocetes (larval lamprey) associated with clear stream eddies with settled mud, silt, and sand.	During spawning, which may occur spring–summer	Occurs in the Rogue River, Ward Creek, and Evans Creek within the Analysis Area (USFWS 2015b).	Migration, spawning, and rearing
Steelhead / coastal rainbow trout (Rogue/South Coast SMU, summer run) *Oncorhynchus mykiss / irideus*	S	Migrates between freshwater breeding and marine nonbreeding habitats.	During spawning, which usually occurs in spring	Occurs Evans Creek, Jones Creek, Rogue River, Rock Creek, Sams Creek, Sardine Creek, Savage Creek, Snider Creek, and Whetstone Creek within the Analysis Area.	Migration, spawning, and rearing
Chinook salmon (Rogue/South Coast SMU, spring run) *Oncorhynchus tshawytscha*	S	Migrates between freshwater breeding and marine nonbreeding habitats.	During spawning which usually occurs in the fall.	Occurs in the Rogue River within the Analysis Area.	Migration, spawning, and rearing

Table P-5. State Sensitive Species with the Potential to Occur within the Analysis Area

Common Name	State Status[1]	Expected Habitats	Sensitive Period	Observed or Expected Occurrence within Analysis Area[2]	Potential Use of Habitat Within the Analysis Area
Coho salmon (Rogue/South Coast SMU) *Oncorhynchus kisutch*	S	Migrates between freshwater breeding and marine nonbreeding habitats.	During spawning which usually occurs November–December (sometimes into January)	Occurs in Cardwell Creek, Evans Creek, Rogue River, Sams Creek, Sardine Creek, and Savage Creek within the Analysis Area.	Migration, spawning, and rearing

1. Oregon Status: S = State Sensitive; SC = State Sensitive—Critical

2. The occurrence locations provided by ORBIC (2017) are from a variety of sources that vary in accuracy and precision. Because some ORBIC records, particularly older records, have a high level of uncertainty, some occurrence locations are represented by large polygons in order to reflect this lack of precision. These polygons are sometimes more than one mile in diameter around a single occurrence location, and do not necessarily reflect the actual location of the sensitive species. As a result, the ORBIC occurrence information was used as a rough approximation of occurrence.

6.0 Baseline Survey of Habitat Use by State Sensitive Species – OAR 345-021-0010(1)(p)(E)

OAR 345-021-0010(1)(p)(E) A baseline survey of the use of habitat in the analysis area by species identified in (D) performed according to a protocol approved by the Department and ODFW.

The use of habitat in the Analysis Area by state sensitive species is described in Table P-3. The table includes a description of the anticipated occurrence of the species within the Analysis Area, the type of habitat used, and the role of the habitat in the species' life history. To determine if each species was likely to use the habitat within the Analysis Area for breeding, foraging, or other important activities, PacifiCorp analyzed the known habitat and range information for each species, and compared this to the land cover types within the Analysis Area based on existing data. For example, if the type of habitat used by a species to breed was determined to occur within the Analysis Area, and the breeding range of the species included the location of that habitat, that species was assumed to use that habitat for breeding. No field surveys have been performed to identify the presence of State Sensitive Species within the Site Boundary. PacifiCorp proposes that EFSC finds this approach meets the requirements of a baseline survey.

7.0 Description of Potential Adverse Impacts – OAR 345-021-0010(1)(p)(F)

OAR 345-021-0010(1)(p)(F) A description of the nature, extent and duration of potential adverse impacts on the habitat identified in (B) and species identified in (D) that could result from construction, operation and retirement of the proposed facility.

Project construction would result in both permanent and temporary impacts to wildlife and their habitats. A detailed description of the actions associated with construction of the Project can be found in the Request. Permanent impact areas are those that would be occupied by a permanent structure or otherwise used for the life of the Project; these areas would not be restored. Temporary impact areas are those areas that would be disturbed during construction activities, but would be restored and revegetated consistent with the Reclamation and Revegetation Plan (Section 8.0).

7.1 Potential Impacts to Fish and Wildlife Habitat

This section describes potential Project impacts to fish and wildlife habitat from construction and operation of the Project. Many of these impacts would be avoided and/or minimized as described in Section 8.0. Impacts that cannot be avoided or minimized will be mitigated for as described in the Habitat Mitigation Plan (Attachment P-4). The acres of temporary and permanent disturbance to

cover types by habitat category are displayed in Table P-4 above. A majority of vegetation disturbances would occur within the existing transmission lines' wire-border zone, which was previously disturbed and has been under long-term vegetation management during operation of the existing line.

Vegetation removal required for construction and operation could result in a loss of habitat for some species. Most vegetation removal would be temporary (174.6 acres) and would primarily affect shrub/scrub, herbaceous, and hay/pasture cover types. Approximately 59.7 acres of vegetation would be permanently cleared during construction, of which 21.2 acres would occur in the shrub/scrub cover type, 18.5 acres in the hay/pasture cover type, 9.8 acres in the herbaceous cover type, 5.7 acres in the developed/open space cover type, 4.1 acres in the evergreen forest and mixed forest cover types, and 0.4 acres in the woody wetland cover type. It is PacifiCorp's policy to not clearcut all woody vegetation within the right-of-way. The amount of forest and shrub/scrub vegetation cleared would be minimized by limiting clearing to those areas directly impacted by construction activities and trees that pose a hazard to the proposed transmission line.

Additionally, existing snags and large woody debris within the right-of-way would be retained, provided they are not a safety hazard (i.e., have the potential to fall onto the line or encroach on minimum clearance standards) to minimize the loss of potential wildlife habitat. In addition, riparian corridors would be spanned to the extent possible, thus retaining any existing riparian/drainage vegetation for use as wildlife travel corridors.

This loss of potential habitat would be minor relative to the amount of habitat available in the surrounding area, and would not preclude wildlife use of the Site Boundary. Most vegetation clearing would be temporary and would impact shrub scrub or herbaceous habitat types, which are common in the surrounding area and can reestablish habitat functionality within 5 years or less.

Sediments created by Project-related erosion could ultimately reach nearby streams, thereby impacting water quality and fish habitat. However, impacts associated with soil disturbance would be short-term and temporary and the potential significance of these impacts would be eliminated or reduced through the implementation of erosion control measures discussed in Exhibit I and included in an Erosion and Sediment Control Plan developed for the National Pollutant Discharge Elimination System permit 1200-C (Exhibit I, Soil Protection Condition 1). No adverse modifications to fish habitat within the Middle Rogue subbasin would occur.

7.2 Potential Impacts to State Sensitive Species

During construction, wildlife species within close proximity to the Project Area could be affected by increased noise and human activity, causing them to avoid construction areas or surrounding areas. Species may be temporarily displaced into adjacent habitats. However, these areas would provide equally suitable or more suitable habitats for displaced species. In addition, these impacts would be temporary and would not result in mortality or injury to species. Construction of the Project would not involve any in-water work in any perennial or fish-bearing streams. All fish-bearing streams crossed by the Project would either be avoided entirely or protected from disturbance through the use of existing bridges.

Table P-6 identifies potential impacts specific to each State Sensitive Species resulting from Project construction and operation, and the overall extent of these impacts. The Project, including avoidance and minimization measures, is not likely to cause a significant impact to any State Sensitive Species. As the intent of the ODFW Sensitive Species List is to prevent species from declining to the point of qualifying as threatened or endangered, significant impacts are considered to be impacts that would result in a species qualifying for listing under the Oregon Endangered Species Act (ODFW 2016). In an attempt to better describe Project impacts, the terms negligible, minor, moderate, and significant are used to describe the extent of impacts to State Sensitive Species. Negligible impacts would not be detectable and would have no discernible effect; minor impacts would be slightly detectable, but would not be expected to have an overall effect; moderate impacts would be clearly detectable and could have an appreciable effect; and significant impacts would have a substantial, highly noticeable effect. The extent of impact decisions below consider avoidance, minimization, and mitigation.

From a landscape perspective, the Site Boundary mostly occurs in an existing disturbed corridor that passes through a variety of habitats. The linear configuration of the Site Boundary means that the impacted habitat is adjacent to similar habitat capable of providing refuge for species displaced by the Project. Individuals may be either temporarily displaced by the Project as a result of avoiding construction disturbance, or permanently displaced as a result of habitat conversion in the 38.9 acres of permanent impact. Because the amount of habitat affected is small on a landscape scale and the Site Boundary is within an existing disturbed corridor, most displacement and habitat-related impacts are expected to be minor.

Table P-6. Potential Adverse Impacts to State Sensitive Species

Species	Potential Impacts	Extent of Impacts (Negligible, Minor, Moderate, or Significant)
Bats Pallid bat, Townsend's big-eared bat, spotted bat, silver-haired bat, hoary bat, California myotis, fringed myotis, and long-legged myotis.	Mortality or injury resulting from collisions with construction equipment, although, bat species would likely move out of the right-of-way during construction and use adjacent available habitats. Loss of potential roosting habitat. Disturbance during construction and periodic maintenance activities that could result in decreased fitness and reproductive success and/or increased mortality.	**Minor** Impacts to state sensitive bat species resulting from Project construction and operation are expected to be minor as the risk of disturbance at roost sites is low due to the relatively small impact area within potential roosting habitat. The risks of collision with Project equipment and Project infrastructure are minor and negligible, respectively.
Red tree vole	Potential impacts to red tree voles include loss or damage to nest trees resulting in injury or death to individual voles.	**Minor** The amount of potential nesting habitat (old growth and mature conifer forest) within the Site Boundary is minimal. While mortality associated with disturbance to potential habitat is unlikely due to the low likelihood of presence, the loss of a few individuals would have minor effects on the species.
Ringtail	Mortality or injury resulting from collisions with construction equipment. Loss or modification to established foraging habitat. Disturbance during construction and periodic maintenance activities that could result in decreased fitness and reproductive success and/or increased mortality.	**Minor** Highly mobile species would be able to avoid construction activities and move out of the Site Boundary during construction and use adjacent available habitats. Exception may be if caring for altricial young, under which case efforts to avoid construction activities may reduce reproductive success.

Table P-6. Potential Adverse Impacts to State Sensitive Species

Species	Potential Impacts	Extent of Impacts (Negligible, Minor, Moderate, or Significant)
Fisher	Mortality or injury resulting from collisions with construction equipment. Loss or modification to established denning or resting habitat. Disturbance during construction and periodic maintenance activities that could result in decreased fitness and reproductive success and/or increased mortality.	**Negligible** The amount of potential denning and resting habitat (old growth and mature conifer forest) within the Site Boundary is minimal and use by this species is likely limited to transient individuals during dispersal events. Highly mobile species would be able to avoid construction activities and move out of the Site Boundary during construction and use adjacent available habitats.
Non-raptors Grasshopper sparrow, common nighthawk, yellow-breasted chat, Lewis's woodpecker, acorn woodpecker, and white-headed woodpecker	Habitat loss and modification, including temporary loss of foraging and breeding habitat in temporary impact areas. Displacement and/or disturbance as a result of construction activities. Collision with construction equipment and vehicles is unlikely as birds are expected to fly out of the way of construction equipment, and speed limits would by followed by construction vehicles. Potential loss of nests as a result of habitat removal during construction if vegetation clearing occurs during the bird breeding season.	**Minor** Impacts to non-raptor bird species are expected to be minor as direct mortality is expected to be rare, and impacts to habitat will be minimized through the avoidance and mitigation measures discussed in Section 8.0. Areas adjacent to the Site Boundary should be capable of providing refuge for bird species displaced by the Project temporarily due to construction disturbance and clearing.
Raptors Flammulated owl, great gray owl	Foraging or roosting owls could experience visual or auditory disturbance as a result of Project construction. Direct mortality during construction is not expected as owls are expected to fly out of the way of construction equipment. Potential loss of nests as a result of habitat removal during construction if vegetation clearing occurs during the breeding season.	**Negligible** Impacts to owl species are expected to be negligible as direct mortality is expected to be undetectable and any activities leading to disturbance would be rare. Vegetation clearance would take place outside of the breeding season.

Table P-6. Potential Adverse Impacts to State Sensitive Species

Species	Potential Impacts	Extent of Impacts (Negligible, Minor, Moderate, or Significant)
California mountain kingsnake	Construction activities in upland habitat could result in mortality associated with vehicle collisions and crushing of logs, burrows, and other substrate used for cover. Periodic very low risk of mortality during operation and maintenance activities.	**Minor** Impacts to the California mountain kingsnake are expected to be minor as a result of risk of collision with or crushing of cover substrate from Project equipment during construction and operation and maintenance.
Western pond turtle	Impacts to aquatic habitats would be avoided by Project design when feasible, but construction adjacent to wetlands and waterways could cause direct mortality to adults migrating between nesting areas and overwintering areas, locally aestivating adults, and eggs and young overwintering in terrestrial nests. Construction could cause direct mortality to eggs and/or young. Periodic very low risk of vehicle collisions with adults or damage to nests during operation and maintenance.	**Minor** Impacts to the western pond turtle are expected to be minor since impacts to aquatic habitats will be avoided to the extent practicable. The risk of collision with Project equipment is also expected to be low due to the short term use of construction equipment within potentially suitable terrestrial habitats.
Western toad	Toads move more slowly than frogs and thus may not be able to move out of the way of equipment during construction, and some mortality could occur. Temporary habitat loss due to clearing may occur during construction. Impacts to breeding ponds are expected to be avoided during construction.	**Minor** Construction impacts are not expected to have more than a minor effect on the western toad due to the low risk of collisions with vehicles and machinery. Operation impacts are expected to be negligible, given the species' use of a wide variety of habitats, and avoidance of impacts to riparian habitat.

Table P-6. Potential Adverse Impacts to State Sensitive Species

Species	Potential Impacts	Extent of Impacts (Negligible, Minor, Moderate, or Significant)
Salamanders Clouded salamander, Del Norte salamander, and Siskiyou Mountains salamander	Salamanders move slowly and thus may not be able to move out of the way of equipment during construction, and some mortality could occur due to crushing of logs, burrows, and rocky substrate used for cover. Periodic very low risk of mortality during operation and maintenance activities. Temporary habitat loss due to clearing may occur during construction.	**Minor** Clearing of vegetation is not expected to have more than a minor effect on these species. There is a small risk of collision with Project equipment or vehicles during construction and a negligible risk of such mortality during Project operation.
Foothill yellow-legged frog	It is assumed that most adult frogs will move out of the way of construction equipment and vehicles if encountered, but some mortality of frogs could occur. Impacts to riparian vegetation will be avoided, thereby minimizing the risk to areas most likely to harbor foothill yellow-tailed frogs. This frog's movements are restricted to streams and stream-riparian corridors (Olson and Davis 2009).	**Negligible** Due to avoidance and mitigation measures (Section 8.0) which will avoid most impacts to aquatic and riparian habitats used frogs, impacts are expected to be negligible.
Fish Pacific lamprey, steelhead (Rogue/South Coast SMU, summer run), Chinook salmon (Rogue/South Coast SMU, spring run), and coho salmon (Rogue/South Coast SMU)	Potential impacts include temporary increases in sedimentation or an inadvertent release of hazardous materials that could temporarily cause physiological stress, reduced food availability, and mortality.	**Negligible** Construction of the Project would not involve any in-water work in any perennial or fish-bearing streams. All fish-bearing streams crossed by the Project would either be avoided entirely, or protected from disturbance through the use of existing bridges. An existing bridge would be used to cross Sardine Creek and Sams Creek. Construction vehicles would be routed around the remaining six stream crossings and a helicopter or line gun would be used to string the new transmission line. However, there is a minor risk of impacts in the case of an inadvertent release of hazardous materials. Avoidance and mitigation measures to be used during construction should make the risk of impacts associated with sediment released from construction activities negligible.

8.0 Measures to Avoid, Reduce, or Mitigate Impacts – OAR 345-021-0010(1)(p)(G)

OAR 345-021-0010(1)(p) (G) A description of any measures proposed by the applicant to avoid, reduce, or mitigate the potential adverse impacts described in (F) in accordance with the general fish and wildlife habitat mitigation goals and standards described in OAR 635-415-0025 and a description of any measures proposed by the applicant to avoid, minimize, and provide compensatory mitigation for the potential adverse impacts described in (F) in accordance with the sage-grouse specific habitat mitigation requirements described in the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-140-0000 through -0025, and a discussion of how the proposed measures would achieve those goals and requirements.

This section identifies the measures that have been and will be implemented to avoid, reduce (minimize), and mitigate potential adverse impacts on fish and wildlife habitat and State Sensitive Species. The Habitat Mitigation Plan (Attachment P-4) describes how proposed compensatory mitigation for unavoidable impacts is in accordance with the general fish and wildlife habitat mitigation goals and standards described in OAR 635-415-0025.

8.1 Pre-construction

8.1.1 Project Design

To avoid impacts, PacifiCorp attempted to site the Project within the existing disturbed transmission corridor and utilize existing roads for construction and operation activities.

PacifiCorp has designed the Project in accordance with Avian Power Line Interaction Committee (APLIC 2006) suggested practices to avoid and minimize the potential adverse impacts on avian species, including state sensitive species likely to use the Analysis Area.

8.1.2 Construction and Operation Plans

Prior to construction, PacifiCorp will prepare the following plans for department approval.

PacifiCorp will prepare a Reclamation and Revegetation Plan describing actions to minimize the adverse impacts associated with ROW preparation and the construction of facilities and will immediately stabilize disturbed areas to facilitate native plant revegetation. PacifiCorp recommends Fish and Wildlife Condition 1 (Section 2.0), which ensures that the site certificate holder shall submit a Reclamation and Revegetation Plan to the Department prior to construction.

PacifiCorp will prepare a Noxious Weed Plan describing the measures that PacifiCorp will undertake to control noxious weed species and avoid adverse impacts associated with the introduction of these species during construction and operation activities. PacifiCorp recommends

Fish and Wildlife Condition 2 (Section 2.0), which ensures that the site certificate holder shall submit a Noxious Weed Plan to the Department prior to construction.

PacifiCorp will finalize a Habitat Mitigation Plan that is consistent with the general fish and wildlife goals and standards of ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025(1) through (6)).PacifiCorp recommends Fish and Wildlife Condition 3 (Section 2.0), which ensures that the site certificate holder shall submit a final Fish and Wildlife Habitat Mitigation Plan to the Department prior to construction.

8.1.3 Environmental Training and Sensitive Resource Awareness

Construction personnel will be notified of the protection of sensitive resources within their work areas, as well as the need to adhere to all applicable restrictions and permit requirements. PacifiCorp will develop a set of maps that depict the extent of sensitive resources within the Site Boundary. These maps will be maintained at the Project site. Sensitive resources that occur within or adjacent to the Site Boundary and work areas will be flagged on the ground, where practical, to ensure they are avoided. PacifiCorp recommends Fish and Wildlife Condition 4 (Section 2.0), which ensures that the site certificate holder shall instruct all construction personnel on the protection of sensitive natural resources. During construction, the site certificate holder shall flag sensitive natural resources as restricted work zones.

8.1.4 Vegetation Management

Vegetation management will be performed in accordance with the specifications identified in PacifiCorp's Transmission and Distribution Vegetation Management Program Specification Manual (Attachment P-5). Integrated vegetation management works to minimize adverse impacts to fish and wildlife habitat and species by establishing sustainable plant communities that are compatible with the facility while promoting plant diversity and establishment of a sustainable supply of forage, escape, and nesting cover, and movement corridors.

8.1.5 Speed Limits

PacifiCorp will implement speed limits for construction and operation and maintenance vehicles to avoid and minimize the adverse impacts associated with the risk of collision with wildlife. PacifiCorp recommends Fish and Wildlife Condition 5 (Section 2.0), which ensures the site certificate holder shall employ a speed limit of 25 miles per hour on facility access roads, unless the applicable land-management agency or landowner has designated an alternative speed limit.

8.1.6 Avian Protection

PacifiCorp will implement its Avian Protection Plan (Attachment P-6), which works to avoid and minimize adverse impacts on eagles, hawks, and other migratory birds associated with electrocution and collision mortality from overhead power lines. PacifiCorp will implement restrictions during construction and operation activities that could disturb state sensitive nesting

raptors. PacifiCorp recommends Fish and Wildlife Condition 6 (Section 2), which ensures that during construction and operation, the certificate holder shall restrict activities that may disturb occupied nests of raptor species, during nesting season. Upon request by the certificate holder, the Department may provide exceptions to this restriction. The certificate holder's request must include a justification for the request, including any actions the certificate holder will take to avoid, minimize, or mitigate impacts to the raptor and its nest.

9.0 Monitoring Program – OAR 345-021-0010(1)(p)(H)

> *OAR 345-021-0010(1)(p)(H) A description of the applicant's proposed monitoring plans to evaluate the success of the measures described in (G).*

The Reclamation and Revegetation Plan and the Noxious Weed Plan both will include monitoring components. PacifiCorp also will monitor compensatory mitigation actions, if required to meet the Fish and Wildlife Habitat Standard (OAR 345-022-0060), to determine if mitigation performance measures have been met at habitat mitigation sites. The Fish and Wildlife Habitat Mitigation Plan (Attachment P-4) discusses habitat mitigation actions and will identify monitoring of those actions. Environmental inspectors will be onsite regularly to monitor permit compliance and oversee construction. In addition to on-site inspectors, PacifiCorp environmental personnel will also monitor permit compliance and construction.

10.0 Conclusion

This exhibit describes biological and botanical surveys performed to support the exhibit; identifies, describes, and maps the fish and wildlife habitats within the Analysis Area and categorizes them pursuant to OAR 635-415-0025; identifies State Sensitive Species with the potential to occur within the Analysis Area and describes the baseline desktop effort used to do this; describes the nature, extent, and duration of potential adverse impacts; and describes efforts to avoid, minimize, and mitigate adverse impacts including monitoring.

Therefore, based on the information provided in this exhibit, there is sufficient evidence upon which the Council may find that the design, construction, and operation of the Project, taking into account the proposed mitigation measures, are consistent with the fish and wildlife mitigation goals and standards of OAR 635-415-0025(1) through (6). Accordingly, PacifiCorp demonstrates compliance with OAR 345-022-0060.

11.0 References

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Attachment P-1. Biological Review And Survey Report (WEST 2015)

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Sam's Valley Reinforcement Project

Jackson and Josephine County, OR

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1.0 INTRODUCTION

PacifiCorp is proposing to construct an approximately 18-mile-long transmission line that will begin at PacifiCorp's existing facilities in Grants Pass, Oregon and end at a new facility outside Gold Hill, Oregon. The Project, referred to as the Sam's Valley Reinforcement Project (hereafter Project), follows existing utility corridors and is being upgraded for a higher capacity utility line (Figure 1). The project crosses lands managed by the Bureau of Land Management (BLM) Medford Field Office and private lands. HDR Engineering, Inc. (HDR) has been contracted to prepare environmental review documents for the Project. HDR has contacted the BLM Field Office, the United States Fish and Wildlife Service (USFWS), and the state to introduce the Project, to request sensitive species information, and to discuss issues or concerns the agencies may have with the Project.

Under the direction of HDR, Western EcoSystems Technology, Inc. (WEST) has been subcontracted to conduct biological reviews and surveys to support HDR's environmental review documents. This report summarizes the 2015 biological review and rare plant surveys conducted by WEST along the proposed Project corridor.

Figure 1. Sam's Valley Reinforcement Project in Josephine and Jackson County, Oregon

2.0 METHODS

WEST, under contract to HDR, conducted a biological desktop review as well as completed field surveys when needed for habitat characterization, wetland and stream resource characterization, northern spotted owl (*Strix occidentalis caurina*) suitability, golden eagle (*Aquila chrysaetos*) nesting habitat suitability, and rare plants and lichen/liverwort/moss surveys. Data on northern spotted owl, golden eagle and rare plants was generated by Oregon Natural Heritage Information Center (ORBIC 2014). The right of way (ROW) corridor is defined as the proposed 135 foot ROW corridor for the Project and access road surveys were limited to 14 feet off center of roadway. On BLM lands, PacifiCorp has 100 feet of existing ROW. ROW on private land varies in width.

2.1 Habitat Characterization

The objective of the habitat characterization was to provide insight on habitat types present across the proposed Project and their suitability for supporting rare plants. The desktop analysis was completed using a GIS and the latest U.S. Geological Survey (USGS) Northwest Gap Analysis Program (GAP) level 3 vegetation data overlaid on the Project ROW (GAP 2011). The desktop analysis was completed by clipping the GAP layer to the ROW. Once the desktop analysis was completed, 50 random verification points were selected within the ROW and visited in the field to verify the accuracy of the GAP data.

2.2 Wetland and Water Resources Characterization

The wetland and water resources characterization included a desktop review of National Wetland Inventory (NWI) and USGS National Hydrological Dataset (NHD) shapefiles overlaid on the Project ROW in a GIS. Two wetlands and up to 30 stream crossings identified during the desktop review were visited in the field to verify the accuracy of the datasets. The USGS NHD was broken down into perennial, intermittent, and ephemeral drainages and verified in the field. Perennial streams were defined as having flow year-round. Intermittent streams were defined as not having continuous flowing water and are not "relatively permanent water", but have a define channel. Ephemeral streams were defined as having even less flow than intermittent streams, carrying water only for brief periods in response to rain or snow events and no definable channel (US Army Corp of Engineers 2001).

2.3 Northern Spotted Owl Suitability

The objective of the northern spotted owl habitat suitability analysis was to conduct a desktop review within the ROW to determine if any suitable nesting/roosting habitat is available for northern spotted owls. Scientific research and monitoring indicate northern spotted owls generally rely on mature and old-growth forests because these habitats contain the structures and characteristics required for nesting, roosting, and foraging (FWS 2011).The desktop review

was completed by looking at habitat along the Project ROW using ArcMap 10.2 topographic maps and aerial imagery to identify areas that may be suitable for northern spotted owls. Through discussions with BLM, three areas along the proposed ROW were identified for WEST biologists to assess suitability (David Roelofs, BLM Biologist, pers. comm.).

2.4 Golden Eagle Habitat Suitability

The objective of the golden eagle habitat assessment was to conduct a desktop review of the Project and surrounding area (2 miles) to determine if any nesting habitat was available to support golden eagles. Nesting habitat in open and semi-open habitats are the most common, but can nest in coniferous habitat when open space is available (e.g. fire breaks, clear-cuts, burned areas, etc:Kochert et al. 2002]). Golden eagles tend to build nest on cliffs or the upper third of deciduous and coniferous trees (Kochert 2002). Areas that appeared to have the potential to support golden eagle nests were further evaluated in the field. A desktop review of potential eagle nesting habitat was completed by looking at the Project using ArcMap 10.2 aerial imagery and topographic maps to identify areas that may be suitable for nesting golden eagles.

2.5 Rare Plant and Lichen/Liverwort/Moss Survey

Rare plant surveys were required for vascular and nonvascular plants listed under the federal endangered species act (ESA) that could occur within the Project ROW. Surveys for ESA-listed plant species occurred on all BLM lands and on private lands where botanist could survey effectively. There was one known ESA listed species Gentner's fritillary (*Fritillaria gentneri*) that occurs within the alignment was checked. In addition to surveys for ESA-listed species, all BLM lands within the Project ROW and access roads on BLM lands were surveyed for BLM special status species (SSS; as identified by the Medford district office).

Trained botanists with experience in threatened and endangered species surveys conducted all botanical surveys. Voucher specimens from herbarium collections of the one ESA-listed species of interest, Gentner's fritillary, were studied in advance of ground surveys. Gentner's fritillary is the only ESA listed species known to exist in the Project ROW. Surveys were conducted for Gentner's fritillary from April 3 through April 18, 2015, during the field season to coincide with optimal survey conditions for the species of interest (e.g., peak flowering period). Survey windows were defined by BLM Medford Field District. Surveys for SSS occurred from June 17 to 19, 2015 and did not fall within all peak flowering periods for SSS but limited to the best survey window to capture most SSS. The ROW was surveyed by walking meandering transects on each side of the ROW such that the entire 135 ft corridor (existing 75 ft and new 60 ft ROWs) and access roads (BLM roads only) on from center line of 14 ft. was covered (USDI 1999).

<u>USFWS ESA-Listed Plants:</u>

- Gentner's fritillary (*Fritillaria gentneri*; FE)

BLM Special Status Plants:

- Long-stemmed androsace (*Androsace elongate acuta*)
- Winged-water-starwort (*Callitriche marginata*)
- One--leaved mariposa-lily (*Calochortus monophyllus*)
- Howell's camas (*Camassia howellii*)
- Slender-flowered evening-primrose (*Camissonia graciliflora*)
- Coastal lipfern (*Cheilanthes intertexta*)
- Clustered lady's-slipper (*Cypripedium fasciculatum*)
- Red larkspur (*Dephinium nudiacule*)
- Wayside aster (*Eucephalus vialis*)
- Bellinger's meadow-foam (*Limnanthes floccosa spp. bellingeriana)*
- Slender nemacladus (*Nemacladus capillaris*)
- American pillwort (*Pilularia americana*)
- Austin's plagiobothry's (*Plagiobothrys austiniae*)
- Coral-seeded allocarya (*Plagiobothrys figuratus spp. corallicarpus*)
- Greene's popcorn flower (*Plagiobothrys greenei*)
- Southern Oregon buttercup (*Ranunculus austrooreganus*)
- Drooping bulrush (*Scirpus pendulus*)
- Liverwort (*Porella bolanderi*)

3.0 RESULTS

3.1 Habitat Characterization

Field biologists examined the 50 randomly sampled habitat verification points and found that only 8 out of the 50 points visited (16%) were misclassified. Overall the desktop review and field verification were similar (Table 1).

Table 1. Habitat Characterization Along the Sam's Valley Reinforcement Project

ID Number	NWGAP Level 3 Classification	Actual Classification
1	Developed, Open Space	Successional Fallow (Grass and Shrubs) from Open Space
2	North Pacific Oak Woodland	Early Successional North Pacific Oak Woodland
3	North Pacific Oak Woodland	Successional North Pacific Oak Woodland
4	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
5	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
6	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
7	Mediterranean California Mixed Oak Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
8	Developed, Open Space	Successional Northern and Central California

Table 1. Habitat Characterization Along the Sam's Valley Reinforcement Project

ID Number	NWGAP Level 3 Classification	Actual Classification
		Dry-Mesic Chaparral
9	Northern and Central California Dry-Mesic Chaparral	Northern and Central California Dry-Mesic Chaparral
10	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
11	East Cascades Oak-Ponderosa Pine Forest and Woodland	East Cascades Oak-Ponderosa Pine Forest and Woodland
12	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
13	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
14	North Pacific Oak Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
15	Mediterranean California Mixed Oak Woodland	Young Mediterranean California Mixed Oak Woodland
16	Northern and Central California Dry-Mesic Chaparral	Northern and Central California Dry-Mesic Chaparral
17	Harvested Forest - Northwestern Conifer Regeneration	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
18	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
19	North Pacific Oak Woodland	North Pacific Oak Woodland
20	Developed, High Intensity	Developed High Intensity
21	Pasture/Hay	Pasture/Hay/Lawn Grasses
22	Pasture/Hay	Pasture/Hay/Lawn Grasses
23	East Cascades Oak-Ponderosa Pine Forest and Woodland	Fallow or Very Early Succession North Pacific Oak Woodland
24	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak Woodland
25	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak Mixed Woodland
26	East Cascades Oak-Ponderosa Pine Forest and Woodland	East Cascades Oak-Ponderosa Pine Forest and Woodland
27	East Cascades Oak-Ponderosa Pine Forest and Woodland	East Cascades Oak-Ponderosa Pine Forest and Woodland
28	Developed, Open Space	Developed, Lawn
29	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak Mixed Woodland
30	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Developed, Lawn
31	Recently burned forest	Early Successional Mediterranean California Lower Montane Black Oak Woodland from former Chaparral
32	Northern and Central California Dry-Mesic Chaparral	Northern and Central California Dry-Mesic Chaparral

Table 1. Habitat Characterization Along the Sam's Valley Reinforcement Project

ID Number	NWGAP Level 3 Classification	Actual Classification
33	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
34	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
35	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Early Successional Mediterranean California Lower Montane Black Oak Woodland from former Chaparral
36	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
37	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
38	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
39	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
40	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
41	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
42	Pasture/Hay	Pasture/Hay
43	Pasture/Hay	Pasture/Hay
44	North Pacific Oak Woodland	North Pacific Oak Woodland
45	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
46	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland
47	Northern and Central California Dry-Mesic Chaparral	Northern and Central California Dry-Mesic Chaparral
48	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Mediterranean California Lower Montane Black Woodland
49	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Developed or Northern and Central California Dry-Mesic Chaparral
50	Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Successional Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland

3.2 Wetland and Water Resources Characterization

Field biologists visited two potential wetlands and 30 stream crossings identified from NWI and NHD data during the desktop review. The two potential wetlands were located along Evans Creek and Sardine Creek and were verified in the field as wetlands by the presence of characteristic hydrology and vegetation only. The two potential wetlands were classified as persistent emergent vegetation wetlands by Cowardin 1979. This type of wetland can be

classified as a fringe wetland by the US. Environment Protection Agency (EPA 2002). The 30 stream crossings were identified as ephemeral, intermittent, or perennial streams according to U.S Army Corp of Engineers 2001. All 30 stream crossing classifications were confirmed in the field and all were confirmed to be the same classification as NHD.

3.3 Northern Spotted Owl Suitability

The desktop review indicated that no potential nesting habitat for northern spotted owl exists within the ROW. BLM biologists agreed and commented to HDR that no suitable habitat was expected to be present in the ROW. However, BLM did ask WEST to assess the three locations with the most potential for being considered suitable habitat for nesting, roosting and foraging in the field and confirmed the areas not suitable. All three locations were between transmission poles 1/12 and 2/14 (Figure 2). All three potential locations were assessed for mature old growth forest and were confirmed in the field on June 18, 2015 as not having mature old growth forest. Photos were taken and are included in Appendix B. Sites were labeled 1-3 going west to east. Site 1 contained Douglas fir (*Pseudotsuga menziesii*) up to 15 to 20 inches diameter at breast height (DBH) as well as a number of snags, but was not considered suitable habitat for northern spotted owls. Sites 2 and 3 were primarily composed of Pacific madrone (*Arbutus menziesii*) and manzanita (*Arctoscuphlos spp.*) and are not considered suitable habitat for northern spotted owls.

3.4 Golden Eagle Habitat Suitability

The desktop review showed a dominate tree mixture of Douglas fir and Oregon white oak (*Quercus garryana*). Baglien (1975) describes golden eagles using Douglas fir in western Washington, but only on edges of large clearcuts that provided access to prey. There is little suitable foraging habitat for golden eagles along the Project ROW as the vegetation is dense and would be hard for golden eagles to effectively hunt. Menkins and Anderson (1987) stated that golden eagles nesting in trees needed stout branches, such as those in *Populus spp*. or *Pinus spp*., to support their large nest structures, however, golden eagles tend to prefer nesting on cliffs. There were no cliff faces identified along the Project ROW and trees were generally considered not well-suited for golden eagle nests. The Douglas fir observed was not open enough to provide golden eagles to nesting opportunities.

On April 30th, a WEST biologist with prior experience searching for and monitoring golden eagle nests visited the Project to confirm the lack of suitable nesting habitat identified during the desktop review. Habitats along the Project ROW were observed as having limited nesting suitability for golden eagles. There was one escarpment (Table Rock) located approximately 2 miles to the southeast of the Project that may provide cliffs suitable for supporting golden eagle nests.

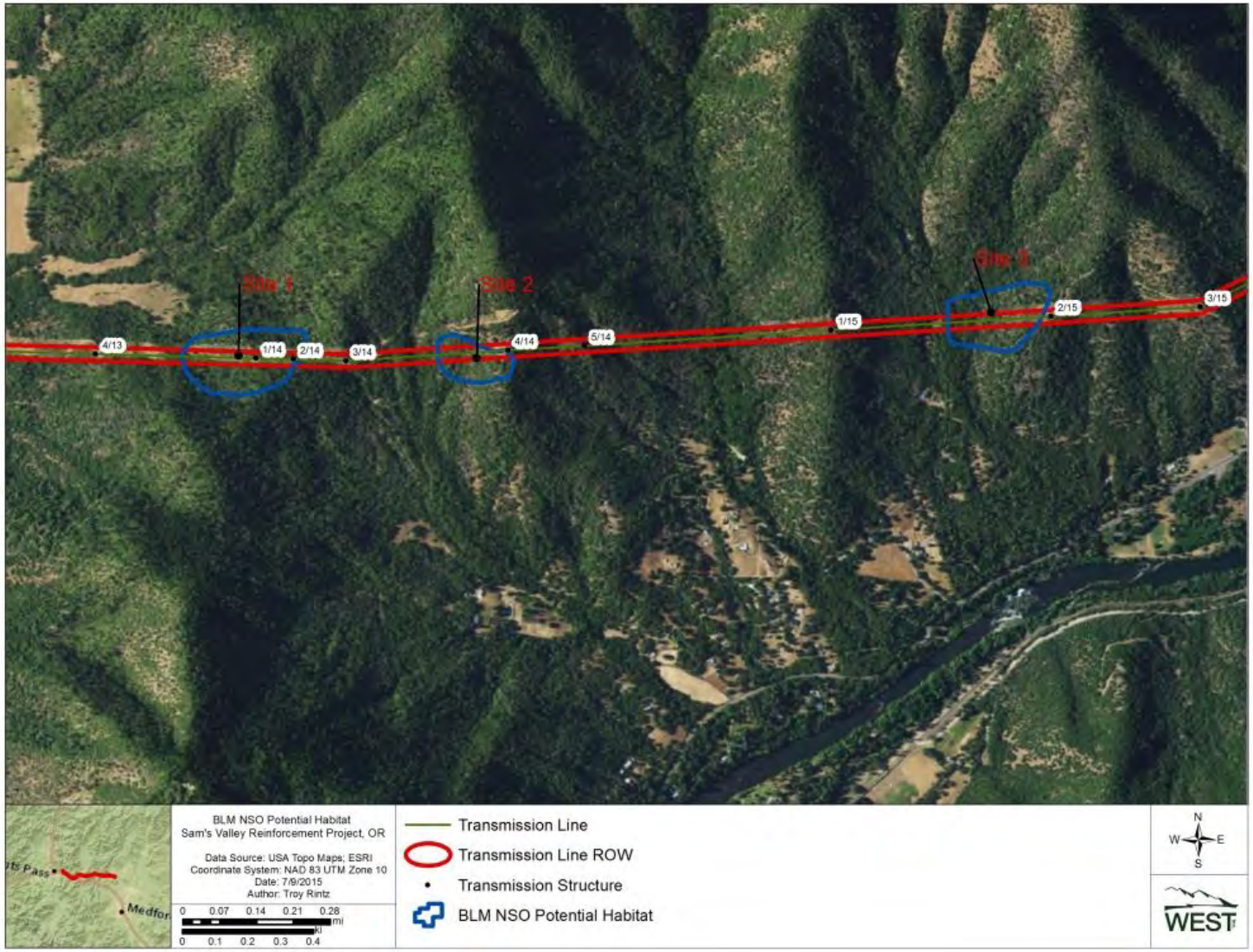

Figure 2. BLM Northern Spotted Owl Potential Habitat on Sam's Valley Reinforcement Project

3.5 Rare Plant and Lichen/Liverwort/Moss Survey

There were two surveys completed for rare plants. The first survey focused on Gentner's fritillary during the flowering season and was conducted between April 3 and April 19. The first survey was conducted in areas with suitable access as well as the one location provided by the BLM where Gentner's fritillary had been previously documented (Appendix C). A total of over 81% of the ROW was surveyed for Gentner's fritillary. No Gentner's fritillary was observed during the survey.

On June 17, WEST biologists conducted a second rare plant survey to search for BLM SSS. This survey was limited to BLM lands and roads that crossed BLM lands that may need improvements (Appendix D). A full list of the roads surveyed can be found in Appendix A. No BLM special status species were detected and all BLM lands and all access roads were 100% surveyed (Table 2).

4.0 SUMMARY

No species of concern were found while conducting rare plants surveys. Nesting habitat is considered not suitable for golden eagles and northern spotted owls. NWI and NHD correctly identified the wetlands and stream characterization of the area. The habitat characterization survey provided insight that the habitat was well represented by GAP data and did not alter the rare plant survey.

Table 2. USFWS and BLM rare plant species for which surveys were conducted.

Scientific Name / Common Name	Survey Period (Flowering/ Fruiting)	Survey Area	Habitat	Species Encountered (Yes/No)
Androsace elongate spp. acuta Long-Stemmed Androsace	March - June	BLM lands	Chaparral, valley and foothill grassland	No
Callitriche marginata Winged-water-Starwort[a]	Feb-Mar	BLM lands	wetland-riparian	No
Calochortus monophyllus One-Leaved Mariposa-Lily[a]	Apr-May	BLM lands	Foothill Woodland, Yellow Pine Forest	No
Camassia howellii Howell's Camas	Late spring	BLM lands	Forest/Woodland, Grassland/herbaceous, Savanna, Woodland - Conifer	No
Camissonia graciliflora Slender-Flowered Evening-Primrose	Late April- mid May	BLM lands	Several habitat types, often on clay soils	No
Cheilanthes intertexta Coastal Lipfern	Late spring - fall	BLM lands	Rocky slopes and ledges	No
Cypripedium fasciculatum Clustered Lady's-Splipper	April-August	BLM lands	Moist to dry coniferous forests and thickets	No
Dephinium nudiacule Red Larkspur	Late winter –early summer	BLM lands	Moist talus, cliff faces	No
Eucephalus vialis Wayside Aster[a]	July	BLM lands	Dry open oak or coniferous woods	No
Fritillaria gentneri Gentner's fritillary	April - June	All Accessible lands	Dry woodlands	No
Limnanthes floccosa spp. Bellingeriana Bellinger's Meadow-foam[a]	April -May	BLM lands	Vernal pool edges in shallow soil of rocky meadows	No

Table 2. USFWS and BLM rare plant species for which surveys were conducted.

Scientific Name / Common Name	Survey Period (Flowering/ Fruiting)	Survey Area	Habitat	Species Encountered (Yes/No)
Nemacladus capillaris Slender Nemacladus[a]	Late April- mid May	BLM lands	Cushion plant communities along ridges and low hills, in areas devoid of grasses	No
Pilularia americana American Pillwort	Spring - fall	BLM lands	Shallow water of ponds and temporary pools	No
Plagiobothrys austiniae Austin's Plagiobothry's	March - May	BLM lands	Moist and wet areas	No
Plagiobothrys figuratus spp. corallicarpus Coral Seeded Allocarya	May-June	BLM lands	Sparsely-vegetated shale slopes and ridges	No
Plagiobothrys greenei Greene's Popcorn Flower	Late May-August (generally done later in season)	BLM lands	Wet sites, grassland to woodland	No
Ranunculus austrooreganus Southern Oregon buttercup[a]	May	BLM lands	Grassland/herbaceous, Savanna; temporary pools; Open oak savannahs and grasslands and along the margins of rocky vernal pools at low elevations on a valley floor and margins.	No
Scirpus pendulus Drooping bulrush[a]	Mid July-September	BLM lands	Sub-irrigated alluvial soils along streams, floodplains, wet meadows	No

Table 2. USFWS and BLM rare plant species for which surveys were conducted.

Scientific Name / Common Name	Survey Period (Flowering/ Fruiting)	Survey Area	Habitat	Species Encountered (Yes/No)
Porella bolanderi Liverwort	Late winter to early summer	BLM lands	variety of rock types (siliceous, calcareous, and metamorphic) and trunks of *Quercus, Umbellularia*, and *Acer macrophyllum*. elevations range from 500-3000 feet. Primary forest types are dry *Quercus garryana, Pinus ponderosa, and Pseudotsuga menziesii* associations. Capsules usually develop in late winter to early summer	No

a –Outside of flowering/fruiting period when surveyed

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Appendix A. Access Roads Surveyed for BLM Rare Plants in 2015

County	Transmission Pole	Class	Surveys Conducted (Yes/No); Species found (Yes/No)
Josephine			
	2/1	Dirt - May Req Improvements	Yes; No
	4/1	Dirt - May Req Improvements	Yes; No
	4/1	Dirt - May Req Improvements	Yes; No
	1/2	Dirt - May Req Improvements	Yes; No
	1/2	Dirt - No Improvements	Yes; No
	1/2	Dirt - May Req Improvements	Yes; No
Jackson		Dirt - May Req Improvements	Yes; No
	2/2	Dirt - May Req Improvements	Yes; No
	1/3	Dirt - May Req Improvements	Yes; No
	5/4	Dirt - May Req Improvements	Yes; No
	6/4	Dirt - May Req Improvements	Yes; No
	1/5	Dirt - May Req Improvements	Yes; No
	1/6	Dirt - May Req Improvements	Yes; No
	1/8	Dirt - May Req Improvements	Yes; No
	1/8	Dirt - May Req Improvements	Yes; No
	2/8	Dirt - May Req Improvements	Yes; No
	2/8	Dirt - May Req Improvements	Yes; No
	5/10	Dirt - May Req Improvements	Yes; No
	6/10	Dirt - May Req Improvements	Yes; No
	1/11	Dirt - May Req Improvements	Yes; No
	2/11	Dirt - May Req Improvements	Yes; No
	3/11	Dirt - May Req Improvements	Yes; No
	3X/11	Dirt - May Req Improvements	Yes; No
	4/11	Dirt - May Req Improvements	Yes; No
	7/11	Dirt - May Req Improvements	Yes; No
	4/13	Dirt - May Req Improvements	Yes; No
	1/14	Dirt - May Req Improvements	Yes; No
	3/14	Dirt - May Req Improvements	Yes; No
	4/14	Dirt - May Req Improvements	Yes; No
	5/14	Dirt - May Req Improvements	Yes; No

Appendix B. Representational Photos of Northern Spotted Owl Habitat

Northern Spotted Owl Habitat at Site 1 (west side)

Northern Spotted Owl Habitat Site 1 (west side)

Northern Spotted Owl Habitat at Site 2 (middle site)

Northern Spotted Owl Habitat at Site 2 (middle site)

Northern Spotted Owl Habitat Site 3 (east side)

Northern Spotted Owl Habitat Site 3 (east side)

Appendix C. Figures for Gentner's fritillary Rare Plant Surveys

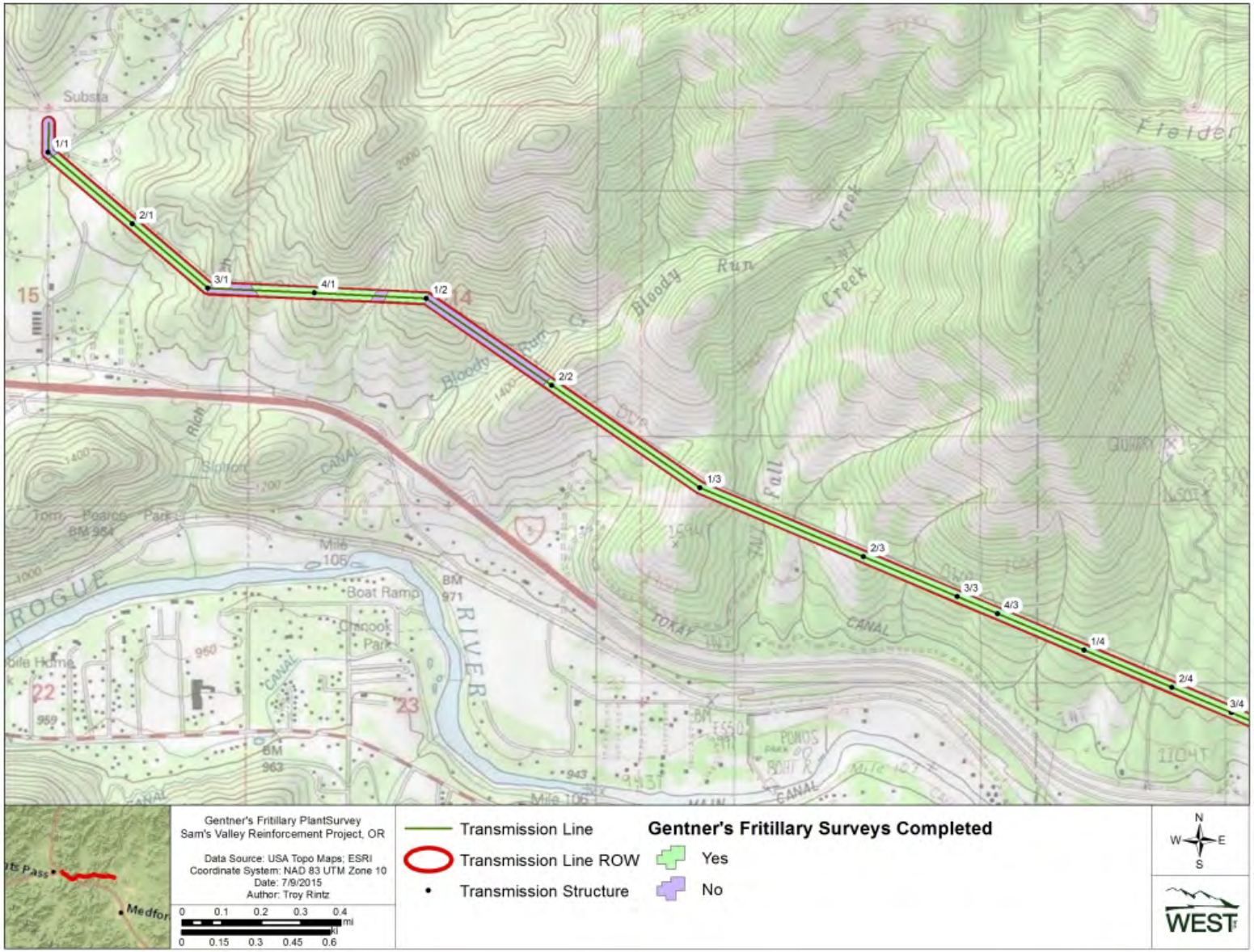


Figure C1. Gentner's Fritillary Survey on Sam's Valley Reinforcement Project.

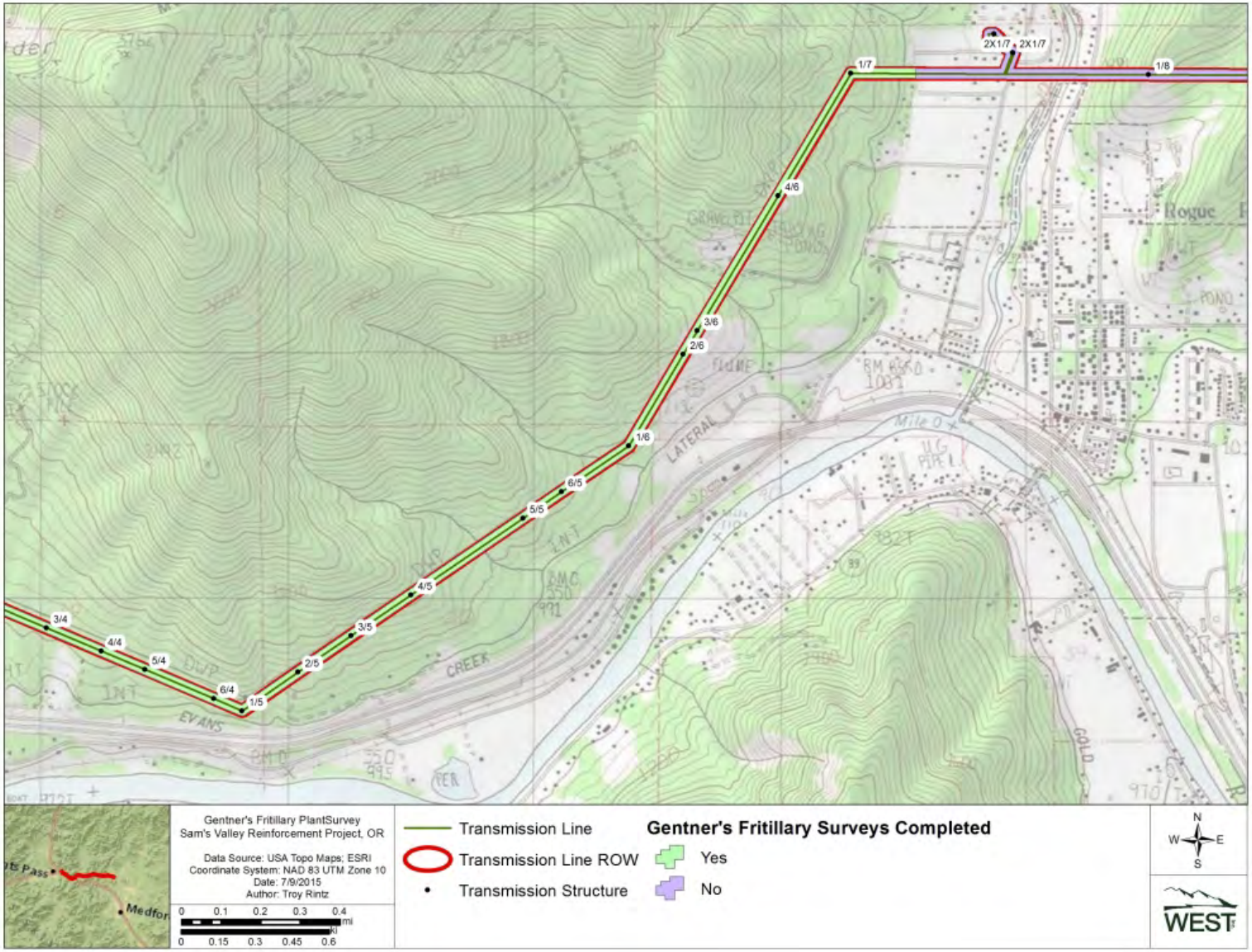
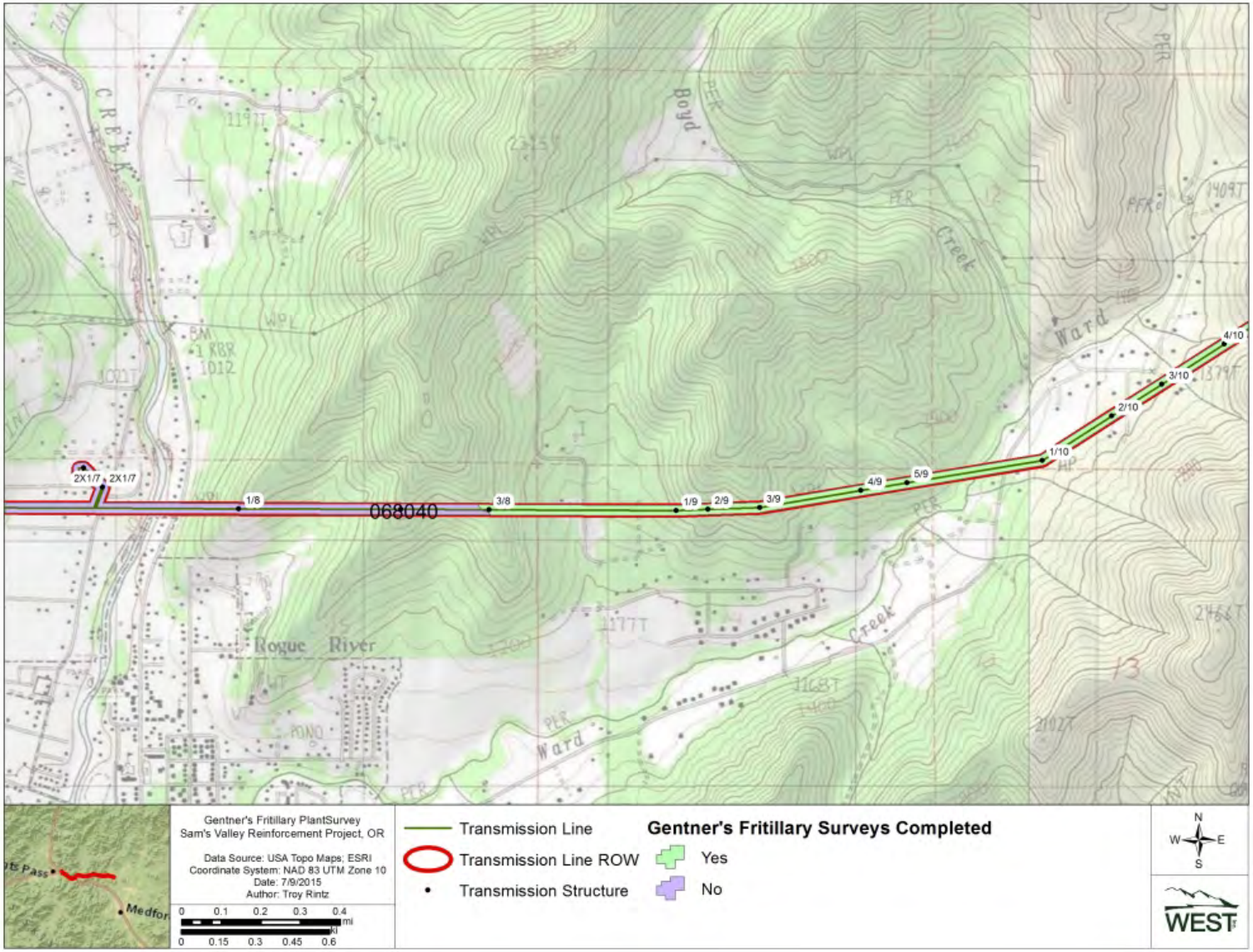


Figure C2. Gentner's Fritillary Survey on Sam's Valley Reinforcement Project



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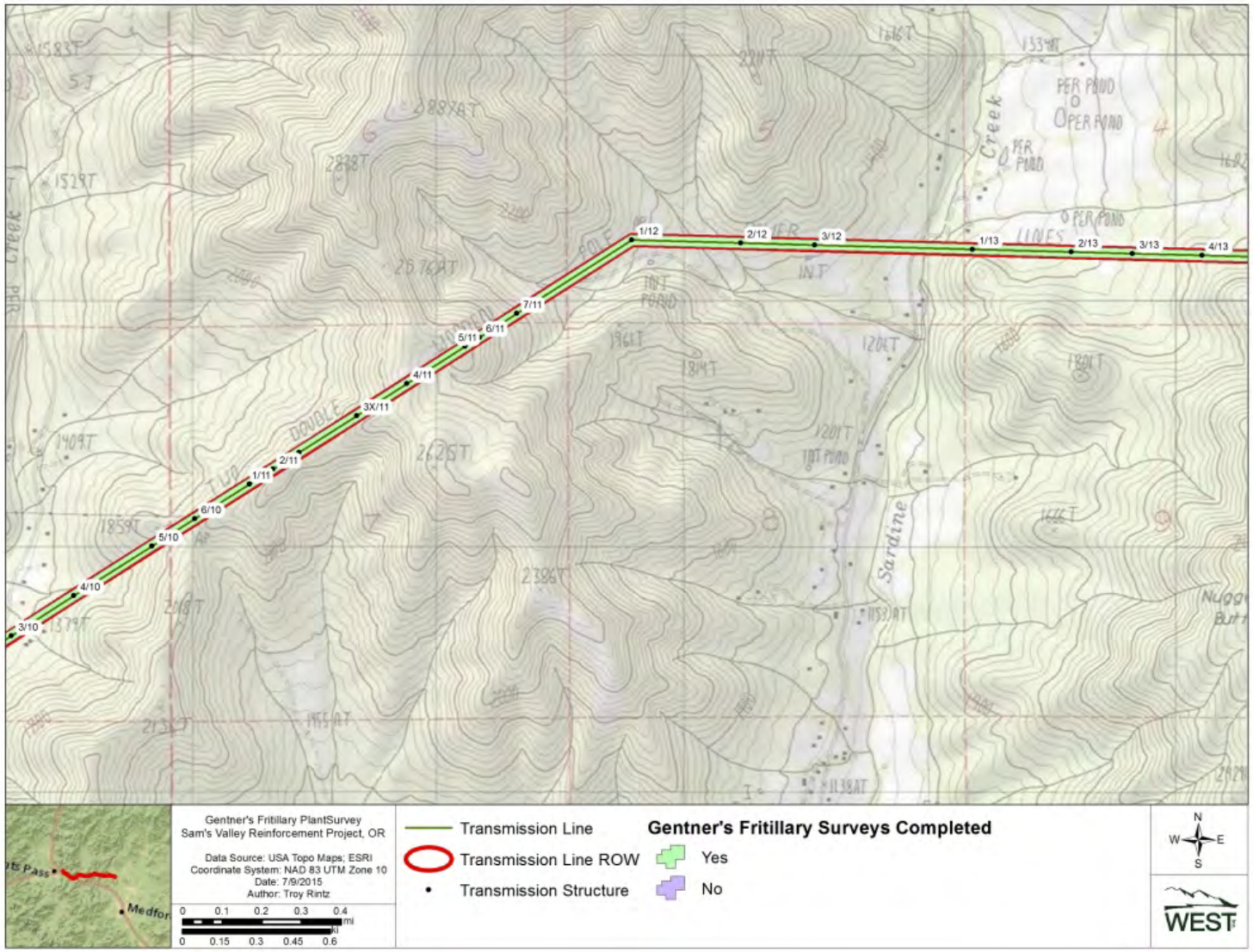

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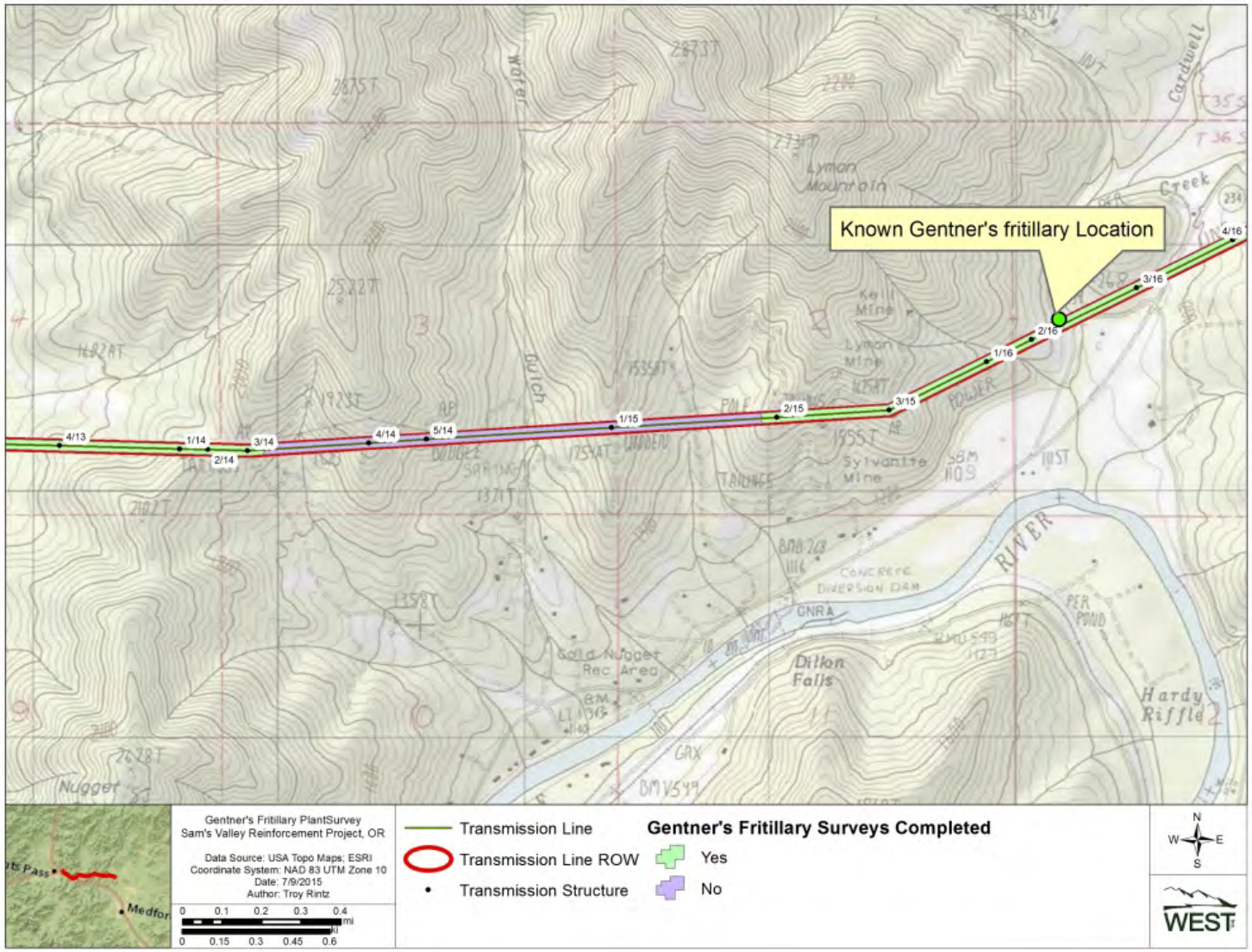


Figure C5. Gentner's Fritillary Survey on Sam's Valley Reinforcement Project

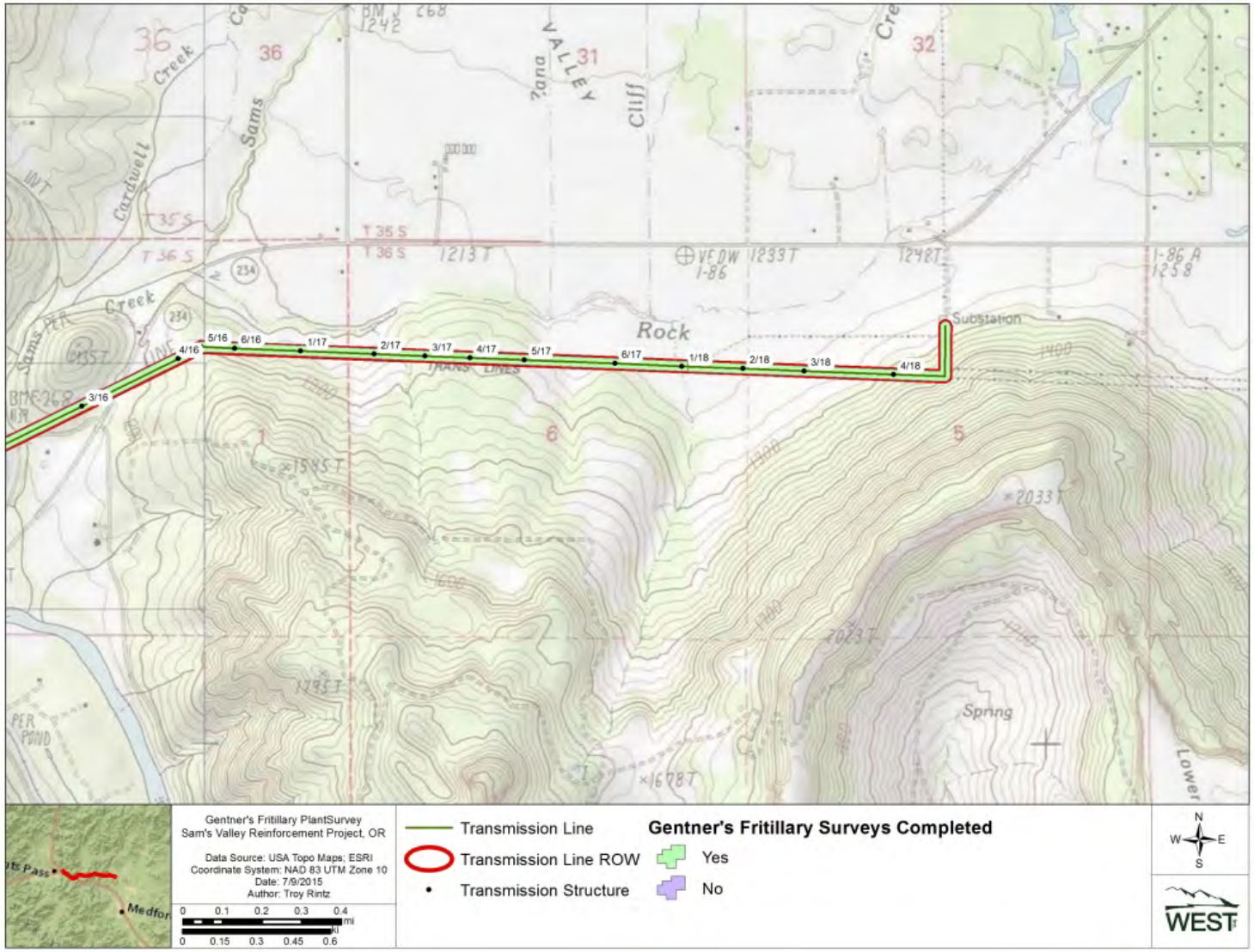


Figure C6. Gentner's Fritillary Survey on Sam's Valley Reinforcement Project

Appendix D. Figures for BLM Rare Plant Surveys

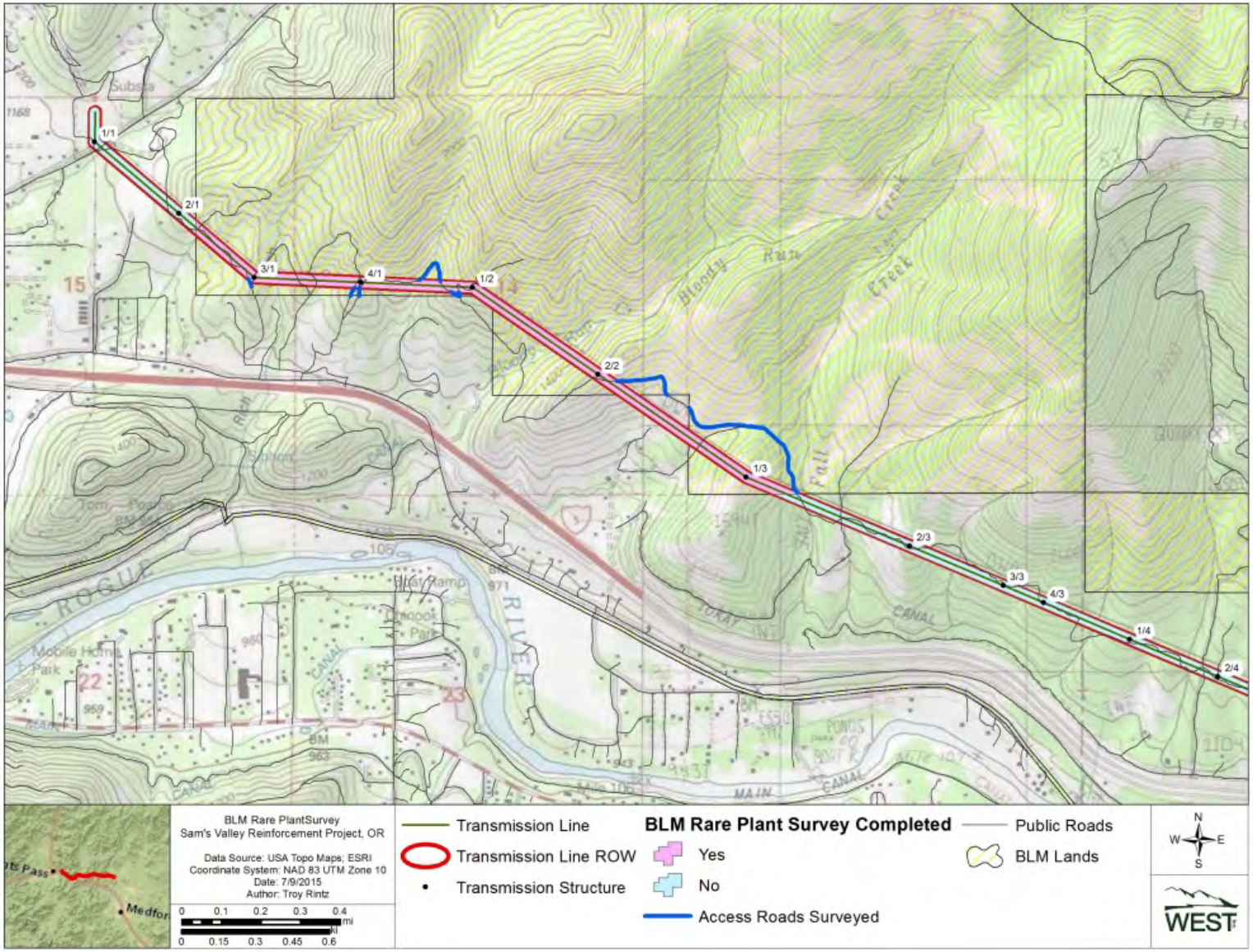
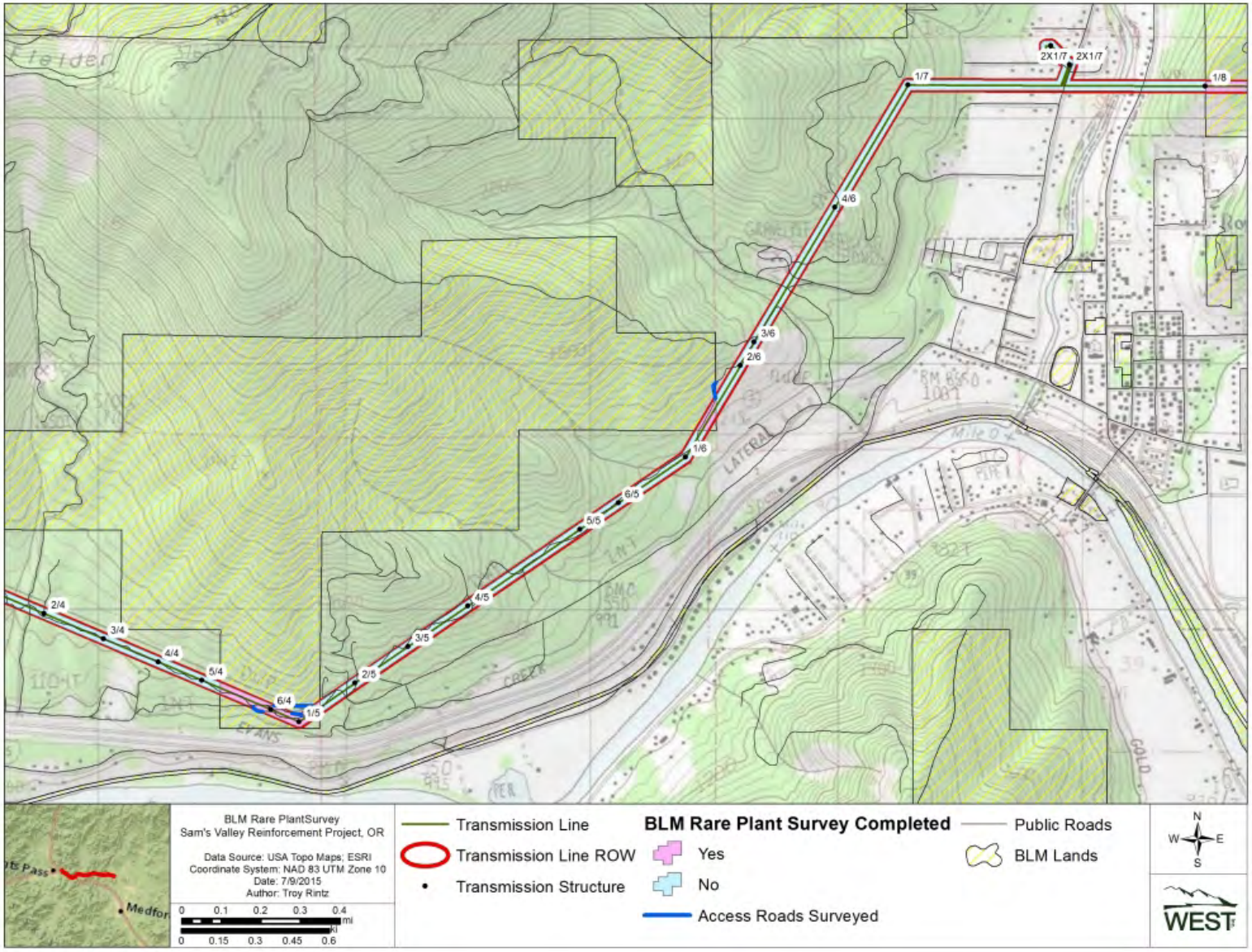


Figure D1. BLM Rare Plants on Sam's Valley Reinforcement Project



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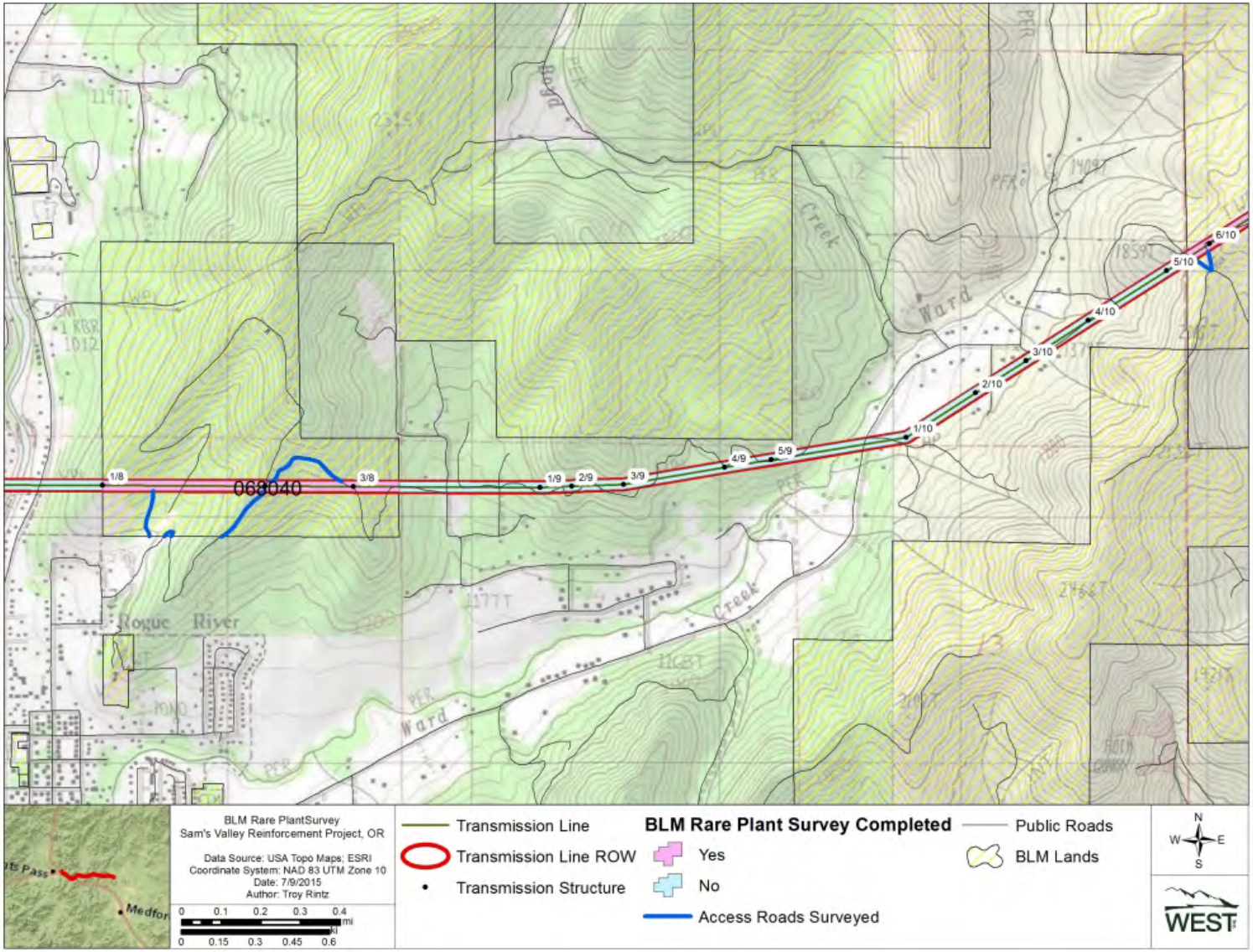

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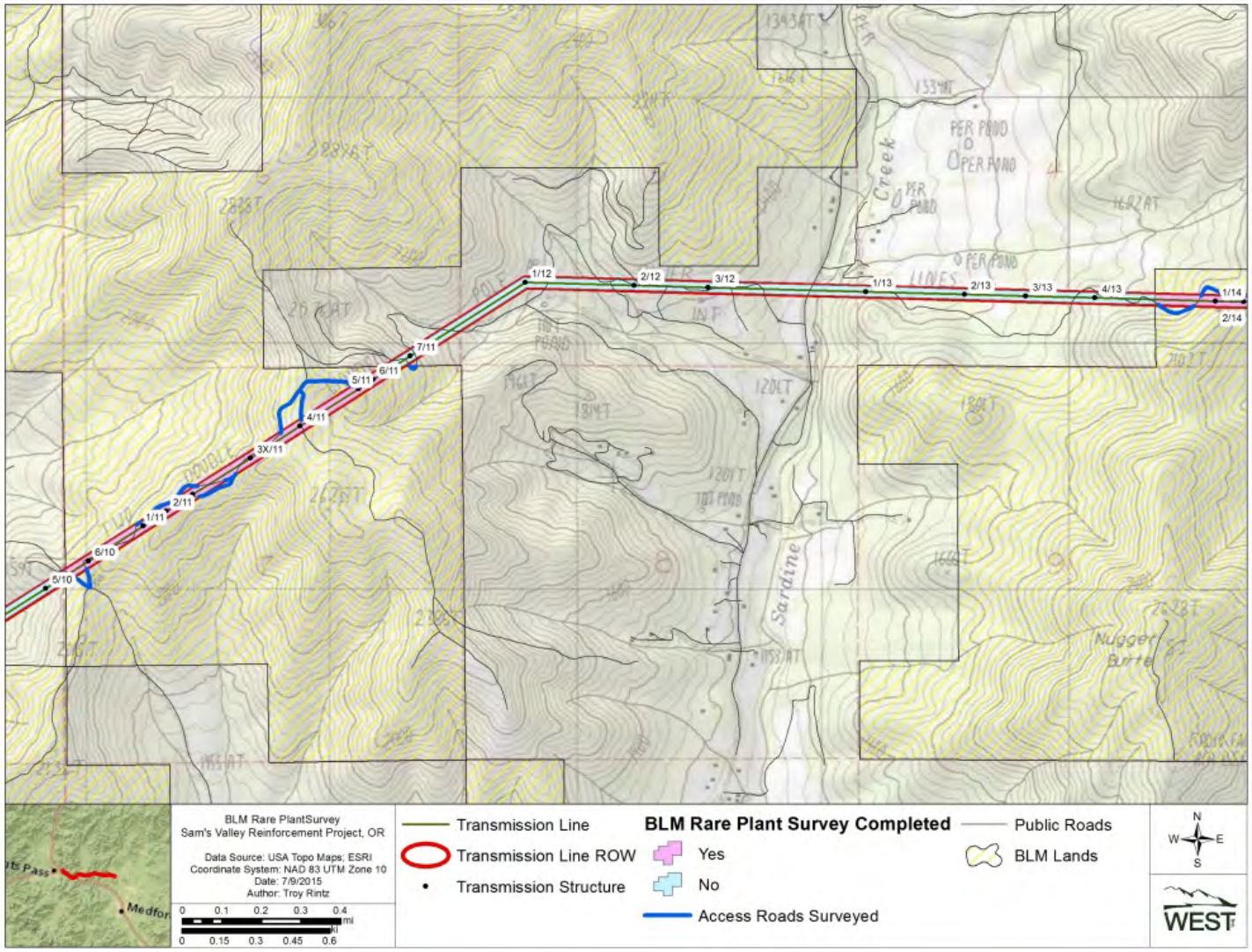

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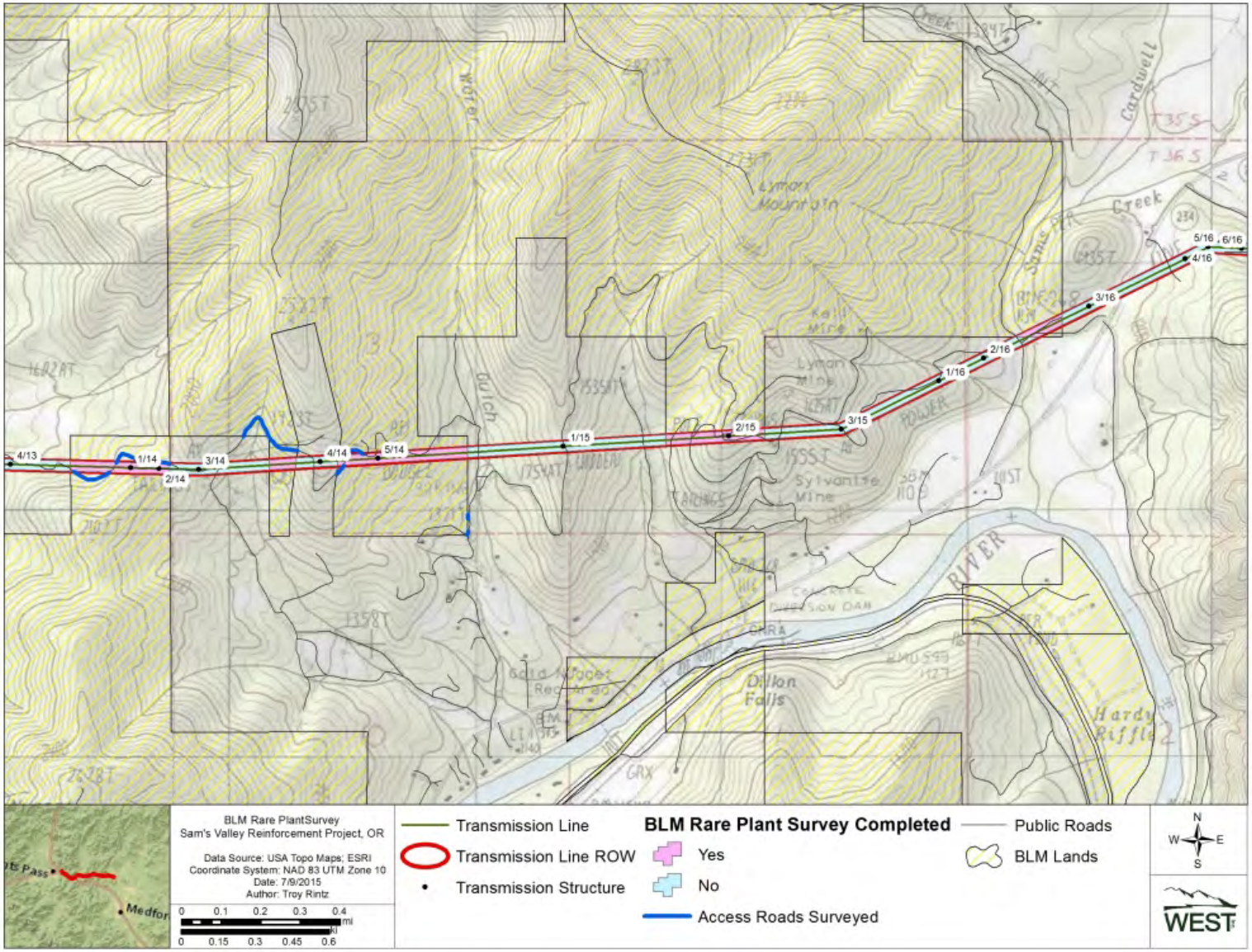

Figure D5. BLM Rare Plants on Sam's Valley Reinforcement Project

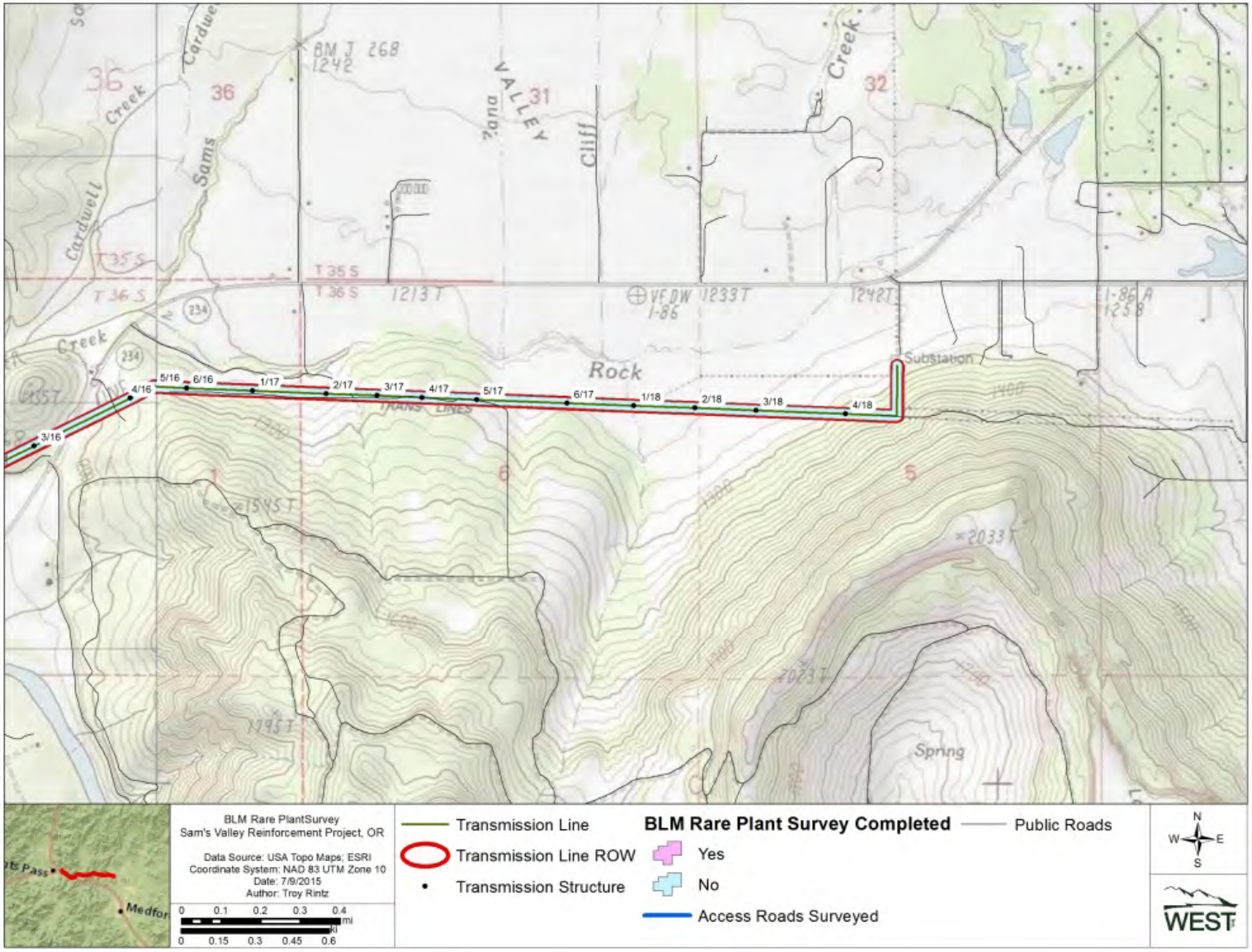

Figure D6. BLM Rare Plants on Sam's Valley Reinforcement Project

Sam's Valley Reinforcement Project

Jackson County, OR

Prepared for:

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June 27, 2016

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1.0 INTRODUCTION

PacifiCorp is proposing development of the Sam's Valley Reinforcement Project, an upgrade utility line (reconductoring) to an approximately 4.6-mile (mi) long section of existing transmission line (Figure 1). This upgrade follows existing utility corridors and will originate at a new facility (Sam's Valley substation) outside of Gold Hill, Oregon and terminate at an existing Whetstone substation. The proposed Sam's Valley substation, right of way (ROW), and access roads will collectively be referred to as the Project. The Project crosses lands managed by the Bureau of Land Management (BLM) Medford Field Office and private lands. HDR Engineering, Inc. (HDR) has been contracted to prepare environmental review documents for the Project. HDR has contacted the BLM Field Office and the United States Fish and Wildlife Service (USFWS) to introduce the Project, to request sensitive species information, and to discuss issues or concerns the agencies may have with the Project.

Under the direction of HDR, Western EcoSystems Technology, Inc. (WEST) has been subcontracted to conduct biological reviews and surveys to support HDR's environmental review documents. This report summarizes the 2016 rare plant surveys conducted by WEST along the proposed Project.

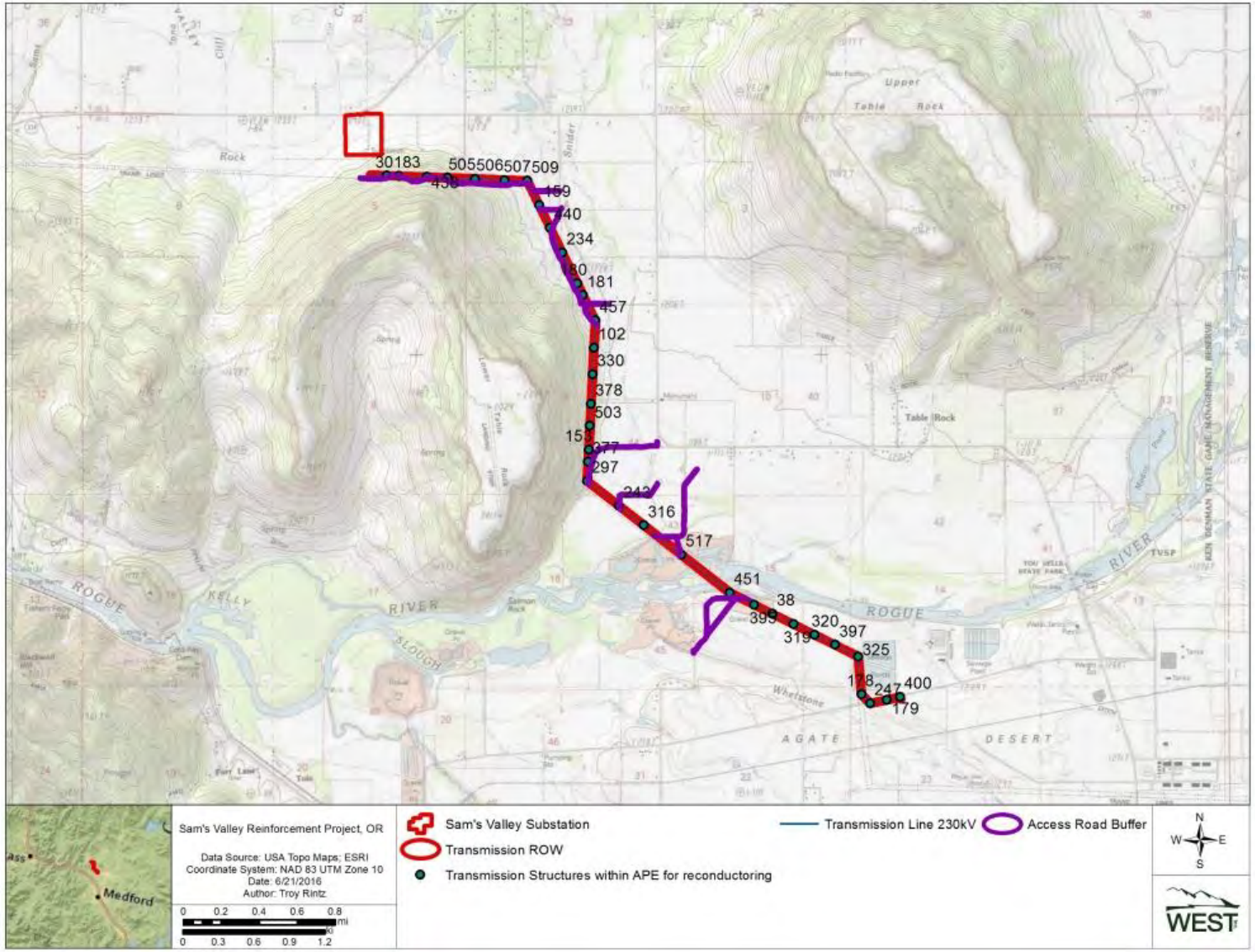

Figure 1. Sam's Valley Reinforcement Project in Jackson County, Oregon

2.0 METHODS

WEST, under contract to HDR, conducted rare plants and lichen/liverwort/moss surveys with the proposed Project (Sam's Valley substation, ROW, and access roads). Data on rare plants was generated by Oregon Natural Heritage Information Center (ORBIC 2014). The ROW corridor is defined the entire 135 foot (ft) corridor (existing 100 ft ROW and 35 ft buffer) for the Project and access road surveys were limited to 14 ft either side of the center of roadway.

2.1 Rare Plant and Lichen/Liverwort/Moss Survey

Rare plant surveys were required for vascular and nonvascular plants listed under the federal endangered species act (ESA) that could occur within the Project. Gentner's fritillary (*Fritillaria gentneri*) is the only ESA listed species is potential occur within the Project. In addition to surveys for ESA-listed species, all BLM lands within the Project ROW and access roads on BLM lands were surveyed for BLM special status species (SSS; as identified by the Medford district office).

Trained botanists with experience in threatened and endangered species surveys conducted all botanical surveys. Voucher specimens from herbarium collections of the one ESA-listed species of interest, Gentner's fritillary, were studied in advance of ground surveys. Surveys were conducted for Gentner's fritillary from April 25 through April 26, 2016, to coincide with optimal survey conditions for the species of interest (i.e., peak flowering period). Survey windows were defined by BLM Medford Field District. Surveys for SSS occurred on June 6, 2016 and did not fall within all peak flowering periods for SSS, but limited to the best survey window to capture most other listed SSS. The Sam's Valley substation within the boundary was surveyed using a meandering transects targeting the best available habitat. The Project was surveyed by walking meandering transects on each side of the ROW such that the entire 135 ft corridor (existing 100 ft ROW and new 35 ft buffer) and access roads on from center line of 14 ft. was covered (USDI 1999).

The list below represents species addressed as possible species to occur with the Project area.

<u>USFWS ESA-Listed Plants:</u>

- Gentner's fritillary (*Fritillaria gentneri*; FE)

<u>BLM Special Status Plants:</u>

- Long-stemmed androsace (*Androsace elongate acuta*)
- Winged-water-starwort (*Callitriche marginata*)
- One--leaved mariposa-lily (*Calochortus monophyllus*)
- Howell's camas (*Camassia howellii*)
- Slender-flowered evening-primrose (*Camissonia graciliflora*)
- Coastal lipfern (*Cheilanthes intertexta*)

- Clustered lady's-slipper (*Cypripedium fasciculatum*)
- Red larkspur (*Dephinium nudiacule*)
- Wayside aster (*Eucephalus vialis*)
- Bellinger's meadow-foam (*Limnanthes floccosa spp. bellingeriana)*
- Slender nemacladus (*Nemacladus capillaris*)
- American pillwort (*Pilularia americana*)
- Austin's plagiobothry's (*Plagiobothrys austiniae*)
- Coral-seeded allocarya (*Plagiobothrys figuratus spp. corallicarpus*)
- Greene's popcorn flower (*Plagiobothrys greenei*)
- Southern Oregon buttercup (*Ranunculus austrooreganus*)
- Drooping bulrush (*Scirpus pendulus*)
- Liverwort (*Porella bolanderi*)

3.0 RESULTS

3.1 Rare Plant and Lichen/Liverwort/Moss Survey

There were two surveys completed for rare plants. The first survey focused on Gentner's fritillary during the flowering season and was conducted between April 25 and April 26. The first survey was conducted in areas with suitable habitat, which included Sam's Valley substation, ROW, and access roads. No Gentner's fritillary was observed during the survey.

On June 6, WEST biologists conducted a second rare plant survey to search for BLM SSS. This survey was limited to BLM lands and roads that crossed BLM lands that may need improvements (Appendix C). A full list of the roads surveyed can be found in Appendix A. No BLM special status species were detected and all BLM lands and all access roads were 100% surveyed (Table 2).

4.0 SUMMARY CONCLUSION

Surveys on April 25 and 26, 2016 did not document Gentner's fritillary on the Project. Other than a small area within an island on the Rogue River all areas of the Project were surveyed. On June 6, 2016 a BLM SSS survey took place on the one BLM parcel that has two access roads and a quarter mile section of the Project and no special status species or species of concern were observed.

Table 1. USFWS and BLM rare plant species for which surveys were conducted.

Scientific Name / Common Name	Survey Period (Flowering/ Fruiting)	Survey Area	Habitat	Species Encountered (Yes/No)
Androsace elongate spp. acuta Long-Stemmed Androsace	March - June	BLM lands	Chaparral, valley and foothill grassland	No
Callitriche marginata Winged-water-Starwort[a]	Feb-Mar	BLM lands	wetland-riparian	No
Calochortus monophyllus One-Leaved Mariposa-Lily[a]	Apr-May	BLM lands	Foothill Woodland, Yellow Pine Forest	No
Camassia howellii Howell's Camas	Late spring	BLM lands	Forest/Woodland, Grassland/herbaceous, Savanna, Woodland - Conifer	No
Camissonia graciliflora Slender-Flowered Evening-Primrose	Late April- mid May	BLM lands	Several habitat types, often on clay soils	No
Cheilanthes intertexta Coastal Lipfern	Late spring - fall	BLM lands	Rocky slopes and ledges	No
Cypripedium fasciculatum Clustered Lady's-Splipper	April-August	BLM lands	Moist to dry coniferous forests and thickets	No
Dephinium nudiacule Red Larkspur	Late winter –early summer	BLM lands	Moist talus, cliff faces	No
Eucephalus vialis Wayside Aster[a]	July	BLM lands	Dry open oak or coniferous woods	No
Fritillaria gentneri Gentner's fritillary	April - June	All Accessible lands	Dry woodlands	No
Limnanthes floccosa spp. Bellingeriana Bellinger's Meadow-foam[a]	April -May	BLM lands	Vernal pool edges in shallow soil of rocky meadows	No

Table 1. USFWS and BLM rare plant species for which surveys were conducted.

Scientific Name / Common Name	Survey Period (Flowering/ Fruiting)	Survey Area	Habitat	Species Encountered (Yes/No)
Nemacladus capillaris Slender Nemacladus[a]	Late April- mid May	BLM lands	Cushion plant communities along ridges and low hills, in areas devoid of grasses	No
Pilularia americana American Pillwort	Spring - fall	BLM lands	Shallow water of ponds and temporary pools	No
Plagiobothrys austiniae Austin's Plagiobothry's	March - May	BLM lands	Moist and wet areas	No
Plagiobothrys figuratus spp. corallicarpus Coral Seeded Allocarya	May-June	BLM lands	Sparsely-vegetated shale slopes and ridges	No
Plagiobothrys greenei Greene's Popcorn Flower	Late May-August (generally done later in season)	BLM lands	Wet sites, grassland to woodland	No
Ranunculus austrooreganus Southern Oregon buttercup[a]	May	BLM lands	Grassland/herbaceous, Savanna; temporary pools; Open oak savannahs and grasslands and along the margins of rocky vernal pools at low elevations on a valley floor and margins.	No
Scirpus pendulus Drooping bulrush[a]	Mid July-September	BLM lands	Sub-irrigated alluvial soils along streams, floodplains, wet meadows	No

Table 1. USFWS and BLM rare plant species for which surveys were conducted.

Scientific Name / Common Name	Survey Period (Flowering/ Fruiting)	Survey Area	Habitat	Species Encountered (Yes/No)
Porella bolanderi Liverwort	Late winter to early summer	BLM lands	Variety of rock types (siliceous, calcareous, and metamorphic) and trunks of *Quercus, Umbellularia*, and *Acer macrophyllum*. elevations range from 500-3000 feet. Primary forest types are dry *Quercus garryana, Pinus ponderosa, and Pseudotsuga menziesii* associations. Capsules usually develop in late winter to early summer	No

a –Outside of flowering/fruiting period when surveyed

5.0 LITERATURE CITED

Oregon Natural Heritage Information Center. 2014. Rare, threatened and endangered species of Oregon. Oregon Natural Heritage Information Center, Oregon State University, Portland, Oregon.

U. S. Department of Interior Bureau of Land Management and United States Department of Agriculture Forest Service (USDI BLM and USDA FS). 1999. Survey and manage survey protocols - vascular plants. Instruction memorandum No. OR-99-26.

Appendix A. Access Roads Surveyed for ESA/BLM Rare Plants in 2016

County	Transmission Pole	Class	Surveys Conducted (Yes/No); Species found (Yes/No)
Jackson			
	509	Dirt - May Req Improvements	Yes; No
	159	Dirt - May Req Improvements	Yes; No
	440	Dirt - May Req Improvements	Yes; No
	181	Dirt - May Req Improvements	Yes; No
	457	Dirt - May Req Improvements	Yes; No
	297	Dirt - May Req Improvements	Yes; No
	243	Dirt - May Req Improvements	Yes; No
	316	Dirt - May Req Improvements	Yes; No
	517	Dirt - May Req Improvements	Yes; No
	451	Dirt - May Req Improvements	Yes; No

Appendix B. Figures for Gentner's fritillary Rare Plant Surveys

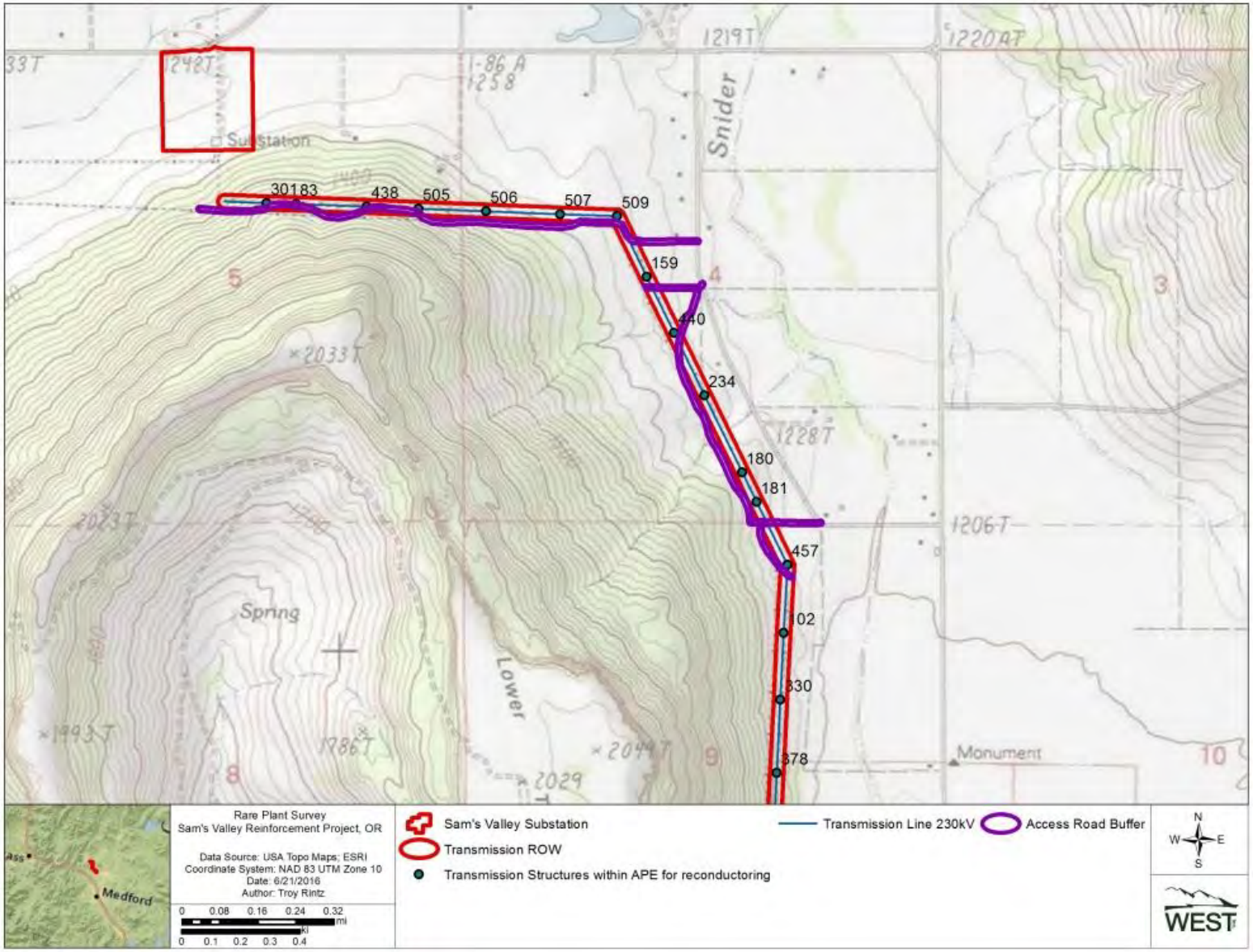

Figure B1. Gentner's Fritillary Survey on Sam's Valley Reinforcement Project.

Figure B2. Gentner's Fritillary Survey on Sam's Valley Reinforcement Project

Appendix C. Figures for BLM Rare Plant Surveys

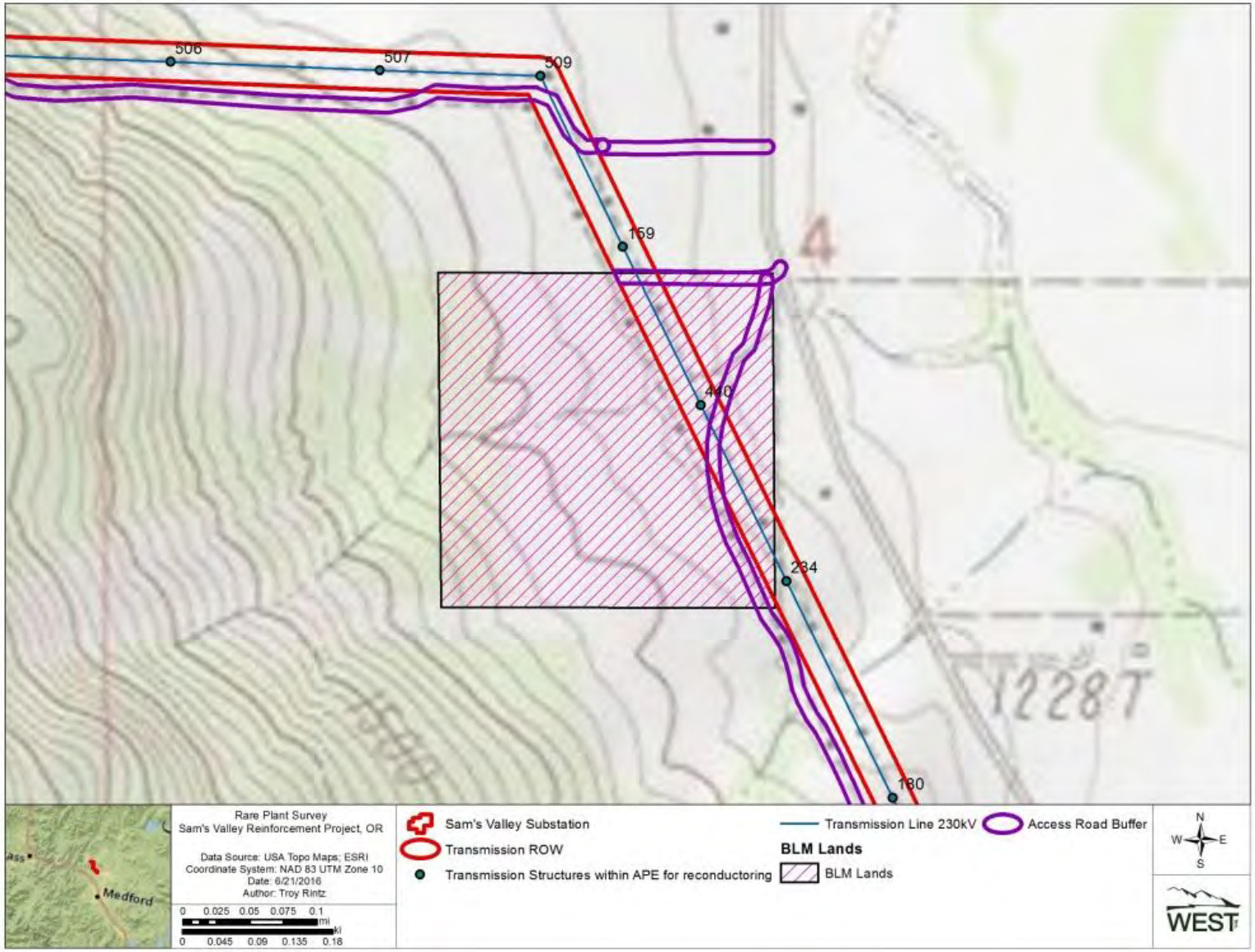

Figure C1. BLM Rare Plants on Sam's Valley Reinforcement Project.

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Memo

Date:	Wednesday, December 09, 2015
Project:	Sam's Valley Reinforcement Project
To:	Pacific Power
From:	Corrinne Atkinson and Matt Hutchinson (HDR)
Subject:	NSO Survey Summary

Introduction

HDR was contracted by Pacific Power to survey a portion of the project area for the Sam's Valley Reinforcement project (Project) that has been identified by the Bureau of Land Management (BLM) as potential habitat for Northern spotted owl (NSO), a threatened species listed under the Endangered Species Act. The site, referred to as NSO Site #1, crosses the Project's right-of-way (ROW) corridor and a potential access road between poles 4/13 and 2/14 on the existing Grants Pass-Lone Pine 115kV transmission line. The overall objective of the survey was to determine the suitability of the habitat and the likelihood of use by the NSO. Data collected may also be used to support future effects determinations under Section 7 of the Endangered Species Act, as necessary.

In its *Designation of Revised Critical Habitat for the Northern Spotted Owl* (2012), U.S. Fish and Wildlife identifies various habitat features, or primary constituent elements (PCEs) that are preferred by the NSO, some of which are suspected by BLM to occur at NSO Site #1. Habitat features important to the NSO include forest types with mature and old-forest characteristics; low-density forest patches within a mosaic of mature and older forest habitat; stands with adequate tree size and moderate to high canopy cover, to provide protection from avian predators and adequate foraging opportunities; high incidence of large, live trees with various deformities for nest sites and prey species; and large accumulations of fallen trees and other woody debris on the ground to support prey species. When surveying the habitat at NSO Site #1, surveyors aimed to collect relevant data that could be used to evaluate the presence or absence of PCEs for the NSO.

Methods

On November 12-13th, 2015, HDR biologists surveyed trees and habitat complexity within a defined survey area for NSO Site #1, to assess the likelihood of use by the NSO. The survey area was defined as the expanded ROW corridor (135 feet wide), and access roads within the BLM-defined NSO Site #1, plus a 40-foot wide buffer on either side of the 135-foot wide ROW edge and access road centerline (for a total width of the 215 feet for the ROW and 80 feet for the access roads). The size of the survey area was selected to represent all of the areas that could potentially be disturbed by construction activities in the area, including access road rehabilitation and ROW widening (i.e., tree removal and vegetation clearing).

Within this area, biologists recorded the location (with GPS) and species of all trees and snags greater than 6 inches in diameter at breast height (dbh). Biologists also recorded observations of habitat features important for the NSO including the relative amount of downed woody debris (i.e., suitable habitat for owl prey species) and percent canopy cover (i.e., protection from avian predators and thermoregulation) at four different locations throughout the study area. Areas exhibiting habitat features important for the NSO were delimited in the field (with GPS) using visual indicators such as mean tree size, snag density, relative amount of downed woody debris, and canopy cover to determine the boundaries between differing habitat conditions. Field observations were compared to aerial photographs and topographic maps to verify their accuracy.

A pre-digitized access road layer was used to determine access road centerlines, apply buffers and delineate the study area in the office, prior to the field visit. In the field, digitized access road locations were verified for accuracy. If the centerline was significantly different from the actual access road location, access road boundaries were recorded (using GPS) so that the study area could be amended as needed.

Results

There are a total of 753 trees within the study area, including 676 live trees and 77 snags (Figure 1). Tree sizes range from 6 to 37 inches dbh, with an average of 11 inches dbh. Snag sizes are slightly larger on average (14 inches dbh) than live trees (10 inches dbh). Tree and snag species are a mix of conifers and hardwoods, typical of Douglas-fir forests in the Klamath Mountains ecoregion, and are dominated by Pacific madrone (46 percent), followed by Douglas fir (29 percent), California black oak (17 percent), Incense cedar (4 percent), Ponderosa pine (4 percent), and Western white pine (<1 percent). Canopy cover ranges between 80 percent and 93 percent, with an average of 86 percent. Survey results are summarized in Table 1.

Vegetation in the existing 100-foot wide ROW is maintained in a low-growing shrub-scrub state for transmission line clearance and safety requirements (Photo 1). Almost all trees greater than 6 inches dbh occurred from the edge of the existing ROW outward. The northern side of the ROW has a substantially lower density of trees greater than 6 inches dbh, when compared to the southern side of the ROW. This is because the northern side of the existing 115kV transmission line ROW is bordered by another existing transmission line ROW that has already been cleared of large trees.

Most of the survey area (about 41 percent), beyond the edge of the existing 100-foot ROW, contains second growth, mixed deciduous/coniferous forest stands characterized by relatively young trees (10 inches dbh on average), and a limited occurrence of snags and large woody debris on the ground (Photo 2). Of all trees surveyed, 73 percent occurred within this type of habitat. Given the young stand age and multiple observations of fire scars, this area likely burned by a wildfire within the last 30-50 years. Canopy cover was relatively high (85 percent on average).

One small portion (about 16 percent) of the study area contained a more mature stand of mixed deciduous/coniferous trees with a higher density of large trees and snags (>20 inches dbh) and

larger accumulations of downed woody trees compared to the rest of the study area (Photo 3, Photo 4, Photo 5). Approximately 27 percent of all trees surveyed occurred within this patch of habitat. The main difference between this patch and the remainder of the study area is the density of large trees and snags and accumulation of downed woody debris (i.e., many large logs; see Table 1). Other habitat features, including species composition and dominance, canopy cover, and average dbh were similar to the other second-growth areas (see Table 1). This small (~1.3 acre), isolated patch of mature forest occurs along the slopes an ephemeral drainage, approximately 300 feet west of pole 1/14 (See "Mature Forest Patch" in Figure 1). The Mature Forest Patch boundary depicted in Figure 1 was delineated in the field; however, the patch appears to extend further upslope (south), along the valley slopes of the drainage about 300 feet, and does not extend beyond the top of the ridge. Habitat features recorded within the mature forest patch are summarized in Table 1.

Table 1: Comparison of Survey Results in Second Growth- and Mature-Forest Habitats

Habitat Feature	Combined Study Area	Second-Growth Forest Habitat	Mature Forest Patch
Area			
Acres	7.3*	3	1.3
Relative %	100	41	18
Count			
Total Trees/Snags Combined	753	547	206
# Trees	676	502	174
# Snags	77	45	32
# Large Trees (>20 in dbh)	31	14	17
# Large Snags (>20 in dbh)	10	0	10
DBH (inches)			
Min	6	6	6
Max	37	30	37
Average	11	10	13
Species (% dominance)			
Pacific madrone	46%	55%	44%
Douglas fir	29%	18%	28%
California black oak	17%	21%	16%
Ponderosa pine	4%	4%	4%
Incense cedar	4%	2%	8%
Western white pine	<1%	<1%	<1%
Canopy Cover (%)			
Min	80	80	84
Max	93	89	93
Average	86	85	88
Density			
Large Tree (>20 inch dbh) Density (# Large Trees or Snags per acre)	6/acre	5/acre	21/acre

Snag density (# snags per acre)	11/acre	15/acre	25/acre

*This acreage includes shrub-scrub habitat within the existing 100-foot ROW as well as mature forest and second growth forest. Acreages for second-growth and mature forests do not add up to 7.3 because shrub scrub is not included in the table.

Digitized access road locations were accurate in the eastern half of the study area, but were not accurate in the western half. The digitized location of the road segment that crosses through the mature habitat patch differed substantially from its actual location. In order to account for this inaccuracy, access road edges were recorded (using GPS) and the study area was amended to account for the shift in the access road's centerline.

Of the total 753 trees within the study area, 216 of them are located within the expanded (135-foot wide) ROW corridor and 24 occur within 10 feet of the access road centerline (not including access roads that are within the expanded ROW). Table 2 summarizes the number, size and type of trees or snags that occur within the expanded ROW or within 10 feet of access roads only.

Table 2: Trees and Snags within Expanded ROW or within 10 feet of Access Road

Tree/Snag Features	Expanded ROW (within 135 foot width)	Access roads (within 10 feet of either side of centerline)*
Count		
Total Trees/Snags Combined	216	24
# Trees	202	19
# Snags	14	5
6-12" dbh	177	11
12-18" dbh	33	7
18-24" dbh	5	2
24-30" dbh	1	3
30"+ dbh	0	1
DBH (inches)		
Min	6	7
Max	30	37
Average	10	16
Tree/Snag Species		
Pacific madrone	98	4
Douglas fir	65	7
California black oak	41	6
Ponderosa pine	5	4
Incense cedar	7	1
Western white pine	0	2

*To prevent double-counting where access roads and ROW overlap, this only includes access roads outside of the expanded ROW.

Conclusion

In conclusion, a total of 753 trees and snags greater than 6 inches dbh were documented within 40 feet of the expanded ROW and access roads. A total of 240 trees and snags occur within the expanded 135-foot wide ROW or in close proximity to the access road and are likely to be

removed during construction. Additional trees and snags outside of the expanded ROW or further removed from the access road may also need to be removed or pruned to meet transmission line clearance and safety requirements (i.e., hazard trees). While most of affected area contains young, second-growth forest stands, one small patch of relatively mature forest occurs within the affected area that appears to provide some of the PCEs preferred by the NSO. Given the proximity of NSO Site #1 to designated critical habitat (~0.5 mile), and the presence of some PCEs for NSO habitat, HDR concludes that use of the site by NSOs is possible and a more detailed analysis of the site's suitability for NSOs is warranted. A biological assessment (BA) is needed to provide a more detailed analysis and support a final effects determination on potential impacts to the NSO.

Photo 1: Example of Shrub-Scrub Habitat within existing 100-foot ROW
Facing east towards Pole 1/14

Photo 2: Example of Second Growth Habitat found throughout Most of Survey Area
Facing NE towards ROW corridor

Photo 3: Example of Habitat within Mature Forest Patch
Facing N towards ROW

Photo 4: Example of View from within Mature Forest Patch
Facing SW down access road

Photo 5: Overview of the Mature Forest Patch on Left Side of the ROW
Facing SW towards pole 4/13

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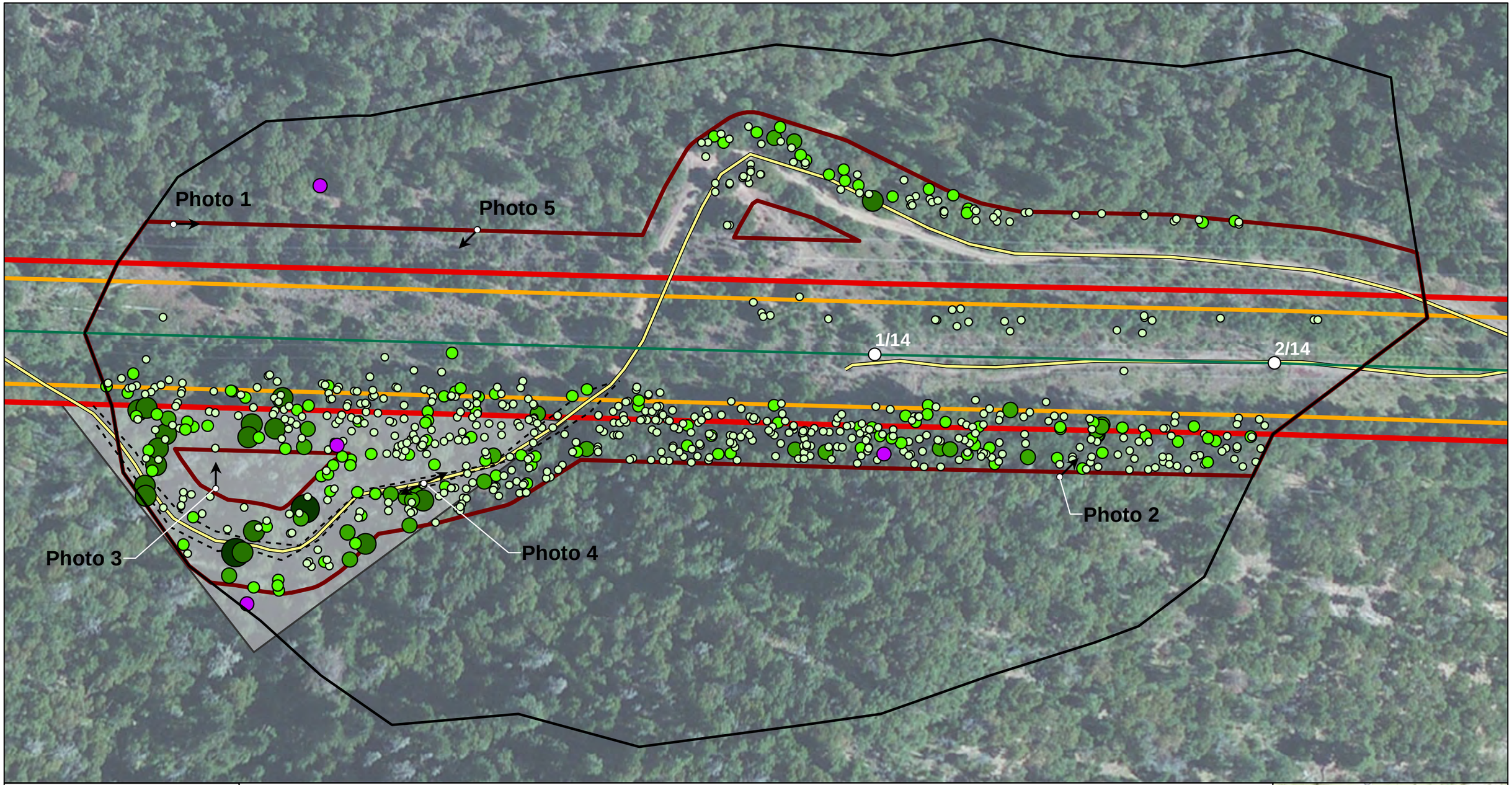

NSO Site #1 Survey Results

Sams Valley Reinforcement Project

HDR

12/1/2015

Projection: NAD 1983 UTM Zone 10N

Approximate Location of New Proposed 230 kV Line & Existing Location of 115 kV Line

Existing 100-foot ROW

Additional ROW (Requested)

Study Area

Project Access Roads

Transmission Line Structure

NSO Site #1

Existing Access Road Boundary

Mature Forest Patch

Tree DBH

- 6" -12"
- 12" -18"
- 18"-24"
- 24"-30"
- 30"+

Canopy Cover

Photo Location

Arrows show direction of photo

0 50 100 150 Feet

0 10 20 30 40 Meters

Data Source: PacifiCorp, HDR, BLM
ESRI World Imagery Map Service

N

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Attachment P-2. Biological Assessment

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Medford District Office
3040 Biddle Road
Medford, Oregon 97504
http://www.blm.gov/or/districts/medford

JUN 7 2016

Fed Ex (8094-5382-6050)

To: Field Office Supervisor, Roseburg Office, US Fish and Wildlife Service

From: District Manager, Medford

Subject: Submission of the Medford BLM FY 16 June Biological Assessment

This Biological Assessment describes and evaluates the potential effects from projects on the Medford District: the Bieber Salt and Lost Creek Forest Management Projects in the Butte Falls Resource Area (BFRA); the Cold Elk Forest Management Project in the Grants Pass Resource Area (GPRA); and the Pacific Power Transmission Line Reinforcement Project (PPTLR) on both the Butte Falls and Grants Pass Resource Areas. All of these projects affect spotted owls and the Bieber Salt and Cold Elk projects affect northern spotted owl designated critical habitat. The Cold Elk project also affects marbled murrelets, but not their designated critical habitat. No other listed wildlife species or critical habitats are affected. Listed plants are evaluated under other consultation documents.

The Medford BLM June FY 16 Biological Assessment for these projects is attached. The BA also includes Appendix A, the Project Design Criteria (PDC); Appendix B, Detailed Stand Prescriptions; Appendix C, Treatment Summary Tables; Appendix D, Site History for Northern Spotted Owl Sites within the Project Area; and Appendix E, Maps referenced in the BA. GIS project, habitat, and spotted owl site layers will be hand delivered to Cindy Donegan at the Medford Interagency Office.

We request formal consultation with the US Fish and Wildlife Service for these projects. We look forward to working with the US Fish and Wildlife Service to meet our joint obligations under the Endangered Species Act 7(a) 1 and 7(a) 2.

For additional information, please contact Robin Snider 541-618-2496.

Sincerely,

Dayne Barron
District Manager
BLM Medford District

Biological Assessment
for the
Bieber Salt, Cold Elk, and Lost Creek Forest Management Projects and the Pacific Power Reinforcement Project

(Cite FY 16 June LAA BA)

An Assessment of Effects to the Northern Spotted Owl and Marbled Murrelet

Medford District
Bureau of Land Management
June 2016

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1. INTRODUCTION

1.1 Purpose of the Assessment

The Medford District of the Bureau of Land Management (BLM) is submitting this Biological Assessment (BA) to the US Fish and Wildlife Service (Service) pursuant to Section 7 (a)(2) of the Endangered Species Act (ESA). Section 7 (a)(2) requires federal agencies to consult with the Service to ensure agency actions will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats. Conservation measures described in this Biological Assessment (BA) are also intended to meet obligations under Section 7 (a)(1) to conserve listed species. Additionally, the Bieber Salt, Cold Elk, and Lost Creek Projects meet the intent of the 2011 Northern Spotted Owl Recovery Plan Actions such as Recovery Actions 6, 10, and 32. By following Recovery Actions 10 and 32, the BLM has protected high priority spotted owl sites and has retained structurally-complex forest habitat within these projects. This follows recommendations by the Service in the 2011 Revised Recovery Plan to conserve occupied spotted owl sites throughout the range, especially those containing the habitat conditions to support successful reproduction (USFWS 2011a). The Bieber Salt, Cold Elk, and Lost Creek Projects will meet other non-owl-specific objectives (timber production and forest health) while still creating, maintaining, and improving habitat over the long term. The desired future conditions for northern spotted owl (NSO) habitat include encouraging tree growth; increasing heterogeneity; enhancing and creating horizontal and vertical structure; and reducing risk of habitat loss due to fire, disease and insects. These treatments for NSO habitat also aim to restore ecosystem functions by accelerating the growth of healthier trees. More details are found in Section 2.3.

This BA describes and evaluates the potential effects from projects on the Medford District: the Bieber Salt and Lost Creek Forest Management Projects in the Butte Falls Resource Area (BFRA); the Cold Elk Forest Management Project in the Grants Pass Resource Area (GPRA); and the Pacific Power Transmission Line Reinforcement Project (PPTLR) on both the Butte Falls and Grants Pass Resource Areas. The Bieber Salt, Cold Elk, and Lost Creek Projects are designed to meet the BLM's need to manage Matrix lands in a manner that provides for a sustainable supply of timber, helps meet the Medford BLM's annual timber volume target, and improves forest health, while protecting and conserving federally listed and proposed species and their habitats. Timber products produced from this project would be sold in support of the District's Allowable Sale Quantity (ASQ) declared in the 1995 Medford District RMP. The PPTLR is designed to meet the BLM's need to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in this RMP (USDI 1995).

The projects are described in more detail in Section 2.3 below. These projects will be consistent with the project descriptions and Project Design Criteria (PDC) described in this BA. If any changes to the proposed action occur after the Biological Assessment has been submitted, the new proposals will be presented to the Level 1 team for evaluation to determine if reinitiation of consultation is necessary. The Level 1 team includes the Rogue River-Siskiyou National Forest

Biologist, the Medford BLM District Biologist, and the Roseburg Fish and Wildlife Office Biologist.

1.2 Species Addressed

Northern Spotted Owl (Threatened) - LAA

The proposed Bieber Salt, Cold Elk, Lost Creek, and PPTLR projects would remove and downgrade spotted owl habitat and would adversely affect spotted owl sites. In total, approximately 5,295 acres of NRF and dispersal habitat is proposed for treatment in all three of the projects combined. The Bieber Salt and Cold Elk projects are within the 2012 Revised Designated Northern Spotted Owl (NSO) Critical Habitat (77 Federal Register 233:71876-72068). BLM requests formal consultation for the Bieber Salt, Cold Elk, Lost Creek, and PPTLR projects because, as described below, the BLM has determined the proposed action *may affect, and is likely to adversely affect (LAA)* the northern spotted owls and their designated critical habitat.

Marbled Murrelet (Threatened) - NLAA

The Cold Elk Project occurs within the marbled murrelet survey Zone A (western hemlock Zone) and survey Zone B (10 kilometer buffer area east of Zone A). Proposed Cold Elk units are not within **suitable** marbled murrelet habitat. Suitable habitat is high quality habitat that includes older, stands with lager trees and multiple layers. Some treatments would occur in **potential** habitat, which are younger stands with remnant trees. The BLM is implementing project design features to exclude removal of trees with potential structure to support marbled murrelet nesting. Designated Marbled Murrelet Critical Habitat is located within the Action Area. However, there are no proposed treatment units, temporary road construction, or landing construction within designated marbled murrelet habitat (USFWS 2011b). Therefore, there would be no effects to marbled murrelet designated critical habitat from the Cold Elk project. BLM requests concurrence for effects to marbled murrelets from the Cold Elk Project because, as described below, we have determined the proposed action *may affect, and is not likely to adversely affect (NLAA)* the marbled murrelet.

1.3 Species Not Addressed

No other listed wildlife species or designated critical habitat will be affected by the activities identified in this BA. Below is a summary of the No Effect determination for these species:

Gray Wolf (Endangered) - No Effect

- The gray wolf is a federally listed species in Oregon west of highways 395 and 78. Until 2011, gray wolves were only known to occur in Oregon east of these highways. In September 2011, one radio collared male wolf (OR-7) dispersed from the Imnaha pack in Northeastern Oregon. Since 2011, Oregon Department of Fish and Wildlife (ODFW) has been tracking OR-7's dispersal, which included some time in Northern California, and ODFW has posted an area of activity map on their website. Since March 2013, ODFW has documented OR-7 spending the majority of his time in the southwest Cascades. In

May 2014, ODFW reported that OR-7 had found a mate and then in June, pups were confirmed. In January, 2015, ODFW identified OR-7, his mate, and pups as the Rogue Pack and the known wolf activity map was updated on the ODFW website on January 13, 2015. ODFW also identified the Keno Area of Known Wolf Activity (AKWA) at this time. In 2015, new pups were confirmed in the Rogue Pack. The Lost Creek project is within the Rogue AKWA and the Bieber Salt project is approximately four miles south/southwest of the Rogue AKWA. The Cold Elk and PPTLR projects are outside of both of these southern Oregon wolf activity areas.

- Effects from this project are not expected because the proposed activities would not disturb key wolf areas such as den sites and rendezvous sites, would not change prey availability, and would not increase public access in the area suspected to be used for denning and rendezvous sites. Wolves are habitat generalists and roam across large areas. Timber harvest activities have been occurring on private lands within the Rogue AWKA and the pack has acclimated to these types of actions. Light to heavy thinning at the small project level is not significant to their success because of the scale at which they use the landscape (J. Stephenson, USFWS, personal communication, May 3, 2016)
- As the Rogue Pack continues to increase in size and because den and rendezvous sites are difficult to locate and can change from year to year, this will need to be assessed on an ongoing basis throughout the life of this project through annual updates and communication with the Service and ODFW. If a den or rendezvous site is identified prior to or during project activities, Section 7 Consultation PDC for wolves will be followed (Appendix A). The BLM will implement seasonal restrictions (March 1 to June 30) for project activities located within one mile of a den or rendezvous site. Additionally, if wolves are found in the project areas in the future, the BLM will reinitiate consultation.

Oregon Spotted Frog (Threatened) – No Effect

- The Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects will not affect habitat and will not occur within the Upper Klamath and Upper Klamath Lake subbasins, where Oregon Spotted frogs are known to occur.

Vernal Pool Fairy Shrimp (Threatened) – No Effect

- The Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects will not affect habitat and will not occur within the range of the vernal pool fairy shrimp.

Consultation for federally listed plants is covered in the *Biological Assessment and Letter of Concurrence for Activities that May Affect the Federally Listed Plant Species, Gentner's Fritillary, Cook's Lomatium, and Large-flowered Woolly Meadowfoam, on Bureau of Land Management, Medford District and Cascade Siskiyou National Monument (USDI 2014).* Federally listed fish species will be evaluated separately through consultation with the National Marine Fisheries Service.

1.4 Consultation History

The Bieber Salt, Cold Elk, and PPTLR projects are new projects that have not had previous consultation. Some of the Lost Creek Project proposed units were originally covered in three previous biological assessments. Table 1 summarizes the history of the various biological assessments that incorporated portions of the Lost Creek Project. New consultation is necessary because the units carried forward in the previous biological assessments were never implemented and the 2008 District Analysis and Biological Assessment of Forest Habitat (2008 DA BA FH) was never completed.

Table 1. Consultation History

Project	BA FY 04-08	BA FY 06-08	BA DA BA FH	Name of original project
Lost Creek	X	X	X	Flounce Around

The projects in this BA were presented to the Level 1 team during separate project briefing meetings on February 11, 2016. During these meetings, the Butte Falls and Grants Pass Resource Areas presented the preliminary proposed actions, the project development strategy, and discussed issues that needed to be resolved. The Level 1 team did not meet about the PPTLR Project.

The Butte Falls Resource Area hosted a field trip with the Level 1 team on January 21, 2016 to visit a selection of units from both the Lost Creek and Bieber Salt Projects. Level 1 field trips to the Cold Elk Project occurred on April 15, 2015 and November 23, 2015.

Recommendations from the Level 1 team were submitted to both resource areas on February 19, 2016. These recommendations were incorporated into the preparation of the final proposal for consultation. The draft Biological Assessment was submitted to the Level 1 team for review on May 16, 2016. Recommendations from the review process have been incorporated into the final BA.

1.5 Definitions

Northern Spotted Owl Habitat

Table 2. Northern Spotted Owl Breeding Periods

Entire Breeding Period	Critical Breeding Period	Extended Breeding Period
March 1-September 30	March 1-June 30	July 1-September 30

Nesting, Roosting, and Foraging (NRF) Habitat for the northern spotted owl consists of habitat used by owls for nesting, roosting, and foraging. Generally, this habitat is multistoried, 80 years old or older (depending on stand type and structural condition), has high canopy cover, and has sufficient snags and down wood to provide opportunities for nesting, roosting, and foraging. Other attributes that may be present include large trees with various deformities (e.g.

large cavities, broken tops, mistletoe infestations, and other evidence of decadence), large snags, large fallen trees and other woody debris on the ground, and sufficient open space below the canopy for owls to fly (Thomas, et al. 1990). Not all of these habitat components need to be present to qualify as NRF habitat. Sometimes only some of the habitat components are present, or all of them are present, but at lower quantities. Nesting habitat is described above and the basal area ranges from approximately180 to 240 ft^2/acre, but is typically greater than 240 ft^2/acre.

In southwest Oregon, NRF habitat varies greatly, but is typified by mixed-conifer habitat, recurrent fire history, patchy habitat components, and a higher incidence of woodrats. It may consist of somewhat smaller tree sizes. One or more important habitat components, such as dead down wood, snags, dense canopy, multistoried stands, or mid-canopy habitat, might be lacking or even absent in portions of southwest Oregon NRF. NRF habitat also functions as dispersal habitat.

Roosting/Foraging (RF) Habitat is different than nesting habitat because even though the stands might have large trees and high canopy, they are often single storied, lack decadent features, and usually have at least 150 ft^2/acre basal area. Currently, the SW Oregon Level 1 team uses NRF habitat in the Biological Assessment to represent both NRF and Roosting/Foraging habitat. The Medford District uses a six category system to classify spotted owl habitat (Mckelvey 1 through 6). NRF (Mckelvey 1) and Roosting/Foraging (Mckelvey 2) habitat was separated in the field by Butte Falls and Grants Pass Resource Area biologists and used to inform the effects determinations for both projects. Grants Pass Resource Area biologists also used aerial photos and a remote sensing tool, LiDAR (Light Detection and Ranging) interpretation to update unit habitat layers.

RF habitat is broken out in this BA to demonstrate that not all treatments in NRF habitat would occur in optimal NRF habitat as described above. Additionally, since these RF stands do not currently function as NRF habitat, treatments were often designed to create NRF habitat conditions in the future.

Dispersal Habitat at a minimum consists of stands with adequate tree size and canopy cover to provide protection from avian predators and at least minimal foraging opportunities. Dispersal habitat may include younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, but such stands should contain some roosting structures and foraging habitat to allow for temporary resting and feeding for dispersing juveniles (USDI FWS 1992). Dispersal habitat is generally forest stands with canopy cover of 40 percent or greater and an average diameter at breast height (DBH) of 11 inches or greater. It provides temporary shelter for owls moving through the area between NRF habitats and some opportunity for owls to find prey; but it does not provide all of the requirements to support an owl throughout its life. NRF habitat can also function as dispersal habitat. However, dispersal (or dispersal-only) will be used throughout this document to refer to habitat that does not meet the criteria to be NRF habitat, but has adequate cover to facilitate movement between blocks of NRF habitat.

Capable Habitat for the northern spotted owl is forestland that is currently not habitat but can become NRF or dispersal in the future, as trees mature and the canopy closes.

Non-habitat does not provide habitat for northern spotted owls and will not develop into NRF or dispersal in the future.

Northern Spotted Owl Treatment

Treat and Maintain NRF or Dispersal Habitat is the treatment defined when an action or activity in NRF or dispersal habitat removes some trees, but does not change the current function of the habitat because the conditions that would classify the stand as NRF or dispersal would remain post-treatment. The treated stand will still function as NRF habitat because it will continue to provide at least 60 percent canopy cover, large trees, multistoried canopy, standing and down dead wood, diverse understory adequate to support prey, and may have some mistletoe or other decay. The treated stand will still function as dispersal habitat because it will continue to provide at least 40 percent canopy cover, flying space, and an average of trees 11 inches DBH or greater.

Downgrade NRF alters the condition of spotted owl NRF habitat so the habitat no longer supports nesting, roosting, and foraging behavior. Downgraded NRF habitat has enough tree cover to support spotted owl dispersal. Downgrade is defined when the canopy cover in a NRF stand drops to 40-60 percent at the stand level, and when conditions are altered such that an owl would be unlikely to continue to use that stand for nesting, or roosting and foraging. Downgraded NRF continues to provide habitat for dispersal.

Remove NRF alters known spotted owl NRF habitat so the habitat no longer functions as nesting, roosting, or foraging habitat. Removal generally drops canopy cover to less than 40 percent, alters the structural diversity and dead wood in the stand or otherwise changes the stand so it no longer provides nesting, roosting, or foraging, or dispersal habitat for owls.

Remove Dispersal alters known spotted owl dispersal-only habitat so the habitat no longer functions as dispersal habitat. Removal generally drops canopy cover to less than 40 percent and otherwise changes the stand so it no longer provides dispersal habitat for owls. The post-harvest stand would be too open to provide protection from predators.

Marbled Murrelet Habitat

Table 3. Marbled Murrelet Breeding Period

Entire Breeding Period	Critical Breeding Period	Extended Breeding Period
April 1-September 15	April 1-August 5	August 6-September 15

Suitable Marbled Murrelet Habitat includes old-growth and mature forest with trees with multiple layers and multiple platforms containing moss, lichen or mistletoe (McShane et. al. 2004, Hamer and Nelson 1995, Ralph et al. 1995, Nelson 1997). A platform is a relatively flat surface at least 10 cm (4 in) wide and at least 10 m (33 ft) high in the live crown of a coniferous tree. It may occur up to 10km east of the western hemlock zone and the known range (Zone A), which includes the western portion of the Planning Area.

Potential Marbled Murrelet Habitat includes younger or mature stands with approximately one residual old-growth tree per acre and the younger trees at least ½ the height of the residual trees. These remnant trees contain potential nesting platforms as described above.

Marbled Murrelet Occupied Habitat occurs when murrelets are located within stands by interagency established survey protocol (Evans Mack et al. 2003). Survey data collected by the Rogue River-Siskiyou National Forest (Forest Service) and BLM in southwestern Oregon (9,795 survey visits for murrelets between 1988 and 2001) indicate murrelets inhabit forested areas relatively close to the ocean. Murrelets have not been found more than 32 miles (51.5 kilometers) inland on the Powers Ranger District or more than 16 miles (25.7 kilometers) inland on the Gold Beach or Chetco Ranger Districts of the Rogue River-Siskiyou National Forest, located adjacent to Medford BLM (Dillingham et al. 1995; USDA and USDI 1996; USDA and USDI 2003, Appendix I).

The Northwest Forest Plan established two management/survey zones for the marbled murrelet: Zone 1 from the coast to approximately 35 miles inland, and Zone 2 from the eastern boundary of Zone 1 to approximately 50 miles inland from the coast. The Forest Service and BLM completed an evaluation to better quantify the likelihood of murrelet occurrence beyond the eastern boundary of the western hemlock/tanoak vegetation zone in southwest Oregon (Alegria 2002). This evaluation refined the existing survey zone boundaries to better reflect known murrelet occurrence on the Rogue-Siskiyou National Forest and the Medford BLM District. The study area was divided into four zones (A, B, C, and D) representing areas at increasing distances from the Oregon coast, and closely tied to the transition from the hemlock/tanoak vegetative zone to the more inland mixed conifer/mixed evergreen zone. Zones C and D represent the mixed conifer/mixed evergreen zone and extend to 50 miles inland. These zones were modified based on the marbled murrelet zones 1 and 2 as described by the Forest Ecosystem Management Assessment Team.

Zone A encompasses the known range of the marbled murrelet. Approximately 82,400 acres of suitable habitat are located in Zone A. NWFP LSRs and other reserved areas contain 90 percent of the suitable habitat in Zone A; any stands of suitable habitat in Matrix subsequently found to be occupied are designated as additional "Murrelet" LSR. Zone B is a "buffer" to Zone A and includes all land 6.2 miles (10 kilometers) east of Zone A. Surveys are conducted only in Zones A and B. Federal land east of Zone B is assumed to not contain murrelet habitat and is no longer surveyed. To date, no murrelets have been documented in Zone B within Medford BLM or Rogue River Siskiyou National Forest. (The Service concurred with the evaluation conclusions in a letter: *Technical Assistance on the Final Results of Landscape Level Surveys for Marbled Murrelets in Southwest Oregon* (USDI Fish and Wildlife Service reference: 1-7-02-TA-6401).)

Murrelet Detection: An observation, either visual or auditory, of one or more murrelets during a survey. A site with murrelet **presence** is a potential habitat site where there has been at least one murrelet detection. An **occupied site** is where murrelets have been observed exhibiting sub-canopy behaviors, which are behaviors that occur at or below the forest canopy and that strongly indicate that the site has some importance for breeding (Evans Mack *et al.* 2003).

Unsurveyed Habitat: Consists of suitable habitat or nesting structure within younger stands that has not been surveyed by the established survey protocol (Evans Mack *et al.* 2003). Absent surveys, unsurveyed suitable habitat is assumed to be occupied.

Marbled Murrelet Treatment

Maintain marbled murrelet suitable habitat means the stand retains large trees with potential platforms for nesting and multi-storied canopy that contributes to the nesting structure.

Remove marbled murrelet habitat means to alter murrelet suitable habitat, so that the habitat no longer provides any function for the species.

2. DESCRIPTION OF THE PROPOSED ACTION

2.1 Project Area History and Current Condition

Bieber Salt Project Area Current Vegetation Conditions

The Bieber Salt project is located within the Little Butte Creek 5th field watershed and the Cascades West physiographic province and includes portions of the Oak Savanna Foothills and Southern Cascades Ecological Regions (EPA). Elevation ranges from 1,600 to 5,200 feet. The Bieber Salt Project is within three different forest zones as described by Franklin and Dyrness (1973): Interior Valley, Mixed-Conifer, and White Fir. Forest stands selected for treatment in the Bieber Salt Project Area are overstocked and are experiencing declining growth rates due to high levels of density-related competition. The current average relative density for the area indicates that, physiologically, stands have entered the zone of imminent mortality. The stands proposed for treatment are primarily overstocked with Douglas-fir and white fir trees. Current relative densities within stands proposed for treatment range from 0.41-0.84 RDI (Relative Density Index). This suggests that the majority of stands have either entered the zone of imminent mortality (> 0.55 RDI) or would enter that zone in a relatively short period of time. Evidence from several studies suggests increased tree densities have contributed to a shift in the species composition of stands throughout Southern Oregon, such as increased mortality in sugar pines, decreased regeneration of shade intolerant species, and increased densities of shade-tolerant/fire-intolerant species (Goheen and Goheen 2014; Metlen, Olson and Borgias 2011; Sensenig 2002; Hawkins 2009).

The Bieber Salt Project Area and some of the associated owl home ranges were impacted by a winter wind storm (2008) and large wildfires (2005, 2008):

- A series of severe winter windstorms hit Jackson County in early January, 2008. National Weather Service weather stations recorded peak winds up to 70 miles per hour in the Southern Oregon Cascades. Winds may have exceeded this on the ridges. The storm affected Federal forest lands administered by the Medford BLM in the Double Bowen project area. The impact occurred mostly in unmanaged forest stands and recently harvested stands that are generally 80 years or older. Impacts from the

windstorm varied from scattered individual windthrown trees that were uprooted and blown over to large areas that sustained severe damage. The severe damage occurred when the majority of the stand had trees uprooted, tops snapped off and crowns defoliated by the loss of branches and needles. Blow down occurred in forest stands across all topographic positions from low riparian areas to the upper ridges. Canopy cover in some areas prior to the windstorm was 80-to-100 percent. Following the windstorm, canopy in the stands where severe damage occurred is approximately 0-to-30 percent (USDI 2008).

- The Doubleday Fire burned in September of 2008 and burned approximately 1,272 acres across BLM-administered lands and private lands. Approximately 451 acres occurred on BLM-administered lands. Of those acres, 179 acres burned at high severity, 259 acres at moderate severity, and 13 acres at low severity. In the northern area of the fire, high severity areas were generally more densely vegetated, but the presence of heavy blow down from the winter storm generally resulted in a greater percentage of overstory mortality, even where the overstory was open. Visual observations indicate that winds and terrain were the strongest drivers of fire severity in southern area of the fire, independent of the amount of blow down present (USDI 2009).

- The Wasson Fire Burned in July of 2005 and burned approximately 1,510 acres across BLM-administered lands, Forest Service administered lands, and private lands. Approximately 188 acres of NRF and 49 acres of dispersal-only habitat were removed as a result of the fire.

Cold Elk Project Area Current Vegetation Conditions

The Cold Elk project is located within the West Fork Cow Creek Fifth Field Watershed and within the Klamath Mountains physiographic province. Elevations range from 1,000 feet to 4,000 feet above sea level. The Cold Elk project is immediately adjacent to portions along the western perimeter of the 2013 Douglas Complex and the perimeter overlaps two sections of the southeast end of the project.

The Cold Elk Project is within the mixed evergreen zone of vegetation (commonly referred to as mixed conifer and hardwood forest). This zone is generally characterized by an upper layer of conifers and a lower layer of hardwoods (Franklin and Dyrness 1973, p.133). Most of the Cold Elk Project is characterized as dry forest whereas less than half is considered moist forest. The Douglas-fir group is composed of an overstory of Douglas-fir, minor components of sugar pine, and very minor representations of ponderosa pine and incense cedar; while understories exhibit a dense shrub and hardwood layer, with only minor incidents of current and advanced conifer regeneration. The more productive moist forest sites within this group will support dense, multi-layered old growth forests with a closed canopy overstory; whereas lower productive dry forest sites fail to support large closed canopy (> 80 percent canopy) Douglas-fir forests. Where canyon live oak is present some larger (> 16 inch) CWD populate the forest floor in varied amounts where Douglas-fir have receded.

Species composition has become increasingly less diverse. Douglas-fir vastly dominates the landscape and retains the competitive advantage over shade intolerant species. Pine, incense cedar, and oaks are only occasionally present and often succumb to competition mortality; their

seedlings rarely germinating beneath the dense shade in predominantly overstocked stands. In general, very little to no understory recruitment of the most fire resilient tree species is occurring within units. Overall, the forested areas in the watershed are slowly expanding and the competition from undergrowth (including conifers, shrubs and hardwoods) is increasing. This translates to increased competition for water and nutrients resulting in reduced growth and increases in mortality in both the forest overstory and understory.

Dense stands of trees undergo moisture stress, especially when accompanied with periods of prolonged drought. According to the National Oceanic and Atmospheric Administration (NOAA 2015) southern Oregon is experiencing a persistent hydrologic drought. Extended drought periods, even following recent recoveries in precipitation have ecological impacts on forests and wildlife. From November 2013 to January 2014, Oregon was the third driest state in the 1895-2014 precipitation pattern record (NOAA 2014). Extended droughts, especially on south facing slopes and lower productive sites, can have lasting effects on the landscape, causing widespread stress to individual trees and their ability to resist change, including further drought stress, insects and diseases, and fire. Although short term drought conditions have recovered, the effects of drought over the last several years have taken their toll on tree vigor and stand health.

Lost Creek Project Area Current Vegetation Conditions

The Lost Creek Project is surrounding Lost Creek Lake and is within the Big Butte Creek, Lost Creek-Rogue River and the South Fork-Rogue River 5th field watersheds. The elevation ranges between 1,800 and 4,000 feet. The Analysis Area is located within the Cascades West physiographic province and includes portions of the Oak Savanna Foothills and Southern Cascades Ecological Regions (EPA).

The project is within three different forest zones as described by Franklin and Dyrness (1973): Interior Valley, Mixed-Conifer, and White Fir Zones. The historical role of fire, fire suppression, and previous management activities have led to the development of stand conditions that reduce growth, reduce resiliency to insects and pathogens, and reduce structural heterogeneity.
Due to fire exclusion policies, stands that established after 1900 have developed with higher tree densities and suppressed understories and are more susceptible to insect outbreaks and stand-replacing fire (Sensenig, Bailey and Tappeiner 2013). Tree densities in the Lost Creek Project Area range from 88 trees per acre to 618 trees per acre, indicating stand development outside of known historical patterns. Evidence from several studies suggests increased tree densities have contributed to a shift in the species composition of stands throughout Southern Oregon, such as increased mortality in sugar pines, decreased regeneration of shade intolerant species, and increased densities of shade-tolerant/fire-intolerant species (Goheen and Goheen 2014; Metlen, Olson and Borgias 2011; Sensenig 2002; Hawkins 2009).

PPTLR Project Area Current Vegetation Conditions

The Pacific Power Transmission Line Reinforcement (PPTLR) project is located within the Evans Creek, Gold Hill-Rogue River, and Grants Pass-Rogue River Fifth Field Watersheds. The project area ranges between 1,000 and 2,600 feet in elevation and lies within the Interior Valley, Mixed-Conifer, and White Fir Zones as described by Franklin and Dyrness (1988). The project

area is within the Klamath Mountains physiographic province. The original Right-of-Way (ROW) has already been disturbed, and primarily consists of non-habitat or capable habitat. Spotted owl capable, dispersal, non-habitat, and NRF habitat occurs along the transmission line corridor.

2.2 Proposed Action Overview

Bieber Salt, Cold Elk, and Lost Creek Projects

The Bieber Salt, Cold Elk, and Lost Creek Forest Management Projects were designed to conform to the 1995 Medford District Resource Management Plan (USDI 1995). The Bieber Salt, Cold Elk, and Lost Creek Projects are in the Matrix land use allocation (LUA), which includes federal lands outside of reserves and special management areas that are available for scheduled timber harvest at varying levels (USDI 1995). Matrix lands are intended to achieve sustainable timber production and other forest commodities, provide jobs and contribute to community stability through both growth and harvest, and promote the development of fire-resilient forests (USDI 1995, p. 38). These projects were considered for treatment at this time as a result of a previous review that identified dense forested stands within the Project Areas that need to be treated to reduce competition and promote forest resiliency. The Cold Elk project also includes some thinning within Riparian Reserves to enhance the development of vertical structure and heterogeneity in otherwise homogeneous stands with smaller diameter trees. Riparian Reserves are areas along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis (USDA USDI 1994a).

The Medford District's 2012 Integrated Vegetation Management analysis of the current conditions of watersheds within the Medford District evaluated all 5th field watersheds based on the specific timber, fuels, silviculture, and northern spotted owl needs. In 2015, the District re-assessed the watersheds and updated the rankings. The following categories with separate measurements were used to score and rank the watersheds: 1) percentage of BLM lands within the watershed; 2) departure acres in need of disturbance weighted by BLM ownership; 3) the amount of 10-30" diameter at breast height (DBH) class available for harvest; 4) the amount of high and moderate wildfire hazard and Fire Regime Condition Class (FRCC) within Wildland Urban Interface (WUI) within the watershed; 5) opportunities for enhancement of northern spotted owl sites; and 6) the amount of existing roads within the watershed. Table 4 summarizes the watershed rankings for the 5th field watersheds associated with the Bieber Salt, Cold Elk, and Lost Creek projects.

Table 4. Medford IVM Fifth Field Watershed Rankings

5th Field Watershed	Associated Project (s)	2012 Medford IVM Ranking	2015 Medford IVM Ranking Update
Big Butte Creek	Lost Creek	High	High
Little Butte Creek	Bieber Salt	Medium	High

Table 4. Medford IVM Fifth Field Watershed Rankings			
5th Field Watershed	**Associated Project (s)**	**2012 Medford IVM Ranking**	**2015 Medford IVM Ranking Update**
Lost Creek-Rogue River	Lost Creek	Low	Medium
South Fork Rogue River	Lost Creek	Medium	Medium
West Fork Cow Creek	Cold Elk	Medium	High

PPTLR

Pacific Power is proposing to construct, operate, and maintain a new 230 kV transmission line, which would run from the existing Grants Pass Substation in Josephine County near Grants Pass, Oregon east to a proposed new 230/500 kV substation in Jackson County, Oregon just south of the Sams Valley Highway at Tresham Lane (See Map 11). The proposed 230 kV line would be constructed within an existing right-of-way (ROW) and would be constructed as a double circuit that would also carry the existing 115 kV line. The proposed line would help meet new power demands due to regional growth, and act as a redundant path for power in the event that another local transmission line is damaged or experiences a disruption of service. The existing 115 kV transmission line and right-of-way corridor is approximately 40 to 100 feet wide, 18 miles long, and crosses both privately-owned and BLM-managed lands. On all BLM-managed land, the existing right-of-way is approximately 100 feet wide. The majority (77.7 percent) of the right-of-way corridor is located on private land, and the remainder (22.3 percent) occurs on BLM land.

2.3 Detailed Project Objectives and Descriptions

Field surveys and inventories were completed during the project planning process to determine current and desired stand conditions. The stand data was used to determine where management could occur within the project area to ensure the sustainability and resiliency of forest ecosystems now and in the future. Spotted owl habitat determinations were also incorporated into the treatment designs and prescriptions. Table 5 below provides a breakdown of the amount of proposed vegetation treatment, road construction and landing construction by spotted owl habitat type.

Table 5. Project Treatment/Road/Landing Construction Acres by NSO Habitat						
Project	**NRF**		**Dispersal-Only**	**Capable**	**Non-Habitat**	**Total**
	NRF (McKelvey 1)	**Roosting/Foraging (McKelvey 2)**				
Bieber Salt	0	208	214	14	0	**436**
Cold Elk	67	1,230	2,115	327	9	**3,748**
Lost Creek	381	758	353	107	54	**1,653**
PPTLR	1	0	13	27	25	**66**
TOTAL	**449**	**2,196**	**2,695**	**475**	**88**	**5,903**

2.3.1 Project Objectives and Development Strategies

Bieber Salt, Cold Elk, and Lost Creek Objectives

There are four common forest management objectives for the Bieber Salt, Cold Elk, and Lost Creek Projects:

1) *Design and implement commercial timber sales on matrix lands.*
    - The Medford District Resource Management Plan (p. 81) directs the BLM to design and implement forest management activities to produce a sustained yield of products to support local and regional economic activity.
    - The timber harvested from this project would produce revenue for the federal government which would contribute timber toward the Medford District's annual Allowable Sale Quantity during fiscal year 2016 and 2017, and would produce revenue for the federal government.

2) *Improve forest health by increasing landscape resiliency to environmental disturbances and accelerate the development of structural complexity and spatial heterogeneity.*
    - Reduce stand densities to natural carrying capacities and create favorable growing conditions to improve individual tree health (vigor) for desirable species.
    - Promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes.
    - Accelerate the development of forest stand conditions that meet long-term management objectives for northern spotted owl habitat and shift stand trajectories to encourage key habitat components for the future
    - Reduce the risk of wildfire that may result from the fuels (e.g. limbs, branches, twigs) produced during harvest activities (USDI 1995, p. 91);

3) *Protect and conserve federally listed and proposed species, and manage their habitats to contribute toward their recovery in compliance with the Endangered Species Act (ESA), approved recovery plans, and Bureau Special Status Species policies (USDI 1995, pp. 17-18, 50-51); and*

4) *Maintain a transportation system within the Project Area that serves resource management needs in an environmentally sound manner (USDI 1995, pp. 84-86).*
    - Remove vegetation along roadsides to improve sight distance for travel, improve transportation safety, improve road integrity, improve drying out of rocked and natural surface roads and road durability
    - Improve and maintain fire breaks provided by the road management system

PPTLR Objectives

The objective of the Sams Valley Reinforcement Project is to increase the capacity and improve the reliability of Southern Oregon's regional electrical transmission system as part of the North American Electric Reliability Corporation (NERC) reliability standards and the Western Electricity Coordinating Council (WECC) system operating standards. System modeling

indicates that the existing regional electrical transmission system is at risk of unacceptable failure in the event of a local outage or disruption of service. System modeling also indicates that a new 230 kV line between the existing Grants Pass Substation and a new 500 kV substation north of Medford is needed to provide system reliability and reduce the possibility of large scale load dropping in Medford, Grants Pass, and Crescent City in the event of an outage.

Spotted Owl Considerations in Project Planning

Bieber Salt, Cold Elk, and Lost Creek

Effects to spotted owls and their critical habitat were considered while planning the Bieber Salt, Cold Elk, and Lost Creek projects. The following strategies were implemented in order to meet the project objectives and reduce effects to northern spotted owls and their critical habitat. To the extent practicable, the Relative Habitat Suitability (MaxEnt) model described in the *2011 Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011), the Medford District known owl site Geographic Information System (GIS) layer, recent spotted owl survey results, and spotted owl breeding season locations (Butte Falls 1990-2015; Grants Pass historical nest tree locations and NSO responses 2005-2015) were used to determine treatment options in order to reduce effects to spotted owl sites. The Relative Habitat Suitability (MaxEnt) model described in the *2011 Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011) is a broad scale model that incorporates abiotic factors such as aspect, slope position, and distance to edge to determine the ability for a landscape to support nesting spotted owls over the long term. Caution was used when applying this model at the project level to ensure the appropriate abiotic factors were present at the project level (i.e. areas of high suitability were north facing or lower on the slope, while areas of low suitability were on the ridges).

1) The core teams followed principles in the SW Oregon Recovery Action 10 Guidance Document (2013). Sites within the project area were prioritized by recent spotted owl pair occupancy, reproductive success, resident singles, and adverse effects were avoided at high priority sites. Treatments proposed at lower priority sites may have adverse effects, but are designed to improve habitat in the long-term. For example, proposed downgrade in roosting/foraging habitat would occur in areas of high habitat suitability according to the Relative Habitat Suitability (RHS) output from the MaxEnt model (USDI FWS 2011) in order to create more stand structure and species diversity in the future and promote the development of NRF (Mckelvey 1) habitat conditions. See the "Consistency with NSO Recovery Plan Recommendations" Section below to see how the Bieber Salt, Cold Elk, and Lost Creek Projects are consistent with the Recovery Plan, especially Recovery Actions 10 and 32.
2) The 2012 Final Critical Habitat Rule and principles in the 2011 Recovery Plan were used to inform specific prescriptions when treatment units were located within the 2012 designated critical habitat.
    a. Adverse effects were avoided within the home ranges of occupied sites within critical habitat, to minimize impacts to the demographic support role of the critical habitat sub-units.

b. Adverse effects (NRF downgrade) were minimized in critical habitat, but allowed in areas where the habitat could be improved in the long term (i.e., proposed treatments in capable, dispersal, or roosting/foraging habitat within high habitat suitability according to the relative habitat suitability model; treatments would improve stand resiliency; or where the ecological needs of the stand outweighed the owl habitat needs. For example, pine restoration on a ridge that is in low habitat suitability according to the relative habitat suitability model. NRF and Roosting/Foraging habitat are not proposed for removal within critical habitat through vegetation treatments.

3) The total acres of treat and maintain prescriptions within the 0.5-mile core area of high priority owl sites were reduced and, in some cases, eliminated in order to reduce the effects to spotted owls at these sites.

4) Treatments in spotted owl habitat were dropped from the projects primarily in the 0.5-mile core areas. These units also include areas where the most owl observations (concentrated areas) have occurred during the breeding season over the past 25 years.

   a. **Bieber Salt** = Approximately 145 acres of spotted owl habitat were dropped from the Bieber Salt project; they were primarily in the 0.5-mile core areas.

   b. **Cold Elk** – Approximately 2,210 acres of NRF treatments in spotted owl habitat dropped from the Cold Elk project, with approximately 700 of these acres in the 0.5-mile core areas.

   c. **Lost Creek** – Approximately 363 acres of spotted owl habitat were dropped from the Lost Creek project; they were primarily in the 0.5-mile core areas.

5) More intense prescriptions that would have adverse impacts to spotted owl habitat were considered in areas outside of critical habitat and high priority owl sites. In these areas, timber production and/or forest health were the primary objectives. In the Cold Elk project, ecological stand resiliency and structural development was emphasized outside of high priority owl sites while maintaining a minimum of dispersal habitat function was the primary objective.

6) Proposed treatments in RA32 stands and nest patches were eliminated from the project.

   a. **Bieber Salt –** approximately 323 acres of RA 32 were dropped from the project and no treatments will occur in nest patches.

   b. **Cold Elk** – approximately 1,200 acres of RA32 stands and 732 acres of nest patches were eliminated from the project.

   c. **Lost Creek -** approximately 906 acres of RA 32 were dropped from the project and no treatments will occur in nest patches.

7) In limited cases, where temporary route construction was necessary to access the proposed treatment and no other road was available, small amounts of NRF, roosting/foraging, and dispersal removal would occur in the project area from road and landing construction. No habitat removal from road construction or landings would occur in nest patches. The Cold Elk project is proposing 2.5 acres of daylighting (roadside vegetation clearing adjacent to NSO habitat) within three nest patches).

2.3.2 Project Descriptions and Prescriptions

The Bieber Salt, Cold Elk, and Lost Creek projects used silviculture treatments identified in the 1995 Medford District RMP for managing conifer forests to accomplish the project level objectives. The prescriptions applied to each stand were also based on existing stand conditions, as well as spotted owl habitat determinations made in the field or aerial photo/LiDAR interpretation. The project prescription writer and project wildlife biologist will review and adjust marked trees (if necessary) to ensure prescription objectives and spotted owl habitat retention levels are met in the field as described in the Biological Assessment and Environmental Assessment.

A summary of proposed acres treated by prescription are listed below in Table 6. The prescriptions are summarized below. More detailed objectives and stand data are located in Appendix B.

Table 6. Acres of Vegetation Treatments and Road/Landing Construction

Treatment Type	Bieber Salt acres	Cold Elk acres	Lost Creek acres	PPTLR acres	Total Acres
Density Management	104	0	461	0	**565**
Selective Thinning-DF	25	0	87	0	**112**
Selective Thinning-WF	7	0	0	0	**7**
Selective Thinning-MC	290	0	673	0	**963**
Regeneration Harvest	0	0	33	0	**33**
Structural Retention	0	0	21	0	**21**
Small Diameter Thin	0	0	198	0	**198**
Fuels Treatments	0	0	106	0	**106**
Laminated Root Rot	0	5	0	0	**5**
Variable Density Thinning	0	3,328	0	0	**3,328**
Understory Reduction	0	321	0	0	**321**
Road Maintenance	6	0	25	0	**31**
Daylighting	0	39	0	0	**39**
ROW Clearing	0	0	0	66	**66**
Road and Landing Construction	4	54	49	0	**107**
TOTAL[2]	**436**	**3,747**	**1,653**	**66**	**5,902**

1 This does not include (Understory Reduction) UR treatments that are combined with other treatments.
2 This total includes all treatment, including treatment in non-spotted owl and capable habitat (536 acres)

<u>Bieber Salt and Lost Creek Prescriptions</u>

Proposed treatments would help put stands on trajectories towards the development of structural complexity, tree age and size variability, and an assortment of canopy configurations (Medford District RMP, 1995). The prescriptions take into account changes in the potential vegetation based on factors such as aspect, slope, available moisture, and soil type, in addition to species composition, stem density, and habitat considerations for late-successional species, particularly the northern spotted owl (NSO). For some stands, silvicultural objectives were superseded by owl habitat considerations and thus do not address objectives pertaining solely to forest health.

Selective Thinning
Selective Thinning would be a combination of thinning and group selection to the extent or amount recommended by vegetation type and/or plant series that exists. These stand treatments would generally target low vigor trees to reduce stand density and improve stand resiliency and individual tree health. There are three types of Selective Thinning prescriptions proposed in the Lost Creek and Bieber Salt Forest Management Projects based on the vegetation type (Douglas-fir, Mixed Conifer, and White-fir). The specific prescriptions for each vegetation type are included in Appendix B.

Trees infected with mistletoe would be selectively removed, where necessary and feasible, in order to reduce the level of infection in target stands and decrease the rate of proliferation. Treatment would be considered necessary when infected trees are adjacent to or are shading out younger, smaller trees, when mistletoe is likely to spread into unaffected areas without treatment, and when individual trees may be removed without substantial impacts to canopy cover. This would provide flexibility in allowing some infected stems to be retained for wildlife habitat purposes.

Proportional thinning would be used to accelerate the growth of remaining trees while promoting desired species that are best adapted to site conditions. Spatial distribution of leave trees would be based on tree condition (live crown ratio and crown form). Stands would have a wide range of basal area or tree spacing targets based on stand types or conditions. Trees would be removed singly or in groups (openings); the amount and size of openings created would depend on vegetation types (Douglas-fir, mixed conifer, and white fir) and current stand development stages.

Opening size would range from 0.10-0.25 acre where fire resilient and drought tolerant species need release to reduce competition. Opening size would range from 0.25-0.50 acres where regeneration is encouraged or where poor crown conditions exist (due to density-related suppression and mistletoe infection). The extent or amount of openings permitted would range from 5-10 percent of the total treatment unit area. Openings would be no closer than 100 feet from the next opening. Trees may be marked in patches (e.g., groups of trees with poor crowns) and left in clumps (e.g., groups of old trees) where necessary. Unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would typically be retained to maintain desired structural components for wildlife. In addition to such stand features, rock outcrops, special status species sites, and seeps/wet areas would be protected.

Selective thinning treatments would remove NRF habitat, downgrade NRF habitat, maintain NRF habitat, remove dispersal habitat, and maintain dispersal habitat. The specific prescriptions were changed in order to reduce impacts to spotted owls based on spotted owl habitat and location of the unit (i.e. within our outside of home ranges, within high or low NSO priority sites, and within our outside of critical habitat). Removal would occur outside of home ranges and critical habitat.

Density Management (DM)
The primary objective of the density management prescription is to reduce stand density to a level at which NSO habitat is not adversely affected after treatment. Density Management is prescribed in stands that are currently providing northern spotted owl NRF and RF habitat, in which smaller trees are targeted for removal over larger trees. The primary objective of the Density Management prescription is to reduce stand density in order to promote the growth and structural development of the remaining stand. Spatial distribution of the residual (leave) trees would be determined by the crown spacing of the healthiest dominant and co-dominant trees necessary to achieve a canopy cover of 60 percent or greater at the stand level. Stands would be treated to a relative density within a range of 0.50-0.60 index rating as a result and would be thinned using guidelines to reduce basal area to between 160 and 220 ft^2 per acre. Unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would typically be retained to maintain desired structural components for wildlife.

Density management would consist of both proportional thinning and thinning from below. Proportional thinning consists of removing trees from each size class and thinning from below consists of removing trees from the lower canopy classes, such as intermediate and suppressed trees and trees exhibiting old-growth characteristics would typically be retained. Generally, smaller trees would be targeted for removal over larger trees but the intent is to maintain the current structure and not remove single tree layers or simplify the stand. Trees targeted for removal would include those exhibiting a decline in crown ratio, narrow crown widths, and which contribute least to the canopy layer or structural diversity, unless removal compromises the required minimum canopy cover of 60 percent. Trees may be marked in small patches (i.e., groups of trees with poor crowns) and left in clumps (i.e., groups of old trees) to create hiding cover for wildlife species and increase spatial heterogeneity. The size of patches or openings should be no greater than 0.20 acres and should not exceed 5 percent of the total treatment unit area.

Understory Reduction (UR/Fuels)
Understory Reduction is used to accomplish pre-commercial thinning and fuels reduction treatments for even and uneven-aged conifer stands. Understory Reduction consists of cutting small trees less than 8 inches in diameter for conifer and less than 12 inches diameter for hardwood) and vegetation with chainsaws and disposing of the material by hand-piling and burning or use of a lop and scatter method in lighter fuels. Understory Reduction increases tree growth rates and promotes horizontal and vertical structural diversity in stands. Understory Reduction is also used in stands where pine and shade-intolerant hardwood species are diminishing in vigor and numbers because of overcrowded stand density conditions. This prescription may be applied to understories and/or areas of high stocking of small trees in commercial stands after harvest in conjunction with wildlife considerations and habitat objectives. This treatment is proposed in dispersal habitat and would maintain the habitat after treatment.

Fuels Treatment of Forest Management Activity Slash
Activity fuels created from forest management activities would be treated post-harvest. The BLM would conduct a fuels assessment within each unit following harvest activity. This assessment would determine the fuel hazard and fire risk based on surface fuel loading, aspect,

slope, access, and location of each unit. Post-harvest fuels treatments may include lop and scatter, selective slashing, hand pile burning, biomass removal, and under-burning.

Follow-up maintenance underburning may take place within five years following initial treatments. Underburning involves the controlled application of fire to understory vegetation and downed woody material when fuel moisture, soil moisture, and weather and atmospheric conditions allow for the fire to be confined to a predetermined area at a prescribed intensity to achieve the planned resource objectives. Prescribed underburning usually occurs during late winter to spring when soil and duff moisture conditions are sufficient to retain the required amounts of duff, large woody material, and to reduce soil heating. Occasionally, these conditions can be met during the fall season.

Roadside Vegetation Maintenance

Roads have not been maintained in recent years and now have walls of larger vegetation and trees preventing road maintenance equipment from maintaining and improving proper drainage patterns on BLM roads. Project proposes to cut vegetation along roadsides that would not be removed under typical roadside brushing specifications in hard money and timber sale contracts. By removing this vegetation, proper drainage patterns can be created, maintained, or restored to help reduce sedimentation from roads. Project limits would be 6 feet horizontally from the center line of the ditch away from road and 6 feet horizontally from the outside shoulder of the road. Vegetation to be removed would not be larger than 24 inches DBH. Vegetation may be hardwood or conifer trees and merchantable timber may be sold. Approximately 20 miles of BLM-controlled roads in the Project Area are proposed for treatment. These treatments do not occur in spotted owl nest patches.

Prescriptions proposed in Lost Creek Only

There are two regeneration harvest prescriptions proposed in the Lost Creek project to manage stands for high levels of sustained timber productivity, provide support to local economies, and improve forest resiliency by reducing competition for resources in stands with high relative densities. The treatments are located outside of critical habitat and spotted owl home ranges, so the primary objectives in these units are for timber and silviculture and not for spotted owls.

Regeneration Harvest (NGFMA)

Regeneration harvest would occur to maximize volume growth and yield in older forest stands with declining growth rates or experiencing deterioration from insects, disease, or other factors. Retained trees would be the most vigorous trees and would be selected based on tree crown ratio and form. Some healthy understory ponderosa pine, sugar pine, incense cedar, and Douglas-fir trees free of insects, disease, or damage would be left. Wildlife snags and coarse woody debris would be designated for retention. All other trees would be removed. Regeneration harvest using northern NGFMA (Northern General Forest Management Areas) prescription guidelines would retain 6 to 8 trees per acre greater than 20 inches DBH (diameter at breast height). Spatial distribution of these trees would vary from individual trees to groups.

Structural Retention (SR)
This prescription applies to stands primarily dominated by mature Douglas-fir, have poor annual stand growth, and/or have limited conifer regeneration. Thinning these stands would not provide the desired growth and increase in productivity. As directed by the Medford District RMP, structural retention as proposed under this project would leave at least 16 to 25 large green conifer trees per acre, provided structural objectives are met. Large green conifer trees are described as those greater than 20 inches diameter at breast height (DBH). Stands would be harvested to a range of 30-40 percent canopy cover.

Small Diameter Thinning (SDT)
High stand densities in younger ponderosa pine and mixed conifer stands would be reduced to promote stand health, create structural diversity, and increase landscape resiliency to environmental disturbances. These stands are overstocked with more trees than the site has water, nutrients, and growing space to sustain. Precommercial thinning and commercial thinning would reduce the number of trees per acre to levels the site has resources to sustain. A minimum of 40-60 percent canopy cover would remain after the harvest depending on NSO habitat type and proximity to high priority NSO owl sites.

Stands proposed for treatment within NSO high priority sites would maintain the current habitat in those stands. For roosting/foraging stands a minimum of 160 square feet of basal area, 60 percent canopy cover, and other habitat features would be retained. In dispersal stands a minimum of 40 percent canopy would be retained. Stands outside of high priority sites would be thinned to a target basal area of 120-130 square feet and would retain a minimum of 40 percent canopy.

<u>Cold Elk Prescriptions</u>

Variable Density Thinning
In the Cold Elk project, forested areas are generally homogenous, dominated by Douglas-fir, single layered and simplified in species and structural composition. This prescription is proposed in Douglas-fir stands in spotted owl critical habitat because it would promote vertical and horizontal heterogeneity while promoting the persistence of minor tree species and developing understory vegetation growth. The treatment proposes a thin from below strategy that encourages tree clumping, to maintain the largest tree structure and composition for both marbled murrelet and spotted owl habitats. Residual trees would be configured in less uniform spacing with tree clustering to avoid homogenous structure.

In NSO dispersal habitat, treatments are designed to treat and maintain while developing future NRF habitat. Residual stand basal areas would range from 80 to 160 square feet per acre and would maintain at least 40 percent canopy cover. In NSO Roosting/Foraging habitat, treatments would maintain habitat and in some cases downgrade habitat. Units designed to treat and maintain would retain at least 60 percent canopy cover, retain at least 150 ft^2/acre total basal area (conifer and hardwoods), and other key NSO habitat features in units within high priority owl sites. Some areas where helicopter yarding is the method of extraction may see small gap openings. However, the openings would not exceed ¼ acre in size (59 ft. radius) and would remove less than 20 percent of the stand acreage. In NRF habitat (67 acres), a minimum of 180

square feet basal area per acre and greater than 60 percent canopy cover would be retained and no more than 20 percent basal area stand reduction. NRF (McKelvey 1) treatment would only occur outside of 0.5 mile core areas of occupied NSO sites. If more NRF (McKelvey 1) patches are found during marking, inspections, or unit layout, these NRF prescriptions would be incorporated into the timber mark, the prescription would be changed to Understory Reduction only, or the unit would be dropped.

Variable Density Thinning units in Roosting/Foraging habitat that would retain at least 40 percent canopy cover would downgrade the habitat to dispersal habitat. These units are primarily proposed in low habitat suitability (RHS) and upper slope/ridgetop areas to promote structural and species diversity, increase sustainability of legacy trees, reduce stand density, increase forest health and improve ecological stand resiliency to fires, insects, and drought. Approximately 60 acres of RF downgrade from the VDT prescription is proposed in areas of high habitat suitability (RHS) to improve structural diversity and promote the development of NRF (McKelvey 1) habitat conditions.

Understory Reduction
This treatment would reduce tree and brush densities in units that are overstocked. Leaving these units untreated would compromise their resiliency to fire, vegetation competition, and climate extremes. Spacing of conifers would likely occur from 16-18 feet apart while hardwoods would be spaced 40-45 feet apart. No trees greater than 8 inches DBH would be cut unless joined with a Variable Density Thinning prescription. The proposed treatment would treat and maintain NRF and dispersal habitat.

Disease Management – Laminated Root Rot
Laminated root disease (*Phellinus sulphurascens*) is present in the Cold Elk project area. The effects on plant growth include reduced height, needle dieback, reduction in canopy cover, crown transparency, and susceptibility to insect infestations (Thies and Sturrock 1995). The root disease generally persists on a site for decades infecting all size classes of susceptible trees. Infected live trees can be easily windthrown and snags are seldom found Nelson et al. (1981) state that as a general rule, losses can be expected to double about every 15 years. While *Phellinus sulphurascens* can enhance diversity by creating openings and altering forest composition and succession, its presence will cause repeated mortality in new generations of susceptible species that typically die at an early age and never attain large size. The continued presence and regeneration of susceptible species increases the incidence of *Phellinus sulphurascens* and reduces forest productivity and the ability to produce large woody structure.

Disease management is prescribed in stands that are heavily infected with laminated root rot (5 acres). Susceptible trees (Douglas-fir and white fir) would be cut and resistant or low susceptible trees would remain on site (ponderosa pine, sugar pine, western red cedar, Port Orford cedar, incense cedar, and hardwoods). The resulting treatment is a gap opening where resistant species would be planted so that the site is occupied with a new cohort stage of resistant tree seedlings that over time would continue to develop into large woody structure with reasonable assurances that the site would sustain this long term habitat development.

Disease management would reduce the canopy to less than 40 percent overall with and would remove dispersal-only habitat. In the long term, treatments are expected to improve habitat

conditions by ensuring the area is reforested with disease-resistant conifers and still maintains some hardwoods. Treatments would reduce mortality; restore vigor, resiliency and stability; and disrupt the spread of root rot into adjacent, uninfected stands. Treatments would meet both sustainable timber harvest objectives and allow the stands to become spotted owl NRF habitat more quickly than if left on its current trajectory towards hardwoods.

Roadside Vegetation Maintenance - Daylighting

Roads have not been maintained properly and now have walls of larger vegetation and trees that present a safety concern for road travelers and the integrity of the road from roadside litterfall. Project proposes to cut vegetation along roadsides that would not be removed under typical roadside brushing specifications in hard money and timber sale contracts. Project limits would be 15 feet slope distance from the center line of the ditch upslope away from road and 15 feet slope distance downslope from the outside shoulder of the road. Vegetation may be hardwood or conifer trees and merchantable timber may be sold. Approximately 13.5 miles of BLM controlled roads in the project are proposed for treatment. Approximately 2.5 acres occur adjacent to spotted owl NRF and dispersal habitat in three spotted owl nest patches.

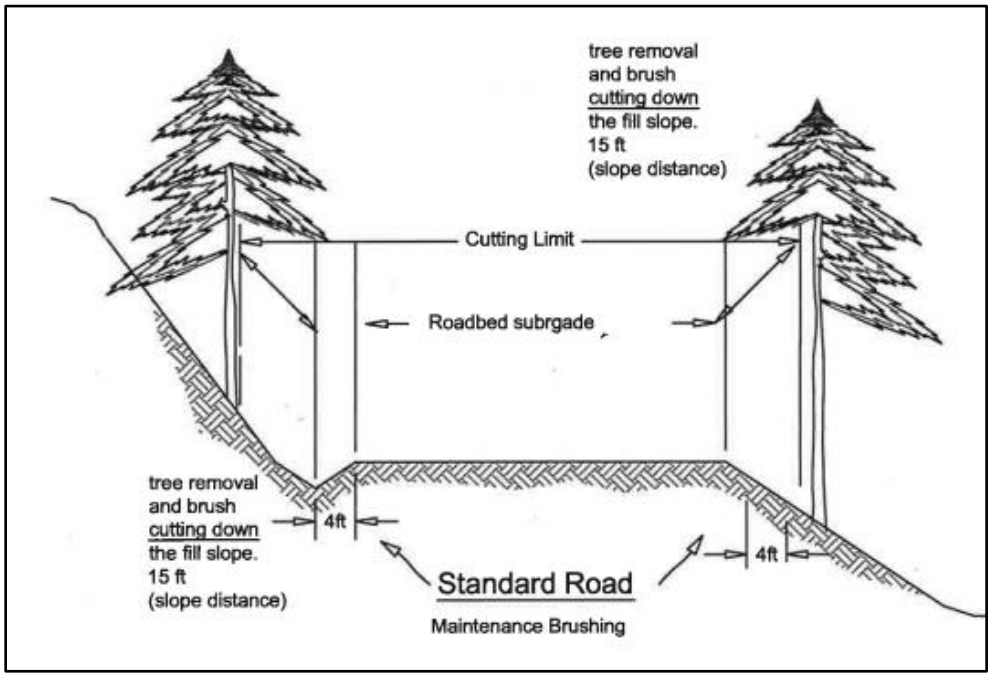

Figure 1: Cold Elk Daylighting Diagram

Forest Management Activity Fuels

Activity fuels created from forest management activities would be treated post-harvest. The BLM would conduct a fuels assessment within each unit following harvest activity. This assessment would determine the fuel hazard and fire risk based on surface fuel loading, aspect, slope, access, and location of each unit. Post-harvest fuels treatments may include no treatment, lop and scatter, selective slashing, and hand pile burning.

Pacific Power Transmission Line Reinforcement Project (PPTLR)

The existing 115 kV transmission line and right-of-way corridor is approximately 40 to 100 feet wide, 18 miles long, and crosses both privately-owned and BLM-managed lands. On all BLM-managed land, the existing right-of-way is approximately 100 feet wide.

To accommodate the new line, the existing 115 kV right-of-way corridor would need to be widened from 40 or 100 feet to 135 feet. This is an additional 17.5 or 47.5 feet on either side of the existing corridor. The expanded right-of-way would retain the original 115 kV centerline to the extent possible, however, the centerline may shift in some areas (expanding more to one side of centerline than the other) to avoid encroachment into other existing easements or sensitive resources. To determine the effects to habitat as described in the Effects Section, the BLM buffered the existing ROW by 50 feet. Since the widening ranges from 17.5 to 47.5 feet, this is likely an overestimate of effects. However, the exact buffering widths for each segment are not known at this time, so the maximum width was used.

Right-of-way widening would require both permanent and temporary vegetation removal. Permanent vegetation removal would primarily affect forested areas, whereas temporary vegetation removal would primarily affect shrub/scrub and herbaceous vegetation. Permanent vegetation clearing would include vegetation that would exceed transmission line clearance requirements, which vary relative to the location of the structures and projected line sag. Tree removal would generally only be needed within the additional corridor, added to either side of the right-of-way, but could be necessary within the existing right-of-way if incompatible species exist. In addition, temporary clearing of non-forested (i.e., shrub/scrub and herbaceous) vegetation within the right-of-way may be needed to accommodate the transport and staging of construction equipment and allow for safe construction of the project.

Within the right-of-way, tall growing trees that exceed transmission line clearance requirements would either be removed or pruned, depending on the tree species, growth rate, and conditions of the tree (i.e., dead or dying). Where conductor to ground clearance is 100 feet or more (e.g., a canyon or ravine crossing), tall-growing trees would be left in place as long as the conductor clearance to the vegetation tops is 50 feet or more. Trees with less than 50 feet of clearance may be selectively removed. Trees located on or off the right-of-way that are identified as a danger[1] or hazard[2] would be removed on an as-needed basis as part of the proposed action and through the life of the project. Existing snags within the right-of-way would be retained, provided they are not a safety hazard (i.e., have the potential to fall onto the line or encroach on minimum clearance standards). The exact number and location of trees that need to be removed is not known at this time; preconstruction surveys would be performed to identify trees to be removed. Danger and hazard trees would be felled with a chainsaw, feller buncher, or other mechanical means, and branches would be lopped and either scattered or chipped within the right-of-way. If chipped, the chips would be broadcast. Pacific Power would discuss tree removal activities with the BLM prior to removal.

1 Danger trees are trees on or off the right-of-way that may contact electric facilities either through growth or by falling.
2 Hazard trees are dead, dying, diseased, deformed, or unstable trees that have a high probability of falling and contacting a substation, distribution, or transmission conductors, structure, guys, or other electric facility.

Following construction, tall growing trees would be prohibited from growing within the expanded right-of-way, while transmission line right-of-way compatible shrub/scrub and herbaceous vegetation would be allowed to revegetate, with types and heights maintained according to Pacific Power's Transmission & Distribution Vegetation Management Program Specification Manual (2015). Vegetation management within and along the right-of-way and access roads would occur periodically to keep vegetation a safe distance from the conductor, maintain access to structures, and to help control noxious weeds. Vegetation management is guided by Pacific Power's *Transmission & Distribution Vegetation Management Program Specification Manual* (2015). Maintenance activities would occur along the entire transmission line corridor, which crosses non-habitat as well as NSO capable, dispersal, and NRF habitat types.

2.3.3 Proposed Action Implementation Methods

Bieber Salt, Cold Elk, and Lost Creek Forest Management Projects

The proposed treatments would be implemented using a variety of manual and mechanical tools. These methods include ground-based, skyline-cable, and helicopter log extraction. Polygons representing possible landing locations were included in the proposed units GIS layer used to determine effects from the proposed action. Approximately 17 acres of NRF (4 acres of NRF and 13 acres of RF) habitat and 12 acres of dispersal-only habitat scattered throughout the Bieber Salt, Cold Elk, and Lost Creek Projects would be removed by landing construction. The habitat effects from the proposed landing construction are analyzed as a separate treatment area and have been incorporated into the total habitat effects for the project as habitat removal (Table 16). Openings created from proposed yarding corridors were assessed and added to the potential treatment effects determination for each unit (either maintained habitat or downgraded NRF habitat). Additionally, the BLM would use one of the timber sale contract stipulations (L-25) to ensure canopy cover is retained. The L-25 stipulation requires yarding corridors to be flagged prior to marking the unit and if previously reserved trees are needed for yarding corridors, a tree previously marked for harvest could be re-marked as reserve to replace the original reserved tree in the corridor.

The BFRA and GPRA spotted owl nest tree locations were compared with the proposed cable units and no known nest trees are located near potential guy line anchor or tailhold tree estimated locations, so no known nests would be removed. The exact number of guyline or tailhold trees that would be cut in the proposed units is unknown, but likely several could be cut adjacent to each cable unit. The guyline or tailhold trees could be cut in NRF, dispersal, or non-habitat. Even though several trees could be cut, these stands adjacent to the harvest units are still anticipated to retain their current habitat function post-treatment because it is estimated that no more than three to six trees per landing would be cut. The total number of trees to be cut would depend on the amount of yarder settings/landings for each unit. The removal is not expected to have substantial reductions to the canopy cover or basal area, change multi-layer stand conditions (if they exist), or remove other key habitat components. The amount of individual trees that could be cut would not collectively change the current function of NRF or dispersal stands in which they occur. In some cases, the adjacent areas where the guylines are located do not qualify as habitat, and when single remaining trees are not present, dozers would be used as anchors. According to Oregon OSHA Regulations, felled trees would be removed

from the site if they cannot be stabilized and pose an additional threat of sliding or rolling onto the roadways (OAR 437-007-0225 and OAR 437-007-0500).

The Bieber Salt and Lost Creek Projects do not have potential guyline or anchor trees proposed in NSO nest patches. Guyline/tailhold trees may occur in (on the edge of) two nest patches in the Cold Elk project (# 0920O and #2622A). Approximately three trees could be used for tailhold trees at the edge of the nest patch of site #2622A, but since they are tail hold trees they likely do not need to be felled. However, if they do need to be felled, they would be left on site. Dozers are proposed to be used for guyline anchors in the nest patch of sites #2662O, #0920O, and #4671O to avoid needing to fell anchor trees. However, the unit layout and terrain has not been field verified for one unit affecting site #0920O and there is a potential that 3-6 guyline anchor trees would need to be felled in the nest patch if the dozer option would not work. If they do need to be felled, they would be left on site. Seasonal restrictions would also be implemented to avoid potential disturbance effects if the site is occupied.

Access to some units would require temporary route construction to extract timber. The habitat effects from the road construction are analyzed as a separate treatment areas and have been incorporated into the total habitat effects for the project as habitat removal (Table 16). The roads were buffered to create polygons to represent the effects from the road building and included in the proposed units GIS layer used to determine effects from the proposed action. Approximately 13 acres of NRF (2 acres of NRF and 11 acres of RF) habitat and 24 acres of dispersal-only habitat would be removed by proposed temporary route construction scattered throughout the Bieber Salt, Cold Elk, and Lost Creek Projects.

Reinitiation would occur if the actual effects from these tools exceed the anticipated effects described in the BA.

PPTLR Project

The project activities would primarily be implemented through the use of existing access roads and ground-based manual or mechanical methods. Helicopters would be used in some areas (i.e., areas with steep slopes or sensitive resources) to deliver and set some of the electrical transmission structures in place. Construction would occur in accordance with Pacific Power's standard construction techniques and best practices.

Construction equipment would access each structure site using existing access roads or the right-of-way. There would be no new temporary or permanent access roads constructed for the Project. Existing access roads within the right-of-way were generally created for use by Pacific Power, are typically 8 feet wide, and either bare soil or gravel. Up to 19.8 miles of existing access roads would need improvements prior to construction to ensure access to the transmission line corridor for construction and ongoing operation and maintenance activities. Improvement to existing access roads would, on average, result in a 25-foot-wide disturbance area for construction, which includes widening access roads from their existing width (8 foot travel way on average) to a 14-foot travel way, with additional area for drainage, side cast, and maneuverability in steep terrain.

Access road improvements (i.e., widening) would involve removal of vegetation, blading to shape existing road surfaces and turnouts, placement of surfacing aggregate (i.e., gravel) to

maintain or restore existing road surfacing, and installing water bars and drain dips as needed to manage stormwater runoff.

Following construction, improved access roads would be allowed to revegetate within the expanded roadway margins. However, forested areas that are temporarily cleared for access road improvements would take longer to revegetate. Most access roads would be maintained to an 8-foot road width during operation and maintenance, however, some roads located on challenging terrain (steep slopes) may not be recontoured to the original 8-foot road width due to a high probability for post-treatment slope failure (e.g., erosion or mass-wasting).

Access road improvements, and associated vegetation clearing activities, are proposed within NSO capable, dispersal, and NRF habitat types. Access road improvements would require the removal of trees and other vegetation within these habitat types. However, access road improvements are not proposed within designated critical habitat, documented spotted owl sites (including known nesting sites), or known owl activity centers.

2.4 Project Design Criteria and Conservation Measures

2.4.1 Project Design Criteria

Project Design Criteria (PDC) are conservation measures developed to reduce disturbance impacts to listed species (Appendix A). Disturbance of listed wildlife species occurs when noise, smoke, vibration, or visual stimuli cause impairment of normal behavior. PDC, measures applied to project activities, are designed to avoid the potential adverse disturbance effects to nesting birds and their young. PDC that restrict activities to outside of the critical breeding season (Tables 2 and 3) and/or occur beyond recommended disturbance distance thresholds will be incorporated into the all of the projects in this BA. PDC involving seasonal restrictions will be implemented unless surveys, following approved protocols, indicate either non-occupancy or non-nesting of target species.

If new spotted owl sites are located during surveys, biologists will review PDCs and the BO to confirm the ESA analysis remains valid. Timber sales have a contract clause (E-4) that authorizes stop work when threatened and endangered species are found in the timber sale or to comply with court orders. If or when a spotted owl or other listed species is found in the project area the timber operators would be notified in writing by the contracting officer to stop the work until the issue is evaluated further. If the impacts to the new site are no longer consistent with the analysis, the project will remain stopped until the BLM completes one or more of the following:

- Modifies the proposed action to ensure that impacts remain as described in the consultation documents.
- Imposes seasonal protections (if necessary).
- Reinitiates and completes new consultation.

2.4.2 Conservation Measures

The following conservation measures were designed for the Bieber Salt, Cold Elk, and Lost Creek Projects to help reduce impacts to northern spotted owls:

- No vegetation treatments, road construction, or landing construction would occur in spotted owl NRF, Roosting/ Foraging, or dispersal habitat within spotted owl nest patches (See Effects Section below for more information). Only minor actions (NLAA) from tailhold/guyline trees and daylighting treatment would occur in five nest patches within the Cold Elk Project. These are discussed in more detail in the NSO Effects Section (Tables 19 and 20).
- No known nest trees would be removed.
- No-treatment buffers for protecting mollusks, great gray owls, meadows, red tree voles, sensitive plant sites, riparian areas, and fragile soils will provide untreated patches of spotted owl habitat throughout the Action Areas.
- Additional spotted owl NRF/RF habitat was dropped from proposed treatments:
    - 508 acres of spotted owl habitat were dropped from the Lost Creek and Bieber Salt project; they were primarily in the 0.5-mile core areas.
    - 2,210 acres of spotted owl NRF habitat were dropped from the Cold Elk project, with 700 of these acres in the 0.5-mile core areas. An additional 122 acres were dropped as marbled murrelet suitable habitat.
- No harvest activities, temporary route construction, yarding corridors, anchor trees, or skid roads are planned to occur within RA32 stands.
    - Field evaluations identified 323 acres of RA 32 habitat in 22 patches (3 to 49 acres) in the Bieber Salt project.
    - Field evaluations identified 906 acres of RA 32 habitat in 60 patches (1 to 90 acres) in the Lost Creek project.
    - Field evaluations, aerial photo review, and LiDAR review identified 1,200 acres of RA32 habitat in patches ranging from approximately 1 to 85 acres in the Cold Elk project.
    - Any new RA32 patches are found during layout or marking would be dropped from treatment consideration.

- The timber sale mark in proposed NRF treat and maintain units would be reviewed to ensure the implementation would retain the function of NRF (or in some cases roosting/foraging) habitat. The priority for review would be in the home ranges of occupied owl sites. The desired habitat retention stand conditions described in the effects section below would be checked in the field by the project area biologist and/or the prescription writer. Additional trees would be marked for retention if the field review indicated the habitat function (i.e. high canopy cover, layering, basal area, etc.) as intended in the prescription would not be retained post-harvest.
- Large standing (snags and live trees) and down wood will be retained in all project areas to meet RMP (USDI 1995) guidelines. Generally the marking guidelines favor the retention of large hardwoods and large deformed trees, which provide nesting

opportunities for spotted owls or marbled murrelets. Some snags may be felled for safety reasons, but will be left on-site to provide additional down woody material.

- No vegetation treatments or road/landing construction would occur within Known Spotted Owl Activity Centers (KSOAC). KSOAC are the best 100 acres around northern spotted owl activity centers that were documented as of January 1, 1994 on Matrix and Adaptive Management Area (AMA) lands, and are managed as Late-Successional Reserves (LSR). LSR are managed to protect and enhance habitat conditions for late-successional and old-growth related species. These reserves are designed to maintain a functional, interacting late-successional and old-growth ecosystem. The criteria for mapping these areas are identified on pages C-10 and C-11 of the Northwest Forest Plan Standards and Guidelines (USDA USDI 1994b).

Specific spotted owl conservation measures were not part of the design of the PPTLR project. However, the following measures would still apply:

- Seasonal restriction PDCs would be implemented if new owls are located within disturbance distances.
- No known nest trees would be removed.
- The project would not occur within Known Spotted Owl Activity Centers (KSOAC) or nest patches.

3. STATUS OF THE SPECIES

3.1 Northern Spotted Owl

Status of Northern Spotted Owls Range Wide

ESA regulations (50 CFR 402.02) state that *the environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the Action Area, the anticipated impacts of all proposed federal projects in the Action Area that have already undergone formal or early section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land management activities*.

A detailed account of the taxonomy, ecology, and reproductive characteristics of the spotted owl can be found in the *2011 Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011), SEI 2004 Northern Spotted Owl Status Review (Courtney, et al. 2004); Interagency Scientific Committee Report (Thomas, et al. 1990); Forest Service Ecosystem Management Report (USDA, et al. 1993), final rule designating the spotted owl as a threatened species (USDI 1990), and several key monographs (e.g. Dugger et al 2016, Anthony, et al. 2006 and Forsman, et al. 2011). These documents are incorporated by reference.

Eleven demographic study areas have been established to represent owl status across the range of the northern spotted owl (Forsman, et al. 2011). Owl sites and productivity are annually monitored within these areas to

- *assess changes in population trend and demographic performance of spotted owls on federally administered forest lands within the range of the owl, and*
- *assess changes in the amount and distribution of nesting, roosting, and foraging habitat and dispersal habitat for spotted owls on federally administered forest lands.*

Metadata analysis evaluates population statistics of the owls in the demographic study areas. The most recent metadata analysis was published in 2016 and found that fecundity, the number of female young produced per adult female, is declining. Dugger et. al (2016) concluded that fecundity, apparent survival, and/or populations were declining on most study areas, and that increasing numbers of barred owls and loss of habitat were partly responsible for these declines. The 2016 metadata analysis found these declines are occurring in more study areas than indicated in the last 2011 metadata analysis (Forsman 2011). The 2016 data indicate that competition with barred owls may now be the primary cause of northern spotted owl population declines across their range.

Status of Northern Spotted Owl Demography Areas

There are two demographic study areas associated with these projects. The Cold Elk and PPTLR projects are in the Klamath province which is represented by the Klamath Demography Study Area. The Bieber Salt and Lost Creek projects are in the West Cascades province which is represented by the South Cascades Demography Study Area. An annual report is completed for the demographic study areas and the last four years for the Klamath and South Cascades Study Areas are summarized below.

Klamath Study Area

According to the 2012 Annual Report for the Klamath Demography Study Area, at least one spotted owl was detected at 79 (50 percent) of the sites. In recent years there has been a steady decline in the number of non-juveniles detected and an even larger decrease in the number of pairs detected in the study area. The number of non-juveniles detected in 2012 (134) was the lowest ever documented on the study area. The number of individual spotted owls during 2012 was 39.6 percent less than the high of 222 during 2002. The decline in the number of pairs was even more sizeable, with 48.4 percent fewer detected in 2012 than the high of 97 during 2005. The 50 pairs detected during 2012 was the lowest number documented during the study period. The number of pairs detected at sites has declined within the study area and the number of unoccupied sites has increased. While the recent meta-analysis (Forsman et al, 2011) indicated that survival on the KSA was stable through 2006, the most recent data regarding occupancy has shown a rapid decline, which suggests the stability of the survival rate may no longer be valid. The fecundity rate in 2012 was 0.191, which was lower than the average for the years 1990-2012 (0.320). Forsman et al. (2011) noted that the fecundity rate on the KSA was declining and the most recent data agrees with this conclusion. The number of juveniles detected within the KSA during 2012 (12) was much lower than the overall median (44) (Davis et al, 2013).

The 2013 data indicates the occupancy and fecundity rates have not improved. At least one spotted owl was detected at 78 (49.3 percent) of the sites and there were no new sites documented within the study during 2013. The fecundity rate for 2013 was 0.160. Fifteen juveniles were detected in the study area in 2013 (Davis et al 2014). The 2014 data indicates the occupancy rates continued to decline. At least one spotted owl was detected at 61 (38.6 percent) of the sites. The fecundity rate was 0.366 in 2014. Thirty-one juveniles were detected in the

study area in 2014 (Hollen et al. 2015). The 2015 data indicates the occupancy rates continued to decline. At least one spotted owl was detected at 59 (37.3 percent) of the sites. The fecundity rate was 0.219 in 2015. Nesting status was confirmed at 30 sites in 2015, which is the lowest number documented since the study was initiated. Fourteen juveniles were detected in the study area in 2015 (Hollen et al. 2016).

South Cascades Study Area

According to the 2012 Annual Report for the Southern Oregon Cascades Demography Study Area, at least one spotted owl was detected at 71 (42 percent) of the sites. This represented a 3.5 percent increase from 2011. However, the 44 pairs located were the fewest recorded during the study. The average fecundity rate in 2012 was 0.24 (averaged across sites in matrix, LSR, and wilderness). There were 22 juveniles detected in the Southern Oregon Cascades Study Area in 2012 (Dugger, et al. 2013). The 2013 data indicates the occupancy and fecundity rates declined compared to 2012. At least one spotted owl was detected at 60 (35 percent) of the sites in 2013, which represents a decline in occupancy of 7 percent from 2012. The average fecundity rate was 0.20 in 2013, which also represents a decline from 2012. Thirteen juveniles were detected in the study area in 2013 (Dugger, et al. 2014). The 2014 data indicates the occupancy rate declined compared to 2013. At least one spotted owl was detected at 53 (31 percent) of the sites in 2014, which represents a decline in occupancy of 4 percent from 2013. The average fecundity rate was 1.31 in 2014, which in an increase from 2013. Forty-seven juveniles were detected in the study area in 2014 (Dugger, et al. 2015). The 2015 data indicates the occupancy rates continued to decline. At least one spotted owl was detected at 52 (30.4 percent) of the sites. Nesting status was confirmed at 26 sites in 2015. Thirty-one juveniles were detected in the study area in 2015. The average number of young fledged per confirmed breeding pair in 2015 was 0.97 (Dugger, et al. 2016).

3.2 Marbled Murrelet

A brief status of the species is included below, but more detailed accounts of the taxonomy, ecology, and reproductive characteristics of the marbled murrelet can be found in the final rule designating the species as threatened (USDI FWS 1992b), the final rule designating critical habitat for the species (USDI FWS 1996), *Ecology and Conservation of the Marbled Murrelet* (Ralph et al. 1995), *1997Recovery Plan for the Threatened Marbled Murrelet* (USDI FWS 1997), the 5-year review for the murrelet (USDI FWS 2009), survey protocol (Evans Mack *et al.* 2003), and recent scientific literature. These documents are incorporated by reference.

In the 1992 listing, range-wide habitat loss was identified as the greatest terrestrial threat to murrelets. The loss of significant amounts of suitable, unoccupied murrelet habitat may hamper efforts to stabilize and recover this species. The Federal listing of the murrelet as Threatened was primarily based on the loss of late-successional forest and the subsequent reduction in the number of nest sites available to murrelets (USDA and USDI 1994a; Carter and Erickson 1992). This loss of habitat may also explain gaps in their inland distribution. In 2009, the U.S. Fish and Wildlife Service identified new stressors are due to several environmental factors affecting murrelets in the marine environment.

The murrelet is a small diving seabird that nests mainly in coniferous forests and forages in near-shore marine habitats. Murrelet habitat use during the breeding season is positively associated with the presence and abundance of mature and old-growth forests, large core areas of old-growth, low amounts of edge habitat, reduced habitat fragmentation, proximity to the marine environment and fog-influenced zone, and forests that are increasing in stand age and height. The historical breeding range of the murrelet extends from Bristol Bay, Alaska, south to the Aleutian Archipelago, northeast to Cook Inlet, Kodiak Island, Kenai Peninsula and Prince William Sound, south coastally throughout the Alexander Archipelago of Alaska, and through British Columbia, Washington, Oregon, to northern Monterey Bay in central California.

At the time of listing, the distribution of active nests in nesting habitat was described as non-continuous (USFWS 1997, p. 14). The at-sea extent of the species currently encompasses an area similar in size to the species' historic distribution, but with the extremely low density of murrelets in Conservation Zone 5, and the small population in Conservation Zone 6, the southern end of the murrelet distribution is sparsely populated compared to Conservation Zones 1-4. The Medford BLM is within Conservation Zone 4.

Landscape and Habitat Use Characteristics

Elevation

Murrelet nests have been located at a variety of elevations from sea level to 5,020 ft. (Burger 2002, p. 109). However, most nests have been found below 3,500ft (1000m) as reported by McShane et al. (2004, p. 4-35), and in Washington, Oregon and California, nests continue to be found below 2,625 feet (800 meters) in elevation (McShane et. al 2004). The mean elevation of nest trees in the Pacific Northwest (which includes British Columbia) was 332 m, and for Oregon and California, elevation ranged from 45m to 646m (up to 2,119 feet).

Nest Trees

Inland, murrelets are detected almost exclusively in forest stands with old-growth characteristics. All murrelet nests, south of Alaska, have been found in old-growth trees (>81 cm [32"] d.b.h.), therefore all nests have been in stands with old-growth trees. Nests in the Pacific Northwest were typically in the largest diameter old-growth trees available in a stand (x = 211 cm [83"]); many nest trees were in declining conditions and had multiple defects. Nest trees were located in large diameter, old-growth forests, and decadent trees with mistletoe, deformations, and moss on limbs. Occupied sites had at least one old-growth tree per acre (Ralph et al 1995).

Nest Stands

The majority of nests in the Pacific Northwest, and in Oregon and California, were located on the lower one-third or middle one-third of the slope. Stand age in Oregon, stand age ranged from 180 to 350 years old. Canopy height in Oregon and California ranged from 45 to 88 M. Canopy layers in Oregon had 2 to 3 layers. Canopy Closure in Oregon and California ranged from 25-99 percent, and in the Pacific Northwest, mean canopy closure was 49 percent (McShane et. al. 2004, Hamer and Nelson 1995).

In nesting and occupied sites in Coast Range and Siskiyou Mountains, Douglas-fir was the dominant tree species in the north and mixed-evergreen species, including Douglas-fir and

tanoak, were dominant in the south. All nests were in old-growth trees. Murrelet nest sites had fewer trees/ha and less canopy closure compared to adjacent sites. Their results support previous studies that concluded murrelets use stands with old-growth characteristics and that stand structure is more important than stand age (Ralph et al 1995).

Occupation and Range

In the Dillingham et.al. study (1995), murrelets were not detected in the mixed conifer/mixed evergreen zone on the eastern part of the Forest. This zone, which extends from 20-60km (12.5-37.5 miles) inland, is drier and has smaller trees than the western hemlock vegetation zone. The distribution of murrelets on the Siskiyou National Forest were hypothesized to be limited by the availability of trees with suitable nesting limbs. Because marbled murrelets nest primarily in large trees with large moss covered limbs and they appear more abundant close to the coast (Hamer and Nelson 1995a), they hypothesized that factors such as habitat suitability, vegetation type, topography, climate (including temperature and relative humidity), and distance from the ocean would limit murrelet distribution.

Meyer & Miller (2002) had similar hypothesis and conclusions. They hypothesized that murrelet pair exchange flights, incubation, and feeding incur high energy costs, particularly for nests distant from marine feeding areas. Consequently, murrelets were not found occupying areas 40 km (25 miles) from the coast, even when the western hemlock zone extended farther inland. Just north of the study area, the hemlock zone extended 56 km (35 miles) inland, yet the occupied plot farthest inland in that area was only 37 km (23 miles) (Meyer and Miller 2002). The shorter limiting distance in the study area was hypothesized to be due to the stresses of hotter temperatures inland, especially outside the western hemlock zone. Although birds were detected 56 km (35 miles) inland in the study area, no nesting behaviors were observed in these areas despite many follow-up surveys. They hypothesized that they were nonbreeders. Marbled murrelets in the Siskiyou National Forest were generally not occupying areas inland of the fog-influenced western hemlock zone or above 1000 meters (3,300 feet). Dillingham et al. (1995) found the same result. They found that the birds tend to not use ridgetops, which may be more windy and exposed to the elements. They hypothesized that murrelets would use the western hemlock zone because it may have larger trees and a cooler, foggy climate that reduces heat stress. Hunter et al. (1998) did not find any birds inland of the fog zone in northern California, where the temperatures were quite warm (5.9–9.1 Celsius) (10.6-16.4 Fahrenheit) warmer than where murrelets were found in the fog zone.

The Recovery Plan identified six Conservation Zones throughout the listed range of the species: Puget Sound (Conservation Zone 1), Western Washington Coast Range (Conservation Zone 2), Oregon Coast Range (Conservation Zone 3), Siskiyou Coast Range (Conservation Zone 4), Mendocino (Conservation Zone 5), and Santa Cruz Mountains (Conservation Zone 6). Recovery zones are the functional equivalent of recovery units as defined by FWS policy (USDI-FWS 1997, p. 115). The Medford District is located within Zone 4.

Conservation Zone 4 (Siskiyou Coast Range Zone) (USDI-FWS 1997, pp. 127-128)*:*
The Siskiyou Coast Range zone extends from North Bend, Coos County, Oregon south to the southern end of Humboldt County, California. It includes waters within 1.2 miles of the Pacific Ocean shoreline and, in general, extends inland a distance of 35 miles from the shoreline.

4. ENVIRONMENTAL BASELINE

4.1 Northern Spotted Owl

4.1.1 Description of the Spotted Owl Action Area

The Action Area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR 402.02). For northern spotted owls, the Action Area is usually based on the radius of a circle that would capture the provincial home range, which is 1.2 miles for the West Cascades Province and 1.3 miles for the Klamath Province (Thomas et al. 1990 and Courtney et al. 2004). The Bieber Salt and Lost Creek Projects are in the West Cascades province and the Cold Elk and PPTLR Projects are in the Klamath Province. Therefore, the Action Area represents all lands within 1.2 miles and 1.3 miles of proposed treatment units and all lands within any overlapped associated provincial home ranges of known spotted sites that could be directly, indirectly or cumulatively impacted by the proposed action. The Action Areas for all projects are displayed in the maps in Appendix E. Tables 7, 8, and 9 below provide habitat baseline data for the Action Areas. The Bieber Salt and Lost Creek projects were included in the same action area because they are within the same physiographic province (West Cascades).

4.1.2 Status of Northern Spotted Owl Habitat in the Action Area

The environmental habitat baseline for spotted owls on the Medford BLM-administered lands for the Action Areas is current as of April 2016. The Medford environmental baseline was initially developed in 2008 using field assessments by experienced wildlife biologists, Interagency Vegetation Mapping Project (IVMP) imagery from 1996 (as corrected through 2003), and additional stand data. The BLM used the updated 2014 Rogue Basin habitat layer based on GNN (Gradient Nearest Neighbor) data for non-BLM managed lands. This layer types habitat (NRF, dispersal, capable, and non-habitat) across the region and across all ownerships. Given that the spatial resolution of these layers makes it unsuitable for tracking habitat effects at the scale of individual projects, the baseline is updated for each BLM project area for each proposed treatment unit.

Habitat updates within the Lost Creek and Bieber Salt treatment units were based on field evaluations. These field evaluations included taking measurements of overstory canopy cover using a moosehorn, measuring overstory tree diameters, recording the number of canopy layers, recording the amount of coarse woody debris and snags, and recording other habitat characteristics such as nesting platforms, cavities, and mistletoe brooms.

Habitat updates within the Cold Elk treatment units were based on field evaluations taking the same measurements as described above. However, not all units were able to be field verified, so other tools and methods were used to update the habitat. These tools included Forest Operation Inventory (FOI) data, aerial photo interpretation (1995-2014), and LiDAR imagery interpretation, including Shaded Feature Height and Top Tree Height features. Features in these tools were compared to adjacent and similar stands that had been verified in the field to help determine current habitat conditions. LiDAR tree top points were used to show tree height as

well as conifer spacing and density. LiDAR Shaded Feature Height was used to display, in color, the general crown form, widths, and tree spacing and gaps. Aerial photos provided additional color and texture revealing occurrence of hardwoods, pine, and large snags. These tools were combined to determine vertical structure (layering), horizontal structure (crown widths and tree spacing). Stands that showed tight tree spacing, relatively uniform heights and crown widths and color, were very comparable to other field reviewed stands which had simple structure and lacked large diameter mature and remnant trees with and consistent layering, and lacked large snags, decadence, cavities, remnant trees. These stands were typically typed as Roosting/Foraging (McKelvey 2) or Dispersal. Older stands in both LIDAR and photos showed diversity in tree heights and canopy structure and were typically typed as NRF habitat (McKelvey 1).

The current baseline also includes updates to habitat from post-harvest monitoring of the recently implemented timber sales and stewardship projects in these action areas. Specifically, the habitat updates from Far Out project in the Cold Elk Action Area and the Vine Maple project in the Lost Creek Action Area. No habitat changes occurred from recently harvested units within the Bieber Salt Action area because no recently harvested units occurred within the action area. However, the Bieber Salt Action Area includes habitat changes from the 2008 Double Day fire and 2008 windstorm blowdown event. The Bieber Salt Action Area also includes habitat changes from the two NRF downgrade units in the 2014 Double Bowen project.

Tables 7, 8, and 9 summarize the baseline habitat and ownership information for the Bieber Salt/Lost Creek, Cold Elk, and PPTLR Action Areas.

Table 7. Environmental Baseline for the Bieber Salt/Lost Creek Action Area

		Total Acres	NSO NRF Habitat Acres (% Total)	Capable NSO Habitat Acres (% Total)	Reserved Acres[1] (% Of Total)	Non-Reserved Acres (% Of Total)	Dispersal[2,] Acres (% Of Total)
OWNERSHIP							
-All Ownerships		81,186	17,441 (21%)	16,929 (21%)	5,803 (7%)	75,383 (93%)	46,787 (58%)
- Non-Federal (Private, State)		48,363	4,815 (10%)	7,581 (16%)	0	48,363 (100%)	26,681 (55%)
-Federal (BLM, USFS)		32,823	12,626 (38%)	9,348 (28%)	5,803 (18%)	27,020 (82%)	20,106 (61%)
LAND ALLOCATION—FEDERAL (*hierarchal, no acres double-counted*)							
-Late-Successional Reserves (mapped)		2,025	1,189 (59%)	501 (25%)	3,914 (100%)	0	1,339 (66%)
- 100-Acre Spotted Owl Core Areas in the Matrix		1,889	1,218 (64%)	164 (9%)			1,692 (90%)
-Matrix/AMA[3]		30,237	11,422 (38%)	8,847 (29%)	1,889 (7%)	28,348 (94%)	18,292 (62%)
SPOTTED OWL CRITICAL HABITAT							
Critical Habitat Unit	**Sub-unit**	**Acres**	**NRF Habitat Acres**	**Capable NSO Habitat Acres**	**Reserved**	**Non-Reserved**	**Dispersal**
10	**KLE-4**	2,592	1061 (36%)	414 (14%)	2,592 (100%)	0	2,385 (82%)
10	**KLE-5**	5,336	1,487 (28%)	1,827 (34%)	667 (13%)	4,669 (87%)	3,289 (62%)

Notes: 1. Reserved= land allocation with no programmed timber harvest which includes Congressionally Reserved land, LSRs, Owl Cores and Wild and Scenic River Corridors. 2. Dispersal includes NRF habitat. 3. Matrix/AMA includes Riparian Reserves (no Riparian Reserve layer is available)

Table 8. Environmental Baseline for the Cold Elk Action Area

		Total Acres	NSO NRF Habitat Acres (% Total)	Capable NSO Habitat Acres (% Total)	Reserved Acres[1] (% Of Total)	Non-Reserved Acres (% Of Total)	Dispersal[2,] Acres (% Of Total)
OWNERSHIP							
-All Ownerships		66,014	24,886 (38%)	17,155 (26%)	10,217 (15%)	55,797 (85%)	43,780 (66%)
- Non-Federal (Private, State)		26,055	3,408 (13%)	7,585 (29%)	0	26,055 (100%)	14,542 (56%)
-Federal (BLM, USFS)		39,959	21,478 (54%)	9,570 (24%)	10,217 (26%)	29,742 (74%)	29,238 (73%)
-Late-Successional Reserves, Wilderness, etc.		9,018	5,017 (56%)	2,523 (28%)	10,217 (100%)	0	6,010 (67%)
- 100-Acre Spotted Owl Core Areas in the Matrix		1,199	1,055 (88%)	32 (3%)			1,162 (97%)
-Matrix/AMA[3]		25,029	12,953 (52%)	5,991 (24%)	1,199 (5%)	2,382 (95%)	18,778 (75%)
SPOTTED OWL CRITICAL HABITAT							
Critical Habitat Unit	**Sub-unit**	**Acres**	**NRF Habitat Acres**	**Capable NSO Habitat Acres**	**Reserved**	**Non-Reserved**	**Dispersal**
9	**KLW-1**	38,383	20,768 (54%)	9,338 (24%)	1,850 (5%)	36,533 (95%)	28,338 (74%)
9	**KLW-2**	105	41 (39%)	61 (58%)	102 (97%)	3 (3%)	44 (42%)

Notes: 1. Reserved= land allocation with no programmed timber harvest which includes Congressionally Reserved land, LSRs, Owl Cores and Wild and Scenic River Corridors. 2. Dispersal includes NRF habitat. 3. Matrix/AMA includes Riparian Reserves (no Riparian Reserve layer is available)

Table 9. Environmental Baseline for the PPTLR Action Area

		Total Acres	NSO NRF Habitat Acres (% Total)	Capable NSO Habitat Acres (% Total)	Reserved Acres[1] (% Of Total)	Non-Reserved Acres (% Of Total)	Dispersal[2,] Acres (% Of Total)
OWNERSHIP							
-All Ownerships		35,662	1,419 (4%)	6,748 (20%)	0	35,662 (100%)	4,429 (12%)
- Non-Federal (Private, State)		23,565	437 (2%)	0	0	23,565 (100%)	437 (2%)
-Federal (BLM, USFS)		12,097	982 (8%)	6,748 (56%)	0	12,097 (100%)	3,992 (33%)
LAND ALLOCATION—FEDERAL (*hierarchal, no acres double-counted*)							
-Late-Successional Reserves or 100 acre NSO cores		0	0	0	0	0	0
-Matrix/AMA[3]		12,097	982 (8%)	6,748 (56%)	0	12,097 (100%)	3,992 (33%)
SPOTTED OWL CRITICAL HABITAT							
Critical Habitat Unit	**Sub-unit**	**Acres**	**NRF Habitat Acres**	**Capable NSO Habitat Acres**	**Reserved**	**Non-Reserved**	**Dispersal**
10	**KLE-3**	1,229	312 (25%)	193 (16%)	0	1,229 (100%)	965 (79%)

Notes: 1. Reserved= land allocation with no programmed timber harvest which includes Congressionally Reserved land, LSRs, Owl Cores and Wild and Scenic River Corridors. 2. Dispersal includes NRF habitat. 3. Matrix/AMA includes Riparian Reserves (no Riparian Reserve layer is available)

Table 10 estimates the current NSO habitat conditions within the fifth field watersheds associated with the Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects. Fifth field watersheds can provide a qualitative evaluation for dispersal function using the concepts of Thomas, et al., as described below. This landscape-level approach provides a general dispersal condition. Thomas, et al. (1990), along with Lint, et al. (2005) and Davis, et al. (2011), suggested using a landscape-level approach to analyze the effects to dispersal. Thomas, et al. (1990) originally recommended assessing dispersal habitat conditions on the quarter-township scale. Since then, the Service has generally recommended using a fifth field or larger landscapes for assessing dispersal habitat conditions because watersheds or provinces offer a more biologically meaningful way to evaluate dispersal function. For the larger fifth field watershed scale analysis in this BA, the BLM used the updated 2014 Rogue Basin habitat layer based on GNN (Gradient Nearest Neighbor) data. This layer types habitat (NRF, dispersal, capable, and non-habitat) across the region and across all ownerships.

Table 10. Dispersal Habitat Conditions in the Fifth Field Watersheds Associated with the BA Projects

5th Field Watershed	Associated Project (s)	Total Watershed Acres	Total NRF Habitat Acres	Total Dispersal-Only Habitat Acres	Total Dispersal Acres (NRF+ Dispersal Only)	% Watershed Dispersal Habitat (NRF +Dispersal-only)
Big Butte Creek	Lost Creek	158,257	44,809	66,613	111,422	70%
Evans Creek	PPTLR	143,279	32,209	69,956	102,165	71%
Gold Hill-Rogue River	PPTLR	135,947	13,526	32,273	45,799	**34%**
Grants Pass-Rogue River	PPTLR	53,767	6,503	16,548	23,051	**43%**
Little Butte Creek	Bieber Salt	238,724	60,937	74,934	135,871	57%
Lost Creek-Rogue River	Lost Creek	32,088	5,116	14,525	19,641	61%
South Fork Rogue River	Lost Creek	160,773	66,279	64,731	131,010	81%
West Fork Cow Creek	Cold Elk	55,922	16,554	21,410	37,964	68%

4.1.3 Status of Northern Spotted Owl Sites in the Action Area

Northern spotted owl site occupancy is defined as locations with evidence of continued use by spotted owls (including breeding), repeated location of a pair or single birds, presence of young before dispersal, or some other strong indication of continued occupation. Spotted owl sites used in this BA are based on historic information, protocol surveys, or incidental observations. Spotted owls are generally monogamous and primarily mate for life (Courtney 2004). They are also known to exhibit high site fidelity. However, owls often switch nest trees and use multiple core areas over time, possibly in response to fluctuations of prey availability, loss of a particular nest tree, or presence of barred owls. These multiple nest locations (original and alternates) are

combined to represent one spotted owl pair territory. For this assessment, survey history was used to determine whether the original or alternate nest locations would be analyzed in this BA to represent the territory.

As mentioned above, the Action Area represents all lands within 1.2 and 1.3 miles of proposed treatment units and all lands within any associated provincial home ranges of known spotted sites that could be directly, indirectly or cumulatively impacted by the proposed action. Sites that could be directly, indirectly, or cumulatively impacted include sites with proposed units within their home range. There are 50 NSO known site home ranges (including three territories with original and alternate site locations) that could be impacted by proposed Bieber Salt, Cold Elk, and Lost Creek Projects. Therefore these home ranges are completely contained within the Bieber Salt/Lost Creek and Cold Elk Action Areas. There are 33 NSO site centers outside of the Action Areas and a portion of their home range overlaps the Action Areas. However, no units are proposed within these home ranges, so no effects are anticipated. Therefore these home ranges are not included in the Action Area and the sites are not carried forward in the effects analysis. Table 11 summarizes this description of NSO sites associated with the Action Areas.

Table 11. Spotted Owl Sites Associated with the Action Areas

	Bieber Salt	Cold Elk	Lost Creek	PPTLR	Total
Number of Owl Home Ranges Completely Contained in AA *(proposed units in NSO HR)*	**10**	**25[1]**	**15[2]**	**0**	**50**
Number of Owl Home Ranges Overlapping AA *(site center outside of AA and no units inside NSO HR)*	**7**	**19**	**5**	**2**	**33**
TOTAL	**17**	**44**	**20**	**2**	**83**

1 - Includes 2 territories with 2 locations/home ranges
2 – Includes 1 territory with 2 locations/home ranges and one territory with 3 locations/ home ranges

Bieber Salt and Lost Creek

All suitable NRF habitat will be surveyed to protocol on BLM lands within 1.2 miles of project units. The second year of spotted owl surveys, following the 2012 USFWS NSO Protocol, was completed for the Lost Creek and Bieber Salt project in 2015. Spot check surveys will continue beyond 2015 in areas where spotted or barred owls were detected in the first two years of surveys. Additionally, the BLM is coordinating with private timber land surveyors that are surveying lands adjacent to BLM land. See Appendix D for a summary of the survey efforts and a summary of the survey results.

Cold Elk

Spotted owl surveys in the Cold Elk project are being conducted using a combination of the 2012 USFWS protocol and the 1999 Demograpy survey protocol. Three Cold Elk NSO sites are within the Klamath Demographic Study Area (KSA). Six sites are adjacent to the KSA and have long-term continuous surveys with at least 3 survey visits annually to determine occupation.

The remaining sites in the Cold Elk project have historical intermittent surveys for past project clearances or may have had less than required protocol surveys. Spotted owl surveys for sites outside of the KSA started in 2014 using the 2012 USFWS protocol These sites will be surveyed with the 2012 USFWS protocol to determine occupation status in 2016 (at least 6 visits if no response). Three sites adjacent to the KSA have been surveyed under the demography protocol annually and would continue in the future. All NRF habitat outside of home ranges and within 1.3 miles of the units received 6 survey visits in 2015 according to the 2012 USFWS protocol and the 2nd year will continue in 2016. Spot checks will continue in 2017 and 2018 as needed. See Appendix D for a summary of the survey efforts and a summary of the survey results.

PPTLR

The PPTLR project is not located within any known spotted owl home ranges. Surveys have not been conducted and will not be conducted for the project activities.

Summary of Current NSO Site Habitat Conditions

The pre-treatment NRF habitat acres for spotted owl sites in the Bieber Salt/Lost Creek and Cold Elk Action Areas are displayed in Tables 19 and 20. These tables provide the current habitat baseline on federal lands to help with effects determinations from the proposed actions. NRF habitat is displayed because research has indicated that the quantity and configuration of "older forest" (analogous to NRF habitat) provides a valid inference into the likelihood of occupancy (Hunter, et al. 1995), survival, and reproduction (Franklin, et al. 2000; Zabel, et al. 2003; Olson, et al. 2004; Dugger, et al. 2005; Dugger, et al. 2011).

NSO Site Potential Outside of Known Spotted Owl Home Ranges

Table 12 below summarizes the amount of NRF habitat on federal lands within the Action Area, but outside of known spotted owl home ranges.

Table 12. Spotted Owl NRF Habitat Outside of Known NSO Home Ranges

Project Action Areas	NRF Acres
Bieber Salt	867
Cold Elk	1,937
Lost Creek	1,959
PPTLR	811
TOTAL	5,574

<u>Bieber Salt, Cold Elk, and Lost Creek Projects</u>

Many of these acres occur in small patches that are unlikely to support owl occupancy, but there are larger blocks in the Action Areas where spotted owls could be present. Contiguous NRF habitat greater than 70 acres is one factor to determine if owls are present and based on threshold models developed by Swindle, et al. (1997) and Perkins (2000) that indicate the 200- to 300-meter radius (and sometimes greater), encompassing up to 70 acres around a nest is important to spotted owls. Additionally, large blocks of habitat located in high habitat suitability according to

the Relative Habitat Suitability (RHS) output from the MaxEnt model (USFWS 2011a) have a higher potential of supporting owls. Abiotic factors represented in the high habitat suitability, such as slope, aspect, and core habitat, increase the likelihood of supporting nesting owls compared to other locations across the landscape.

BLM is completing 2012 NSO protocol surveys for the Bieber Salt, Cold Elk, and Lost Creek projects, which includes surveying NRF habitat within the provincial home range distance of the proposed units. Surveys are being conducted within historic home ranges and outside of historic home ranges. Spot checks surveys will continue as needed according to the protocol. At the time of this BA submission, no new spotted owl sites have been found in the potential contiguous large block areas of NRF within the action areas. If owls are located, the BLM will modify or drop the units to reduce potential effects to spotted owls or reinitiate consultation.

PPTLR

As mentioned above, surveys will not be conducted for the project activities. The project is entirely located in low habitat suitability according to the Relative Habitat Suitability (RHS) output from the MaxEnt model (USFWS 2011a). Approximately four percent of the action area is within high habitat suitability. The project area is located north of the Rogue River between Grants Pass and Sam's Valley, in a location that does not provide any nesting opportunities for spotted owls due to past fires and current vegetation conditions. There is only one large contiguous patches of NRF (70 acres or greater), but the area does not occur in high habitat suitability according to the Relative Habitat Suitability (RHS) output from the MaxEnt model (USFWS 2011a). Abiotic factors represented in the high habitat suitability, such as slope, aspect, and core habitat, increase the likelihood of supporting nesting owls compared to other locations across the landscape. The amount of habitat within an approximate 0.5-mile radius provides a reliable predictor of occupancy; the quantity and configuration have been shown to provide reasonable inferences into survival and reproduction. The BLM conducted a GIS analysis by placing a point in available large contiguous NRF stands (70 acres or greater) on BLM lands and buffering the location by 0.5 miles to determine if the amount of NRF habitat on federal lands could support owls. This analysis was done even though the 70 acre patches occurred in low relative habitat suitability.

The results indicated that the one large patch of habitat in the PPTLR action area could not support a nesting pair of owls because only 23 percent of NRF habitat exists on federal lands within the 500 acre analysis area. Additionally, only 7 percent NRF habitat on federal lands within a potential 1.3 mile home range of this NRF patch. Generally, survival and reproduction are supported when there is between 40 and 60 percent older forest within the core (Dugger, et al. 2005).

4.1.4 Northern Spotted Owl Prey Species

The composition of the spotted owl's diet varies geographically and by forest type. Generally, flying squirrels are the most prominent prey for spotted owls in Douglas-fir and western hemlock forests in Washington and Oregon (USDI FWS 2011). In southwest Oregon, dusky-footed woodrats are a primary prey species for spotted owls. They are typically found in high densities in early-seral or edge habitat (Sakai and Noon 1993; Bingham and Noon 1997), but are also

abundant in old growth and complex forests (Carey, et al. 1997). Northern flying squirrels are another major source of owl prey in southwest Oregon. While red tree voles (RTVs) may comprise only 2.6 percent of the diet of spotted owls on the majority of the Medford District (Interior Southwest Zone), the Cold Elk Project is closer to the South Coast Zone where RTVs make up 18.2 percent of the spotted owls diet (Forsman et al. 2004).

Surveys were completed across the Cold Elk planning area where forest stands were at least 80 years old and met habitat conditions and habitat altering activities were being considered that would trigger pre-disturbance surveys (USDA USDI 2012). Approximately 3,450 acres were surveyed for RTV's within the planning area and approximately 1,020 acres were buffered (dropped) from treatment where active and associated inactive RTV nests were found.

The Bieber Salt and Lost Creek Projects are outside of the range of the red tree vole. Other important prey items include deer mice, red-backed voles, gophers, snowshoe hare, bushy-tailed wood rats, birds, and insects, although these species comprise a small portion of the spotted owl diet (USDI FWS 2011).

4.1.5 Barred Owls

The 2011 Revised Recovery Plan for the Northern Spotted Owl identifies competition from the barred owl as a threat to the spotted owl (USDI FWS 2011). Barred owls (*Strix varia*) are native to eastern North America, but have moved west into spotted owl habitat. Existing evidence suggests that barred owls compete with northern spotted owls for habitat and prey with near total niche overlap and that interference competition (Dugger, et al. 2011; Van Lanen, et al. 2011; Wiens et al. 2014) is resulting in increased northern spotted owl site abandonment, reduced colonization rates, and likely reduction in reproduction (Olson, et al. 2005; Dugger, et al. 2011; Forsman, et al. 2011; Wiens et al. 2014).

Barred owls are detected opportunistically because the BLM does not conduct barred owl surveys across the District. These incidental observations are increasing within the Medford District, which matches the trend of increasing numbers of barred owls across the range of the northern spotted owl. Incidental observations across the District, as well as information from the Klamath and South Cascades Demography Study Areas, indicate that barred owls are increasing in southwest Oregon. Local populations of barred owls are likely to increase over time. Observational data suggests direct competition with and aggressive displacement of spotted owls from prime nesting habitat.

The BLM did not conduct surveys specifically for barred owls in the Bieber Salt, Cold Elk, and Lost Creek Project Areas. While the BLM did not specifically survey for barred owls, a study in the Oregon Coast range suggests that over the course of a season, spotted owl surveys to protocol (> 3 visits) allow ~85 percent of the barred owls present in the area to be detected (Wiens et al. 2011). Additionally, the 2012 NSO survey protocol allows for a reasonable assurance that spotted owls in an area will be detected, even where barred owls are present. The Service and cooperators conducted analyses of historical spotted owl survey data, leading to estimates of detection rates for spotted owls that account for the effects of barred owl presence. These detection rates, along with data on spotted owl site colonization and extinction probabilities, and

empirical analysis of spotted owl site occupancy, were utilized in developing the survey protocol used by the BLM in the Project Area. Use of the 2012 Protocol serves two primary purposes: (1) provide a methodology that results in adequate coverage and assessment of an area for the presence of spotted owls, and (2) ensure a high probability of locating resident spotted owls and identifying owl territories that may be affected by a proposed management activity, thereby minimizing the potential for unauthorized incidental take (USFWS 2012).

Barred owls have been recorded when detected during spotted owl surveys. Table 13 summarizes the barred owl observations in each project. Of the 25 NSO territories associated with the Cold Elk project, 14 have had barred owl detections. Within the past 5 years, 7 sites were occupied by pairs of barred owls. This trend is consistent with larger range-wide trends of increased barred owl occupancy, and data from the Klamath Demographic Study Area (KSA) has shown the percentage of spotted owl sites with barred owl detections is steadily increasing, from less than 10 percent in all years previous to 2003, to greater than 10 percent in all years after 2003 (Hollen et. al. 2015). On the KSA, the number of sites where barred owls were detected exceeded the number of sites where spotted owls were detected for the first time in 2014 (Hollen et. al. 2015).

Of the 25 NSO territories associated with the Bieber Salt and Lost Creek projects, 13 have had barred owl detections. It is unknown how many different barred owls the single detections represent; however, it has been confirmed that there are six NSO sites with barred owl pairs in the last 5 years.

Table 13. Barred Owl Observations by Project

Project	Total NSO Territories	Sites with Barred Owl Observations	NSO IDNOs with Barred Owl Detections	Comments
Bieber Salt	10	3	2004O, 2005O, 3255B	
Cold Elk	25	14	0098A, 0905O, 0937O, 2072O, 2016B, 2079A, 2236O, 2249O, 2407A, 2622A, 2662O, 3926O 4615O, 4671O	Nesting barred owls at three NSO sites (2407A, 4615O, and 4671O)
Lost Creek	15	10	0879O, 1831O, 2003O, 2024O, 2058O, 2221O, 2276O, 2359O, 4036O, 4617O	Barred owl pair at site 4617O since 2012 and nested with young in 2014.
PPTLR	0	0	N/A	No NSO sites

4.1.6 Status of Northern Spotted Owl Critical Habitat

Critical habitat for the northern spotted owl was first designated in 1992 in *Federal Register* 57 (USDI 1992), and includes the primary constituent elements that support nesting, roosting, foraging, and dispersal. Designated critical habitat also includes forest land that is currently unsuitable, but has the capability of becoming NRF habitat in the future (57 FR 10:1796-1837). Critical habitat was revised for the northern spotted owl and the final designation was published by the Service in the *Federal Register* (signed on August 12, 2008, 73 FR 157:47326) and

became effective on September 12, 2008. The 2008 Service's Critical Habitat delineations were challenged in court and the 2008 designation of northern spotted owl CHU was remanded. The Service was ordered to revise the CHU designation. On February 28, 2012, the Service released the proposed critical habitat in the form of maps and the draft form of the *Federal Register* publication. The proposed rule was published in the *Federal Register* on March 8, 2012 (77 FR 46:14062-14165). The final Critical Habitat Rule was published in the *Federal Register* on December 4, 2012 (77 FR 233:71876-72068) and became effective January 3, 2013.

Section 4(a)(3) of the ESA specifies that the Service shall designate critical habitat for endangered or threatened species and may, from time-to-time thereafter as appropriate, revise such designation. Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features that are essential to the conservation of the listed species and which may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of a listed species. Regulations focus on the "primary constituent elements," or PCEs, in identifying these physical or biological features. The physical or biological features essential to the conservation of the northern spotted owl are forested lands that are used or likely to be used for nesting, roosting, foraging, or dispersing.

Primary Constituent Elements of Critical Habitat

Based on current research on the life history, biology, and ecology of the northern spotted owl and the requirements of the habitat to sustain its essential life history functions, as described above, the Service has identified the following PCEs for the northern spotted owl:

1) Forest types that may be in early, mid-, or late-seral states and support the northern spotted owl across its geographical range

2) Habitat that provides for nesting and roosting. This habitat must provide:
   a) Sufficient foraging habitat to meet the home range needs of territorial pairs of northern spotted owls throughout the year.
   b) Stands for nesting and roosting that are generally characterized by:
      (i) Moderate to high canopy cover (60 to over 80 percent),
      (ii) Multilayered, multispecies canopies with large (20–30 in. [51-76 cm] or greater dbh) overstory trees,
      (iii) High basal area (greater than 240 ft^2/acre [55 m^2/ha]),
      (iv) High diversity of different diameters of trees,
      (v) High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence)
      (vi) Large snags and large accumulations of fallen trees and other woody debris on the ground, and
      (vii) Sufficient open space below the canopy for northern spotted owls to fly.

3) Habitat that provides for foraging, which varies widely across the northern spotted owl's range, in accordance with ecological conditions and disturbance regimes that influence vegetation structure and prey species distributions.

4) Habitat to support the transience and colonization phases of dispersal, which in all cases would optimally be composed of nesting, roosting, or foraging habitat (PCEs (2) or (3)), but which may also be composed of other forest types that occur between larger blocks of nesting, roosting, and foraging habitat. In cases where nesting, roosting, or foraging habitats are insufficient to provide for dispersing or nonbreeding owls, the specific dispersal habitat PCEs for the northern spotted owl may be provided by the following:
   a) Habitat supporting the transience phase of dispersal, which includes:
      (i) Stands with adequate tree size and canopy cover to provide protection from avian predators and minimal foraging opportunities; in general this may include, but is not limited to, trees with at least 11 in. (28 cm) dbh and a minimum 40 percent canopy cover; and
      (ii) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.
   b) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting, and foraging habitat as described in PCEs (2) and (3), but may be smaller in area than that needed to support nesting pairs.

Approximately 319 acres of the proposed Bieber Salt Project treatments and 3,484 acres of the proposed Cold Elk Project occur in northern spotted owl habitat (NRF, Roosting/Foraging, and Dispersal) within the 2012 Revised Designated Northern Spotted Owl (NSO) Critical Habitat (77 Federal Register 233:71876-72068). The Bieber Salt Project is within Critical Habitat Unit 10 and sub-unit KLE-5. The Cold Elk Project is within Critical Habitat 9 and sub-unit KLW-1. Even though the Cold Elk Area includes land in sub-unit KLW-2, no Cold Elk treatment units occur in sub-unit KLW-2. The following descriptions for CHU 9 and 10 and their associated sub-units where proposed treatments occur are directly out of the final rule in the *Federal Register* (77 Federal Register 233:71931-71935). The Lost Creek and the PPTLR are not located within designated NSO Critical Habitat.

Unit 9: Klamath West (KLW)

Unit 9 contains nine subunits, and consists of the western portion of the Klamath Mountains Ecological Section M261A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994, Section M261A). A long north-south trending system of mountains (particularly South Fork Mountain) creates a rainshadow effect that separates this region from more mesic conditions to the west. This region is characterized by very high climatic and vegetative diversity resulting from steep gradients of elevation, dissected topography, and the influence of marine air (relatively high potential precipitation). These conditions support a highly diverse mix of mesic forest communities such as Pacific Douglas-fir, Douglas-fir tanoak, and mixed evergreen forest interspersed with more xeric forest types. Overall, the distribution of tanoak is a dominant factor distinguishing the Western Klamath Region. Douglas-fir dwarf mistletoe is uncommon and seldom used for nesting

platforms by northern spotted owls. The prey base of northern spotted owls within the Western Klamath is diverse, but dominated by woodrats and flying squirrels.

Sub-unit KLW-1

The KLW-1 subunit occurs in Douglas, Josephine, Curry, and Coos Counties, Oregon, and comprises lands managed by the State of Oregon and the BLM. Of this subunit 7,682 ac (3,109 ha) are managed by the State of Oregon for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Southwest Oregon State Forests Management Plan (ODF 2010b, entire). Federal lands are managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats to the essential physical or biological features from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support to the overall population and for north-south and east-west connectivity between subunits and critical habitat units. This subunit sits at the western edge of an important connectivity corridor between coastal Oregon and the western Cascades.

There are approximately 114 total historic spotted owl sites on BLM lands in this entire critical habitat sub-unit.

Unit 10: Klamath East (KLE)

Unit 10 contains seven subunits and consists of the eastern portion of the Klamath Mountains Ecological Section M261A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994, Section M261A), and portions of the Southern Cascades Ecological Section M261D in Oregon. This region is characterized by a Mediterranean climate, greatly reduced influence of marine air, and steep, dissected terrain. Franklin and Dyrness (1988, pp. 137-149) differentiate the mixed-conifer forest occurring on the "Cascade side of the Klamath from the more mesic mixed evergreen forests on the western portion (Siskiyou Mountains)," and Kuchler (1977) separates out the eastern Klamath based on increased occurrence of ponderosa pine. The mixed-conifer/evergreen hardwood forest types typical of the Klamath region extend into the southern Cascades in the vicinity of Roseburg and the North Umpqua River, where they grade into the western hemlock forest typical of the Cascades. High summer temperatures and a mosaic of open forest conditions and Oregon white oak (*Quercus garryana*) woodlands act to influence northern spotted owl distribution in this region. Northern spotted owls occur at elevations up to 1,768 m. Dwarf mistletoe provides an important component of nesting habitat, providing additional structure and enabling northern spotted owls to occasionally nest within stands of relatively younger, small trees.

Subunit KLE-5

The KLE-5 subunit occurs in Jackson County, Oregon, and comprises lands managed by the BLM. The BLM lands are managed per the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats to the essential physical or biological features from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls.

This subunit is expected to function primarily for north-south connectivity between subunits, but also for demographic support.

There are approximately 40 total historic spotted owl sites on BLM lands in this entire critical habitat sub-unit. This critical habitat sub-unit is not within lands managed by the Forest Service.

Northern Spotted Owl Critical Habitat Baseline Data
Table 14 summarizes the NSO habitat baseline for the entire critical habitat subunits KLE-5 and KLW-1. The Service created the habitat baseline acres by clipping the NWFP Interagency Regional Monitoring Program NSO habitat layer to the December 2012 critical habitat layer. The Service then created a spreadsheet on December 19, 2012 with the baseline habitat acres by CHUs and subunits. For this BA, the BLM used the May 2, 2016 USFWS updated critical habitat acres for the current CH habitat baseline for subunits. These acres were derived by subtracting NSO habitat removed by habitat-altering projects and fires from the December 19, 2012 layer. Project specific habitat calls are based on field verification, GIS habitat layers, and photo interpretation.

Table 14. Critical Habitat Baseline (acres)

CHU/ Subunit	NRF	Dispersal-Only	Dispersal (NRF + Dispersal-Only)	Capable or Non-Habitat	Total (Dispersal + Capable + Non-Habitat)
9-KLW-1	72,080	45,511	117,591	29,672	147,263
10-KLE-5	18,475	13,065	31,540	6,712	38,252

* Total Unit acres, Source: Recent projects in the USFWS NWFP tracking database subtracted from the USFWS NSOCH_2012_Baseline_Summaries_Dec19_2012 Data on May, 2, 2016.

4.2 Marbled Murrelet

4.2.1 Status of Marbled Murrelet Habitat in the Action Area

The Action Area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR 402.02). The marbled murrelet action area for this BA is based on the NSO Cold Elk Action area in order to account for the baseline conditions adjacent to the project area.

Table 15 displays the amount of suitable marbled murrelet habitat Cold Elk Action Area.

The BLM used the spotted owl NRF habitat layer to identify areas that have the potential to provide the forest structure necessary to provide for nesting of murrelets. The NRF baseline layer is a broad category that likely overestimates suitable marbled murrelet habitat with high quality nesting habitat because the layer also includes RF (roosting/foraging) habitat, which may not have suitable marbled murrelet nesting structure. However, the Medford District does not have a corporate habitat data system in place to evaluate large branches and special site-specific criteria that would qualify as potential marbled murrelet habitat. Prior to implementation the projects will be evaluated in the field to refine project-level marbled murrelet habitat conditions.

Table 15. Marbled Murrelet Habitat Baseline		
Action Area	**Total Suitable Habitat on Federal Lands within the Action Area**	**Suitable Habitat on Federal Lands within Zones A/B**
Cold Elk Project AA	21,478 acres	12,928 acres

4.2.2 Status of Marbled Murrelet Occupancy in the Action Area

The Cold Elk Project occurs within the marbled murrelet Zone A (western hemlock Zone) and Zone B (10 kilometer buffer area east of Zone A). The Medford BLM has never confirmed murrelet occupancy on the Medford district in Zone A or Zone B.

The Forest Service and Medford BLM completed a study to better quantify the likelihood of murrelet occurrence beyond the eastern boundary of the western hemlock/tanoak vegetation zone (marbled murrelet Zone A) in SW Oregon (USDA Forest Service and USDI Bureau of Land Management 2001). This study refined the existing survey zone boundaries to better reflect known murrelet occurrence. Zone A encompasses the known range of the marbled murrelet. Zone B is a "buffer" to area A and includes all land 10 km east of Area A. Surveys are conducted only in Zones A and B. Federal Land east of B is assumed to not be murrelet habitat, and is no longer surveyed. The project area is within Zone A and B. To date, no murrelets have been found in Zone A or Zone B on the Medford District (Grants Pass Resource Area). Appendix J of FY 06-08 BA (USDA, USDI 2006) includes a letter from the Service concurring with our study conclusions: *Technical Assistance on the Final Results of Landscape level Surveys for Marbled Murrelets in Southwest Oregon (USDI Fish and Wildlife Service reference: 1-7-02-TA-6401).*

Protocol surveys have previously been conducted in the West Fork Cow Creek 5th field watershed at 506 stations from 1995 – 2002 (*Alegria et.al. 2002*). An additional 54 survey stations were surveyed for project clearance (2009-2011) which overlap the Cold Elk project area, for a total of 560 survey stations, with no murrelets detected. Including surveys in Zone A and B within the Grants Pass Resource Area, 850 stations from 1995 through 2011 have been surveyed with no detections.

The 2003 revision of the approved protocol (Mack et al. 2003) confirmed the marbled murrelet is not likely to be found beyond the western hemlock/tanoak zone at the latitude of the Medford District BLM Grants Pass and Glendale Resource Areas. The protocol states that "murrelet occurrence in the Siskiyou Mountains in Oregon was associated with the extent of the hemlock/tanoak vegetation zone, which occurs 16-51 km (10 - 32 miles) inland" (p.4, Mack et al. 2003). Specifically referring to this exclusion, Raphael (2006, p.301) noted "Areas classified as habitat may actually fall outside the revised species range." Over 2,000 intensive surveys and 950 general surveys were conducted east of the western hemlock/tanoak zone in southwestern Oregon from 1988 to 1994 and no murrelets were found (Dillingham et al. 1995). Those data were used to revise the survey protocol (Mack et al. 2003) by deleting survey areas as far as 50 miles inland, at this latitude.

The Cold Elk project is approximately 35-40 miles inland from the coast. Increasing distance from the ocean becomes a negative factor in murrelet inland site selection after 12-20 miles (19.5- 32.5 km) (Burger 2002). Additionally, habitat with< 6 trees with potential structure within a 5-acre area, and located> 20 miles (32.5km) inland, has a negligible likelihood of use by nesting murrelets (Burger 2002). The Medford BLM has never confirmed murrelet occupancy on the district. Figure 2 displays marbled murrelet occupied sites in relation to the Westside BLM Districts.

Based on the information presented above, there is a low likelihood of marbled murrelets nesting on the Medford District. However, because surveys will not be conducted, the BLM is assuming suitable habitat may be occupied and have included project design features to avoid adverse effects to marbled murrelets (see Effects Section).

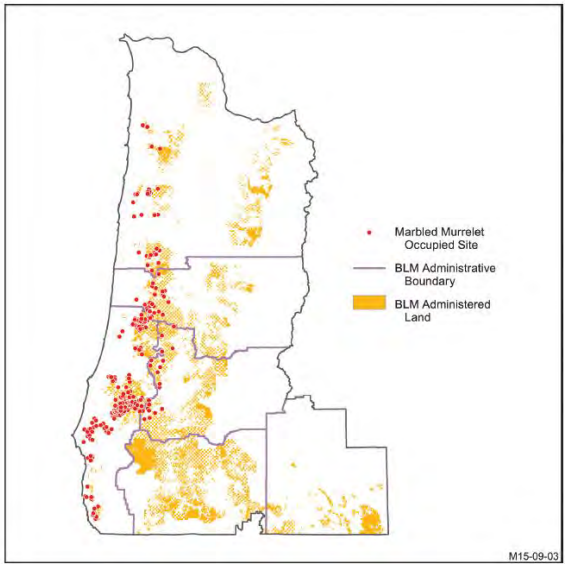

Figure 2: Marbled Murrelet Occupied Sites in Western Oregon (USDI 2016)

5. EFFECTS OF THE PROPOSED ACTION

***Interrelated and Interdependent Actions*:** Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interrelated actions are related to the federal action, but do not depend on the federal action. Interdependent actions are those that might occur independently of the larger action, but which have no independent utility apart from the action under consideration. Interdependent actions depend on the federal action and would make no sense without the federal action.

Because the individual activities of the proposed action would be planned, managed, or reviewed and, in most cases, implemented by the federal administrative units, no activities evaluated by this assessment would be interrelated or interdependent to the proposed action. The effects, described below, encompass all potential effects from the proposed action.

5.1 Effects to Northern Spotted Owls

5.1.1 Effects to Northern Spotted Owls Analyzed by Habitat

The effects to NRF (including RF) and dispersal-only habitats are summarized in Table 16 and displayed in the maps in Appendix E. The project listed in this BA represents the current proposal for the Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects. It is likely the effects to habitat described below would be reduced at the time of the NEPA Decision Record because it is anticipated that acres would be deferred for various reasons including economics or logging feasibility issues, resulting in fewer acres offered for sale. Consultation monitoring reports will reflect the actual implemented acres for this project.

Table 16. Effects to NSO Habitat from the Proposed Actions (except road maintenance)

	NRF Remove (acres)		NRF Downgrade (acres)		NRF T&M (acres)		Dispersal-only Remove[4] (acres)	Dispersal-only T&M (acres)	Total Acres Treated
	NRF[2]	RF[3]	NRF[2]	RF[3]	NRF[2]	RF[3]			
Action Area Baseline Habitat ***(From Table 8)***	***(24,886)***						***(43,780)*** *(NRF + Dispersal-only)*		***66,014[1]*** *(total AA)*
Cold Elk Project	0	8	0	274	67	937	32	2,066	**3,384**
% Change to the Cold Elk Action Area Baseline Habitat	**-0.3%**		**-1.1%**		**No Change**		**-0.07%**	**No Change**	**5.1 % of AA treated**
Action Area Baseline Habitat ***(From Table 7)***	***(17,441)***						***(46,787)*** *(NRF + Dispersal-only)*		***81,186[1]*** *(total AA)*
Bieber Salt Project	**0**	**2**	**0**	**66**	**0**	**139**	**62**	**150**	**419**
Lost Creek Project	**21**	**49**	**98**	**380**	**257**	**324**	**47**	**302**	**1,478**
% Change to the BS/LC Action Area Baseline Habitat	**-0.4%**		**-3.1%**		**No Change**		**-0.2%**	**No Change**	**2.3% of AA treated**
Action Area Baseline Habitat ***(From Table 9)***	***(1,419)***						***(4,429)*** *(NRF + Dispersal-only)*		***35,662[1]*** *(total AA)*
PPTLR	**1**	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**14**
% Change to the PPTLR Action Area Baseline Habitat	**-0.07%**		**No Change**		**No Change**		**-0.3%**	**No Change**	**0.04% of AA treated**
TOTAL HABIAT EFFECTS FOR JUNE FY 16 BA	**22**	**59**	**98**	**720**	**324**	**1,400**	**154**	**2,518**	**5,295**

1- Total Action Area acres across all ownership, including non-habitat and capable habitat acres
2- NRF = Nesting/Roosting/Foraging (McKelvey 1)
3- RF = Roosting /Foraging (McKelvey 2)
4- **Total dispersal-only acres, but only the 109 acres outside of critical habitat will be discussed below. The 45 acres in critical habitat will be discussed in the Effects to Critical Habitat Section.**

The determinations below describe the general effects to the habitat from the proposed actions. They represent the total acre effects as summarized in Table 16. The determinations cover NRF removal, NRF downgrade, NRF treat and maintain, dispersal removed, and dispersal treat and maintained collectively for each project unit. These general effect determinations serve as a

starting point for the more detailed analysis for effects to each NSO site within the Action Area and (Section 5.1.2) and for effects to critical habitat (Section 5.1.2).

Effects to NRF Habitat

The BLM has determined the removal of 81 acres of NRF habitat (22 acres of NRF and 59 acres of RF) associated with the Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects (*selective thinning, regeneration harvest, road and landing construction, and ROW removal*) **may affect and is likely to adversely affect (LAA) northern spotted owls because:**

- The removal of NRF habitat from vegetation treatments (16 NRF acres and 35 RF acres) would remove large amounts of key habitat structural elements for roosting and foraging, including large-diameter trees, adequate cover, and hunting perches.
- Regeneration and selective thinning harvest would reduce the overall canopy cover to near or below 40 percent and the existing multi-canopy, uneven age tree structure, and key habitat features would not remain post-treatment. These treatment acres would not be expected to provide suitable NRF habitat for many years post-treatment.
- NRF removal through ROW clearing, road and landing construction is not expected to return to NRF conditions in the future (6 NRF acres and 24 RF acres).
- The removal of these key habitat features would reduce the roosting, foraging, and dispersal opportunities for owls in the Action Area, and lead to increased predation risk.
- Loss of habitat would reduce opportunities for future reproduction and survival of young.
- Removal of NRF and RF would reduce the amount of existing NRF in the Action Areas (federal, state and private): 0.3 percent in the Cold Elk Action Area, 0.4 percent in the Bieber Salt/Lost Creek Action Area, and 0.09 percent in the PPTLR Action Area.

The BLM has determined downgrading 818 acres of NRF (98 acres of NRF and 720 acres of RF) habitat associated with the Bieber Salt, Cold Elk, and Lost Creek Projects (*selective thinning, density management, small diameter thinning, and variable density thinning)* **may affect, and is likely to adversely affect (LAA) northern spotted owls because:**

- Thinning that downgrades suitable NRF habitat to dispersal habitat would remove key habitat elements (high percent of canopy cover and hunting perches).
- The removal of these key habitat features would reduce the roosting and foraging opportunities for owls within the Action Area, and may lead to increased predation risk by exposing owls to other raptors.
- The removal of these key habitat features from NRF downgrade would reduce the amount of existing NRF habitat within the Action Areas (federal, state, private): 1.1 percent in the Cold Elk Action Area and 3.1 percent in the Bieber Salt/Lost Creek Action Area

The BLM has determined that <u>treating and maintaining</u> 1,724 acres of NRF habitat (324 of NRF and 1,400 acres of RF) associated with the Bieber Salt, Cold Elk, and Lost Creek Projects (*selective thinning, density management, small diameter thinning understory reduction, and variable density thinning*) **<u>may affect, but is not likely to adversely affect (NLAA)</u> northern spotted owls because:**

- Treatments would not change the intended function of the habitat and the conditions that would classify the stand as NRF would remain post-treatment.
- Canopy cover in treated roosting/foraging stands would be retained at or above 60 percent, which would provide the minimum canopy to function as NRF habitat.
- Approximately 324 acres of NRF (McKelvey 1) habitat would be treated and maintained within the Lost Creek and Cold Elk projects. In order to maintain NRF function post-harvest, no more than 20 percent of the existing basal area would be removed (Wagner and Anthony, 1998). Generally no more than 20 percent of the existing basal area would be removed. The wildlife biologist and prescription writer would review the NRF (McKelevey 1 units) to habitat elements are retained to ensure the stands would still function as NRF (McKelvey 1) habitat post-treatment.
- Roosting/foraging stands (McKelvey 2) would maintain a minimum of 160 ft^2/acre total basal area (conifer and hardwoods) in the Bieber Salt/Lost Creek projects and a minimum of 150 ft^2/acre total basal area (conifer and hardwoods) in the Cold Elk project.
- Multiple canopy layers would be retained in stands with more than one layer present prior to treatment, which would provide canopy layering necessary to function as NRF habitat.
- Decadent components important to owls, such as large snags, large down wood, and large hardwoods, would be retained within the stands. Snags that must be felled to meet Occupational Safety and Health Administration guidelines would be left on site where safety allows.
- Small openings (approximately 0.1 to 0.25 acre) in group selection units would not exceed 20 percent of the treatment area to maintain NRF quality and canopy cover.
- No spotted owl nest trees would be removed.

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<u>Effects to Dispersal-only Habitat</u>

The BLM has determined that the <u>removal</u> of 96 acres of dispersal-only habitat associated with the Bieber Salt, Cold Elk, and Lost Creek Projects (*regeneration harvest, structural retention, laminated root rot, variable density thinning, selective thinning, and road/landing construction*) **located outside of critical habitat <u>may affect, but is not likely to adversely affect (NLAA)</u> northern spotted owls because:**

- No dispersal habitat would be removed in nest patches.
- 89 acres of dispersal-only habitat removal from vegetation treatments outside of critical habitat would be distributed throughout the Action Area. Additional removal of 7 acres

of dispersal-only habitat would occur in small proposed road and landing construction areas.

- Removal of dispersal-only habitat would occur in two 5th field watersheds (Little Butte Creek – Bieber Salt project and Lost Creek-Rogue River – Lost Creek project). According to Table 10, these watersheds currently have more than 50 percent of the watershed in dispersal habitat conditions (NRF + dispersal-only). The dispersal removal associated with the Bieber Salt and Lost Creek projects would not drop the amount of dispersal habitat below the 50 percent threshold post-harvest.
- The removal of 96 acres of dispersal-only habitat outside of critical habitat would not preclude owls from dispersing throughout the Action Area. Removal of dispersal-only habitat would result in the reduction the total dispersal habitat (NRF and dispersal-only) in the Action Areas: 96 acres (0.2 percent) in the Bieber Salt/Lost Creek Action Area.
- The additional 50 acres of NRF removal would reduce total dispersal habitat in the action areas by 0.3 percent in the Bieber Salt/Lost Creek Action Area.
- Forest landscapes traversed by dispersing owls typically include a fragmented mosaic of roads, clear-cuts, and non-forested areas, and a variety of forest age classes ranging from fragmented forests on cutover areas to old-growth forests (Forsman, et al. 2002).
- Approximately 45 acres of dispersal-only habitat removal within critical habitat may affect and is likely to adversely affect northern spotted owls (see Effects to Critical Habitat section below).

The BLM has determined that the <u>removal</u> of 13 acres of dispersal-only habitat associated with the PPTLR Project <u>may affect, and is likely to adversely affect (LAA)</u> northern spotted owls because:

- Approximately 13 acres of dispersal-only habitat removal from the PPLTR project is proposed in the Grants Pass-Rogue River watershed, which currently has less than 50 percent of the watershed in dispersal habitat (NRF + dispersal-only).
- The removal of 13 acres of dispersal-only habitat within this fifth field watershed would not preclude owls from dispersing throughout the watershed and would result in an insignificant and discountable reduction of dispersal-only habitat in the watershed. This removal would reduce the dispersal habitat in the 5th field watershed by only 0.04 percent.
- The removal of 13 acres of dispersal-only habitat outside of critical habitat would not preclude owls from dispersing throughout the Action Area. Removal of dispersal-only habitat would result in the reduction the total dispersal habitat (NRF and dispersal-only) in the Action Area by 13 acres (0.3 percent) in the PPTLR Action Area. The additional 1acre of NRF removal would reduce total dispersal habitat in the action areas by 0.3 percent in the PPTLR Action Area.

The BLM has determined that <u>treating and maintaining</u> 2,518 acres of dispersal-only habitat associated with the Bieber Salt, Cold Elk, and Lost Creek Projects (*selective thinning, fuels treatments, small diameter thinning, understory thinning, and variable density thinning*) **<u>may affect, but is not likely to adversely affect (NLAA)</u> northern spotted owls because:**

- Treatments would not change the intended function of the habitat and the conditions that classify the stand as dispersal would remain post-treatment.
- Canopy cover in treated stands will be maintained at 40 percent and key habitat features would be retained, which would enable the stands to continue to function as dispersal habitat.
- Decadent components important to owls, such as large snags, large down wood, and large hardwoods, would be retained. Snags that must be felled for Occupational Safety and Health Administration guidelines would be left on-site where safety allows.
- These treatment acres would be expected to continue to provide dispersal opportunities post-treatment.
- The proposed treatments would be distributed throughout the Action Area to minimize the potential for adversely affecting spotted owl dispersal.

<u>Effects to NRF and Dispersal-only Habitat from Road Maintenance Activities</u>

Table 17 below summarizes the amount of Road Maintenance activities by project and habitat type. The work would be done within the vegetation that is part of the road prism, or the area affected by original road construction. The activities would remove vegetation, but due to the proximity of the already disturbed area and minimal distance into the stand, the effects are not described as habitat removal. At a minimum, the effects could be described as disturbance when near owl sites, but seasonal restrictions would be applied to avoid disturbance effects.

The BLM has determined that road maintenance vegetation treatments <u>adjacent to 45</u> acres spotted owl habitat associated with the Bieber Salt, Cold Elk, and Lost Creek Projects <u>may affect, but is not likely to adversely affect (NLAA)</u> northern spotted owls because:

- Treatments would not change the function of the larger stand of NSO habitat beyond the road prism. The road prism area has been previously disturbed and the vegetation does not contribute to the function of the adjacent habitat. Treatments would not occur beyond the original road prism/clearing limits.
- Treatments would not change the intended function of the habitat and the conditions that classify the stand as dispersal or NRF would remain post-treatment.
- Seasonal restrictions would be applied to avoid effects from disturbance.
- The treatments would also have beneficial effects to the adjacent spotted owl habitat by reducing fuel build-up adjacent to the road, which could help protect the adjacent habitat.

The treatment would also improve and maintain fire breaks provided by the road management system.

Table 17. Effects to NSO Habitat from the Road Maintenance projects

Project	Activity	Treatment Acres Adjacent to NRF	Treatment Acres Adjacent to RF	Treatment Acres Adjacent to Dispersal
Cold Elk	Road Maintenance - Daylighting	0	11	17
Bieber Salt	Road Maintenance	0	1	2
Lost Creek	Road Maintenance	5	5	4
	TOTAL	**5**	**17**	**23**

5.1.2 Effects to Northern Spotted Owl Sites

Analysis Methods

This section summarizes the analysis used for this consultation. For this particular consultation, the BLM developed a set of factors based on NSO resource use across the landscape at various spatial scales (home range, core use area, and nest patch) to inform the effects analysis. The spatial scales and general factors are described below, followed by the effects to individual owl sites.

Habitat reduction from the proposed actions will be analyzed at the home range, core, and nest patch scales. These scales are described in more detail below:

Home Range Circle is an approximation of the median home range size used by spotted owls. The Medford District uses the median home range estimated for southwestern Oregon of 3,400 acres or a circle with a radius of 1.2 for the West Cascades Province and 1.3 miles for the Klamath Province (Thomas, et al. 1990; Courtney, et al. 2004). The Home Range Circle provides a coarse but useful analogue of the median home range for northern spotted owl (Lehmkuhl and Raphael 1993; Raphael, et al. 1996). Although it provides an imprecise estimate of actual home ranges, the home range circle approach has been used to show that stand age/structure, patch size, and configuration within the circle influences the likelihood of occupancy. When less than 40 to 60 percent of the circle is in NRF habitat, the likelihood of spotted owl presence is lower, and survival and reproduction may be reduced (Thomas, et al. 1990; Bart and Forsman 1992; Bart 1995; Dugger, et al. 2005). Therefore, the home range circle is a useful analytical scale for the purpose of quantifying habitat and the impact to owl sites from proposed habitat modification. The provincial home ranges of several owl pairs may overlap.

Core Area Circle has a radius that captures the approximate core use area, defined as the area around the nest tree that receives disproportionate use (Bingham and Noon 1997). The Medford District uses a 0.5-mile radius (≈500 acre) circle to approximate the core area. Research has indicated that the quantity and configuration of "older forest" (analogous to NRF habitat) provides a valid inference into the likelihood of occupancy (Hunter, et al. 1995), survival, and reproduction (Franklin, et al. 2000; Zabel, et al. 2003; Olson, et al. 2004; Dugger, et al. 2005;

Dugger, et al. 2011). Generally survival and reproduction are supported when there is between 40 and 60 percent older forest within the core (Dugger, et al. 2005), but local conditions and possibly pair experience, contribute to large variance in actual amounts for individual owls. The amount of habitat within an approximate 0.5-mile radius provides reliable predictor of occupancy, and the quantity and configuration have been shown to provide reasonable inferences into survival and reproduction. Core areas represent the areas that are defended by territorial owls and generally do not overlap the core areas of other owl pairs (Wagner and Anthony 1998; Dugger, et al. 2005; Zabel, et al. 2003; Bingham and Noon 1997).

Nest Patch is the 300-meter radius (70 acres) around a known or likely nest site and is included in the core and home range areas. Nest area arrangement and nest patch size have been shown to be an important attribute for site selection by spotted owls (Swindle, et al. 1997; Perkins 2000; Miller, et al. 1989; Meyer, et al. 1998). Models developed by Swindle, et al. (1997) and Perkins,(2000) showed that the 200- to 300-meter radius (and sometimes greater), encompassing up to approximately 70 acres, around a nest is important to spotted owls. The nest patch size also represents key areas used by juveniles prior to dispersal. Miller, et al. (1989) found that the extent of forested area used by juvenile owls prior to dispersal averaged approximately 70 acres.

Analysis Approach

Using best available habitat and spatial use information on northern spotted owls, the BLM developed a general approach, informed by local conditions, to evaluate effects determinations for individual sites affected by the proposed action. Table 18 provides the general approach, while recognizing site-specific conditions may provide exceptions to the factors.

Table 18. Medford BLM General Factors for NSO Site Effect Determinations

LAA Determination Factors	NLAA Determination Factors
• More than 2 acres of contiguous NRF Removal or Downgrade in a 0.5 mile core area or home range. • NRF treatment in the nest patch. • Treatments in NRF in the 0.5 mile core areas with low amounts of NRF habitat pretreatment.	• NRF would not be removed or downgraded within the home range, 0.5-mile core area, or nest patch. • Less than 2 acres of contiguous NRF removal or downgrade in the home range or 0.5-mile core area. • No treatment in a nest patch.

Effects to Individual Owl Sites

As indicated above in the NSO Site Baseline Section, there are 50 owl sites/territories affected by the proposed projects. Some treatments are proposed in all 50 home ranges. Effect determinations to NSO sites are based on changes to habitat conditions and potential noise disturbance during the critical breeding season. The effects to the owl sites are analyzed below and summarized in Tables 19 and 20. Maps displaying owl sites, home ranges, 0.5-mile core areas, nest patches, and proposed units are included in Appendix E.

As indicated in Tables 19 and 20, the NRF habitat amounts are currently low on federal lands within the home ranges of 42 territories and 29 of the 0.5-mile core areas. All of the Bieber Salt

sites and Lost Creek sites have low NRF habitat at the home range scale and all of the Bieber Salt sites have low NRF habitat at the 0.5 mile core scale. There is more contiguous federal ownership within the Cold Elk project, so more sites currently have higher amounts of NRF habitat at the home range and 0.5 mile core area scales. When less than 40 to 60 percent of the home range is NRF habitat, the likelihood of spotted owl presence is lower and survival and reproduction may be reduced (Thomas, et al. 1990; Bart and Forsman 1992; Bart 1995; Dugger, et al. 2005). Additionally, adjacent private lands have removed or could remove potential NRF on their lands within NSO home ranges. Therefore, the BLM cannot assume private lands are contributing to the older forest conditions in these home range and core areas in the Bieber Salt, Cold Elk, and Lost Creek projects.

Sites Likely to be Adversely Affected from Habitat Modification:
Based on the general factors listed in Table 18, 22 sites would be adversely affected by the proposed action. Five of these sites were ranked high in the RA10 site priority ranking process due to historically high rates of pair occupancy and reproductive success. While the LAA determinations described below to these high priority sites would be measurable, the proposed actions are not expected to adversely impact reproduction and survival of the owls at the following five high priority sites for the reasons listed below:

- Roosting/Foraging downgrade is proposed in four sites, but the actions are not anticipated to affect occupancy and reproduction because these sites would stay above thresholds post-treatments:
    - Site # 0905O (Cold Elk) – Post-harvest, the NRF thresholds within the home range would be at 60 percent and 82 percent at the 0.5 mile core area scale.
    - Site # 2666O (Cold Elk) – Post-harvest, the NRF thresholds within the home range would be at 75 percent and 94 percent at the 0.5 mile core area scale.
    - Site # 9802T (Cold Elk) – Post-harvest, the NRF thresholds within the home range would be at 53 percent and 84 percent at the 0.5 mile core area scale.
- Approximately 17 percent of the NRF in the 0.5 mile core of Site # 2622A (Cold Elk) would be treated and maintained, which is typically an amount that could affect foraging and reproduction. However, this site has been unoccupied since 2014 after the Douglas Fire.
- Site # 2276O (Lost Creek) – Four acres of NRF would be removed from road and landing construction within the home range at this site and only 0.5 would be removed within the 0.5 mile core area. The road/landing construction occurs in low habitat suitability (RHS). These 4 acres are spread out within the home range and are not contiguous. The removal would not affect the contiguous NRF habitat the owls are using at the center of the 0.5 mile core area. Due to the location and small acreage, it is unlikely the treatments would adversely impact essential habitat for nesting or foraging, which could affect reproduction and survival of the owls associated with the site.

More site specific information for the effects determination for each LAA NSO site is included in Table 19.

Sites Not Likely to be Adversely Affected from Habitat Modification:
Based on the general factors listed in Table 18, 28 sites would not be adversely affected by the proposed action. The proposed action is not expected to adversely impact essential habitat for nesting or foraging, which could affect reproduction and survival of the owls associated with the sites. Sixteen of these 28 sites are high priority sites as determined through the RA10 priority ranking process. More site specific information for the effects determination for each NLAA NSO site is included in Table 20.

Table 19. NSO Sites Adversely Affected (LAA) by the Proposed Action

Site	Pre-treatment NRF Habitat[1] (acres)/%		NRF Habitat Removed (acres)			NRF Downgrade (acres)			Dispersal Removed (acres)			T&M in Home Range (acres)/%		T&M in Core (acres)		Post-Treatment NRF Habitat (acres)/%		Site Status in 2014/ 2015[3]		Comments
	HR	Core	HR	Core	NP	HR	Core	NP	HR	Core	NP	NRF	Disp	NRF	Disp	HR	Core			
Bieber Salt (Home Range=2,895 acres)																				
1303O[2]	572 (20%)	106 (21%)	2	0	0	6	0	0	34	5	0	43	55	0	4	564 (19%)	106 (21%)	NR	NR	
3256O[2]	229 (8%)	86 (17%)	0	0	0	20	20	0	8	0.2	0	0	0	0	0	209 (7%)	66 (13%)	Not Surveyed	Not Surveyed	Site heavily impacted by 2008 blowdown. Very little habitat left. Surveys started in 2016 for remaining habitat
3378O	601 (21%)	184 (37%)	2	2	0	6	6	0	10	0	0	42	3	0	0	593 (20%)	176 (35%)	Male once	NR	2014 male did not meet resident single status
Cold Elk (Home Range= 3,400 acres)																				
0905O[2]	2,058 (61%)	412 (83%)	1	0	0	26	0	0	2	0	0	243	137	76	2	2,031 (60%)	408 (82%)	NR	NR	Still above threshold post-treatment; 0.1 acres of Daylighting treatment adjacent to NRF in the patch, but seasonal restrictions would be implemented.
0920O[2]	1,795 (53%)	253 (51%)	1	0	0	153	4	0	3	1	0	143	367	34	58	1,641 (48%)	253 (51%)	NR	Male once from adjacent site (did not meet resident single status)	Still above threshold post-treatment. Guyline/tailhold trees maybe felled at the edge of the nest patch, which could remove up to 3 trees. If they do need to be felled, they would be left on site for coarse woody debris. 0.9 acres of Daylighting treatment adjacent to NRF in the patch. Seasonal restrictions would be implemented for treatments in the nest patch.

Table 19. NSO Sites Adversely Affected (LAA) by the Proposed Action

Site	Pre-treatment NRF Habitat[1] (acres)/%		NRF Habitat Removed (acres)			NRF Downgrade (acres)			Dispersal Removed (acres)			T&M in Home Range (acres)/%		T&M in Core (acres)		Post-Treatment NRF Habitat (acres)/%		Site Status in 2014/ 2015[3]		Comments
	HR	Core	HR	Core	NP	HR	Core	NP	HR	Core	NP	NRF	Disp	NRF	Disp	HR	Core			
2079A[2]	429 (13%)	167 (34%)	1.5	0	0	0	0	0	5	0.2	0	123	198	32	26	427.5 (13%)	167 (34%)	NR	NR	19% of NRF in core treated.
2622A[2]	932 (27%)	190 (38%)	0	0	0	0	0	0	0	0	0	141	81	32	25	932 (27%)	190 (38)	NR	NR	17% of NRF in core treated. No Response since after 2014 Douglas Fire; Still above threshold post-treatment. Guyline/tailhold trees maybe felled at the edge of the nest patch, which could remove up to 3 trees. Seasonal restrictions would be implemented.
2666O[2]	2,586 (76%)	466 (94%)	0	0	0	22	0	0	0	0	0	91	63	0	0	2,564 (75%)	466 (94%)	NR	Pair	Still above threshold post-treatment
4671O[2]	1,154 (34%)	167 (34%)	1.5	0	0	80	0	0	3	1.6	0	325	293	63	108	1,072.5 (32%)	167 (34%)	NR	Female once (did not meet resident single status)	Likely not occupied with a resident single or territorial pair. Continuing surveys in in 2016. Dozers would be used as anchor trees in the nest patch to avoid the need to fell anchor trees. 0.9 acres of Daylighting treatment adjacent to NRF in the patch. Seasonal restrictions would be implemented for treatments in the nest patch. Seasonal restrictions would also be implemented to avoid potential disturbance effects.
9802T[2]	1,848 (54)	417 (84%)	0.2	0	0	42	0	0	0	0	0	0	0	0	0	1,805.8 (53%)	417 (84%)	Not Surveyed	Male and Female; pair status unknown	Still above threshold post-treatment; Likely not occupied with a resident single or territorial pair. Continuing surveys in in 2016.

Table 19. NSO Sites Adversely Affected (LAA) by the Proposed Action

Site	Pre-treatment NRF Habitat[1] (acres)/%		NRF Habitat Removed (acres)			NRF Downgrade (acres)			Dispersal Removed (acres)			T&M in Home Range (acres)/%		T&M in Core (acres)		Post-Treatment NRF Habitat (acres)/%		Site Status in 2014/ 2015[3]		Comments
	HR	Core	HR	Core	NP	HR	Core	NP	HR	Core	NP	NRF	Disp	NRF	Disp	HR	Core			
Lost Creek (Home Range=2,895 acres)																				
0953A	454 (16%)	118 (24%)	4	0	1	1	0	0	2	0	0	157	19	12	0	449 (16%)	118 (24%)	NR	NR	
0953O	810 (28%)	197 (40%)	3	0.2	0	66	1.3	0	2	0	0	107	33	34	6	741 (26%)	195.5 (39%)			
1831O	395 (14%)	212 (43%)	0	0	0	16	0	0	0	0	0	8	0	0	0	379 (13%)	212 (43%)	NR	NR	
2003O	1,111 (38%)	419 (84%)	3	2	0	16	8	0	1	0.5	0	11	0	11	0	1,092 (38%)	409 (82%)	NR	NR	
2024O	661 (23%)	0 (0%)	3	0	0	16	0	0	1	0	0	0	0	0	0	642 (22%)	0 (0%)	NR	NR	Site Center and core all on Private. Private "decertified" site through ODF and logged site.
2058O	860 (30%)	234 (47%)	0	0	0	13	8	0	0	0	0	17	0	6	0	847 (29%)	226 (45%)	NR	NR	
2221O	249 (9%)	78 (16%)	2	2	0	23	23	0	0	0	0	0	0	0	0	224 (8%)	53 (11%)	NR	NR	
2276O	555 (19%)	165 (33%)	4	0.5	0	0	0	0	0	0	0	64	60	6	0	551 (19%)	164.5 (33%)	NR	NR	Pair 2016; Effects to reproduction are not expected because only 4 acres of NRF would be removed from landing construction and would occur in low habitat suitability (RHS). These 4 acres are spread out within the home range and are not contiguous. The removal would not affect the contiguous NRF habitat the owls are using at the center of the 0.5 mile core area.

Table 19. NSO Sites Adversely Affected (LAA) by the Proposed Action

Site	Pre-treatment NRF Habitat[1] (acres)/%		NRF Habitat Removed (acres)			NRF Downgrade (acres)			Dispersal Removed (acres)			T&M in Home Range (acres)/%		T&M in Core (acres)		Post-Treatment NRF Habitat (acres)/%		Site Status in 2014/ 2015[3]		Comments
	HR	Core	HR	Core	NP	HR	Core	NP	HR	Core	NP	NRF	Disp	NRF	Disp	HR	Core			
2359O	626 (22%)	114 (23%)	2	0	0	149	6	0	1	0	0	65	56	0	6	475 (16%)	108 (22%)	NR	NR	
3562O	324 (11%)	20 (4%)	4	0	0	5	0	0	2	0	0	134	39	0	0	315 (11%)	20 (4%)	Male once	NR	2014 male did not meet resident single status
4036O	200 (7%)	83 (17%)	0	0	0	24	5	0	0	0	0	28	0	10	0	176 (6%)	78 (16%)	NR	NR	
4465O	266 (9%)	158 (32%)	0	0	0	31	2	0	0	0	0	0	0	0	0	235 (8%)	156 (31%)	Not Surveyed	NR	
4617O	455 (16%)	348 (70%)	1	1	0	118	112	0	1	1	0	0	20	0	20	336 (12%)	235 (47%)	NR	NR	

Table 20. NSO Sites Not Adversely Affected (NLAA) by the Proposed Action

Site	Pre-treatment NRF Habitat[1] (acres)/%		NRF Habitat Removed (acres)			NRF Downgrade (acres)			Dispersal Removed (acres)			T&M in Home Range (acres)/%		T&M in Core (acres)		Post-Treatment NRF Habitat (acres)/%		Site Status in 2014/ 2015[3]		General Reason for NLAA Determination
	HR	Core	HR	Core	NP	HR	Core	NP	HR	Core	NP	NRF	Disp	NRF	Disp	HR	Core			
Bieber Salt (Home Range=2,895 acres)																				
0887O[2]	269 (8%)	67 (13%)	0	0	0	0	0	0	34	0	0	31	55	0	0	269 (8%)	67 (13%)	Male once	NR	No detectable change at home range and core scale. 2014 male did not meet resident single status.

Table 20. NSO Sites Not Adversely Affected (NLAA) by the Proposed Action

Site	Pre-treatment NRF Habitat[1] (acres)/%		NRF Habitat Removed (acres)			NRF Downgrade (acres)			Dispersal Removed (acres)			T&M in Home Range (acres)/%		T&M in Core (acres)		Post-Treatment NRF Habitat (acres)/%		Site Status in 2014/ 2015[3]		General Reason for NLAA Determination
	HR	Core	HR	Core	NP	HR	Core	NP	HR	Core	NP	NRF	Disp	NRF	Disp	HR	Core			
0955O	327 (11%)	131 (26%)	0	0	0	0	0	0	0	0	0	3	9	0	0	327 (11%)	131 (26%)	Female once	Female once (from site 3255)	No detectable change at home range and core scale; Female did not meet resident single status
2004O[2]	413 (14%)	140 (28%)	0	0	0	0	0	0	0	0	0	0	0	0	0	413 (14%)	140 (28%)	NR	NR	Roadside only; No detectable change at home range and core scale
2005O[2]	327 (11%)	29 (6%)	0	0	0	0	0	0	7	0	0	0	0	0	0	327 (11%)	29 (6%)	NR	NR	No detectable change at home range and core scale
3255B	472 (16%)	72 (14%)	0	0	0	0	0	0	1	0	0	94	68	0	0	472 (16%)	72 (14%)	Pair w/ young	Pair w/young	No detectable change at home range and core scale
3349O[2]	779 (27%)	242 (49%)	0	0	0	0	0	0	0	0	0	0	2	0	0	779 (27%)	242 (49%)	NR	RS Male	No detectable change at home range and core scale
4466O	291 (10%)	118 (24%)	0	0	0	0	0	0	0	0	0	0	0	0	0	291 (10%)	118 (24%)	NR	Not Surveyed	No detectable change at home range and core scale. Road maintenance only.
Cold Elk (Home Range= 3,400 acres)																				
0098A[2]	2,114 (62%)	373 (75%)	0	0	0	0	0	0	2	0	0	158	30	0	0	2,114 (62%)	373 (75%)	Pair	Pair	No detectable change at home range and core scale
0249O[2]	1,961 (58%)	331 (67%)	0.2	0	0	2	0	0	0	0	0	0	0	0	0	1.958.8 (58%)	331 (67%)	Not Surveyed	Pair	Two acres of NRF downgrade and 0.2 acres of NRF removal from temp roads at the very outer edge of the home range. Actual habitat use at the home range scale is not circular, so unlikely this small amount of downgrade and removal would adversely affect the site. Additionally, only 0.1 percent of the NRF would be affected at the home range and NRF thresholds would still be above threshold post-treatment

Table 20. NSO Sites Not Adversely Affected (NLAA) by the Proposed Action																				
Site	**Pre-treatment NRF Habitat[1] (acres)/%**		**NRF Habitat Removed (acres)**			**NRF Downgrade (acres)**			**Dispersal Removed (acres)**			**T&M in Home Range (acres)/%**		**T&M in Core (acres)**		**Post-Treatment NRF Habitat (acres)/%**		**Site Status in 2014/ 2015[3]**		**General Reason for NLAA Determination**
	HR	**Core**	**HR**	**Core**	**NP**	**HR**	**Core**	**NP**	**HR**	**Core**	**NP**	**NRF**	**Disp**	**NRF**	**Disp**	**HR**	**Core**			
0368B[2]	907 (27%)	139 (28%)	0	0	0	0	0	0	0	0	0	6	2	0	0	907 (27%)	139 (28%)	Pair	Pair	No detectable change at home range and core scale
0937O[2]	2,152 (63%)	288 (58%)	0	0	0	0	0	0	0	0	0	8	11	0	0	2,152 (63%)	288 (58%)	NR	NR	No detectable change at home range and core scale
1911C[2]	531 (16%)	70 (14%)	0	0	0	0	0	0	0	0	0	3	0	0	0	531 (16%)	70 (14%)	NR	NR	No detectable change at home range and core scale
2016B[2]	1,255 (37%)	183 (37%)	0	0	0	0	0	0	0	0	0	50	0	0	0	1,255 (37%)	183 (37%)	Pair	Pair	No detectable change at home range and core scale
2023O[2]	702 (21%)	246 (50%)	0	0	0	0	0	0	3	0.2	0	58	199	5	20	702 (21%)	246 (50%)	Pair	Pair	No detectable change at home range and core scale
2072O[2]	1,057 (31%)	285 (57%)	0.1	0	0	0	0	0	4	0	0	8	113	0	0	1,057 (31%)	285 (57%)	Pair	Pair	No detectable change at home range and core scale
2236O[2]	397 (12%)	146 (30%)	0	0	0	0	0	0	7	1.2	0	35	179	17	38	397 (12%)	146 (30%)	NR	Male and Female; pair status unknown	No detectable change at home range and core scale; 12% of NRF in core treated
2249O[2]	1,005 (30%)	367 (73%)	1	0.2	0	0	0	0	0.6	0	0	95	185	15	16	1,004 (30%)	366.8 (73%)	NR	NR	No detectable change at home range and core scale; 4% of NRF in core treated
2407A[2]	938 (28%)	132 (27%)	1	0	0	0	0	0	9	1.1	0	33	317	0	75	937 (28%)	132 (27%)	NR	NR	No detectable change at home range and core scale
2623O[2]	1,404 (41%)	337 (68%)	1	0	0	0	0	0	6	0	0	198	219	0	0	1,403 (41%)	337 (68%)	Pair	Pair	No detectable change at home range and core scale
2623B[2]	1,222 (33%)	217 (44%)	0	0	0	0	0	0	2	0	0	145	22	0	0	1,222 (33%)	217 (44%)			

Table 20. NSO Sites Not Adversely Affected (NLAA) by the Proposed Action																				
Site	**Pre-treatment NRF Habitat[1] (acres)/%**		**NRF Habitat Removed (acres)**			**NRF Downgrade (acres)**			**Dispersal Removed (acres)**			**T&M in Home Range (acres)/%**		**T&M in Core (acres)**		**Post-Treatment NRF Habitat (acres)/%**		**Site Status in 2014/ 2015[3]**		**General Reason for NLAA Determination**
	HR	**Core**	**HR**	**Core**	**NP**	**HR**	**Core**	**NP**	**HR**	**Core**	**NP**	**NRF**	**Disp**	**NRF**	**Disp**	**HR**	**Core**			
2662O[2]	859 (25%)	199 (40%)	1	0.6	0	0	0	0	6	2	0	21	276	21	39	858 (25%)	198.4 (40%)	NR	NR	No detectable change at home range and core scale; 11% of core NRF treated
2663O[2]	1,344 (40%)	234 (47%)	0	0	0	0	0	0	1.5	0	0	25	227	7	33	1,344 (40%)	234 (47%)	Pair	Male and Female; pair status unknown	No detectable change at home range and core scale. Dozers would be used as anchor trees in the nest patch to avoid the need to fell anchor trees. Seasonal restrictions would also be implemented to avoid potential disturbance effects.
3281O[2]	835 (25%)	168 (34%)	1	0.5	0	0	0	0	1	0.6	0	46	30	6	14	834 (25%)	167.5 (34%)	Pair	One Male Response	No detectable change at home range and core scale. 2015 male did not meet resident single status.
3926O[2]	625 (18%)	216 (44%)	1	0	0	0	0	0	2	0	0	73	156	28	4	624 (18%)	216 (44%)	NR	NR	No detectable change at home range and core scale; 13% of core NRF treated
4051A[2]	760 (22%)	170 (34%)	0.3	0	0	0	0	0	0	0	0	14	59	4	4	759.7 (22%)	170 (34%)	2 females from adjacent sites observed at 4041	Male from adjacent #2072	No detectable change at home range and core scale
4051O[2]	904 (27%)	222 (45%)	0.3	0	0	0	0	0	0	0	0	14	67	4	1	903.7 (27%)	222 (45%)			No detectable change at home range and core scale
4615O[2]	565 (17%)	173 (35%)	0	0	0	0	0	0	0.1	0	0	24	30	0	0	565 (17%)	173 (35%)	NR	NR	No detectable change at home range and core scale
Lost Creek (Home Range=2,895 acres)																				
0879O	713 (25%)	318 (64%)	0	0	0	0	0	0	0	0	0	6	31	0	0	713 (25%)	318 (64%)	NR	RS Male	No detectable change at home range and core scale
2220O	909 (31%)	230 (46%)	1	0	0	0	0	0	1	0	0	239	48	21	7	908 (31%)	230 (46%)	Pair w/ young	Pair w/ young	No detectable change at home range and core scale; 9% of NRF in core treated

Table 20. NSO Sites Not Adversely Affected (NLAA) by the Proposed Action																				
Site	**Pre-treatment NRF Habitat[1] (acres)/%**		**NRF Habitat Removed (acres)**			**NRF Downgrade (acres)**			**Dispersal Removed (acres)**			**T&M in Home Range (acres)/%**		**T&M in Core (acres)**		**Post-Treatment NRF Habitat (acres)/%**		**Site Status in 2014/ 2015[3]**		**General Reason for NLAA Determination**
	HR	**Core**	**HR**	**Core**	**NP**	**HR**	**Core**	**NP**	**HR**	**Core**	**NP**	**NRF**	**Disp**	**NRF**	**Disp**	**HR**	**Core**			
3561A	417 (14%)	47 (9%)	0	0	0	0	0	0	0	0	0	0	9	0	0	417 (14%)	47 (9%)	NR	NR	No detectable change at home range and core scale
3561B	515 (18%)	249 (50%)	0	0	0	0	0	0	0	0	0	0	4	0	0	515 (18%)	249 (50%)	Pair	Pair w/young	No detectable change at home range and core scale
3561O	486 (17%)	119 (24%)	2	0	0	0	0	0	0	0	0	94	59	0	14	484 (17%)	119 (24%)	NR	NR	No detectable change at home range and core scale

1- NRF on federal lands/ percent of habitat within the total home range
2- Site centers are within Critical Habitat
3 – More historical data in Appendix D
NR= No Response
RS= Resident Single
RA10 High Priority Sites

Proposed Treatments Outside of Known Home Ranges
The Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects are proposing to treat 625 acres of spotted owl habitat outside of home ranges of historic spotted owl sites. These acres are a subset of the total project acres listed in Table 16 above. The treatment acres occurring outside of known home ranges are summarized by project in Table 21.

Table 21. Effects to NSO Habitat Outside of Known Home Ranges

	NRF Removed (acres)		NRF Downgraded (acres)		NRF T&M (acres)		Dispersal-Only Removed (acres)	Dispersal-Only T&M (acres)	Total Acres Treated
	NRF[2]	RF[3]	NRF[2]	RF[3]	NRF[2]	RF[3]			
Bieber Salt	0	0	0	41	0	8	20	24	**93**
Cold Elk	0	2	0	79	0	20	0	196	**297**
Lost Creek	15	38	0	51	0	2	41	74	**221**
PPTLR	1	0	0	0	0	0	13	0	**14**

As noted above in the Environmental Baseline Section, there is not enough NRF habitat in the PPTLR action area to support nesting pairs of owls. However, enough habitat exists to support spotted owl pairs in areas outside of the home ranges within the Bieber Salt, Cold Elk, and Lost Creek Action Areas. The BLM has been conducting spotted owl protocol surveys in NRF habitat (including roosting/foraging habitat) outside of known home ranges to determine occupancy status of these areas. To date, no resident single owls or territorial pairs have been found in these locations. Spotted owl protocol surveys will continue in 2016 in habitat outside of known spotted owl home ranges within the Action Area. If new spotted owl sites are found from surveys, Butte Falls and Grants Pass plan to drop units or modify proposed prescriptions to avoid adverse effects to newly detected spotted owls, or reinitiate consultation.

No adverse effects are anticipated to these potentially occupied habitat areas because the BLM would take actions to reduce adverse effects if owls are located in the future. These changes could include dropping units within home ranges, cores, and nest patches. The BLM could also modifying units to change prescriptions to treat and maintain habitat from the original removal or downgrading of habitat. Site specific analysis would be done if owls are located in the future to determine what unit modifications are needed to avoid adverse effects to spotted owls and to determine if reinitiation of consultation is necessary.

5.1.3 Effects to Barred Owls/Spotted Owl Interaction

Available evidence suggests that the presence and distribution of barred owls may affect habitat quality for spotted owls (Wiens 2012 and Yackulic et al. 2012). Additionally, many studies suggest that the two species compete for resources and maintaining older, high quality forest habitat may help spotted owls persist, at least in the short-term. There are no known forest conditions that give spotted owls a competitive advantage over barred owls. While not common, Wiens (2012) did find spotted owls and barred owls occupying the same territories concurrently.

It is also not known if forest habitat removal directly results in a range expansion of barred owls (USDI FWS 2013).

As mentioned above, Grants Pass and Butte Falls surveyed for RA 32 (structurally complex forest) within the Cold Elk, Bieber Salt, and Lost Creek Projects and identified 2,429 acres of RA32 habitat. All RA 32 habitat acres were deferred from treatment under these projects. The intent of RA 32 is to maintain the older and more structurally complex multi-layered conifer forests on federal lands in order to not further exacerbate the competitive interactions between spotted owls and barred owls. Since Grants Pass and Ashland would not be treating structurally complex forest and is retaining additional NRF (McKelvey 1) habitat within the project area, the likelihood that inter-species competition would be exacerbated as a result of this project would be minimal. Some competitive interactions are still anticipated to occur since barred owls have been observed in the action areas. Barred owls have been recorded when detected during spotted owl surveys and have been detected at 21 sites (see Table 13). Of these 21 sites with barred owl activity, treatments resulting in adverse effects to spotted owls are only proposed at 10 sites (#4671O, #, 1831O#, #2003O, #2024O, #2058O, #2221O, #2276O, #2359O, #4036O, and #4617O). No spotted owls have been observed at sites 1831O#, #2003O, #2024O, #2359O, #4036O, and #4617O in the past 2 years.

5.1.4 Effects from Disturbance

Mandatory PDC restricting activities during the breeding season and within recommended disturbance distance thresholds will be incorporated into the Bieber Salt, Cold Elk, Lost Creek, and PPTLR Projects (Appendix A). Applying the Mandatory PDC should avoid noise or activity which would adversely affect nesting owls and their young. Nesting owls are confined to an area close to the nest, but once the young fledge, they can move away from noise and activities that might cause adverse effects.

5.1.5 Effects to Northern Spotted Owl Critical Habitat

There are portions of the Bieber Salt and Cold Elk Projects within the 2012 designated critical habitat. Table 22 summarizes effects to the primary constituent elements (Forest Habitat, Nesting Roosting, Foraging, and Dispersal Habitat) from the proposed action.

The consultation process evaluates how a proposed action is likely to affect the capability of the critical habitat to support northern spotted owl nesting, roosting, foraging, or dispersal (primary constituent elements) by considering the scales at which the life-history requirements of the northern spotted owl are based regardless of the species' presence or absence (USDI 2012).

Table 22. Effects to NSO Critical Habitat from the Proposed Actions, except road maintenance									
	NRF Removed (acres)		NRF Downgrade (acres)		NRF T&M (acres)		Dispersal-Only Removed (acres)	Dispersal-Only T&M (acres)	Total Habitat Acres Treated
	NRF[1]	RF[2]	NRF[1]	RF[1]	NRF[1]	RF[2]			
KLW-1 (baseline acres from Table 14)	72,080						45,511		
Cold Elk	**0**	**8**	**0**	**274**	**67**	**937**	**32**	**2,066**	**3,384**
% Change to KLW-1 Baseline Habitat	**- 0.01%**		**- 0.4%**		**No Change**		**- 0.07%**	**No Change**	
KLE-5 (baseline acres from Table 14)	18,475						13,065		
Bieber Salt	**0**	**1**	**0**	**62**	**0**	**97**	**13**	**146**	**319**
% Change to KLE-5 Baseline Habitat	**- 0.005%**		**- 0.3%**		**No Change**		**- 0.1%**	**No Change**	

1- NRF = Nesting/Roosting/Foraging (McKelvey 1) - PCE #2
2- RF = Roosting /Foraging (McKelvey 2) - PCE #3
3- All Dispersal Baseline (Dispersal-only + NRF)

Effects from NRF Removal and NRF Downgrade

The Bieber Salt and Cold Elk Projects would remove 9 acres of RF habitat (from road and landing construction) and would downgrade 336 acres of roosting/foraging habitat in critical habitat subunits KLE-5 and KLW-1. No NRF (Primary Constituent #2) would be removed or downgraded within critical habitat.

As shown in Table 22, all of the NRF habitat acres proposed for removal or downgrading are actually RF habitat, but the proposed actions would contribute to a 0.5 percent reduction of the suitable baseline NRF habitat that combines NRF and RF habitat. Treatments proposed to downgrade RF habitat (Primary Constituent #3) in CHU would be designed to improve habitat within high habitat suitability (according to the relative habitat suitability model) in the long-term, improve stand resiliency, or improve ecological needs of the stand that are not in conflict with spotted owl habitat needs (i.e., pine restoration on a ridge that is in low habitat suitability according to the relative habitat suitability model and in areas not expected to provide long-term suitability and high frequency use for spotted owls). Table 23 contains a summary of the rationale for each downgrade unit within critical habitat.

Treatments in stands that are located in roosting/foraging habitat and in high habitat suitability (according to the Relative Habitat Suitability Model) are designed to increase diameter growth, create multi-layered structure, promote structural and species diversity, and place stands on a faster trajectory towards NRF habitat.

Table 23. Critical Habitat RF (McKelvey 2) Downgrade Summary by Treatment Unit	
Unit Number	**Rationale**
Bieber Salt	
13-1	Downgrade is proposed in Low habitat suitability (RHS) for ecological benefits. The stand is a single-layered stand, with average tree diameters greater than 16 inches. Selective thinning would reduce stand density to increase tree growth, quality, and vigor of the remaining trees; create diversified stand structure (height, age, and diameter classes), develop spatial heterogeneity within stands; increase resilience of forest stands to wildfire, drought, insects, by reducing stand density and ladder fuels; and increase growing space and decrease competition for large and/or legacy pine, oak, and cedar.
20-3	Downgrade is proposed in Low habitat suitability (RHS) for ecological benefits. The stand is single-layered stand with areas containing a bottom tree layer, and average tree diameters greater than 20 inches. Same treatment rationale as unit 13-1.
29-4	Downgrade is proposed High habitat suitability (RHS) with the intent to grow NRF habitat in the long term by creating more structural diversity, while also retaining existing diversity in the stand. The stand is currently single-layered with average tree diameters of about 20 inches. Selective thinning would reduce stand density to increase tree growth, quality, and vigor of the remaining trees; create diversified stand structure (height, age, and diameter classes), develop spatial heterogeneity within stands; increase resilience of forest stands to wildfire, drought, insects, by reducing stand density and ladder fuels; and increase growing space and decrease competition for large and/or legacy pine, oak, and cedar.
35-4	Downgrade is proposed High habitat suitability (RHS) with the intent is to reduce tree densities and provide more growing room for the larger trees and improve NRF functions. Currently the stand is dense with up to three tree layers and overstory tree diameters between 16 and 20 inches. Selective thinning would reduce stand density to increase tree growth, quality, and vigor of the remaining trees; create diversified stand structure (height, age, and diameter classes), develop spatial heterogeneity within stands; increase resilience of forest stands to wildfire, drought, insects, by reducing stand density and ladder fuels; and increase growing space and decrease competition for large and/or legacy pine, oak, and cedar.
Cold Elk	
03-08	Downgrade (Variable Density Thinning) is proposed on the border of low/high habitat suitability (RHS) and on upper slope near ridge top to promote structural and species diversity, reduce stand density, increase forest health and improve ecological stand resiliency to fires, insects, and drought.
08-01	Downgrade (Variable Density Thinning) is proposed in low habitat suitability (RHS) and upper slope/ridge top to promote structural and species diversity, increase sustainability of legacy trees, reduce stand density, increase forest health and improve ecological stand resiliency to fires, insects, and drought.
08-07	Same rationale as unit 08-01 and is on the upper slope.
08-27	Same rationale as unit 08-01 is on the upper slope/ridge top.
09-05	Downgrade is proposed in areas of low habitat suitability (RHS) for ecological reasons on the mid to upper slopes (1/2 of unit). Downgrade is proposed in areas of high habitat suitability (RHS) to create more stand structure and diversity in the future and promote the development of NRF (McKelvey 1) habitat conditions (1/2 of unit). Variable Density Thinning to promote structural and species diversity, increase sustainability of legacy trees, reduce stand density, increase forest health and improve ecological stand resiliency to fires, insects, and drought. Approximately 1/3 of all unit acres would be retained in untreated riparian reserves.
10-02	Same rationale as unit 03-08 and is on a ridge top and upper 1/3 slope. A portion of this stand is NRF (McKelvey 1) and would have all dominant trees and NRF basal area retention prescribed.

Table 23. Critical Habitat RF (McKelvey 2) Downgrade Summary by Treatment Unit	
Unit Number	**Rationale**
10-04	Downgrade is proposed in high habitat suitability (RHS) create more stand structure and diversity promote the development of NRF (McKelvey 1) habitat conditions. Variable Density Thinning to promote structural and species diversity, increase sustainability of legacy trees, reduce stand density, increase forest health and improve dry forest ecological stand resiliency to fires, insects, and drought. Approximately 50 percent of the unit will be in untreated riparian reserves.
16-02	Same rationale as unit 08-01 and is on a ridge top.
17-03	Same rationale as unit 08-01 is on the upper slope/ridge top.
18-07C	Same rationale as unit 08-01 is on the upper slope/ridge top.

According to the 2012 Final CHU rule (77 *Federal Register* 46:14062-14165), Section 7 consultations need to consider the temporal and spatial scale of impacts a proposed action may have on the PCEs. The USFWS recommends using a scale that is relevant to the needs and biology of the spotted owl and believes the 500-acre core area scale is a reasonable metric for land managers to use as a screen when assessing effects on critical habitat. This 500-acre analysis approach was recommended in the proposed critical habitat rule. To be consistent with recent critical habitat effects analyses, the 500-acre analysis will be used in this BA. To conduct this recommended analysis, the BLM delineated 500-acre (0.5-mile radius) circles around centroids of proposed treatment units that would remove or downgrade NRF habitat in critical habitat. These units represent the areas of critical habitat that would be most impacted by the proposed action and were used to determine potential localized effects to the critical habitat. Pre-and post-treatment NRF (PCE2 and 3) habitat amounts in the 500-acre analysis areas were compared to determine effects to primary constituent elements and primary biological features of critical habitat (Table 24).

Table 24. Pre- and Post-Treatment NRF Habitat Amounts in 500-acre Critical Habitat Analysis Areas

Project	CHU Subunit	NRF Reduced (acres)	NRF Pre-Treatment (acres)	NRF Post-Treatment (acres)	Percent Change	Effect to CH
Bieber Salt	KLE-5	41[1]	184	143	22%	LAA
Cold Elk	KLW1	91[2]	289	198	31%	LAA

1 = Includes NRF Downgrade from unit 20-3 and portions of other NRF downgrade units within the 500-acre circle (total of 41 acres).

2= Includes NRF Downgrade from Unit 18-07C and portions of other NRF downgrade units and NRF removal road construction within the 500-acre circle (total of 91 acres)

Based on the 500-acre analyses the Medford District has determined the NRF downgrade associated with the Bieber Salt and Cold Elk Projects in the KLE-5 and KLW-1 subunits may affect and would **likely adversely affect (LAA)** spotted owl critical habitat because the amount of NRF treatment relative to the existing NRF at the 500-acre scale would be measureable. The downgrading of NRF habitat in the 500-acre landscape surrounding the treatment area could reduce spotted owl foraging opportunities (see Section 5.1.6, Effects to Spotted Owl Prey). The proposed treatments are likely to decrease flying squirrel abundance by removing mid-story and overstory structure (Wilson 2010; Manning, et al. 2011), which could reduce spotted owl

foraging opportunities. However, dusky-footed woodrats, the primary prey of owls in this area, might benefit from some removal or downgrade of forest stand through thinning that would result in increased shrub and pole stands (Sakai and Noon 1993). These impacts to critical habitat primary constituent elements and principle biological features important to the conservation of spotted owls are measurable and likely to occur. Even with the adverse effects, there could be some beneficial effects to critical habitat anticipated from the project (see below).

Effects from NRF Treat and Maintain

The BLM has determined that treating and maintaining 1,101 acres of NRF habitat (67 acres NRF, PCE#2 and 1,034 acres RF, PCE#3) in critical habitat would have an insignificant effect to spotted owl critical habitat and is **not likely to adversely affect (NLAA)** critical habitat because the treatment will not change the intended function of the habitat and the conditions that classify the stand as NRF would remain post-treatment. Canopy cover within treated stands will be maintained at 60 percent or greater post-treatment.

- Roosting/foraging stands (McKelvey 2) would maintain a minimum of 150 ft^2/acre total basal area (conifer and hardwoods).
- Decadent components important to owls, such as old growth trees, large snags, large down wood, and large hardwoods, would remain post-treatment.
- Any multi-canopy, uneven-aged tree structure that was present prior to treatment would remain post-treatment.
- No spotted owl nest trees would be removed.

Effects from Dispersal Habitat Removal

The Cold Elk Project would remove 32 acres of dispersal-only habitat in critical habitat subunit KLW-1 from road/ landing construction and laminated root rot treatment. The Bieber Salt Project would remove 13 acres of dispersal-only habitat in critical habitat subunit KLE-5 from road/ landing construction and selective thinning treatment. The removal of 9 acres of NRF habitat that also serves as dispersal habitat would, when combined with the removal of dispersal-only habitat, contribute to a reduction of suitable dispersal habitat (Primary Constituent #4) in these critical habitat sub-units. The BLM has determined the removal of 45 acres of dispersal-only habitat may affect, and would **likely adversely affect (LAA)** spotted owl critical habitat because it would result in a measurable removal of a primary constituent element.

The removal of dispersal habitat (NRF + dispersal-only) would not affect the intended connectivity function of these sub-units (KLW-1 north/south and east/west; KLE-5 east/west). The removal of dispersal-only habitat would result in a reduction of 0.07 percent of the dispersal habitat within subunit KLW-1 and a reduction of 0.1 percent of the dispersal habitat within KLE-5. Additionally, the landing and temporary route construction and treatment areas are small in size and spread throughout the project area and would not preclude owls from dispersing through the adjacent landscape. Forest landscapes traversed by dispersing owls typically include fragmented mosaics of roads, clear-cuts, and non-forested areas, and a variety of forest age

classes ranging from fragmented forests on cutover areas to old-growth forests (Forsman, et al. 2002). The removal of 40 acres of dispersal habitat (NRF + dispersal-only) within sub-unit KLW-1 from the Cold Elk project would result in a reduction of 0.07 percent in the West Fork Cow Creek fifth field watershed. The removal of 14 acres of dispersal habitat (NRF + dispersal-only) within sub-unit KLE-5 from the Bieber Salt project would result in a reduction of 0.006 percent in the Little Butte Creek fifth field watershed. As shown in Table 10, over 50 percent of these watersheds currently provide dispersal habitat for spotted owls.

Effects from Dispersal Treat and Maintain

The District has determined the proposed maintenance of 2,060 acres of dispersal-only habitat within critical habitat would have an insignificant effect to spotted owl critical habitat and is **not likely to adversely affect (NLAA)** critical habitat because the treatment would not change the intended function of the habitat and the conditions that would classify the stand as dispersal would remain post-treatment.

- Canopy cover within affected stands will be maintained at 40 percent or more post-treatment.
- Decadent components important to owls, such as large snags, large down wood, and large hardwoods, would be retained.
- The proposed treatments would be distributed in relatively small patches within the CHU to further minimize the potential for adversely affecting stand characteristics for dispersal habitat.

Effects to NSO Critical Habitat from Road Maintenance Activities

Table 25 below summarizes the amount of Road Maintenance activities by project and habitat type within NSO designated critical habitat. The work would be done within the vegetation that is part of the road prism, or the area affected by original road construction. The activities would remove vegetation, but due to the proximity of the already disturbed area and minimal distance into the stand, the effects are not described as habitat removal. The proposed action would not remove primary constituent elements. At a minimum, the effects could be described as disturbance when near owl sites, but seasonal restrictions would be applied to avoid disturbance effects.

The BLM has determined that road maintenance vegetation treatments within designated critical habitat and adjacent to 31 acres of spotted owl habitat associated with the Bieber Salt and Cold Elk Projects may affect, but is not likely to adversely affect (NLAA) northern spotted owls because:

- Treatments would not change the function of the larger stand of NSO habitat beyond the road prism. The road prism area has been previously disturbed and the vegetation does not contribute to the function of the adjacent habitat. Treatments would not occur beyond the original road prism/clearing limits.

- Treatments would not change the intended function of the habitat and the conditions that classify the stand as dispersal or NRF would remain post-treatment.
- Treatments would not remove primary constituent elements
- The proposed treatments would be distributed throughout the Action Area to minimize the potential for adversely affecting spotted owl dispersal.
- Seasonal restrictions would be applied to avoid effects from disturbance.
- The treatments would also have beneficial effects to the adjacent spotted owl habitat by reducing fuel build-up adjacent to the road, which could help protect the adjacent habitat. The treatment would also improve and maintain fire breaks provided by the road management system.

Table 25. Effects to NSO Habitat from the Road Maintenance projects

Project	NSO Critical Habitat Sub-Unit	Activity	Treatment Acres Adjacent to NRF	Treatment Acres Adjacent to RF	Treatment Acres Adjacent to Dispersal
Cold Elk	KLW-1	Road Maintenance - Daylighting	0	11	17
Bieber Salt	KLE-5	Road Maintenance	0	1	1
		TOTAL	**1**	**12**	**18**

Effects to Critical Habitat Subunits KLW-1 and KLE-5

The proposed removal and downgrade of NRF and removal of dispersal habitat within critical habitat subunits KLW-1 and KLE-5 would not alter the intended subunit function of providing demographic support for spotted owls. Only seven of the 114 total historic spotted owl sites in this subunit KLW-1 would be adversely affected by the proposed action (see footnote in Tables 19 and 20 for sites located in critical habitat). However, based on recent surveys these sites are either unoccupied or have not had a resident single or territorial pair. Surveys are ongoing and units would be dropped or modified if resident singles or territorial pairs are located. Additionally, the amount of NRF would remain above thresholds after treatment, which would reduce the likelihood of adversely affecting the reproduction and survival of the owls associated with the sites. Only three of the 40 total historic spotted owl sites in this subunit KLE-5 would be adversely affected by the proposed action. However, based on recent surveys and the minimal amount of habitat available at one site (3256O), these three sites are likely not occupied by a resident single or territorial pair of spotted owls.

Even with the removal of NRF and dispersal-only habitat, the proposed action would not affect the intended conservation function of north-south and east-west connectivity between subunits and critical habitat units because the proposed removal of NRF habitat and dispersal-only habitat would result in a reduction of 0.09 percent of the dispersal habitat (NRF + dispersal-only habitat) within subunit KLW-1 and a 0.1 percent reduction of dispersal habitat in subunit KLE-5 . Habitat supporting the transience phase of dispersal contains stands with adequate tree size and canopy cover to provide minimal foraging opportunities and protection from avian predators.

This may include younger and less diverse forest stands, such as even-aged, pole-sized stands, than foraging habitat but such stands should contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the movement phase (USFWS 2011a). Spotted owls are able to move successfully through highly fragmented landscapes typical of the mountain ranges in western Washington and Oregon (Forsman, et al. 2002).

Beneficial Effects to Critical Habitat

The following beneficial effects may be realized as a result of implementation of the proposed action:

- Thinning in RF and dispersal-only habitat would accelerate growth, improve future foraging conditions for spotted owls, and promote the development of structurally complex forest conditions. See Appendix B for tables describing stand improvement that would occur over time in the Bieber Salt, Cold Elk, and Lost Creek Projects.
- The quality of spotted owl foraging habitat in treated stands may improve in response to the relatively more open structure of the treated stands.
- Thinning in young stands that do not currently provide dispersal or NRF habitat would accelerate the development of spotted owl habitat.
- Very dense stands would be opened by thinning, thereby improving the ability for spotted owls to disperse within these stands. Thinning stands that currently provide poor quality dispersal habitat would improve the dispersal function for spotted owls by providing more "flying space," and encouraging residual trees to develop more size and structural diversity.
- Treated stands are likely to be more ecologically sustainable because residual stands would be less susceptible to suppression mortality, as well as mortality from insects and disease. Treatments would result in more vigorous trees that are less susceptible to insects and disease.
- Treatments would increase survivability and vigor of more drought- or fire-tolerant species (pines, cedars, hardwoods) on ridge tops and in areas where site conditions do not favor Douglas-fir, or Douglas-fir is suppressing the occurrence of pines.

5.1.6 Effects to Northern Spotted Owl Prey

The northern flying squirrel, dusky-footed woodrat, bushy-tailed woodrat, and red tree voles (Cold Elk) are important prey of the northern spotted owl in this Action Area (Forsman, et al. 2004). Woodrat densities in the Douglas-fir/hardwood forests in the Klamath Province were nearly equal or greater than flying squirrels (Zabel et al., 1995). Spotted owl prey relationships are complex and prey-switching may be important (Courtney, et al. 2004). Vegetation treatment projects may impact spotted owl foraging by changing habitat conditions for different prey species.

Sakai and Noon (1993) stated that dusky-footed woodrats, the primary prey of owls in the Action Area, might benefit from some thinning or harvest that would increase shrub and pole stands. Bushy-tailed woodrat presence is more dependent on cover and food availability than on seral stage. They often use areas previously disturbed by fire (Carey 1991). Bushy-tailed woodrats are most abundant along streams, and riparian areas may serve as the principal avenue for woodrat recolonization (Carey, et al. 1992). Lemkuhl, et al. (2006) found that fuels projects in eastern Washington could have impacts on bushy-tailed woodrats, but confirmed the importance of maintaining snags, down wood, and mistletoe. These components would be retained as part of the proposed action.

Some disturbance of habitat may improve forage conditions, provided the understory structure and cover are retained. Removal of some tree canopy (under NRF treat and maintain conditions), would bring more light and resources into the stand, stimulating forbs, shrubs and other prey food. Once the initial impact of disturbance recovers (six months to two years), the understory habitat conditions for prey food would increase over the next few years, until shrubs and residual trees respond and once again close in the stand. A dispersal stand that resulted from the downgrade of NRF habitat would begin to develop the pretreatment habitat within 25 to 40 years, depending on treatment type, plant association, and location. Residual trees, snags, and down wood that are retained in the thinned stands would provide some cover for prey species over time, and would help minimize harvest impacts to some prey species. The retained trees may respond favorably to more light and resources and gain height and canopy over time.

Flying squirrel densities are correlated with high cavity density, large amounts of hypogeous fungi, and crown class differentiation (Carey, et al. 1997; Carey, et al. 2000). Gomez, et al. (2005) noted that commercial thinning in young stands of Coastal Oregon Douglas-fir (35 to 45 years old) did not have a measurable short-term effect on density, survival, or body mass of northern flying squirrels. Similarly, Waters, and Zabel (1995) compared squirrel densities and body mass in shelterwoods, and in old and young stands in the northern Sierras (old = 3.29/Ha, shelterwood = 0.31/ha, young = 2.28/Ha) and found no difference in body mass or recapture rates between young and old stands in northern more mesic forest habitats, although they concluded that heavy logging and site preparation (burning) in the shelterwoods negatively affected flying squirrels. More recent studies have indicated negative impacts of thinning on flying squirrels (Wilson 2010; Holloway and Smith 2011). Additionally, Ritchie, et al. (2009) found negative landscape effects on flying squirrels when harvested areas opened the stand to create open conditions. Flying squirrels predation pressure increases and their survival and reproduction decrease in stands with too many gaps, large gaps, lacking a mid-story canopy layer, and low overall stem densities (Wilson and Forsman 2013).

Based on the flying squirrel research, the BLM predicts the treat and maintain prescriptions in this BA would retain cover that would be used by flying squirrels. Removal and downgrade treatments may reduce flying squirrel densities. The proposed actions in the Bieber Salt, Cold Elk, Lost Creek, and PPTLR projects would remove or downgrade 899 acres of NRF habitat. These proposed actions would remove flying squirrel habitat, which could decrease flying squirrel abundance (Wilson 2010; Manning, et al. 2011) and reduce spotted owl foraging opportunities in these areas. Residual trees, snags, and down wood that are retained in the units

would provide some cover for prey species over time and would help minimize long-term harvest impacts to some prey species.

Edges created from harvest can be areas of good prey availability and potentially increased vulnerability (i.e., better hunting for owls) (Zabel, et al. 1995). Prey animals may be more exposed in the disturbed area or may move away from the disturbed area for the short-term. Some minor changes in prey availability may occur as cover is disturbed and animals move around in the understory. They may become more vulnerable and exposed. The disturbance might attract other predators such as hawks, other owls, and mammalian predators. This may increase competition for owls in the treatment area, but the exposure of prey may also improve prey availability for northern spotted owls.

Bingham and Noon (1997) reported that a spotted owl core area is the area that provides the important habitat elements of nest sites, roost sites, and access to prey, benefiting spotted owl survival and reproduction. Rosenberg and McKelvey (1999) reported that spotted owls are "central place" animals with the core area (the area closest to the nest) being the focal area. Several studies (Wagner and Anthony 1998; Dugger, et al. 2005; Zabel, et al. 2003; Bingham and Noon 1997) indicate the core area size for the Klamath and Western Cascades provinces is 0.5-mile (or 500 acres) around the nest site. Therefore, effects to prey species are most critical at the nest patch and core areas. Effects to spotted owl sites at the nest patch and core areas are analyzed in Section 5.1.2 above and the effects to prey species can also be derived from this data.

As mentioned in the Environmental Baseline Section above, red tree vole surveys were completed across the Cold Elk planning area where forest stands were at least 80 years old and met habitat conditions and habitat altering activities were being considered that would trigger pre-disturbance surveys (USDA USDI 2012). Approximately 3,450 acres were surveyed for RTV's within the planning area and approximately 1,020 acres were buffered (dropped) from treatment where active and associated inactive RTV nests were found. Dropping these known RTV areas in the project area also reduces the impacts to spotted owl prey species in the Cold Elk Project. Undiscovered nests located outside of the buffer areas may be negatively affected due to reduced canopy cover, isolating nests, and reducing dispersal capability. Some undiscovered nests may also be lost through removal of nest trees. However, the likelihood of undiscovered nests and associated effects would likely be low because RTV surveys are designed to ensure detection of RTV nests where the most viable populations exist within the stands. Additionally, even with the loss of some RTV nests, RTVs would persist in action area because known RTV sites would be protected and habitat would be retained throughout the action area and is not expected to affect spotted owl foraging for this prey species.

Treatment implementation would be spread out temporally and spatially within the Action Areas, which would provide areas for spotted owl foraging during project implementation and reduce the impact of these short-term effects at the project level. Untreated patches will be retained within the project areas for special status species, riparian vegetation, and other constraints. Residual trees, snags, and down wood that are retained in the thinned stands would provide some cover for prey species over time, and would help minimize harvest impacts to some prey species. Flying squirrel habitat may be reduced in quality in some places, but those same places are likely to maintain or improve habitat for woodrats and other small mammals (Courtney, et al. 2004).

5.1.7 Consistency with NSO Recovery Plan Recommendations

On June 30, 2011, the Service released the *Revised Recovery Plan for the Northern Spotted Owl* (Strix occidentalis caurina) (USDI FWS 2011). The Notice of Final Revised Recovery Plan Availability was published in the Federal Register on July 1, 2011 (76 FR 38575-38576) for the Northern Spotted Owl. Recovery plans are not regulatory documents; rather, they provide guidance to bring about recovery and establish criteria to be used in evaluating when recovery has been achieved. The BLM continues to work with the Service to incorporate Recovery Goals and Actions consistent with BLM laws and regulations. The BLM is a participant in the inter-organizational spotted owl working group (Recovery Action 1) and will continue demographic monitoring to address Recovery Actions 2 and 3. The Bieber Salt, Cold Elk, and Lost Creek projects follow the intent of other Recovery Actions listed in the Revised Recovery Plan, such as Recovery Actions 6, 10, and 32. The NSO Revised Recovery Plan was not used to design the PPTLR project.

Recovery Action 6
Approximately 3,007 acres of young stand thinning treatments (dispersal and capable habitat) planned in the Bieber Salt project (220 acres), Cold Elk project (2,372 acres), and the Lost Creek project (415 acres) would accelerate the development of structural complexity and biological diversity and would meet Recovery Action 6. The PPTLR project is not designed to treat young stands to improve spotted owl habitat in the future.

Recovery Action 10
As mentioned above, the NSO Revised Recovery Plan was not used to design the PPTLR project, so the application of Recovery 10 was not part of the process. However, no spotted owl sites are within 1.3 miles of the proposed ROW project.

The BLM worked to meet the intent of Recovery Action 10 in the Butte Falls and Grants Pass projects by planning the projects to minimize effects to spotted owl sites. BLM incorporated RA10 to the extent it was compatible with the primary purpose and need of the forest management projects: manage Matrix lands in a manner that provides for a sustainable supply of timber, helps meet the Medford BLM's annual timber volume target, and improves forest health, while protecting and conserving federally listed and proposed species and their habitats. To the extent practicable, the Butte Falls and Grants Pass project biologist and core teams followed principles in the SW Oregon Recovery Action 10 Guidance Document (USDA USDI 2013) to reduce impacts to sites with recent pair and/or reproduction activity within the project areas.

NSO sites within the Bieber Salt, Cold Elk, and Lost Creek project areas were prioritized in high and low (Table 26) categories based on occupancy and reproductive success data.

Of the 50 sites within the Bieber Salt, Cold Elk, and Lost Creek projects, 21 rated as high in the RA10 prioritization because of their recent occupation and reproductive status or their history of extensive pair occupation and reproduction. The objective at these sites was to conserve these high priority sites by avoiding adverse effects that could affect spotted owl breeding and survival. The intent was to avoid or significantly reduce the amount of NRF habitat removal or downgrading within the home range. While some adverse effects are anticipated at five sites, the

proposed action is not likely to impact the reproduction or survival of the owls at these sites because the vegetation treatments are in areas where owls were not located in previous breeding seasons, only small amounts of NRF habitat would be removed from road/landing construction, or downgrading NRF would not drop available NRF below critical levels at the home range. The project core teams also focused on reducing the amount of treat and maintain treatments within the 0.5-mile core area because it is the area that provides the important habitat elements of nest sites, roost sites, and access to prey, benefiting spotted owl survival and reproduction (Bingham and Noon1997).

The remaining 29 sites within the projects rated as low in the RA10 prioritization because of the poor NSO occupation history. The objectives at these sites were enhance these sites in order to accelerate the growth of spotted owl habitat or treat stands for ecological benefits as described in the Recovery Plan and the 2012 designated critical habitat rule. These objectives would result in short-term adverse effects for long-term benefits.

Table 26. RA 10 Site Summary

Site	RA 10 Priority	Effects	RA 10 Treatment Strategy/Rationale
BIEBER SALT			
0887O	LOW	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
0955O	LOW	NLAA	Same as 0887O
1303O	LOW	LAA	2 acres of NRF removal in the home range area due to landing and temporary route construction and in low habitat suitability (RHS). 6 acres of NRF downgrade low habitat suitability (RHS) for ecological reasons.
2004O	LOW	NLAA	Same as 0887O
2005O	LOW	NLAA	Same as 0887O
3255B	HIGH	NLAA	Same as 0887O
3256O	LOW	LAA	20 acres NRF downgrade in home range and 0.5 in high habitat suitability (RHS). Downgrade is proposed to create more stand structure and species diversity in the future and promote the development of NRF (Mck. 1) habitat conditions. The site is not occupied. Site heavily impacted by 2008 blowdown. Very little habitat left at the home range and 0.5 mile core scales.
3349O	HIGH	NLAA	Same as 0887O
3378O	LOW	LAA	2 acres of NRF removal in the home range area and 0.5 mile core area due to landing and temporary route construction and in low habitat suitability (RHS). 6 acres of NRF downgrade low habitat suitability (RHS) for ecological reasons. Site has not been occupied by a resident single or pair in 2 or more years.
4466O	LOW	NLAA	Same as 0887O
COLD ELK			
0098A	HIGH	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
0249O	HIGH	NLAA	2 acres of Roosting/Foraging downgrade and 0.2 acres of removal from road construction would occur at the very edge of the home range. Post-harvest, the NRF thresholds within the home range would be at 58%. Downgrade is proposed in low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought.
0368B	HIGH	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.

Table 26. RA 10 Site Summary			
Site	**RA 10 Priority**	**Effects**	**RA 10 Treatment Strategy/Rationale**
0905O	HIGH	LAA	1 acre of NRF removal from road construction within the home range. 26 acres of NRF downgrade would occur in low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought. Post-harvest, the NRF thresholds within the home range would be at 60%.
0920O	LOW	LAA	1 acre of NRF removal from road construction within the home range. 153 acres of NRF downgrade would occur in low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought. Post-harvest, the NRF thresholds within the home range would be at 48%.
0937O	LOW	NLAA	Same as 0368B
1911C	HIGH	NLAA	Same as 0368B
2016B	HIGH	NLAA	Same as 0368B
2023O	HIGH	NLAA	Same as 0368B
2072O	HIGH	NLAA	Same as 0368B
2079A	LOW	LAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
2236O	LOW	NLAA	Same as 0368B
2249O	HIGH	NLAA	All treatments Treat and Maintain habitat at Home range and Core scales, with the exception of 1acre of NRF removal from potential road construction/ landings.
2407A	LOW	NLAA	Same as 2249O
2622A	HIGH	LAA	All treatments Treat and Maintain habitat at Home range and Core scales. High percentage of NRF treatment in the 0.5 mile core, but site has been unoccupied since the 2013 Douglas Fire.
2623B,O	HIGH	NLAA	Same as 2249O
2662O	LOW	NLAA	Same as 2249O
2663O	HIGH	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
2666O	HIGH	LAA	22 acres of NRF downgrade would occur in low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought. Post-harvest, the NRF thresholds within the home range would be at 75%.
3281O	HIGH	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
3926O	LOW	NLAA	Same as 2249O
4051O,A	HIGH	NLAA	All treatments Treat and Maintain habitat at Home range and Core scales, with the exception of 0.3 acres of NRF removal from potential road construction/ landings.
4615O	LOW	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
4671O	LOW	LAA	1.5 acres of NRF removal from road/landing construction within the home range. 80 acres of NRF downgrade would occur in low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought.
9802T	HIGH	LAA	0.2 acres of NRF removal from road construction within the home range. 42 acres of NRF downgrade would occur in low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought. Post-harvest, the NRF thresholds within the home range would be at 53%.

Table 26. RA 10 Site Summary			
Site	**RA 10 Priority**	**Effects**	**RA 10 Treatment Strategy/Rationale**
LOST CREEK			
0879O	LOW	NLAA	Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
0953A,O	LOW	LAA	66 acres of Roosting/Foraging downgrade would occur in the home range, but outside of the core area of the original location that hasn't been occupied since 2006. Downgrade is proposed in areas of high habitat suitability (RHS) to create more stand structure and species diversity in the future and promote the development of NRF (Mck. 1) habitat conditions. Downgrade is proposed in areas of low habitat suitability (RHS) and on the ridges for forest health, ecological enhancement, and to increase stand resiliency from fires, insects, and drought. One acre of downgrade would occur at the very outer edge of the newer alternate site. However, this site has not been occupied in 2 or more years. 4 acres of NRF removal from landing and road construction in the home ranges.
1831O	LOW	LAA	16 acres of NRF downgrade in the home range, but outside of the core area and in low habitat suitability (RHS) for ecological reasons
2003O	LOW	LAA	3 acres of NRF removal in the home range and 0.5 mile core area due to landing and temporary route construction and in low habitat suitability (RHS). 16 acres of NRF downgrade in the home range and 8 acres in the 0.5 mile core area. These units are in low habitat suitability (RHS) and are downgraded for ecological reasons.
2024O	LOW	LAA	3 acres of NRF removal in the home range area due to landing and temporary route construction and in low habitat suitability (RHS). 16 acres of NRF downgrade in the home range, but outside of the 0.5 mile core area. These units are in low habitat suitability (RHS) and are downgraded for ecological reasons. The site center and core is entirely on Private. Private "decertified" site through ODF and has recently logged a large portion of the core area.
2058O	LOW	LAA	13 acres of NRF downgrade in the home range, and 8 acres of downgrade in the 0.5 mile core area. These units are in low habitat suitability (RHS) and are downgraded for ecological reasons.
2220O	HIGH	NLAA	1 acre of NRF removal in the home range, but outside of the 0.5 mile core area from landing construction. Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
2221O	LOW	LAA	2 acres of NRF removal in the home range area and 0.5 mile core area due to landing and temporary route construction and in low habitat suitability (RHS). 23 acres of NRF downgrade low habitat suitability (RHS) in the home range and 0.5 mile core area for ecological reasons. Site has not been occupied by a resident single or pair in 2 or more years.
2276O	HIGH	LAA	4 acres of NRF removal from road/ landing construction in the home range and 0.5 acres in the 0.5 mile core area. Removal from landings and roads are spread out in separate segments and would not affect the contiguous NRF habitat the owls are using at the center of the 0.5 mile core area. Vegetation treatments avoided NRF downgrade and removal within the home range and core area.
2359O	LOW	LAA	4 acres of NRF removal from road/ landing construction in the home range and 0.5 acres in the 0.5 mile core area. 149 acres of NRF downgrade in the home range, but outside of the core area and in low habitat suitability (RHS) for ecological reasons.
3561A, B, O	HIGH	NLAA	2 acres of NRF removal from landing construction in the home range of the original site that has not had the most recent pair activity. Removal is outside of the 0.5 mile core area. Vegetation treatments avoided NRF downgrade and removal within the home range and core area of original and alt A and B home ranges.

Table 26. RA 10 Site Summary			
Site	**RA 10 Priority**	**Effects**	**RA 10 Treatment Strategy/Rationale**
3562O	LOW	LAA	4 acres of NRF removal from road/ landing construction in the home range and 0.5 acres in the 0.5 mile core area. 5 acres of NRF downgrade in the home range, but outside of the core area and in low habitat suitability (RHS) for ecological reasons.
4036O	LOW	LAA	24 acres of NRF downgrade in the home range, but outside of the core area and in low habitat suitability (RHS) for ecological reasons.
4465O	LOW	LAA	31 acres of NRF downgrade in the home range, and 2 acres within the 0.5 mile core area. Located in low habitat suitability (RHS) and treated for ecological reasons.
4617O	LOW	LAA	1 acre of NRF removal from road/ landing construction in the home range and 0.5 acres in the 0.5 mile core area. 118 acres of NRF downgrade in the home range, but outside of the core area and in low habitat suitability (RHS) for ecological reasons. Barred owl pair since 2012 and nested with young in 2014.

Recovery Action 32

The BLM is also a collaborator in Recovery Actions that address barred owl issues, such as Recovery Action 32 (RA 32). The intent of RA 32 is to maintain the older and more structurally complex multi-layered conifer forests on federal lands in order to not further exacerbate the competitive interactions between spotted owls and barred owls. Within the administrative units of the Rogue River-Siskiyou National Forest and the Medford District BLM, an interagency, interdisciplinary team was created to develop a methodology for identifying Recovery Action 32/ structurally complex forest for project level planning and NSO consultation needs in SW Oregon (USDA USDI 2010).

RA 32 evaluations have been completed in Bieber Salt, Cold Elk, and Lost Creek projects. In some cases aerial photo and LiDAR interpretation was used to rule out RA32 field survey areas. However, as described above, if new RA32 patches are found during layout, marking, or marking inspections, they would be dropped from the proposed action. Table 27 Summarizes the RA32 found in each project. No harvest activities, fuels reduction treatments, road construction, yarding corridors, or skid roads are planned to occur within RA32 stands. Therefore, no effects to RA32 stands are anticipated. As mentioned above, the NSO Revised Recovery Plan was not used to design the PPTLR project, so the application of Recovery 32 was not part of the process. However, the company contracted to write the environmental assessment conducted some field reviews in NRF areas selected by the Butte Falls Wildlife Biologist. Their stand exam results did not indicate RA32 habitat qualities were present.

Table 27. RA32 Summary by Project		
Project	**RA 32 Acres**	**Description**
Bieber Salt	323	22 patches (3 to 49 acres)
Cold Elk	1,200	48 patches (1 to 85 acres)
Lost Creek	906	60 patches (1 to 90 acres)
PPTLR	N/A	
Total	2,429	

5.2 Effects to Marbled Murrelets

In order to avoid adverse effects, the BLM is incorporating recommendations from the 2004 (and updated in 2012) Southwest Level 1 Remnant Tree Marbled Murrelet guidelines (USDI 2004, 2012). To date, the Rogue Basin Level 1 team has not adopted these guidelines, so the Cold Elk Project Wildlife Biologist and core team members have relied on recent literature, historic survey information on the Medford District, and incorporated a combination of Options 2 and 3 in the Remnant Tree Guidelines Document to plan actions that would avoid adverse effects to marbled murrelets. No treatment would occur in high quality suitable habitat. Important structural trees with platforms where old-growth trees are sparse in forested stands would be retained throughout the entire project, even beyond 20 miles inland and the fog-influenced zone, and where there is negligible likelihood of use by nesting murrelets. Remnant trees, stand structure and variability, are important habitat characteristics for suitable marbled murrelet habitat.

The BLM has determined that the maintenance of suitable marbled murrelet habitat associated with these projects **may affect, but is not likely to adversely affect (NLAA)** marbled murrelets because:

- The Cold Elk project is <u>not</u> proposing treatments in **suitable marbled murrelet habitat.** As described in the Definition Section above, marbled murrelet suitable habitat is the high quality habitat that includes older, stands with lager trees, multiple layers, with multiple nesting platforms available. Spotted owl RA32 habitat (older, structurally complex forests) has been dropped from the proposed Cold Elk project, which also represents stands that are optimal habitat for the murrelet.
- The Cold Elk Project would implement a combination of elements from Options 2 and 3 in the South Coast Remnant Tree Recommendations to exclude the possibility of removing trees with potential structure for marbled murrelet nesting found in younger stands (potential habitat). Additional measures would be applied to avoid affecting the structure of the suitable remnant trees with potential nesting structure.
    - Field evaluations of proposed treatment stands would be conducted prior to implementation to identify habitat patches or remnant trees that could support a marbled murrelet nest tree. These habitat patches and remnant would not be treated. These could also be identified during marking evaluations.
    - Large dominant (remnant) trees with large branches and crowns located within younger stands that are not suitable marbled murrelet habitat would not be cut. Adjacent trees within interlocking crowns of the retained remnant trees would also be retained to preserve murrelet habitat suitability and structure of the large remnant trees. Additionally, at least 60 percent canopy cover would be retained in the rest of the units that are suitable NSO NRF habitat. The prescription would retain all dominant trees, and retain trees adjacent to large trees with multiple nest platforms to retain canopy cover around these trees.
    - In accordance with Service (1997, pg. 21), no gaps greater than <u>≥ 0.25 acres would be created within</u> a distance equal to one site-potential tree height of potential structure.

- Seasonal restrictions would be followed to avoid potential disturbance. Seasonal restrictions would also be applied to treatments in younger stands with remnant trees, to understory reduction treatments in less complex stands with suitable murrelet structure, and in all units adjacent to suitable marbled murrelet habitat.
- Based on previous surveys within the Medford District, conclusions from *Technical Assistance on the Final Results of Landscape level Surveys for Marbled Murrelets in Southwest Oregon (USDI Fish and Wildlife Service reference: 1-7-02-TA-6401,* additional negative surveys results through 2011, Mack et al. 2003, Dillingham et.al. (1995), Meyer & Miller (2002), Hunter et al. (1998), there is a low likelihood of murrelets nesting within the Cold Elk project area. However, Grants Pass has incorporated project design features to reduce potential impacts to undetected marbled murrelets. Therefore, the proposed action is not likely to directly affect nesting marbled murrelets and their habitat.

Effects from Disturbance

Potential disturbance can occur from projects occurring near marbled murrelet sites that do not directly affect the marbled murrelet habitat itself. Disturbance is also a possibility when marbled murrelet habitat is treated. However, seasonal restrictions listed in the PDCs (Appendix A) would be implemented to ensure projects would avoid adverse effects through disturbance to potential nesting murrelets.

6. CUMULATIVE EFFECTS

Cumulative effects under ESA are "those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area of the federal action subject to consultation" (50 CFR 402.02). The effects of future federal actions will be evaluated during future section 7 consultations and are not included in cumulative effects. Updates to habitat from post-harvest monitoring of recent BLM timber sales within these action areas have been included in this Biological Assessment.

The Action Areas have a checkerboard pattern of ownership of private land interspersed with BLM. Management practices occurring on private lands range from residential home site development to intensive industrial timber management. The majority of state and private forests in Washington, Oregon, and Northern California are managed for timber production. Non-federal lands are not expected to provide demographic support for spotted owls across and between physiographic provinces (Thomas, et al. 1990; USDA and USDI 1994a). Historically, non-federal landowners practiced even-aged management (clear-cutting) of timber over extensive acreages. Private industrial forestlands are managed for timber production and will typically be harvested between 40 and 60 years of age, in accordance with State Forest Practices Act Standards.

The Medford BLM assumes past management practices on private lands will continue. The BLM anticipates some loss of owl habitat on private lands, but cannot predict the rate of loss, types of spotted owl and marbled murrelet habitat affected, or the specific location of harvest.

BLM does not track private land harvest activity. Harvest activities on state and private lands can be expected to impact spotted owls located within adjacent federal lands by removing and fragmenting habitat and through disturbance activities adjacent to occupied sites during sensitive periods. The Oregon Forest Practices Act Rules (OAR 629-665-0210) protects spotted owl nest sites (70-acre core areas) for at least three years after the last year of occupation.

Reciprocal ROW permit holders may fell hazard trees and adjacent trees on BLM lands. Landowners or their agents are required to obtain Road Use Permits to build roads across BLM managed land for commercial purposes or to haul commercial products on BLM maintained road systems. Reciprocal ROWs with private parties already cover many existing road activities in the Action Area. According to BLM Information Bulletin (IB) # OR-2000-174, this is a non-discretionary action, including the disposal of the logs. If these areas occur in LSR or Riparian Reserves, the BLM cannot ask the permittees to leave these trees as CWD.

NSO Sites Impacted by Other Federal Projects

Table 28 below summarizes spotted owl sites included in this Biological Assessment that have been affected by other proposed federal actions covered under consultations in the last three years or older projects with adverse impacts discovered from implementation. Even though some actions are occurring within the same sites as previous projects, for the reasons listed below, it is unlikely the new projects would add additional cumulative effects beyond what has already been analyzed.

Table 28. NSO Site Cumulative Effects from Previous Federal Actions

Site ID	Current Project	June FY16 BA Effects Determination	Previous Project Consultation	Previous BO Effects Determination	Cumulative Effects
1911C	Cold Elk	NLAA	Douglas Post Fire Salvage	NLAA	No additional effects. No detectable change at home range and core scale from the Cold Elk project.
2016B	Cold Elk	NLAA	Douglas Post Fire Salvage	NLAA	No additional effects. No detectable change at home range and core scale from the Cold Elk project.
2622A	Cold Elk	LAA	Douglas Post Fire Salvage	NLAA	17% of NRF in core treated and maintained in Cold Elk, but site has not been active since the Douglas Fire
2079A	Cold Elk	LAA	Far Out Timber Sale	NLAA	Post-Harvest Monitoring of the Far Out Sale indicated approximately 11 acres of NRF were downgraded within this home range. The site is unoccupied, so no additional effects.
2005O	Bieber Salt	NLAA	Double Bowen	LAA (no incidental take)	No additional effects. No Response in last 2 years. Double Bowen has not been harvested yet.
2221O	Lost Creek	LAA	Big Butte Creek	LAA (no incidental take)	No additional effects. No Response in last 2 years.

Table 28. NSO Site Cumulative Effects from Previous Federal Actions					
Site ID	**Current Project**	**June FY16 BA Effects Determination**	**Previous Project Consultation**	**Previous BO Effects Determination**	**Cumulative Effects**
3561A, B, O	Lost Creek	NLAA	Big Butte Creek	NLAA	No detectable change at home range and core scale from the Lost Creek Project. Big Butte Creek has not been harvested yet.

7. BIOLOGICAL ASSESSMENT CONCLUSIONS

It is the conclusion of this biological assessment that proposed actions may affect the Northern Spotted Owl and Marbled Murrelet as documented above. Formal consultation is requested for the Bieber Salt, Cold Elk, Lost Creek, and PPTLR projects. Table 29 summarizes the effects determinations for each project.

Table 29. Effects Determination Summary				
Project	**Effects to NSO**	**Effects to NSO CH**	**Effects to MAMU**	**Effects to MAMU CH**
Bieber Salt	LAA	LAA	NE	NE
Cold Elk	LAA	LAA	NLAA	NE
Lost Creek	LAA	NE	NE	NE
PPTLR	LAA	NE	NE	NE

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Appendix A: Project Design Criteria (PDC)

Project design criteria (PDC) are measures applied to project activities designed to minimize potential detrimental effects to proposed or listed species. PDC usually include seasonal restrictions and may also include clumping of retention trees around nest trees, establishment of buffers, dropping the unit(s)/portions, or dropping the entire project. Use of project design criteria may result in a determination of no effect for a project that would have otherwise been not likely to adversely affect. In other cases, project design criteria have resulted in a determination of not likely to adversely affect for a project that might have otherwise been determined to be likely to adversely affect. The goal of project design criteria is to reduce adverse effects to listed or proposed threatened or endangered species.

Northern Spotted Owl

Physical impacts to habitat and disturbances to spotted owls will be reduced or avoided with PDC. Listed are project design criteria designed for the programmatic impacts discussed in the *Effects of the Action* section.

Medford BLM retains discretion to halt and modify all projects, anywhere in the process, should new information regarding proposed and listed threatened or endangered species arise. Minimization of impacts will then, at the least, include an appropriate seasonal restriction; and could include clumping of retention trees around the nest trees, establishment of buffers, dropping the unit, modifying units, or dropping the entire project.

The seasonal or daily restrictions listed below may be waived at the discretion of the decision maker if necessary to protect public safety (as in the case of emergency road repairs or hazard tree removal). Emergency consultation with the Service will then be initiated in such cases, where appropriate.

PDC for disturbance are intended to reduce disturbance to nesting spotted owls. For this consultation, potential disturbance could occur near either documented owl sites or projected owl sites. To estimate likely occupied habitat outside of known home ranges, nearest-neighbor distances and known spotted owl density estimates were utilized to "place" potential spotted owl occupied sites in suitable habitat

Any of the following Mandatory PDC may be waived in a particular year if nesting or reproductive success surveys conducted according to the U.S. Fish and Wildlife Service endorsed survey guidelines reveal that spotted owls are non-nesting or that no young are present that year. Waivers are only valid until March 1 of the following year. Previously known sites/ activity centers are assumed occupied until protocol surveys indicate otherwise.

Mandatory Project Design Criteria

A. Activities (such as tree felling, yarding, road construction, hauling on roads not generally used by the public, prescribed fire, muffled blasting) that produce loud noises above ambient levels will not occur within specified distances (Appendix A-1) of any owl site between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center is non-nesting or failed in their nesting attempt. The distances may be

shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the work location and nest sites.

B. The action agency has the option to extend the restricted season until September 30 during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt) if project would cause a nesting spotted owl to flush (See disturbance distance).

C. Burning will not take place within 0.25 miles of spotted owl sites (documented or projected) between March 1 and June 30 (or until two weeks after the fledging period) unless substantial smoke will not drift into the nest stand.

Table A-1: Mandatory Restriction Distances to Avoid Disturbance to Spotted Owl Sites	
Activity	**Buffer Distance Around Owl Site**
Heavy Equipment (including non-blasting quarry operations)	105 feet
Chain saws	195 feet
Impact pile driver, jackhammer, rock drill	195 feet
Small helicopter or plane	360 feet*
Type 1 or Type 2 helicopter	0.25 mile*
Blasting; 2 lbs. of explosive or less	360 feet
Blasting; more than 2 lbs. of explosives	1 mile

* If below 1,500 feet above ground level

Above-ambient noises further than these Table A-1 distances from spotted owls are expected to have either negligible effects or no effect to spotted owls. The types of reactions that spotted owls could have to noise that the Service considers to have a negligible impact, include flapping of wings, the turning of a head toward the noise, hiding, assuming a defensive stance, etc. (SERVICE 2003).

Recommended PDC

Recommended PDC will be incorporated during project implementation when practical. If recommended PDC cannot be incorporated, the project will still be in compliance with this BA.

- No NRF habitat removal will occur within 0.25 miles of any spotted owl site from March 1 through September 30, or until two (2) weeks after the fledging period, unless protocol surveys have determined owls are not present, are non-nesting, or nesting has failed.

Gray Wolf

The Level 1 team is currently developing PDFs and will be finalized by the 2016 breeding season. These PDFs would be followed if a den or rendezvous site is identified in the within the Lost Creek and Bieber Salt Project areas. At a minimum, these PDFs would include the restriction of activities within 1 mile of a denning or rendezvous sites from March 1 to June 30 to avoid disturbance to wolves during the breeding season.

Mandatory Marbled Murrelet Project Design Criteria

Restrict operations from March 1 through September 15 (through the extended breeding period) within disturbance distances (unless protocol surveys demonstrate non-nesting).

Table A-2. Mandatory Marbled Murrelet Restriction Distances	
Activity	**Zone of Restricted Operation**
Blasting: more than 2 pounds of explosive	1 mile
Blasting: 2 pounds or less of explosive	120 yards
Impact pile driver, jackhammer, or rock drill	120 yards
Type 3 or 4 Helicopter or single-engine airplane	120 yards
Type 1 or 2 Helicopter	0.25 miles
Chainsaws (hazard trees, tree harvest, etc.)	120 yards
Heavy equipment	120 yards

Table A-3. Marbled Murrelet Project Design Criteria	
Impacts	**Species: Marbled Murrelet**
Disturbance	(II) **Mandatory** -For **Survey Areas A and B work activities** (such as tree felling, yarding, road and other construction activities, hauling on roads not generally used by the public, muffled blasting) which produce noises above ambient levels will not occur within specified distances (see table below) of any occupied stand or un-surveyed suitable habitat between April 1 – August 5. For the period between August 6 and September 15, work activities will be confined to between 2 hours after sunrise to 2 hours before sunset. See Fuels management PDC for direction regarding site preparation and prescribed fire.
Disturbance	**(III) Mandatory** -Clean up trash and garbage daily at all construction and logging sites. Keep food out of sight so as to not attract crows and ravens (predators on eggs or young marbled murrelets).
Disturbance	**(IV)Mandatory**- Blasting (open air/un-muffled) – No blasting activities during the critical breeding period (1 April through 15 August) within 1.0 mile of occupied stands or un-surveyed suitable habitat. This distance may be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the blast and nest sites or less than 2 lbs of explosives are used If so, then use described distance.
Disturbance	**1) Recommended -** Delay project implementation until after September 15 where possible (unless protocol surveys demonstrate non-nesting).

Table A-3. Marbled Murrelet Project Design Criteria	
Impacts	**Species: Marbled Murrelet**
Disturbance	**2) Recommended -** Between 1 April and 15 September, concentrate disturbance activities spatially and temporally as much as possible (e.g., get in and get out, in as small an area as possible; avoid spreading the impacts over time and space).
Disturbance	**(IV)Mandatory-** Blasting (open air/un-muffled) – No blasting activities 1 April through 15 September within 1.0 mile of occupied stands or un-surveyed suitable habitat. This distance may be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the blast and nest sites or less than 2 lbs of explosives are used If so, then use described distance.
Disturbance	**1) Recommended -** Delay project implementation until after September 15 where possible
Disturbance	**2) Recommended -** Between 1 April and 15 September, concentrate disturbance activities spatially and temporally as much as possible (e.g., get in and get out, in as small an area as possible; avoid spreading the impacts over time and space).
Restoration projects	**Mandatory** To minimize the number of potential northern spotted owl or marbled murrelet nest trees used for in-stream structures, only the following sources shall be used: (I) Trees already on the ground in areas where large woody material is adequate; (II) Trees lacking suitable nesting structure for northern spotted owls or marbled murrelets or contributing to trees with suitable nesting structure, as determined by an action agency wildlife biologist.
Fuels	**Mandatory** (I) Prescribed fire would not take place within 0.25 mile of known occupied marbled murrelet sites, or un-surveyed marbled murrelet habitat between April 1 and August 6 unless substantial smoke will not drift into the occupied site or suitable habitat. (II) All broadcast and under-burning operations (except for residual "smokes") will be completed in the period from two hours after sunrise to two hours before sunset. (IV) During helicopter operations, flights over suitable habitat will be restricted (helicopter should be a least 1,500 feet above ground level); if not possible, fly a minimum of 500 feet above suitable habitat (above canopy).

Appendix B: Stand Analysis and Additional Detailed Prescriptions

The sections below describe the current and future stand conditions and effects on spotted owl habitat for the Bieber Salt, Cold Elk, and Lost Creek Projects.

Bieber Salt Project

Table B-1 shows the differences in stand conditions between taking no action and the proposed action. Stand data such as diameter at breast height (for poles through mature classes), forest type (PP, DF, MC, WF), and tree height was collected in the proposed treatment units. Both alternatives were modeled through Forest Vegetation Simulator (FVS) in order to estimate the differences in impacts to stand characteristics that collectively affect northern spotted owl habitat quality. Table B-1 shows how changes in the average mean diameter of all trees (QMD), basal area (BA), trees per acre (TPA), canopy cover, and relative density develop with and without management intervention. The table also highlights the trends associated with stand density and canopy cover as silvicultural prescriptions are applied.

Table B-1. Bieber Salt Current and Future Stand Conditions and Effects to Habitat

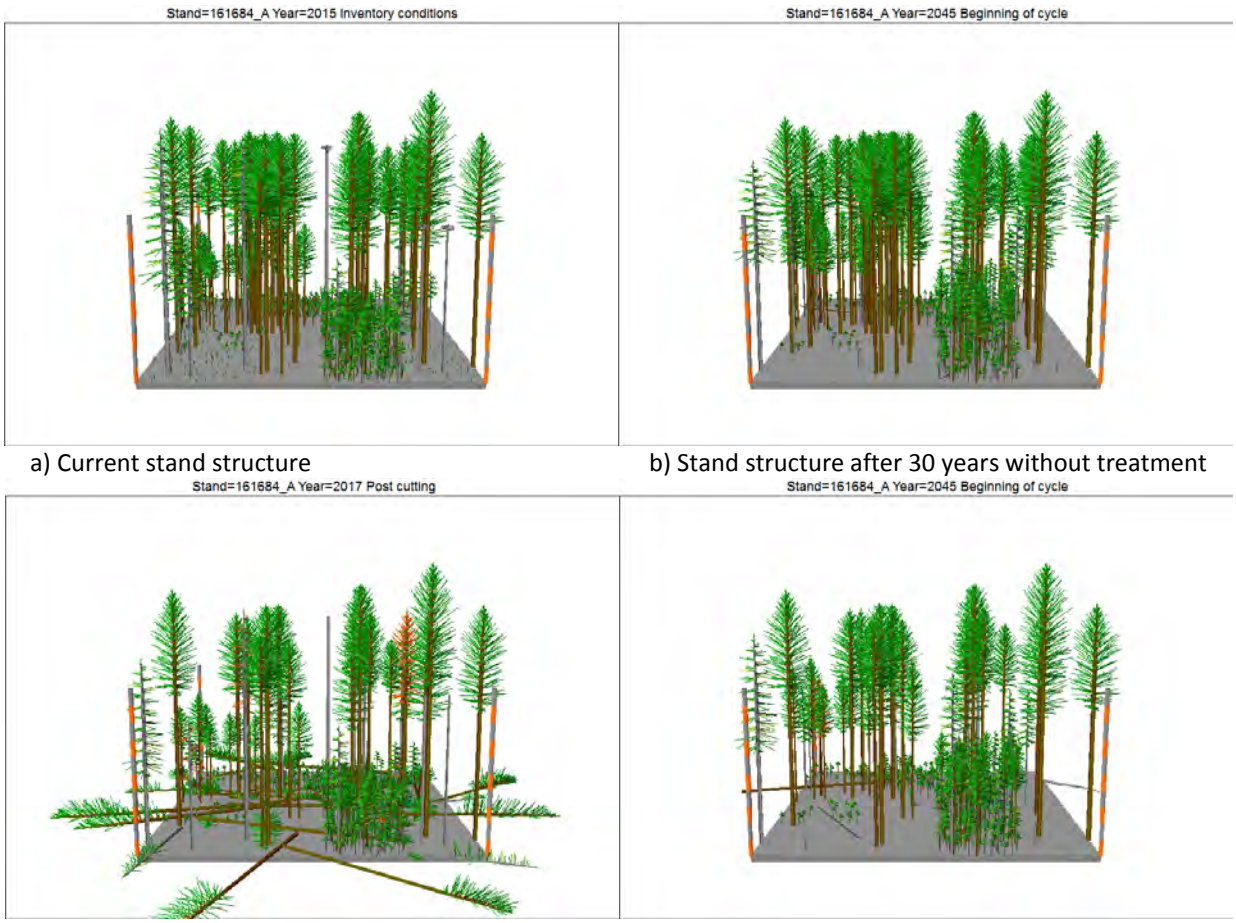
	QMD (inches)	BA (ft^2)	TPA	Canopy Cover (%)	Relative Density
Dispersal Maintain – Selective Thinning/Mixed Conifer					
Current Conditions	15	250	418	63	64*
30 years No Action	18	290	340	63	69*
Post-Treatment	16	150	322	40	37
30 Years Post-Treatment	17	180	306	47	44
Roosting/ Foraging Maintain - Density Management/Mixed Conifer					
Current Conditions	11	210	297	67	62*
30 years No Action	14	236	240	70	64*
Post-Treatment	13	160	172	60	46
30 Years Post-Treatment	16	200	154	63	51
Roosting/ Foraging Downgrade - Selective Thinning/Mixed Conifer					
Current Conditions	10	223	431	69	71*
30 years No Action	11	252	367	71	85*
Post-Treatment	14	140	140	49	40
30 Years Post-Treatment	15	167	130	54	43

*Relative Density (Curtis 1982) indices above 0.55 = zone of occurrence of suppression mortality. Without stand treatments that reduce trees per acre, RDIs that remain above the 0.55 RDI threshold leaves stands more vulnerable to drought, insect, and disease mortality. Reducing stand density is critical in meeting the stated purpose and need of the Bieber Salt Forest Management Project.

Table B-1 displays that 30 years following treatment these stands would have a lower average canopy cover than if left untreated; however, stand densities would be reduced and the remaining trees would have more optimal growing conditions than "No Action" 30-year projection. The proposed treatments would reduce stand densities immediately post-treatment and would set the stand on a more desirable stand development trajectory to create a multiple canopy, multi-age stand for the future (refer to Figure B-1d). These treatments would accelerate the development of

forest stand conditions that meet long-term management objectives for northern spotted owl habitat and shift stand trajectories to encourage the development of key habitat components for the future, such as structural diversity and a variety of tree ages. Reducing stand densities through thinning treatments would promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes. Stands in which treatments are not applied would maintain a higher level of relative density, which are typically above optimal levels that would lead to competition-induced mortality and reduced growth rates over the following 30-year period. Figure B-1 below illustrates the differences in stand structure conditions in a mature stand at its current condition; what it would look like in 30 years with no treatment; and what the condition would be directly post-treatment and 30 years post-treatment if it was treated using the Selective Thinning prescription. The Stand Visualization System (SVS) was used to create visual images of these scenarios using data generated through FVS.

Figure B-1. Stand Structure Conditions of a Project Stand over a 30-Year Period



a) Current stand structure

b) Stand structure after 30 years without treatment

c) Stand structure post-treatment

d) Stand structure after 30 years with treatment

Although relative densities would increase over time as trees continue to grow and regeneration occurs, the proposed treatments would put stands on a more desirable developmental trajectory so that future increases in density would have less substantial impacts on forest health. The proposed treatments would also accelerate the development of forest stand conditions that meet

long-term management objectives for northern spotted owl habitat and shift stand trajectories to encourage key habitat components for the future. Reducing stand densities through thinning treatments would promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes.

Cold Elk Project

Table B-2 shows the differences in stand conditions between taking no action and the proposed action. This Table provides a sample projection of vegetation qualities and its simulated response to change. These values do not represent actual outcomes to scenarios, but rather provide useful general comparisons of simulations to existing conditions. The canopy cover values are calculated from the sum of the percent largest crown areas using the formula in Crookston and Stage 1999 (http://www.fs.fed.us/fmsc/ftp/fvs/docs/gtr/percancv.pdf). Relative density is the stand density index (Reineke's SDI) for the stand divided by the maximum SDI of the stand's species mix and variant used.

Stand data such as diameter at breast height (for poles through mature classes), forest type, and tree height were collected in the proposed treatment units and input into a modeling program named ORGANON (Oregon Growth Analysis Projection) edition 9.1, which was developed by David Hann from Oregon State University's College of Forestry (Hann 2011). The program applies specific growth equations to tree data to model future stand conditions, such as growth, mortality, and regeneration, based on treatment parameters defined by the user. The Southwest Oregon variant was used to model stands in the project area, which provides more accurate growth equations specific to trees in this region. For this project, treatment vs no-treatment alternatives were modeled through this ORGANON in order to estimate the differences in impacts to stand characteristics that collectively affect northern spotted owl habitat quality.

Table B-2. Cold Elk Current and Future Stand Conditions and Effects to Habitat

Effect to Habitat	QMD (inches)	TPA	BA/AC (ft^2)	Canopy Cover (%)	Relative Density
Dispersal Maintain					
Current Conditions	14.7	156	185	69	0.55
20 years No Action	18.2	139	253	71	0.69
Post-Treatment	15.4	77	100	45	0.29
20 Years Post-Treatment	19.7	73	155	51	0.41
Dispersal Removal					
Current Conditions	14.6	145	168	65	0.50
20 years No Action	16.9	143	223	69	0.63
Post-Treatment	14.6	89	104	30	0.31
20 Years Post-Treatment**	7.1	515	141	35	0.56
Roosting and Foraging Maintain					
Current Conditions	14.6	197	229	72	0.68
20 years No Action	17.5	155	258	71	0.72
Post-Treatment	14.7	149	175	62	0.52
20 Years Post-Treatment	17.9	112	197	60	0.54

Table B-2. Cold Elk Current and Future Stand Conditions and Effects to Habitat					
Effect to Habitat	**QMD (inches)**	**TPA**	**BA/AC (ft^2)**	**Canopy Cover (%)**	**Relative Density**
Roosting and Foraging Downgrade					
Current Conditions	23.2	113	332	72	0.82
20 years No Action	24.8	105	351	73	0.85
Post-Treatment	26.7	47	182	45	0.43
20 Years Post-Treatment	29.4	45	190	45	0.43
**Laminated root disease infection center that includes disease resistant seedlings planted at 436 TPA following the first year of disturbance.					

Lost Creek Project

Table B-3 shows the differences in stand characteristics between a "No Action" alternative and an action ("Treatment") alternative. Stand data such as diameter at breast height (for poles through mature classes), forest type (DF, MC, WF), and tree height were collected in the proposed treatment units and input into a modeling program named ORGANON (Oregon Growth Analysis Projection) edition 9.1, which was developed by David Hann from Oregon State University's College of Forestry (Hann 2011). The program applies specific growth equations to tree data to model future stand conditions, such as growth, mortality, and regeneration, based on treatment parameters defined by the user. The Southwest Oregon variant was used to model stands in the project area, which provides more accurate growth equations specific to trees in this region. For this project, treatment vs no-treatment alternatives were modeled through this ORGANON in order to estimate the differences in impacts to stand characteristics that collectively affect northern spotted owl habitat quality.

Table B-3. Lost Creek: Current and Future Stand Conditions and Effects to Habitat						
	QMD (inches)	**BA (ft^2)**	**TPA**	**Crown Ratio (%)**	**Canopy Cover (%)**	**Relative Density**
Dispersal Maintain						
Current Conditions	14	220	214	38	70	67*
30 years No Action	18	288	160	33	72	79*
Post-Treatment	22	120	45	43	42	30
30 Years Post-Treatment	26	164	43	36	46	39
Dispersal Removal						
Current Conditions	12	206	271	33	68	67*
30 years No Action	14	240	215	30	69	72*
Post-Treatment	26	44	12	43	15	11
30 Years Post-Treatment	30	54	11	41	16	12
Nesting, Roosting, and Foraging Maintain						
Current Conditions	16	315	238	40	77	92*
30 years No Action	18	354	205	38	78	97*
Post-Treatment	18	180	102	43	51	49

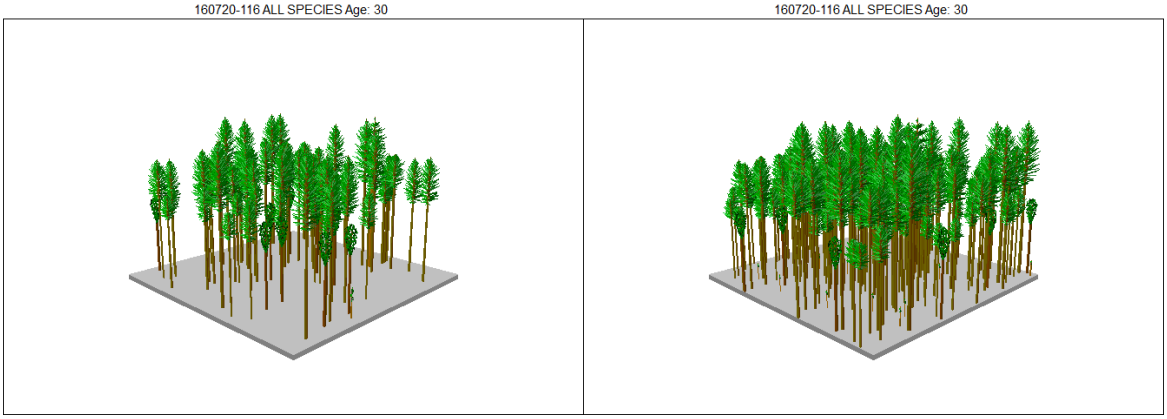
Table B-3. Lost Creek: Current and Future Stand Conditions and Effects to Habitat						
	QMD (inches)	BA (ft^2)	TPA	Crown Ratio (%)	Canopy Cover (%)	Relative Density
30 Years Post-Treatment	20	208	95	42	54	55*
Nesting, Roosting, and Foraging Downgrade						
Current Conditions	13.5	240	242	38	77	74*
30 years No Action	17	290	197	33	79	83*
Post-Treatment	16	120	91	39	51	35
30 Years Post-Treatment	18	147	84	34	54	40
Roosting and Foraging Maintain						
Current Conditions	9	211	457	40	73	75*
30 years No Action	12	264	322	34	75	84*
Post-Treatment	11	170	280	42	61	58*
30 Years Post-Treatment	14	223	224	35	67	69*
Roosting and Foraging Downgrade						
Current Conditions	12	232	284	37	69	74*
30 years No Action	17	300	193	32	71	85*
Post-Treatment	12	120	154	38	45	39
30 Years Post-Treatment	16	179	122	37	52	51

*Relative Density (Curtis 1982) indices above 0.55 = zone of occurrence of suppression mortality. Without stand treatments that reduce trees per acre, RDIs that remain above the 0.55 RDI threshold leaves stands more vulnerable to drought, insect, and disease mortality. Reducing stand density is critical in meeting the stated purpose and need of the Lost Creek Forest Management Project.

As displayed in table B-3, after 30 years stands that were treated will have a lower average canopy cover than will stands that were not treated. However, treated stands will have lower stand densities and thus will provide retained trees with more optimal growing conditions than those in untreated stands. Treatment will accelerate the development of forest stand conditions that meet long-term management objectives for northern spotted owl habitat and shift stand trajectories to encourage the development of key habitat components for the future, such as structural diversity and a variety of tree ages (refer to figures B2-a, B3-a, and B4-a). Reducing stand densities through thinning treatments will promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes. A no-treatment alternative will retain the high, current levels of relative density which will lead to mortality and reduced growth rates over the following 30-year period. The stands will also retain their homogeneous stand structure which lacks the complexity desirable for NSO habitat for at least 30 years (refer to figures B2-b, B3-b, and B4-b).

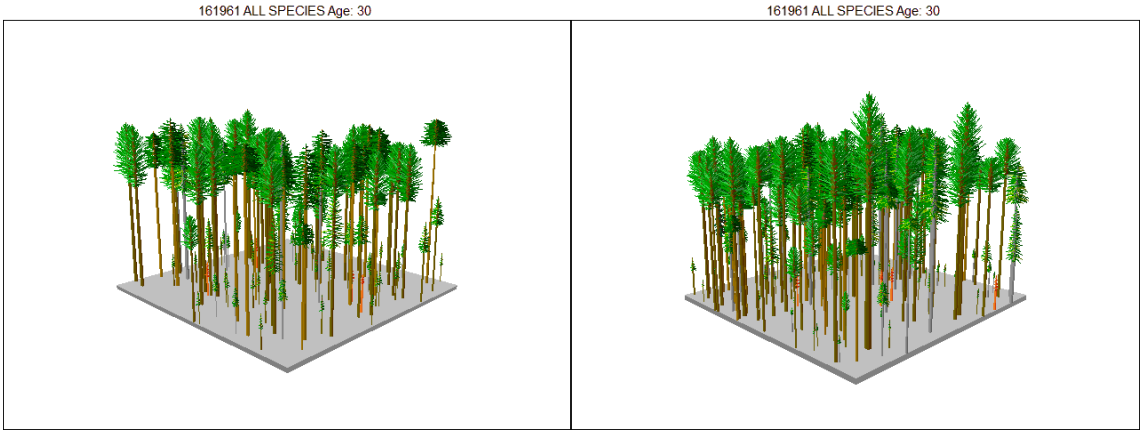
Figures B3and B4 illustrates the differences in stand structure conditions in two mature mixed conifer stands modeled with ORGANON and SVS over a 30 year time period. The Stand Visualization System (SVS) illustrates characteristics of what untreated forest stands currently look like what they would look like after application of the proposed prescriptions (USDA and University of Washington, 1995). ORGANON plot data was entered into the SVS program for the simulations. The SVS images below simulate the two modeled scenarios. The figure(s) below show the long-term change in stand condition following a Selective Thinning treatment and a "no treatment".

Figure B2 Nesting, Roosting and Foraging Downgrade- Mixed Conifer Selective Thinning



a): Stand structure 30 yr. post-treatment **b): Stand structure 30 yr. no treatment**

Figure B3. Roosting and Foraging Downgrade- Mixed Conifer Selective Thinning



a): Stand structure 30 yr. post-treatment **b): Stand structure 30 yr. no treatment**

Figure B4. Roosting and Foraging Maintain- Density Management

a): Stand structure 30 yr. post-treatment **b): Stand structure 30 yr. no treatment**

In summary, stands under the Lost Creek Management Project would benefit immediately from forest management treatments. These silvicultural treatments would improve and/or maintain vigorously growing conifer forests, reduce tree mortality, and encourage a mixture of tree species that are more fire resilient and drought tolerant than its current condition. The reduction in stand densities, preference of shade intolerant species over shade intolerant (white fir), and increasing growing space for residual trees will result from such treatments

Lost Creek and Bieber Salt Specific Selective Thinning Prescriptions

The following target conditions would be applied to Selective Thinning units based on their vegetation composition.

Selective Thinning —Douglas-fir (ST/DF)
Stands that are predominantly Douglas-fir and have low-moderate productive site conditions would be treated to a relative density range of 0.30-0.40. Stands would be harvested to a range of 40-50 percent canopy cover and would be thinned using guidelines to reduce basal area to between 100 and 140 ft^2 per acre. These stands are lacking suitable natural regeneration of drought tolerant and fire resilient species in the understory, while the overstory is greater than 90 percent Douglas-fir with scattered legacy ponderosa pine, incense cedar, and black oak. Treatment would allow more growing room for regeneration of less common but desired species such as sugar pine, ponderosa pine and incense cedar by creating openings suitable for growth and removing trees overtopping healthy regeneration.

Selective Thinning —Mixed Conifer (ST/MC)
Stands that are predominantly Douglas-fir and have moderate-high productive site conditions would be treated to a relative density range of 0.35-0.45. Stands would be harvested to a range of 40-50 percent canopy cover and would be thinned using guidelines to reduce basal area to between 110 and 160 ft^2 per acre. Depending on aspect and elevation these mixed conifer stands can have a relatively high amount of stand density due to the presence of shade tolerant species. These stands are generally dominated by a Douglas-fir, ponderosa pine, and white fir overstory, with less prominent species as incense cedar and sugar pine.

Selective Thinning —White Fir (ST/WF)
Stands that are predominantly white fir and have moderate-high productive site conditions would be treated to a relative density range of 0.35-0.45. Stands would be harvested to a range of 40-55 percent canopy cover and would be thinned using guidelines to reduce basal area to between 120 and 140 ft^2 per acre. These stands are dominated by shade tolerant species in the understory and overstory. The overstory is greater than 90 percent white fir with remnant or legacy Douglas-fir and incense cedar.

Appendix C: Treatment Summaries

Table C-1 Treatment Summary Information -Habitat Effects

PROJECT INFORMATION		GENERAL EFFECTS						CHU EFFECTS							
RA	Project ID	NRF remove	NRF dwngrd	NRF T&M	Disp remove	Disp T&M	Total Habitat acres	CHU	Sub-Unit	NRF remove	NRF dwngrd	NRF T&M	Disp remove	Disp T&M	all CHU acres
BF	Biber Salt Timber Units	0	66	139	61	150	416	10	KLE5	0	62	97	12	146	317
BF	Bieber Salt Landing Construction	1	0	0	1	0	2	10	KLE5	1	0	0	1	0	2
BF	Bieber Salt Road Construction	1	0	0	0	0	1	10	KLE5	0	0	0	0	0	0
BF	Lost Creek Timber Units	50	438	512	39	209	1,248	N/A	N/A	0	0	0	0	0	0
BF	Lost Creek Forest Health Units (fuels/small diameter)	0	40	69	0	93	202	N/A	N/A	0	0	0	0	0	0
BF	Lost Creek Landing Construction	15	0	0	3	0	18	N/A	N/A	0	0	0	0	0	0
BF	Lost Creek Road Construction	5	0	0	5	0	10	N/A	N/A	0	0	0	0	0	0
GP	Cold Elk Timber Units	0	274	911	1	1,910	3,096	9	KLW1	0	274	911	1	1,910	3,096
GP	Cold Elk Forest Health Units (UR and Disease)	0	0	93	5	156	254	9	KLW1	0	0	93	5	156	254
GP	Cold Elk Landing Construction	0	0	0	7	0	7	9	KLW1	0	0	0	7	0	7
GP	Cold ElkRoad Construction	8	0	0	19	0	27	9	KLW1	8	0	0	19	0	27
BF	PPTLR	1	0	0	13	0	14	N/A	N/A	0	0	0	0	0	0
	Total	**81**	**818**	**1,724**	**154**	**2,518**	**5,295**			**9**	**336**	**1,101**	**45**	**2,212**	**3,703**

Table C-2 Site Effects summary - Bieber Salt and Lost Creek																
PROJECT	NSO SITE	NRF Acres Removed			NRF Acres Downgraded			NRF Acres Maintained			Dispersal Acres Removed			Dispersal Acres Maintained		
		HR	Core	NP	HR	Core	NP	HR	Core	NP	HR	Core	NP	HR	Core	NP
BS	0887O	0	0	0	0	0	0	31	0		34	0	0	55	0	0
BS	0955O	0	0	0	0	0	0	3	0	0	0	0	0	9	0	0
BS	1303O	2	0	0	6	0	0	43	0	0	34	5	0	55	4	0
BS	2004O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BS	2005O	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0
BS	3255B	0	0	0	0	0	0	94	0	0	1	0	0	68	0	0
BS	3256O	0	0	0	20	20	0	0	0	0	8	0.2	0	0	0	0
BS	3349O	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
BS	3378O	2	2	0	6	6	0	42	0	0	10	0	0	3	0	0
BS	4466O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LC	0879O	0	0	0	0	0	0	6	0	0	0	0	0	31	0	0
LC	0953A	4	0	0	1	0	0	157	12	0	2	0	0	19	0	0
LC	0953O	3	0.2	0	66	1.3	0	107	34	0	2	0	0	33	6	0
LC	1831O	0	0	0	16	0	0	8	0	0	0	0	0	0	0	0
LC	2003O	3	2	0	16	8	0	11	11	0	1	0.5	0	0	0	0
LC	2024O	3	0	0	16	0	0	0	0	0	1	0	0	0	0	0
LC	2058O	0	0	0	13	8	0	17	6	0	0	0	0	0	0	0
LC	2220O	1	0	0	0.1	0	0	239	21	0	1	0	0	48	7	0
LC	2221O	2	2	0	23	23	0	0	0	0	0	0	0	0	0	0
LC	2276O	4	0.5	0	0	0	0	64	6	0	0	0	0	60	0	0
LC	2359O	2	0	0	149	6	0	65	0	0	1	0	0	56	6	0
LC	3561A	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
LC	3561B	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
LC	3561O	2	0	0	0.2	0	0	94	0	0	0	0	0	59	14	0
LC	3562O	4	0	0	5	0	0	134	0	0	2	0	0	39	0	0
LC	4036O	0	0	0	24	5	0	28	10	0	0	0	0	0	0	0
LC	4465O	0	0	0	31	2	0	0	0	0	0	0	0	0	0	0
LC	4617O	1	1	0	118	112	0	0	0	0	1	1	0	20	20	0

Table C-2 Site Effects summary - Cold Elk																
PROJECT	NSO SITE	NRF Acres Removed			NRF Acres Downgraded			NRF Acres Maintained			Dispersal Acres Removed			Dispersal Acres Maintained		
		HR	Core	NP	HR	Core	NP	HR	Core	NP	HR	Core	NP	HR	Core	NP
CE	0098A	0	0	0	0	0	0	158	0	0	2	0	0	30	0	0
CE	0249O	0.2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
CE	0368B	0	0	0	0	0	0	6	0	0	0	0	0	2	0	0
CE	0905O	1	0	0	26	0	0	243	76	0	2	0	0	137	2	0
CE	0920O	1	0	0	153	4	0	143	34	0	3	1	0	367	58	0
CE	0937O	0	0	0	0	0	0	8	0	0	0	0	0	11	0	0
CE	1911C	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
CE	2016B	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0
CE	2023O	0	0	0	0	0	0	58	5	0	3	0.2	0	199	20	0
CE	2072O	0.1	0	0	0	0	0	8	0	0	4	0	0	113	0	0
CE	2079A	1.5	0	0	0	0	0	123	32	0	5	0.2	0	198	26	0
CE	2236O	0	0	0	0	0	0	35	17	0	7	1.2	0	179	38	0
CE	2249O	1	0.2	0	0	0	0	95	15	0	0.6	0	0	185	16	0
CE	2407A	1	0	0	0	0	0	33	0	0	9	1.1	0	317	75	0
CE	2622A	0	0	0	0	0	0	141	32	0	0	0	0	81	25	0
CE	2623B	0	0	0	0	0	0	145	0	0	2	0	0	22	0	0
CE	2623O	1	0	0	0	0	0	198	0	0	6	0	0	219	0	0
CE	2662O	1	0.6	0	0	0	0	21	21	0	6	2	0	276	39	0
CE	2663O	0	0	0	0	0	0	25	7	0	1.5	0	0	227	33	0
CE	2666O	0	0	0	22	0	0	91	0	0	0	0	0	63	0	0
CE	3281O	1	0.5	0	0	0	0	46	6	0	1	0.6	0	30	14	0
CE	3926O	1	0	0	0	0	0	73	28	0	2	0	0	156	4	0
CE	4051A	0.3	0	0	0	0	0	14	4	0	0	0	0	59	4	0
CE	4051O	0.3	0	0	0	0	0	14	4	0	0	0	0	67	1	0
CE	4615O	0	0	0	0	0	0	24	0	0	0.1	0	0	30	0	0
CE	4671O	1.5	0	0	80	0	0	325	63	0	3	1.6	0	293	108	0
CE	9802T	0.2	0	0	42	0	0	0	0	0	0	0	0	0	0	0

Appendix D: NSO Site History

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
Bieber Salt and Lost Creek												
0879O (LC)	Male Resident Single. Single Barred owl	No NSO, pair barred owl	No NSO, pair barred owl	No Response	Barred owl pair	23	14	5	2006	2006	2015	BLM Surveying in 2016; Frank Wagner surveyed 2013-2015. More information below the table.
0887O (BS)	No Response	Single NSO male detected once on Sept. 14	No Response	Single NSO male detected on May 14 and July 9	No Response	22	1	0	1991	-	2015	USFWS 2012 protocol surveys planned for 2016
0953A (LC)	No Response	No Response	No Response	Single NSO - Unknown Sex - detected on August 16	No Response	9	6	2	2009	2006	2015	USFWS 2012 protocol surveys planned for 2016 More information below the table.
0953O (LC)	No Response	No Response	No Response	No Response	Female NSO detected on June 24, NSO Pair on July 9	18	14	8	2011	2010	2015	USFWS 2012 protocol surveys planned for 2016
0955O (BS)	Female observed once – not resident single (banded-from Wasson site)	Single NSO Female subadult detected	Undetected (Banded Male from 3255B on one survey)	No Response	Undetected (Banded Male from 3255B on one survey)	25	13	5	2003	2003	2015	Frank Wagner surveyed 2013-2015

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
1303O (BS)	No Response	No Response	No Response	No Response	No Response	26	3	2	1996	1994	2015	USFWS 2012 protocol surveys planned for 2016
1831O (LC)	No Response	No Response; Male and Female barred owls	No Response; Barred owl pair	Single NSO - unknown Sex - detected on June 3	Single barred owl.	23	6	3	2007	2007	2015	BLM Surveying in 2016; Frank Wagner surveyed 2013-2015. More information below the table.
2003O (LC)	No Response	No Response; Female barred owl	No Respose; Barred owl pair and 3 young	No Response	Barred owl pair	25	15	2	2004	1989	2015	BLM Surveying in 2016; Frank Wagner surveyed 2013-2014
2004O (BS)	Single barred owl.	No Response	No Response	No Response	No Response	26	10	2	2006	2006	2015	USFWS 2012 protocol surveys planned for 2016
2005O (BS)	Barred owl pair	Single barred owl detected	No Response	Single NSO - unknown Sex - detected once on May 15	No Response	26	12	2	2002	2000	2015	USFWS 2012 protocol surveys planned for 2016
2024O (LC)	No Response	Barred owl	Barred owl	No Response	No Response	11	3	0	2007	-	2015	USFWS 2012 protocol surveys planned for 2016 Decertified on private
2058O (LC)	Single barred owl	No Response	Barred owl male	Barred owl	No Response	25	8	3	1998	1996	2015	Spot Checks in 2016
2220O (LC)	Pair + Young	Pair + Young	Pair	No Response	Pair	25	20	8	2015	2015	2015	USFWS 2012 protocol surveys planned for 2016

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
2221O (LC)	Barred owl	No Response	No Response	No Response	No Response	24	12	3	2006	2002	2015	Spot Checks in 2016
2276O (LC)	Barred owl	Barred owl	Barred owl. Single female NSO on one occasion	Barred owl pair	No Response	25	12	4	2009	2005	2015	USFWS 2012 protocol surveys planned for 2016 Male and female auditory on first visit in 2016. More information below the table.
2359O (LC)	No Response; barred owl pair	No Response; Barred owl Pair	Single male on 2 visits. Barred owl pair.	No Response	Single male detected August 16	24	0	0	-	-	2055	BLM Surveying in 2016; Frank Wagner surveyed 2013-2015. More information below the table.
3255B (BS)	Pair + Young. Single barred owl.	Pair + Young	Pair + Young	Pair + Young	Pair	24	11	10	2015	2015	2015	USFWS 2012 protocol surveys planned for 2016
3256O (BS)	Not surveyed	Not surveyed	Not surveyed	Not surveyed	No Response	20	15	3	2008	2000	2011	Surveying in 2016. Historic, core area is no longer habitat following 2008 windstorm. More information below the table.
3349 (BS)	Resident Single Male	No Response	No Response	No Response	No Response	27	1	0	1992	-	2015	
3378O (BS)	No Response	Single male detected once on August 23	Single male detected twice	No Response	No Response	23	1	0	1992	-	2015	USFWS 2012 protocol surveys planned for 2016. More information below the table.
3561A (LC)	No Response	No Response	Pair	Not surveyed	Not surveyed	7	6	0	2013	-	2015	

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
3561B (LC)	Pair + young	Pair	N/A	N/A	N/A	2	2	1	2015	2015	2015	USFWS 2012 protocol surveys planned for 2016
3561O (LC)	No Response	No Response	No Response	Pair	Pair	25	10	2	2012	2010	2015	
3562O (LC)	No Response	Single male NSO detected once on Sept 20	No Response	No Response	No Response	17	0	0	-	-	2015	USFWS 2012 protocol surveys planned for 2016
4036O (LC)	No Response	Barred Owl	Barred Owl Pair	Barred Owl	Barred Owl	22	6	3	2002	2001	2015	USFWS 2012 protocol surveys planned for 2016
4465O (LC)	No Response	Not Surveyed	Not Surveyed	Not Surveyed	Not Surveyed	14	3	2	1999	1999	2015	USFWS 2012 protocol surveys planned for 2016. More information below the table.
4466O (BS)	Not surveyed	No Response	Not surveyed	Not surveyed	Not surveyed	10	2	1	1998	1998	2014	
4617O (LC)	Barred owl pair	Barred owls + young	Barred owl pair	Barred owl pair	No Response	11	6	1	2008	2003	2015	Spot Checks in 2016
Cold Elk												
0098A	Pair	Pair	Not surveyed	Not surveyed	Not surveyed	15	6	3	2015	2015	2015	More info below table
0249O	Pair	Not surveyed	Not surveyed	Resident Male	Pair	5	4	0	2015	none	2015	More info below table
0368B	Pair	Pair	Pair	Pair	Pair	33	26	7	2015	2014	2015	

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
0905O	No Response	No Response	Not surveyed	No Response	Not surveyed	26	9	1	2008	1989	2015	More info below table
0920O	No Response	Resident male of adjacent site observed once	Not surveyed	Not surveyed	Not surveyed	14	0	0	None	None	2015	More info below table
0937O	No Response	No Response; Barred Male	Not surveyed	Not surveyed	Not surveyed	11	0	0	None	None	2015	More info below table
1911C	No Response	No Response	No Response	No Response	Pair	29	21	10	2011	2009	2015	More info below table
2016B	Pair	Pair	Pair	Pair	Pair	28	24	4	2015	2014	2015	More info below table
2023O	Pair	Pair	Resident Female	Male + female pair status unknown	Pair	10	7	3	2016	2015	2015	More info below table
2072O	Pair	Pair	Pair	Pair	Pair	27	19	4	2016	2004	2015	More info below table
2079A	No Response	No Response; Barred owl Pair	No Response; Barred owl Pair	No Response	No Response; Barred Male	23	11	3	2008	2004	2015	More info below table
2236O	Male + Female, pair status unknown; Barred owl Pair	No Response	No Response	Resident Male	Resident Male	9	2	1	2008	2007	2015	More info below table

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
2249O	No Response; Single Barred	No Response; Single Barred	Not surveyed	Not surveyed	Not surveyed	23	8	5	2008	2008	2015	More info below table
2407A	No Response; Barred Pair with young	No Response	No Response; Barred Pair	No Response	No Response	25	10	1	2009	2001	2015	More info below table
2622A	No Response	No Response; Barred Pair	Male+ female, pair status unknown	Resident Male	Pair	25	15	2	2010	1994	2015	More info below table
2623B,O	Pair	Pair	Not surveyed	Not surveyed	Not surveyed	14	11	3	2001	2001	2015	More info below table
2662O	No Response	No Response	No Response	No Response	No Response	19	2	0	1994	NONE	2015	More info below table
2663O	Male + Female Response, pair status unknown	Pair	One Male response	Resident Female	Resident Male	9	4	0	2010	None	2015	More info below table
2666O	Pair	No Response	Not surveyed	No Response	Not surveyed	10	4	2	2016	2008	2015	2016 pair not nesting, More info below table
3281O	One male response	Pair	Pair	Pair	One pair response	22	12	3	2014	2013	2015	More info below table
3926O	No Response	No Response	Not surveyed	No Response	No Response	16	2	1	1995	1994	2015	2016 Pair response, More info below table

Table D-1: Northern Spotted Owl Sites within the Bieber Salt, Lost Creek, and Cold Elk Project Areas

Site #	Survey Results					Historic Summary						Notes
	2015	2014	2013	2012	2011	# Years Surveyed (at Least 1 Visit)	# Years with Pair Status	# Years Nested with Young	Last Year with Pair Status	Last Year Nested with Young	Last Year Surveyed	
4051 A/O	Female from #2072 and female #0368 both observed here also	Male from adjacent #2072 observed here	Not surveyed	Male + female Pair status unknown	Pair	23	18	8	2011	2005	2015	More info below table
4615O	No Response; single Barred	No Response; Barred owl pair w/young	No Response	No Response	No Response; single Barred	10	5	2	2008	2008	2015	More info below table
4671O	1 female night response; barred pair	No Response; Barred owl pair w/young	Not surveyed	Not surveyed	Not surveyed	9	2	1	2005	2004	2015	More info below table
9802T	Pair response, pair status unknown	Not surveyed	Not surveyed	Not surveyed	Not surveyed	3	1	0	2015	None	2015	2015 Pair status not verified, More info below table

Additional NSO Site History Information

Bieber Salt and Lost Creek

Site # 0879O
The site has been monitored from 1990-2015, with a total of 112 survey visits. Pair status was last confirmed at this site in 2006 and successful nesting last occurred at this site in 2006. In 2007, 2008, 2009, and 2010 a barred owl was detected at this site. In 2011, there was a pair of barred owls at this site. 2012 USFWS protocol surveys will occur in 2016 with spot checks in 2017 and beyond if necessary.

Site # 0953A
The site has been monitored from 1998-2015, with a total of 38 survey visits. 2009 was the last time pair status was confirmed and 2006 was the last time successful nesting occurred. A single spotted owl was last detected within this home range on one survey visit in 2012 and did not meet resident single status. In 2015, a barred owl was detected about midway between sites 0953A and 0953O. This site was discovered after 1994 and does not have a designated 100-acre reserve. Expanded 2012 USFWS protocol surveys within 1.2 miles of this site will continue in 2016, with spot checks in 2017 and beyond, if necessary.

Site # 0953O
The site has been monitored from 1990-2015, with a total of 83 survey visits. 2011 was the last time pair status was observed and 2010 was the last time successful nesting occurred. In 2015, a barred owl was detected about midway between sites 0953A and 0953O. Expanded 2012 USFWS protocol surveys within 1.2 miles of this site will continue in 2016, with spot checks in 2017 and beyond, if necessary.

Site # 1831O
The site has been monitored from 1990-2015, with a total of 122 survey visits. Pair status was last confirmed at this site in 2007 and nesting last occurred at this site in 2007. A single spotted owl was last detected within this home range on one survey visit in 2012 and did not meet resident single status. In 2009 and 2011 a barred owl was detected at this site. 2012 USFWS protocol surveys will occur in 2016 with spot checks in 2017 and beyond if necessary.

Site # 2276O
The site has been monitored from 1990-2015, with a total of 84 survey visits. Pair status was last confirmed at this site in 2009 and successful nesting last occurred at this site in 2005. A single spotted owl was last detected within this home range on one survey visit in 2013 and did not meet resident single status. In 2007, 2013, 2014, and 2015 a barred owl was detected at this site. In 2012, there was a pair of barred owls at this site. 2012 USFWS protocol surveys will continue in 2016 with spot checks in 2017 and beyond if necessary.

Site # 2359O
The site has been monitored from 1990-2015, with a total of 121 survey visits. Pair status was never observed at this site. A single male spotted owl was last detected within this home range on two survey visits in 2013 and on one survey visit in 2011, and did not meet resident single

status. The only year that resident single status was confirmed at this site was in 1990. In 2013, there was a pair of barred owls at this site. 2012 USFWS protocol surveys will occur in 2016 with spot checks in 2017 and beyond if necessary.

Site # 3256O
The site has been monitored from 1990-2011, with a total of 117 survey visits. Pair status was confirmed from 1992-1994, 1996-2000, and 2002-2008. Successful nesting was observed at this site in 1994, 1997, and 2000, with a total of five fledglings produced. Failed nesting attempts were observed in 2003, 2004, 2005, and 2007.

In January, 2008, a winter wind storm blew down trees in over 200 acres of NRF habitat within the 0.5 mile core, resulting in NRF downgrade. The remaining NRF habitat on federal lands at the home range scale is 8 percent and 17 percent at the 0.5 mile core scale. There have been no spotted owls detected from 2009-2011. Surveys will occur in the home range in the remaining 4 percent of NRF/RF in 2016.

Site # 3378O
The site has been monitored from 1992-2015, with a total of 97 survey visits. Pair status was last confirmed in 1992 and successful nesting was never observed at this site. A single male spotted owl was last detected within this home range on one survey visit in 2014 and on two survey visits in 2013, and did not meet resident single status. 2012 USFWS protocol surveys will occur in 2016 with spot checks in 2017 and beyond if necessary.

Site # 4465O
The site has been monitored from 1997-2009 and in 2015 with a total of 53 survey visits. Pair status was last confirmed at this site in 1999 and successful nesting last occurred at this site in 1999. A single spotted owl was last detected within this home range on one survey visit in 2000 and did not meet resident single status. 2012 USFWS protocol surveys will continue in 2016 with spot checks in 2017 and beyond if necessary.

Cold Elk

Site # 0098A
Long term history of pairs and reproduction, dating back to 1974. Started out as Mt. Bolivar site, and pair moved to current Wilson Creek sites. No surveys 2008-2013. 2014 pair confirmed nesting at Alt A. 2015 pair confirmed nesting at Alt A. Barred owl detected 2015 once. Surveying in 2016 with 2012 USFWS protocol. So far the site is occupied with female NSO.

Site # 0249O
Pair status in years 2009-2011 with no nesting. Visited once in 2012 with male confirmed; 2015 male confirmed with new female. Surveys in 2016 so far confirmed nesting.

Site # 0368B
This site is adjacent to the KDSA and is surveyed annually with the demography protocol. Pair 2015, pair + 2 juveniles 2014, pair 2013, nesting pair + one juvenile 2012, pairs 2010-11.

Site # 0905O
Surveyed to 2012 USFWS with the 6 visit protocol in 2014 and 2015. One night female response was between the core areas of this site and site#4671O and attributed to the closer site $4671O. Surveying in 2016 with 2012 USFWS protocol (6 visits). 2012 barred owl female response.

Site # 0920O
This site has never been a firm site. No pair or nesting history. One owl seen in1979; owl seen twice in 1980; No response in 1981-82; one owl heard 1983; no response 1984; one owl heard 1986; no response 1988. Surveyed to protocol 1991 with no response. Bobby Walker male was observed in 1993 in the Finger Walker site; male heard 1994. Surveyed to protocol in 1999 with a night male response heard closer to Bobby Walker site. Bobby Walker male was confirmed in 2014 and 2015 within the home range of Bobby Walker but also once near the core area of Finger Walker in 2014. This is likely part of the Bobby Walker territory and has had no evidence yet of distinct separate sites. Surveyed with 2012 USFWS protocol (6 visits) in 2014-15 and surveying in 2016 with 2012 USFWS protocol.

Site # 0937O
No pair history. One owl was heard 1980, 1981, 1982, and 1983. There was no response for years surveyed 1984 and 1988. Timber sale clearance survey in 1991 had one night female response towards site #0905, with no response on follow-up survey. Surveyed once in 1992 with no response. Surveyed with 2012 USFWS protocol (6 visits each) in 2014-15 with no response. Surveying in 2016 with 2012 USFWS protocol (6 visits). A male barred owl was detected once in 2014 outside the NSO core area.

Site # 1911C
Surveyed annually as part of KDSA using demography protocol. Extensive past harvesting on BLM and Private, and removal of habitat from the 2014 Douglas Complex fire has reduced habitat.

Site # 2016B
The site is within the KDSA and is surveyed annually using demography protocol. Barred owl male 2015, 2008-09.

Site # 2023O
This site is adjacent to the KDSA and is surveyed annually with the demography protocol (3 night visits). One positive nesting visit confirmed in 2016. Resident female in 2013 confirmed at site, and also found paired later in season with male at #2622.

Site # 2072O
This site is adjacent to the KDSA and is surveyed annually with the demography protocol (3 night visits). Nesting has been confirmed in 2016.

Site # 2079A
Spotted owl pairs or male and female for years 1989-1993; 1996, 2000, 2001, 2004-08. Single male 2009-10. Surveyed 3+ visits 2011-2013 (no nso response). Surveyed with 6 visits 2015

and surveying in 2016 with 2012 USFWS protocol. Barred owls detected 2011, and barred pairs 2013-2014, and 2016.

Site # 2236O
Surveys in 2011 (5 night/2 day) confirmed male not nesting, and also observed once at site #2662. In 2012 male was confirmed, and also found late in the season at site #2662. Surveys in 2013 (3 night) with no response and a barred female. Surveys in 2014 (3 night) with no response. Surveys in 2015 with 2012 USFWS protocol (6 nights) confirmed a replacement male and replacement subadult female, with pair status undetermined and not nesting. Barred owl responses 2008, 2009, 2013, 2015 pair. Surveying in 2016 with 2012 USFWS protocol (6 visits). So far one pair response and a male response in 2016. Also, the 2015 female has been confirmed in 2016 at site #3926, paired once with a new male from site #3281, nesting status undetermined.

Site # 2249O
Pairs in 2005-2009. No surveys in 2010-2011, 1 visit in 2012 and 2013 (no response). 2012 USFWS protocol surveys in 2014-15 (6 nights) no response. Barred owls detected 1998-00, 2014-15. Surveying in with 2012 USFWS protocol (6 visits).

Site # 2407A
This site is adjacent to the KDSA and is surveyed annually with the demography protocol (3 night visits). Surveyed with 3 nights visits 2011-14 with no NSO response. Surveys in 2015 with 2012 USFWS protocol (6 visits) with no NSO response. Barred owls were detected 2010, 2012, 2013 (pair), and 2015 (2 fledglings). Surveying in with 2012 USFWS protocol (6 visits).

Site # 2622A
The site is within the KDSA and is surveyed annually using demography protocol. The 2013 pair was a replacement adult male and replacement adult female, both banded as adults from other sites. Pair status was undetermined, confirmed not nesting. Surveys in 2014 (3 night/1 day) with no response. The 2013 male was confirmed in 2014 at site #2023 and one time at site #2622. Surveys in 2015 (3 night/1 day) with no response. Barred owl pair 2014.

Site # 2623O
Not surveyed 2011-2013. Surveys in 2014 confirmed replacement adult male and female, banded as adults at other sites. Confirmed not nesting, but female had a brood patch, in a new activity center area, analyzed as #2623B. Surveys in 2015 confirmed a replacement adult male and female at the original site #2623O both banded as adults from other sites. No young found. Another adult male was observed at #2623B. Surveying in with 2012 USFWS protocol (6 visits).

Site # 2662O
No pair or nesting has been documented for this site. Male resident confirmed 1991, no response 1992 (3 day/2 night), male 1993 (5 day/2 night), 1994 male, 1 female response (4 day/2 night), single male response in 1995 (3 day/2 night), single male response in 1996 (4 day/2 night), 2002 (3 day/1 night) female found once on Aug 27th; 2003 male resident; 2004 (3 nights) 1 unk response Aug 18; 2010 Six visits with 1 night female response. In 2011-12 the male from adjacent site #2236 (not nesting) also observed at this site once. In 2013 the male from adjacent

site #2072 (not nesting) was observed at this site once. 2014 two day visits with no response. Surveyor for Plum Creek timber company confirmed site #2072 at night once with no response on follow-up. Surveyed in 2015 with 2012 USFWS protocol (7 night visits) with one male night response only between core areas of #2072 and #2662. Responses at this site are consistently associated with site #2072 and site #2236. Barred owl female heard once in 2015. Surveying in 2016 with 2012 protocol. So far, one pair response at night, but no response on follow-up.

Site # 2663O
Pair status confirmed 2007-10; 2011 one visit, male confirmed; 2012 (4 night/ 2 days) new unbanded female confirmed; 2013 (1 night/1 day) 1 male response; 2014 (1 night/follow-up) female response; Surveyed in 2015 with 2012 USFWS protocol (6+ visits) - one male, one female, one unknown response. Surveying in 2016 with 2012 USFWS survey protocol. So far the male has been confirmed and there has been one pair response.

Site # 2666O
Nesting pair with one fledgling 2008. Not surveyed 2009-13 (1 night/1 day visit 2012). 2014 (6 nights/1 day) this male was confirmed once near site #0920. Surveyed in 2015 with the 2012 USFWS protocol. The male was confirmed, a replacement subadult female was present and the pair was not nesting. Surveying in 2016 with 2012 USFWS protocol. So far in 2016 the male was confirmed and new replacement adult female not nesting.

Site # 3281O
Only two visits occurred in 2015. A pair was present, but nesting status was undetermined. Surveying in2016 with 2012 USFWS protocol. So far, the 2015 male was found paired at site #2926 once with a different female.

Site # 3926O
Pairs in 1994-95 (fledged in 1994) from site #2249 (1.4 miles away). Surveyed to protocol 1996, 1999-01 with no response. Same pair found back at site #2249 in 2001-02. Surveyed 3+ visits 2004, 2008, and 2009, with one night male response in 2009. Surveyed (6 night/1 day) 2010 with no response. Surveyed (3 nights) in 2011-12 with no response. No surveys in 2013. Surveyed in 2014 with 2012 USFWS protocol (6 nights) with no response. Surveyed with 2012 USFWS protocol in 2015 (6 nights) with 1 night female response, with no response on follow-up. Surveying in 2016 with 2012 USFWS protocol So far the female from site # 2236O (2015) and site #3281 male (2015) was observed on one occasion in 2016. Pair and nesting status is unknown at this time. Barred owl response October 2009.

Site # 4051O/B
This site is adjacent to the KDSA and is surveyed annually using the demography protocol (3 night visits). Pair nested 2010 (no young) and located at both Original and Alt B sites. 2011 pair at Alt B site. 2012 Pair at Alt B with replacement male. 2013 (not surveyed). In 2014 (1 day/1 night visit) the 2014 the #2072 male was also observed at this site. In 2015, females from adjacent site #2072 and site #0368 were also observed at this site.

Site # 4615O
This site is adjacent to the KDSA and is surveyed annually using the demography protocol (3 night visits). Pairs and 2 years with reproduction from 2003 through 2008. Male only 2009 (4 day/2 night visits). 2010 male confirmed, also confirmed at site #0370 and site#4051. No responses 2011-14 (3 night visits). No response 2015 using the 2012 USFWS protocol (6 night visits). Barred owls detected 2009-11, 2014 (nesting), and 2015.

Site # 4671O
Pair found nesting 2004 (1 young) and in 2005 (failed). Male only found 2006-07. Male moved to site #0905 in 2008 with new female. 2009 only nesting barred owls found. No surveys 2010-11, one visit 2012, no survey 2013. Surveyed with the 2012 USFWS protocol (6 visits) in 2014 and 2015. One female night response on 3rd outside of the core area in 2015 and adjacent to site #0905 core area, with no responses on next 3 visits. Barred owls fledged 2014 and nested in 2008-09 and 2014-15 in the JJ Walker activity center. Surveying in 2016 with 2012 USFWS protocol (6 visits). So far one adult NSO in site #0905 in 2016 and no responses in #4671O.

Site # 9802T
In 2010 a male responded 3 times throughout surveys (5 night/3 day) with no response on follow-ups. No survey 2011-13. In 2014, 2 day visits with no response. In 2015, there was pair night response and a male night response on second visit, with no responses on follow-ups, with pair status undetermined. Surveying in 2016 with 2012 USFWS protocol.

Appendix E: Maps

Map 1: Bieber Salt NSO Action Area

Map 2: Cold Elk NSO Action Area

Map 3: Lost Creek NSO Action Area

Map 4: Bieber Salt Project Units by NSO Habitat Effects

Map 5: Cold Elk Project Units by NSO Habitat Effects

Map 6: Lost Creek Project Units by NSO Habitat Effects

Map 7: Bieber Salt Project Units by Treatment Type

Map 8: Cold Elk Project Units by Treatment Type

Map 9: Lost Creek Project Units by Treatment Type

Map 10: Cold Elk MAMU Action Area and Project Units

Map 11: PPTLR Action Area and Proposed Action

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Map 1. Bieber Salt NSO Action Area

Legend

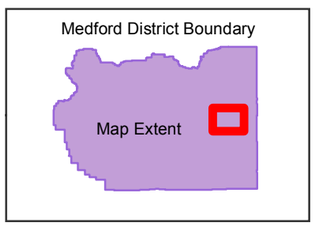
- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Pre-Harvest Habitat

- Capable
- Dispersal
- NRF
- Non-Habitat

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company



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Bureau of Land Management
Medford District
3040 Biddle Rd
Medford, OR 97504

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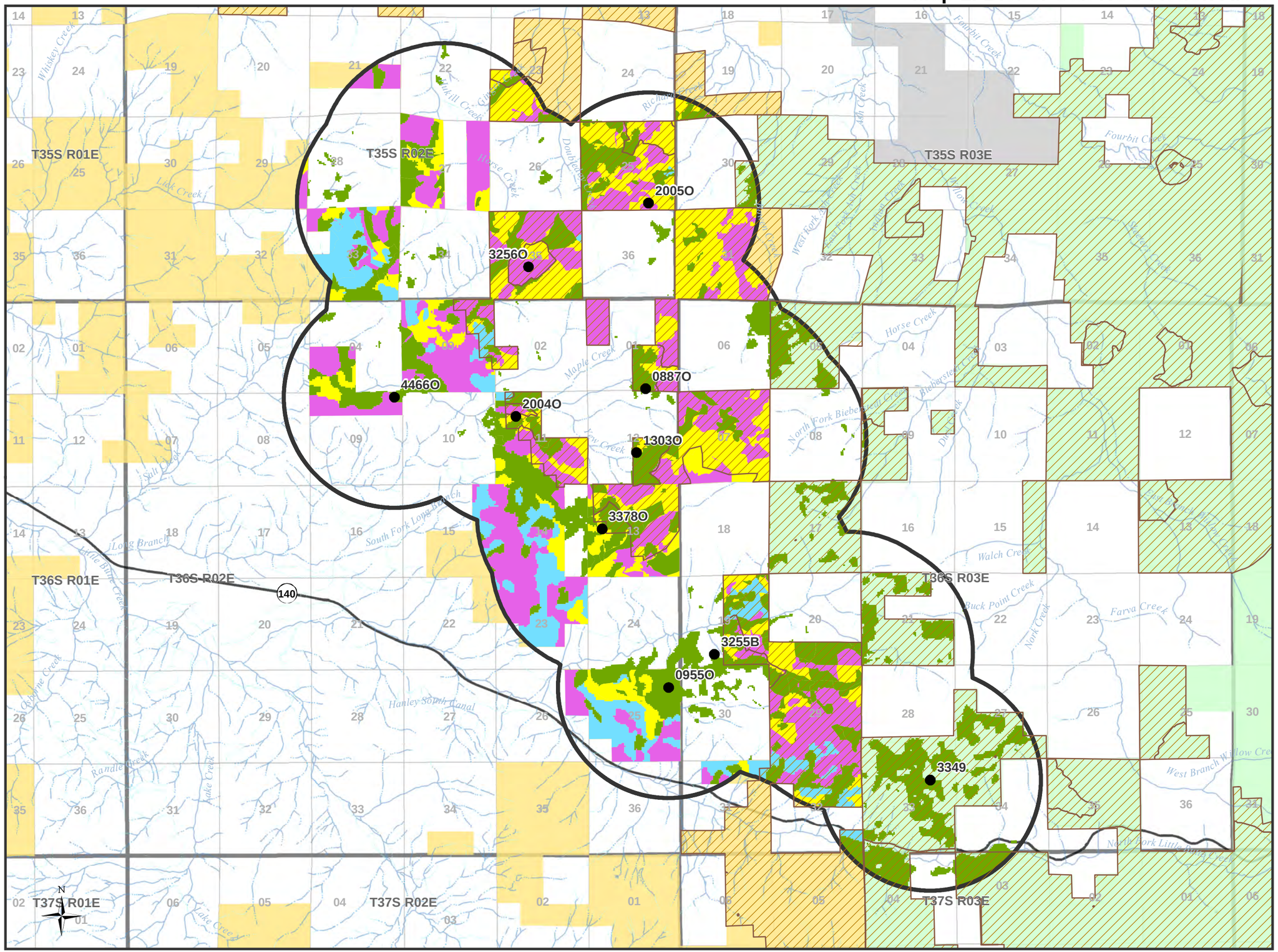


Map 2. Cold Elk NSO Action Area

Legend

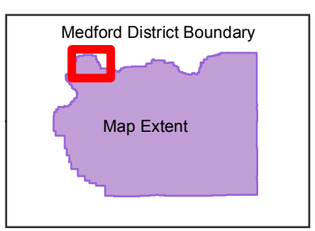
- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Pre-Harvest Habitat

- Capable
- Dispersal
- NRF
- Non-Habitat

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company



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0 0.5 1 2 Kilometers

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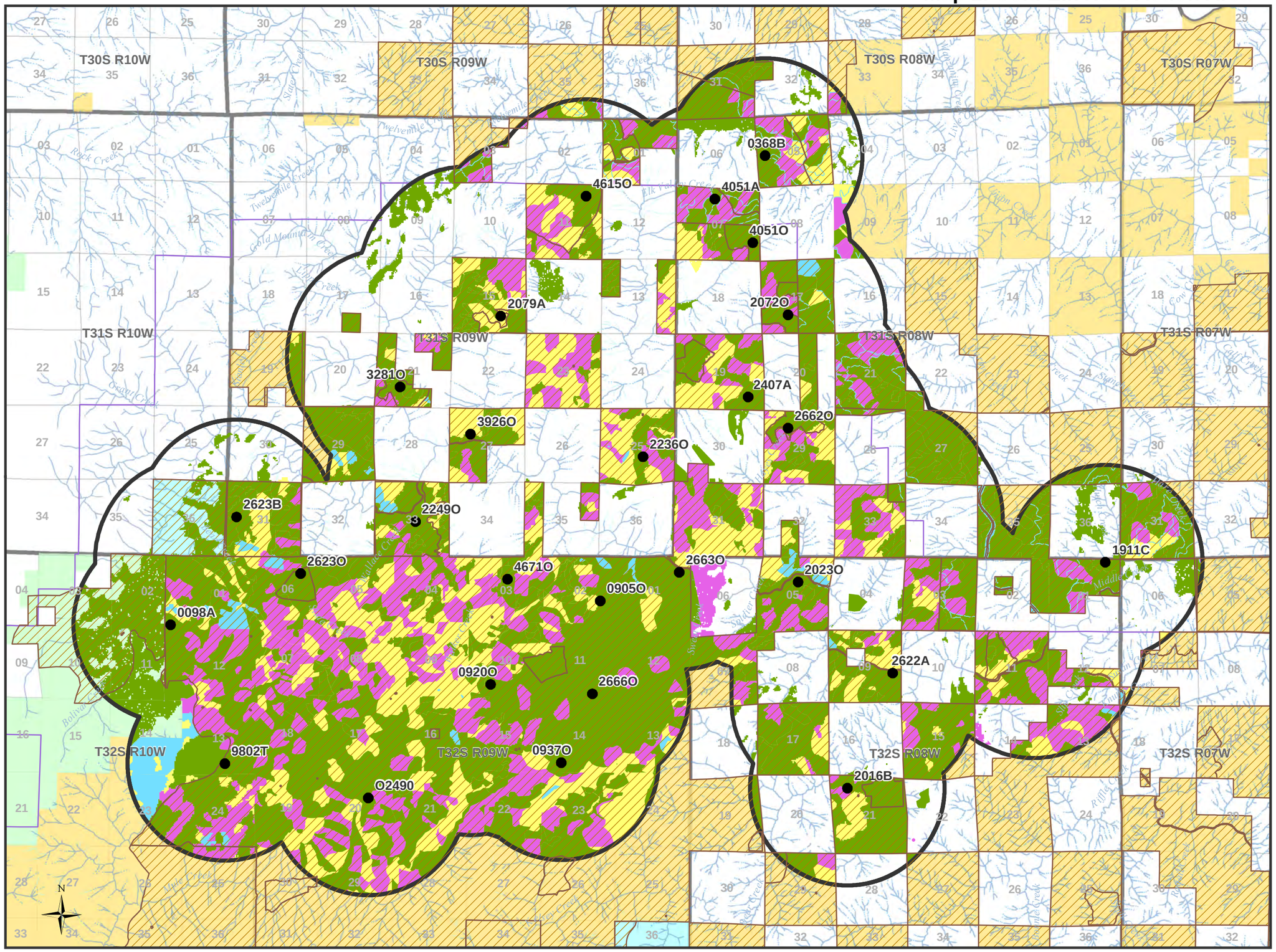


Map 3. Lost Creek NSO Action Area

Legend

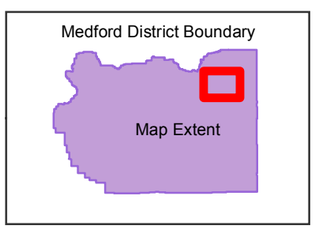
- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Pre-Harvest Habitat

- Capable
- Dispersal
- NRF
- Non-Habitat

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company



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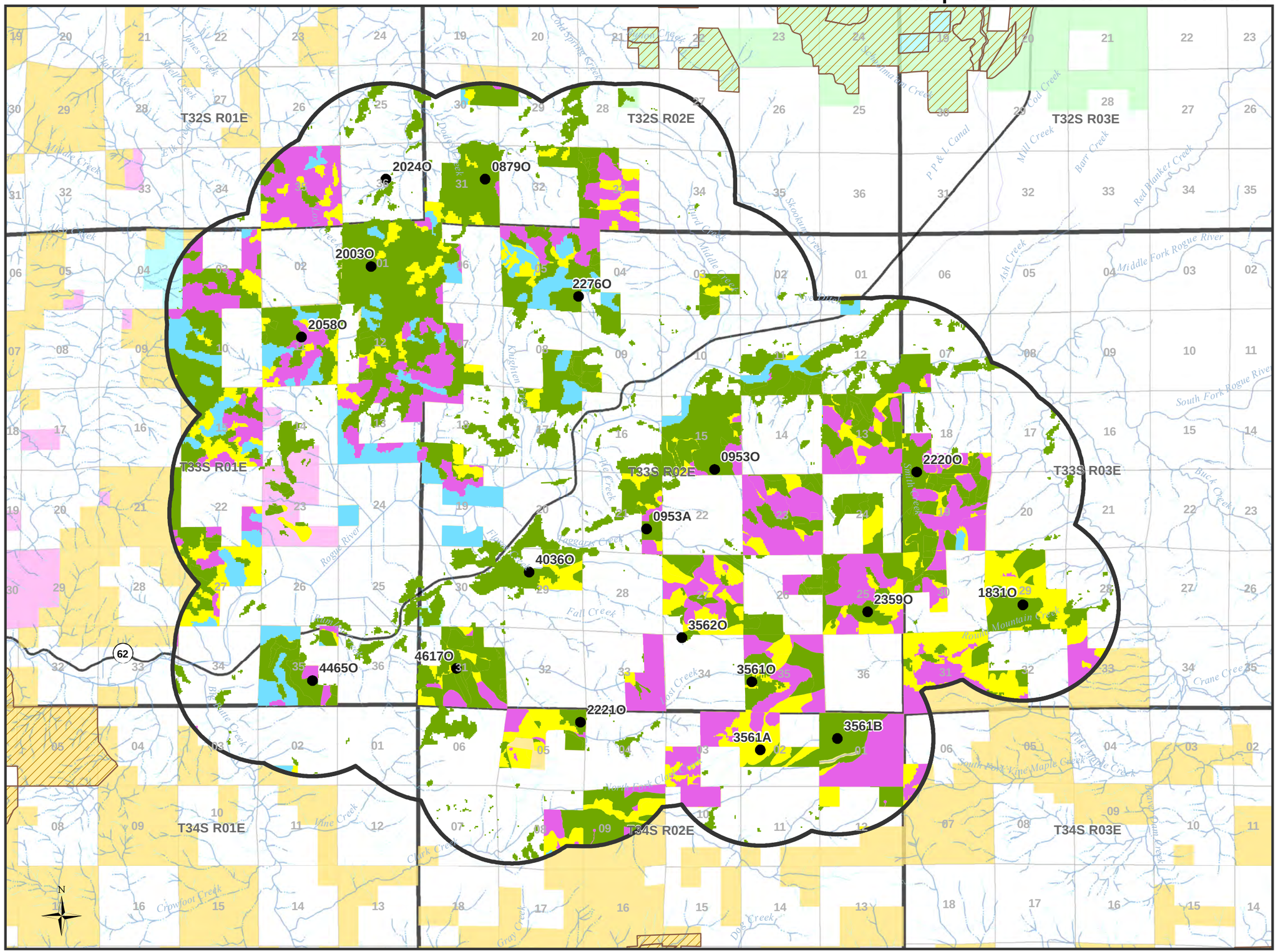
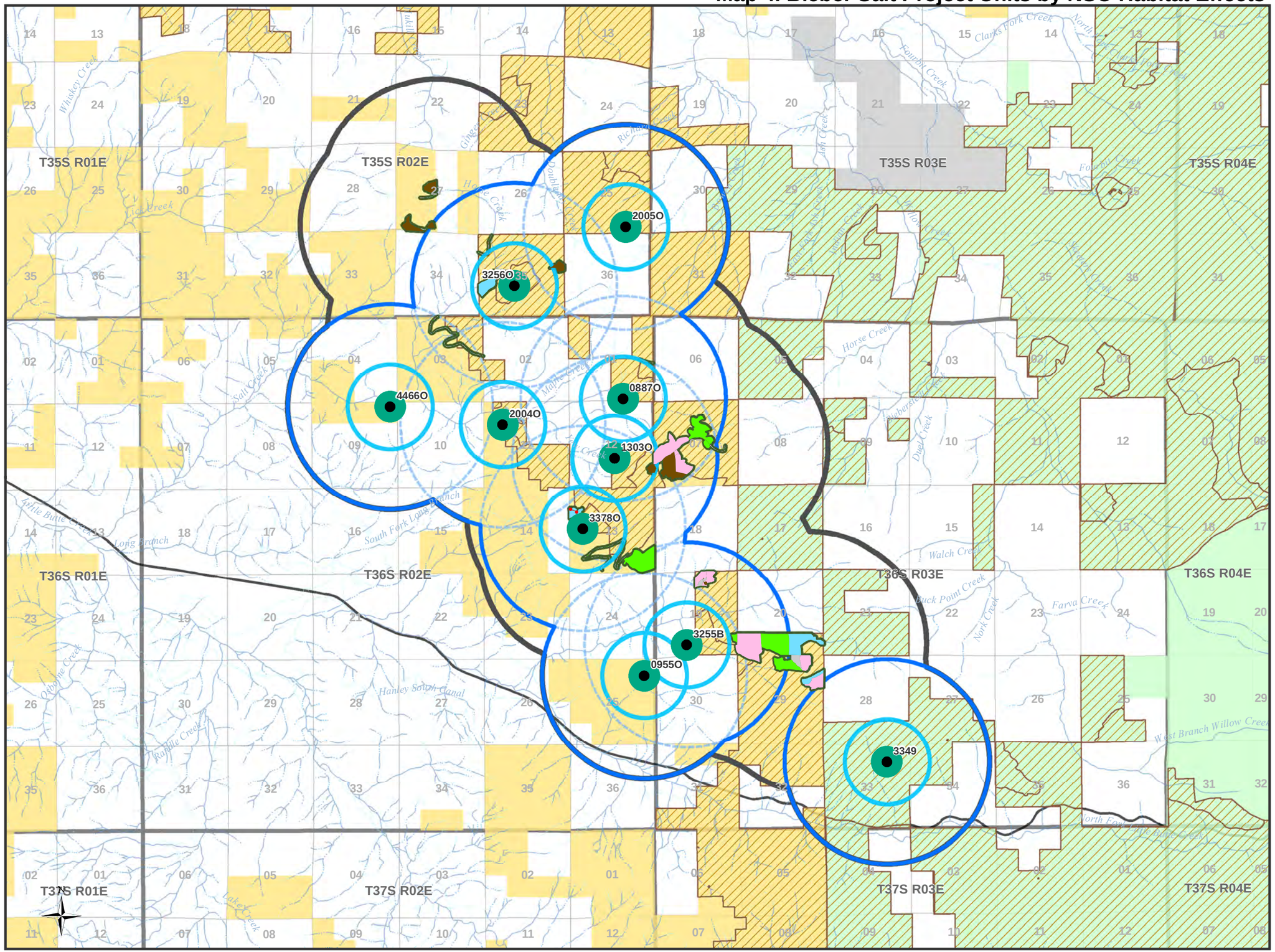


Map 4. Bieber Salt Project Units by NSO Habitat Effects



Legend

- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Northern Spotted Owl

- Nest Patch
- Owl CORE
- Home Range

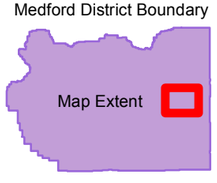
Unit Treatments

- Dispersal Maintained
- Dispersal Removed
- No Effect
- NRF Downgrade
- NRF Maintained
- NRF Removed

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company

Medford District Boundary



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United States Department of the Interior
Bureau of Land Management
Medford District
3040 Biddle Rd
Medford, OR 97504

Date: 6/3/2016

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Map 5. Cold Elk Project Units by NSO Habitat Effects

Legend

- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Northern Spotted Owl

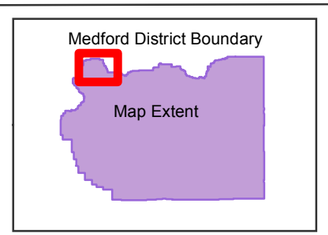
- Nest Patch
- Owl CORE
- Home Range

Unit Treatments

- Dispersal Maintained
- Dispersal Removed
- No Effect
- NRF Downgrade
- NRF Maintained
- NRF Removed

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company



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0 0.5 1 2 Kilometers

United States Department of the Interior

Bureau of Land Management
Medford District
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Medford, OR 97504

Date: 6/3/2016

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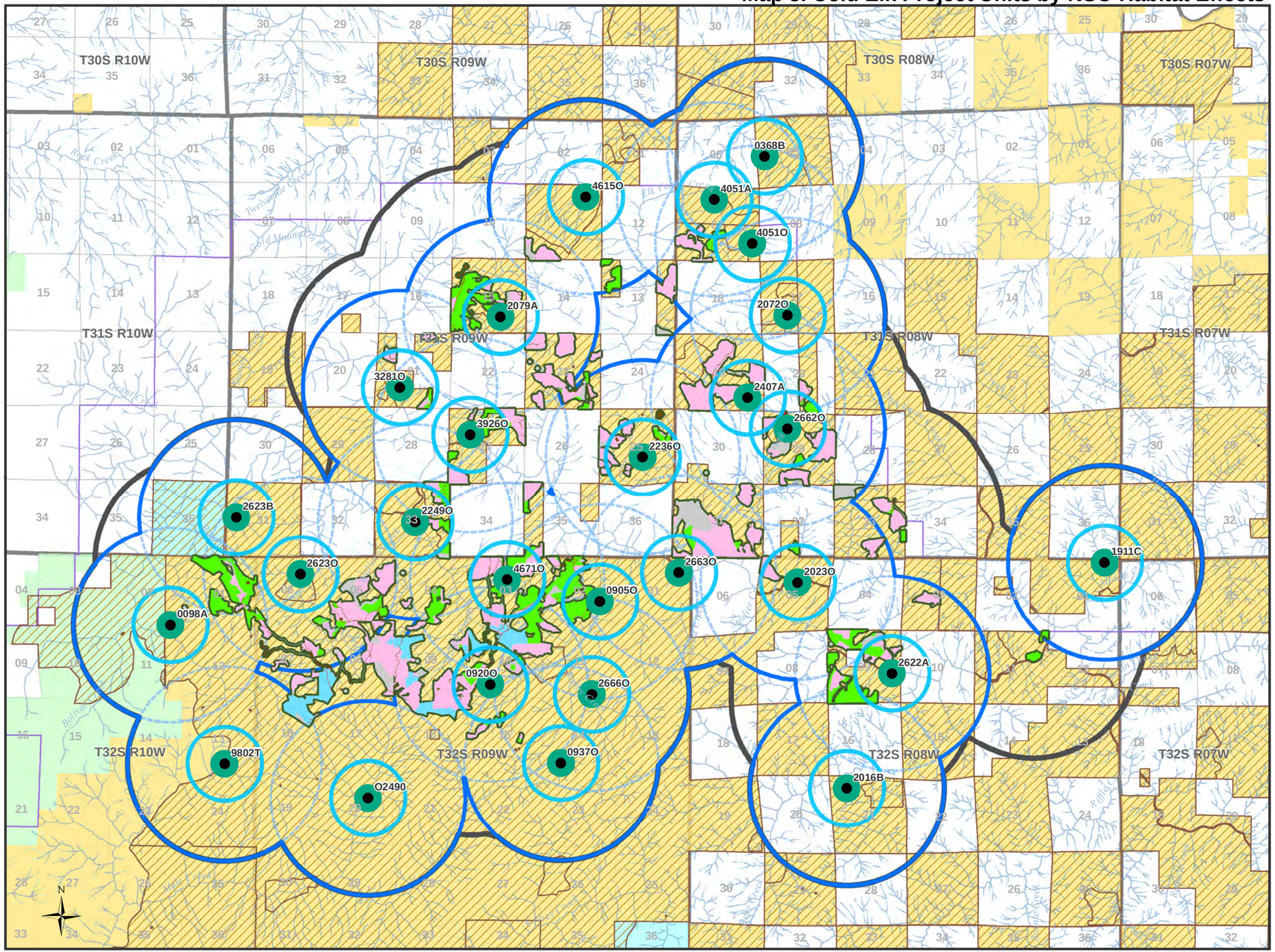


Map 6. Lost Creek Project Units by NSO Habitat Effects

Legend

- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Northern Spotted Owl

- Nest Patch
- Owl CORE
- Home Range

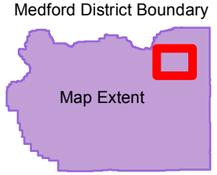
Unit Treatments

- Dispersal Maintained
- Dispersal Removed
- No Effect
- NRF Downgrade
- NRF Maintained
- NRF Removed

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company

Medford District Boundary



1:75,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

United States Department of the Interior
Bureau of Land Management
Medford District
3040 Biddle Rd
Medford, OR 97504

Date: 6/3/2016

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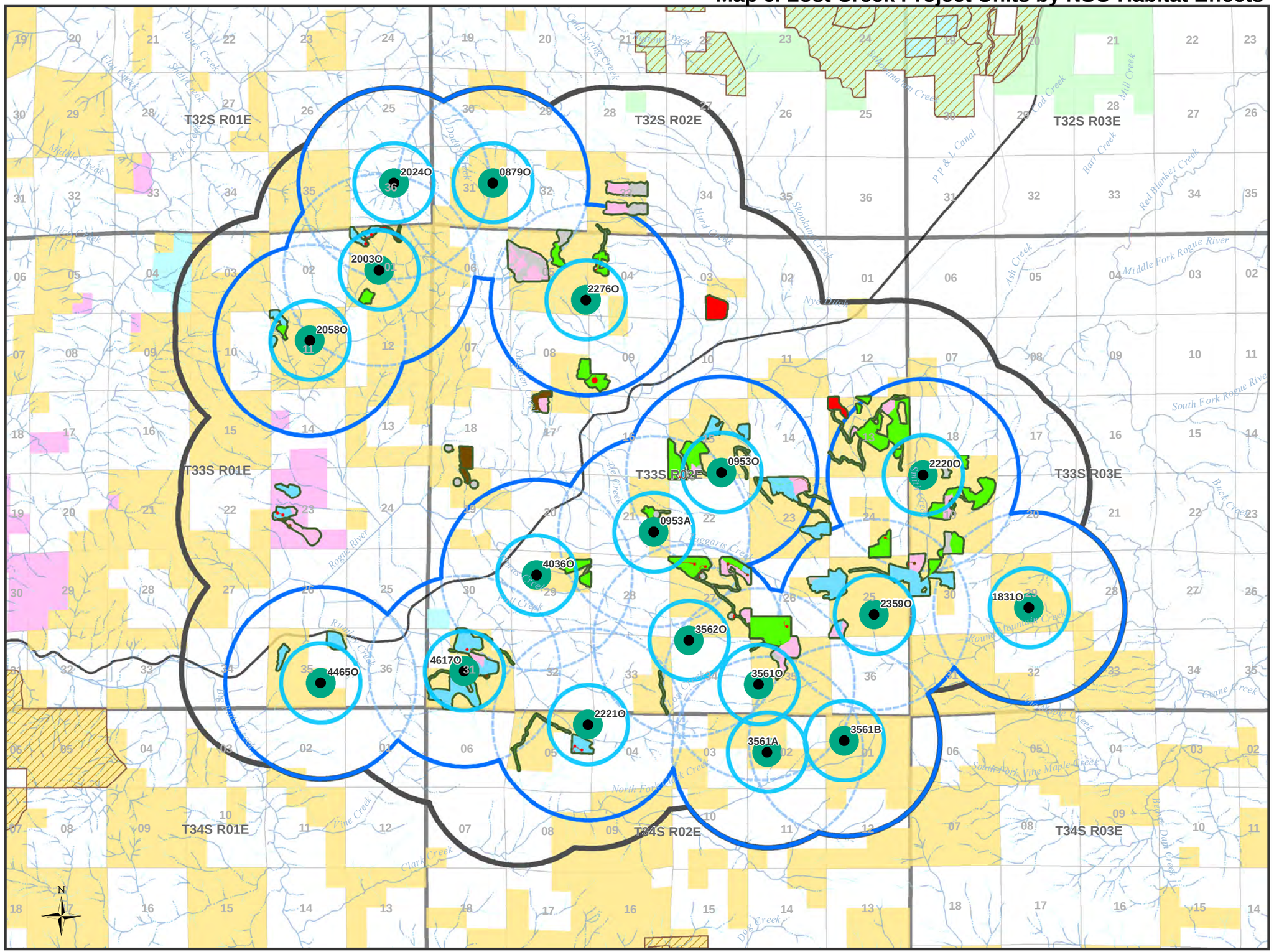
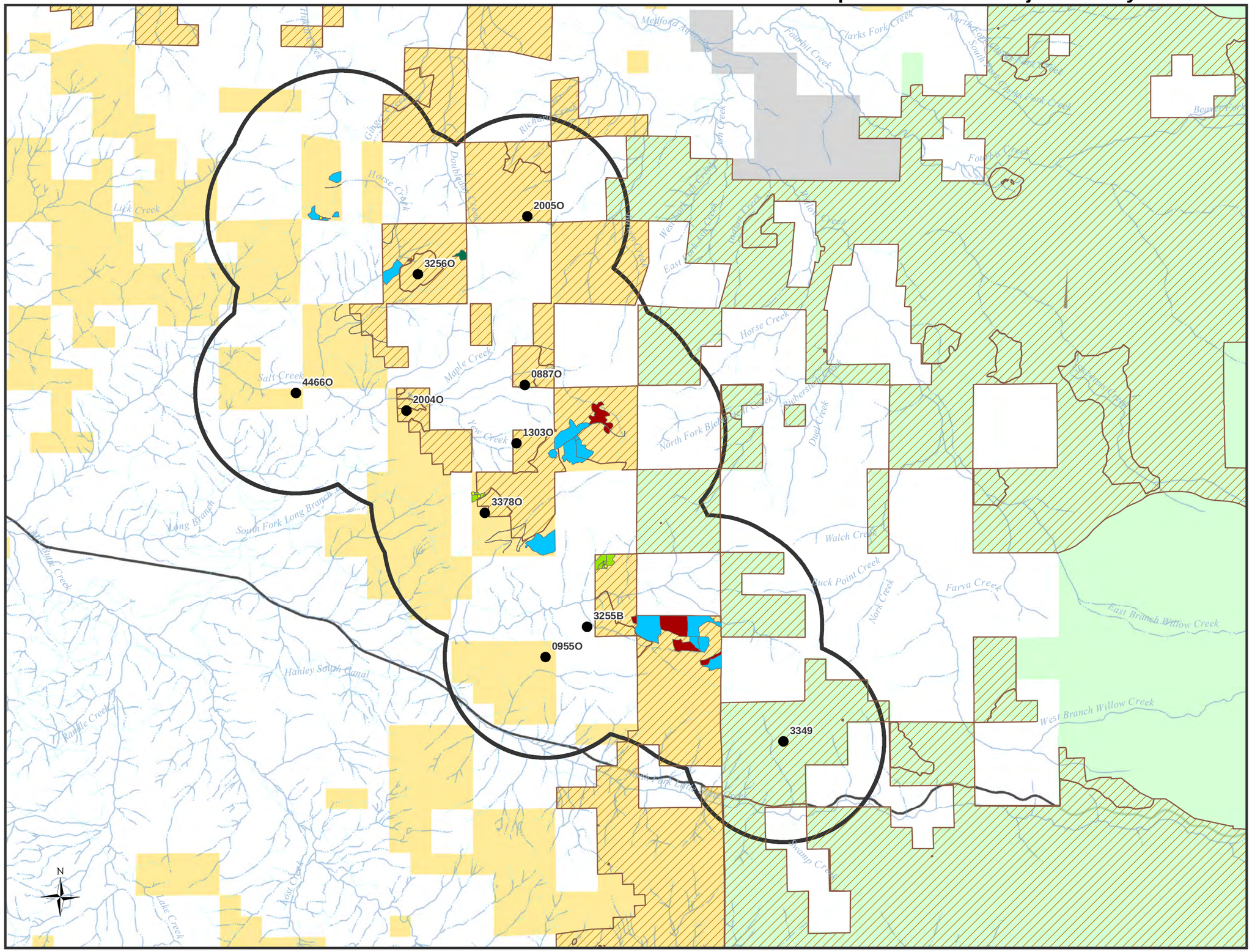


Map 7. Bieber Salt Project Unit by Treatment



Legend

- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Treatment Type

- Density Management
- Log Landing
- Roadside Maintenance
- Selective Thinning / DF
- Selective Thinning / MC
- Selective Thinning / WF
- Temporary Road

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company

Medford District Boundary

Map Extent

1:70,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

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Bureau of Land Management
Medford District
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Medford, OR 97504

Date: 6/3/2016

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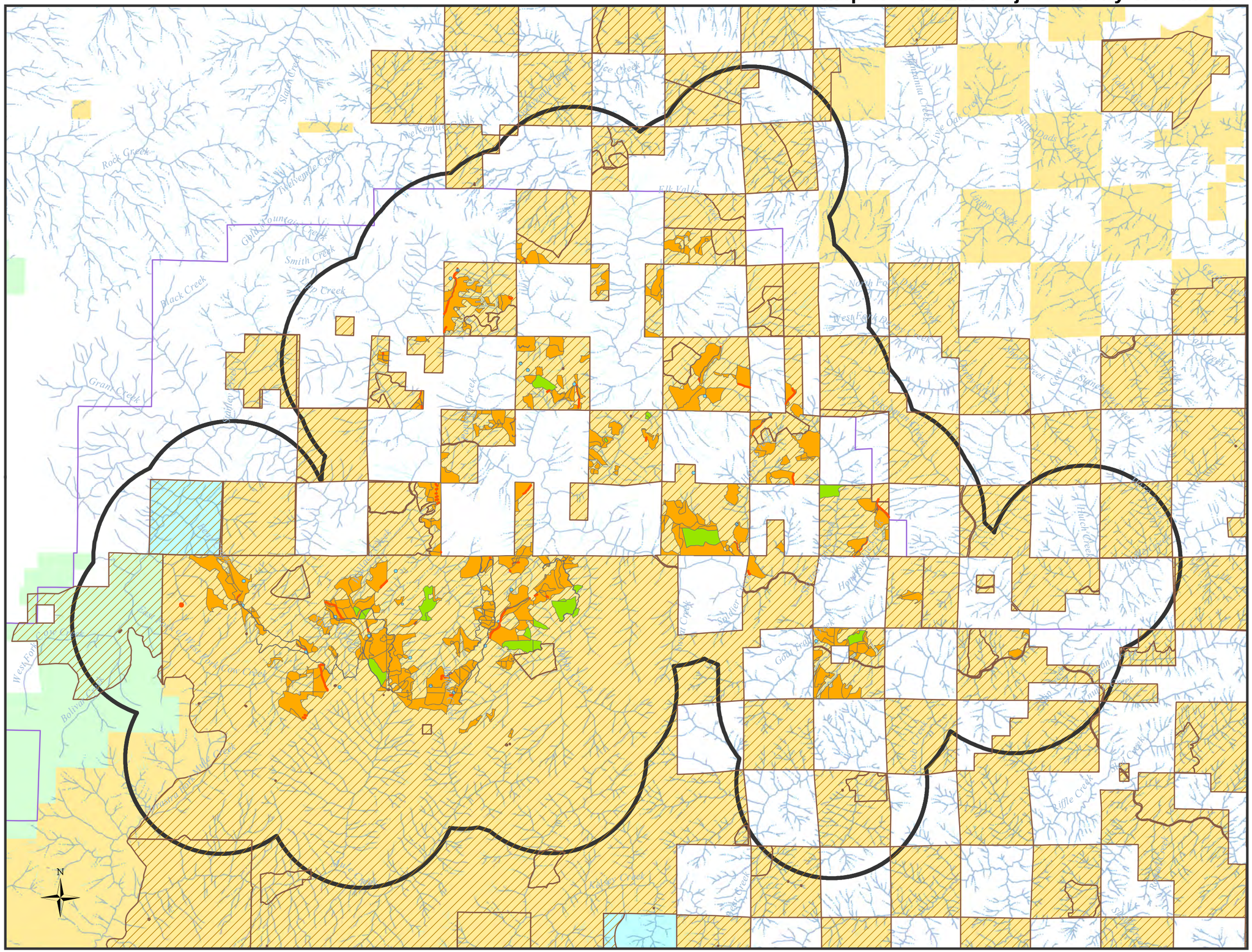
Map 8. Cold Elk Project Unit by Treatment



Legend

- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Treatment Type

- Forest Health/Fuels
- Day Lighting
- Road Construction
- Helicopter Landing
- Timber Sale

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company

Medford District Boundary

Map Extent

1:80,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

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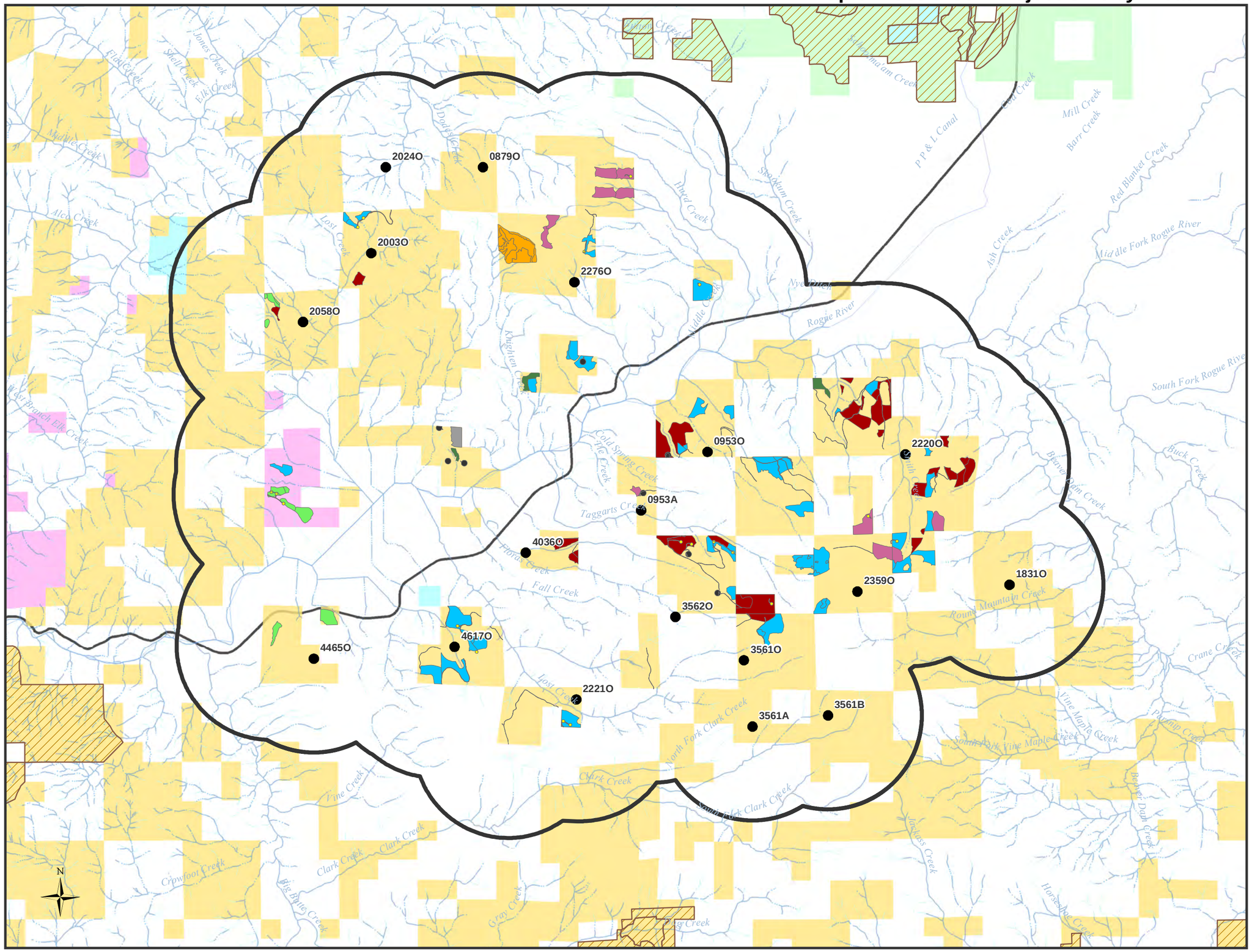
Map 9. Lost Creek Project Unit by Treatment



Legend

- Northern Spotted Owl Sites
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Treatment Type

- Density Management
- Fuels
- Helicopter Landing
- Log Landing
- Regeneration
- Roadside Maintenance
- Selective Thinning / DF
- Selective Thinning / MC
- Selective Thinning / WF
- Small Diameter Thin
- Structural Retention
- Temporary Road

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company

Medford District Boundary

Map Extent

1:75,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

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Map 10. Cold Elk Marbled Murrelet Action Area

Legend

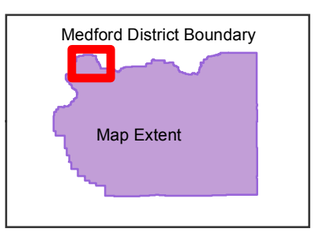
Final Action Area

Marbled Murrelet
- Survey Line A
- Survey Line B

Marbled Murrelet Critical Habitat

Cold Elk NSO Habitat (for comparison)
- Foraging
- Capable
- Non-Habitat
- Dispersal

Ownership
- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company



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0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

United States Department of the Interior
Bureau of Land Management
Medford District
3040 Biddle Rd
Medford, OR 97504

Date: 6/4/2016

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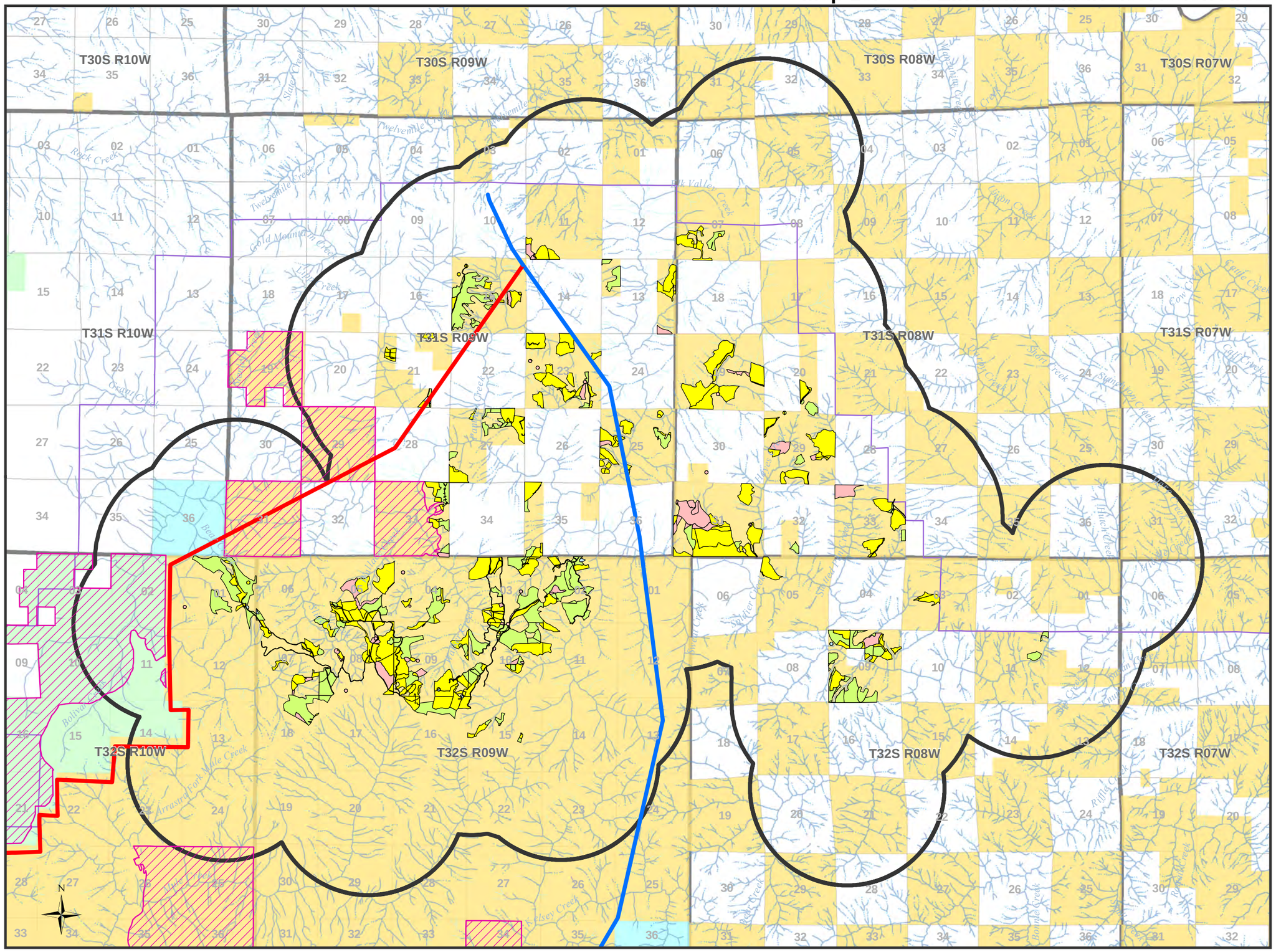
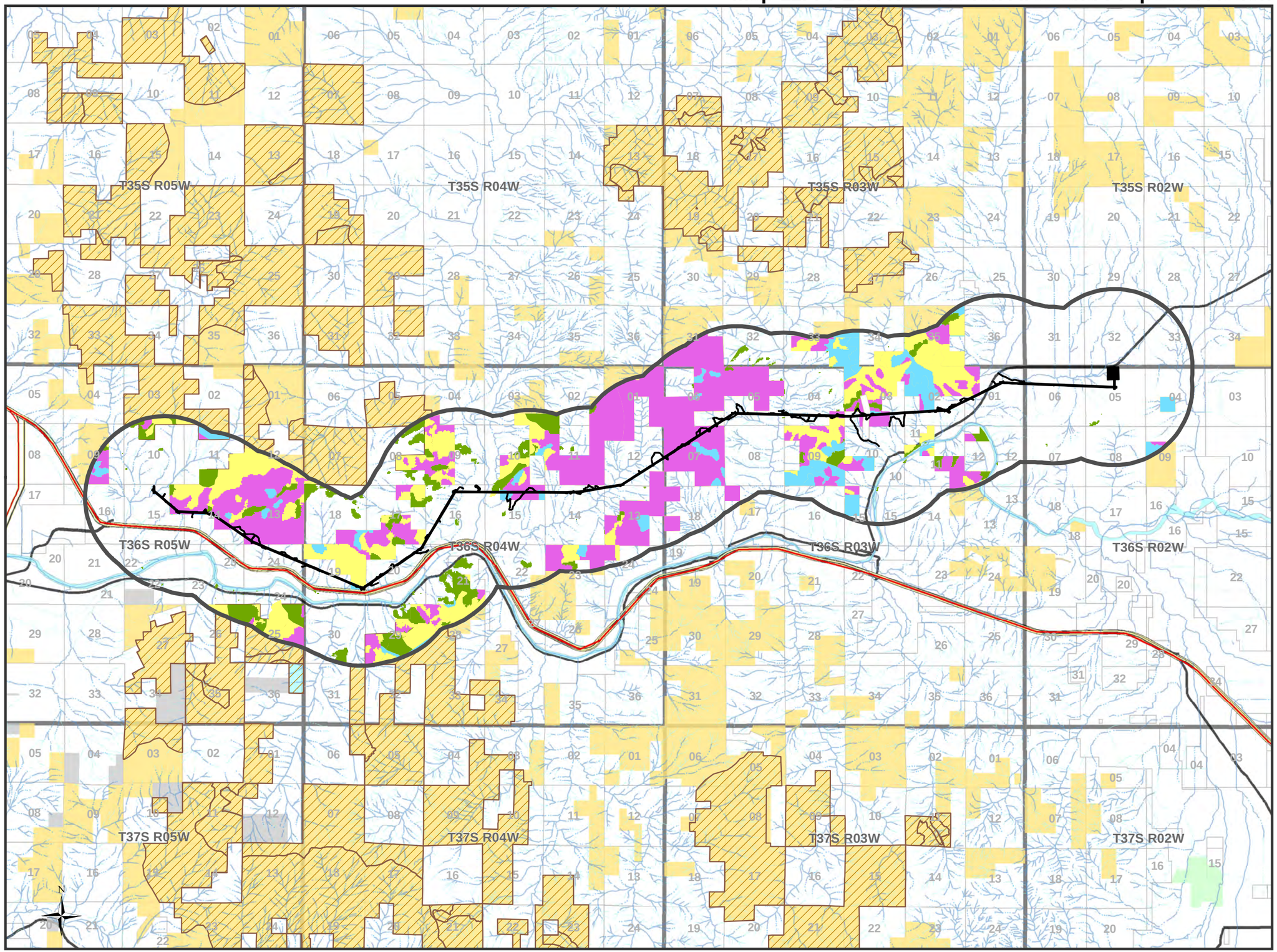


Map 11. PPLTR NSO Action Area and Proposed Action



Legend

- Proposed Action
- Final Action Area
- Northern Spotted Owl Critical Habitat November 2012

Pre-Harvest Habitat

- Capable
- Dispersal
- NRF
- Non-Habitat

Ownership

- Bureau of Land Management
- U.S. Forest Service
- Bureau of Reclamation
- Corps of Engineers
- Local Government
- State
- Private Individual or Company

Medford District Boundary

Map Extent

1:100,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

United States Department of the Interior
Bureau of Land Management
Medford District
3040 Biddle Rd
Medford, OR 97504

Date: 6/4/2016

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Attachment P-3. Maps of Habitat Location

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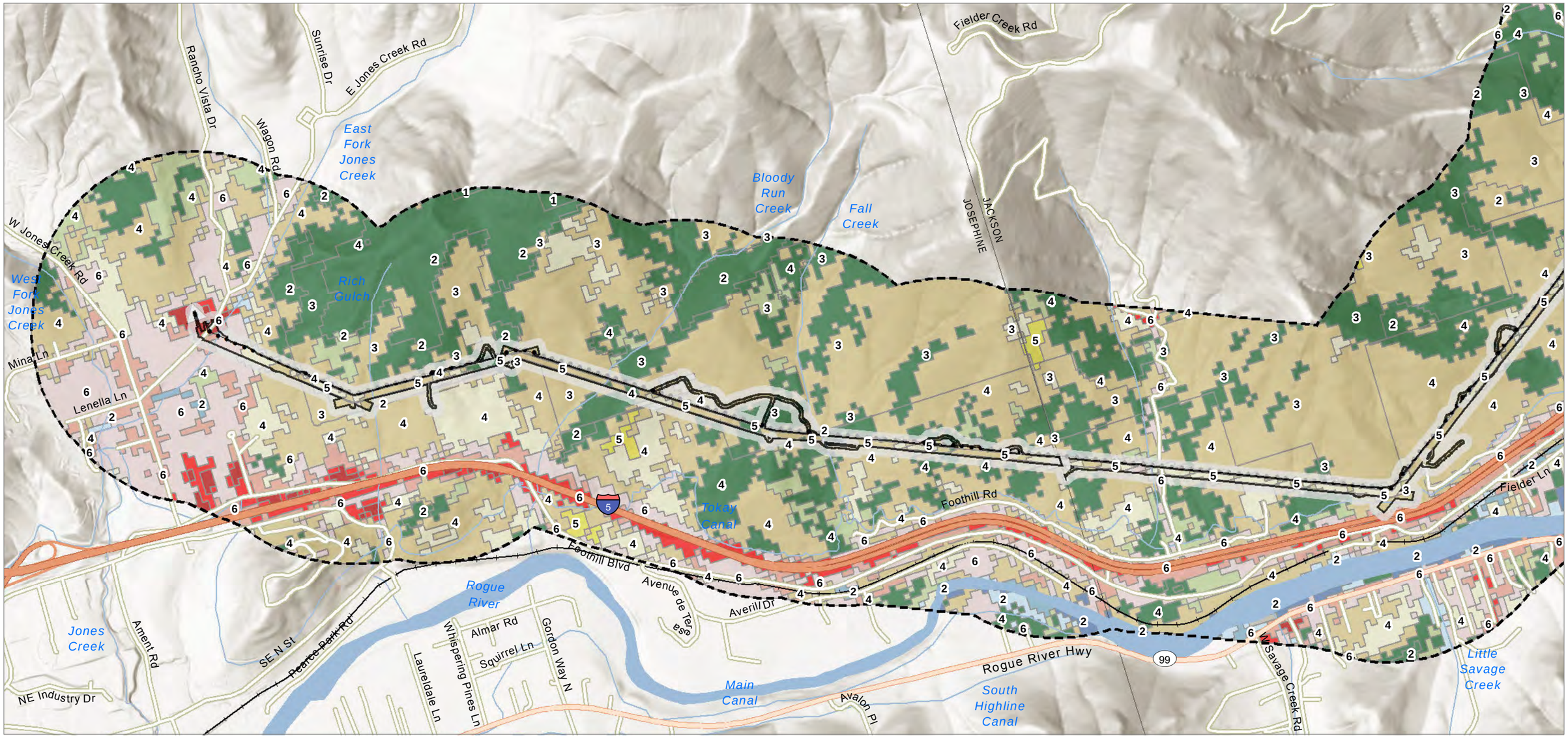
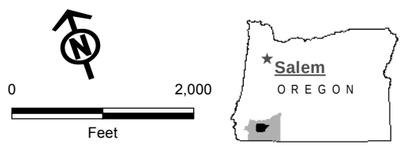




Map Area

Source(s): Esri, NLCD, PacifiCorp

Disclaimer: No warranty is made as to the accuracy or completeness of the data shown, and its use is not intended for other than the stated purpose.

Z:\UtilServ\Sams Valley\Reports\Exhibit P_Wildlife\Maps\FIG P-1 Land Cover_10_31.mxd
November 2017

Land Cover (Habitat Category is Labeled on Map)

- Analysis Area (1/2-mile buffer of Site Boundary)
- Woody Wetlands
- Shrub/Scrub
- Open Water
- Mixed Forest
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Barren Land

Project Features

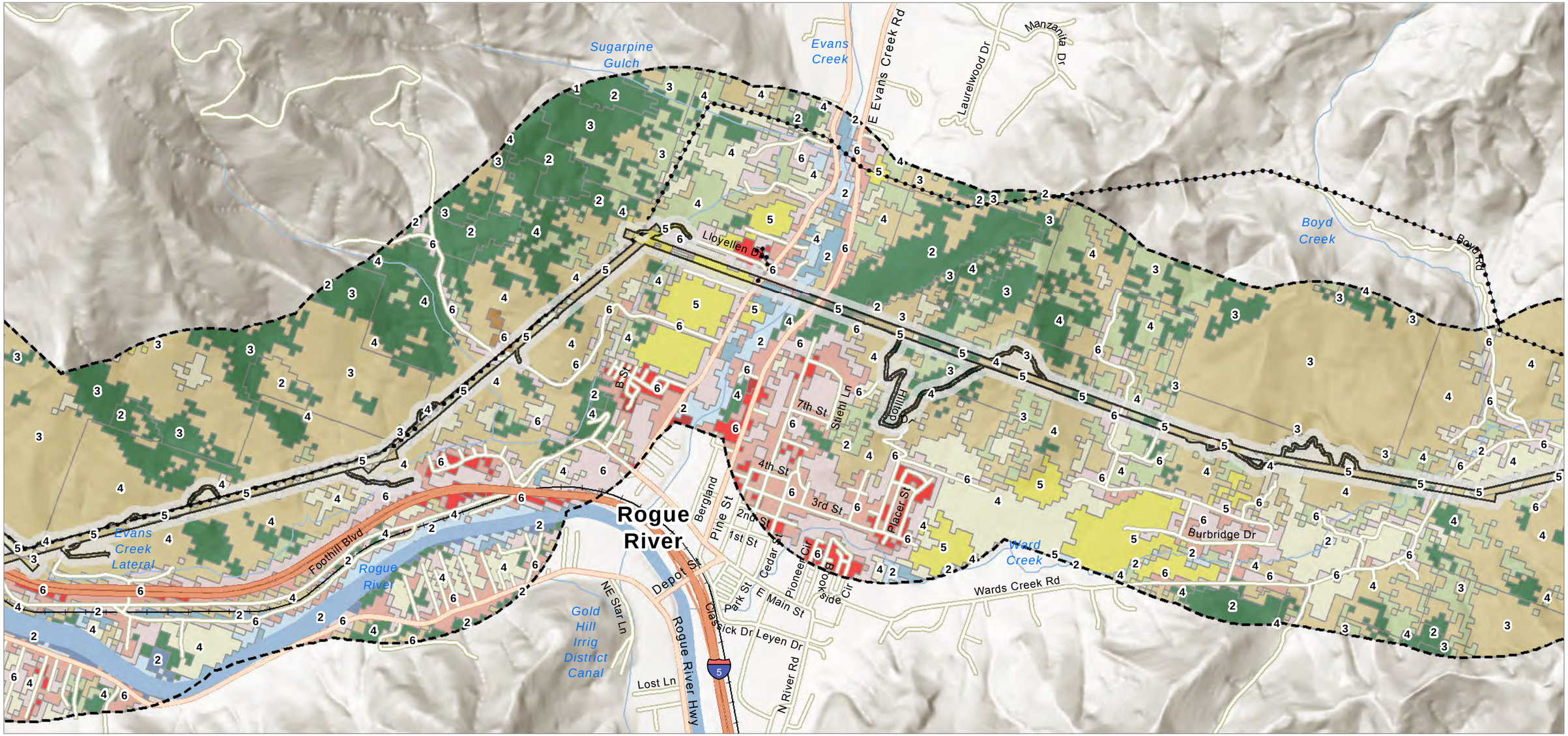
- Site Boundary
- Existing Substation

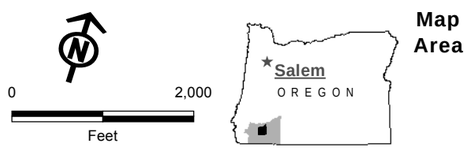
PACIFICORP

Sams Valley Reinforcement Projects
Josephine and Jackson Counties
Amendment #4

Habitat Categorization

Figure P-1





Source(s): Esri, NLCD, PacifiCorp

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Z:\UtilServ\Sams Valley\Reports\Exhibit P_Wildlife\Maps\FIG P-1 Land Cover_10_31.mxd
November 2017

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- Mixed Forest
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Cultivated Crops
- Barren Land

Project Features

- Site Boundary

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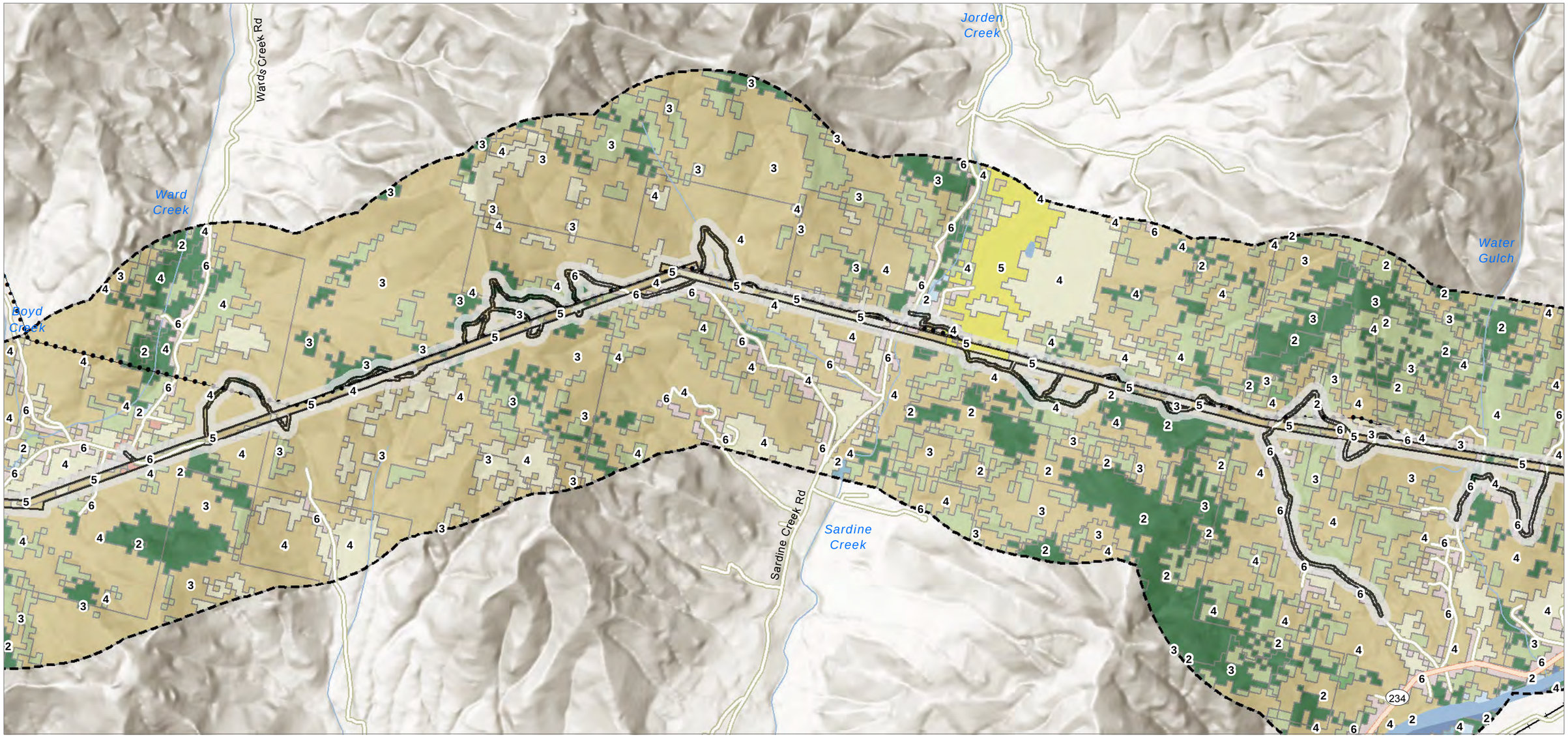
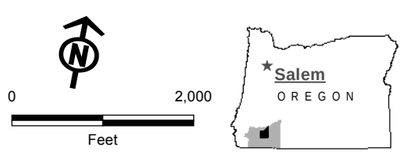
Sams Valley Reinforcement Projects
Josephine and Jackson Counties
Amendment #4

Habitat Categorization

Figure P-2





Map Area

Source(s): Esri, NLCD, PacifiCorp

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November 2017

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- Open Water
- Mixed Forest
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Low Intensity
- Deciduous Forest

Project Features

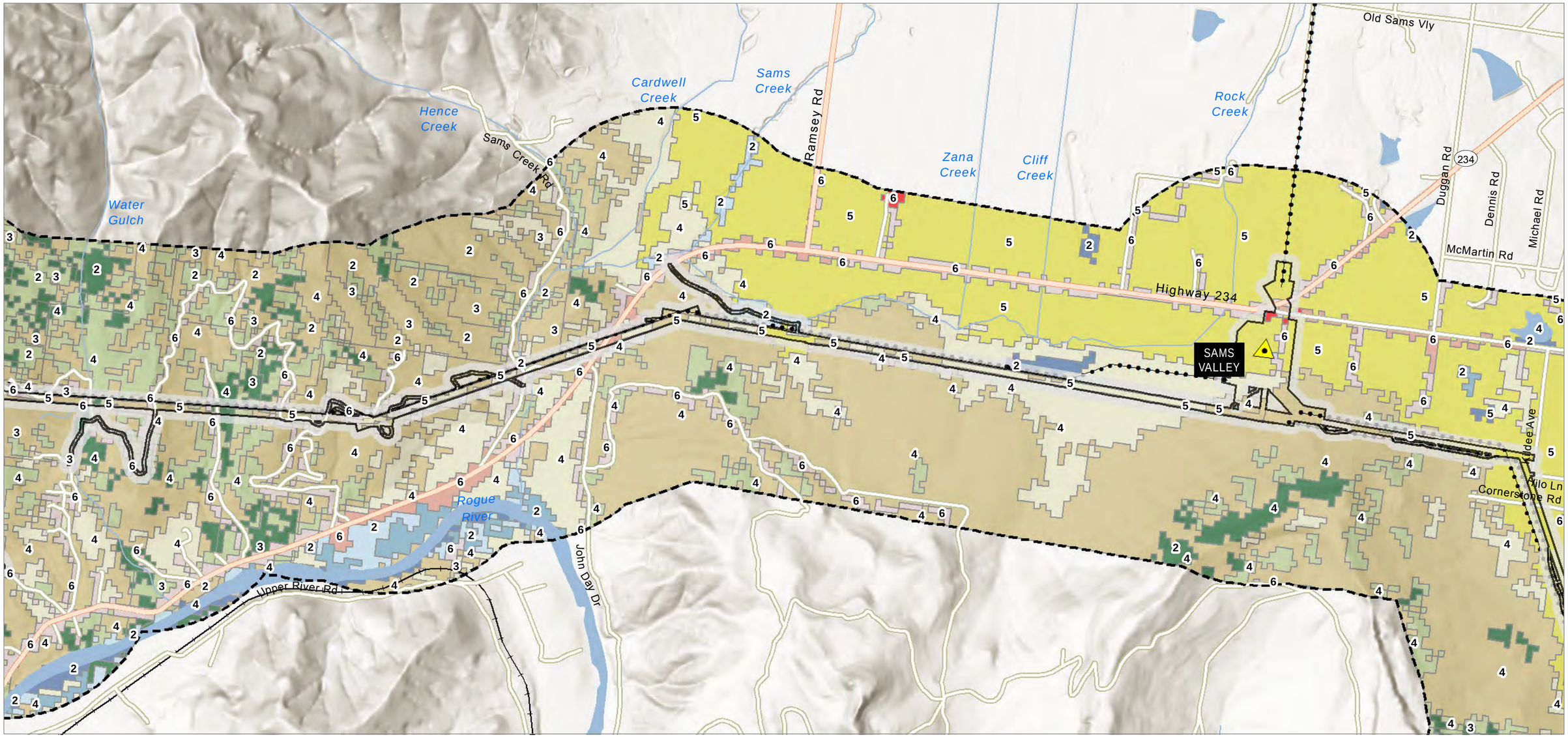
- Site Boundary

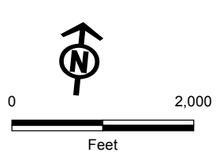
PACIFICORP

Sams Valley Reinforcement Projects
Josephine and Jackson Counties
Amendment #4

Habitat Categorization

Figure P-3





Map Area

Source(s): Esri, NLCD, PacifiCorp

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- Shrub/Scrub
- Open Water
- Mixed Forest
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Barren Land

Project Features

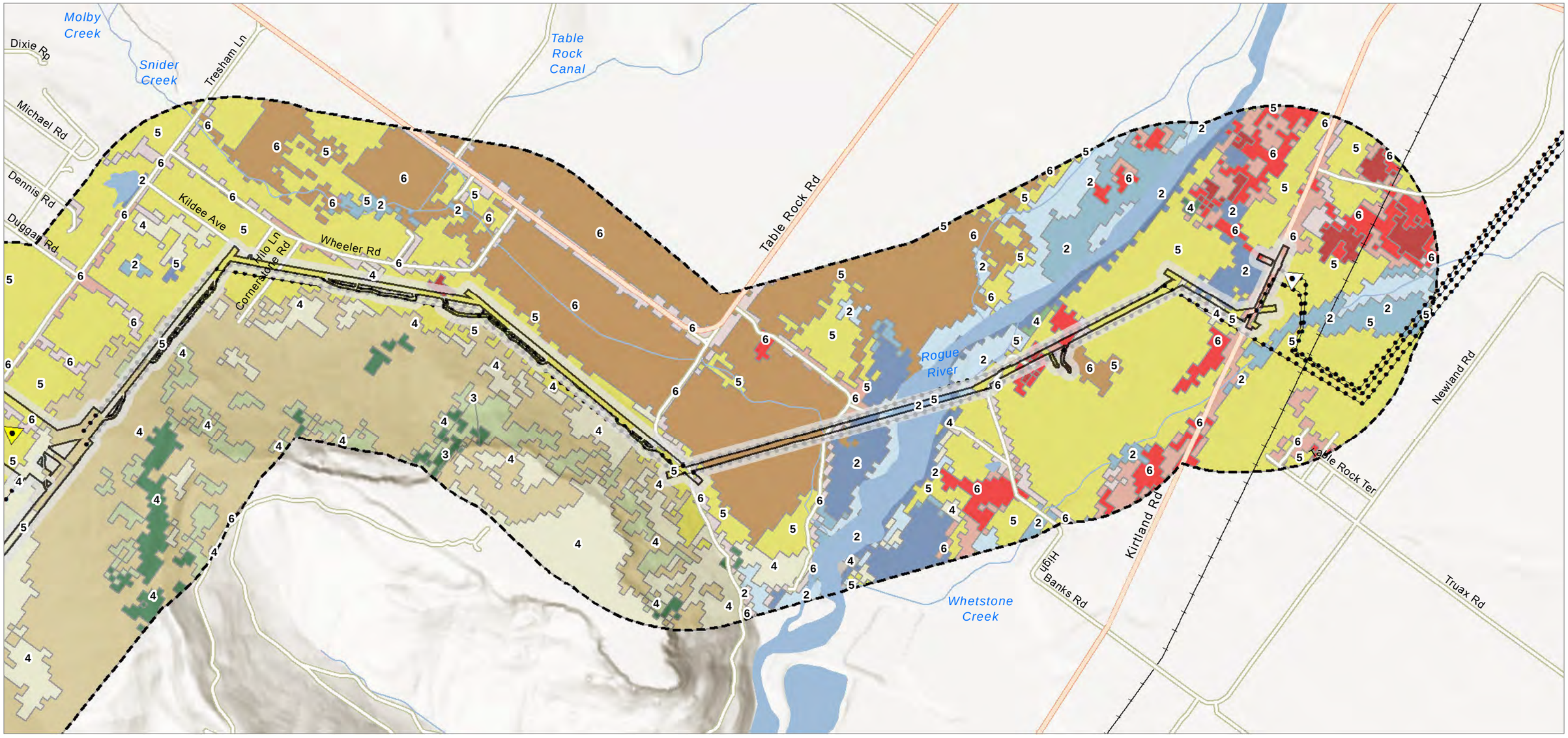
- Site Boundary
- Proposed Substation

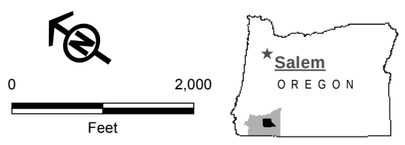
PACIFICORP

Sams Valley Reinforcement Projects
Josephine and Jackson Counties
Amendment #4

Habitat Categorization

Figure P-4





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November 2017

Land Cover (Habitat Category is Labeled on Map)

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- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Deciduous Forest
- Cultivated Crops
- Barren Land

Project Features

- Site Boundary
- Existing Substation

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Sams Valley Reinforcement Projects
Josephine and Jackson Counties
Amendment #4

Habitat Categorization

Figure P-5

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Attachment P-4. Habitat Mitigation Plan

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Habitat Mitigation Plan

Sams Valley Reinforcement Projects
December 2017

Prepared for

PacifiCorp

Prepared by

Tetra Tech, Inc.

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1.0 Introduction

As part of Exhibit P for the *Written Request for Amendment #4 Eugene–Medford 500 kV Transmission Line*, PacifiCorp dba Pacific Power (PacifiCorp) must show that the design, construction, and operation of the Proposed Sams Valley Reinforcement Project (Project), taking into account mitigation, are consistent with the general fish and wildlife habitat mitigation goals and standards of Oregon Department of Fish and Wildlife's (ODFW) Fish and Wildlife Habitat Mitigation Policy at Oregon Administrative Rule (OAR) 635-415-0025(1) through (6) (see OAR 345-022-0060, EFSC's Fish and Wildlife Habitat Standard). This fish and wildlife Habitat Mitigation Plan (HMP) sets forth the mitigation measures PacifiCorp will implement to achieve the goals and standards of ODFW's Habitat Mitigation Policy with respect to fish and wildlife habitat.

The Project is sited almost entirely within an existing transmission and distribution right-of-way that has had vegetation management occurring for decades. PacifiCorp has a reclamation and revegetation plan, a noxious weed plan, and a vegetation management plan for the Project, among other measures discussed in Exhibit P (Section 8) to avoid and minimize potential adverse impacts on fish and wildlife habitat and species. Regardless of these efforts to avoid and minimize potential adverse impacts, unavoidable impacts on fish and wildlife habitat and species will occur.

This HMP provides an approach for accounting for mitigation consistent with the ODFW Habitat Mitigation Policy, mitigation measures will be implemented and completed either prior to or concurrent with the Project.

This version of the HMP provides a conceptual approach for ensuring the Project is consistent with the general fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025. As such, this HMP will be updated as Project design is completed and mitigation measures are determined in consultation with the Oregon Department of Energy (ODOE). Updates to the HMP will be provided to ODOE for review.

2.0 Applicable Rules and Agency Guidance

2.1 General Standards for Siting Facilities

The Fish and Wildlife Habitat Standard at OAR 345-022-0060 states:

> *To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are consistent with:*
>
> *(1) The general fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025(1) through (6) in effect as of February 24, 2017, and*

> *(2) For energy facilities that impact sage-grouse habitat, the sage-grouse specific habitat mitigation requirements of the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-415-0025(7) and OAR 635-140-0000 through -0025 in effect as of February 24, 2017.*

Since the Project is not within the range of the greater sage-grouse, OAR 345-022-0060(2) is not applicable to this HMP.

3.0 Methods

3.1 Avoidance

ODFW's Habitat Mitigation Policy sets forth a mitigation goal for each habitat category, and provides recommendations or requirements ODFW shall take to achieve the mitigation goals. Depending on the habitat category, ODFW's recommendations or requirements provide that the project proponent must avoid impacts to the habitat or at least consider avoidance of the habitat.

3.1.1 Habitat Category 1

For Habitat Category 1, ODFW's recommendations or requirements provide that impacts to the habitat must be avoided through alternatives to the proposed development action or the project should not be authorized (see OAR 635-415-00252(1)(b)). PacifiCorp has not identified any Category 1 habitat within the Site Boundary. However, there is potential for Category 1 habitat associated with raptor nests to be identified within the Site Boundary prior to construction. To ensure that Category 1 raptor nests and raptor breeding activities are not disturbed by Project activities, the avoidance and minimization measures identified in Exhibit P, Section 8 will be applied. Application of these measures will ensure that Category 1 raptor nests are not affected by the Project.

3.1.2 Habitat Categories 2 through 6

ODFW's recommendations or requirements for meeting the mitigation goals for Habitat Categories 2 through 6 provide that the project proponent must consider avoiding impacts to the relevant habitats. However, unlike Habitat Category 1, strict avoidance is not a requirement in Habitat Categories 2 through 6. Rather, unavoidable impacts to Habitat Categories 2 through 5 may be addressed by showing the impacts will be mitigated for, and unavoidable impacts to Habitat Category 6 need only be minimized (see OAR 635-415-00252(2)(b)(B), (3)(b)(B), (4)(b)(B), (5)(b)(B), and (6)(b)). Here, as discussed in Exhibit P, Section 8.0, PacifiCorp is proposing measures to be implemented during construction and operation that will avoid and minimize impacts to fish and wildlife habitats.

3.2 Minimization

3.2.1 Habitat Categories 2 through 5

ODFW's Habitat Mitigation Policy does not specify that unavoidable impacts to Habitat Categories 2 through 5 must be minimized, in addition to being mitigated. Regardless, the minimization measures that PacifiCorp is proposing (Exhibit P, Section 8) will be implemented Project-wide and across all habitat categories.

3.2.2 Habitat Category 6

ODFW's Habitat Mitigation Policy provides for minimizing impacts to Habitat Category 6 and does not require compensatory mitigation for such impacts (see OAR 635-415-00252(6)(b)). Implementation of a Reclamation and Revegetation Plan (Exhibit P, **Fish and Wildlife Condition 1**) will minimize impacts to Habitat Category 6 consistent with ODFW's Habitat Mitigation Policy, and no compensatory mitigation is required or proposed.

3.3 Compensatory Mitigation

For unavoidable impacts to Habitat Categories 2 through 5, compensatory mitigation will be considered. The following discussion presents the potential impacts to Habitat Categories 2 through 5 and proposed methods for accounting for compensatory mitigation to offset the Project impacts.

3.3.1 Quantifying Project Impacts

PacifiCorp identified habitat types within the Site Boundary consistent with the Habitat Mitigation Policy (see Exhibit P). PacifiCorp then identified the direct impacts of the Project to each habitat type by calculating the number of acres of each habitat type within the construction and operation footprints. PacifiCorp anticipates that many of the temporary and permanent disturbances currently being categorized as either a Category 3 or Category 4 habitat will ultimately be categorized as a Category 5 habitat. PacifiCorp will update the habitat categorization during final design through the review of current land uses to more accurately depict on the ground conditions compared to what is available through the use of the existing land cover dataset used in Exhibit P.

Vegetation removal required for construction and operation could result in a loss of habitat for some species. Most vegetation removal would be temporary (174.6 acres) and would primarily affect shrub/scrub, herbaceous, and hay/pasture cover types. Approximately 59.7 acres of vegetation would be permanently cleared during construction, of which 21.2 acres would occur in the shrub/scrub cover type, 18.5 acres in the hay/pasture cover type, 9.8 acres in the herbaceous cover type, 5.7 acres in the developed/open space cover type, 4.1 acres in the evergreen forest and mixed forest cover types, and 0.4 acres in the woody wetland cover type.

3.3.2 Calculating Mitigation

Permanent impacts will be mitigated through the restoration, establishment, enhancement, and/or preservation of similar habitat. Table 1 outlines the approach to calculating the mitigation accrued from permanent impacts.

Table 1. Calculating Mitigation for Permanent Impacts

Habitat Category	Impact Acres	Mitigation Ratio	Mitigation Description
Category 2	1	>1	The mitigation goal for Category 2 habitat is "no net loss" and "net benefit." Accordingly, mitigation for permanent impacts on Category 2 habitat needs to demonstrate a net benefit in quality or quantity.
Category 3 & Category 4	1	1	The mitigation goal for Category 3 & 4 habitat is "no net loss" in quantity or quality.
Category 5	1	<1	The mitigation goal for Category 5 habitat is a "net benefit in habitat quantity or quality." Mitigation is accrued at a lesser amount (but greater than zero) of acreage than what is impacted by the Project; however, mitigation actions performed to offset the Category 5 mitigation requirements will be improving the quality of Category 2, 3, or 4 habitats and result in a net benefit to quality.
Category 6	1	0	The mitigation goal for impacts on Category 6 habitat is minimization; no compensatory mitigation proposed.

Temporary impacts will be restored during site reclamation. The certificate holder assumes restoration will be successful. The certificate holder will propose mitigation beyond restoration for temporary impacts on Category 2 habitat to meet the net benefit requirement. The certificate holder will not propose mitigation for temporary impacts on Category 3 through Category 6 habitat. Table 2 outlines the approach to calculating mitigation for temporary impacts.

Table 2. Calculating Mitigation for Temporary Impacts

Habitat Category	Impact Acres	Mitigation Ratio	Mitigation Description
Category 2	1	1	The mitigation goal for Category 2 habitat is "no net loss" and "net benefit." Accordingly, mitigation for temporary impacts on Category 2 habitat needs to demonstrate a net benefit in quality or quantity. All areas of temporary disturbance would be restored at the site of impact. The proposed mitigation ratio, when considered with restoration efforts, would meet the "net benefit" requirement.
Category 3 and Category 4	1	0	The mitigation goal for Category 3 & 4 habitat is "no net loss" in quantity or quality. Restoration will meet the "no net loss" goal.

Table 2. Calculating Mitigation for Temporary Impacts

Habitat Category	Impact Acres	Mitigation Ratio	Mitigation Description
Category 5	1	0	The mitigation goal for Category 5 habitat is a "net benefit in habitat quantity or quality." Reclamation activities in Category 5 habitat will result in a higher functioning habitat and therefore be a "net benefit" in habitat quality for all temporary impacts on Category 5 habitat; therefore, no compensatory mitigation is proposed.
Category 6	1	0	The mitigation goal for Category 6 habitat is minimization; no compensatory mitigation is proposed.

4.0 Results

Table 3 applies the proposed mitigation ratios (Table 1 and Table 2) to the impact acreages presented in Exhibit P (Table P-4) to estimate the potential mitigation requirements associated with the Project. As previously stated, PacifiCorp anticipates that that many of the temporary and permanent disturbances currently being categorized as either a Category 3 or Category 4 habitat will ultimately be categorized as a Category 5 habitat. PacifiCorp will update the habitat categorization during final design through the review of current land uses to more accurately depict on the ground conditions compared to what is available through the use of the existing land cover dataset used in Exhibit P.

Table 3. Estimated Mitigation

ODFW Habitat Category	Land Cover Type	Temporary Disturbance Considered for Mitigation (acres)	Permanent Disturbance Considered for Mitigation (acres)	Estimated Mitigation
2	Evergreen Forest	0.2	0.1	**>0.3**
	Mixed Forest	0.1	0.1	**>0.2**
	Shrub/Scrub	0.5	0.2	**>0.7**
	Emergent Herbaceous Wetlands[1]	0.1	0.0	**>0.1**
	Woody Wetlands[1]	0.6	0.4	**>1.0**

Table 3. Estimated Mitigation

ODFW Habitat Category	Land Cover Type	Temporary Disturbance Considered for Mitigation (acres)	Permanent Disturbance Considered for Mitigation (acres)	Estimated Mitigation
	Open Water[1]	0.3	0.0	**>0.3**
3	Evergreen Forest	NA	0.9	**0.9**
	Mixed Forest	NA	0.3	**0.3**
	Herbaceous	NA	0.2	**0.2**
	Shrub/Scrub	NA	3.0	**3.0**
4	Evergreen Forest	NA	0.2	**0.2**
	Mixed Forest	NA	1.1	**1.1**
	Herbaceous	NA	3.8	**3.8**
	Shrub/Scrub	NA	11.2	**11.2**

1. Impacts to wetlands and waters are addressed in Exhibit J. Wetlands and waters presented here are likely to be an overestimation of the actual impacts to wetlands and waters due to the land cover data used in the analysis. Actual mitigation responsibilities for impacts to wetlands and water will not be addressed in the HMP; however, wetland and water cover types are included for the purpose of estimating mitigation in accordance with the ODFW Habitat Mitigation Policy.

As discussed in Exhibit Q, approximately 11 acres of northern spotted owl habitat will be disturbed by the Project. This includes 6.3 acres of temporary disturbance (0.8 acre Category 2 and 5.5 acres Category 3) and 4.7 acres of permanent disturbance (0.4 acre Category 2 and 4.3 acres Category 3). PacifiCorp will review the designation of northern spotted owl habitat within the Site Boundary to ensure it is adequately addressed within this HMP.

5.0 Discussion

PacifiCorp estimates approximately 25 acres (or equivalent mitigation currency) of mitigation may be needed to satisfy the ODFW Habitat Mitigation Policy. PacifiCorp anticipates these estimates will be greatly reduced, if not eliminated, upon further review of current land use within the Site Boundary. In the event that compensatory mitigation is required, PacifiCorp would prefer to

address these requirements through purchasing mitigation credits from a mitigation bank or in-lieu fee sponsor. If mitigation banking or in-lieu fee sponsors are not available, PacifiCorp will address mitigation requirements through conservation easements (primary) or fee-title acquisitions (secondary). Conservation easements or fee-title acquisitions will gain credit for mitigation through a combination of enhancement and avoided loss.

Enhancement includes measures that increase the quantity and/or quality of fish and wildlife habitat and are aimed at transitioning an area of habitat from a less than desirable state to something more desirable. Appropriate enhancement measures may vary among sites, depending on the initial and desired states of a site. Avoided loss includes measures that prevent undesirable state changes in areas that are at a demonstrated risk of degradation from threats such as development, wildfire, and invasive species. Depending on the current and anticipated future threats at a given site, appropriate avoided loss activities may include legal protection, fire prevention, and management of invasive species. Avoided loss is not being proposed as a stand-alone mitigation action; it will be implemented alongside enhancement actions.

If compensatory mitigation is required, PacifiCorp will update this HMP as mitigation sites are identified and will describe the proposed mitigation site, any associated enhancement actions, an implementation schedule, and monitoring and reporting criteria. Monitoring will consist of measurable success criteria; if success criteria are not met adaptive management actions will be implemented to trend toward meeting success criteria. Legal and financial assurances for the easement or acquisition area will be in place prior to construction.

PacifiCorp proposes that this HMP may be amended after issuance of a site certificate, and that EFSC would authorize ODOE (in consultation with ODFW) to approve amendments of this HMP without amending the site certificate.

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Attachment P-5. PacifiCorp's Transmission and Distribution Vegetation Management Plan

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Transmission & Distribution
Vegetation Management Program

Standard Operating Procedures

Revision	Status	Date	Author	Change Tracking
00	Issued for implementation	12/15/2008	R. H. Miller	Manual created
01	Reviewed/Updated	06/15/2012	R. H. Miller	1. Clarified language throughout 2. Revised Chapter 4 to reflect a process checklist used for project management. 3. Modified Clearance 2 to strictly reflect table 5 in IEEE 516-2003 Table 5. 4. Section 6.4.1 changed so that if contract utility foresters identify an imminent threat, they contact the appropriate line patrolmen to initiate the imminent threat procedure.
02	Reviewed/Updated	09/06/2013	R.H. Miller	1.Clarified language throughout. 2. Revised distribution action thresholds and clearance standards to accommodate three and four year cycles. 3. Modified transmission clearance requirements to accommodate FAC-003-02
03	Reviewed/Updated	06/24/2015	R.H. Miller	1. Clarified language 2. Brought specification manual into line with FAC-003-03
04	Reviewed/Updated	07/01/2015	R.H. Miller	1. Corrected Table of Contents 2. Updated Figures 2.1 and 6.6 with Rocky Mt. Power 3. Corrected reference to Table 2.2 4. Added substation inspection Section (2.6 and 4.2.4.6) 5. Clarified definition of interim work. 6. Clarified side work.
05	Reviewed/Updated`	06/01/2016	R.H. Miller	1. Changed document to "Standard Operating Procedures" 2. Clarified language 3. Chapter 2. a. Added "At Fault" tree crew caused outages language – Section 2.1.6 b. Added language to contact media – Section 2.4.2.1 c. Added language to contact legal – Section 2.4.2.2 d. Added language that mechanical cutting (Jarraff's and helicopters) to comply with ANSI A300. e. Added language for storm emergency response 2.10. f. Added language assigning responsibility for property damage to contractors 2.12. 4. Chapter 4 a. Added language to requiring rules be followed on hydroelectric facilities and communicate with plant manager – Section 4.2.4.7. b. Added language requiring limited visual hazard tree inspections around substations and transition stations – 4.2.4.8.

Revision	Status	Date	Author	Change Tracking
				c. Added language on working around schools – Section 4.2.7.1. d. Added language regarding working near mobile home parks and apartment complexes – Section 4.2.7.2. e. Simplified language on accounting for pruning in – Section 4.3.1 5. Chapter 5 a. Updated interim maintenance language – Section 5.3 b. Added a section on distribution herbicide maintenance – Section 5.5 c. Updated work thresholds and clearances – Table 5.1 d. Added table on interim work thresholds and clearances – Table 5.2 e. Added section on padmount transformers – Section 5.7. 6. Chapter 7 a. Added section on closed chain of custody – Section 7.1 b.

Approval: Steve Anderton, Managing Director, T&D Support Services Date: 06/01/2017

Transmission & Distribution
Vegetation Management Program

Standard Operating Procedures

June 1, 2017

PacifiCorp, Director, Vegetation Management
1407 West North Temple, Room 230
Salt Lake City, Utah 84116
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Transmission & Distribution
Vegetation Management Program

Standard Operating Procedures

Mission Statement:

Manage trees and vegetation around PacifiCorp's transmission and distribution facilities in a professional, cost effective and environmentally conscientious manner to provide safe, reliable and outstanding service to our customers.

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1. PROGRAM OVERVIEW

Trees growing into or near power lines are a concern for PacifiCorp because they can create safety and service reliability risks. Close growing branches can provide access for children and others to high-voltage lines, exposing them to the potential danger of serious injury or death due to electric contact. Branches touching power lines can spark and start fires and cause interruptions in electric supply. Trees whipped by winds or weighed down by rain or snow can interrupt power, which disrupts businesses, homes, and compromises critical community infrastructure, such as hospitals and emergency services.

Three major electric grid failures, including the catastrophic blackout on August 14, 2003, were initiated by tree-caused outages on transmission lines (U.S.-Canada Power System Outage Task Force 2003).

For these reasons and others, the National Electrical Safety Code (ANSI 2016) Section 218-A-l, states:

> *Trees which may damage ungrounded supply conductors should be pruned or removed. Note: Normal tree growth, the combined movement of trees and conductors under adverse weather conditions, voltage and sagging of conductors at elevated temperatures are among the factors to be considered in determining the extent of pruning required.*

PacifiCorp's distribution system averages scores of trees for every mile of line, any of which could potentially create problems. With that level of exposure, it is impossible to secure the system completely. Electric utilities, such as PacifiCorp, manage their systems to reduce electric supply and service reliability risks by clearing trees from power lines.

Often, particularly in the case of transmission lines, the best solution is to remove tall-growing trees in favor of low-growing species that will never interfere with the high-voltage lines. However, it is not always possible to remove conflicting trees. Trees that cannot be removed must be pruned to clear the utility space using modern, arboriculturally-sound pruning practices.

PacifiCorp's standard operating procedures cover the vegetation management program for both distribution and transmission facilities. It includes program descriptions, specifications and protocols for customer relations. Its intent is to provide direction for foresters as well as contract GF/supervisors, contract utility foresters and utility tree workers on PacifiCorp's system, and helps inform PacifiCorp employees about vegetation management.

1.1 Applicable References

The following standards and best practices shall be followed:

- *American National Standard for Tree Care Operations: ANSI A300 (Part 1) Pruning*
- *American National Standard for Tree Care Operations: ANSI A300 (Part 7) Integrated Vegetation Management*
- *American National Standard for Tree Care Operations: ANSI A300 (Part 9) Tree Risk Assessment.*

- *American National Standard for Arboricultural Operations ANSI Z133 Safety Requirements*

The following best practice should be followed:

- International Society of Arboriculture: *Best Management Practices, Utility Pruning of Trees*
- International Society of Arboriculture: *Best Management Practices, Integrated Vegetation Management*
- International Society of Arboriculture: *Best Management Practices, Tree Risk Assessment*
- Utility Arborist Association Best Management Practices: *Field Guide to Closed Chain of Custody for Herbicides in the Utility*

1.2 Professionalism

PacifiCorp employs a staff of professional foresters to manage its vegetation program and communicate effectively the community service it provides. Contractor front line managers, supervisors or general foreman (GFs) must be Society of Arboriculture (ISA) Certified Arborists and ISA Certified Utility Specialists. PacifiCorp promotes Board Certified Master Arborist credentials among its staff foresters.

1.2.1 Contract utility forester Qualifications

Contract utility foresters should have the following qualifications:

- Contract utility forester 1: No experience required. ISA certification and a certified applicator card not required. Maximum of 90 days in this position.
- Contract utility forester 2: Minimum of an associate's degree and up to two (2) years' experience. ISA certification and a certified applicators license required.
- Contract utility forester 3: Minimum of an associates degree and over two (2) years' experience. Certified applicator's license and ISA certification required.
- Contract utility forester 4: Minimum of a bachelor's degree or four (4) years' experience. Certified applicator's license, ISA certification and Utility Specialist certification are required.
- Contract utility forester 5: Minimum of a bachelor's degree and five (5) years' experience. Certified applicator's license, ISA certification and Utility Specialist certification are required. This is the preferred classification.

PacifiCorp vegetation management is founded on the industry's best practices, including systematic maintenance, scientifically-based pruning, tree removal, tree replacement, cover type conversion, herbicide use and tree growth regulator applications; as well as specialized tools and equipment. PacifiCorp is progressive in trying innovative methods, products and equipment in order to improve safety and productivity.

1.3 Tree Line USA

PacifiCorp has been a Tree Line USA recipient utility every year since 2002. Tree Line USA is an award from the National Arbor Day Foundation, which recognizes utilities for utilizing practices that protect America's urban forests. To qualify, utilities must apply scientifically-based tree care, conduct annual worker training, plant trees, and conduct public education, including participating in Arbor Day celebrations. Contract

employees should participate in annual worker training to cooperate with and help PacifiCorp continue to merit this award.

2. GENERAL PROCEDURES

General specifications cover safety, the environment, how to approach archeological sites, communication, tree growth rate definition, tree removal, mechanical and helicopter cutting, slash disposal, emergency disposal, facility inspection, property damage, freelance work and miscellaneous procedures.

2.1 Safety Federal and state OSHA requirements governing vegetation management activities shall be followed at all times. ANSI Z133.1 (ANSI 2012) and OSHA 1910.269, are examples of these requirements. Activities shall be conducted in a manner that minimizes both tree crew and public safety risks. Crews shall have functional radio or telephone communication on the job site at all times.

PacifiCorp's electrical system will continue in normal operations during routine vegetation management work. Contract employees shall be aware of the potential dangers and qualified to work in the vicinity of energized facilities. Contract personnel performing line clearance work shall hold one of the following designations as defined by ANSI Z13:

- Qualified Line Clearance Arborist
- Qualified Line Clearance Arborist Trainee

2.1.2 Holds and Clearances

Minimum approach clearances for qualified line clearance arborists specified in ANSI Z133 or PacifiCorp's *Accident Prevention Manual* (Joint Safety Committee 2003 [Table 2.1]), should not be compromised. If there is a difference in the distances required in the two standards, the greater of the two is operative. If work requires violating minimum approach distances, or if a crew leader determines conditions to be unsafe, crew leaders should contact their supervisor/GF before proceeding. The GF/supervisor should determine whether or not a clearance or hold is necessary at that work site.

A hold means deactivating automatic line reclosers on a circuit. It is intended to protect PacifiCorp facilities and should not be considered a safety measure. If, in the judgment of the crew leader, an energized line cannot be worked safely, the GF/supervisor should arrange a clearance. A clearance is de-energizing a line.

PacifiCorp does not issue holds or clearances to tree crews. Rather, the Company will issue holds or clearances to a journeyman lineman, who shall be present at the site during work. Holds require at least 48 hours' notice to dispatch, vegetation management and the district operations manager. In some cases, a clearance on transmission lines must be requested weeks or even months in advance. Customers do not need to be notified if a clearance is necessary to safely work trees from lines in an emergency.

Customers who will be affected by planned power outages associated with clearances must also receive 48 hours notice, except during emergency situations such as storm restoration work. De-energized lines; whether due to a planned outage, wind or storm damage, or some other reason; must be worked as if they are energized. If a line cannot be worked safely assuming it is energized, it must be grounded. Linemen must set the grounds and be present during work, and

give approval prior to tree crew members breaching minimum approach distances to ensure safety.

Figure 2-1 Emergency procedure for a tree on line incident.

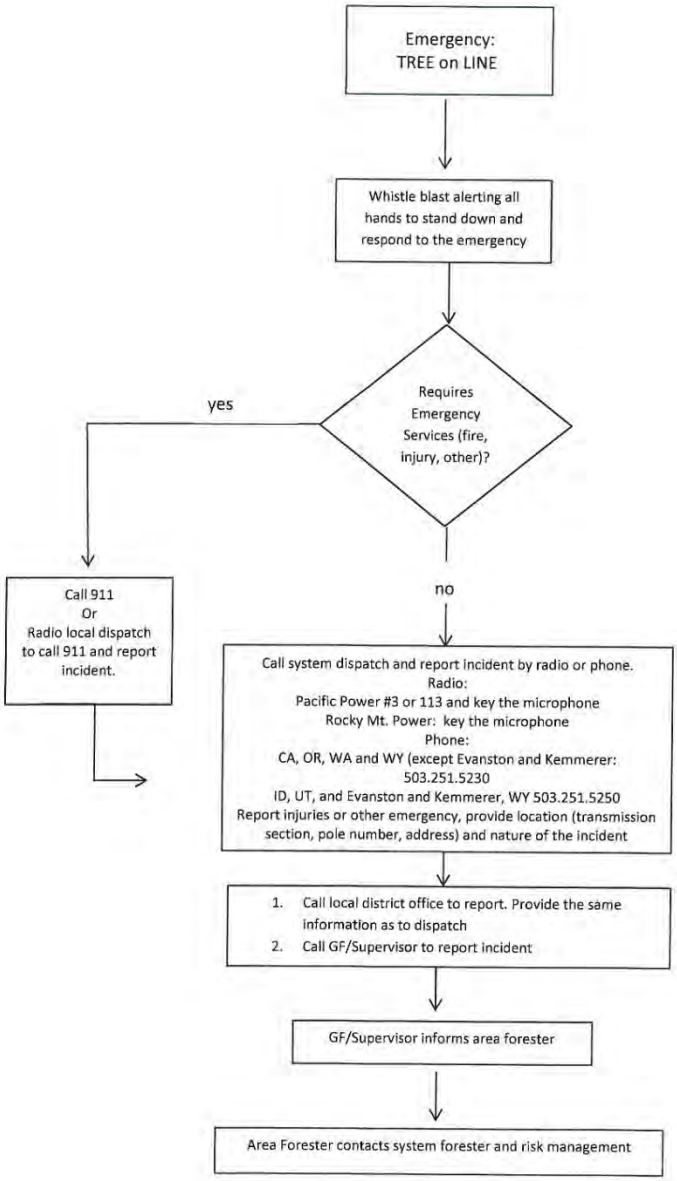

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Table 2-1 Minimum approach distances for qualified line-clearance arborists and line-clearance arborist trainees

Voltage Phase-to-Phase	Minimum Approach Dist.	Source
50-300 v	Avoid contact	APM/Z133
301-750 v	1 foot	APM/Z133
301 v-15 kV	2 feet, six inches	APM
15-46 kV	3 feet	APM/Z133
46-72 kV	4 feet, 2 inches	Z133
72-121 kV	4 feet, 6 inches	Z133
138-145 kV	5 feet, 2 inches	Z133
161-169 kV	6 feet	Z133
230-242 kV	7 feet 11 inches	Z133
345-362 kV	13 feet 2 inches	Z133
500-550 kV	19 feet	Z133

Note: APM is PacifiCorp's *Accident Prevention Manual* (Joint Safety Committee 2003). Z133 is the *American National Standard for Tree Care Operations*. Z133 distances are for sea level up to 5,000. Distances increase for elevations above 5,000 feet (ANSI 2012).

2.1.1 Emergencies

An emergency is major storm (as declared by PacifiCorp), or situation where vegetation has either caused or presents a clear, imminent threat of causing an outage, fire or public electric contact.

2.1.1.1 Whistles

Every crew member, supervisor/GF and forester shall carry a whistle at all times while on work sites. A whistle shall be used as an alarm, commanding all crew members to immediately stop work and respond to the emergency. Whistle blasts should also be used to initiate aerial rescue drills. Whistles are not to be used for non-emergency situations, such as getting another crew member's attention.

2.1.1.2 Tree on Line

If a tree or tree part accidentally falls onto an energized line, work shall stop immediately, and procedures outlined in Figure 2.1 followed.

2.1.2 Readily Climbable

Readily climbable trees have low limbs that are accessible from the ground and sufficiently strong and close together to support a child or average person so that the tree and can be accessed without using a ladder or special equipment. Access into a tree by a vehicle does not render a tree climbable.

Readily climbable trees pose a high risk when a main stem would allow a child or average person to climb either within arm's reach of an uninsulated, energized electric line or within such proximity to the electric line that the climber could be injured by direct or indirect contact. They are located near homes, schools, parks, businesses or other locations where people (particularly children) frequent.

If readily climbable trees are identified, within two weeks, steps shall be taken to reduce the safety risk by removing the tree or pruning it to specification clearances. If possible, branches should be removed to at least 8 feet above the ground or altering facility construction so energized lines can no longer be accessed through the tree.

2.1.3 Tree Houses

Tree houses built in trees growing near high voltage lines present possible electric safety risks. Safety risks in these cases could materialize if a tree house is sufficiently close to the conductors so that children or others may contact the line either directly or indirectly. Indirect contact may occur through any conductive object, including a tree or tree parts that are contacting power lines.

Tree houses built in trees growing in proximity to power lines must meet two criteria in order to remain where they are located. First, no part of the structure may be any closer than twice the minimum approach distances for persons other than qualified line-clearance arborists as specified in Table 2 of ANSI Z133 (Table 2.2). Second, the tree must be pruned so that it grows no closer than ANSI Z133 Table 2 (Table 2.2) distances, at least until the next scheduled work. Maximum line sag and sway should be taken into consideration. Tree houses that do not meet these conditions shall be removed within two weeks of their identification.

Tree house safety risks may be managed by changing facility construction so tree house clearances can be maintained. Facility reconfiguration for this purpose may be done at a property owner's request, provided they cover the expense of the facility modification.

2.1.4 Fire Protection

Federal, state and local fire protection laws and regulations shall be followed, and the contractor performing the work must obtain necessary work permits. Crews shall have all firefighting tools and equipment required by the responsible governmental agency. Contractors shall also adhere to fire restrictions concerning work hours, fire watch following work and other policies of the pertinent jurisdiction. Crews working in fire-prone rural areas should receive fire prevention and suppression training from the competent authorities.

2.1.5 At Fault Tree Crew-Caused Outages

Primary distribution and transmission outages caused by tree crews shall be assessed by a committee made up of the managing director of distribution and transmission support, director of vegetation management, business analyst and two contract representatives. The conduct of the subject crew during the incident will be compared to requirements in ANSI Z133, OSHA 1610.269, contractor safety rules and the PacifiCorp Accident Prevention Manual. Outages determined to be "at fault" by the majority of committee members will result in a credit to PacifiCorp from the contractor in an amount specified contractually.

2.2 Environment

Environmental respect is a MidAmerican Energy Holding Company core value, requiring strict adherence to all environmental rules and regulations.

2.2.1 Species of Concern

Tree work should not disturb or harm any rare, threatened, endangered, or protected plant or animal species. Nesting season work restrictions are examples of

important scheduling considerations necessary to accommodate threatened and endangered species. Prior to beginning projects on federal and state lands, PacifiCorp foresters shall contact the responsible agency to determine whether or not such species are present on the right-of-way. If there are, foresters should contact PacifiCorp environmental services for support.

All tree and brushwork shall conform to guidelines of the responsible governing agency. Field data inventories of threatened or endangered species may be on file in PacifiCorp district offices. PacifiCorp environmental services should be contacted whenever threatened and endangered species are identified.

2.2.2 Wetlands

Wetlands are lands where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities present living in and on the soil (EPA 2004). Wetlands shall be worked by hand. Federal, State and local laws and regulations concerning wetlands shall be followed.

2.2.3 Stream Protection

Work shall not pollute water. Trees shall not be felled into streams or drainage ditches in a way that could obstruct or impair the flow of water, unless instructed otherwise by the responsible governing agency. Machine work shall not be performed within fifty feet of a stream. Soil or debris shall not be placed below the high water mark of streams, unless instructed otherwise by a responsible authority. Equipment shall use existing or designated stream crossings. State forestry or fish and wildlife agencies shall be contacted if tree removal in and around streams could cause erosion or if resulting exposure could increase water temperature. Federal and state laws and regulations shall be followed concerning stream protection.

2.2.4 Bird Protection

Migratory birds are protected by the *Migratory Bird Treaty Act of 1918* (16 USC 703-712). The act was most recently amended in 1998. All but a handful of bird species are protected under the act. Vegetation management's policy is that all bird species should be considered subject to the law's provisions. Foresters should provide annual training on bird protection to every tree crew.

The Migratory Bird Treaty Act prohibits removal of bird nests that have eggs or chicks, and killing protected species. Active nests may be disturbed in rare cases of urgent fire or electrical safety risk (in the judgment of the responsible Company regional forester). If tree crews identify a possible immediate risk, they should contact the regional forester for authorization. Foresters should consult PacifiCorp environmental services regarding whether or not work may be approved. If it may not, work should be postponed until after young have left the nest.

Eagle and colonial water bird nests (such as those of cormorants and herons) may not be disturbed regardless of whether or not they are active. Eagles are subject to additional protection insofar as it is illegal to disturb them near their nests or winter roosting sites.

Figure 2-2 Bird nest procedure

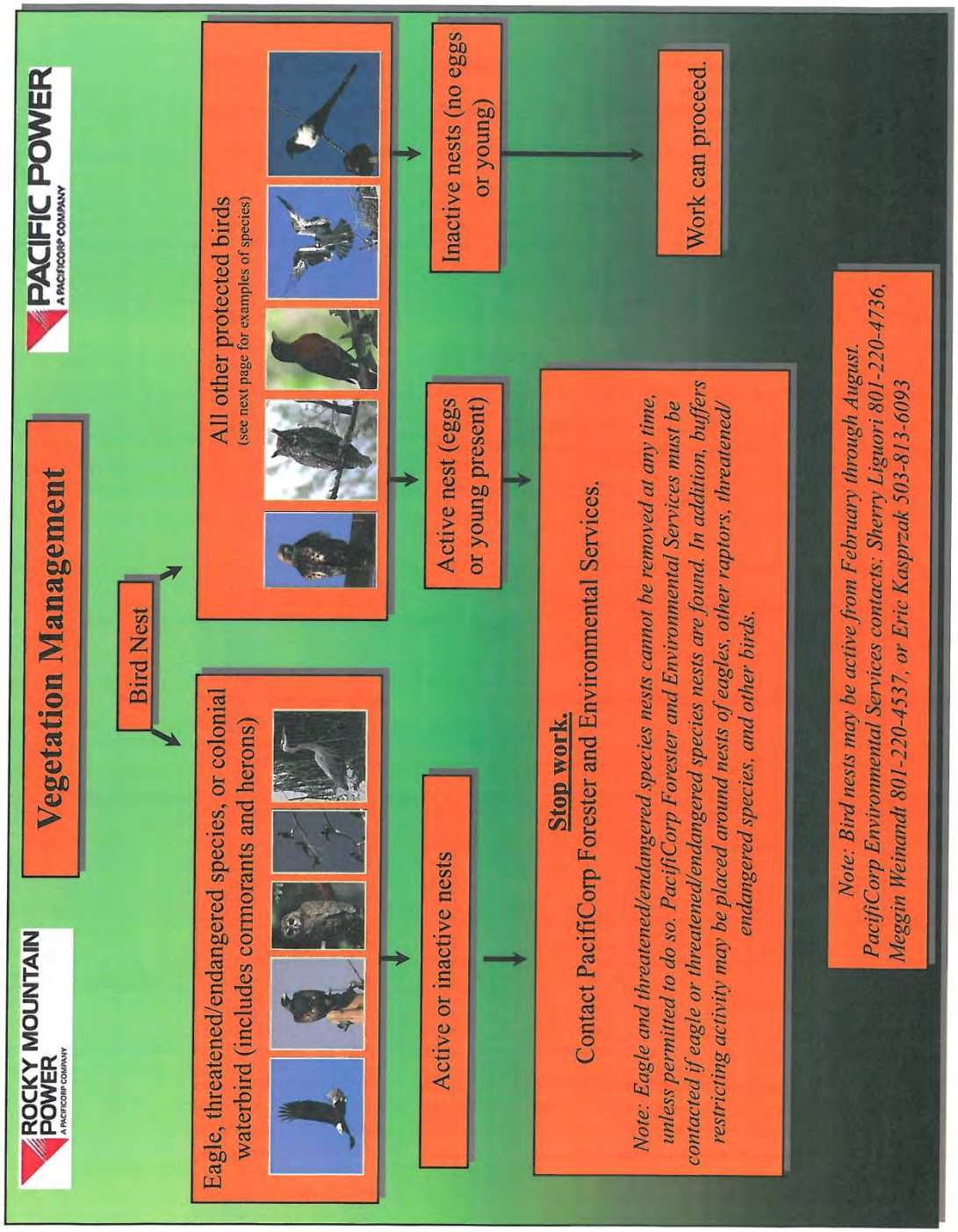

Table 2.2. Tree house clearances.

Tree houses may only be allowed in a tree if they are more than minimum distances from conductors and the tree can be pruned to kept to clearances specified in this table at all times. Specified tree clearances are those for persons other than qualified line-clearance arborists specified in Table 2 of ANSI Z133. Minimum tree house distances are twice ANSI Z133 Table 2 distances.

Voltage (kV phase to phase)	**Minimum Tree House Distance From Conductors (ft.-in)**	**Tree Clearance** (If tree house is built in a tree more than minimum distance from conductors)
0.31-0.75	20-00	10-00
0.751-15	20-00	10-00
15.1-36.0	20-00	10-00
36.1-50.0	20-00	10-00
50.1-72.5	21-06	10-09
72.6-121.0	24-08	12-04
138.0-145.0	26-04	13-02
161.0-196	28-00	14-00
230.0-242.0	32-10	16-05
345.0-362.0	40-10	20-05
500.0-550.0	53-04	26-08

Table 2.3. Work buffers around active nests of eagles and herons.

Species	**Work Buffer**
Herons	1000 feet
Owls	¼-mile
Hawks, ospreys, golden eagles	½-mile
Bald eagles	1 mile

Figure 2.3. Valuable archeological sites.

An ancient food storage structure along the Camp Williams-Four Corners 345 kV right-of-way in Southern Utah. This is an example of the type of valuable archeological site that needs to be identified and protected during vegetation management work.

Rich Buelte photo

Raptors (birds of prey) and herons require buffers around active nests to prevent them from being disturbed (Table 2.3), unless instructed otherwise by competent environmental or fish and wildlife authorities. In general, if a bird leaves a nest and does not return within an hour, it is being disturbed and the buffer should be increased. In these cases, environmental services should be contacted within 24 hours to monitor the nest and respond appropriately if the adults fail to return.

2.2.4.1 Reporting

Active bird nests and inactive eagle nests should be reported to the appropriate forester and environmental services following the procedure outlines in Figure 2.2. Anyone working in vegetation management encountering a dead bird should report it to environmental services.

2.2.5 Spills

To prepare for accidental spills, absorptive material shall be available. Mixing, loading and cleaning equipment are critical activities that present the greatest exposure to accidents or spills (Miller 1993).

In the event of a spill or herbicide misapplication:

- STOP, CONTAIN, ISOLATE
  - Stop the source of the spill
  - Contain the spill (it is especially important to prevent the spill from entering waterways)
  - Isolate the area – prevent people or vehicles from passing through the area.
- Report the spill to the Spill Hotline: 800.94.SPILL and provide:
  - Caller and manager's name
  - Date and time spill was discovered
  - Location (address or longitude and latitude)
  - Manufacturer name and serial number
  - Cause of spill
  - Amount of spill
  - Types of surfaces contaminated
  - Containment and/or clean-up activities performed so far
- Request the help of and notify supervisor/GF and PacifiCorp forester and environmental services.
- Remediate the spill
  - Clean up the spill or have it cleaned up, following directives from the Spill Hotline
  - Wash equipment and vehicles.
  - Properly dispose of cleanup materials
  - Follow up with appropriate cleanup documentation.
- Clean-up at or near PacifiCorp generating sites or substations must comply with site specific spill prevention and remediation plans.

2.3 Archaeological Sites

Vegetation management activities shall not disturb archeological sites. Known archaeological sites (Figure 2.3) shall be identified on the process checklist described in Chapter 4. If a contract utility forester or tree crew identifies something that might have archeological significance, they should move off site and contact the appropriate forester. The forester should contact environmental services for advice on whether or not to continue. Work should not proceed without environmental service's authorization.

Prior to beginning work on federal and state lands, PacifiCorp vegetation management shall contact the appropriate agency to determine whether or not such sites are present on or near the right-of-Way. PacifiCorp district offices may have field data inventories of known sites to assist in the determination. If present, foresters should secure the assistance of PacifiCorp environmental services. Archeological sites shall be located and marked. Work must conform to guidelines of the responsible governing agency. If archaeological artifacts are located on private lands, the finding shall be reported to PacifiCorp environmental services. Field data inventories of known sites could be on file in PacifiCorp district offices.

2.4 Communication

Communication should be open and interactive. It should include everyone involved: management, planners, vegetation management crews, property owners, public land managers, appropriate governmental officials, members of organizations dedicated to related causes and others.

2.4.1 Internal Communication

Communication within the vegetation management department needs to be clear and concise to ensure everyone involved understands the desired results. Decision

making authority should be delegated throughout the origination, as appropriate.

Communication between vegetation managers and workers ought to be both written and verbal. Written instruction should include PacifiCorp Vegetation Management Standard Operating Procedures. It should also include details regarding concerned customers and locations of environmentally sensitive or archeological areas. Written instruction should be reviewed verbally. Appropriate communication also involves post work debriefings to review challenges and prevent problems from recurring.

Communication between utility vegetation management staff and other internal employees, such as engineers and operations managers, includes why, where, when and how vegetation management projects will be conducted. This is important because people within PacifiCorp, but outside vegetation management, can help set priorities, anticipate and prevent potential problems, and provide historical perspectives. Communicating with operations staff during work can also add a margin of safety. By knowing there is a vegetation management job underway, operations staff may be able to provide a timelier and more appropriate incident response than they would if they were unaware of the project. At the beginning of every week, districts in which vegetation management work is being conducted shall be emailed a spreadsheet with the approximate tree crew work locations for the coming week.

2.4.1.1 Communication of Vegetation Conditions that is Likely to Cause an Outage At Any Moment)

Members of the vegetation management team must comply with *Transmission Grid Operations Operating Procedure PCC-215,* which is designed to meet Requirement 4 of the *NERC Transmission Vegetation Management Program* standard FAC-003. Requirement 4 instructs utilities to notify the control center with switching authority for the applicable line of vegetation conditions that could cause an outage at any moment (see Figure 6.6 for the appropriate PacifiCorp dispatch center). PacifiCorp may implement temporary action, such as rating reductions or taking transmission lines out of service until vegetation can be cleared. Inspectors should report the exact location of the subject trees (providing longitude and latitude if possible) as part of the process.

2.4.1.2 Media

Requests from media (print, electronic, radio or television) shall be referred to PacifiCorp Media Relations and the community relations manager responsible for the area in which the request was made. Media Relations can be reached for each business unit at:

- Pacific Power: 800.570.5838
- RMP: 800.775.7950

Vegetation management personnel and contractors shall not speak to media representatives without prior authorization from PacifiCorp Media Relations.

2.4.1.3 Legal

No response shall be made to an attorney unless through PacifiCorp's General Counsel's office.

2.4.2 Communication with External Stakeholders

Public land managers, property owners, regulators, and civic organizations have interests in utility vegetation management activities.

Educating potentially affected parties about the need for, benefits of and science behind vegetation management can clarify expectations. Members of the vegetation management team, including crewmembers, should know the facts about the program, be prepared to answer basic questions and refer more complex issues through to their GF/Supervisor.

Communication should begin well in advance of work and involve listening to and understanding people's concerns. Work on governmentally-managed property can involve administrative procedures that take months of advance work, including navigating through permit processes and the concerns of specialists who have responsibility for stewardship over public lands. It is not always clear to lands specialists how vegetation management helps balance their (the land manager's) responsibilities against the public's need for a safe and reliable electric grid. A memorandum of understanding among Edison Electric Institute (EEI) member utilities and federal land management agencies (EEI 2006) established a framework for developing cooperative rights-of-way integrated vegetation management (IVM) practices among EEI shareholder-owned electric companies, federal land management agencies and the Environmental protection agencies. The MOU is expired and being renewed as of this writing.

2.5 Growth Rate Definitions

Slow-growing trees grow vertically less than one-foot a year. Moderate growing trees grow between one and three feet a year and fast-growing trees grow more than three feet a year.

2.6 Tree Removal

Tree removal is an important component of PacifiCorp's vegetation management program. Tree removal can reduce safety risks; improve access to facilities, clear lines of sight and moderate future workloads. Tree conditions are site and tree specific.

Tree removal on distribution facilities requires either written notification to or signed permission from the property owner, unless there is a right-of-way, easement or permit that expressly authorizes tree removal. If such an easement or permit exists, notification to the property owner may be verbal, provided it is documented. Signed permission may be obtained on the removal door hanger (see Section 8.2.1.3) or *Property Owner Permission Form* (see Section 8.2.2).

Stumps shall be cut to within six inches of the ground or as close to it as practical (for example, at the top of a barbed wire fence that has become imbedded in the trunk). Stumps of all deciduous trees, brush and vines that are removed shall be treated with an approved herbicide, where permitted (see Section 7.3.5).

PacifiCorp prefers to remove the entire tree in the following situations:

- Transmission rights-of-way where the conductors are fewer than 50 feet off the ground or between 50 and 100 feet off the ground depending on the size of the tree (see Table 6.1 and Figure 6.3).
- High risk trees (dead, dying, clearly diseased, deformed, or unstable trees which have a high probability of falling and contacting transmission or distribution conductors). Note that every tree is potentially hazardous. With millions of trees under management, it is impossible to

identify and correct every potentially hazardous tree. Nevertheless, PacifiCorp has a responsibility to maintain its system by making a reasonable effort to identify trees that are clearly hazardous, and correct the problems they could cause in a timely manner.

- Trees that will take no more than twice the time to remove than to prune during distribution cycle work. High risk trees are not limited by this constraint.
- Trees that take no more time to remove than to prune during interim and ticket work. High risk trees are not limited by this constraint.
- Readily climbable trees.
- Trees with tree houses not meeting the clearance to transmission or distribution conductors shown in (Table 2.2)
- Fast-growing trees that, through growth could interfere with distribution conductors or violate specific state regulatory clearances before the next scheduled maintenance work (cycle-busters).
- Volunteer trees less than six-inches in diameter (DBH), which, through growth, could eventually interfere with distribution conductors.

2.6.1 Equipment Mowing

Mowing is often more cost effective than manual methods of tree removal and should be pursued wherever practical (Figure 2.4). Mowing should be limited to fifteen feet either side of distribution primary wires within transmission rights-of-way and along access roads serving Company facilities

2.7 Mechanical and Helicopter Cutters

Mechanical and helicopter cutters can improve productivity in rural, densely vegetated areas (Figure 2.5). Mechanical cutting shall comply with ANSI A300 (Part 1) section 9.3.2. It should be limited to rural or remote locations and cuts should be made close to the main stem, outside of the branch bark ridge and branch collar. Precautions should be taken to avoid stripping or tearing of bark or excessive wounding.

In subsequent cycles, mechanical work should be monitored and repaired if need be to prevent high risk conditions from developing.

2.8 Slash Disposal

Slash is brush and limbs less than six-inches in diameter removed during tree operations.

2.8.1 Developed Areas

In developed areas, slash should be chipped and removed from the site unless an agreement has been reached with the property owner to leave it. Slash may be left temporarily, provided the crew has notified the property owner or tenant, and arrangements made to clean it up to the customer's reasonable satisfaction within two business days. Tree stems greater than six-inches in diameter should be left on site. Work locations shall left in a safe and orderly condition.

2.8.2 Rural Areas

In rural areas, slash should be disposed of on-site whenever possible. For off-road, wooded areas, brush should be lopped into three-foot maximum lengths, and scattered in piles no more than two-feet high. Stems larger than six-inches in diameter should be left on site.

Limbs and slash should be piled separately. Limbs and slash should be disposed of at the sides of distribution rights-of-way, and outside the wire zone of transmission rights-of-way, unless specified otherwise by the regional forester. If brush is chipped, it should be broadcast on site wherever possible. Resulting chip piles should be no higher than two-feet. Debris piles should not limit or block access to the right-of-way, or create fire risk.

2.9 Emergency Response

Tree work will be required from time to time on emergency storm restoration. Crews shall be properly equipped to perform the work. PacifiCorp will be the sole determiner of equipment appropriateness. Travel and lodging during the storm is billable. Double occupancy is expected for crew members.

Contractor should provide a designated contact person for each region. Requests for crews should be routed through that contact. Contractor shall be responsible for dispatching crews whenever emergency restoration services are needed.

Crew rosters shall be provided by the contractor and maintained during restoration efforts. At a minimum, rosters shall include: crew member names and position, location, contact information, equipment and identification number.

Debris from storm work is left on site and not chipped or cleaned up, so chippers should not be taken into the field during restoration work. Notification is not required during emergency restoration work, but crews should conduct themselves respectfully.

Emergency work shall be reported on a *Weekly Vegetation Report* according to section 4.2.1.

Emergency work is done under the authority of the district operations managers in cooperation with Company foresters. Tree crews and contract utility foresters assigned to storms should work under the direction of circuit captains assigned by operations. Tree crews should report their progress at least daily to both the circuit captain and their GF/supervisor. The supervisor should report crew progress to the appropriate forester.

Figure 2.4. Side mower used on distribution rights-of-way.

Figure 2.5. Jarraff mechanical "trimmer" that may improve productivity in remote areas.

Figure 2.6. Cracked pole – an example of the type of conditions tree crews should report.

Figure 2.7. PacifiCorp Vegetation Management Maintenance inspection report form.

Maintenance Conditions Found by Crews			
Week Of			
Location - closest address, meter number if available and facility point number.			
Address (city and state)			
Meter #		Facility Point #	
Description of Problem:			
Employee Name:			

All storm work must be conducted as if the line is energized. If the line cannot be worked safely under the assumption it is energized, it must be grounded in accordance with section 2.1.1. In general, PacifiCorp does not dispose of slash or debris resulting from storm damage. Trees that fall during storms would do so regardless of whether or not the lines are present. It should not be the Company's responsibility to clear the debris simply because the tree or trees from which it originated damaged Company facilities on the way down. However, if an outage is preventable, slash may be cleaned-up and removed from a property at the forester's discretion.

2.10 Facility Inspection

While tree crew members are not facility inspectors, they can be helpful in identifying pronounced conditions, such as cracked poles (Figure 2.6) broken cross arms or insulators, loose guy wires, and other problems. Tree crew members should report the condition on the *Maintenance Condition Report Form* (Figure 2.7).

When contract utility foresters are lining out work, they should inspect the perimeter around substations for trees that could interfere with or hazard trees that could fall into the facility, or for climbable trees that could allow access into the substation.

2.11 Property Damage

Contractor shall be responsible for property damage arising out of or related to work. Restoration of surfaces and repair of property damage in the execution of the Contract shall be part of the work. Such restoration shall include, but is not limited to, ruts, disturbed drainage ditches,

broken drain tiles, cut fences and damaged fence posts.

Contractor shall inform PacifiCorp of claims within 24 hours of damaging the property. Contractor has 15 business days to resolve any damages or PacifiCorp will settle the claim and bill the contractor. Contractor must inform PacifiCorp personnel and get permission for an extension if the time frame cannot be met.

Contractor shall be responsible for any damage or claims against PacifiCorp resulting in violations of conservation measures as a consequence of Contractors actions.

2.12 Freelance Work

No one employed in PacifiCorp's vegetation management department or their contractor may solicit or perform arboricultural-consulting or tree work (pruning, removal, insect or disease control, fertilization etc.) for interests outside of officially authorized PacifiCorp projects on open feeders, grids, transmission projects, tickets, storm orders, work orders or other PacifiCorp assigned project. Outside projects may include side jobs for cash, work for private arboricultural firms (whether or not they are owned by the tree crew members doing the work), consulting or any other arboriculturally related enterprise.

2.13 Miscellaneous Items

2.13.1 Fences and Gates

Gates should be left open or closed as they were found, or as the property owner instructs. Damage to fences or gates shall be reported to the property owner and the appropriate supervisor/GF, and repaired as soon as possible.

2.13.2 Climbing Spurs

Climbing spurs shall not be used when climbing to prune trees.

Exceptions:

- when limbs are more than throw line distance apart and there is no other safe means of climbing the tree.
- when the bark is sufficiently thick to prevent spur damage to the cambium.
- when working high risk trees that are to be reduced in height and left for wildlife.

2.13.3 Winching Vehicles.

Winch cables or ropes should not be wrapped directly around anchor trees. Doing so damages a tree's bark and cambium and can not only reduce its health and value, but also eventually create high risk to overhead lines. If the need arises to winch a vehicle (including an all-terrain vehicle), a nylon strap (or equivalent) at least 2-inches wide shall be used around the tree, and cables or ropes attached to the strap. Utility poles or towers shall not be used as winch anchors.

3. TREE BIOLOGY AND PRUNING

The primary purpose of utility line clearance work is to minimize safety and service reliability risks caused by tree-power line conflicts. Pruning is primarily performed on distribution facilities, although it can have application to transmission lines in some cases.

Pruning to clear conductors shall adhere to the principles of modern arboriculture. The *American National Standard for Tree Care Operations* A300 (ANSI 2012a), International Society of Arboriculture (ISA) *Best Management Practices: Tree Pruning* (Gilman and Lilly 2002), *Best Management Practices: Utility Pruning of Trees* (Kempter 2004), and *An Illustrated Guide to Pruning* (Gilman 2002), among other references, convey those principles.

While proper utility line clearance work should be consistent with practices that promote tree health, utilities cannot place tree health over public welfare. Sometimes, there is no way to obtain proper clearance in a manner that ensures the health of a tree (Lilly 2010). This is particularly true regarding foliage retention. In cases were the tree cannot be pruned without harming its health, tree removal is often best for the tree, tree owner and utility. If tree removal is not permissible or practical, the tree should be pruned to specification clearances, even if that work is against a customer's wishes or could harm the tree.

3.1 Pruning for Clearance (directional pruning).

Directional pruning is natural target pruning applied to routing tree growth away from utility lines (Miller 1998). ANSI A300 (2012a) and ISA's *Best Management Practices* (Kempter 2004) instruct that pruning to clear the utility space involves thinning cuts: removing at natural targets entire branches that are growing toward (or once cut will produce sprouts that will grow toward) the power lines.

While heading cuts produce sprouts that grow quickly back into the power lines, branch removal and reduction promotes growth away from conductors. Since the point of utility pruning is to train trees around power lines wherever practical, branches growing away from the electric facility should not be pruned. Instead, these stems should be allowed to develop to their natural height or length, provided that growth does not create unreasonable safety risks. This cannot be accomplished with strongly excurrent trees trapped directly beneath conductors.

Topping, round-overs, flush cuts, branch tipping and rip cuts are improper because they damage trees. Directional pruning is consistent with natural tree structure. Remaining branches retain their taper, strong attachments, growth regulators and spacing. They continue to grow and function normally, allowing the tree to reach to its natural height.

"V" shapes often result on properly pruned trees growing under power lines, particularly on decurrent, deciduous trees (Miller 1998, Shigo 1990, Gilman 2002, Kempter 2004) [Figure 3.1]). Limbs growing upward and toward the facility should be cut back to the trunk or to limbs growing away from the conductors.

Remaining branches should have sufficient clearance so they do not damage

the conductors in inclement weather common for the locality (high wind, freezing rain, snow or other conditions). Excurrent trees (such as many conifers) are more problematic, but should be reduced to appropriate laterals or whorls.

"L" or one-sided shapes often result on properly pruned trees to the side of conductors. (Shigo 1990, Gilman 2002 [Figures 3.2]). Limbs on the wire side of trees located adjacent to facilities should be cut back to the trunk; or to limbs growing vertically, sideways or downward; depending on the distance to the line or available natural target.

3.2 Tree Biology

Understanding fundamental tree biology is essential to applying proper pruning to utility line clearance (Miller 1998).

3.2.1 Leaves

Leaves are the tree's food source. Tree survival depends on the leaves' ability to manufacture carbohydrates from the sun's energy, carbon dioxide and water. Current thinking among scientists is that if a tree abruptly loses a large portion of its foliage, as can happen with over-pruning, it could lack the energy resources to meet its needs. Trees with insufficient foliage could be weakened to the point where they become subject to attack by opportunistic insect and disease pests. Damage can extend to the roots as well as to above ground portions of the tree (Shigo, 1986). Trees can suffer sun injury after sudden excessive foliage loss (Miller 1998).

Authorities disagree over how much foliage removal trees can tolerate in a given year. ANSI A300 (2008) recommends no more than 25%, while Gilman (2002) suggests less than 10 to 15 percent. Often, much more than 25% of foliage must be removed from the tree in order to appropriately maintain electric facilities. The ANSI committee did not intend the 25% provision to impede utilities from achieving appropriate clearances (Smith 2002). Utility arborists faced with the choice of maintaining public welfare by clearing the tree to specifications and removing more than 25% of the foliage have no choice but to remove more than 25% of the foliage

3.2.2 Stem Anatomy

Trunks and branches are tree stems. Their function is support, energy storage, and water, mineral, carbohydrate and growth regulator transport. The point of origin of a branch or limb is a node. A lead is an upright trunk or major limb with a dominant role in the tree crown, and a lateral is a branch off a parent stem. Some leads can also be laterals.

3.2.3 Xylem

Xylem is wood tissue. Sapwood is young, living xylem that stores carbohydrates, provides support, and conducts water and essential elements. Heartwood is old, dead xylem that provides support, and often contains anti-microbial compounds.

Long, hollow conducting cells (trachieds or vessels) predominate xylem structure. While trees need this vascular structure to conduct water and essential elements, it can be exploited by pathogens to spread up and down the stem. Trees attempt to block or "wall" off disease spread by plugging conducting cells in various ways, but pathogens can use energy stored in the trunk or branch to breach these walls (Shigo1986).

Figure 3.1. "V"-shapes can develop from crown reduction on deciduous trees (left). The ultimate objective is to train trees up and around the wire wherever possible, so the facility is clear and the tree is healthy. These two photos are of the same tree, in 1992 (left) and 2007 (right).

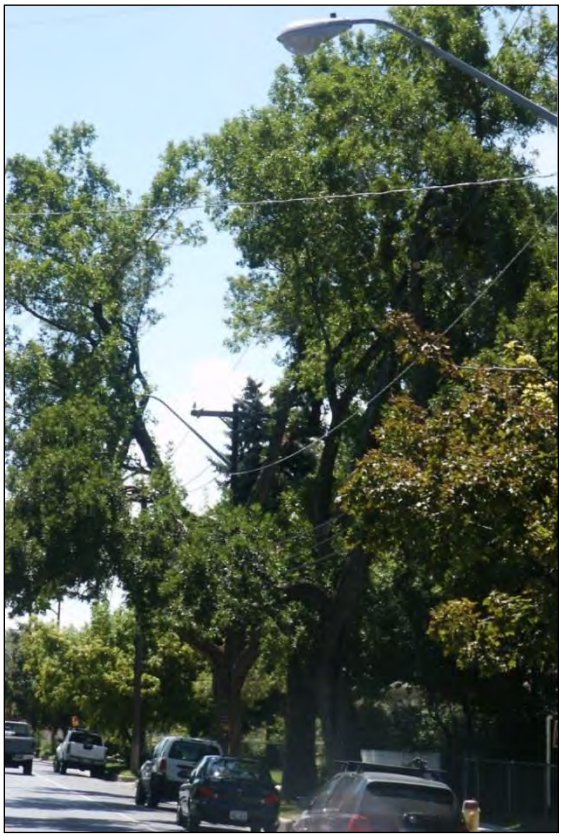

Figure 3.2 "L" or one-sided shapes.

"L" or one-sided shapes often result on properly pruned trees growing to the side of conductors. Pruning may be mechanical in rural areas, below right

3.2.4 Cambium

The tree's cambium is a thin layer of rapidly dividing cells around the outside of the sapwood. One of the functions of the

cambium is to produce wood to its inside, creating diameter growth. This is the only source of wood production in the tree system, and the tree has no ability to replace damaged or decayed wood.

Pathogens gain access to wood through wounds. In response to wounding, the cambium generates a "barrier zone" containing antimicrobial compounds (Figure 3.3). It protects new wood by separating it from potentially infected wood that existed at the time of wounding. Following infection, a "race" develops between the cambium and wood-rotting microorganisms, with the structural integrity of the tree at stake. The cambium must produce new wood faster than pathogens can digest the former stem if the tree is to remain viable (Figure 3.3).

While the barrier zone contains strong antimicrobials, it is weak structurally. This structural weakness can be problematic, as cracks may develop along the barrier zone when the stem twists and flexes due to wind, ice or other stress loads. These cracks allow pathogens to breach the barrier zone and enter new wood, further threatening the tree (Figure 3.3 [Shigo 1986]).

3.2.5 Branch Collars

Branch collars are a combination of parent stem and branch tissue generated through coordinated growth around the branch attachment (Figure 3.4). In the spring of the year, diameter growth begins at branch tips, and works toward the base. When new wood meets the branch base, it turns at 90°, and wraps around the juncture. Later in the growing season, wood from the parent stem envelops branch wood laid down earlier. As a result, two layers of wood secure the branch every year, and the attachment increases in strength as the branch grows (Shigo1986).

3.2.6 Branch Bark Ridge

An important structure associated with branch attachment is the branch bark ridge. The branch bark ridge is a line of raised bark, formed as the branch and parent stem grow together. It marks where branch wood meets stem wood Figure 3.5). A raised branch bark ridge is often a sign of a strong attachment.

3.2.7 Branch Protection Zone

Branch protection zones are areas of antimicrobial compounds that form internally at the base of diseased or injured branches (Shigo 1986). They inhibit pathogens in the branch from passing to the parent stem. While protection zones are effective, pathogens can overcome them using energy stored in the branch.

3.2.8 Taper

Tree stems taper from their bases, where they are widest, to twig tips, where they narrow to buds or apical meristems. Taper provides flexibility and strength that disperses loads from branch weight and from wind, snow or ice loads. The adaptation reduces the likelihood of failure under stress.

***Figure 3.3* The cambium creates a barrier zone that contains discoloration and decay in old wood, protecting new wood. Note on the right, a ring shake formed along the old barrier zone. This is a structural flaw.**

Figure 3.4. Branch collars form at branch bases.

Figure 3.5. A raised branch bark ridge i

A raised branch bar ridge s often a sign of a strong attachment. It marks where the branch meets the parent stem.

Figure 3.6. Codominant stems are at least 50% of the diameter of their parent stem.

They have no branch collars or branch protection zones. Codominant stems can grow together and have bark included (embedded) between the stems in the attachment.

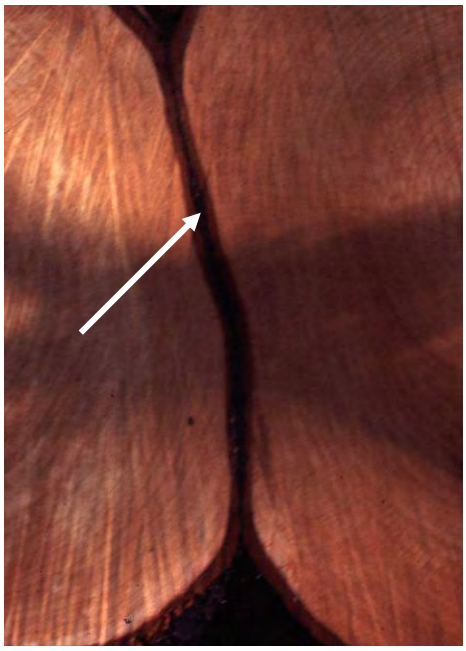

Figure 3.7. A before and after collar cut.

3.2.9 Codominant Stems

Codominant stems are stems that are at least half the diameter of their parent stem, and compete for dominance in the tree crown (Gilman 2002). They are similar to branches, but have no branch collars or branch protection zones. Disease moves from one codominant stem to another as readily as it moves through ordinary stems. Codominant stems can have a branch bark ridge. However, they are structurally flawed because they do not have room to develop (Figure 3.6). As crowded branches grow in diameter, they can press together, creating wounds and squeezing bark in between the two stems (Figure 3.6).

The resulting wounds allow disease entry and weaken branch attachments. Moreover, stems with included bark often pry one another apart as they grow, further weakening their attachments. Attachments with included bark often fail, and can be recognized by a crease between stems near their juncture (Figure 3.6).

3.2.10 Growth Regulators

Growth regulators are chemicals that coordinate plant growth. A growth regulator can have confusing, even contradictory roles depending on its concentration, the concentration of other growth regulators, environmental conditions the species of tree, and other factors. Nevertheless, scientists understand that growth regulators are responsible for orderly plant growth and development.

For example, auxin is a growth regulator produced in apical meristems, while cytokinin is another type synthesized in root tips. In response to environmental factors, roots grow and make cytokinens that stimulate shoot growth, which can result in auxin production that promotes root development. The resulting cycle is one way the tree system "communicates" to stay in balance as it grows. Auxin also functions in apical dominance. Auxin produced in apical meristems inhibits lateral growth, and helps to account for orderly branch development and spacing. Conversely, removing an apical bud or

meristem promotes lateral growth, which alters the tree's normal growth habit, and can lead to codominant stems, poor spacing, and included bark.

Gibberellins are another class of growth regulators. Among other functions, gibberellins promote cell elongation. Marketed chemicals commonly known as "Tree Growth Regulators" (TGRs) are actually gibberellin inhibitors. By inhibiting gibberellins synthesis, TGRs reduce cell elongation, which in turn slows growth.

3.3 Natural Target Pruning

Natural targets are proper final pruning cut locations at strong points in the tree's disease defense system. Removing branches at natural targets rarely damages the joining trunk or limb (Miller 1998). The ISA *Best Management Practices: Tree Pruning* (Gilman and Lilly 2002) and *A300* (ANSI 2008) describe the technique. Targets vary depending on whether a branch is removed or reduced.

3.3.1 Collar Cuts

Branches should be removed at the collar (Figure 3.7). Cutting into the collar, known as flush cutting, is inappropriate because it creates a direct port of disease entry into the parent stem.

Disease can weaken stems, potentially creating safety risks. On the other hand, proper branch removal does not leave stubs that pathogens can use as an energy source to overcome the tree's defense system and spread into the trunk. If the branch is removed correctly, only the branch protection zone is exposed, giving an advantage to trees in keeping out disease. As a result, collar cuts virtually prevent decay from entering the parent stem (Figure 3.7 [Miller 1998]).

3.3.2 Approximating the Collar

Occasionally, branch collars are not readily evident and the collar must be approximated using the branch bark ridge (Figure 3.8). Start the cut in the branch crotch, just outside the branch bark ridge, and follow an outward angle that mirrors the inward angle the branch bark ridge makes with the trunk or parent stem. The cut should end roughly opposite the bottom of the branch bark ridge (Figure 3.8).

3.3.3 Reduction Cuts

Reduction cuts shorten leads to appropriate laterals. An appropriate lateral is no less than one-third the diameter of the original limb and retains at least three-quarters of the lead's foliage (ANSI 2008 [Figure 3.9]). The reason for these requirements is that branches are autonomous in their energy requirements. Removing too much foliage from a limb could deprive it of sufficient energy to establish apical dominance, maintain its taper, close the wound, and compartmentalize and "out-race" disease which will enter the wound.

As a result, the lateral will not develop into a structurally viable leader. Moreover, shortening a lead removes apical meristems and other points of growth regulator production, which can disrupt orderly growth. If, for example, auxin concentrations are insufficient, on some species a crowded mass of upright, rapidly growing, poorly attached shoots can sprout from the cut and grow directly back into the lines.

Therefore, removing more than 25% of foliage from a limb has the same damaging result as a random topping cut (Figure 3.10), regardless of whether or not the cut is made to a proper-sized lateral. Even under the best circumstances, reduction cuts are potentially harmful,

acting more like a heading than a thinning cut (Gilman 2002). Consequently, if a lead cannot be shortened to a limb at least one-third the diameter of the original lead, or if a cut removes more than 25% of the foliage, that limb should be either targeted for removal, or not pruned. Removal may be gradual over the course of several cycles.

3.3.4 Large Branches

Large branches (those 3-inches in diameter or greater) can seldom, if ever, be removed without harming the tree, particularly if they are codominant stems. Yet, large branches must be prevented from growing toward the utility space, and that nearly always means heading or removing them entirely. Either option can be harmful, but heading large branches not only injures the tree, but fails to effectively clear the conductors (Figure 3.10).

Removal may take a measured approach. For example, one or two large limbs might be removed out of three that are growing toward the conductors, and the remaining limb(s) targeted for removal on subsequent cycles.

Large branches selected for later removal can be subordinated, or removed gradually over subsequent cycles (either interim or cycle). Subordination thins a portion of a limb's foliage. Reducing a fraction of the foliage in this way suppresses the stem's growth, and allows the remaining tree parts to adjust and develop. In some cases, subordination can allow a codominant stem to develop into a branch over time, enabling a branch protection zone to form so a limb can be removed without unnecessarily subjecting a tree to disease (Gilman 2012). Using subordination over multiple cycles to remove large branches can reduce the effect of structural limb removal on tree health, while ultimately circumventing the permanent problems heading cuts can cause, even if that means temporarily heading the branch.

3.3.5 Old Heading Cuts

Removing large stems that have been headed often leaves wide gaps in the tree, because shoots that proliferate from the old heading cuts often dominate the crown (Figure 3.10), and gaps result when branches containing these shoot clusters are removed. Moreover, previously headed branches usually lack natural targets. When such branches are growing toward the conductors, there might be no alternative but to remove them entirely. However, in some cases, headed limbs may be left as a temporary measure. Such headed branches could be removed on subsequent cycles.

Headed branches growing away from the facility space should not be pruned as a matter of standard practice. However, shoots growing from the old heading cuts should be inspected for structural integrity during subsequent visits. Corrective action, such as crown restoration (ANSI 2008), could be necessary if these sprouts are found to be structurally weak.

However, in some cases, structural defects resulting from heading cuts are so severe that they cannot be corrected (Dahle et al. 2006). In these cases, the customer should be contacted about removing the entire tree, or at least the subject branch or branches. If tree or branch removal is not possible, there could be no choice but to remove the weak growth with a new heading cut. This should be done only when extensive decay or hollow exists in the remain-ing branch, with the approval of the forester or GF/supervisor, for safety (not "aesthetic") purposes.

Figure 3.8 Approximated collar cut.

Figure 3.9. Crown reduction cut.

Figure 3.10. Old heading cut.

Shoots that proliferate from these cuts often dominate the tree's crown, and gaps result when branches containing these shoot clusters are removed.

3.3.6 Reduction

Reduction is selective pruning applied to reduce the top or side of a tree or individual limb (ANSI 2008). In a utility context, the goal of reduction is to promote future tree growth away from the conductors, at least on decurrent trees (Figure 3.1)

3.3.6.1 Deciduous Trees

The "V" in many crown reduced deciduous trees quickly fills in with shoots. These shoots eventually require pruning to be kept from interfering with the lines (Figure 3.1) In subsequent cycles, it is important not to strip all these sprouts away, since that causes lion's tailing and can stimulate resurgent growth in many species. Rather, about half of the shoots should be removed, and the other half retained (Figure 3.11).

Shoots selected for removal should be the largest and most vigorous, leaving smaller sprouts behind. Growth selected for retention should be pencil-thin at the point of attachment. If need be, these remaining shoots may be headed back to obtain specification clearances. In this way, a rotation can be established where the largest, most vigorous shoots are removed each cycle, but smaller, suppressed shoots are left to soften the negative visual effect that many customers find objectionable.

Moreover, leaving shoots in the interior of a "V" provides shade and retains auxin production, both of which suppress vigorous sprouting, and helps the trees hold (Figure 3.11). Eventually the sides of the tree will overtop the wires, resulting in more of a "U," and shade the interior of the tree, suppressing shoot growth even more. In time, this top growth decreases the proportion of the crown occupied by the cleared utility space, and softens the negative aesthetics.

3.3.6.2 Conifers

Many conifers; such as pine (*Pinus spp.*), spruce (*Picea spp.*) and Douglas-fir

(*Pseudotsuga menziesii*); have strong central leaders (excurrent form). When these types of trees grow directly under the lines, they should be reduced to the whorl or largest available lateral that provides specification clearance. Cuts made to conifer whorls are typically flat-topped in order not to damage any branches in the whorl (Figure 3.12). Laterals should be tipped on conifers, which prevents them from forming compression wood and bending up toward the conductor.

Figure 3.11 On return visits to "V-Outs", under pruning should leave the smaller, suppressed shoots to retain foliage and soften the visual effect of crown reduction.

Figure 3.12.

Crown reduction.

4. SCHEDULING AND REPORTING WORK

Scheduled work involves systematic cycle or interim projects on both distribution and transmission lines. Schedules should be based on the time elapsed since the last scheduled work, compliance, voltage (particularly for transmission lines), the frequency of tree-caused outages, customer count, the existence of important accounts (hospitals, factories, mines or other high demand facilities), tree conditions, the number of customer complaints, the growth rate of predominant tree species, geography, customer density, rainfall and other environmental factors.

4.1 Process Checklist

Scheduled distribution and transmission work should follow the *PacifiCorp Vegetation Management Process Checklist* (Figure 4.1). The purpose of the process checklist is to facilitate systematic project management. The project should be identified along with the start date on the top of the process checklist.

4.1.1 Authorize Project Work

PacifiCorp foresters are responsible for work authorization. No work should begin on a project until foresters have authorized it to proceed as outlined.

4.1.1.1 Contractor Work Release

Before beginning a scheduled project, the forester shall open a *Work Release* (Figure 4.2). The *Work Release* authorizes a contractor to proceed with a specific maintenance project, and provides written instructions for the work. Contractors will not get compensated for work performed on projects that have not been authorized through a work release.

The *Work Release* specifies the project type (distribution cycle or interim, transmission cycle or interim, TGR or chemical). It provides instructions on tree removals, tree replacement, tree growth regulators (TGRs) and other particulars. It also assigns desired starting and ending dates. Before work begins, the GF/supervisor shall distribute copies of the *Work Release* to each crew assigned to the project, and review instructions for proceeding.

After the project is finished, the supervisor/GF shall sign the *Work Release* to certify the project is completed and closed. The contractor shall provide the actual starting and completion dates, as well as any pertinent comments. Comments should note work that is either incomplete (due to refusals, for example) or does not meet specifications at the time the *Work Release* is closed. By signing off on a project, the contractor guarantees that the work has been completed to PacifiCorp's specifications, and assumes responsibility for any failures to meet Company requirements, outside of exceptions noted in the comments.

4.1.1.2 Set Labor-hour Goals

The forester should set goals for labor-hours a tree and mile for time and equipment distribution cycle and interim work. These goals should be based on production data drawn from the last work on the feeder or grid, with a stretch goal of 10% improvement. Goals should also be established for transmission facilities at labor-hours a mile from previous or similar projects.

Figure 4.1 Process Checklist

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Vegetation Management Process Checklist

Work ID: _____

Date: _____

Authorize Project Work - Utility Forester

- ☐ Open Work Release and Set Goals. Distribute and Discuss with Vegetation Contract Supervisor
- ☐ Labor-hour Goals Set for Trees, Miles or acre (for transmission lines)
- ☐ Work Release Sent to Consultant LD/SR, Service Coordinator and System Forester
- ☐ ☐ N/A Notify Operations Managers, Community Relations Managers, Communications

Project Plan - Forester, Contract Supervisor and Forest Technician

- ☐ ☐ N/A Identify Overbuilt Transmission and Open Transmission Work Release
- ☐ ☐ N/A Research and Identify Governmental, Tribal, and Environmentally sensitive areas
- ☐ ☐ N/A Identify External Agencies and Notify if Necessary (Federal, State County, City and pertinent NGOs
- ☐ ☐ N/A Conduct Pre-job Meetings With Government Agencies
- ☐ ☐ N/A Contract Expert to Delineate Sensitive Sites or Areas and Identify On Maps
- ☐ Forester Inventories, Compiles, Assembles, Checks Out Maps to Vegetation Contract Supervisor

Project Plan Developed - Contract Supervisor and Forest Technician

- ☐ Pre Job Meeting With Forester, Supervisor and Forest Tech — Date: _____
- ☐ Identify Concerned/Dangerous Customers
- ☐ ☐ N/A Identify and Obtain Federal Special Use Permits:
- ☐ ☐ N/A Identify and Obtain Federal, State, and Local Herbicide Use Permit(s)
- ☐ ☐ N/A Identify and Obtain Other Required Permits: Specify:
- ☐ ☐ N/A Identify Outstanding Ticket Work
- ☐ ☐ N/A Identify Flagging Work
- ☐ ☐ N/A Distribution Configuration ☐ Wye ☐ Delta

Work Identification - Contract Forest Technician

- ☐ ☐ N/A Review of Special Precautions: (list)
- ☐ ☐ N/A Follow-up: Personal Contact Requirements, Special Access, Time Sensitive Instructions
- ☐ ☐ N/A Verify Facility Point Inspections Locations
- ☐ ☐ N/A Verify Aerial Waypoint Locations
- ☐ ☐ N/A Review Environmental and Cultural Requirements:
- ☐ Inspect, Prioritize Work Areas
- ☐ Notify Private Landowners and Public Land Managers

Work Assigned to Project Crews - Contract Forest Technician and Supervisor

- ☐ Activity Reports And Other Pertinent Feeder/grid Information Issued to Crews
- ☐ ☐ N/A Required Permits Issued to Crew
- ☐ Work Release and Project Specifics Communicated and Issued To Crews
- ☐ ☐ N/A Sensitive Sites or Areas Reviewed With Crews — Date: _____
- ☐ ☐ N/A Special Instructions: (list below in comments section)

Figure 4.1. Continued

Project Closure - Contract Supervisor and Forest Technician

Date: _____

- ☐ Post Inspection of Work to Verify Completion
- ☐ Inventory and Check In Maps
- ☐ Maps and Documentation Submitted
- ☐ ☐ N/A Concerned Customer Forms Submitted
- ☐ ☐ N/A Refusal Information Submitted
- ☐ ☐ N/A Dangerous Customer Information Submitted
- ☐ ☐ N/A Tree Replacement Voucher Copies Submitted
- ☐ ☐ N/A Hazard Forms - Copy in File and Copy to Utility General Foreman
- ☐ Daily Logs for Project Sent to Utility Area Forester

Project Closure - Forester

- ☐ Verify Receipt of All Maps, Daily Logs, Activity Reports, Tree Replacement Vouchers, and Hazard Forms
- ☐ Verify Receipt of Refusal and Concerned/Dangerous Customer Information
- ☐ Verify Receipt of Signed Work Release
- ☐ Close Work Release (Send to Consultant LD/SR, Service Coordinator and System Forester)

X_____ X_____

Contract Supervisor / Date Area Forester/ Date

Comments:

Figure 4.2. Vegetation Management Contractor Work Release

PacifiCorp Vegetation Management

Contractor Work Release

This work release authorizes *Contractor* to proceed with the specified maintenance project. All work shall conform to PacifiCorp's Vegetation Management Specifications. Following project completion, a *Contractor* representative shall sign this work release, and return it to PacifiCorp. Refusals or any work performed that does not conform to PacifiCorp Specifications shall be noted.

District: **Project #:**

Contractor: **Supervisor/GF:**

_____ **Distribution Cycle Maintenance** **Feeder/Grid #:**
Work according to PacifiCorp *Specifications*. Identify and correct all climbable tree and tree house hazards, and remove danger trees.

_____ **Tree Removals:** Limit removals to cases where removal time equals twice pruning time. Forester approval is required for removals outside of this constraint.

_____ **Tree Replacement:** Use coupons to pursue removals as needed.

_____ **Tree Growth Regulators:** Pursue TGRs on cycle busters.

_____ **Bulk Transmission:** Work bulk transmission with distribution.

_____ **Other:** _____

Desired Starting Date: _____ **Completion Date:** _____

Area Forester Approval: _____ **Date:** _____

To be completed by the Contractor:

Starting Date: _____ **Completion Date:** _____

Comments: _____

Supervisor/GF Signature: _____

4.1.1.3 Work Release Forwarded to Senior Business Specialist and Director of Vegetation Management

The forester should forward the work release and goals to the PacifiCorp senior business specialist and director of vegetation management. The consultant will authorize payment for work on the project.

4.1.1.4 Notify Appropriate Company Personnel

The forester should notify internal stakeholders of a project prior to beginning work. Internal stakeholders include operations managers, customer-community managers, line patrolmen, hydro facility site managers and other personnel. PacifiCorp tariff policy should be notified if work will be conducted in a location where either past or current state public utility commission complaints have been received. PacifiCorp communications department should be informed if work will be conducted in the vicinity where public relations issues have surfaced in the past or could be reasonably expected to arise during currently planned work.

4.1.2 Project Plan

The project plans section provides direction for foresters, contract supervisors and contract utility foresters.

4.1.2.1 ID Overbuilt Transmission and Open Transmission Work Release

Transmission overbuilt on distribution lines should be worked in conjunction with distribution feeder or grid projects.

4.1.2.2 Research and Identify Governmental, Tribal and Environmentally Sensitive Areas.

Governmental, tribal and environmentally sensitive lands present particular demands. Lands under governmental or tribal management and environmentally sensitive areas should be identified early to allow time to work through the required processes.

4.1.2.3 Identify External Agencies and Notify if Necessary.

Identify federal, state, county, city and pertinent non-governmental organizations potentially affected by the project. The appropriate entity should be notified of the impending project, and asked whether or not they have any concerns.

4.1.2.4 Conduct Pre-job Meetings with Governmental Agencies

Before any field work begins, a meeting shall be conducted with governmental agencies that have interest in the project. This is especially important for federal land managers and tribal leaders. In particular, no work may begin on Bureau of Land Management or Forest Service managed lands without a pre-work meeting among federal officials and vegetation management. Multiple projects and multiple agencies may be covered by a single meeting.

The meeting(s) shall be organized by the forester and PacifiCorp's environmental services must be notified and invited to attend. The meeting may be held either in person or through a conference call. Work shall not begin until vegetation management receives written notice to proceed from the appropriate agency.

4.1.2.5 Contract Expert to Delineate Sensitive Areas

If environmentally or culturally sensitive areas are identified on governmentally-managed lands, a contractor with appropriate expertise should be retained to delineate subject sites or areas. Target locations should be marked on maps and on site. Care should be taken with field marking to ensure it is sufficiently clear to alert crews, while at the same time being sufficiently discreet to avoid casual detection.

4.1.2.6 Forester Inventories, Compiles, Assembles, Checks Out Maps to Vegetation Contract Supervisor

It is critical for foresters to be gatekeepers over company maps in order to ensure there is only a single master version of each. If paper map copies are necessary, the forester will check out copies of the master version, which should include sensitive environmental or cultural sites. Effort should be made to work off of digitized maps wherever possible. Contract utility foresters should work with mapping to secure digital maps and communicate with the Company forester responsible for the region. Foresters should ensure that there is a digital master with all pertinent information.

4.1.3 Project Plan Developed

The contract supervisor and contract utility forester are responsible for developing the project plan.

4.1.3.1 Pre-Job Meeting

The contract supervisor and contract utility forester must have a pre-job meeting to discuss the upcoming project. They should discuss elements of the project plan and focus on solving problem issues that arose during the initial stages of the planning process.

4.1.3.2 Identify Concerned or Dangerous Customers

Contract utility foresters should research the feeder or grid file to identify customers with a history of concerns. Contract utility foresters should be proactive in working with these customers. Contract utility foresters, supervisors/general forepersons and foresters should discuss strategies for avoiding violence with dangerous customers.

4.1.3.3 Identify and Obtain Federal Special Use Permits

PacifiCorp facilities that cross federally-managed lands are in place under the authority of special use permits. Contract utility foresters and supervisors should study and ensure the conditions in the pertinent special use permits are satisfied. Any concerns about the potential of not complying with provisions in special use permits shall be communicated to the forester.

4.1.3.4 Identify and Obtain Federal, State and Local Herbicide Use Permits.

Herbicide or pesticide use permits are required in certain jurisdictions, particularly on federally-managed land. If a permit is required, foresters must ensure that contract utility foresters or supervisors/GFs have obtained it before herbicide application may proceed.

4.1.3.5 Identify and Obtain Other Required Permits.

Permits may be required. Examples may include projects along state road rights-of-way, in some communities, county or state forests or riparian areas. All required permits shall be obtained by the contractor before work may proceed.

4.1.3.6 Identify Outstanding Ticket Work.

From time to time, customers who have called in work requests have been told that their request did not present an immediate threat to safety or electric service and could wait until regularly scheduled work. Contract utility foresters should research tickets associated with a feeder or grid, ensure contact is made with those customers, and either explain the reasons why the work does not need be done or schedule it for completion

4.1.3.7 Identify Flagging Work.

Many areas require flaggers and traffic control. Contract utility foresters should identify areas where flagging support is necessary. Those locations should be identified on both the *Activity Report* and a map. Planning should maximize the number of tree crews working with each flagging crew.

4.1.3.8 Identify Circuit Configuration

The overwhelming majority of PacifiCorp distribution circuits are built with wye configuration, which includes a neutral wire. However, delta construction, which does not have a neutral wire, is found in some areas.

The difference is of little consequence on wires attached to cross arms, as all cross arm-mounted wires should be cleared to primary specifications (see section 5.6.5). However, there is a significant distinction on lines without cross arms. Wye construction has a low neutral, while the low wire on delta carries primary voltage. This could lead to safety and clearance risks if the low primary is mistakenly identified as a neutral. In noting that a circuit is delta construction, contract utility foresters should alert tree crew leaders of the potential of a low-mounted primary, so safe work practices can be conducted and proper clearances obtained.

4.1.4 Work Identification

Contract utility foresters are responsible for work identification.

4.1.4.1 Review Special Precautions

Before beginning field work on a project, contract utility foresters should review special precautions. These might include areas where difficulties have arisen in the past, such as a particularly sensitive community or neighborhood, areas where the media has been called to help oppose line clearance work, locations where there is a concentration of people who object to herbicide application, environmentally or culturally sensitive areas, or other matters of concern.

4.1.4.2 Follow-up On Items of Concern

Contract utility foresters should follow-up with customers who requested personal contact in the past, note special access (property owners who have requested tree crews not use a gate or drive, for example), or time sensitive instructions. Examples of time sensitive instructions include advisories not to work prior to hay harvest, not to drive in a field during the raining season in the Pacific Northwest, or some other matter.

4.1.4.3 Verify Facility Point Locations

Contract utility foresters should print outstanding facility points for the feeder, grid or transmission lines on which they are planning work. They should inspect outstanding conditions and assign work where necessary.

4.1.4.4 Verify Aerial Waypoint Locations

For transmission projects, contract utility foresters should print outstanding locations from recent aerial patrols and ensure they are inspected and worked if necessary.

4.1.4.5 Review Environmental and Cultural Requirements

For work crossing governmentally managed land, contract utility foresters should review any existing environmental and cultural requirements. These can include threatened and endangered species, riparian areas or the location of culturally sensitive sites.

4.1.4.6 Inspect, Prioritize Work Areas

Contract utility foresters shall document their contact with property owners or land managers, and organize work for tree crews on an *Activity Report* (Figure 4.3).

The *Activity Report* should identify the district in which work is to be conducted, the project number (the discrete number assigned to the district), the contractor assigned to the job and the feeder or grid number for distribution or plant locality number for transmission.

For each work location, the contract utility forester should note the date they inspected the site, a detailed location, the identity of the tenant or property owner (if known), the type of contact (door hanger, letter, personal visit, telephone or no contact), the crew type required to perform the work (lift, climb, flagging, mowing or other), a description of the work, and comment, if necessary. Comments could include special considerations such as how to access the work, whether or not there is a dog on site, a sensitive area of the yard such as flower beds, cultural or environmental sites, or other matters.

4.1.4.7 Hydroelectric Facilities

PacifiCorp hydroelectric facilities and adjacent rights-of-way could have restrictions on vegetation management activities. PacifiCorp's hydro operations and implementation (compliance group), PacifiCorp right-of-way services, or PacifiCorp environmental services shall be contacted before activities on or adjacent to hydroelectric facilities begin.

Herbicide use on or adjacent to PacifiCorp hydroelectric facilities shall be reported to the plant manager weekly. Tree crews working on property that is part of a hydroelectric project site should check in with the plant office before beginning work and check out after work each day.

4.1.4.8 Substations and Transition Stations

Contract utility foresters should provide a limited visual assessment of the vicinity around substations and transition stations for trees that have a high probability of falling into or interring with the facility. Trees identified in the limited visual assessment should undergo a basic assessment. If the basic assessment indicates trees are likely to interfere with or fail and strike the sub or transition station, the trees should be assigned to a tree crew for removal or mitigation. Limited visual and basic assessments are described in Smiley, Matheny and Lilly (2011). Climbable trees that could provide access into the fenced area should

also be identified and corrected along with any vegetation growth that could interfere with the facility. Tree crew substation activity should be charged to a work order supplied by sub operations.

4.1.4.9 Notify Private Landowners and Public Land Managers

Prior to any tree crew work, contract utility foresters should attempt to contact the property owner or tenant on whose property the work will occur. Customer contact shall follow procedures outlined in Section 8.2.

Public land managers should have been consulted before this stage (see section 4.1.2.4). However, during the notification process, contract utility foresters should follow-up with appropriate land managers to inform them that work is proceeding as planned, and provide an update on when crews are expected to begin work.

4.1.4.10 Schools

School main or administrative offices should be notified of work to be done within school grounds or on property adjacent to schools. An effort should be made to schedule work without children present or specific accommodations made for pupils' safety. Particular effort should be made to identify targets within drop zones, climbable trees, access issues and other safety matters on site.

4.1.4.11 Mobile Home Parks and Apartment Complexes

Mobile home park and apartment complex managers should be notified in advance of planned work. Managers could be aware of tenants with specific concerns. Mobile home park and apartment managers should be encouraged to communicate with affected renters. Individual units may still need notification of impending work.

4.1.5 Work Assigned to Project Crews

Work assignments are the responsibility of both contract utility foresters and supervisors/GFs.

4.1.5.1 Activity Reports and Other Pertinent Information Issued to Tree Crews

Contract utility foresters or supervisors/GFs should distribute completed *Activity Reports* to the tree crews.

4.1.5.2 Required Permits Issued to Tree Crews

Appropriate permits shall be issued to tree crews. Tree crew members should have them available to produce to the appropriate authorities on demand.

4.1.5.3 Work Release and Project Specifics Communicated and Issued to Crews

Before beginning work on a project, the tree crew should be issued the pertinent work release. Tree crews should be able to produce the work release to foresters during audits.

Figure 4.3. PacifiCorp Vegetation Management Activity Report.

District : _____	**Cycle Maintenance**	**Interim Maintenance**	**Ticket Maintenance**	**Work Order**
Project #: _____	Trans. PL#: _____	Trans. PL#: _____	Trans. Ticket _____	W.O. #: _____ &
Inspected By: _____	Dist. F/G#: _____	Dist. F/G#: _____	Dist. Ticket _____	District CC #: _____

Date Inspect.	Detailed Location	Property Owner	Phone Number	Type of *Contact	^TGR s	Crew Type	Description of Work / Comments	Date Comp.	^Cst. Survey	Crew ID No.	Forem. Initials

*Type of Contact Legend: D-Door Hanger, L-Letter, N-None, P-Personal, T-Telephone

^TGRs and Customer Surveys: Check = yes, Blank = no

4.1.5.4 Sensitive Site or Area Review With Crews

Sensitive site locations should be communicated to tree crews.

4.1.5.5 Special Instructions

If there are special instructions, such as working in sensitive areas, contract utility foresters should communicate this in writing and ensure that tree crews have read and understand them.

4.1.6 Project Completion

After completing work, the crew leader shall note the date it was performed and initial the location entry.

4.1.6.1 Post Inspection to Verify Completion

The vegetation management contractors are ultimately responsible for ensuring that all work on a project is completed to PacifiCorp specifications. Supervisors/GFs should either inspect the work themselves, or delegate that inspection. If the work is delegated to the contract utility foresters, supervisors/GFs still have the responsibility for ensuring the project is completed to specifications. Any exceptions to specifications for any reason must be noted on the work release (see section 4.1.1.1).

4.1.6.2 Inventory and Check in Maps

Supervisors/GFs and contract utility foresters should collect all maps that have been distributed to tree crews and return them to the forester from whom they were initially issued. Foresters shall account for all maps originally issued, and file them appropriately.

4.1.6.3 Maps and Documentation Submitted

Supervisors should submit maps, completed activity reports and other pertinent documentation to foresters.

4.1.6.4 Concerned Customer Tracking

Contract utility foresters and supervisors should gather information on customers that might require follow-up the next time a project is worked. Examples are customers who refuse to allow work or access, customers who express concerns about work or customers or property owners who threaten vegetation management employees. Information should be presented to the forester in writing on the customer refusal form and appropriately filed, preferably digitally.

4.1.6.5 Tree Replacement Voucher Copies Submitted

Contract utility foresters and supervisors should submit digitized copies of tree replacement coupons to the forester.

4.1.6.6 Hazard Forms Copied, Filed and Submitted to the Utility General Foreman

Forms documenting facility points (Figure 2.7) that need to be corrected (broken cross arms, broken insulators, leaning or unstable poles, for example) should be submitted to the PacifiCorp district general foreman or operations manager.

4.1.6.7 Daily Logs for Project Submitted to Area Forester

Supervisors should collect *Daily Logs* from each crew member under their direction. These should be digitized and emailed to the forester, as well as filed by the forester.

4.1.6.8 Sign Work Release

Once they have determined that all work on a project is completed to specifications, GF/supervisor should sign and date the work release. Any locations that have not been worked to specifications should be documented on the work release with an explanation of the circumstances (see section 4.1.1.1).

4.1.7 Project Closure

Foresters are responsible for closing projects by completing the tasks in 4.1.7.1-4.1.7.3.

4.1.7.1 Verify Receipt of Maps and Other Pertinent Information

Foresters should inventory maps and collect daily logs, tree replacement vouchers, hazard forms as well as concerned customer, dangerous customer and refusal information from the supervisor. Foresters should file this information digitally so it can be retrieved when work is conducted the next time through. Foresters should ensure to keep one master digital map.

4.1.7.2 Verify Receipt of Signed Work Release

Foresters should ensure they have received and filed a copy of the signed work release from the contractor. They should examine the comment section for any work that was not completed to specification, and if necessary, make provisions to correct those outstanding conditions.

4.1.7.3 Close Work Release

The forester should close the work release and inform the lead/senior consultant and director of vegetation management of the closure by electronic mail.

4.2 Reporting Work

After completing work, the crew leader shall document tree work on *Weekly and Daily Reports*. Note the date the work was performed, the crew ID number and the crew leader's initials.

4.2.1 Weekly Vegetation Report

Tree work shall be reported on the *Weekly Time & Vegetation Report* (Figure 4.4) or other approved method. The report is a combination contractor time sheet and PacifiCorp weekly production report. The back of the report provides instructions and definitions for each cell (Figure 4.5). Weekly Reports, along with the corresponding invoice should be submitted to the forester responsible for the area in which the report was completed,

Most of the items on the *Weekly Report* are self explanatory. A few cells warrant clarification, (reference Figures 4.4 and 4.5).

- Item 23. General Work Location: The general location should be the approximate address. For example, the 4000 block of Dead Elm Memorial Road. Note that for audit purposes, crew leaders will be responsible to find and identify all the trees they worked over the course of a week. Consequently, more detailed information should be kept in the *Daily Report* (covered in Section 4.2.2 [Figure 4.6]).
- Items 31 and 32. Woody plants (including vines) less than 4-inches in diameter at breast height are classified as saplings. The actual square footage occupied by the above ground portion of the plant should be measured and recorded, with a 100 ft^2 maximum per plant for both pruned and removed vegetation. Note that multi-stemmed

woody plants where no single stem is over 4-inches in diameter are classified as saplings, with a maximum of 100 ft^2 per plant.

- Item 37. Stump Spraying: Document the time spent treating stumps of trees and brush feet that have been removed during the day. Use quarter-hour increments.
- Items 43-45. To obtain the diameters of multi-stemmed trees, add the diameters at breast height of individual stems. For example, if a tree has three stems of 8, 4 and 3- inches in diameter, the tree would be 15 inches in diameter and reported as a 12-24 inch removal. An exception would be if no stems on the plant are over 4-inches in diameter at breast height, in which case the plant should be classified as a sapling (see items 31 and 32). If only one stem is over 4-inches in diameter and the remaining stems are less, report the diameter of that specific removal as the diameter of the single largest stem.
- Item 47 and 48. Saplings pruned and removed. Saplings are trees under four-inches in diameter at breast height (they could also be 6-inches or less in diameter at the stump). Report area covered by the crown of the plant, with a 100 ft^2 maximum for each plant. There must be six inches of soil between stems of the same species to count as multiple plants.
- Items 54 and 55. For transmission cycle work, capture the number of acres cleared or sprayed respectively using linear feet.

4.2.2 Daily Report

The *Daily Report* shall be used by crew leaders to keep detailed records on their productivity (Figure 4.6). It is particularly important as a reference for locating trees during audits and tracking chemical use. Like the *Weekly Report*, the *Daily Report* provides instructions on a cell by cell basis. The *Daily Report* is the property of PacifiCorp, and when completed, supervisors/GFs shall digitize it, and sent to the appropriate forester.

4.3 Tree Crew Audits

The primary purpose of a crew audit is quality control. Furthermore, crew audits offer an opportunity for the forester to provide tree crew leaders and their supervisors/GFs with a clear understanding of PacifiCorp's expectations.

Foresters shall audit one full week of work as many times a year as specified in their goals. All work, including transmission and pole clearing, shall be audited. Each audit should have the forester, the crew's GF/supervisor and the crew leader in the field together reviewing completed work. Audits should begin with the first tree, and progress in order to the last tree worked during the week. Over the course of the audit, the forester, supervisor/GF and crew leader should open a dialog regarding the week's results.

The audits should objectively assess quality, adherence to specifications, tree counts, herbicide and other matters. Moreover, audits should provide the tree crew leader with feedback on production, professionalism, equipment, safety and crew efficiency. Results shall be documented on a *Tree Crew Audit Report* (Figure 4.8).

4.3.1 Objective Components

Objective audit components shall be determined on the straight percentage of trees that meet expectations compared to the total trees worked in each category. The percent score shall be averaged for the final rating.

4.3.1.1 Quality

The quality component documents crew adherence to natural target pruning as described in Section 3.3. Before conducting an audit, the forester and supervisor/GF should agree on a day to examine cut quality. One way would be to roll a die. In this case, 1 would designate Monday as cut quality day, 2 Tuesday and so on. Six would represent Saturday, so it would require further rolls until a different number turns up.

All final cuts made by the crew that day should be counted and examined for proper technique. A minimum of 20 cuts shall be inspected. If a crew did not make 20 cuts on the selected day, another day should be added until a minimum of 20 cuts have been evaluated. Note that if Friday is the selected day and 20 cuts were not made, the crew leader should alert the forester and GF/supervisor before the audit begins so another day can be added for cut quality.

Rip cuts, flush cuts and improper lateral selections violate the principles of natural target pruning, and shall be counted against the category score. Foresters should grant tree crews one grace faulty cut (the "Mulligan"). In addition, each “hanger” left in the tree will count as one improper cut per inch of the hanger’s diameter. For every two hangers under one-inch in diameter, a single cut penalty should be assessed.

Lombardi poplar, Douglas hawthorn and other species are exempted from cut quality examination at the PacifiCorp director of vegetation management’s discretion.

4.3.1.2 Specification Adherence

The *Specification* section examines all trees worked over the course of a week, both pruned and removed. It takes a straight percentage of trees that comply with clearances specified in Chapters 5 and 6 against all those worked during the week. Brush feet sprayed may be counted as brush feet removed. In addition, if climbing spurs were used in violation of section 2.6.3, the crew will be penalized for a tree out of specification.

4.3.1.3 Tree Count

The tree count section is used to validate numbers in the *Weekly Report* against those actually identified in the field on a straight percentage basis. Reported trees pruned, secondary trees, and brush feet equivalents ($ft^2 \div 100\ ft^2$ of saplings pruned or removed) should be validated for discrepancies in these categories. Note that no plant should be reported at more than 100 ft^2. Smaller, pencil-diameter stems may be counted at 10 ft^2 each.

Figure 4.4. Weekly Time and Vegetation Report

WKLY TIME REPORT & PACIFICORP WKLY VEGETATION REPORT

1 W/E _____ State _____ Local Union # _____ Crew _____ Contract# _____

Last 4	Employee Name	Code	T	Pay Rate	Sun	Mon	Tue	Wed	Thur	Fri	Sat	ST	OT	DT	Total	HOL	VAC	Other	PAD

Explain Other Hours:

PAD- Paid Absent Day

Eq Name	Equipment Number	Mileage	TOTAL	Sun	Mon	Tue	Wed	Thur	Fri	Sat

MAN HOURS	TOTAL	Sun	Mon	Tue	Wed	Thur	Fri	Sat
28 Travel & Misc.								
29 Inspection/Notification								
30 Traffic Flagging								
31 Chp/Cleanup/Dmp/Stmp Grnd								
32 Tree Prune								
33 Tree Removal								
34 Saplings Pruned								
35 Saplings Remove								
36 TGR								
37 Pole Clear/Treating								
38 ROW Clearing								
39 ROW Spraying								
40 Stump Spraying								
41 Total Man-Hours								

PRODUCTIVITY	TOTAL	Sun	Mon	Tue	Wed	Thur	Fri	Sat
42 # Intentionally Blank								
43 # Primary Pruning								
44 # Intentionally Blank								
45 # Sec/Serv. Pruning								
46 # Removals 4"-11"								
47 # Removals 12"-23"								
48 # Removals 24"-Up								
49 TOTAL PRUNED/REMOVED								
50 Ft^2 Saplings Pruned								
51 Ft^2 Saplings Removed								
52 # Stump Application								
53 # Stumps Ground								
54 # TGR Application								
55 # Poles Cleared								
56 # Poles Treated								
57 # ROW Ac Cleared								
58 # ROW Ac Sprayed								
59 Ft^2 Sprayed								
59 # Loads of Chips								
60 # Survey Cards								

2 District _____

3 Project _____

Crew Information

4 Crew Leader _____

5 PacifiCorp # _____

6 Crew Type _____

7 Cert. Appl# _____

8 Supervisor _____

Work Activity

Local Transmission Maintenance

9 Trans Cycle (TRN) TID# _____

10 Trans Ticket (TTK) ☐ _____

11 Trans Hot-Spot (THS) TID# _____

12 Trans Chemical (TCM) TID# _____

13 Trans Inspection (TNT) TID# _____

14 Trans Pole Clear (TPL) TID# _____

Distribution Maintenance

15 Dist Cycle (DST) F/G # _____

16 Dist Ticket (DTK) ☐ _____

17 Dist Hot-Spot (DHS) F/G # _____

18 Dist Chemical (DCM) F/G # _____

19 Dist Pole Clear (DPL) F/G# _____

Main Grid Transmission Maintenance

20 MG Cycle (MGT) TID# _____

21 MG Hot-Spot (MHS) TID # _____

22 MG Chemical (MCM) TID# _____

23 MG Inspection (MGI) TID# _____

24 MG Pole Clear (MPL) TID# _____

25. District Work Order or Storm #s

PM Order # _____

26 Shop Location _____

27. General Work Location

Mon _____

Tue _____

Wed _____

Thrs _____

Fri _____

Sat _____

Sun _____

62 Crew Leader Signature _____

PAGE _____

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Figure 4.5. PacifiCorp Weekly Time and Vegetation Management Report Instructions and Definitions.

Instruction & Definitions

1. Week Ending: The week ending date (Saturday).
2. District: The PacifiCorp district where the work occurred.
3. Project #: District identification number
4. Cr. Leader: Crew Leader's name.
5. Crew #: Three-digit crew number assigned to crew leader.
6. Crew Type: Two-character crew-type code (2-Lift, 2-Mow, 3-Lift, 3-Climb. 4-Climb, 5-Climb, F. Tech, Others)
7. Certified Appl. #: The certified applicators license number.
8. Supervisor: Crew's Supervisor's name.
9. Local Trans Cycle, TID#: Transmission line six-digit Tech ID number.
10. Local Trans Ticket: Check when working transmission tickets. Tech ID number not required.
11. Local Trans Hot-Spot, TID#: Transmission line six-digit Tech ID number.
12. Local Trans Chemical: Transmission line six digit Tech ID number.
13 Local Trans Inspection: Transmission line six digit Tech ID number.
14. Local Trans Pole Clear: Transmission line six digit Tech ID number California Only
15. Dist. Cycle, F/G#: Feeder or grid number, maximum eight characters.
16. Dist. Ticket: Check when working distribution ticket. Feeder or grid numbers not required.
17. Dist. Hot-Spot, F/G#: Feeder or grid number, maximum eight characters.
18. Dist. Chem. F/G#: Chemical Cycle Maintenance: Enter Feeder/Grid #.
19. Dist. Pole Clear F/G#: Feeder or grid number. maximum eight digits. This activity is only in California.
20. Main Grid Cycle: Transmission line six digit Tech ID number
21. Main Grid Hot-Spot: Transmission line six digit Tech ID number
22. Main Grid Chemical: Transmission line six digit Tech ID number
23. Main Grid Inspection: Transmission line six digit Tech ID number
24. Main Grid Pole Clear: Transmission line six digit Tech ID number California Only
25. District Work Order or Storm Work: Plant Maintenance (PM) Order and Cost Center.
26. Shop Location: Shop location.
27. General Work Location: General work location for the day. Detailed locations are to be kept separately in the "yellow books." For audit purposes, crew leaders are responsible to find and identify all trees they worked.
28. Travel & Misc. Man-hours: Number of travel and miscellaneous (meetings, stand-by, etc.) man-hours a day.
29. Inspection/Notification: Number of inspection and notification man-hours a day. Includes facility inspection property owner notification.
30. Traffic Flagging: Number of traffic flagging man-hours a day.
31. Chip/Cleanup/Dump: Number of chipping, cleanup, and dumping man-hours a day. Stump grinding shoud be accounted for here.
32. Tree Prune: Number of man-hours a day spent pruning, including setup.
33. Tree Removal: Number of tree removal man-hours a day, including setup.
34. Saplings Pruned: Man-hours a day spent pruning saplings, including setup. Saplings are woody plants under 4" DBH (diameter at 4.5 feet above the ground) of species which have the potential to reach wire height at maturity. Report no more than 10 ft2 a plant.
35. Sapling Removed: Man-hours a day removing saplings, including setup. Saplings are woody plants under 4" DBH (diameter at 4 .5 feet above the ground) of species which have the potential to reach wire height at maturity. Report no more than 10 ft2 a plant.
36. TGR: Man-hours a day applying TGRs. including setup.
37. Pole Clear/Treating: Pole clearing man-hours a day.
38. ROW Clearing: Transmission ROW clearing man-hours a day.
39. ROW Spraying: Transmission ROW spraying man-hours a day.
40. Stump Spraying: Man-hours a day spent spraying stumps and stubble from removed saplings. Use 1/4 hour increments
41. Total Man-Hours: Total number of man-hours a day and week. Use 1/4 hour increments.
42. Intentionally blank.
43. Primary pruning. Total trees pruned on primary conductor each day.
44. Intentionally blank.
45. Sec/Serv. Pruning: Total trees pruned each day for secondary, service, or street light where there is no primary.
46. Removals 4"-11": Total trees removed between 4"-11" DBH
47. Removals 12"-23": Total trees removed between 12"-23" DBH
48. Removals 24" and greater: Total trees removed 24" DBH and greater.
49. TOTAL PRUNED/REMOVED: Total trees pruned or removed a day and week.
50. Sq. Ft. Saplings Pruned: Square feet (length x width) of saplings pruned. Saplings are woody plants under 4" DBH (diameter at 4.5 feet above the ground) of species which have the potential to reach wire height at maturity. Report no more than 100 ft^2 a plant.
51. Sq. Ft. Saplings Removed: Square feet (length x width) of saplings removed. Saplings are woody plants under 4" DBH (diameter at 4.5 feet above the ground) of species which have the potential to reach wire height at maturity. Report no more than 100 ft^2 a plant.
52. Stump Application: Total trees that were stump treated with herbicides.
53. Stumps Ground: Stumps ground out.
54. TGR Application: Trees treated with Tree Growth Regulators (TGRs [(Implants, soil drench, and soil injection]).
55. Poles Cleared: Poles cleared of trees and brush. This activity is only in California.
56. Poles Treated: Poles treated with herbicides.
57. ROW Acres Cleared: Transmission ROW acres cleared of trees and saplings.
58. ROW Acres Sprayed: Transmission ROW acres where trees and saplings were treated with herbicides.
59. Sq. Ft. Sprayed: Report the square feet of undesirable vegetation sprayed.
60. Loads of Chips: Loads of chips dumped.
61. # Survey cards: Total number of survey cards distributed
62. CREW LEADER SIGNATURE: Crew leader signs the report to authenticate its accuracy.

Figure 4.6 Daily Report

PacifiCorp Vegetation Management Daily Report

Crew Leader:

[2]Date	[3]Feeder/Grid #, Ticket Work, Trans. TID#, Work Order #	[4]Detailed Location: Street Address, Pole Number, Structure Number, Mile Marker, Reference Point	[5]# Side Prune	[6]# Crown Reductions	[7]# Over-hang Prune	[8]# Sec/Serv Prune	[9]# Brush Ft² Prune	[10]# Brush Ft² Removed	[11]# Removals 4"-11"	[11]# Removals 12"-23"	[11]# Removals 24" up	[12]# Stump Applications	[13]# Stumps Ground	[14]# TGR Applications	[15]# Poles Cleared	[16]# Poles Treated	[17]# ROW Acres Cleared	[18]# ROW Acres Sprayed	[19]# Brush Ft² Sprayed	[20]Herbicide Product	[21]# Oz. or # Gal. applied	[22]Temperature (F)	[23]Wind Direction	[24]Wind Speed (MPH)	[25]Start Time	[26]Finish Time	[27]Customer Survey

[28]Certified Applicator: _____ [29]Certified Applicator #: _____

[30]Forester _____

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Figure 4.7 Vegetation Management Daily Report

PacifiCorp Vegetation Management Daily Report

Instruction and Definitions

1. **Crew Leader:** The name of the crew leader for the day.
2. **Date:** Date work was performed.
3. **Feeder/Grid #, Ticket work, Trans TID #, After Hours Trans or Dist. Storm Work, Worker Order #:** Identify the work with the appropriate number, or as ticket work.
4. **Detailed Location:** Report a detailed work location for each job site.
5. **Side Pruning:** Report the number of trees pruned to the side of the primary conductors.
6. **Crown Reductions:** Report the number of trees pruned under the primary conductors.
7. **Overhang Pruned:** Report the number of pruned overhanging the primary conductors.
8. **Sec/Service Pruned:** Report the number of trees pruned for secondary, service, or street lights where there is no primary.
9. **# Ft^2 Saplings Pruned:** Report the area of power line right-of-way where saplings were pruned. Report the area occupied by the crown of the plant(s), with no more than 10 ft2 reported for an individual plant. Saplings are defined as woody plants under 4" DBH (diameter at breast height) of species which have the potential to reach wire height at maturity.
10. **# Ft^2 Saplings Removed:** Report the area of power line right-of-way where saplings were removed. Report the area occupied by the crown of the plant(s), with no more than 10 ft2 reported for an individual plant. Saplings are defined as woody plants under 4" DBH (diameter at breast height) of species which have the potential to reach wire height at maturity.
11. **# Removals 4"-11", 12"-23", and 24" and up:** Report the number of trees removed in each size class measured 4½ feet above the ground).
12. **# Stump Applications:** Report the number of trees that were stump treated with herbicides.
13. **# Stumps Ground:** Report the number of stumps that were ground.
14. **# TGR Applications:** Report the number of trees treated with tree growth regulators.
15. **# Poles Cleared:** Report the number of poles cleared of trees and brush to bare ground.
16. **# Poles Treated:** Report the number of poles treated with herbicides.
17. **# ROW Acres Cleared:** Report the number of transmission ROW acres were cleared.
18. **# ROW Acres Spayed:** Report the number of ROW acres sprayed with herbicides.
19. **# Ft^2 Sprayed:** Report the number of square feet of right-of-way sprayed with herbicides.
20. **Loads of chips:** loads of chips dumbed that day.
21. **Herbicide Product:** Report the herbicide product used at the site. Refer to Herbicides A-F.
22. **# Oz., or # Gal. Applied:** Report the number of herbicide ounces or gallons applied at the site.
23. **Temperature (F):** Report the temperature when the herbicide application is made.
24. **Wind Direction:** Report the wind direction at the site when the herbicide application was made.
25. **Wind Speed (MPH):** Report the wind speed in miles per hour at the site when the herbicide application was made.
26. **Start Time:** Report the time when the herbicide application was started.
27. **Finish Time:** Report the time when the herbicide application was completed.
28. **Certified Applicator:** The name of the liscensed applicator.
29. **Certified Applicator #:** The number of the applicator's license.

FRPC000009

Figure 4.8 Tree Crew Audit Form.

CREW FOREMAN: _____ **CREW:** _____ **DATE:** _____

CONTRACTOR: Trees Inc. **QUARTER:** _____ **DISTRICT:** _____

	SCORE	WEIGHT	% FACTOR
QUALITY : # Cuts inspected: # Proper cuts: COMMENTS: (Laterals, flush cuts, bark rips, wounds, stubs, hangers)	100.0%	0.25	25%
CLEARANCE: # Trees Inspected: _____ # Trees Spec. Clearance: _____ # Trees non-spec. clearance: 0 COMMENTS:	100%	0.25	25%
TREE COUNT: # Trees reported: # Trees verified: COMMENTS:	100%	0.25	25%
HERBICIDE: # Trees reported: # Trees verified: Pesticide Applicators Lic. # Label & MSDS Sheets (Yes) (Proper Material, Application, Tools, & Knowledge):	100%	0.25	25%
AVERAGE RATING: Of all categories (0 to 100% adherence)	**TOTALS:**		**100.0%**

Specification Manual (yes/no) _____
PRODUCTION:

PROFESSIONALISM:

EQUIPMENT: (Appearance, condition, operational)

SAFETY: ***evaluated by contractor supervisor*** - (Work techniques, traffic control, personal protective equip)

CREW EFFICIENCY: (Job planning, multiple tasking idle labor, clean up chip disposal)

SUPERVISOR: _____ **FORESTER:** _____

**Crew Type & Equip:*
Customer Surveys: Good? _____ Comments: _____
**Week ending date:*

Table 4.1 Herbicide category deductions. Deductions are added together.

Penalty Description	Deduction
Failing to treat stumps or ft^2 of brush requiring treatment	Percentage of stumps or ft^2 of brush missed against the total of those requiring treatment.
Misreported stumps or ft^2 of brush	Percentage of over or under reported stumps, or ft^2 of brush against the total that were actually treated
Crews without a crew leader or an applicator (if required by state regulations) holding a current applicator's license	100% (crew may be shut down at the forester's discretion).
Crew leader or applicator (if required by state regulations) who have a current applicator's license, but does not have it on site.	10%
Missing herbicide SDS or Label	10% for each missing chemical document of on the truck

On transmission projects, work in the right-of-way should be reported as acres cleared if there are more than 40 trees per acre. If there are fewer than 40 trees per acre, work should be reported as individual trees. Trees outside the right-of-way should be reported as individual trees.

4.3.1.4 Herbicide

The herbicide component should compare total treated stumps and brush feet equivalents (total $ft^2 \div 100\ ft^2$) against those that should have been treated. It should also compare stumps and brush feet equivalents treated with herbicide against the total number reported. Deductions for over or under treatment or reporting should be made on a straight percentage basis and added together (Table 4.1). For example, if in an area where herbicide use was acceptable, a tree crew removed five deciduous trees, but only treated four stumps, they would receive a 20% deduction ([1÷5]×100 = 20%). Moreover, if they reported only three out of the four stumps actually treated, the crew would receive an additional 25% demerit. The total deduction in this example would be 45%, and the crew's herbicide score would be 55% (assuming everything else was in order).

Moreover, foresters should apply penalties for violations of herbicide policy. Penalties include a 100% category deduction for cases where the crew leader or applicator did not hold a valid applicator's license (California excepted). The crew may be shut down until the crew is properly credentialed. Further penalties include a 10% penalty for crew leaders or applicators that have valid applicator's licenses, but do not have it on site, and a 10% penalty for each required pesticide

document that is missing (SDS and labels, for example [Table 4.1]).

Failing to report treated trees is a violation of law, in addition to not providing PacifiCorp with accurate information. Examples of trees and brush that do not require treatment include conifers that do not sprout from the stump (pines, firs, spruces, cedars and others), and stumps located in areas where herbicide use is prohibited (certain Federal jurisdictions, municipal watersheds and private property where the owner objects to herbicide use).

4.3.2 Subjective Components

While not included in the final audit score, subjective factors such as productivity, professionalism, equipment and safety are also critical to program success. The audit process allows the forester to comment on these items.

4.3.2.1 Production

For time and equipment work, foresters should provide the tree crew's *Statistics Report* (Figure 4.11) and a *Crew Productivity Report* from PVM for the year to date. On the *Statistics Report,* foresters should review the percentage of removals, the type of removals, the amount of nonproductive time and other factors that affect a tree crew's productivity and quality. The *Crew Productivity Report* compares the subject crew's data with the average productivity of crews working in similar areas. It enables crew members to compare their performance against that of their peers.

While productivity data is objective, valid comparisons involve subjective judgment because specific work types are different from one another. For example, a climb crew's production results will invariably be lower than those of lift crews, ticket work will be worse than cycle work, and one cycle crew working in a vegetation-dense area will have different production from crews working in urban areas. Nevertheless, 70% of PacifiCorp's contractor performance formula is based on productivity; so, audits should stress productivity's importance to program success.

4.3.2.2 Professionalism

Since vegetation management has more interaction with PacifiCorp customers than any other department, it is vitally important for tree crews to exhibit professionalism. Foresters should comment on factors such as ISA Certification, appearance, and other considerations.

4.3.2.3 Equipment

The condition of equipment relates to professionalism and productivity. Well cared for equipment and organized tool boxes are not only a positive reflection on the crew, but they also make work safer and more efficient. Foresters should comment on the appearance and functionally of equipment and organization of the bins.

4.3.2.4 Safety

Safety should be evaluated by the supervisor/GF. However, if a forester observes unreasonable safety risks or obvious safety violations (such as someone failing to wear personal protective equipment), he/she should relate their concerns to the crew, and inform that crew's GF/supervisor so that he or she may correct the situation. All crew members should know the safety requirements applicable to their positions and take responsibility for following those requirements.

4.3.2.5 Crew Efficiency

Reviewing work systematically from the first to last tree worked allows foresters and supervisors/GF to gain an

Figure 4.9. Herbicide Audit Form.

Herbicide Crew Audit Form

CREW FOREMAN: _____ **Crew #** _____ **DATE:** _____

CREW/CONTRACTOR: **WEEK OF WORK AUDITED:** _____

DISTRICT: **QUARTER:**

	SCORE	WEIGHT	%FACTOR
QUALITY: # Stumps reported: _____ #Stumps treated properly: _____	100%	0.33	33%
Ft² brush/Acres: _____ Ft² brush/Acres treated properly: _____			
COMMENTS:			
COUNT: # Trees deciduous stumps: _____ # Deciduous stumps treated verified: _____	100%	0.33	33%
FT² saplings/Acres recorded: _____ Ft² saplings/Acres treated verified: _____			
COMMENTS:			
HERBICIDE: Pesticide Applicators Lic. # _____ Label & MSDS Sheets (Y/N) , _____	100%	0.33	33%
# Stumps/Acres reported _____ # Stumps acres verified _____			
Material, Tools & Knowledge: Herbicide appliation looked good			
AVERAGE RATING: Of all categories (0 to 100% adherence)	**TOTALS:**		*100%*
Specification Manual (yes/no) _____			
PRODUCTION:			

impression of job planning, which is a reflection of crew efficiency. Foresters should share their impression of crew efficiency and also comment on methodology, clean up and chip disposal. Inefficient work organization may be the responsibility of the contract utility forester who originally lined-out the work. Trends in disorganization may require contract utility forester counseling.

4.3.2.6 Crew Composition

Foresters will note the number of crew members and equipment type on the crew being audited. The field notes will be compared to an itemized invoice for accuracy. Foresters should also note the week ending date to help access the proper invoice. Results should be reported monthly on the invoice audit.

4.3.2.7 Customer Surveys

Foresters should compare surveys distributed against the occupied buildings along the audit. The score will be based on the number of surveys distributed against the number that ought to have been distributed. It will not count toward the overall audit score.

4.4 Herbicide Crew Audit

The primary purpose of the herbicide crew audit is quality control. Audits should evaluate one full week of herbicide crew work. Each audit should have the forester, the crew's GF/supervisor and the crew leader in the field together observing completed work. Audits should begin with the first area treated, and progress in order to the last area worked during the week. Over the course of the audit, the forester, supervisor/GF and crew leader should open a dialog regarding the week's results.

Moreover, audits should provide the herbicide crew leader with feedback on production, professionalism, equipment, safety and crew efficiency. Results shall be documented on an *Herbicide Crew Audit Report* (Figure 4.9).

4.4.1 Objective Components

Objective audit components shall be determined on the straight percentage of trees that meet expectations compared to the total trees reported in each category. The percent score shall be averaged for the final rating.

4.4.1.1 Quality

The quality section examines proper square footage of brush treated following specifications described in Chapter 7. Calculate the score by using percentages of proper brush or acres treated against the total number reported.

4.4.1.2 Count

To complete the *Count* section, the square feet of brush or acres treated against which should have been sprayed.

4.4.1.3 Herbicide

Foresters should apply penalties for violations of herbicide policy. Penalties include a 100% category deduction for cases where the crew leader or applicator did not hold a valid applicator’s license (California excepted). The crew may be shut down until the crew leader or applicator are properly credentialed. Further penalties include a 10% penalty for crew leaders or applicators that have valid applicator's licenses, but do not have it on site, and a 10% penalty for each required pesticide document that is missing (SDS and labels, for example [Table 4.1]).

Failing to report treated trees is a violation of law, in addition to not providing PacifiCorp with accurate information. Examples of trees and brush that do not

require treatment include conifers that do not sprout from the stump (pines, firs, spruces, cedars and others), and stumps located in areas where herbicide use is prohibited (certain Federal jurisdictions, municipal watersheds and private property where the owner objects to herbicide use). Foresters should also comment on material, proper tools and crew knowledge.

4.4.2 Subjective Components

While not included in the final audit score, subjective factors such as productivity, professionalism, equipment and safety are also critical to program success. The audit process allows the forester to comment on these items.
Failing to report herbicide treatment or not having a licensed applicator on the crew is a violation of the law.

4.4.2.1 Professionalism

Same instructions as 4.3.2.2

4.4.2.2 Equipment

Same instructions as 4.3.2.3

4.4.2.3 Safety

Same instructions as 4.3.2.4

4.4.2.4 Crew Efficiency

Same instructions as 4.3.2.5

4.4.2.5 Crew Composition

Same instructions as 4.3.2.6

4.4.2.6 Customer Surveys

Same instructions as 4.3.2.7

4.5 Worksite Inspection

PacifiCorp has a *Worksite Inspection Form* (Figure 4.10), which is designed to check tree crew safety. Foresters are required to perform a number of worksite inspections as specified in their annual goals. Foresters may use the form during crew visits. The form provides a general review, as well as tailboard, bucket or climb setup, vehicle, herbicide and other safety provisions.

4.6 PVM

PacifiCorp Vegetation Management (PVM) is a PacifiCorp intranet-based program available at: http://pdxappw51vp.pacificorp.us:8080/BOE/BI?startFolder=AVPSDml489dAlLbJ3JVVZzE&isCat=false. The databse organizes data downloaded from the *Weekly Report* (Figure 4.4). PVM offers a variety of reports, such as the *Statistics Report* (Figure 4.11), which enable program analysis.

The statistics reports are designed to be flexible. They allow data examination on a program level (it contains data since 1996 for Pacific Power, for example), down to a crew level for a specific week of work. They also provide cost and man-hours per tree, the percentage of various work types (tree removals, the size of trees removed, the number of side pruned trees, crown reduction and others), the percentage of time spent on travel, flagging, cleanup and other activities.

Other PVM reports compare the productivity of individual crews, or breakdown production by district, state, and work code. The reports provide objective information upon which foresters and supervisors/GFs can make sound management decisions based on objective information.

4.7 Monthly Reports

Vegetation management has monthly reports tracking distribution cycle and

Figure 4.10. Vegetation Management Worksite Inspection Form.

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

VEG. MANAGEMENT WORKSITE INSPECTION FORM

Employee Name(s)

Feeder/Grid #

District

Inspection Date

0
Crew Leader

Work Location (Address or GPS)

Required? Yes	Required? No	General	In Use? Yes	In Use? No
☐	☐	Hard Hat	☐	☐
☐	☐	Safety Glasses/Face Shield	☐	☐
☐	☐	Hearing Protection	☐	☐
☐	☐	Hand Protection	☐	☐
☐	☐	Chaps	☐	☐
☐	☐	Appropriate Footwear	☐	☐
☐	☐	Safety Vest	☐	☐
☐	☐	Job-site Housekeeping	☐	☐
☐	☐	Proper Clothing	☐	☐
☐	☐	Whistle	☐	☐
☐	☐	Communication	☐	☐
☐	☐	First Aid Kit	☐	☐
☐	☐	Fire Extinguisher	☐	☐
☐	☐	Backpack Water Fire Sprayer	☐	☐
☐	☐	Shovel and Pulaski	☐	☐
☐	☐	Fire Wagon	☐	☐
☐	☐	Dispatch Notified	☐	☐
☐	☐	Seasonal Tools	☐	☐

Required? Yes	Required? No	Bucket Work	In Use? Yes	In Use? No
☐	☐	Bucket Lanyard/Harness	☐	☐
☐	☐	Minimum Separation	☐	☐
☐	☐	Wheel Chocks in Place	☐	☐
☐	☐	Clearance Over Roadway	☐	☐
☐	☐	Outrigger Placement	☐	☐
☐	☐	Hydraulic Saw Use/Storage	☐	☐
☐	☐	Chain Saw Use/Storage	☐	☐
		Climb Work		
☐	☐	Pre-Climb Inspection	☐	☐
☐	☐	Saddle	☐	☐
☐	☐	Rope	☐	☐
☐	☐	Lanyard	☐	☐
☐	☐	2-point Attachment	☐	☐
☐	☐	Proper Tie-in Position	☐	☐
☐	☐	Figure 8 knot	☐	☐
☐	☐	Carabineers/Snaps	☐	☐
☐	☐	Minimum Separation	☐	☐
☐	☐	Ladder Use/Placement	☐	☐
☐	☐	Pole Pruners Hung Safely?	☐	☐

Required? Yes	Required? No	Tailboard	In Use? Yes	In Use? No
☐	☐	Electric Hazard	☐	☐
☐	☐	Traffic	☐	☐
☐	☐	Parked Vehicles	☐	☐
☐	☐	Structures	☐	☐
☐	☐	Fences	☐	☐
☐	☐	Pets/Livestock	☐	☐
☐	☐	Trip Hazards	☐	☐
☐	☐	Slope	☐	☐
☐	☐	Public/Property Owner Access	☐	☐
☐	☐	Yard Ornaments	☐	☐
☐	☐	Other	☐	☐

Required? Yes	Required? No	Vehicle	In Use? Yes	In Use? No
☐	☐	Wheels Chocked	☐	☐
☐	☐	Positioning and Set-up	☐	☐
☐	☐	Loads Secure	☐	☐
☐	☐	Emergency Brake	☐	☐
☐	☐	Conned off	☐	☐
☐	☐	Signage	☐	☐
☐	☐	Chipper Use	☐	☐
☐	☐	Seatbelt Use	☐	☐

Herbicide

Required? Yes	Required? No		In Use? Yes	In Use? No
☐	☐	Labels	☐	☐
☐	☐	MSDS	☐	☐
☐	☐	Containers Labeled	☐	☐
☐	☐	Sprayers Labeled	☐	☐

Required? Yes	Required? No		In Use? Yes	In Use? No
☐	☐	Rubber Gloves	☐	☐
☐	☐	Proper Application	☐	☐
☐	☐	Wetland Product	☐	☐
☐	☐	Current Applicator's Lisc.	☐	☐

COMMENTS: _____

CREW LEADER:

FORESTER: _____

interim progress, distribution spray progress, tree crew deployment, cycle progress, California Pole Clearing and transmission progress reports. These reports can be found at the PacifiCorp T&D Support Services Website: http://idoc.pacificorp.us/pacificorp_organization/rmp/rmpto/rtss/vm.html. A description of three prominent reports follows.

4.7.1 Distribution Progress Report

The distribution progress report (Figure 4.12) accounts for line miles achieved on systematic distribution work compared to goals for a given year. Systematic distribution work is cycle work throughout the six state service territory, as well as interim work in the Pacific Power service territory. The goal is the recommended scheduled miles prorated by the week of the year.

The report provides a summary of line miles achieved, breaks down progress by Pacific Power and Rocky Mountain Power's service territory, includes monthly miles ahead or behind goals, a chart depicting monthly line mile progress, and progress in each state by district and where appropriate, by forester.

4.7.2 Distribution Cycle Progress Report.

The distribution cycle report records line miles achieved over the course of the current recommended cycle compared to goals (Figure 4.13). Goals are prorated monthly and compared to actual progress.

4.7.3 Tree Crew Deployment Report

The tree crew deployment report (Figure 4.14) lists tree crews, contract utility foresters and supervisors/general foremen by forester and district as of the first of each month. In addition to providing information on tree crew locations, the tree crew deployment is used for budget projections.

4.7.4 Invoice Audit Report

Foresters will compare invoices to crew composition information obtained during the crew audits (see sections 4.3.2.6 and 4.4.2.5). Each month, results will be submitted to the director of vegetation management and senior business specialist on the Invoice Audit Report (Figure 4.15). The senior business specialist will ensure discrepancies are reconciled with the appropriate contractor.

Figure 4.11. A sample PVM Statistics Report showing distribution cycle data for Oregon 2010.

PacifiCorp Vegetation Management

Data Updated on 6/13/11 15:10:25 PM

Statistics Report

FISCAL YEAR: 2011

WORK ENDING: 01/03/2010 TO 01/01/2011 INVOICE

COMPANY NAME CREW CODE

STATE OR CREW TYPE

DISTRICT CODE DST

PROJECT WORK ID

SUPERVISOR FOREMAN

FORESTER

TRIM TOTAL	% SIDE TRIMS	%CROWN REDUCTION TRIMS	%OVERHANG TRIMS	SEC/SERV TRIMS	# BRUSH TRIMS	
103,658	44.99	41.95	1.90	4,563.00	70,109	
REMOVALS TOTALS	%TREE REMOVALS	#BRUSH FT REMOVED	% BRUSH FEET REMOVED	% 4 - 11 REMOVED	% 12 - 23 REMOVED	% 24+ REMOVED
90,956	46.74	772,283	84.91	12.56	2.02	0.51
TOTAL TREESBRUSH	#STUMP APPLICATIONS	#ACRES SPRAYED	#ACRES CLEARED	#TGR APPLICATIONS		
194,614	6,098	0	0	668		
	#STUMP GROUND	#POLES CLEARED	#POLES TREATED			
	6	15	0			
TOTAL MANHOURS	%TRAVEL./ MISC MANHOURS	%INSPECT/ NOTIFY MANHOURS	%TRAFFIC/ FLAGGING MANHOURS	%CHIP/ CLEANUP MANHOURS		
147,737	7.66	13.09	9.73	41.35		
%TRIM MANHOURS	%REMOVAL MANHOURS	%TGR MANHOURS	%POLE CLEARING MANHOURS	%ROW CLEARING MANHOURS	% SPRAYING MANHOURS	%STUMP TREAT MANHOURS
22.42	3.64	0.17	0.00	0.00	0.00	0.28
TOTAL COST	TOTAL $/TREE	TRIMMING $/TRIM	REMOVAL $/REMV			
$7,797,560	$40.07	$63.34	$11.73			
TOTAL MH/TREE	TRIMMING MH/TRIM	REMOVAL MH/REMV	TRIM MH/10FT2 SAPPRUN	REMV MH/ 10FT2 SAPREM		
0.76	1.20	0.22	0.06	0.03		

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Figure 4.12 Monthly Distribution Progress Report

PACIFICORP VEGETATION MANAGEMENT 2011 DISTRIBUTION PROGRESS REPORT

Summary

Through Dec 3, 2011

	CYCLE WORK					INTERIM WORK			
	Total Line Miles	Total Miles Scheduled	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)	Total Miles Scheduled	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)
	43,047	**12,182**	**10,058**	**11,244**	**-1,186**	**4,908**	**4,001**	**4,530**	**-529**
State									
California	2,323	581	569	536	33	581	457	536	-79
Idaho	4,358	1,453	1,135	1,341	-206	0	0	0	0
Oregon	14,184	3,655	2,111	3,373	-1,263	3,438	2,675	3,173	-498
Utah	11,377	3,792	3,528	3,501	27	0	0	0	0
Washington	3,557	889	591	821	-230	889	870	821	49
Wyoming	7,248	1,812	2,125	1,673	452	0	0	0	0
Total	43,047	12,182	10,058	11,244	-1,186	4,908	4,001	4,530	-529

SUMMARY OF SYSTEMATIC WORK* BY FORESTER

	Total Line Miles	Total Miles Scheduled	*Line Miles Completed	*Line Mile Completed Goal	Miles Ahead/(Behind)
	43,047	**16,200**	**14,059**	**15,774**	**-1,715**
Forester		*	*	*	*
Hooley	2,830	1,415	868	1,306	-438
Evans	6,030	2,010	1,690	1,855	-166
Jones	2,351	784	931	723	208
Partridge	3,919	1,960	1,135	1,809	-674
Phillips	5,823	2,912	2,368	2,688	-320
Vanderhoof	14,602	4,263	4,167	3,935	232
Armstrong	7,492	2,857	2,900	3,458	-558
Total	43,047	16,200	14,059	15,774	-1,715

*Combines cycle and interim work.

Weeks 48

Figure 4.13. Cycle Progress Report.

PACIFICORP VEGETATION MANAGEMENT 2011 CYCLE DISTRIBUTION PROGRESS REPORT

Pacific Power - Rocky Mountain Power

Through December 3, 2011

	CYCLE WORK				INTERIM WORK			COMBINED		
	Total Line Miles	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)
	43,047	**20,653**	**23,826**	**-3,173**	**14,840**	**16,887**	**-2,047**	**35,493**	**40,713**	**-5,220**
Pacific										0
California	2,323	1,529	1,698	-169	1,602	1,698	-96	3,131	3,395	-264
Oregon	14,184	11,043	13,905	-2,862	11,661	13,480	-1,819	22,704	27,385	-4,681
Washington	3,557	1,293	1,710	-417	1,577	1,710	-133	2,870	3,420	-550
Total	**20,064**	**13,865**	**17,312**	**-3,447**	**14,840**	**16,887**	**-2,047**	**28,705**	**34,200**	**-5,494**
Rocky Mt										
Idaho	4,358	1,135	1,341	-206			0	1,135	1,341	-206
Utah	11,377	3,528	3,500	28			0	3,528	3,500	28
Wyoming	7,248	2,125	1,672	453			0	2,125	1,672	453
Total	**22,983**	**6,788**	**6,514**	**274**	**0**	**0**	**0**	**6,788**	**6,514**	**274**

SUMMARY OF SYSTEMATIC WORK* BY FORESTER					INTERIM WORK			COMBINED		
	Total Line Miles	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)
	43,047	**20,653**	**23,826**	**-3,173**	**14,840**	**16,887**	**-2,047**	**35,493**	**40,713**	**-5,220**
Forester/Pacific		*	*	*						
Hooley	2,830	1,578	2,776	-1,197	2,362	2,776	-414	3,940	5,551	-1,611
Partridge	3,919	2,861	3,770	-909	2808	3770	-962	5,669	7,541	-1,871
Phillips	5,823	4,655	5,203	-548	4,742	5,203	-461	9,397	10,407	-1,010
Armstrong	7,492	4,771	5,563	-792	4,928	5,138	-210	9,699	10,701	-1,002
Total	**20,064**	**13,865**	**17,312**	**-3,447**	**14,840**	**16,887**	**-2,047**	**28,705**	**34,200**	**-5,494**
Forester/Rocky Mt										
Evans	6,030	1,690	1,855	-166			0			0
Jones	2,351	931	723	208			0			0
Vanderhoof	14,602	4,167	3,935	232			0			0
Total	**22,983**	**6,788**	**6,514**	**274**	**0**	**0**	**0**	**0**		**0**

Figure 4.14. Monthly Tree Crew Deployment Report.

PacifiCorp Vegetation Management

Monthly Crew Report: Summary

Date: 12/1/2011

State	Distribution & Local Trans													Main Grid Trans							Total Crews
	2 Man Lift	3 Man Lift	3 Man Climb	4 Man Climb	3 Man Skidder	2 Man Mow	2 Man Slash	2 Man Pole Clear	1 Man Chem	2 Man Flagger	For. Tech	Billed Super	Sub Total	3 Man Climb	3 Man Skidder	2 Man Slash	2 Man Pole Clear	1 Man Chem	Forest Tech	Sub Total	
California	5.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	3.0	2.75	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
Idaho	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.00	5.0	1.0	0.0	0.0	0.0	0.0	0.3	1.0	6.0
Oregon	30.0	12.0	6.0	0.0	0.0	0.0	0.0	0.0	0.5	6.5	12.5	8.25	55.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	57.0
Utah	27.0	2.0	38.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	13.0	10.50	73.0	4.0	0.0	0.0	0.0	0.0	2.0	4.0	77.0
Washington	5.0	1.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	1.5	2.00	10.0	2.0	0.0	0.0	0.0	0.0	0.5	2.0	12.0
Wyoming	5.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.50	8.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	8.0
TOTAL	77	17.0	49.0	0.0	0	0	0	2	13	8.5	32.3	26.00	166.0	9.0	0.0	0.0	0.0	0.0	3.3	9.0	175.0

Forester	Distribution & Local Trans													Main Grid Trans							Total Crews
	2 Man Lift	3 Man Lift	3 Man Climb	4 Man Climb	3 Man Skidder	2 Man Mow	2 Man Slash	2 Man Pole Clear	1 Man Chem	2 Man Flagger	For. Tech.	Billed Super	Crew Sub-Total	3 Man Climb	3 Man Skidder	2 Man Slash	2 Man Pole Clear	1 Man Chem	Forest Tech	Sub Total	
Hooley	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.0	2.00	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5
Evans	9.0	1.0	8.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	6.0	3.00	20.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	22.0
Jones	11.0	1.0	20.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	5.0	4.00	35.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	35.0
Partridge	12.0	7.0	5.0	0.0	0.0	0.0	0.0	0.0	2.5	3.0	5.5	3.50	29.5	2.0	0.0	0.0	0.0	0.0	0.0	2.0	31.5
Phillips	15.0	1.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	1.0	7.0	5.00	25.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	25.0
Vanderhoof	17.0	1.0	12.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	4.3	6.00	31.0	3.0	0.0	0.0	0.0	0.0	1.8	3.0	34.0
Armstrong	8.0	1.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0	2.5	2.50	14.0	2.0	0.0	0.0	0.0	0.0	0.5	2.0	16.0
TOTAL	77.0	17.0	49.0	0.0	0.0	0.0	0.0	2.0	12.5	8.5	32.3	26.00	166.0	9.0	0.0	0.0	0.0	0.0	4.3	9.0	175.0

Figure 4.15. Monthly Invoice Audit Form.

PACIFICORP VEGETATION MANAGEMENT 2013 INVOICE AUDIT REPORT

Through Aug 31, 2013

Forester: T Jones **Month:** Aug-13

Week Ending Work	Invoice #	Feeder/ GRID/Trans Line	Crew Name	Crew Member Composition	Equipment	Invoice Matched ? (Y or N)	Nature of Discreptency, if Any	Cost Discreptency (±)
8/3/2013	3300	SW5/SW7	John Doe	2A	Self feeder-Disc	Y		
8/3/2013	2300	SW5	Jane Doe	3C	Split,BYL & Disc	Y		
8/3/2013	67300	WEAPONS	Ed Doe	2A	Squirtboom-Drum	Y		
8/3/2013	4300	SW5	Dorthy Doe	2A	60/70, Drum	Y		
8/3/2013	6300	SW5	Fred Doe	3C	Drum	N	Fred off on Friday 8hrs/Marcia fill-in foreperson 8hrs	$331.04
8/10/2013	36300	SE4	Rachel Doe	2A	(Squirt Boom) Drum	Y		
8/10/2013	37300	SE4/SE5	Earnest Doe	3C	Self feeder-Disc	Y		
8/10/2013	N/A	MET067011	Camen Doe	3C	Self feeder-Disc	N/A	No invoice provided from contractor?	
Total:								$331.04

PACIFICORP VEGETATION MANAGEMENT 2013 INVOICE AUDIT REPORT

Through Aug 31, 2013

Forester: T Jones **Month:** Aug-13

Week Ending Work	Invoice #	Feeder/ GRID/Trans Line	Crew Name	Crew Member Composition	Equipment	Invoice Matched ? (Y or N)	Nature of Discreptency, if Any	Cost Discreptency (±)
8/3/2013	3300	SW5/SW7	John Doe	2A	Self feeder-Disc	Y		
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8/3/2013	67300	WEAPONS	Ed Doe	2A	Squirtboom-Drum	Y		
8/3/2013	4300	SW5	Dorthy Doe	2A	60/70, Drum	Y		
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8/10/2013	37300	SE4/SE5	Earnest Doe	3C	Self feeder-Disc	Y		
8/10/2013	N/A	MET067011	Camen Doe	3C	Self feeder-Disc	N/A	No invoice provided from contractor?	
Total:								$331.04

5. DISTRIBUTION

Distribution lines are overhead facilities that are energized less than 46 kV. Distribution primary voltage ranges from 600 to 45,000 volts, while lines energized below 600 volts are secondary.

5.1 Distribution New Construction Clearing

Every effort should be made by the Company not to build new line over or through trees that will need to be cleared from the facilities in the future. New distribution rights-of-way should be cleared to specification before the lines are energized. Initial clearing is important because it sets a pattern for future work.

5.2 Distribution Cycle Maintenance

Trees and vegetation should be cleared from distribution facilities on scheduled cycles. Cycle work is methodical, and facilities shall be worked systematically, either by feeder or grid map. Cycles should be based on considerations such as the time elapsed since the last scheduled work, the type of facilities, tree conditions, the number of customer complaints, the growth rate and density of predominant tree species, geography, the frequency of tree-caused outages, customer count, the existence of important accounts (hospitals, factories, mines or other facilities) customer densities, single or multiple phase wires and other factors. Trees and vegetation should be cleared from distribution facilities to last until the next scheduled cycle work.

SPECIFICATIONS

The intent of the cycle program is to:

- Systematically obtain specification clearance and maintain compliance with state regulatory rules, laws or regulations.
- Reduce inventories of trees that could potentially grow into Company facilities. This includes removing non-landscape trees 6-inch DBH or less, after providing the property owner notification (following Section 8.2).
- Improve access to facilities.
- Identify and correct readily climbable trees.
- Identify and remove tree houses built inside of criteria specified in Table 2.2.
- Clear insulated services that have stems causing strain to the point of deflection (Figure 5.1) or that are abrading the insulation to the extent they could cause an outage before the next scheduled cycle. If pruning or removal is not practical, arrangements should be made with operations to re-route facilities or have suitable material or devices installed to avoid insulation damage by abrasion.
- Prune non-insulated services and streetlight wire for one-foot of clearance.
- Prune pole to pole insulated secondaries to 2-feet of clearance from the conductors
- Prune pole to pole non-insulated services. and secondaries for three feet of clearance from the conductors
- Identify and remove high risk trees that could fall through facilities.
- Apply herbicide to saplings (< 4” DBH) of tall-growing species after property owner notification (presuming the property owner has not expressed objection to herbicide application) on the property on which other work is being performed. Spray work in other locations may be authorized at foresters discretion as directed in a work release.

- Apply tree growth regulators (TGR's) to fast-growing tree species after providing property owner notification.

5.3 Distribution Interim Maintenance

Interim work is a cycle performed half way between cycles to address fast-growing trees that will not hold for an entire cycle.On PacifiCorp's system, interim work should be prescribed in California and Oregon. Identified tree conditions on a feeder or grid should be corrected systematically in the interim half way through the scheduled cycle. Work should be limited to trees that grow six feet or more a year or hazard trees.

Interim work should be restricted to critical conditions, including:

- High risk trees.
- Trees violating specific state regulatory agency regulations.
- Trees that have grown within work thresholds specified in Table 5.2.
- Readily climbable trees inside of work thresholds in Table 5.2
- Identifying and removing tree houses built inside of criteria specified in Table 2.2.
- All work should be completed to company specifications. Non-critical conditions should be monitored until the next scheduled cycle work.
- Non-primary facilities do not require work on interim cycles unless they present a clear safety or service reliability risk.

5.4 Distribution Ticket Maintenance

Customers, district operations staff, governmental bodies, regulatory agencies or others alert vegetation management to real or perceived conflicts between trees and power lines from time to time. The intent of ticket maintenance is to determine whether or not the reported conditions present immediate, unreasonable safety or electrical service risks, and if they do, correct them.

Emergency situations should be corrected within 24 hours. Critical conditions reported by regulatory agencies and other urgent situations should be inspected within 48 hours and corrected within 7 days. Other tickets should be inspected within 10 business days from the date of request, and a determination made regarding whether or not the reported condition warrants work.

The concerned party shall be contacted regarding the inspection determination. This contact may be face to face if the customer is present, or by door hanger, letter, or telephone if they are not present.

Ticket work should be limited to critical conditions, including:

- Trees representing an unreasonable safety risk as determined by the responsible contract utility forester.
- Trees that have caused an outage.
- Trees violating specific state regulatory regulations.
- Limbs that are deflecting secondary conductors to the extent they present a high probability of tearing down the wire before the next scheduled cycle work.
- Trees that are likely to start a fire.
- Readily climbable trees.
- Trees where the property owner requires clearance so non-utility line clearance workers may work the tree. This work complies with various state line safety act and may be billed to the requesting party.

All work should be completed to Company specifications. Non-critical conditions should be monitored and corrected on the next scheduled maintenance work.

5.5 Distribution Herbicide Maintenance

Distribution herbicide maintenance should be prescribed in the interim between cycles. Saplings (< 4" DBH) of tall-growing species after property owner notification (presuming the property owner has not expressed objection to herbicide application). Procedures outlined in Chapter 7 shall be followed.

5.6 Distribution Clearance Specifications

Removal of trees that could potentially grow into distribution facilities should be pursued. When trees are pruned, branches should be cut to natural targets rather than predetermined clearance limits (following section 3.3). Consequently, the clearances in these standard operating procedures should not be used as strict boundaries requiring cuts at the precise distances indicated. Rather, they are guidelines to use in obtaining proper clearances. Accurate natural target pruning is the overriding principal, with tree structure dictating appropriate cut locations. In many cases, the best targets are outside established clearance limits. So, many properly pruned trees will have more than specified clearance from conductors.

The type of facility, tree growth rate and perscription determine distribution clearance. Trees should be removed or pruned to provide for specification clearances as described in Figures 5.2, 5.3 and 5.4 and tables 5.1, 5.2 and 5.3. The figures and table provide work thresholds and specification clearances for slow, medium and fast-growing trees. Trees that exceed work threshold distances should hold until the next scheduled cycle and not need to be pruned. However, these trees should still be considered to be removal candidates if they could grow into distribution facilities or they present a high risk of failure. <u>If trees violate thresholds, they shall be removed or pruned to provide specification clearances</u>.

5.6.1 Growth Rate Definitions

Slow-growing trees grow vertically less than one-foot a year. Moderate growing trees grow between one and three feet a year and fast-growing trees grow more than three feet a year.

5.6.2 Side Clearance

Side work thresholds and side clearances from conductors can be found in Tables 5.1, 5.2 and 5.3, as well as Figures 5.2 to 5.4.

Side clearances from conductors may be reduced to 18-inches for structurally sound limbs greater than 6-inches in diameter at wire height, provided the tree is not readily climbable and the tree shows no evidence of conductor contact due to wire or tree sway. High risk trees should be removed or pruned to reduce the potential threat they pose.

5.6.3 Under Clearance

Under clearances work thresholds and clearances from conductors can be found in Tables 5.1 and 5.2, as well as Figures 5.2 to 5.4.

5.6.4 Overhang Clearance

Trees overhanging primary conductors should be removed or pruned to provide at least ten feet of clearance from the conductors (Figures 5.2, 5.3 and 5.4). Increased clearance should be considered by the forester or GF/supervisor under the following types of circumstances: three-phase lines (particularly to the first protective device), rural or difficult to access areas, for weak-

wooded or fast-growing tree species, on poorly-structured trees and to accommodate foreseeable weather conditions such as frequent high wind, heavy rains, ice and snow. Dead wood that could fall or be blown into the primary conductors shall be removed. In some cases, such as three phase lines or remote areas, all overhanging branches may be removed. Overhang may be tapered, with the greatest side clearance at minimum clearance height, with gradually more overhang higher in the tree.

Figure 5.1. Trees with branches applying sufficient pressure to cause damage to insulated service and street light lines should be pruned on cycle to relieve the pressure.

Figure 5.2 Vegetation Management Distribution Primary Clearnances – Slow Growing Trees

Figure 5.2. PacifiCorp Vegetation Management Distribution Primary Clearances

Slow Growing Trees

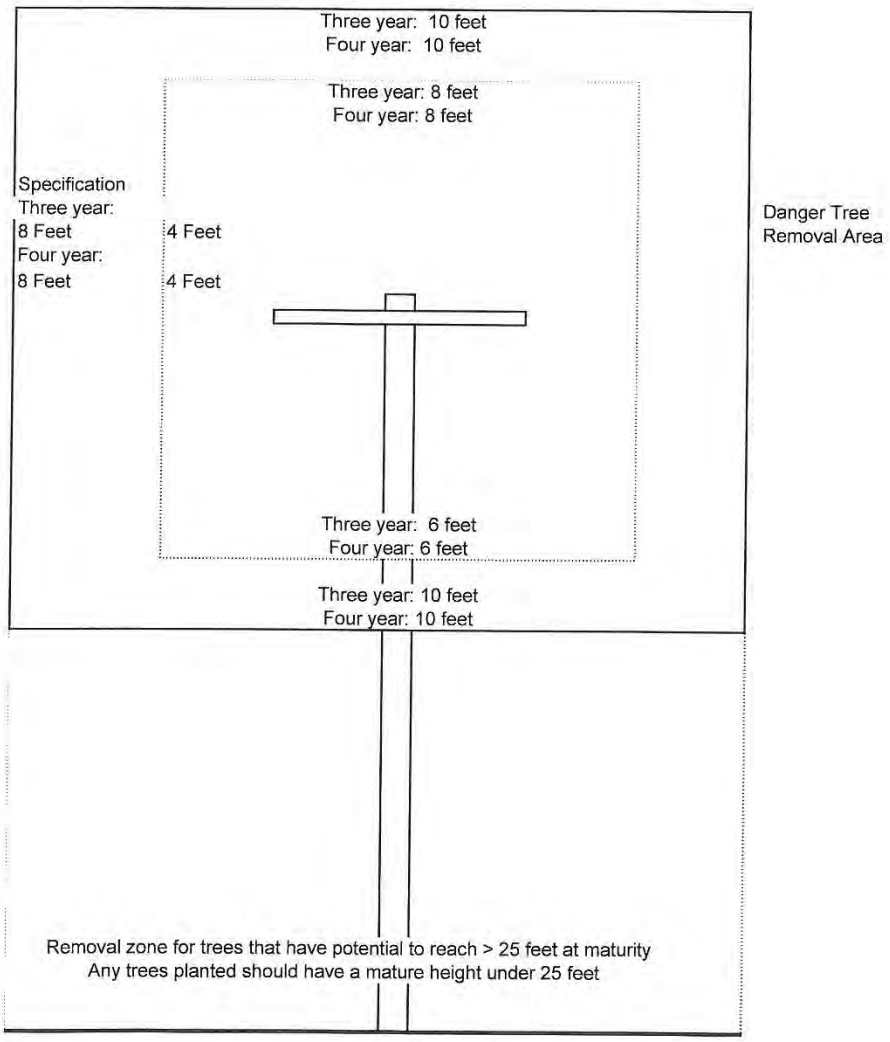


Figure 5.3 Vegetation Management Distribution Primary Clearnances – Moderate Growing Trees

Figure 5.3. PacifiCorp Vegetation Management Distribution Primary Clearances

Moderate Growing Trees

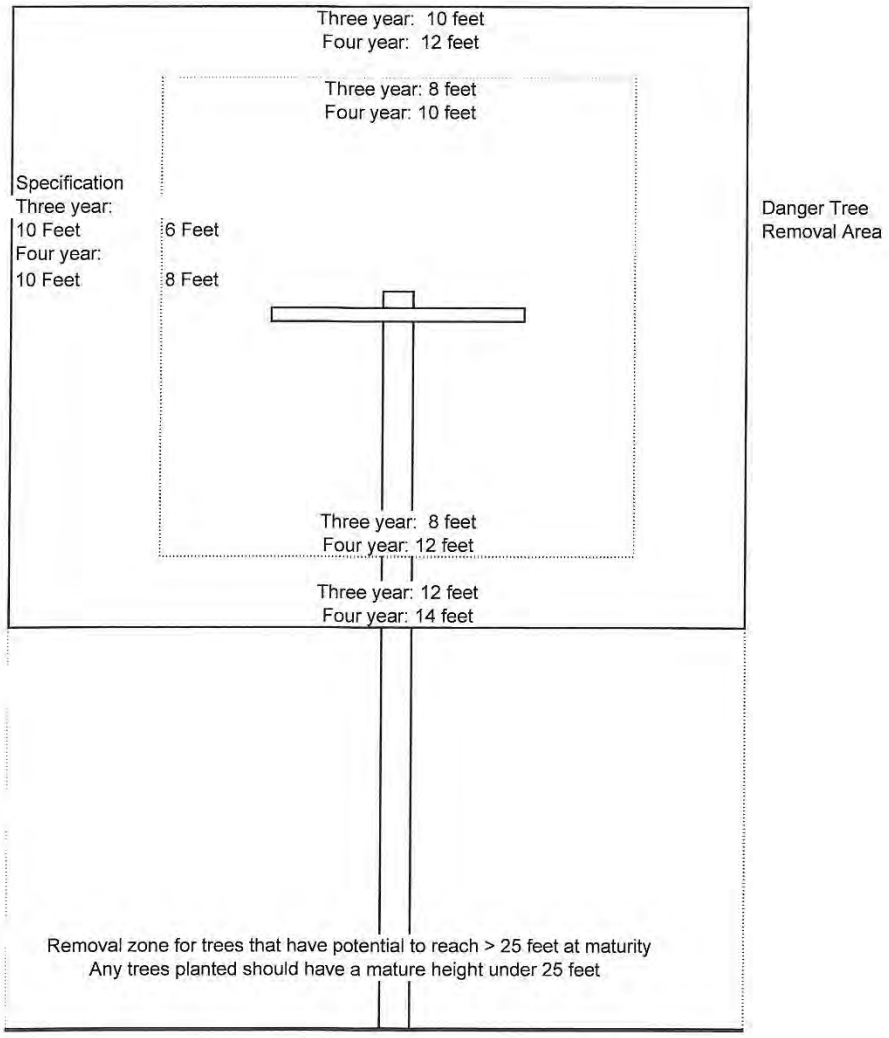


Figure 5.4 Vegetation Management Distribution Primary Clearnances – Fast Growing Trees

Figure 5.4. PacifiCorp Vegetation Management Distribution Primary Clearances

Fast Growing Trees

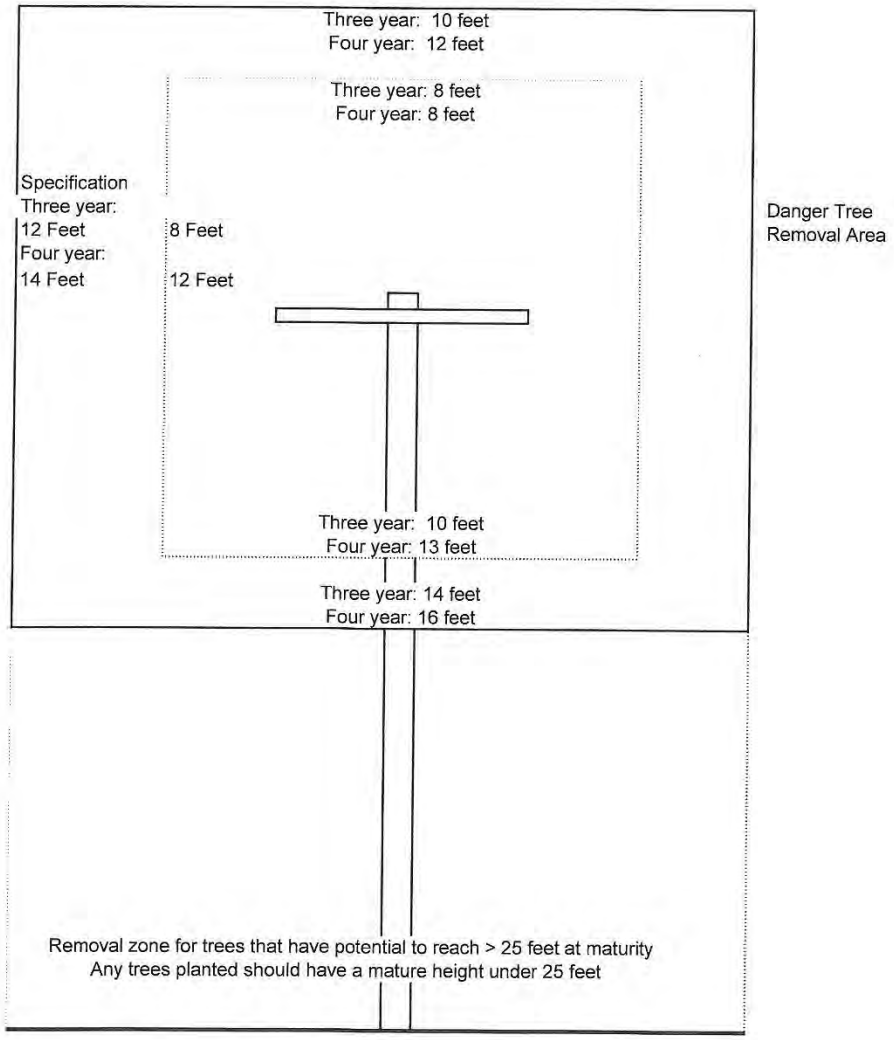


Table 5.1. Distribution primary cycle clearances.

	Slow-Growing < 1 foot/year		Moderate-growing 1-3 feet/year		Fast-growing > 3-feet/year*	
	Work Threshold	***Specification Clearance***	***Work Threshold***	***Specification Clearance***	***Work Threshold***	***Specification Clearance***
Three-year cycle						
Side Clearance	4 feet	8 feet	6 feet	10 feet	8 feet	12 feet
Under Clearance	6 feet	10 feet	8 feet	12 feet	10 feet	14 feet
Overhang Clearance	8 feet	10 feet	8 feet	10 feet	8 feet	10 feet
Four-year cycle						
Side Clearance	4 feet	8 feet	8 feet	10 feet	12 feet	14 feet
Under Clearance	6 feet	10 feet	12 feet	14 feet	13 feet	16 feet
Overhang Clearance	8 feet	10 feet	10 feet	12 feet	8 feet	12 feet

*Note: Specified clearance distances are assumed to be from conductors, Growth-rate definitions refer to vertical growth. Side and overhang growth toward the conductors are assumed to be slower. Specification clearances are minimum, and actual distances achieved at the time of work will often need to exceed those itemized above. Trees with clearances that exceed the pruning threshold should not require work, provided they will not interfere with the primary conductors or violate state tree clearance requirements before the next scheduled cycle work. Work thresholds may have to be expanded for fast-growing trees.

*Fast-growing work thresholds on four-year cycles assume interim work. Wyoming will require at least 25% greater clearances.

Table 5.2. Minimum Distribution primary interim clearances.

	Slow-Growing < 1 foot/year		Moderate-growing 1-3 feet/year		Fast-growing > 3-feet/year	
	Work Threshold	***Specification Clearance***	***Work Threshold***	***Specification Clearance***	***Work Threshold***	***Specification Clearance***
Four-year cycle						
Side Clearance	2 feet	8 feet	3 feet	10 feet	8 feet	14 feet
Under Clearance	2 feet	10 feet	5 feet	14 feet	9 feet	18 feet
Overhang Clearance	2 feet	10 feet	3 feet	10 feet	8feet	10 feet

Table 5.3. Non-primary wire cycle clearances.

Line Type	Work Threshold	Specification Clearance
Triplex service	Deflection/abrasion	Relieve pressure
Triplex pole-to-pole secondary/streetlight wire	Deflection/abrasion	2-feet
Non-insulated wire service/street light wire	Contact	1-foot
Non-insulated wire pole-to-pole secondary	Contact	3-feet
Neutral low position	Contact	2-feet
Neutral on cross arm	Primary as in Table 5.1	Primary as in Table 5.1
Guy wire	2-inch or greater diameter limb applying pressure, threatened by high risk trees	Relieve pressure or remove high risk trees.

5.6.5 Neutral and Insulated Pole-to-Pole Secondary Clearance

During cycle work, trees should be maintained to provide at least two-feet of clearance around insulated pole-to-pole secondary and neutral conductors (Table 5.3). Except trees that have already reached their maximum anticipated mature height. Tree limbs should not be allowed to remain between primary and neutral or insulated secondary conductors. Neutral conductors in a raised (primary) position should be provided secondary clearance distances during ticket or interim work, and primary specification clearance distances during cycle work.

5.6.6 Non-Insulated Open/Spaced Secondary Clearances

Trees growing around non-insulated open/spaced secondary conductors shall be pruned on cycle to provide a minimum of three-feet of clearance from the secondary wires (Table 5.2). During cycle work, trees shall be cleared from the space between primary and non-insulated open/spaced secondary conductors. Side clearances may be reduced to one foot for structurally sound limbs greater than 6-inches in diameter at wire height.

5.6.7 Insulated Service and Insulated Street Light Line Clearances

Stems that are causing strain to the point of deflection (Figure 5.1) or that are abrading the insulation to the extent they could cause an outage before the next scheduled cycle should be pruned to relieve the pressure (Table 5.2). If pruning or removal is not practical, arrangements should be made with operations to have the facility re-routed or have suitable

material or devices installed to avoid insulation damage by abrasion.

If the customer desires to remove other limbs or trees around these lines, they must arrange for a temporary disconnection to allow the desired work to be done safely. PacifiCorp does not clear trees for street light illumination, unless required to by specific language in a franchise agreement.

5.6.8 Non-insulated Service Line and Non-Insulated Street Light Line Clearances

Trees should be pruned on cycle to provide at least one-foot of clearance around non-insulated service and street light lines (Table 5.3). If the customer desires to remove other limbs or trees around these lines, contract utility foresters or crew leaders should inform the customer to call the customer service line to arrange for a temporary disconnection of the facilities to allow safe completion the desired tree work, as required by law.

5.6.9 Other Facility Clearances

5.6.9.1 Guy Wires.

Trees or branches two-inches or more in diameter applying direct pressure to or threatening to fall on or through
poles or guy wires shall be removed or pruned on cycle (Table 5.3).

5.6.9.2 Poles

One-third of the circumference around poles shall be cleared of vegetation to a distance of 5-feet to allow linemen a climbing path.

5.6.9.2.1 Vines

Vines shall be removed on cycle from poles and guys, cut at ground level, and treated with an approved herbicide (see Section 7.3). They shall be reported as brush or tree removed (if they are over 4" in dbh). Vines clearly part of a landscape and rooted well away from the pole may be pruned and reported as saplings pruned. Vines shall be pulled off the bottom 5-feet of poles after they have been cut. The facility point shall be documented by the tree crew and given to their supervisor/GF, who shall report it to operations to clear the remainder of the pole, and arrangements made with PacifiCorp journeymen linemen for the job.

5.6.9.3 Telecom and Private Electrical Lines

Trees should not be pruned or removed expressly to provide clearance for television cable, telephone lines or private electrical facilities unless authorized in advance by the appropriate forester.

5.6.9.4 Street Light Illumination

Trees shall not be pruned to improve street light illumination, unless required by specific language in a franchise agreement.

5.7 Pole Clearing

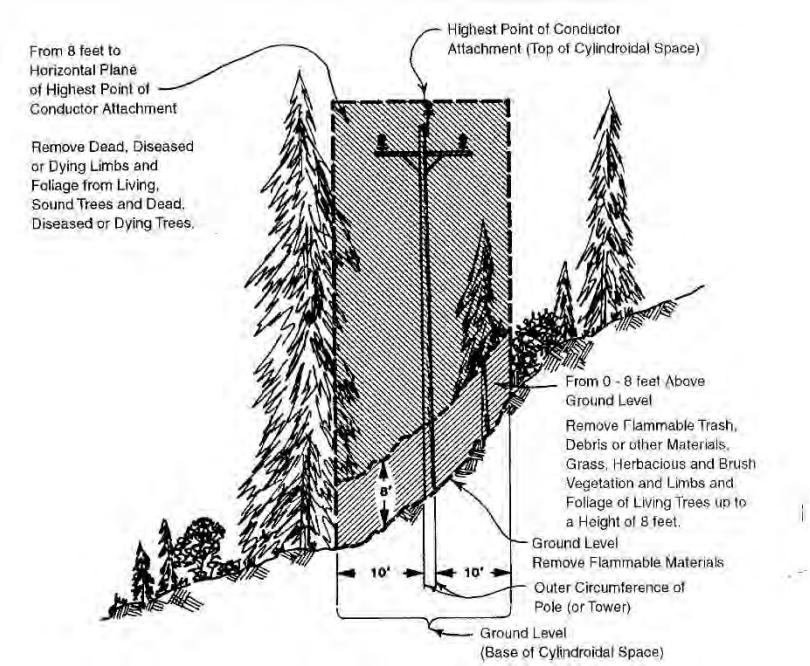
California Resource Code 4292, requires a ten-foot radius cylinder of clear space from pole top to bare ground around "subject" poles in delineated resource areas during designated fire season. Trees or saplings with trunks within clearance zone should have eight feet of vertical clearance from the ground to the highest limb (Figure 5.5.
Subject poles have fuses, air switches, clamps or other devices that could create sparks and start fires (Nichols et al. 1995). This cleared space should be established and maintained by pruning and removing above ground branches and plant parts. After removingvegetation to bare ground for a 10-foot radius around subject poles,

herbicides, including soil sterilants, should be applied, unless expressly prohibited or is against the customer's wishes.

5.8 Padmount Transformers

Padmount transformers should not be cleared as part of normal distribution cycle or interim maintenance. They may be cleared in response to facility point inspection requests should operations require access and a work order is provided. Qualified line clearance tree workers are not required to clear padmount transformers, so contractors responsible for landscape maintenance around substations may be assigned to remove shrubs and other low-growing vegetation that is interfering with padmount transformers

Figure 5.5. California pole clearing requirements (from Nichols et al. 1995).



6. TRANSMISSION VEGETATION MANAGEMENT PLAN (STANDARD OPERATING PROCEDURES)

Transmission facilities are overhead lines energized to greater than 45kV. Typical transmission voltages on PacifiCorp's system are 46kV, 69kV, 115kV, 138kV, 161kV, 230kV, 345kV and 500kV. Facility voltage and type determine the amount of transmission clearance needed. Table 6.1 provides specification clearances for transmission rights-of-way.

Transmission work shall comply with the ANSI A300 (Part 7): *American National Standard for Tree Care Operations (Integrated Vegetation Management a Electric Utility Rights-of-way* [ANSI 2012a]) and the ISA *Best Management Practice: Integrated Vegetation Management for Electric Utility Rights-of-way* (Miller 2014). As well as Tree Risk A300 (Part 9): *American National Standard for Tree Care Operations (Tree Risk Assessment)* and ISA *Best Management Practice: Tree Risk Assessment* (Smiley, Matheny and Lilly, 2011).

Transmission work on lines at or above 200 kV and those designated by the Western Electricity Coordinating Council as an element of the major transfer path in the bulk electric system, including those that extend greater than one mile beyond the fenced area of the generating station switchyard to the point of interconnection with a Company facility or do not have a clear line of site form the generating station switchyard fence to the point of interconnection with a Company facility shall also conform to the North American Electric Reliability Corporation's (NERC) Reliability Standard FAC-003 (NERC 2008) along with other chapters in this manual.

6.1 Work Objective

The objective of systematic transmission work is to improve the reliability of PacifiCorp's transmission system by preventing outages from vegetation located on transmission rights-of-way and minimizing outages from vegetation located adjacent to the right-of-way.

6.2 Philosophy

PacifiCorp's vegetation management philosophy for transmission lines is to utilize integrated vegetation management best practices wherever possible to conduct cover type conversion and to cultivate stable, low-growing plant communities comprised of plants that will never interfere with transmission lines in their lifetime.

Reliability and safety are most effectively protected through establishing and maintaining a right-of-way consistent with the wire-border zone concept (see section 6.8.1.4.1). When the line is less than 50 feet off the ground, the wire-border zone should be cleared of all incompatible vegetation unless an easement fails to provide appropriate authority or there are legal impediments preventing it.

6.3 Initial Clearing and Construction

Newly constructed transmission lines should be cleared to full specifications prior to being energized. In densely vegetated areas, rights-of-way usually have to be completely cleared as the initial stage of establishing a wire-border zone (Figures 6.1 and 6.1)

6.4 Inspection

Transmission lines falling under the auspices of FAC-003 should be inspected at least once a year by ground or air, depending on the anticipated growth of vegetation and any other environmental or operational factors that could affect the relationship of vegetation to the transmission line.

Local transmission (non-FAC-003 lines) over built on distribution should be inspected in conjunction with distribution cycle work.

Line Patrolmen have responsibility for inspecting transmission lines subject to FAC-003 and reporting conditions to vegetation management. In addition, each area forester shall meet twice each year to discuss vegetation conditions with the line patrolman assigned to the area.

Line Patrolmen encountering a tree that poses a threat of causing a transmission outage at any moment shall follow procedures in PacifiCorp Operating Procedure PCC-215, in order to comply with Requirement R4 of NERC Standard FAC-003 (*Transmission Vegetation Management Program*). Line patrolmen must:

- Immediately notify the grid operator by phone and describe the nature and extent of the threat.
- Complete and process the Emergency Tree Action Form.
- Communicate the vegetation conditions to vegetation management for urgent attention.

Examples of tree conditions that pose a threat of causing a transmission outage at any moment include (but are not limited to) trees that violate or pose a risk within 72 hours of violating NERC Minimum Vegetation Clearance Distance (MVCD), uprooted trees that are leaning toward the line and pose a risk of immediate failure and trees with structural failures that may cause them to break in part or whole onto the transmission facilities (See Smiley, Matheny and Lilly 2011).

6.4.1 Additional Inspection

Foresters should annually select lines among those subject to FAC-003 for annual inspection. This inspection is to be done in addition to that performed by line patrolmen. These inspections supplement, rather than substitute for, those conducted by line patrolmen. Foresters should assign representatives to complete these inspections. Using Level 1 assessments from the ISA *Best Management Practices: Tree Risk Assessment (Smiley Matheny and Lilly 2011).*

Such inspection should identify trees that pose a threat of causing an outage at any moment, and trees that could possibly violate work thresholds within the next year. Company plan and profiles should be used in the field itemizing maximize sag and sway along with range finders to confirm the MVCD has not been violated. Locations should be noted on an activity report, and assigned to a tree crew for work, with the appropriate forester's approval.

If the inspections discover a tree that poses a high likelihood of posing an outage at any moment, contract utility foresters shall contact the appropriate forester within three hours. Foresters shall immediately request the appropriate line patrolman to inspect the line according to the imminent threat procedure described in section 6.4.

6.5 Work Plan

The Vegetation Management A300 standard (ANSI 2012a) and the ISA integrated vegetation management best management practice (Miller 2014) recommend against cycle-based

transmission work thresholds. Rather, work should be scheduled depending on line voltage, line importance, vegetation conditions that violate the action thresholds in Table 6.1, location, predominant species' growth rates, threatened and endangered species, archeological sites, topography and other factors.

A comprehensive approach that exercises the full extent of legal rights is superior to incremental management in the long term because it reduces overall encroachments, and it ensures that future planned work is sufficient at all locations on the right-of-way. Removal of trees in the right-of-way is superior to pruning and shall be pursued whenever legal rights exist to do so. Removal minimizes the possibility of conflicts between energized conductors and vegetation.

6.5.1 Annual Work Plan

PacifiCorp performs vegetation management work in accordance with annual work plans that details the circuits and facilities to be managed during a calendar year. MS Project is encouraged as planning software. Plans should include:

- A list of facilities subject to scheduled work.
- If only a portion of a line is scheduled, the line segment must be identified (e.g. structure to structure).
- Dates when work is anticipated to start and end on each project (Gantt charts are recommended).
- A description of the type of control methods, (cycle, herbicide, mowing, aerial, etc.)

6.5.1.1 Annual Work Plan Adjustments

The annual work plan may be adjusted during the year to account for changes in conditions that require a circuit, line segment or project to be moved into or out of the work plan. Examples of reasons for adjustments include, but are not limited to, vegetation growth in excess of anticipated levels, vegetation inspection results, new construction projects or removal of existing facilities. Adjustments to the annual work plan shall be documented as they occur and shall be authorized by the director of vegetation management.

6.6 Action Thresholds

The action thresholds in Table 6.1 provide roughly ten-foot buffers from the NERC MVCD. Trees identified within the action thresholds should be scheduled for work within twelve months.

6.7 Clearances

6.7.1 Minimum Clearances Following Work

Minimum clearances from conductors to be achieved at the time of work are in Table 6.1. These distances should be increased, depending upon local conditions and the expected time frame to return for future vegetation management work. Local conditions may include appropriate vegetation management techniques, fire risk, reasonably anticipated tree and conductor movement, species types and growth rates, species failure characteristics, local climate and rainfall patterns, line terrain and elevation, location of the vegetation within the span, worker approach distance requirements and other factors.

6.7.1.1 Side Clearance in Transmission Rights-of-Way

Specification side clearances to be obtained following work s are presented in Table 6.1. Consider potential sway of

conductors in fresh gale-force (36 mph) or greater wind, particularly mid span, where clearances could need to be increased to accommodate conductor sag and swing in high temperature and winds. If there is any question regarding the need to extend clearances, error should be made on the side of caution.

Table 6.1. Transmission clearance requirements (in feet).

	500 kV	345 kV	230 kV	161 kV	138 kV	115 kV	69 kV	45 kV
Maximum Flash Distances (MVCD)	8.5	5.3	5.0	3.4	2.9	2.4	1.34	N/A
Action thresholds	18.5	15.5	15.0	13.5	13.0	12.5	10.5	5
*Minimum clearances following work	50	40	30	25	25	25	25	20

The Minimum Vegetation Clearance Distance (MVCD) represents minimum clearances that should be maintained from conductors at all times, considering the effects of ambient temperature on conductor sag under maximum design loading, and the effects of wind velocities on conductor sway. MVCDs in this chart are for 10,000-11,000 feet above sea level (the maximum in Table 2 of FAC-003-04) and apply across PacifiCorp's service territory regardless of elevation. Action thresholds indicate work should be scheduled within the next year. They are roughly MVCD plus 10 feet, with the exception of the 46kV, for which no MVCD exists.

6.7.2 MVCD

NERC Minimum Vegetation Clearance Distances (MVCD) are established in FAC-003 (NERC 2008), and represent radial distances from the lines inside of which trees should not encroach (Table 6.1) Trees that violate MVCDs shall be corrected within 24 hours of their identification following PacifiCorp SOP-PCC-215. *Transmission Grid Operations Operating Procedure.*

6.7.3 Structure Clearances

Trees and brush should be cleared within a twenty-five foot radius of transmission "H" or metal structures, a ten-foot radius of single pole construction and a five-foot radius of guy anchors. Clearing activities shall not damage poles, structures, guys or anchors. Grasses, forbs, ferns and other herbaceous species may be left around structures and guys.

6.7.4 Guy Wires

Trees or branches two-inches or more in diameter applying direct pressure to or threatening to fall on or through poles or guy wires shall be removed or pruned.

6.8 Integrated Vegetation Management

The purpose of vegetation management on utility rights-of-way is to Establish sustainable plant communities that are compatible with the electric facilities, wherever possible. These communities are stable, low-growing, compatible with conductors, diverse, and establish a sustainable supply of forage, escape and nesting cover, movement corridors for wildlife, reduced fire risk, and more open access to the line (Yanner and Hutnik 2004). Establishing native vegetation will also reduce the invasion of noxious weeds into the corridor (BPA 2000).

6.8.1 IVM Control Methods

Control methods are the processes used to achieve objectives. Many cases call for a combination of methods. There are a variety of controls from which to choose, including manual, mechanical, chemical, biological, and cultural options (Miller 2014). Ground disturbance shall be minimized on all rights-of-way.

6.8.1.1 Manual Control Methods

Manual methods involve workers using hand-carried tools, such as chainsaws, handsaws, pruning shears. Manual techniques are selective and can be used where others may not be appropriate, including urban or developed areas, environmentally sensitive locations (such as wetlands or places inhabited by sensitive species), in the vicinity of archeological sites and on steep terrain.

6.8.1.2 Mechanical Control Methods

Machines are used for mechanical control. They are efficient and cost effective, particularly for clearing dense vegetation during initial establishment, or reclaiming neglected or overgrown rights-of-way (Figure 6.3). On the other hand, mechanical control methods can be non-selective and disturb sensitive sites, such as wetlands, archeologically rich localities or developed areas. At times, machines leave behind petroleum products, leaks and spills from normal operation. Furthermore, heavy equipment can be risky to use on steep terrain, where they may be unstable. So, they are not always appropriate.

6.8.1.3 Chemical Control Methods

Tree growth regulators and herbicides must be used according to directives on

their labels. Applicators are not only required to comply with label instructions, but also all other laws and regulations pertaining to tree growth regulator and herbicide use (see Chapter 7).

6.8.1.3.1 Tree Growth Regulators

Tree growth regulators (TGRs) are designed to reduce growth rates by interfering with natural plant processes. TGRs can be used to slow some fast-growing species, and be helpful where removals are prohibited or impractical.

6.8.1.3.2 Herbicides

Herbicides control plants by interfering with specific botanical biochemical pathways. There are a variety of herbicides, each of which behaves differently in the environment and in their effects on plants, depending on the formulation and characteristics of the active ingredient. While appropriate herbicide use reduces the need for future intervention, if misused they can cause unintended environmental harm due to drift, leaching and volatilization.

6.8.1.4 Biological Control Methods

Biological control uses natural processes to control undesirable vegetation. For example, some plants, including certain grasses, release chemicals that suppress other species growing around them. Known as allelopathy, this characteristic can serve as a type of biological control against incompatible species. Promoting wildlife populations is also a form of biological control. Birds, rodents and other animals can encourage compatible plant communities by eating seeds or shoots of undesirable plants.

A biological control known as cover-type conversion provides a competitive advantage to short-growing, early successional plants, allowing them to thrive and eventually out-compete unwanted tree species for sunlight, essential elements and water. Cultural methods also take advantage of seed banks of native, compatible species lying dormant on site. In the long run, cultural control is the most desirable method where it is applicable.

The early successional plant community is relatively stable, tree-resistant and reduces the amount of work, including herbicide application, with each successive treatment.

While it is a type of biological control, cover-type conversion employs a combination of manual, mechanical, herbicide and cultural methods. For example, although encouraging allelopathic plants and increasing wildlife populations by improving habitat are types of biological controls, they are also forms of cultural control.

Tree-resistant communities are created in two stages. The first involves non-selectively clearing the right-of-way of undesirable trees using the best applicable control method or methods. The second develops a tree-resistant plant community using selective techniques, including herbicide applications to release the seed bank of native, compatible species for germination.

Cover type conversion, uses herbicides to remove incompatible tall-growing trees and other vegetation from the right-of-way in order to establish a stable, low-growing plant community. The specific IVM technique selected for a particular site is based upon various conditions, which include terrain, accessibility, environmental considerations (wetlands, streams, etc.) cultural factors, worker and public health, economics and other factors.

6.8.1.4.1 Wire-Border Zone

Over sixty years of research on transmission rights-of-way has demonstrated that integrated vegetation management applied to creating distinct, compatible plant communities not only effectively manages vegetation on rights-of-way, but also enhances wildlife habitat, at least in forested areas (Yanner and Hutnik 2004). The wire zone-border zone concept was developed by W.C. Bramble and W.R. Byrnes (Bramble et al 1991).

On flat terrain, the wire zone is the right-of-way portion directly under the wires and roughly 10-feet to the field side of the outside phases. The border zone ranges from ten-feet outside the outer phases to the right-of-way edge (Figure 6.4a). The border zone should be reduced or eliminated on up-slopes where wire sag and sway may preclude leaving trees of any type. It may also extend on down-slopes (Figure 6.4b). Species that could grow into the wires at any time in their lives should not be allowed in the border zone.

Properly managed, wire zone-border zone linear corridors not only effectively protect the electric facilities, but also can become an asset for forest ecology and forest management (Bramble et al 1991, Yanner, Bramble and Byrnes 2001, Yanner and Hutnik 2004).

6.8.1.4.1.1 Region A

Region A is the area where lines are less than 50 feet off the ground (Figure 6.5). The 50 foot height should be from maximum engineered sag mid-span, with attention to side slope and potential sway of conductors in high wind. The right-of-way in Region A should be cleared following the wire zone - border zone recommendations of Bramble and Byrnes (Bramble et. al. 1991 [Figure 6.4a]).

After clearing, the Region A wire zone should consist of grasses, legumes, herbs, ferns and low-growing shrubs (under 5-feet at maturity). The border zone should consist of tall shrubs or short trees (up to 25 feet in height at maturity), grasses and forbs. These cover types benefit the right-of-way by competing with and excluding undesirable plants.

6.8.1.4.1.2 Region B

Region B occurs where the lines are between 50 and 100 feet off the ground from maximum engineered sag (Figure 6.5). In Region B, a border zone regime should be established throughout the right-of-way.

Note that many transmission structures are over 50 feet high. In cases where they are, a border zone community can be maintained near structures. Care should be taken to maintain access to the structure.

6.8.1.4.1.3 Region C

Region C is where the lines are 100 feet or more off the ground (Figure 6.5). Tall-growing trees may be allowed in Region C, provided they have at least 50 feet of clearance. Trees with less than 50 feet of clearance should be selectively removed.

6.8.1.5 Cultural Control Methods

Cultural methods modify habitat to discourage incompatible vegetation. Cultivated landscapes of compatible plants and agricultural crops are examples of cultural control.

6.9 Transmission Rights-of-Way - Widths

Right-of-way clearing should conform to the width indicated on the easement or permit. Removals in Regions A and B shall be done in transmission

rights-of-way wherever legal rights allow. They should also be done when trees have grown within 50 feet of the line in Region C.

Transmission lines may be constructed on the edge of dedicated road right-of-way where there may or may not be an easement or permit on the adjoining property allowing encroaching vegetation to be cleared. In these cases or others where the easement or permit does not specify a width, right-of-way dimensions in Table 6.2 apply. However, if no authority exists to remove trees, at minimum work should conform to Tables 6.1.

Easements should be researched through PacifiCorp Right-of-Way Services referencing the *Plan and Profile.* The *Plan and Profile* may also be useful in determining if the age of the line qualifies it for a prescriptive easement (see Section 8.3.1.1 and Table 8.1). Ground disturbance should be minimized on all rights-of-way.

6.10 Post Work Assessment

Foresters should audit transmission work following procedures outlined in Section 4.4. The audits should objectively assess quality, adherence to specifications, production, herbicide and other matters. Moreover, audits should provide the tree crew leader with feedback on production, professionalism, equipment, safety and crew efficiency. Results shall be documented on an *Audit Report* (Figure 4.7). Following systematic work, the entire length of completed line shall be inspected by the contractor to verify work complies with PacifiCorp specifications.

6.11 Mitigation Measures

NERC Requirement R5 directs transmission owners to develop mitigation measures to achieve sufficient clearances for protection of the transmission facilities when it identifies locations on the right-of-way where the transmission owner is restricted from performing work that may lead to a vegetation encroachment into the MVCD prior to the implementation of the next annual work plan, the owner shall take corrective action to ensure continued vegetation management to prevent encroachments.

Whenever the restriction is caused by a landowner, the refusal process in Chapter 8 shall be followed. If the refusal process has been completed without attaining clearances that would prevent encroachment into the MVCD before the next scheduled work, such locations should be documented on the *Work Release* (Figure 4.2). These sites should be reported in writing to the appropriate line patrolmen within 30 days. The line patrolmen should report annually on these site's status. Moreover, foresters or their contract designee should inspect the site biannually.

Figure 6.1 In densely vegetated areas, rights-of-way usually have to be completely cleared as the initial stage of establishing a wire-border zone.

Figure 6.2. Line 4 in California following work (note the trees mid-span where the line is more than 100-feet off the ground).

Lorelei Phillips photo

Figure 6.3. Right-of-way reclamation using mechanical control. In this case, a slashbuster.

TABLE 6.2. Active transmission right-of-way widths.

Facility	Distance from Center	Urban Width	Rural Width
46 kV Single pole	25 feet	50 feet	50 feet
69 kV Single pole	25 feet	50 feet	50 feet
115 kV Single pole	30 feet	60 feet	60 feet
138 kV Single pole	30 feet	60 feet	60 feet
161 kV Single pole	40 feet	80 feet	80 feet
230 kV Single pole	40 feet	80 feet	80 feet
69 kV H frame	40/50 feet	80 feet	100 feet
115 kV H frame	40/50 feet	80 feet	100 feet
138 kV H frame	40/50 feet	80 feet	100 feet
161 kV H frame	40/50 feet	80 feet	100 feet
230 kV H frame	62½ feet	125 feet	125 feet
345 kV H frame	75 feet	150 feet	150 feet
345 kV Steel tower	75 feet	150 feet	150 feet
500 kV Steel tower	87½ feet	175 feet	175 feet

Note rights-of-way should be cleared to those specified in the easement. If no easement exists or if no width is specified in the easement, rights-of-way in this table apply. Widths conform to PacifiCorp Transmission Construction Standard TA 181

Figure 6.2. Line 4 in California following work (note the trees mid-span where the line is more than 100-feet off the ground).

Lorelei Phillips photo

Figure 6.4a. Bramble and Byrnes Wire Zone - Border Zone (adapted from Yahner, Bramble and Byrnes, 2001).

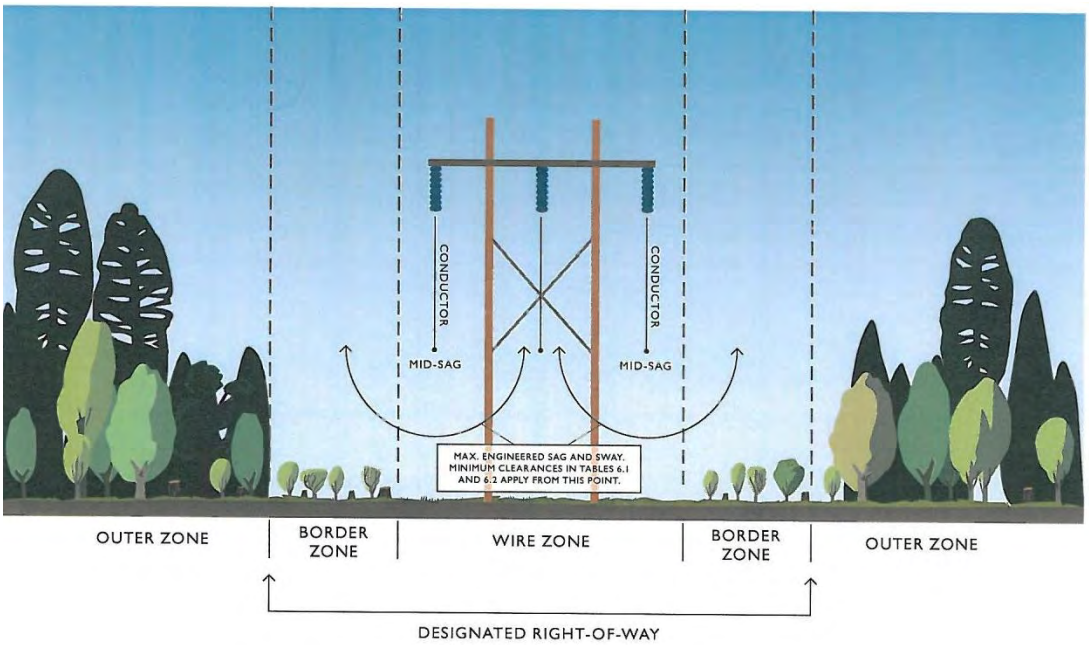
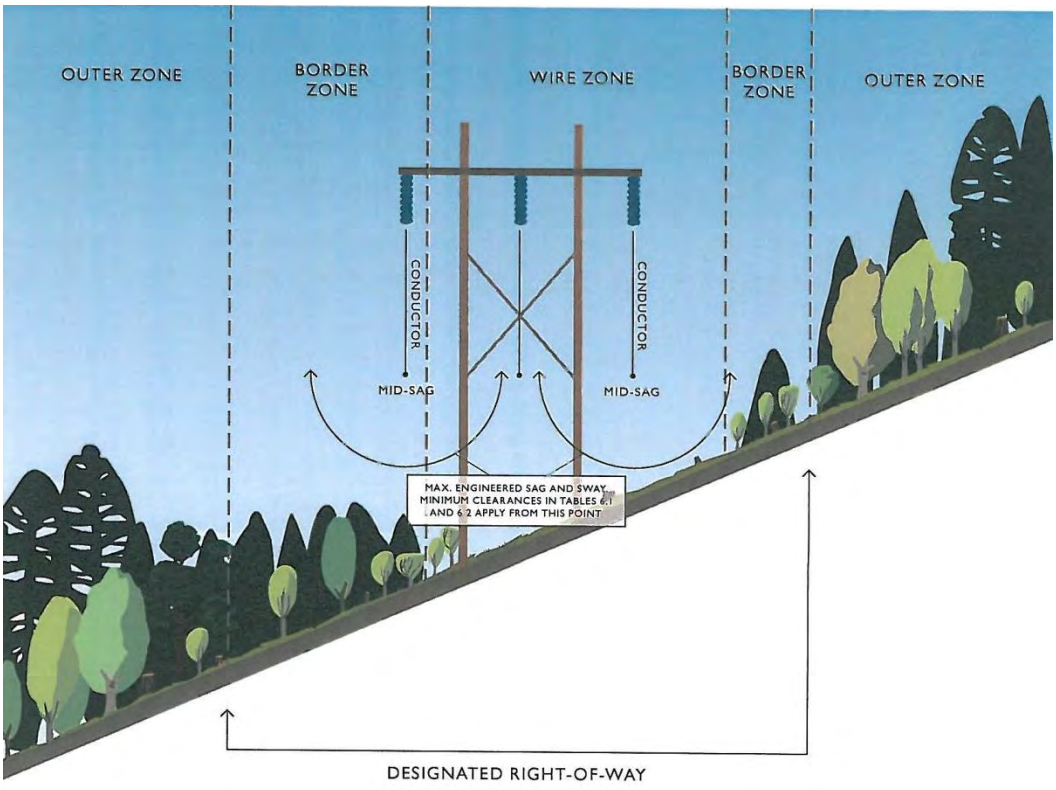
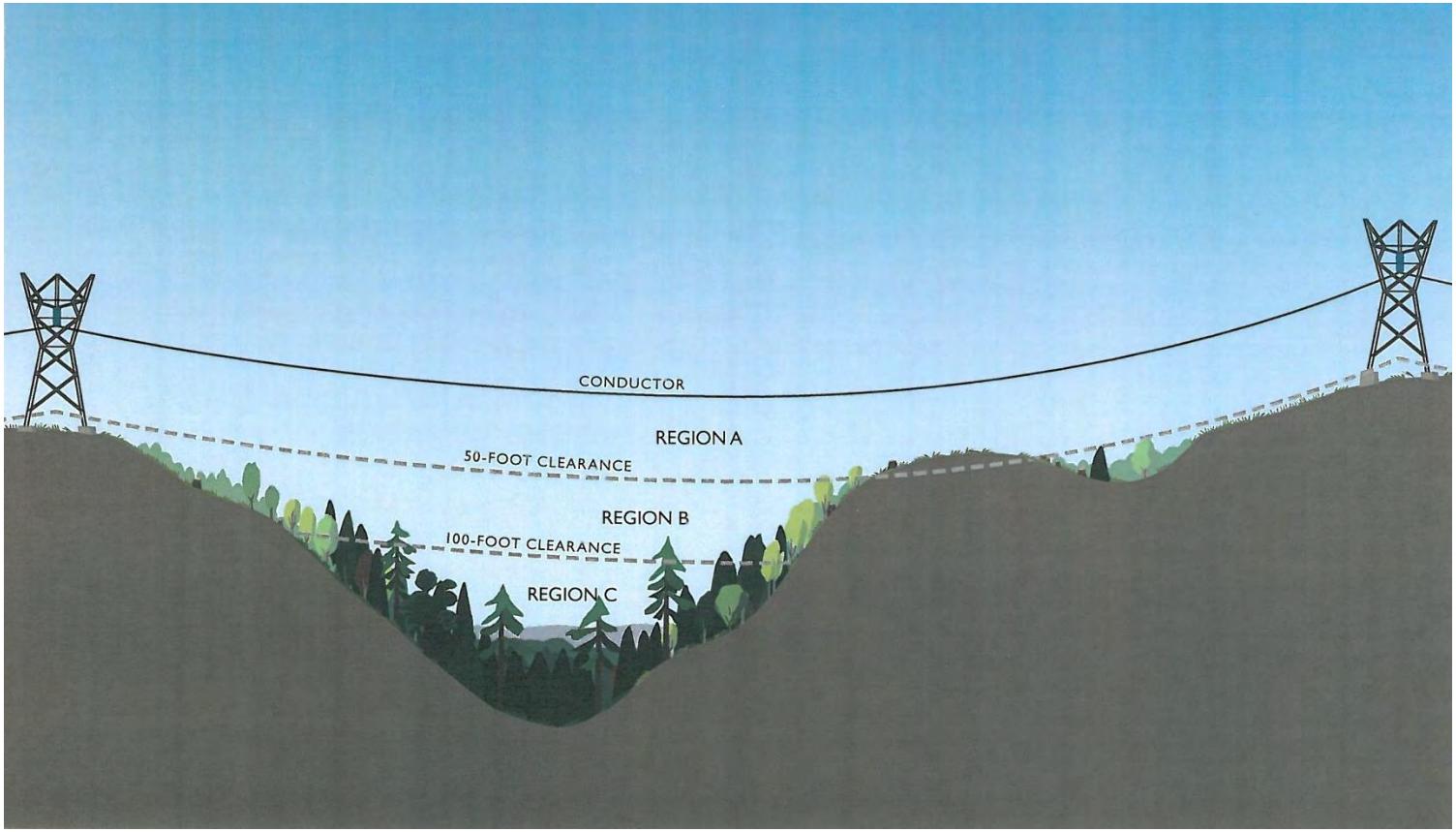


Figure 6.4b. The border zone may be reduced or eliminated on up-slopes where wire sag and sway could bring it into contact with trees, and can be extended on down-slopes.



Brad Gouch drawings (Figures 6.4 and 6.5).

Figure 6.5. Under clearance regions.



Region Definitions:
Region A: Where conductor to ground clearance is less than 50 feet (from maximum engineered sag and sway.
Region B: Where the conductor to ground clearance is 51-100 feet (from maximum engineered sag and sway.
Region C: Where the conductor to ground clearance is over 100 feet (from maximum engineered sag and sway.

Appropriate Region Plant Species:
Region A: Grasses, legumes, ferns and low-growing shrubs (<5' at maturity).

Region B: Region A species as well as large shrubs and short-growing trees (<25' at maturity).
Region C: All tree and shrub species.

6.12 High Risk Trees

High risk trees are structurally unsound and could strike a target (such as electric facilities) when they fail. Off right-of-way hazard trees shall be identified following Smiley, Matheny and
Lilly (2011) using an initial Level 1 assessment and bearing prevailing winds in mind.

Trees on the uphill and windward sides of rights-of-way should receive particular scrutiny. Hazard trees should be either removed or pruned to reduce the exposure. Work shall be performed in a manner that neither damages trunks nor disturbs root systems of adjacent trees. Damaged trees could decline, decay or die, threatening the conductors if they fall.

Federal and state agencies could request high risk trees to be topped to create "wildlife trees". PacifiCorp may honor such requests provided the safety of the tree workers or the integrity of facilities are not compromised, and the trees are topped below a height that would allow them to contact Company facilities should they fall.

PacifiCorp manages multitudes of trees across its over 15,000 mile transmission system. In every mile of line, the Company potentially has hundreds or thousands of trees, any one of which could compromise public safety and electrical service reliability. It is impossible to completely secure an electrical system from that level of exposure. Nevertheless, PacifiCorp has a responsibility to make a reasonable effort to maintain vegetation to reduce risks to both the public and power supply.

6.13 Vegetation Screens

Vegetation screens may be required by federal or local authorities in some locations at high visibility areas such as major road crossings. Where these mandates exist, vegetation screens should consist of border zone communities and be located near structures (where the line is unlikely to sag), if possible. If no border zone species are present, tall-growing trees may be left provided they have at least the minimum clearances in Table 6.1 following scheduled work.

Leaving tall-growing trees in transmission rights-of-way should be discouraged because they impede cover type conversion. So, trees should be removed (gradually over a number of years, if need be), rather than be pruned to obtain proper clearances, if at all possible. Vegetation screens should be no more than twenty-five feet from frequented vantage points into the right-of-way. Areas where tall-growing species are retained as screens shall be documented and monitored annually by line patrolmen. If remaining trees violate work thresholds specified in Table 6.1, within 30 days line patrolmen should report them to Vegetation Management for correction.

6.14 Merchantable Timber

Rights-of-way could contain merchantable timber. Merchantable timber is defined as trees with at least six-inch diameter at breast height (DBH), that are recoverable and have a market in the local area. Merchantable timber belongs to the property owner unless the easement or permit states otherwise. If merchantable timber needs to be felled, the property owner should be contacted regarding timber recovery.

After the merchantable timber is felled, it should be de-limbed and left in total tree length on the right-of-way for recovery by the owner. In limited cases, PacifiCorp may decide to purchase merchantable timber from the property owner and retain or transfer ownership to

another party. A forest practice permit from the appropriate state department of forestry may be required for timber recovery.

6.15 Transmission Safety Procedures

The following safety procedures shall be followed by all tree crews on PacifiCorp transmission facilities.

6.15.1 Pre-work Communication with Dispatch

Operative communication capability is mandatory at all times on transmission rights-of-way Communication with dispatch is critical for tree crew safety. Every morning before starting transmission work, tree crews shall call the dispatcher from the right-of-way by radio or telephone and provide the following information to comply with *Power Delivery System Operations System policy SOP-152* (Figure 6.6):

- Name of crew leader
- Name of company
- Contact information (radio or cell number)
- Name of transmission line
- Line section (substation names between which work is to occur, such as "Alvey to Dixonville," or "Ben Lomond to Terminal")
- Location of work (structure number, address or both)
- How long the crew will be working at that location
- Radio or cellular telephone number of the crew
- Name of GF/supervisor and their cellular telephone number

If radio or telephone contact cannot be made with the dispatcher from the right-of-way, non-emergency work shall not be performed at that site. The crew should relocate to work where they can communicate with the dispatcher. Satellite phones might be necessary in remote locations to provide the required communication.

6.15.2 Post-Work Communication with Dispatch

Each afternoon after completing transmission work for the day, tree crews shall call the dispatcher and provide the following information (Figure 6.6):

- Name of crew foreman
- Name of company.
- Contact information (radio or cell number)
- Name of transmission line
- Line section (substation names between which work occurred, such as "Alvey to Dixonville," or Ben Lomond to Terminal").
- Location where work was performed
  Crew members and equipment are off the right-of-way or in the clear.

6.15.3 Safe Working Procedure

If a tree cannot be felled or pruned safely, work shall not proceed. If a tree or limb falls into the conductors, work shall stop immediately and emergency procedures outlined in Figure 2.1 followed Minimum approach distances (Table 2.1) shall not be violated. Remember, transmission conductors can sag considerably at mid-span during hot

weather, ice buildup and heavy electrical loads. Trees that have safe clearance in the morning may not have safe clearance in the afternoon. Conditions could require a hold or clearance. Clearances on some transmission lines can take weeks or months to schedule. See Section 2.1.1 for hold and clearance instructions.

6.16 Monthly Progress Tracking

Figure 6.6. Transmission communication procedure with Dispatch (operative communication is mandatory at all times on transmission rights-of-way. Satellite phones could be necessary in remote locations).

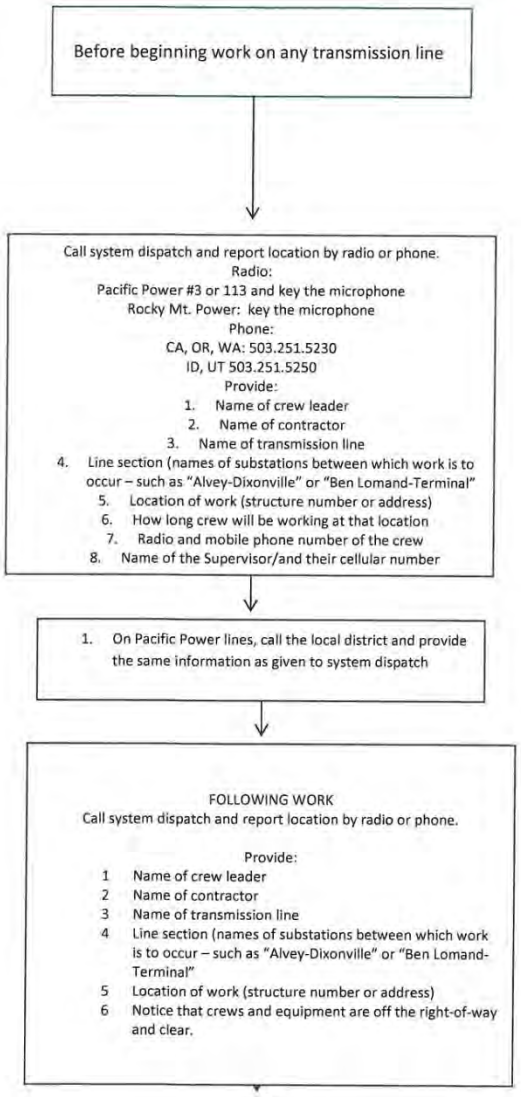


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Figure 6.7. Summary pages of main grid and local transmission monthly reports.

PACIFICORP VEGETATION MANAGEMENT 2011 MAIN GRID TRANSMISSION PROGRESS REPORT

Through Dec 31, 2011

STATE SUMMARY

	TOTAL Line Miles	Line Miles Scheduled	Line Miles Completed	Line Miles Goal	Line Miles Ahead/Behind
	7,160	795	803	795	8
State					
California	129	23	11	23	-11
Idaho	1,206	99	99	99	0
Misc States	66	0	0	0	0
Montana	137	46	30	46	-16
Oregon	1,131	224	224	224	0
Utah	2,329	207	230	207	23
Washington	284	160	168	160	8
Wyoming	1,877	37	41	37	4
TOTAL	7,160	795	803	795	8

FORESTER SUMMARY

	TOTAL Line Miles	Line Miles Scheduled	Line Miles Completed	Line Miles Goal	Line Miles Ahead/Behind
	7160	795	803	795	8
Forester					
Armstrong	609	306	311	306	5
Evans	1865	127	142	127	14
Jones	64	21	21	21	0
Partridge	284	35	42	35	8
Phillips	734	58	46	58	-12
Vanderhoof	3,534	239	237	239	-2
Hooley	71	9	4	9	-5
Total	7,160	795	803	795	8

PACIFICORP VEGETATION MANAGEMENT 2011 LOCAL TRANSMISSION PROGRESS REPORT

Summary

Through Dec 31, 2011

LOCAL TRANSMISSION WORK

	Total Line Miles	Total Miles Scheduled	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)
	7,936	2,136	2,316	2,136	180
State					
California	572	106	116	106	10
Idaho	797	38	46	38	8
Oregon	1,836	279	340	279	61
Utah	3,747	1,445	1,587	1,445	142
Washington	324	131	89	131	-42
Wyoming	660	137	138	137	1
Total	7,936	2,136	2,316	2,136	180

SUMMARY OF WORK BY FORESTER

	Total Line Miles	Total Miles Scheduled	Line Miles Completed	Line Mile Completed Goal	Miles Ahead(Behind)
	7,936	2,136	2,316	2,136	180
Forester		*	*	*	*
Hooley	356	9	41	9	32
Evans	2,304	977	1,035	977	58
Jones	766	330	413	330	83
Partridge	594	259	191	259	-68
Phillips	1,038	90	138	90	48
Vanderhoof	2,134	313	323	313	10
Armstrong	744	158	176	158	18
Total	7,936	2,136	2,316	2,136	180
Weeks					
52					

Progress on the annual work plan for NERC Transmission Lines shall be tracked on the *PacifiCorp Main Grid Transmission MASTER* for lines under the auspices of NERC Standard FAC-003. Progress on the annual work plan for other transmission lines shall be tracked on the monthly *Local Transmission Progress Report.* Both reports track miles achieved against plan on a monthly basis (Figure 6.7).

6.17 Quarterly WECC Audit Report

PacifiCorp is required to report outages on transmission lines subject to FAC-003.

7. CHEMICAL PRODECURES

Herbicides and tree growth regulators (TGRs) are an integral part of PacifiCorp's Vegetation Management program. Chemical applications shall be performed according to federal, state and local regulations. Labels are the law, and chemical use must comply with labeling. PacifiCorp's director of vegetation management shall approve all products and mixes. Property owners shall be notified at least five days, but no more than six weeks in advance, whenever chemicals are to be used on their property. Property owner objection to herbicide use shall be honored.

The company making the application is responsible for chemical purchase and storage, record keeping as well as container disposal. Crew leaders in all states except California shall hold a valid applicator's license. Applicators shall either hold that license, or work under the direct supervision of a certified applicator as required in the state in which they are working. Tree crews found working without a crew leader or applicator without a valid applicators license for the state in which they are working may be shut down at the forester's discretion. Supervisors/GFs of qualified applicators shall hold a certified applicator's license in the state or states in which they supervise crews**.**

7.1 Closed Chain of Custody

Closed chain of custody best practices are encouraged. CU*tility Arborist Association Best Management Practices: Field Guide to Closed Chain of Custody for Herbicides n the Utility Vegetation Management Industry* (Goodfellow and Holt 2011).

Closed chain of custody is a concept in which ready-to-use, diluted concentrate formulations are utilized in closed delivery systems. Closed chain of custody includes herbicide shipping, distribution, storage, and mixing, which includes returning empty containers for refilling and reuse.

7.2 Chemical Reports

All chemical applications shall be documented in the *Daily Report* (Figure 4.6) or other method approved by a Company forester. The company making the application shall be responsible for maintaining reports for review by the state departments of agriculture.

When chemical work is done on or adjacent to PacifiCorp Hydro properties, copies of chemical reports shall be provided to the plant manager weekly.

7.3 Herbicide Applications

Herbicide applications shall be pursued wherever possible as a vegetation management tool. Herbicides prevent sprouting from stumps of deciduous trees and should be used on saplings of tall-growing species to reduce future inventories (Figures 7.1 and 7.2). Herbicides are essential in cover type conversion necessary in establishing the wire zone-border zone method on transmission lines.

When properly used, herbicides are effective and efficient, minimize soil disturbance, and enhance plant and wildlife diversity. Herbicide application can benefit wildlife by improving forage as well as escape and nesting cover. In some instances, noxious weed control is a desirable objective on utility rights-of-way that can be satisfied through herbicide treatment.

Herbicide use can control individual plants that are prone to re-sprout or sucker

after removal. When trees that re-sprout or sucker are removed without herbicide treatment, dense thickets develop, impeding access, swelling workloads, increasing costs, blocking lines-of-site, and deteriorating wildlife habitat (Yanner and Hutnik 2004 [Figures 7.1 and 7.2]).

Treating suckering plants allows early successional, compatible species to dominate the right-of-way and out-compete incompatible species, ultimately reducing work.

7.3.1 Selectivity

Herbicides can be selective or non-selective depending on their type. Selective herbicides only control specific kinds of plants, when applied according to the label. For example, synthetic auxins are a class of selective herbicides that control broadleaved plants, but do not harm grass species. By contrast, non-selective herbicides work against both broadleaved plants and grasses. Non-selective herbicides can be effective where a wide variety of target plant species are present, like those often found during initial clearing or reclaiming dense stands of invasive or other undesirable vegetation.

Application techniques can also be either selective or non-selective. Selective applications are used against specific plants or pockets of plants. Non-selective techniques target areas rather than individual plants (see *Application Methods*). Non-selective use of non-selective herbicides eliminate all plants in the application area. Non-selective use of a selective herbicide controls treated plants that are sensitive to the herbicide, without differentiating between compatible or incompatible species. Selective use of either would only control targeted vegetation. Selective use is preferable unless target vegetation density is high.

7.3.2 Herbicide Best Management Practices

PacifiCorp is dedicated to ensuring proper application of approved herbicides to minimize the effects on non-target vegetation, human health, fish and wildlife species, and water quality (Childs 2005).

Herbicide applications shall (Childs 2005):

- Follow all product label mandatory provisions such as registered uses, maximum use rates, application restrictions, worker safety standards, restricted entry levels, environmental hazards, weather restrictions, and equipment cleansing.
- Follow all product label advisory provisions such as mixing instructions, protective clothing and others matters.
- Have on site a copy of the label and SDS sheets.
- Be made in the presence of a licensed applicator valid for the state in which work is performed.

7.3.3 Wetlands and Waterbodies

The effects of herbicides on wetland and water resources should be minimized by utilizing buffer zones (Table 7.1). Buffer zones reduce the movement of herbicides from the application site into adjoining water bodies. They must be followed unless instructed otherwise by competent authorities. Climate, geology and soil types should be considered when selecting the herbicide mix with the lowest relative risk of migrating to water resources (Childs 2005)

Figure 7.1. Untreated rights-of-way quickly fill in with thickets of sprouts following mowing

Jay Neil photo

Figure 7.2. Incompatible species treated in the Line 72 right-of-way in, Oregon two years after reclamation. Herbicide treatments help maintain the right-of-way and are used to convert it to a wire zone-border zone prescription (Figure 6.3)

Table 7.1. Buffer Widths to Minimize Impacts on Non-Target Resources (adapted from Childs 2005).

Herbicide Ecological Toxicities and Characteristics	Buffer Width from Water Resource per Application Method			
	Spot	Localized	Broadcast	Mixing, Loading, Cleaning
Practically Non-toxic to Slightly Toxic	Up to the Edge	Up to Edge	50 feet	100 feet
Moderately Toxic, or Label Advisory for Ground/Surface Water	25 feet	35 feet	300 feet	250 feet
Highly Toxic to Very Highly Toxic	35 feet	100 feet	Noxious weed control only. Buffers shall comply with local regulations	250 feet

7.3.4 Spills

Mixing, loading and cleaning equipment are critical activities that present the greatest exposure to accidents or spills (Miller 1993). Spills should adhere to Section 2.2.5. Spills can be avoided by using closed chain of custody best management practices.

7.3.5 Inappropriate Applications

There are situations where herbicide applications are inappropriate. If application company representatives are uncertain whether or not applications are appropriate, they shall consult the appropriate forester. Inappropriate situations include (but are not limited to):

- Areas where the property owner expresses objections to herbicide use.
- Areas where herbicide could drift or leach into organic farms.
- Governmental lands where herbicides are prohibited.
- Conditions of heavy precipitation or strong winds. If these conditions exist, the treatment should be deferred until weather improves.
- Periods of high temperatures, which can cause product volatility and damage off-target plants. This is particularly important for foliar applications. During high temperatures, treatment should be deferred until weather cools. Note that vineyards can be especially sensitive to synthetic auxins.
- Trees that could be root grafted to desirable trees.
- Trees that are near desirable plants where the herbicide could move into contact with off target foliage or roots.
- Trees that are sufficiently close agricultural crops or harvestable, edible plants that contamination could be reasonably expected

If there is any uncertainty regarding whether or not an application is appropriate, contact the forester with responsibility for the area.

7.3.6 Application Methods

Herbicide application methods are categorized by the quantity of herbicide

used, the character of the target, vegetation density and site parameters. Dyes can be used in the herbicide mix to mark areas that have been treated. Treatments include individual stem, broadcast and aerial treatments. Ninety-five percent control shall be obtained.

7.3.6.1 Individual Stem Treatment

Individual stem treatments are selective applications. They include stump, basal, injection, frill, selective foliar and side-pruning applications. Due to their specific nature, proper individual stem applications work well to avoid damage to sensitive or off target plants. However, they are impractical against broad areas or sites dominated by undesirable species.

Stump applications are a common individual stem treatment, where herbicides are applied to the stump cut surface around the cambium and to the top side of the bark. Water-based formulations require immediate stump treatment, while oil herbicides can be applied hours, days or even weeks after cutting.

Injections involve inserting herbicide into a tree. Frill (commonly called "hack and squirt") treatments, consist of herbicide application into cuts in the trunk. Injections or frill treatments are especially useful against large incompatible trees to be left standing for wildlife.

Basal applications often use a herbicide in an oil-based carrier at the base of stems and root collar. The oil penetrates the bark, carrying the herbicide into the plant. Although basal applications can be made year round, dormant treatment is often best on deciduous plants, when they do not have foliage that can obstruct access to individual stems.

Selective foliar applications are done by spraying foliage and shoots of specific target plants. They can be either low or high volume treatments. For low volume applications, comparatively high concentrations of herbicide active ingredient are made in lower volumes of water than would be used with high volume treatment. Foliar applications are only made during the active growing season, normally late spring to early fall.

Side pruning is a technique where non-translocatable herbicides are applied to control specific branches growing toward the electric facility. Treating large branches could damage trees in the same way as removing them through pruning.

7.3.6.2 Broadcast Treatment

Broadcast treatments are nonselective because they control all plants sensitive to a particular herbicide in a treatment area. They can provide a degree of selectivity with proper herbicides. Even then, broadcast treatments do not differentiate between compatible and incompatible plants that the herbicide controls. Broadcasting is particularly useful to control large infestations of incompatible vegetation (including invasive species) in rights-of-way or along access roads.

Broadcast techniques include high-volume foliar, cut-stubble and bare ground applications. High volume foliar applications are similar to high volume selective foliar applications. The difference is that broadcast high volume foliar treatments target a broad area of incompatible species, rather than individual plants or pockets of plants. Cut-stubble applications are made over areas that have just been mowed. Bare-ground treatments are used for clearing all plant material in a prescribed area, such as in substations or around poles to protect against fire. Bare-ground applications are usually granular or liquid applications following mechanical removal of

vegetation, or used as a pre-emergent in maintaining graveled areas such as substations.

7.3.6.3 Aerial Treatment

Aerial treatments are made by helicopter (rotary wing) or small airplane (fixed wing). Rotary wing aircraft provide the most accuracy, because helicopters can fly more slowly and are more maneuverable than airplanes. However, airplanes are less expensive to operate than helicopters. Aerial control methods are also nonselective, but can provide a level of selectivity with proper herbicides. Aerial applications can be useful in remote or difficult to access sites, and be cost effective and quick, especially if large areas need to be treated. They also can be used where incompatible vegetation dominates a right-of-way. The primary disadvantage of aerial application is that it carries the threat of off-target drift, so it must be performed under low-wind conditions with low toxicity herbicides.

7.4 Approved Herbicides

A list of approved products appears in the following sections. PacifiCorp's director of vegetation management must authorize other chemicals.

7.4.1 Stump Application

- 2, 4-D
- Glyphosate
- Picloram
- Triclopyr

7.4.2 Low Volume Basal Application

- Imazapyr
- Triclopyr

7.4.3 Foliar Application

- 2, 4-D
- Aminopyralid
- Fosamine ammonium
- Glyphosate
- Imazapyr
- Metasulfuron methyl
- Picloram
- Sulfometuron methyl
- Triclopyr

7.4.4 Soil Application

- Diuron
- Imazapyr
- Picloram
- Sulfentrazone
- Tebuthiuron

7.5 Tree Growth Regulators

Tree Growth Regulator (TGR) applications are intended to retard fast-growing trees so that they will not interfere with facilities or violate state regulatory agency tree policy before the next scheduled maintenance.

7.5.1 Approved TGR Application Chemicals

- Fluprimidol
- Paclobutrazol

8. CUSTOMER RELATIONS

Representatives of vegetation management meet with more customers than any other Company department. As a result, customers often develop an impression of the entire Company based on their experience with PacifiCorp vegetation management. Since vegetation management work is often controversial, excellent customer service is imperative for a successful program. Company and contract personnel must be professional, prompt, fair and courteous to customers.

8.1 Educational Information

PacifiCorp has a variety of educational materials about tree-power line conflicts and planting the right tree in the right place.

8.1.1 Trees and Power Lines Brochure

The *Trees and Power Lines* brochure is a companion to the "yellow door card" (see Section 8.2.1). It explains the need for line clearance work, as well as natural target pruning. It also provides color pictures of how properly pruned trees could look following line clearance.

8.1.2 Small Trees for Small Places

The *Small Trees for Small Places* is a publication in PDF format available at PacificPower.net or RockyMountainPower.net. It provides tree selection tree planting and electrical safety information. It offers an easy to use chart on ornamental and adaptive characteristics of 100 different species that can be used adjacent to power lines. Not all these trees can be used everywhere in PacifiCorp's service territory. However, with a choice of 100 small-statured trees, there should be several to use in any given location around PacifiCorp's system.

8.1.3 Right Tree in the Right Place Poster

The *Right Tree in the Right Place* poster provides illustrations and descriptions of small trees that are suitable across PacifiCorp's service territory. It also relates information about proper utility tree pruning and tree planting.

8.2 Notification for Tree Work

Notification for tree work is not required by any state tariff in PacifiCorp's service territory. However, PacifiCorp vegetation management attempts to notify property owners or tenants prior to vegetation management work at home and business sites. PacifiCorp area foresters should authorize any line clearance work to be done without property owner or tenant notification. In cases of municipal, county, state or federal properties, the proper agency representative shall be notified. The appropriate customer and community relations manager should be notified prior to meeting with governmental officials.

Notification, including that for tree or chemical work, should be by letter, phone, personal visit or door card at least five business days, but no more than six weeks, prior to the crew arriving. Notification shall be documented on an *Activity Report* (Figure 4.3). Notification cards shall not be placed in U.S. Mail boxes. Notification cards should be used only where the owner or tenant is likely to be present on a regular basis. Some circumstances, such as work on historic, unique or unusual trees, could

warrant personal contact with the customer.

8.2.1 Door hangers

PacifiCorp has a variety of door hangers (Figure 8.1). These door hangers come in Pacific Power and Rocky Mountain Power versions. Pacific Power door hangers shall be used in California, Oregon and Washington. Rocky Mountain Power printings shall be used in Idaho, Utah and Wyoming.

8.2.1.1 Distribution (Yellow)

PacifiCorp's yellow distribution door hanger, and should be used to notify customers of upcoming distribution cycle or interim work. The door hanger has contract utility forester contact information, an explanation of the need for line clearance work, of how the work will be performed and how much clearance is required. The door hanger informs customers that volunteer trees (those not planted as part of a landscape) six or fewer inches in diameter at breast height will be removed. It also includes drawings of shapes customers could expect from the work, and tips about tree planting (Figure 8.2). Grow into facilities at some time in their life approx. 10 ft. each side of center

8.2.1.2 Ticket (Blue)

The blue door hanger should be used to communicate with customers who have called in requests for tree work. It has four check boxes with the most common responses to customer requests. The tree(s):

- Do not pose an immediate threat to electric service.
- Are not affecting PacifiCorp facilities.
- Are growing in proximity to service lines, but do not threaten electric service. If a customer wishes to have the tree pruned, PacifiCorp can disconnect the line to enable the customer to safely perform the work or hire a professional tree care company to do it for them.
- Are the customer's responsibility because they have more than ten feet from distribution primary conductors.

The form also has space for comments, and contract utility forester contact information.

8.2.1.3 Distribution Removal (Ivory)

The white door hanger is a tree removal request, to fulfill PacifiCorp's requirement for written permission to remove trees where no easement granting authority exists to do so (see Section 2.7.1). The white door hanger identifies trees to be removed, has check boxes indicating whether or not the logs will be cut to firewood length and the stumps treated with herbicide. The door card also provides contact information for the forest tech, or comments and a sketch to help the customer understand the request.

8.2.1.4 Rural Transmission (Purple)

The rural transmission door hanger explains the need to remove trees under transmission lines. It relates the process the customer can expect, how trees and debris will be left. It informs customers that herbicide could be used on their property, and that we have a coupon program for tree replacement. It provides information on the voltage of the line and widths of the right-of-way. The door hanger also has a wire zone-border zone

Figure 8.1 Various PacifiCorp Vegetation Management door hangers .

illustration and offers contract utility forester contact information.

8.2.1.5 Urban Transmission (Forest Service Green)

The green transmission door hanger is for use in urban or developed areas. It differs from the rural door hanger insofar as it doesn't have a diagram of the wire-border zone concept. It still stresses removal.

8.2.1.6 TGR (Grey)

The grey TGR door hanger is for notifying customers about upcoming tree growth regulator application on their property. It provides space to see what trees will be treated and contract utility forester contact information.

8.2.1.7 Herbicide (Grey)

The grey herbicide door hanger is for notifying customers about upcoming herbicide application on their property.

8.2.1.8 Tree Crew Request (Orange)

The orange door hanger is for tree crews to use to ask customers for their cooperation with upcoming tree work. It provides information about when a tree crew will arrive on site, and has check

Figure 8.2. "Yellow" door hanger.

The Steps for Tree Removal, Pruning and/or Herbicide Application

- This door card is the first step in the process. We are leaving it between one and six weeks before work on your property is planned.
- Please call the arborist listed on the other side of this door card within a week of receiving the verbal or this written notice, with questions or to notify us of any issues on your property.
- Tree crews will remove, prune or treat the trees with herbicides or tree growth regulators as indicated on the front of the card. The main trunk and large limbs will be left for your use. In addition, brush and trees that are under 6-inches in diameter and not intentionally planted as part of the landscape will be removed and treated with herbicide.
- We offer coupons to replace incompatible trees with utility-friendly species that you can plant in appropriate locations on your property. Talk with the forest technician about this option.
- This service is provided at no cost to you.
- If you have questions, please contact the arborist listed on the other side of this door card.

Here are some shapes you may expect from proper pruning around power lines.

For more information on electrical safety, tree pruning or planting the right tree in the right place, we invite you to visit **rockymountainpower.net/trees**.

Para más información, llame al 1-888-225-2611 y podrá hablar con un representante que hable español. ***Este servicio se ofrece sin ningún costo para usted.***

Tree Maintenance & Power Line Safety

It's a pleasure to provide you with safe, reliable, reasonably priced electricity. Keeping trees away from power lines is one of the most important ways to ensure you and your neighbors receive reliable electric service. It also helps keep you and our employees safe.

☐ After routinely inspecting the power lines on your property it's prudent to remove the following trees:

_____

☐ Additionally, we need to prune trees on your property to provide clearance of at least 10 to 14 feet of the overhead power line and/or from the power line running along the side of the trees:

_____

☐ The trees listed below will be treated with tree growth regulator to reduce the rate at which the tree(s) regrow into overhead power lines and also to reduce the frequency in which the tree(s) need to be pruned by our tree crews:

_____

☐ An herbicide will be applied in low volumes to non-landscape trees and brush stumps to prevent future growth. The herbicide is registered with the U.S. Environmental Protection Agency and will be applied in accordance with label requirements and federal, state and local regulations.

We hope you understand the reasons for the actions mentioned above and apologize for any inconvenience. **To understand what happens next, please review the steps for this work on the reverse side of this card.**

For more information on electrical safety, tree pruning or planting the right tree in the right place, we invite you to visit **rockymountainpower.net/trees**.

If you have questions please call:

Arborist: _____

Phone: _____ Date: _____

Comments: _____

_____

Para más información, llame al 1-888-225-2611 y podrá hablar con un representante que hable español. ***Este servicio se ofrece sin ningún costo para usted.***

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VMRMP026
yellow

ROCKY MOUNTAIN POWER

boxes for requests to move something (like a car) from under the tree or secure a dog. It also can be used for permission to dive on property and has space for comments.

8.2.1.9 Pole Clearing

The pole clearing door hanger is to notify California customers of upcoming work to comply with California Resource Code 2492 (see Section 5.6)

8.2.2 Other Customer Contact Forms

In addition to door hangers, PacifiCorp has two forms for use in customer communication. The *Property Owner Permission* form has check boxes requesting authorization for tree removal, tree and brush disposal, mowing, notification of herbicide and TGR application. It provides a space for the property owner's signature. Property owner signatures are required for tree removal, but not brush disbursal or herbicide application.

PacifiCorp also has a *Refusal /Complaint Form.* This form should be completed by contract utility foresters, supervisors/GFs, tree crews or foresters whenever a customer has concerns about upcoming or recently completed work. It identifies the property owner, the type of project and the nature of the refusal or complaint. These documents should be kept in a permanent file.

8.2.3 Crew Arrival on Site

When crews arrive for work at a residential site, they should make a courtesy knock on the door and let the homeowner or tenant know they are about to begin work. If no one is home, the crew should proceed with the planned tree work.

8.3 Customer and Property Owner Refusal Procedure

The customer refusal process is presented in Figure 8.3. Detailed records must be kept of every conversation, including the date and time it occurred, and summary of the matters discussed. If a vegetation management representative makes a failed attempt to contact a refusal by phone, the date and time of the call should also be noted.

8.3.1 Contract Utility Forester Refusal Procedure

When a property owner refuses to allow the work necessary to satisfy PacifiCorp specifications, the contract utility forester shall complete a *Property Owner Refusal/Complaint Report* and notify their supervisor/GF, and area forester within two working days and before any work is performed on the property. Contract utility foresters shall not compromise clearances.

8.3.1.1 Easements

After documenting the refusal, the contract utility forester should research the right-of-way to determine PacifiCorp's property rights for that location. PacifiCorp often owns easements, copies of which are available from PacifiCorp right-of-way services. In addition, states grant prescriptive rights if the line has existed for specified length of time. This time period varies depending on the state (Table 8.1). This information should be provided to the appropriate GF/supervisor.

8.3.2 Crew Leader Refusal Procedure

When a property owner refuses to allow the crew leader to obtain specification clearances, the crew leader shall complete a *Property Owner*

Refusal/Complaint Report and notify their GF/supervisor, contract utility forester, or area forester within two working days and before any work is performed on the property. Crew leader notification initiates the refusal procedure from the beginning.

8.3.3 General Foreman/Supervisor Procedure

The supervisor/GF should contact the property owner within two weeks of being informed of a refusal to try to resolve the situation. The GF/Supervisor should review the documentation surrounding the refusal before contacting the customer. GF/supervisors should not compromise work below the specification without written authorization from the responsible area forester. If a prescriptive or written easement exists, the supervisor/GF should inform the customer of our rights under those easements. Notwithstanding, the general foreman/supervisor should not have the trees worked without customer consent.

If the general foreman/supervisor cannot resolve the refusal to full specification, he or she shall refer it to their area forester by turning in the *Property Owner Refusal/Complaint Report.,* along with any associated easement information.

8.3.4 Regional Forester Procedure

When aregional forester receives a refusal that the contract utility forester and general foreman/supervisor have been unable to resolve, within two weeks he or she shall contact the property owner to attempt to resolve the refusal. The forester may compromise work below the specifications, provided that trees have not grown within work thresholds in Tables 5.1 or 6.1 and the agreement will not present unreasonable safety or electric service risks. This section is not intended to defer judgment to property owners on how much clearance to allow. Neither is it intended to justify clearances outside of specification in order to avoid dealing with an escalated complaint.

If the forester cannot resolve the refusal, the customer shall be sent two letters by the same certified post. One is a description of the legal authority under which the Company is acting and the other letter summarizing the circumstances of the refusal and setting date and time that the tree will be worked. The date shall be at least five business days from the time the letter is postmarked. The refusal letter should reference the applicable written or prescriptive easement if they exist. The forester shall alert the director of vegetation management, transmission and distribution support managing director, as well as the appropriate operations manager, customer and community manager, wires director, and regulatory analyst about the letters. The regulatory analyst will inform the proper regulatory agency about the action. If it appears the media could become involved, the Media Hotline should be notified.

Once the letter is sent, tree crews shall be dispatched to work the site to specifications at the assigned date and time, regardless of whether or not a right-of-way or prescriptive easement exists. The forester or GF/supervisor should be on site during work. Records shall be kept for use in potential litigation. Before and after photos of the site should be taken.

TABLE 8.1. Prescriptive easement time requirements by state

State	Time
California	5 years
Idaho	20 years
Oregon	10 years
Utah	20 years
Washington	10 years
Wyoming	10 years

Figure 8.3. Refusal process.

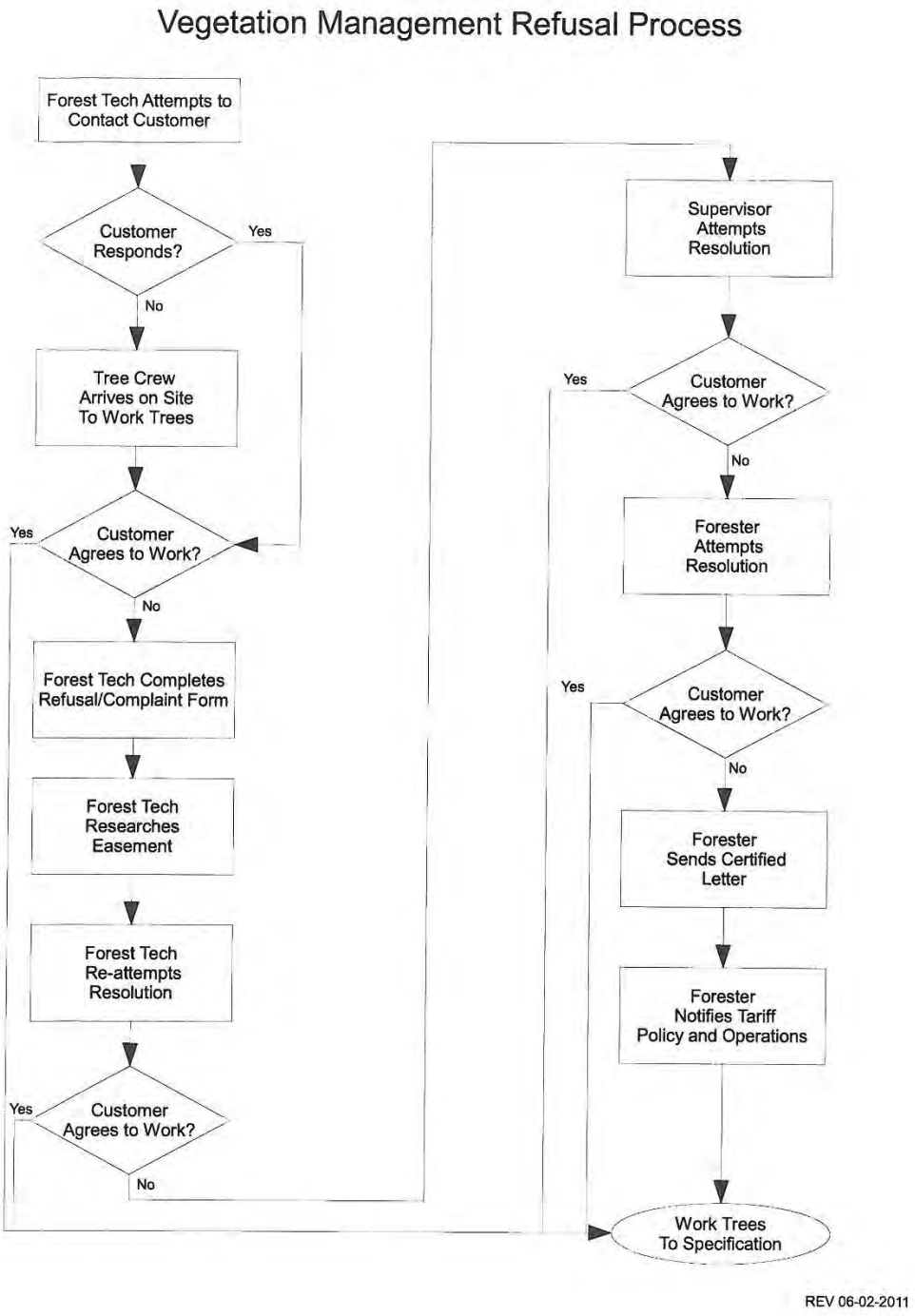

Figure 8.4. Information surrounding refusals should be documented and electronically filed with the appropriate project.

8.4 Customer and Property Owner Complaints

Customer and property owner complaints regarding any aspect of the vegetation management program shall be addressed promptly, fairly and professionally. PacifiCorp should be notified of complaints using a *Property Owner Refusal/ Complaint Report.* Customers will be contacted within 48 hours of receipt of the complaint. Documentation surrounding the refusal should be digitally filed to be accessed with other information from the specific project for use the next time through.

8.5 Commission Complaints

Response to commission complaints should take the highest priority. Commission responses should be made the same day and go through tariff policy with assistance from the vegetation management service coordinator. It is important to provide timelines with appropriate summaries of vegetation management's interaction with the subject party. Response for data request should be provided by the next business day if at all possible, but no later than three business days. Foresters should take the lead in Commission responses.

8.6 Customer Survey

PacifiCorp has Pacific Power and Rocky Mountain Power customer surveys. Surveys are vitally important for quality control, and for giving customer's a voice regarding vegetation management's performance.

The survey asks customers to rate from 1 (lowest) to 5 (highest) Vegetation Management's performance relative to five questions:

- Our notification clearly explained the work we would be doing.
- The workers were friendly and courteous.
- The work was completed as you understood it would be.
- The property was left neat and orderly.
- Overall, I am satisfied with how the work was handled.
- It also allows space for comments and for the customer to identify him/herself.

Tree crews should leave customer surveys on each property on which utility tree work is performed. For work on municipal or other government agency trees, a survey should be provided to the appropriate management authority. The area forester should also see that surveys are left on properties where they conduct crew audits. The survey is self-addressed and postage paid for the respondent's convenience.

9. DEFINITIONS

Allelopathy. Production of a chemical by one plant to suppress competing plants of other species.

BMP. Best management practice

Border zone. The Region A right-of-way portion that extends from the right-of-way edge to 10 feet from the outside phases.

Branch bark ridge. Area of raised bark between two stems. The ridge is formed as the two stems grow together, pushing the bark outward. A raised branch bark ridge is often a sign of a strong branch attachment.

Branch collar. Wood formed around a branch attachment. It contains wood from both the branch and parent stem.

Branch core. Area in the trunk of a tree that traces the branch back to its origins as a bud on a twig.

Branch protection zone. Area in the branch core that undergoes chemical change in response to wounding or disease in the branch. The chemicals protect the tree by inhibiting or preventing diseases from passing from the branch to the parent stem.

Caliper. The diameter of a tree six inches off the ground.

Cambium. Area of cell division responsible for stem diameter growth.

Clearance. Line de-energizing for safety purposes. Clearances require 48 hour notices to all customers that will be effected by the outage.

Company. PacifiCorp.

Crown reduction. Reduction of the top or sides of the tree by thinning cuts (lateral or branch collar cuts).

Crown Restoration. Restoring a previously headed stem's natural structure by thinning sprouts emanating from the old wound. Crown restoration should be done incrementally over the course of several cycles. The crowns of many third order trees may be so damaged they may never be restored.

Cycle buster. Fast-growing tree species that will not hold for a complete cycle.

Cycle work. Cycle work is described in section 5.2. It involves systematic work, addressing trees that have grown within work thresholds outlined in Tabe 5.1, and includes removals, herbicide and TGR treatments as outlined in the *Work Release.*

DBH. Diameter at breast height.

Danger tree. A tree on or off the right-of-way that may contact electric facilities either through growth or if it should fall.

Decurrent form. Trees lacking a strong central leader, resulting in a spreading crown (for example, American elm [*Ulmus americana]*).

Distribution line. Lines energized between 600 and 45,000 volts.

Drip line. The horizontal extent of the crown out to the branch tips.

Drop-crotch. Archaic term for lateral cut.

Excurrent form. Tree with a strong central leader (for example, Ponderosa pine [*Pinus ponderosa]*).

Fast -growing species. Tree species that vertically grows more than three feet per year.

Flush cut. A final pruning cut flush with the parent stem (the trunk, for example) that cuts into or removes the branch collar. Flush cuts are damaging and inappropriate.

GF. General foreman.

Hazard tree. Dead, dying, diseased, deformed, or unstable trees which have a high probability of falling and contacting a substation, distribution or transmission conductors, structure, guys or other Company electric facility.

Heading cut. Internodal cut on a stem, or a cut made to an inappropriate lateral.

Hold. Deactivating the automatic re-closers and the line. Holds are issued to a Journeyman lineman who, in the event of an outage, is responsible for ensuring that it is save to re-energize the line.

Included bark. Bark included in the juncture between two stems. It is a structural defect that can lead to stem failure.

Integrated Vegetation Management (IVM). Integrated vegetation management is a system of managing vegetation in which undesirable vegetation is identified, action thresholds are considered, all possible control options are evaluated, and selected control(s) are implemented (ANSI 2012a).

Interim Work. Scheduled work in the interim half way between cycles. For example, most of Oregon is on a four years cycle. Two years after completing cycle work, feeders will be scheduled for a systematic pass to work trees that will interfere with primary conductors before the end of the current cycle. Work should be limited to trees that grow six feet or more a year or hazard trees.

ISA. International Society of Arboriculture.

kV. One thousand volts.

Lateral cut. A cut that shortens a branch to a lateral no less than one-third the diameter of the original stem and removing no more than one-half the lead's foliage.

Lead. An upright trunk or major limb with a dominant role in the tree crown, and a lateral is a branch off a parent stem

Low-growing tree species. Trees with a potential mature height under 25 feet.

Merchantable timber. Trees with a DBH of 6 inches or more, which are

recoverable and have a market in the area.

Moderate-growing species. Tree species that can be expected to vertically grow between one and three feet per year under normal conditions.

MVCD. Minimum vegetation clearance distance. Maximum flash distance established by FAC-003.

Natural target. Proper final pruning cut location at a strong point in a tree's disease defense system. They are branch collars and proper laterals.

Pruning. Scientifically-based arboricultural practice of removing tree parts.

Readily climbable tree. Readily climbable trees have low limbs that are accessible from the ground and sufficiently close together so that the tree can be climbed by a child or average person without using a ladder or special equipment. Vehicles do not render trees climbable. Climbable trees should have a main stem or major branch that would support a child or average person either within arm's reach of an uninsulated energized electric line or within such proximity to the electric line that the climber could be injured by direct or indirect contact. They are located near homes, schools, parks, businesses or other locations where people (particularly children) frequent.

Refusal. A case where a property owner does not allow trees to be cleared from PacifiCorp facilities to specification.

Region A. The area in transmission rights-of-way where the wire is less than 50 feet off the ground.

Region B. The area in transmission rights-of-way where the wire is between 50 feet and 100 feet off the ground.

Region C. The area in transmission rights-of-way where the wire is more than 100 feet off the ground.

Round over. A traditional line clearing technique that lowers a tree to a specified clearance distance and sculpts it into a ball. Round overs are a damaging practice that expressly violate PacifiCorp specifications.

Sapling. Tree under four inches in diameter at breast height.

Secondary line. Wire energized to less than 600 volts.

Service line. A secondary line that runs between the electric supply and the customer.

Shall. A mandatory requirement.

Short-growing tree. A tree with a potential mature height of 25 feet or less.

Should. A strongly advisory recommendation. It shall be followed unless there is a compelling reason not to.

Slash. Brush and stems under 6 inches in diameter removed from trees during vegetation management operations.

Slow-growing species. Tree species that can be expected to vertically grow less than one foot per year.

Subordination. Removing the terminal, typically upright or end portion of a parent branch or stem to slow the growth rate so other portions of the tree grow faster (Gilman 2002).

Tall-growing species. Tree species that grow to 25 feet or more at maturity.

TGR. Tree Growth Regulator. In the context of these specifications, TGR refers to chemicals that slow growth of some tree species.

Transmission lines. Wire energized over 45 kV

Trimming. Reducing the length of toenails, hair, the amount of budgets and other things, Christmas tree decoration and unskilled removal of tree parts.

Volunteer. A naturally seeded, non-landscape tree.

Wetland. Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (EPA 2004) http://www.epa.gov/owow/wetlands/vital/what.html.

Whorl. A node in a pine tree where three or more limbs commonly originate.

Wire zone. Right-of-way portion that is directly under the wires and within 10 feet to the field side of the outside phases (Bramble et al. 2001).

Work threshold. Distance from conductors inside of which trees should be pruned or removed during cycle work.

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Attachment P-6. Avian Protection Plan

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Pacific Power
Avian Protection Plan

October 2014

Revision 7

Pacific Power Avian Protection Plan

Date: October 1, 2014 **Original Document: November 15, 2004**
Current Revision: Revision 7

Executive Summary

This Avian Protection Plan (APP) details the efforts conducted by Pacific Power in the states of Oregon, Washington, and California to protect eagles, hawks, and other migratory birds from electrocution and collision mortality on Pacific Power's overhead power lines. Since the 1980s, PacifiCorp has had a Bird Management Program in place to address bird issues in Pacific Power and Rocky Mountain Power. This Program was used as a template for the national Avian Protection Plan Guidelines (Avian Power Line Interaction Committee [APLIC] and U.S. Fish and Wildlife Service [USFWS] 2005) and includes the 12 principles identified in the Guidelines. This Pacific Power APP document includes PacifiCorp's existing Bird Management Program policies and procedures, identifies program updates, and details Pacific Power's proactive risk assessment and retrofitting efforts. The USFWS has contributed to the development of PacifiCorp's Bird Management Program over the years and is anticipated to continue to provide guidance in the implementation of this APP.

Purpose

Pacific Power's service area is in a region that supports a diversity of migratory birds, including eagles, raptors, and waterfowl. The purpose of this APP is to reduce mortalities of migratory birds while enhancing power reliability. This APP is intended to be a living document that will be updated as appropriate.

Background

In 2004, PacifiCorp and USFWS signed an "Avian Protection Plan for the Klamath Basin". The plan detailed efforts to be conducted by PacifiCorp in the Klamath Basin of Oregon and California to protect eagles, hawks, and other migratory birds from electrocution mortality on PacifiCorp's overhead power lines. This multi-year plan was developed in cooperation with USFWS and incorporated existing components of PacifiCorp's Bird Management Program with additional proactive efforts to identify and minimize avian electrocution risk within the Klamath Basin. In 2009, PacifiCorp developed APPs for its facilities in Wyoming, Idaho, and Utah. These plans contain comprehensive details of PacifiCorp's bird protection effects, addressing all 12 APP components, as well as long-term schedules for proactive retrofitting. This Pacific Power APP updates the original Klamath Falls APP to include current information consistent with the other recent PacifiCorp APPs and identifies current avian mortality risk areas throughout Pacific Power.

Pacific Power Avian Protection Plan
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I. BIRD PROTECTION POLICIES

PacifiCorp has two policies that address birds within both Pacific Power and Rocky Mountain Power:

1. Bird Management Program/Avian Protection Plan Policy
2. Bird Protection Policy for Substations

PacifiCorp's Bird Management Program Policy was updated in early 2009 to include installation of bird protection on equipment poles in all areas, not just outside city limits, and to include five distribution poles in each direction of eagle mortality poles for retrofitting. PacifiCorp's Policy and Standards for Bird Protection in Substations were also finalized in 2009.

Figure 1. PacifiCorp Bird Management Program/Avian Protection Plan Policy.

ROCKY MOUNTAIN POWER

PACIFIC POWER

PacifiCorp Bird Management Program/ Avian Protection Plan Policy

Bird interactions with power lines may cause bird mortalities, which, in turn, may result in outages, violations of bird protection laws, or raise concerns by employees, resource agencies and the public

This policy is intended to ensure compliance with legal requirements, while improving distribution system reliability. Transmission and Distribution Operation's management and employees are responsible for managing bird interactions with power lines and are committed to reducing the detrimental effects of these interactions.

To fulfill this commitment, PacifiCorp will:

- Implement and comply with its comprehensive Bird Management Program (also referred to Avian Protection Plan).
- Ensure its actions comply with applicable laws, regulations, permits, and Bird Management Program/Avian Protection Plan procedures.
- Provide information, resources, and training to improve its employees' knowledge and awareness of the Bird Management Program/Avian Protection Plan.
- Document bird mortalities and problem nests (including nests that are removed or relocated).
- Construct all new or rebuilt lines in rural areas (outside city limits or beyond residential/commercial developments) and appropriate urban areas to comply with PacifiCorp avian-safe standards.
- Construct all new or rebuilt equipment poles in all areas (within and outside city limits) to comply with PacifiCorp avian-safe standards. This is intended to ensure that bushings, cutouts, arresters, and jumpers are appropriately covered.
- Retrofit or modify facilities where protected birds have been killed or caused an outage. Modifications will be in accordance with Bird Management Program/Avian Protection Plan procedures.
- Retrofit five distribution poles, as needed, in each direction of eagle mortality poles.
- Participate with public and private organizations in programs and research to reduce detrimental effects of bird interactions with power lines.

PacifiCorp's customer service and regulatory compliance will be enhanced, and risk to migratory birds will be reduced through the proactive and innovative resolutions of bird power line interactions guided by this commitment.

Rich Walje, President
Rocky Mountain Power

Pat Reiten, President
Pacific Power

Paul Radakovich, VP, Operations
Rocky Mountain Power

Bill Eaquinto, VP, Operations
Pacific Power

April 2, 2009

Figure 2. PacifiCorp Bird Protection Policy for Substations.

ROCKY MOUNTAIN POWER

PACIFIC POWER

PacifiCorp Bird Protection Policy for Substations

Bird interactions with substations may cause bird mortalities, which, in turn, may result in outages, violations of bird protection laws, or raise concerns by employees, resource agencies and the public.

This policy is intended to ensure compliance with legal requirements, while improving system reliability. Substation Operation's management and employees are responsible for managing bird interactions with substations and are committed to reducing the detrimental effects of these interactions.

To fulfill this commitment, PacifiCorp will:

- Implement and comply with its comprehensive Bird Management Program.
- Ensure its actions comply with applicable laws, regulations, permits, and Bird Management Program procedures.
- Document bird mortalities and problem nests in substations.
- Provide information, resources, and training to improve its employees' knowledge and awareness of the Bird Management Program.
- New substations will comply with PacifiCorp avian-safe substation design standards.
- Retrofit or modify (whenever feasible) substations that pose a high risk due to bird or animal caused outages or protected bird mortalities. Modifications will be in accordance with Bird Management Program procedures and Company avian-safe substation design standards.

PacifiCorp's customer service and regulatory compliance will be enhanced, and risk to migratory birds will be reduced through the resolution of bird/animal substation interactions guided by this commitment.

Pat Reiten, President
Pacific Power

Rich Walje, President
Rocky Mountain Power

Bill Eaquinto, VP, Operations
Pacific Power

Paul Radakovich, VP, Operations
Rocky Mountain Power

Steve Henderson, Director
Substation Operations
Pacific Power

Kevin Freestone, Director
Substation Operations
Rocky Mountain Power

April 2, 2009

II. TRAINING

Bird Management Program/Avian Protection Plan training and/or training resources are provided as needed for various personnel within Pacific Power. Training may be delivered via bulletins, online information, or instructor/hands-on. Employees that may not be present during instructor-led training are required to review the online training with their manager.

Figure 3. Bird Management Program training schedules.

Department/Job Titles	Training Type	Frequency
T&D Field Operations and T&D Substation Operations (foremen, journeymen, troublemen, etc.)	Instructor led, Online, and/or Information Bulletins	As needed
New Managers	Instructor led	As needed
Estimators	Instructor led	As needed
Service Coordinators	Instructor led and Online	As needed
Vegetation Management (training for employees and contractors regarding nest protection)	Instructor led and Online	Annual or as needed
Contract line construction crews and Inspectors	Instructor led	As needed
Dispatch	Instructor led and Online	As needed

Instructor-led training presentations are modified as needed to include current policies, practices, standards, and materials. Online resources are available as training aids. Interactive online training programs may be developed as needed for particular job titles, e.g. service coordinators or dispatchers. The following is a list of training materials that are available online or through Environmental Services (items marked with an * are included in the following pages):

- Bird Management Program Guidelines
- Protected bird mortality/problem nest flowchart for T&D Field Operations (*Figure 4)
- Protected bird mortality/problem nest flowchart for T&D Substation Operations (*Figure 5)
- PacifiCorp's Guide to Birds on Power Facilities
- Protected species/bird-related outage cause codes handout (*Figure 6)
- Documentation flowchart for service coordinators (*Figure 7)
- SAP and BMTS instructions for service coordinators
- Procedures for retrofitting eagle mortality poles and adjacent structures (*Figure 8)

Figure 4. Protected bird mortality/problem nest flowchart for T&D Field Operations (page 1 of 2).

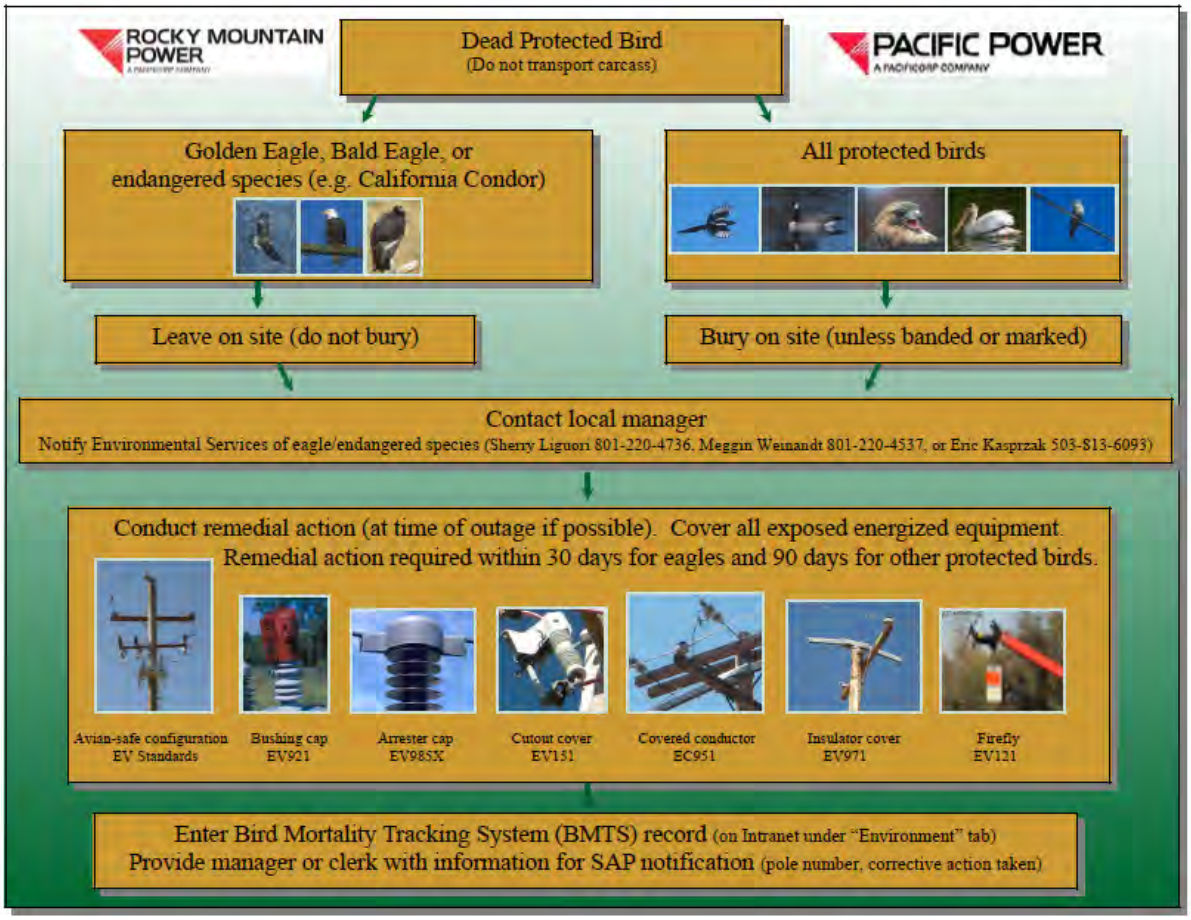

Figure 4 (con't). Protected bird mortality/problem nest flowchart for T&D Field Operations (page 2 of 2).

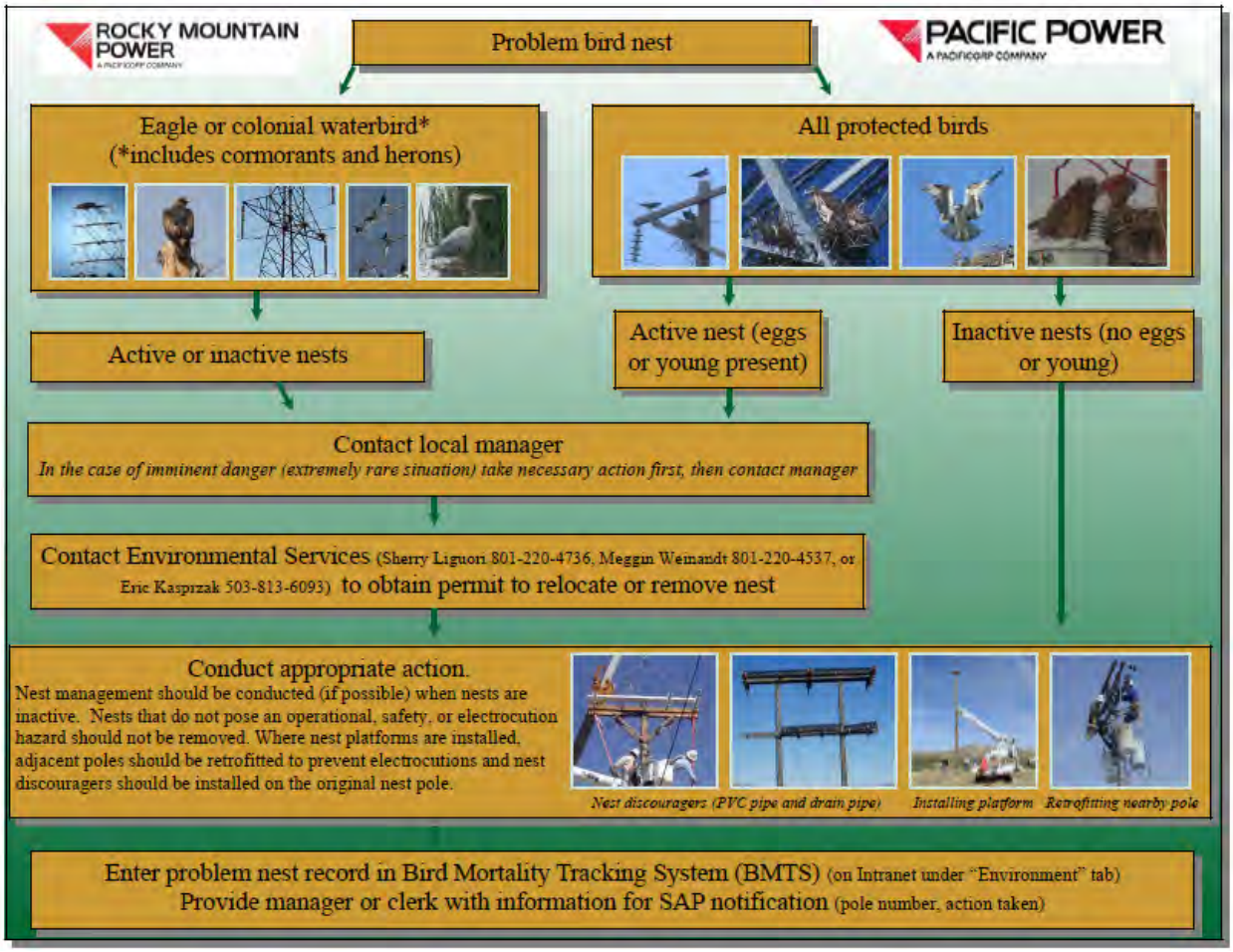

Figure 5. Protected bird mortality/problem nest flowchart for T&D Substation Operations (page 1 of 2).

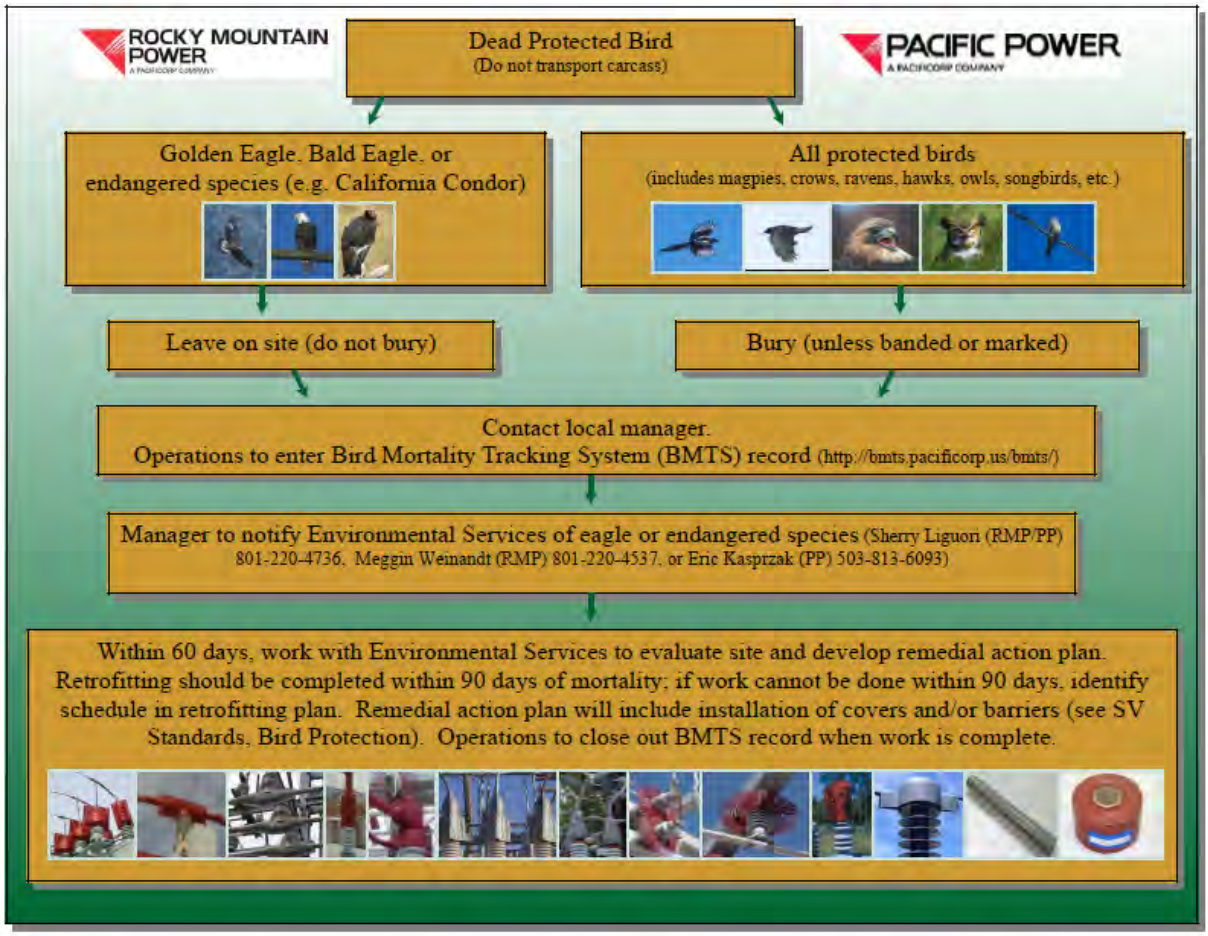

Figure 5 (con't). Protected bird mortality/problem nest flowchart for T&D Substation Operations (page 2 of 2).

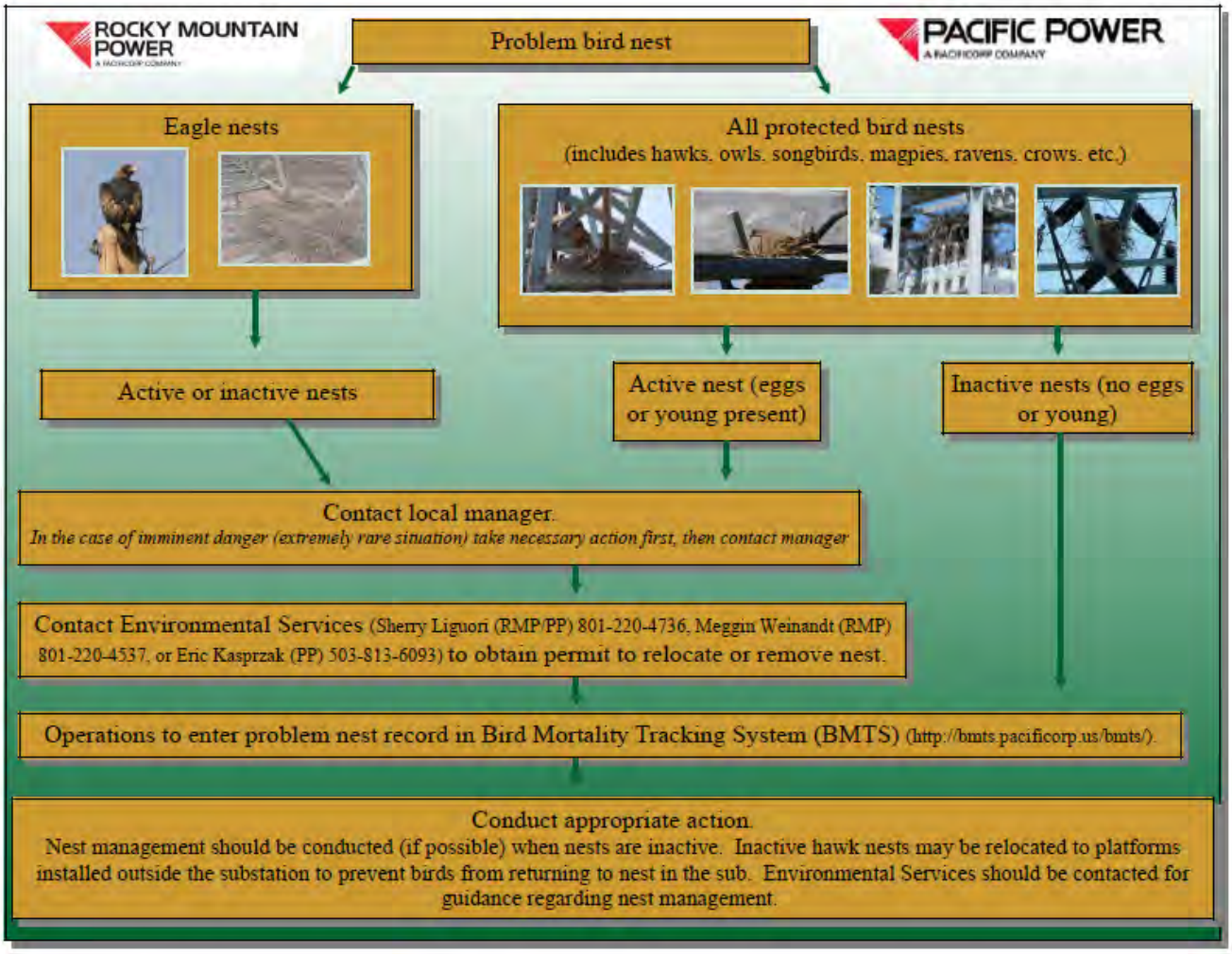

Figure 6. Protected species/bird-related outage cause codes handout (page 1 of 2).

Figure 6 (con't). Protected species/bird-related outage cause codes handout (page 2 of 2).

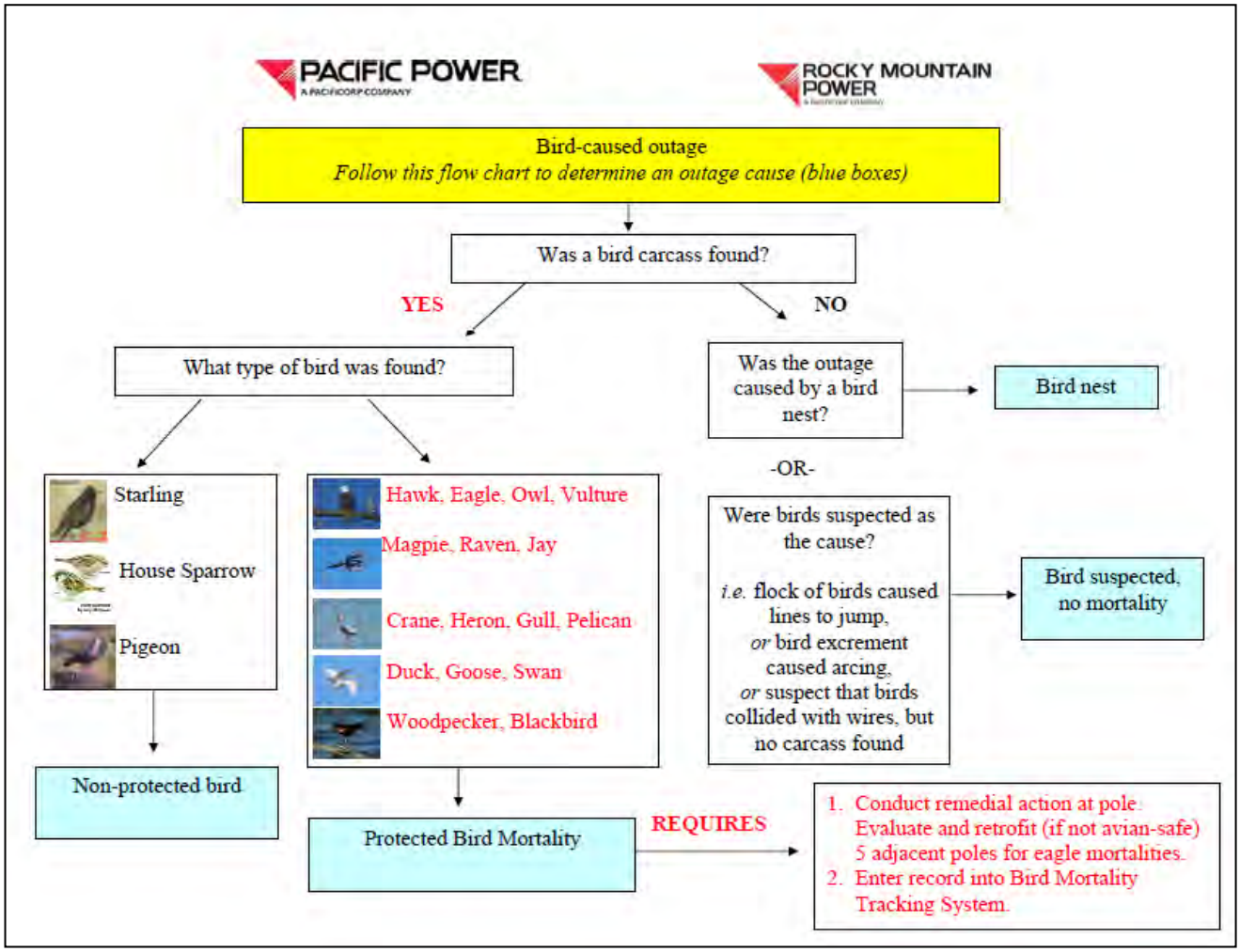

Figure 7. Documentation flowchart for service coordinators (page 1 of 2).

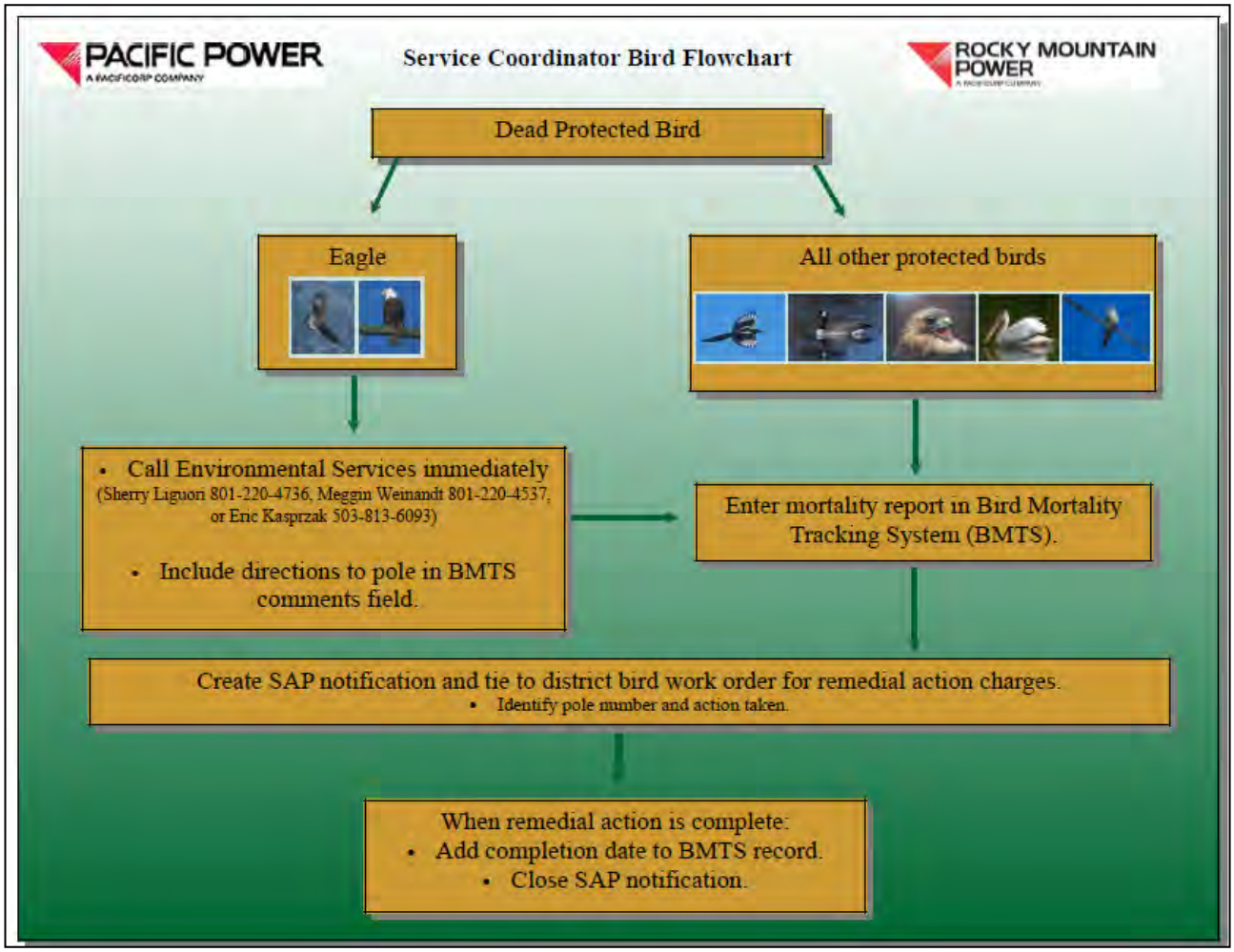

Figure 7 (con't). Documentation flowchart for service coordinators (page 2 of 2).

ROCKY MOUNTAIN POWER

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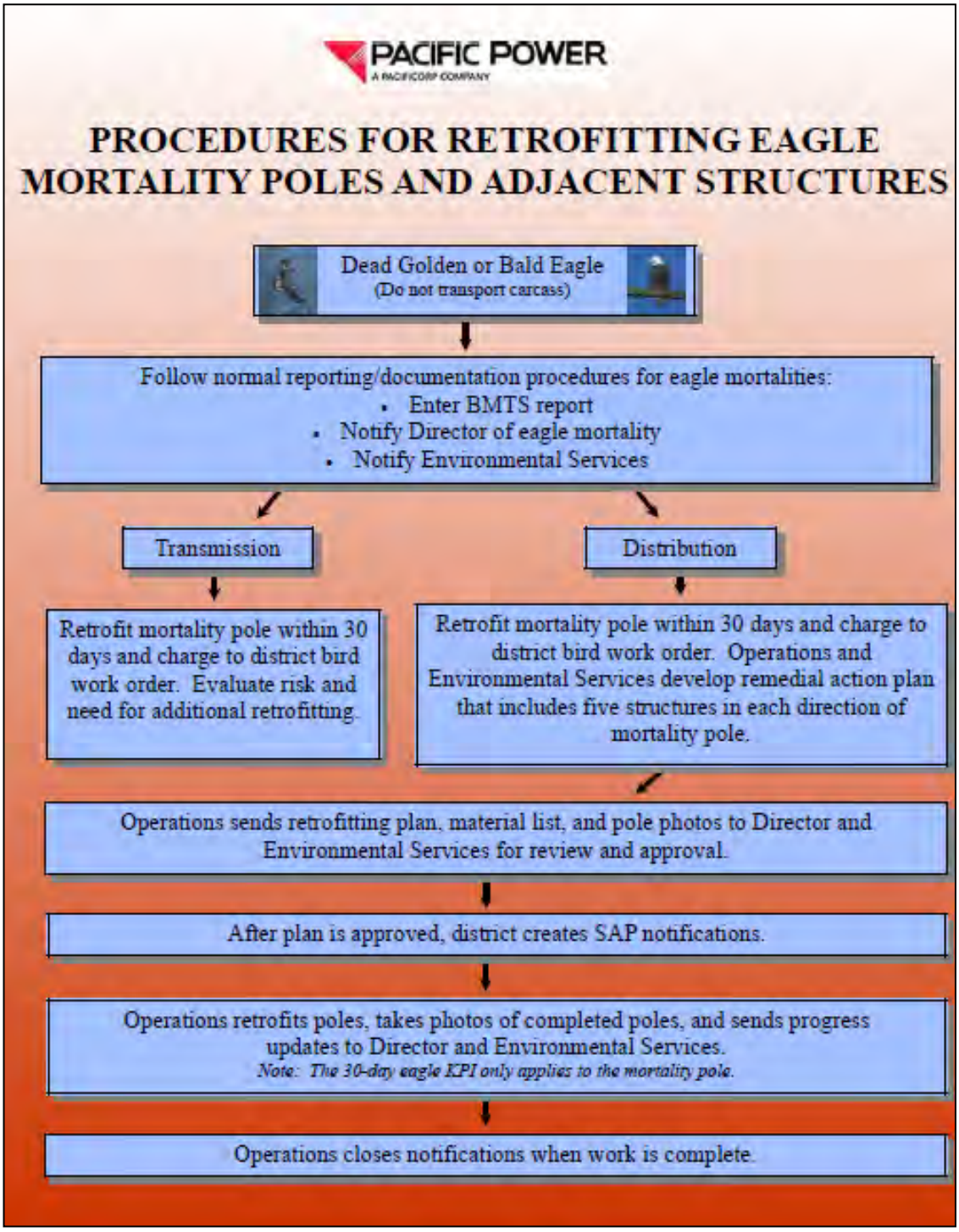
Service Coordinator Bird Monthly Checklist

To ensure complete documentation of bird-related records, please review this checklist monthly:

- Are all protected bird mortalities entered into the Bird Mortality Tracking System?
- Do BMTS records contain a completion date if work is completed?
- Are all problem nests entered into the Bird Mortality Tracking System? This includes any nest that caused an outage, was removed, or relocated.
- Are SAP notifications created and tied to your district bird work order for all charges to that order within the month?
- Do SAP notifications identify which facilities were worked on and what remedial actions were taken?
- Are SAP notifications closed if work is completed?

Questions? Contact Environmental Services:
Sherry Liguori 801-220-4736
Meggin Weinandt 801-220-4537
Eric Kasprzak 503-813-6093

Figure 8. Procedures for retrofitting eagle mortality poles and adjacent structures.



III. PERMITS

PacifiCorp has a Special Purpose Permit issued by the U.S. Fish and Wildlife Service that authorizes temporary possession for disposal of migratory birds and management of migratory bird and eagle nests in Pacific Power (see Figure 12).

As a condition of this permit, an annual report is submitted to USFWS and each state wildlife resource agency detailing the number of protected bird mortalities, active and inactive nests removed or relocated, number of poles and substations retrofitted, dollars spent, nest platforms installed, and other items of significance (Figures 10 and 11). Data from the Bird Mortality Tracking System and SAP are used to generate the information submitted in this report.

Figure 9. Permit action items.

Action Items:	Responsible Department:	Milestone (Due Date)	Status
Submit annual permit report and renew permit as needed for USFWS Special Purpose Permit.	Environmental Services	January 31 of each year	Completed through 2013

Figure 10. Annual Washington permit report data submitted to agencies.

Year	Number mortalities	Number poles with remedial action	Number nest platforms installed	Number substations retrofitted	Cost (O&M and Capital)
2004	6	2	1	0	$5,902
2005	20	35	4	0	$55,197
2006	13	57	1	0	$71,951
2007	23	17	6	1	$54,088
2008	18	20	0	3	$37,851
2009	31	31	1	0	$120,624
2010	18	46	3	2	$84,638
2011	42	13	3	5	$417,946
2012	25	1,016	8	1	$1,299,799
2013	22	267	6	9	$711,704

Figure 11. Annual Oregon/northern California permit report data submitted to agencies.

Year	Number mortalities	Number poles with remedial action	Number nest platforms installed	Number substations retrofitted	Cost (O&M and Capital)
2004	127	50	3	0	$117,194
2005	230	1,047	5	0	$498,403
2006	125	2,829	10	3	$1,775,373
2007	217	773	13	5	$613,811
2008	248	1,344	22	19	$900,923
2009	301	4,791	22	3	$3,690,267
2010	331	2,151	33	12	$1,871,595
2011	185	3,639	13	13	$3,391,523
2012	194	670	15	5	$1,015,951
2013	118	1,068	10	7	$1,371,700

Figure 12. U.S. Fish and Wildlife Service Special Purpose Permit for PacifiCorp.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

FEDERAL FISH AND WILDLIFE PERMIT

2. AUTHORITY-STATUTES
16 USC 703-712

REGULATIONS
50 CFR Part 13
50 CFR 21.27

1. PERMITTEE

PACIFICORP ENERGY
dba PACIFIC POWER & ROCKY MOUNTAIN POWER
ATTN: TRAVIS BROWN
1407 W NORTH TEMPLE, #330
SALT LAKE CITY, UT 84116
U.S.A.

3. NUMBER
MB737207-1 AMENDMENT

4. RENEWABLE ☒ YES ☐ NO

5. MAY COPY ☒ YES ☐ NO

6. EFFECTIVE 11/18/2013

7. EXPIRES 03/31/2016

8. NAME AND TITLE OF PRINCIPAL OFFICER (If it is a business)
SHERRY LIGUORI
ENVIRONMENTAL ANALYST

9. TYPE OF PERMIT
MIGRATORY BIRD SPECIAL PURPOSE UTILITY SALVAGE PERMIT - ELECTRIC

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
Records Kept: Address in Block 1 Above
Activities Conducted: Service territories and/or facilities in
OREGON IDAHO WASHINGTON CALIFORNIA

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW

C. VALID FOR USE BY PERMITTEE NAMED ABOVE

11C (Continued)

The following subpermittees are authorized: PacifiCorp, Rocky Mountain Power personnel, designated a subpermittee by you in writing, may exercise the authority of this permit. Submit a list of subpermittees with annual report.

D. **Possession and transport.**

(1) You and subpermittees are authorized to collect, transport and temporarily possess carcasses and partial remains of migratory birds, **except Bald Eagles and Golden Eagles (Eagles)** and species listed as **Threatened or Endangered** under the U.S Endangered Species Act (see 50 CFR § 17.11), found at the location/property specified in Block 10 for migratory bird mortality monitoring purposes per agreed upon protocol between you and the U.S. Fish and Wildlife Service (Service), or for human health and safety purposes. For **Eagles and federally listed Threatened or Endangered Species** you must call a Service, Office of Law Enforcement (OLE) special agent for instructions and approval BEFORE collecting or moving the carcass(es) or parts. It may be necessary to preserve the carcass (es) or parts onsite until an agent or other Service or State representative arrives to collect. Your OLE contact phone number is CA (916) 569-8444, ID (208) 442-9551, OR (503) 682-6131, WA (425) 883-8122

For all other migratory birds, complete data collection report per Condition 11F below PRIOR to collecting or moving the carcass or its parts.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
ANNUAL REPORT DUE: 01/31
Annual Report Form: www.fws.gov/forms/3-202-17.pdf
Additional Reporting Requirements in Condition I (Reporting).

ISSUED BY	TITLE	DATE
Terrel Rice	CHIEF, MIGRATORY BIRD PERMIT OFFICE - REGION 1	11/18/2013

IV. AVIAN-SAFE CONSTRUCTION DESIGN STANDARDS

PacifiCorp applies avian-safe construction design standards and bird protection products for distribution, transmission, and substation facilities. PacifiCorp's avian-safe construction standards meet or exceed current Avian Power Line Interaction Committee (APLIC) recommendations (*Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* and *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994,* or current version). Avian-safe designs for transmission and distribution structures are achieved by framing poles with 60-inch horizontal and 40-inch vertical phase-to-phase and phase-to-ground separation, or by using covers to achieve these distances. These separations are based on the dimensions of eagles as recommended by APLIC (2006) for utilities located in areas where eagle electrocutions may occur. Because eagle electrocutions in substations are unlikely and have never been documented in PacifiCorp's system, our avian-safe substation standards apply separations based on the dimensions of the largest birds that may be electrocuted in our substations (e.g., red-tailed hawk, great horned owl, common raven). Consequently, PacifiCorp's avian-safe substation designs apply covers or barriers where phase-to-phase or phase-to-ground separation is less than 46 inches horizontal or 30 inches vertical.

The EV section of the T&D Standards includes avian-safe construction requirements and descriptions, installation instructions, and stock item numbers for bird protection products (see Appendix A). Although perch discouragers had been used in the past to reduce electrocutions by managing where birds perch, PacifiCorp has removed perch discouragers from its electrocution-prevention standards because perch discouragers can result in unintended electrocutions, aid in the accumulation of nest material, and are not as effective as insulator covers in preventing electrocutions. Installing covers or reframing crossarms are the preferred methods for avian protection.

Bird protection standards for substations are included in the SV section of the substation standards. Covers and/or barriers may be used for avian protection in distribution (34.5kV or less) substations.

All bird protection standards and products are reviewed periodically and may be updated to ensure that the best available products and methods are being used. Avian-safe designs are designated throughout the T&D and Substation Standards with the following symbol:

May be used
In raptor areas

The following tables provide quick reference guides for bird protection materials contained in the EV section of the T&D Standards and the SV section of the Substation Standards. Examples of common avian-safe design standards are shown in Appendix A.

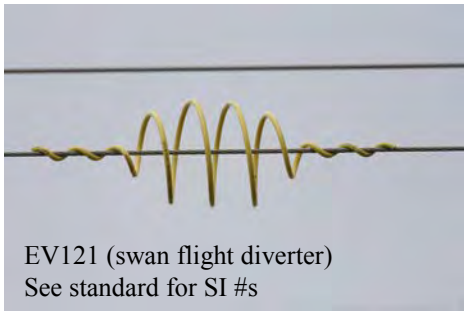
Figure 13. Summary of transmission and distribution bird protection products.

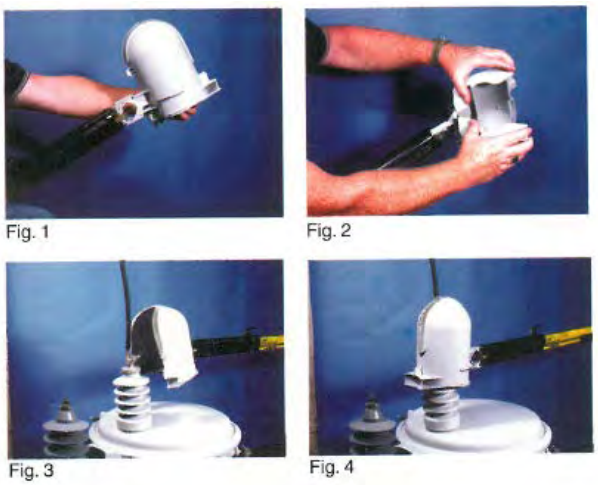
Standard	Product	Stock Item Number
EV001	N/A (contains general information on bird protection)	N/A
EV011	N/A (contains information on non-avian-safe designs)	N/A
EV021	N/A (contains information on avian-safe designs)	N/A
EV101	Perch (for use with nest platforms)	1650120 (constructed locally; not available for purchase)
EV121	Line marking devices: • Bird flight diverters (BFD) • Swan flight diverters (SFD) • Fireflies (fixed) • Bird mark diverters (Swivel)	Conductor diameter 0.175-0.249 in. • BFD = 1010208 • SFD = 7999149 Conductor diameter 0.25-0.349 in. • BFD = 1010209 • SFD = 7999150 Conductor diameter 0.35-0.449 in. • BFD = 1010210 • SFD = 7999151 Conductor diameter 0.45-0.599 in. • BFD = 1010211 • SFD = 7999152 Firefly (fixed): 7991245 Bird mark diverter (swivel): 8001251
EV131	Nest platform	7991280 (constructed locally; not available for purchase)
EV141	Pole top extension	Fiberglass: 7991281 Wood: 7991282 Adapter for wood: 7991283
EV151	Cutout covers	Porcelain 110-125 BIL: 7992182 Porcelain 150 BIL: 7992181 Polymer 150 BIL: 7992738 Power Fuse SMD-20: 7999498
EV901	Jumper covers/hose	Silicone split hose 0.5 in.: 7991284 Silicone Non-spilt hose 0.5 in: 7999413 Silicone split hose 0.75 in.: 7889508 Silicone spilt hose 1.0 in: 7885024 Silicone split hose 1.25 in.: 7991311
EV911	Cap, Pole Top, Perch Deterrent	8-3/8” : 8000362 10-1/4”: 8000364 11-3/4”: 8000365
EV921	Bushing cover	Spring loaded 3”-4.75”: 7999796 Regulator bushing 2.5”-6.8”: 7999573 Recloser bushing: 7999544 Voltage transformer bushing: 3091183 Current transformer bushing: 3091184
EV935	Animal Barrier	Barrier 24”: 8000316
EV951	Covered conductor	#6 solid: 4121000 #4 7-strand: 7992803 #2 7-strand: 8000301
EV971	Insulator cover	Snap-fit pin: • 3-piece, #6 to 795: 7999268 • 3-piece, #6 to 795, fits 56-2 and 56-3: 7999312 • 3-piece, Post-insulator: 8000306

Standard	Product	Stock Item Number
		• 3-piece, Lindsey clamp: 8001203 • 3-piece, Vise-top: 8002161 • double pin, #6 to 795: 7999269 • double pin, #6 to 795, fits 56-2- 56-3: 8002955 • double pin, Vise top: 8002958 • 3-piece, small angle: 8002960 • 3-piece, large angle: 8002971 • 3-piece, small double angle: 8002956 • 3 piece, large double angle: 8002943 • dead-end, #6 to 556:8000307
EV983	Arrester bracket cover	Arrester bolt: 7992055
EV985	Arrester cover	Surge arrester: 7992710 Regulator series arrester: 7999500 Underbuilt arrester: 7889165
EF301	Hendrix-clamp-top Insulator	7999665

Figure 14. Photos of common transmission and distribution bird protection products.

EV121 (bird flight diverter)
See standard for SI #s





EV151
SI# 7999796

Figure 14 (con't). Photos of common transmission and distribution bird protection products.

EV971 SI#8002161

EV971 SI#8000306

EV971
SI# 7999268

EV971
SI# 7999312

EF301
SI# 7999665

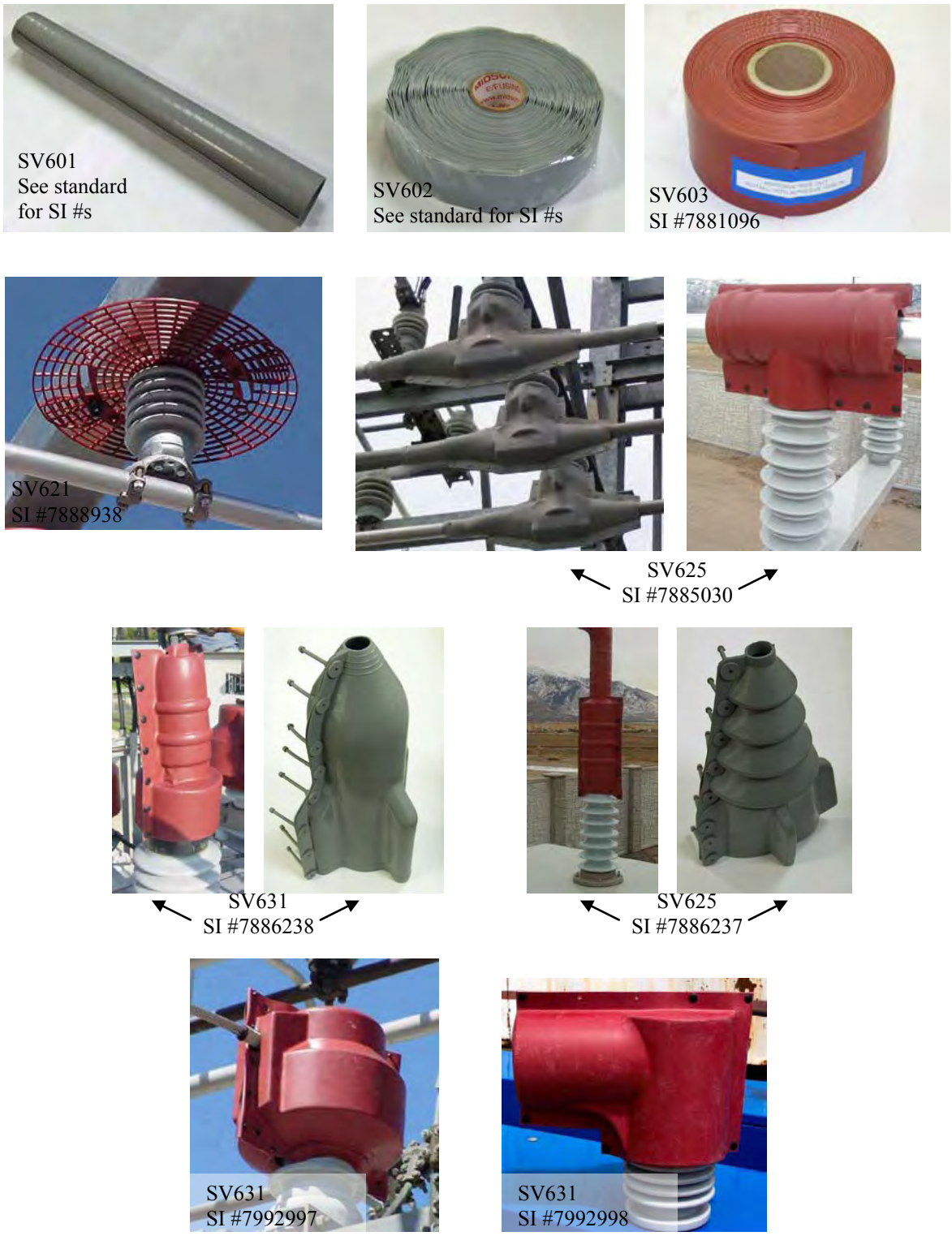
EV971 SI#8002960

EV971 SI# 8002457

Figure 15. Summary of substation bird protection products.

Standard	Product	Stock Item Number
SV601	Hose (split), 0.5 in.	7885023
SV601	Hose (split), 0.75 in.	7889508
SV601	Hose (split), 1 in.	7885024
SV601	Hose (split), 1.25 in.	7991311
SV601	Hose (split), 1.75 in.	7885025
SV601	Hose (split), 2.5 in.	7885026
SV601	Hose (split), 3.5 in.	7885027
SV602	Fusion Tape	7999756
SV603	Heat-shrink tape-2 in.	1005004
SV611	Covered conductor, #6 7-strand	7999036
SV611	Covered conductor, #4 7-strand	7992803
SV611	Covered conductor, #2 7-strand	8000301
SV621	Shield, 24 in.	8000316
SV625	Bus support cover	8000322
SV 625	Bushing cover, large arrester	7992997
SV631	Bushing cover, medium, sight glass	7889141
SV631	Bushing cover, large, sight glass	7889164
SV631	Bushing cover, large, tall	7999545
SV631	Bushing cover, medium, tall	7999570
SV631	Bushing cover, right angle, large	7992998
SV631	Bushing cover, right angle, medium	7999544
SV631	Bushing cover 6”	7999573
SV631	Bushing cover 8”	7999574
SV631	Bushing cover, large, Mid sun	7886238
SV631	Bushing cover, medium, Mid sun	7886237
SV631	Bushing cover, small, Mid sun	7886236
SV631	Arrester cover, 5” diameter	7992710
SV631	Arrester cover, 3.75” diameter	8001235
SV631	Bushing/Arrester cover 4”	7999572
SV631	Bushing/Arrester cover 5”	7889165
SV631	Spring loaded bushing cap	7999796
SV631	Box-shaped cover 24”x11”x12”	7999753
SV631	Box-shaped cover 12”x12”x5”	7999751
SV631	Box-shaped cover 14”x19”x6”	7999752
SV631	Box-shaped cover 4”x12”x4”	7999754
SV631	Box-shaped cover 4”x16”x4”	7999755
SV631	Box-shaped cover 7”x12”x7”	7999571
SV631	Termination/riser covers	7999750
SV641	Insulator barrier cover	7999596
SV631	Silicone Sheet 2’x10’	7888611

Figure 16. Photos of common substation bird protection products.



V. NEST MANAGEMENT

Some birds, including hawk species and ravens, use distribution poles, transmission structures, and substations as substrates for nests. Bird nests on utility facilities can cause bird electrocutions, fires, outages, and other operational problems. Active nests (those with eggs or young) are protected by the Migratory Bird Treaty Act (MBTA) and cannot be removed without a permit. In the case of 'imminent danger' (circumstance where a bird nest poses impending danger of fire, safety risk to crew, avian electrocution, or threat to human life or property that requires immediate action), Pacific Power crews may take immediate appropriate action (nest material trimmed, conductors moved, or nest removal) prior to receiving a permit. However, Environmental Services must be contacted immediately to report 'imminent danger' action taken. Practices to ensure the welfare of nestlings, such as contacting an avian rehabilitator or relocating a nest to a platform, must be followed. If an active nest is to be relocated to a platform, Environmental Services must be contacted to obtain authorization from the U.S. Fish and Wildlife Service. Likewise, if a bird is taken to a licensed wildlife rehabilitator, Environmental Services must be contacted. The U.S. Fish and Wildlife Service allows the public to transport birds to wildlife rehabilitation facilities without specific authorization as long as the bird is directly transported to the rehabilitation center. Inactive problem nests of species other than eagles, herons, or endangered/threatened species can be removed without a permit. Any nest management activities must be documented in the Bird Mortality Tracking System (see Section VI., Reporting).

Eagle or Endangered Species Nests

All eagle (bald and golden), endangered/threatened species, and colonial waterbird (i.e herons, cormorants) nests are protected by federal laws, regardless of whether they are active or inactive. Although eagle nests are uncommon on power equipment, they occasionally occur and can require management action. Contact Environmental Services for confirmation if a problem nest is suspected to be that of an eagle, heron, or endangered species. In the exceptional case of imminent danger, nest material may be trimmed, conductors moved or covered, nest removed, or other appropriate action taken immediately. Practices to ensure the welfare of nestlings, such as contacting an avian rehabilitator or relocating a nest to a platform, must be followed. Any action taken on an active nest prior to Environmental Services notification is highly unusual, and extreme caution is recommended to protect eggs or young and avoid violating federal laws.

Problem Nest Management Options

Many birds build nests on Pacific Power's facilities. Some nests do not pose safety, reliability, outage, or bird electrocution risks. These nests should be left alone. However, other nests may present safety, reliability, outage, or bird electrocution risks. These nests are referred to as "problem nests." Managing problem nests involves several components:

- Discouraging birds from nesting in problem areas
- Providing an alternative nest site
- Ensuring that surrounding utility facilities are avian-safe

Bird nest management procedures are summarized for T&D Field Operations in Figure 4 and for T&D Substation Operations in Figure 5. Nest removal or relocation is intended for problem nests or circumstances where there is an electrocution risk to nesting birds. Nests not interfering

with power operations should be left in place. If a problem with a specific nest is anticipated in the future, permit requirements may be minimized by taking the appropriate action during the non-breeding season before the nest is active. The period when nests are active for most species falls between February 1 and August 31. If there are questions whether a problem nest is active or inactive, contact Environmental Services.

Because birds exhibit strong fidelity to nest sites, removing an inactive nest or nest material alone is often ineffective in preventing nesting. Drain pipe or PVC pipe split in half lengthwise and banded to the crossarms can be used to deter nesting on poles (see Figure 17). Likewise, double wooden crossarms may be changed out with a single fiberglass arm to discourage nesting (see Figure 17). Discouraging nesting in substations can be more difficult and would typically involve site-specific measures. Triangles or spikes should ***not*** be used to deter nesting as they can actually aid in the accumulation of nest material. Where possible, constructing a nest platform on an alternate non-energized pole set off the line or outside the substation is preferred over installing a nest platform on an existing pole with energized facilities. Artificial nesting substrates in a variety of designs are accepted by nesting raptors, especially ospreys. A new nest platform pole should be as tall as or taller than the existing pole.

In some cases a new pole cannot be installed, therefore a nest platform can be mounted above the crossarm. Mounting a nest platform above energized equipment is not encouraged since fallen nest debris could cause a fire or outage. Nest platforms constructed by volunteers are available from Environmental Services. In addition, Standard EV 131 contains a diagram for constructing nest platforms.

Raptors and other birds can be sensitive to human activity near their nest sites. Prolonged human activity (such as line or substation construction) and noise near nest sites can result in nest abandonment or exposure of chicks and/or eggs to the elements (and potential mortality). Prolonged construction activities within buffer distances of active raptor nests (as identified in U.S. Fish and Wildlife Service Raptor Guidelines; typically within 1 mile for eagles and ¼ or ½ mile for other raptors) should be avoided until young have fledged or unless directed otherwise by Environmental Services and the U.S. Fish and Wildlife Service. Active or inactive nests should not be removed to facilitate construction schedules. When relocating active problem nests or performing maintenance near active nests, efforts should be made to minimize the amount of time adult birds are off the nest while maintaining proper safety practices. Environmental Services should be contacted if there are questions or if assistance is needed in nest relocation efforts.

Figure 17. Examples of problem nests and nest management practices.

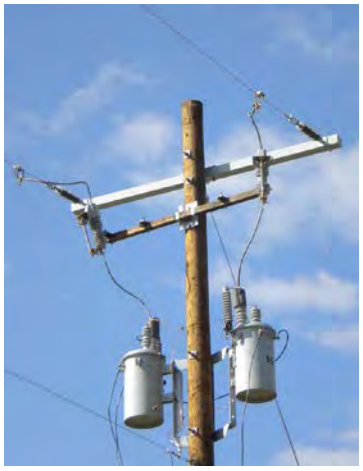
Potential problem nest

Problem nest in substation

Ineffective nest discouragers

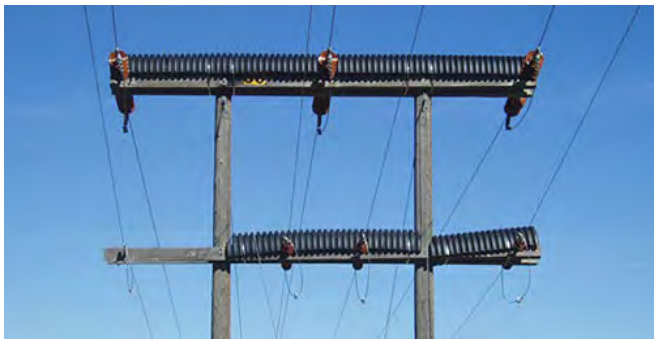
Problem nest relocated from above insulator string to nest platform

Separate pole with nest platform



Fiberglass deadend arm

Split PVC pipe nest discourager



Split drain pipe nest discourager

VI. REPORTING

Bird Mortality Tracking System

Reporting protected bird mortalities and nest management activities are required components of Pacific Power's Bird Management Program and agency permits. The Bird Mortality Tracking System (BMTS) is used to track both bird mortalities and nests on utility facilities. Data from BMTS is used to generate weekly, monthly, and annual internal reports as well as external agency reports. BMTS records also contain identification numbers of outages and SAP notifications, used to ensure that outages caused by protected bird mortalities or nests are documented, and that remedial actions and associated costs are tracked. Several key programs are used to identify and track bird incidents: BMTS, SAP, Prosper, GIS, and risk assessment survey data and photos. BMTS is modified as needed to fix program bugs and to ensure that necessary information is being tracked. Environmental Services is working with the GIS Department to evaluate the feasibility of including a BMTS data layer in Power Map.

Figure 18. Reporting action items.

Action Items:	Responsible Department:	Milestone (Due Date)	Status
Submit bird mortality and retrofitting information in weekly reports.	Environmental Services	Weekly	Ongoing
Submit bird mortality and outage information in monthly bar charts.	Environmental Services	Monthly	Ongoing
Submit information on retrofitting of protected bird and eagle mortality poles for monthly reports.	Environmental Services	Monthly	Ongoing

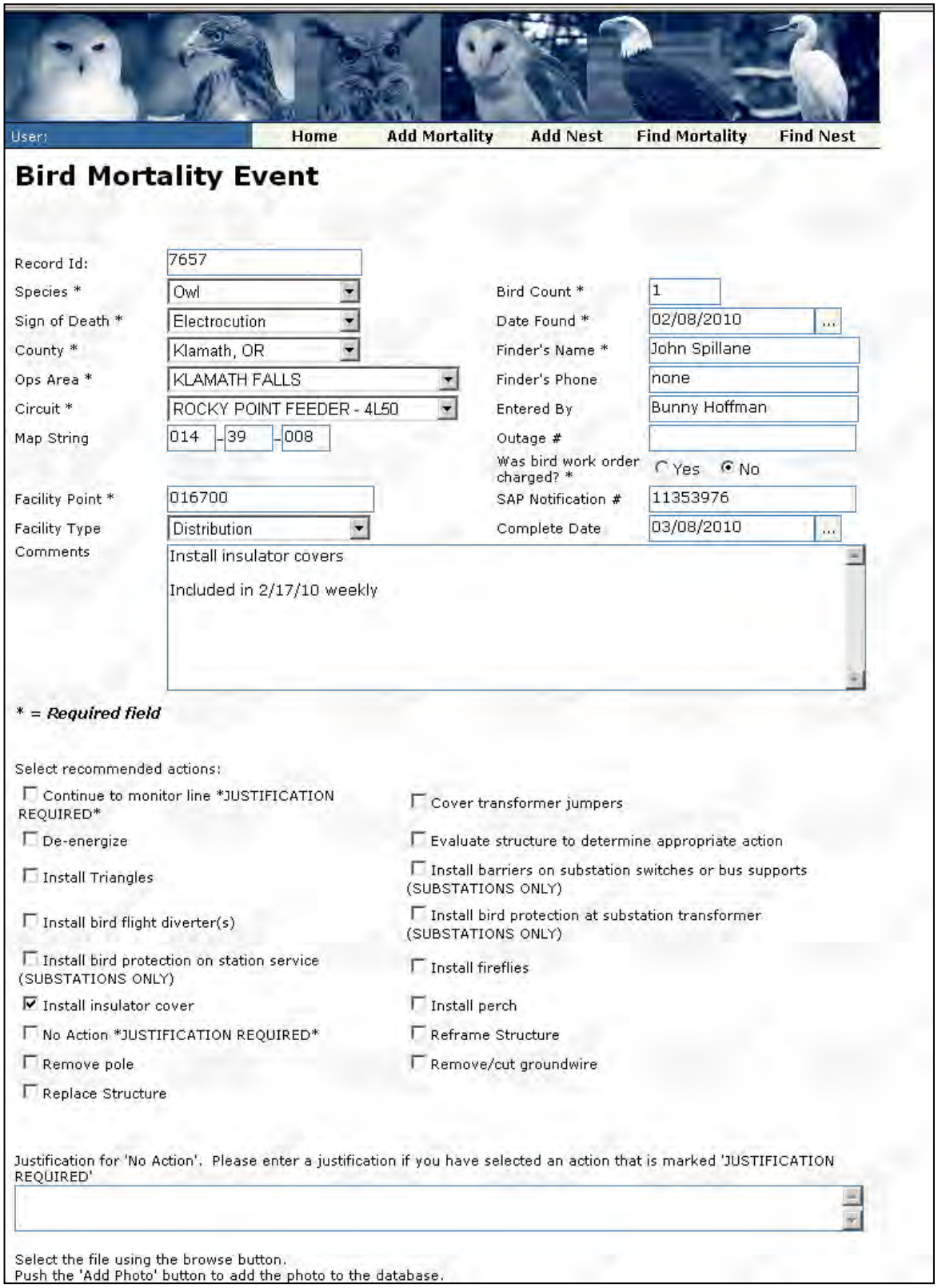
Data Entry

T&D Field and Substation Operations are responsible for entering protected bird mortalities and problem nests that they discover or that are reported to them (e.g., by customers or agencies). All protected bird nests that are removed or relocated (either active or inactive), or that cause an outage, must be reported in BMTS. Field forms are available from Environmental Services or online for crews to keep in their vehicles and complete when birds are found. Any company employee can access BMTS online at the Environmental webpage (see Figure 20 for BMTS screen-shot). Often, records are entered by service coordinators, managers, foremen, troublemen, or line crews. BMTS records should include complete data on the incident with a clear description of remedial action taken, photos if available, and directions to the site for eagle mortalities (so that U.S. Fish and Wildlife Service can recover the bird). In the case of eagle mortalities, Environmental Services should be contacted immediately, as the U.S. Fish and Wildlife Service requires reporting of eagle mortalities per SPUT permit timeline. BMTS records should not be "closed out" (e.g., date of completion added) until the work has been done. When work is complete, the completion date should be updated in BMTS and the SAP notification should be closed. A SAP notification is required for all charges to district bird work orders (see Figure 19). SAP training for bird work orders is available online, with screen-by-screen instructions. If there are questions or problems with BMTS or SAP entry related to birds, contact Environmental Services.

Figure 19. Pacific Power bird work orders.

State	District	Capital Work Order	O&M Work Order
California	Alturas	10036577	ALTRAPTOR
	Crescent City	10036576	CRERAPTOR
	Klamath Falls CA	10036575	KLARAPTOR
	Mt Shasta	10036574	MTSRAPTOR
	Yreka	10036573	YRERAPTOR
Oregon	Albany	10036598	ALBRAPTOR
	Astoria	10036597	ASTRAPTOR
	Bend	10036596	BENRAPTOR
	Coos Bay	10036595	COORAPTOR
	Cottage Grove	10036594	COTRAPTOR
	Dallas	10036593	DALRAPTOR
	Enterprise	10036592	ENTRAPTOR
	Grants Pass	10036591	GRARAPTOR
	Hermiston	10036590	HERRAPTOR
	Hood River	10036589	HOORAPTOR
	Klamath Falls OR	10036588	KLARAPTOR
	Lakeview	10036586	LKVRAPTOR
	Lincoln City	10036587	LINRAPTOR
	Madras	10036585	MADRAPTOR
	Medford	10036584	MEDRAPTOR
	Pendleton	10036583	PENRAPTOR
	Portland	10036582	PORRAPTOR
	Prineville	10036581	PRNRAPTOR
	Roseburg	10036580	ROSRAPTOR
	Stayton	10036579	STARAPTOR
	Walla Walla OR	10036578	WALRAPTOR
Washington	Sunnyside	10036601	SUNRAPTOR
	Walla Walla WA	10036600	WALRAPTOR
	Yakima	10036599	YAKRAPTOR

Figure 20. BMTS screen shot.



User: Home | Add Mortality | Add Nest | Find Mortality | Find Nest

Bird Mortality Event

Record Id:	7657		
Species *	Owl	Bird Count *	1
Sign of Death *	Electrocution	Date Found *	02/08/2010
County *	Klamath, OR	Finder's Name *	John Spillane
Ops Area *	KLAMATH FALLS	Finder's Phone	none
Circuit *	ROCKY POINT FEEDER - 4L50	Entered By	Bunny Hoffman
Map String	014 - 39 - 008	Outage #	
		Was bird work order charged? *	○ Yes ◉ No
Facility Point *	016700	SAP Notification #	11353976
Facility Type	Distribution	Complete Date	03/08/2010

Comments

Install insulator covers

Included in 2/17/10 weekly

* = ***Required field***

Select recommended actions:

- ☐ Continue to monitor line *JUSTIFICATION REQUIRED*
- ☐ De-energize
- ☐ Install Triangles
- ☐ Install bird flight diverter(s)
- ☐ Install bird protection on station service (SUBSTATIONS ONLY)
- ☑ Install insulator cover
- ☐ No Action *JUSTIFICATION REQUIRED*
- ☐ Remove pole
- ☐ Replace Structure
- ☐ Cover transformer jumpers
- ☐ Evaluate structure to determine appropriate action
- ☐ Install barriers on substation switches or bus supports (SUBSTATIONS ONLY)
- ☐ Install bird protection at substation transformer (SUBSTATIONS ONLY)
- ☐ Install fireflies
- ☐ Install perch
- ☐ Reframe Structure
- ☐ Remove/cut groundwire

Justification for 'No Action'. Please enter a justification if you have selected an action that is marked 'JUSTIFICATION REQUIRED'

Select the file using the browse button.
Push the 'Add Photo' button to add the photo to the database.

VII. RISK ASSESSMENTS

In 2001, PacifiCorp began conducting risk assessment surveys to identify locations with increased bird mortality risk and target proactive retrofitting efforts. Pilot surveys were conducted in Cedar City and Tooele, Utah in 2001. The survey methodology was developed by PacifiCorp, U.S. Fish and Wildlife Service (Ecological Services and Law Enforcement), Utah Division of Wildlife Resources, and HawkWatch International. This methodology combines field data with existing GIS data to geographically identify and rank electrocution and collision risks (see Risk Assessment Survey Methodology, below). In 2002, surveys were conducted in all of rural Utah and southwestern Wyoming (Evanston and Pinedale districts). In 2004, surveys were conducted in the Butte Valley of northern California as part of our Klamath Falls Avian Protection Plan. Over the years, the survey methodology and process for developing remedial action plans has been refined with major changes (electronic data collection, photos taken of each pole surveyed) implemented after 2004.

Prioritization of Circuits for Risk Assessment Surveys

This Pacific Power APP prioritizes circuits throughout Pacific Power based on avian mortality history. Figure 21 identifies priority areas for risk assessments and proactive retrofitting from the original Klamath Falls APP, which had included all circuits within the Klamath Basin regardless of electrocution history or risk. To more effectively address high risk areas in a timely manner, lower risk circuits within the Klamath Basin may be scheduled further out so that higher risk circuits outside the Klamath Basin can be addressed more quickly. Therefore, throughout all of Pacific Power, circuits have been prioritized for risk assessment surveys based on the total number of protected bird mortalities (electrocutions and collisions) and the number of eagle mortalities on each circuit. The numbers of protected bird and eagle mortalities per circuit were plotted on histograms to identify mortality frequencies. These histograms were then used to identify the following five mortality risk categories:

Circuit Prioritization Category	**Criteria** ***(number is total protected bird mortalities and/or eagle mortalities)***
1 (highest priority)	Total number protected bird mortalities: 21+ Number eagle mortalities: 7+
2	Total number protected bird mortalities: 16-20 Number eagle mortalities: 5-6
3	Total number protected bird mortalities: 11-15 Number eagle mortalities: 3-4
4	Total number protected bird mortalities: 6-10 Number eagle mortalities: 2
5	Total number protected bird mortalities: 1-5 Number eagle mortalities: 1
6 (lowest priority)	No eagle or other protected bird mortalities documented

Maps of circuit priorities for Pacific Power distribution locations are shown in Figure 22. Likewise, historic bird mortalities in Pacific Power substations are shown in Figure 23. Because avian protection devices are installed (or the presence of existing avian protection devices is verified) at all substations (34.5 kV and below) during routine maintenance, avian electrocution

risk at substations will likely be greatly reduced through this proactive measure. However, if a need for additional retrofitting at high electrocution risk substations is identified, these substations would be included in this APP and added to the retrofitting schedule shown in Figure 24.

Survey and retrofit locations for the next five years for all of Pacific Power (including Klamath Falls) are shown in Figure 24. Although this a long-term, ongoing plan, schedules will be forecasted for five-year periods so that they reflect current data. Each year, the APP will be evaluated and the information for the subsequent five-year period will be updated. This will allow for prioritizations to be updated as additional information is obtained or new risk areas emerge based on changes in bird populations, land use, or other factors.

Figure 22. Bird mortality risk areas on Pacific Power distribution lines.

Bird Mortality Risk Areas, Pacific Power Distribution Lines

Mortality data from 1/1/2001 to 9/20/2014

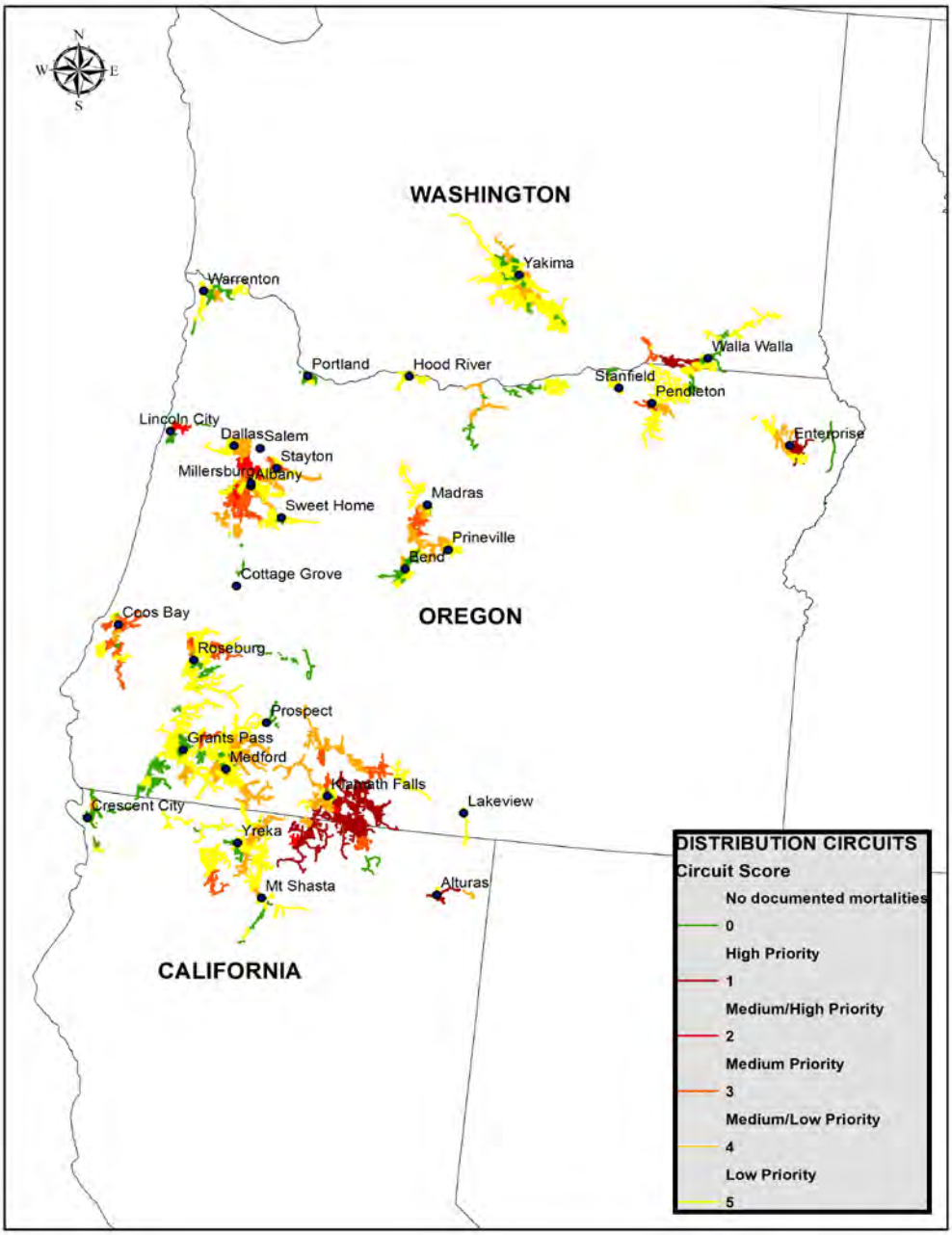


Figure 23. Historic bird mortalities at Pacific Power substations.

Protected Bird Mortalities in Pacific Power Substations

Mortality data from 1/1/2001 to 9/20/2014

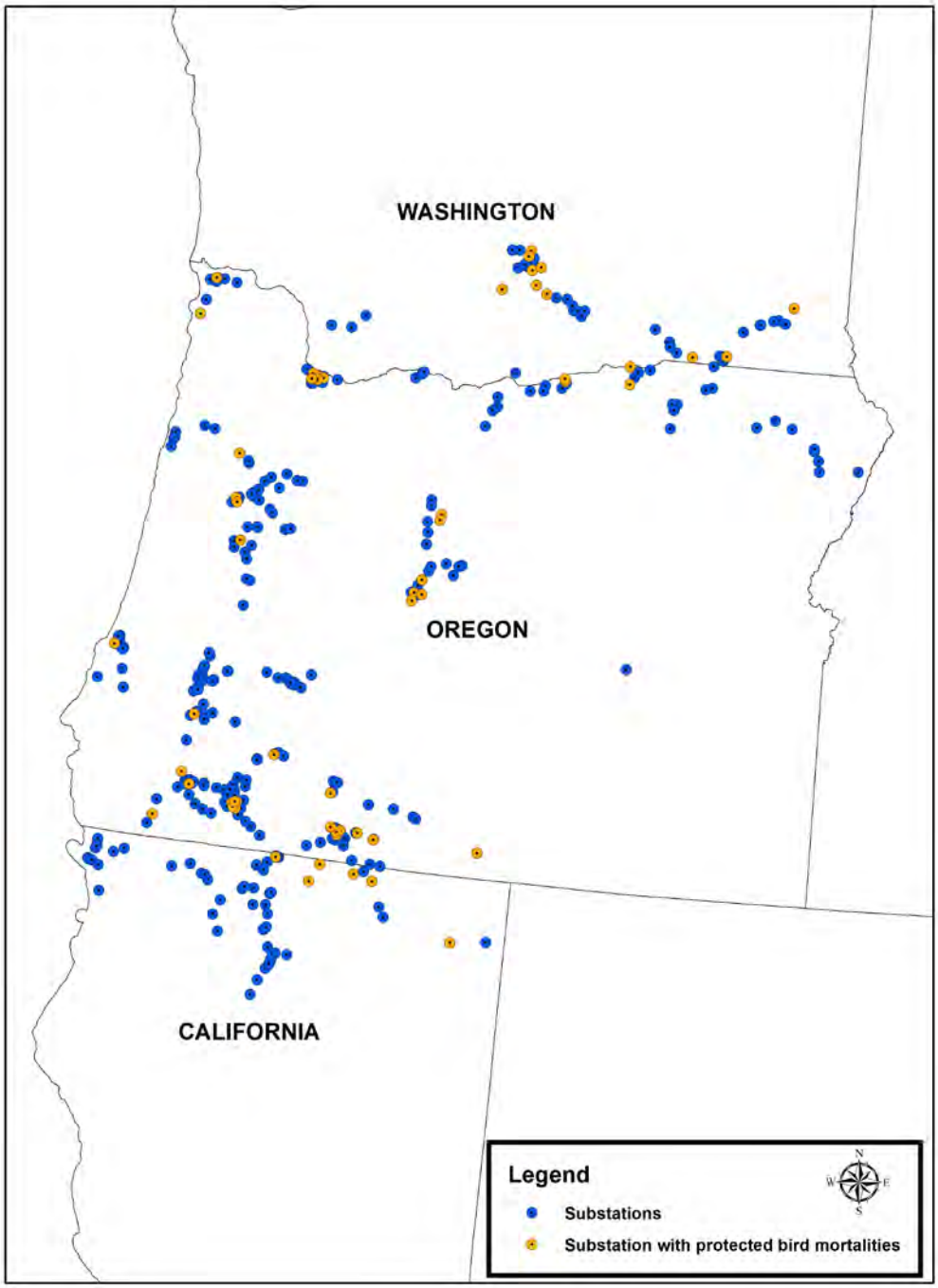


Figure 24. Predicted survey/retrofitting effort and cost for Pacific Power distribution circuits.

See xls files

Risk Assessment Survey Methodology

Data Collection/Field Surveys

Surveys are conducted in areas of suitable habitat for open-country raptors including sagebrush, grasslands, meadows, pasture, cropland, pinyon/juniper, and similar habitats. Surveys are conducted in rural and remote areas, however locations with heavy development (e.g. urban or suburban areas) are not surveyed.

Field surveys are conducted by trained biologists equipped with GPS units with maps of survey areas depicting the locations of poles. Observers walk power lines, visually inspecting the ground as well as poles and lines for evidence of bird use and carcasses. They search an area encompassing 4.5m (15ft.) on each side of the central line and a 7.6m (25ft.) radius around each pole for carcasses, prey remains, pellets, molted feathers, and whitewash.

At each pole, data is recorded on the habitat type, pole configuration, avian mortalities, live species observed, evidence of raptor use, and presence of bird nests. Pole configuration data includes: configuration type, number of energized phases, number of transformers, presence of exposed equipment, material of crossarm and brace, location of ground wire, and presence of bird protection devices (insulator covers, bushing caps, arrester caps, cutout covers, hose, covered conductor, line markers, perch discouragers, perches, etc.). In addition, the surveyor assesses whether or not the structure is avian-safe. If an avian mortality is discovered, the species, number of individuals, distance to nearest pole, and cause of death (if known) and supporting evidence are recorded. Remains of all birds excluding eagles and threatened and endangered species are buried on site. In the event of an eagle or threatened/endangered species mortality, the U.S. Fish and Wildlife Service is notified and salvages the bird. For observations of live raptors, corvids, waterfowl, wading birds, cranes, and sage-grouse, the species, number of individuals, and behavior(s) are recorded. Evidence of prey populations and raptor use, including presence of pellets, whitewash, molted feathers, or prey remains, are documented. If a nest is observed, the species (if known) and status of nest (active/inactive) are recorded.

GIS Data Analysis

The existing pole layer of PacifiCorp's GIS data is used as a base map to which survey data is linked. The field data is then analyzed spatially with other existing datasets such as bird-caused outages, historic bird mortalities, nest locations, etc.

To assess the risk of electrocution, each non-raptor-safe structure is assigned a score based on abundance (>50% total area) of suitable raptor habitat within a 1-km radius, evidence of raptor use, presence of raptor nests within 1km, and presence of avian mortalities. Structures are assigned one point each for presence of suitable habitat, raptor nests, or evidence of raptor use. Structures at which non-eagle avian mortalities were documented are assigned four points. Structures with eagle mortalities are assigned five points. All scores of five or greater are lumped together in a "critical" category.

Using the above scoring method, non-raptor-safe poles are assigned the following risk assessment scores:

Score	Risk Assessment
0	NO CURRENT RISK
1	LOW RISK
2	LOW/MODERATE RISK
3	MODERATE RISK
4	HIGH RISK
5+	CRITICAL

Structures that receive scores of 3 or greater are included for remedial action. A subsequent analysis of the data is conducted to include structures that meet the following criteria:

- Poles adjacent to mortality poles (5 spans on each side)
- Poles near mortality poles with a similar configuration
- Circuits, lines, or taps where multiple mortalities have occurred
- Deadend equipment poles in remote or rural areas
- Configurations that have been documented to have a heightened risk in a district
- Non-raptor-safe poles in otherwise raptor-safe lines
- Non-raptor-safe poles adjacent to poles with perch discouragers
- Incomplete or improper installation of existing avian protection devices
- Portions of circuits or lines with a history of bird-caused or unknown-cause outages
- Poles that pose other safety or reliability risks
- Poles with covers or other bird protection that is degraded, needs replacement, or does not meet current avian-safe standards

Once all poles are identified, a comprehensive remedial action plan is developed with the appropriate service district that identifies a course of action, timeline, and resources required. A spreadsheet is prepared by Environmental Services and T&D Field Operations that includes a list of bird protection materials to be installed at each facility point. Line crews conducting the retrofitting are given the job packet, spreadsheet, and photos of each pole.

One year after retrofitting, follow-up surveys are conducted at 25% of the poles originally surveyed to evaluate the effectiveness of remedial actions and risk assessments. This percentage of poles provides a large enough sample size for data analysis. Poles selected for follow-up surveys include those that were retrofitted, poles with previous mortalities, and those that were not previously identified as a high risk. Based on the results of follow-up surveys, additional remedial actions may be conducted or risk assessment methodology and retrofitting materials may be modified. Additional follow-up surveys may also be conducted as needed to evaluate long-term effectiveness.

In addition to the immediate application of using the risk assessment data to implement remedial actions at high risk poles, the data can also be used to enhance our understanding of electrocution and collision causes and solutions. For example, the data can be analyzed to identify factors that influence avian electrocution and collision risks; evaluate the effectiveness of bird protection devices; identify the overall percentage of poles that cause electrocutions and compare this

spatially within the company's service territory; identify species or habitat-related differences in risk; and quantify the conservation benefit provided by proactively retrofitting poles.

Results from Risk Assessment Surveys

Risk assessment survey data from each survey area is compiled, analyzed, summarized, and compared to the results from other survey areas. A standardized summary report is generated after surveys are conducted in each area and contains information on percent of poles where mortalities were found, percent of poles that are avian-safe, presence of existing bird protection devices, evidence of bird use, and species and causes of mortalities. A report template is shown in Figure 25. This report template is the same as what has been used in the Klamath Falls Avian Protection Plan since 2005.

Poles with eagle mortalities that are documented during risk assessment surveys will be retrofitted within 30 days. In addition, five poles in each direction of the mortality pole, if not already avian-safe, will be retrofitted as soon as possible. Poles with other protected bird mortalities will be included in the APP retrofit schedule, and addressed during the circuit retrofitting job (typically the year following surveys). However, if there is an immediate concern regarding protected species (e.g., multiple mortalities in close proximity, high avian use, high risk nests, or other circumstances that pose a high immediate risk), Environmental Services and the local Field Operations district will evaluate and determine an appropriate action.

Figure 25. Risk assessment survey results report template.

PACIFICORP

[DISTRICT] Draft Risk Assessment Survey Summary Report

Overall Survey Summary (YEAR)
Survey dates:
Total number of poles surveyed:
Number (percentage) of poles surveyed that are avian-safe:
Number of poles proposed for remedial action:
Number of mortalities:
Number of poles at which mortalities were documented:
Number of poles that have some retrofitting but do not meet current avian-safe standards; Number of poles with mortalities that have some retrofitting but do not meet current avian-safe standards:
Percent of total poles surveyed at which mortalities were documented:
Mortalities documented of the following species:

Summary by Circuit

Circuit	Number poles surveyed	Number (percent) of poles at which mortalities were documented	Number (percent) of poles surveyed that are avian-safe	Number of poles that have some retrofitting but do not meet current avian-safe standards	Number poles proposed for remedial action

Poles Proposed for Remedial Action; Breakdown of Selection Criteria
Mortality poles –
Poles requiring nest management –
Other non-avian-safe poles –
Poles requiring replacement of existing avian protection devices –

Comparison with Previous Risk Assessment Survey Results

Survey Area		
Survey year		
Number poles surveyed		
Percent of poles surveyed that are avian-safe		
Percent of poles surveyed with mortalities		
Percent of total mortalities comprised by eagles		
Percent of poles with evidence of raptor use		
Percent of poles with existing bird protection devices		

Transmission & Distribution Environmental Services	[DISTRICT, YEAR] Survey Summary Report	File Name: Revision Date: Page 1 of 1

VIII. MORTALITY REDUCTION EFFORTS (PROACTIVE RETROFITTING)

Transmission and Distribution Lines

Annual Budget for Avian Protection Efforts

Pacific Power has committed to a minimum annual budget of $650,000 for targeted proactive retrofitting efforts and associated risk assessment and follow-up surveys in identified priority areas. In addition to this proactive retrofitting, Pacific Power will continue to retrofit poles per our APP policy (including retrofits in response to mortality poles, bird-caused outages, and nests; retrofitting of poles adjacent to eagle mortality poles; avian-safe new construction outside city limits; avian-safe construction of rebuilt poles outside city limits; and retrofitting of rebuilt equipment poles in all areas). Pacific Power will also respond to "hot spots" as appropriate to address previously unidentified high risk areas in a timely manner. To maintain a current perspective on risk areas and allow for flexibility if priority areas change, the APP will forecast areas for risk assessment surveys and proactive retrofitting within a rolling five-year window which will be reviewed annually with the Service and updated as needed. This annual review will include assessments of current avian risks and priority areas, current estimates for percentage of poles needing retrofitting and cost per-pole for surveys and retrofitting jobs. Although proactive retrofitting will be forecast within a rolling five-year window, the APP will continue to be a long-term commitment.

Proactive Efforts

Risk assessment surveys are conducted throughout Pacific Power to identify high risk structures for proactive retrofitting (see section VII., Risk Assessments, for details on risk assessment surveys). Figure 24 includes locations of survey/retrofitting efforts in upcoming years and within-year schedules and milestones are included in Figure 26. Prioritizations may be modified as needed to address future mortality risks as they arise. Proactive retrofitting plans will clearly identify which structures are to be retrofitted, what remedial actions will be completed, material needs, estimated costs, and timelines for completion. As retrofitting work is conducted, trained inspectors will evaluate remedial actions to ensure that current avian-safe practices are being employed and proper bird protection materials are used and installed correctly. In addition, remedial actions taken will be documented and photos will be taken of work completed. Pacific Power will provide the U.S. Fish and Wildlife Service with summary reports of work completed and associated costs during regularly scheduled meetings and through annual permit reports.

Preventative Efforts

Pacific Power's Bird Management Program Policy requires avian-safe construction for all new lines and rebuilds outside city limits and new and repaired equipment poles in all areas (both within and outside city limits). This is intended to ensure that bushings, cutouts, arresters, and jumpers are appropriately covered. Pacific Power is also evaluating methods to track installation of bird protection materials done through line repairs, rebuilds, or other maintenance that does not involve a protected bird mortality. This will enable Pacific Power to identify the number and locations of additional poles made avian-safe each year.

Response to Eagle Mortalities
In response to eagle mortalities associated with Pacific Power's distribution facilities, five adjacent structures in each direction of the mortality pole will be inspected and retrofitted if not already avian-safe. This is intended to reduce the likelihood of subsequent eagle mortalities in the area. An assessment of the 2008 Worland, Wyoming, survey data was conducted to determine the appropriate number of adjacent poles to be retrofitted to most effectively reduce subsequent risk. This analysis showed a linear increase in the number of additional mortalities that were included in buffers of one to five poles adjacent to mortality poles and a leveling-off of mortality numbers from six to ten adjacent poles. Consequently, PacifiCorp adopted a policy of retrofitting five poles adjacent to eagle mortality poles.

Remedial action is required at eagle mortality poles within 30 days of discovery. The adjacent poles should be retrofitted as soon as possible and are typically completed within 30 days. The T&D Field Operations Manager and Environmental Services will develop a remedial action plan that identifies adjacent facility points and work to be conducted. This plan is then sent to the director for review and approval. T&D Field Operations is responsible for creating and closing out SAP notifications associated with this work. See Figure 8 for eagle mortality work flow procedure.

Procedures for Mortalities Found During APP Surveys
Poles with eagle mortalities that are documented during risk assessment surveys will be retrofitted within 30 days along with five poles in each direction, if not already avian-safe. Poles with other protected bird mortalities will be included in the APP retrofit schedule, and addressed during the circuit retrofitting job (typically the year following surveys). However, if there is an immediate concern regarding protected species (e.g., multiple mortalities in close proximity, high avian use, high risk nests, or other circumstances that pose a high immediate risk), Environmental Services and the local Field Operations district will evaluate and determine an appropriate action.

Hot Spots
Pacific Power will identify "hot spot" areas as they emerge. Hot spots are locations where the bird mortality risk was previously thought to be low, but suddenly increased due to a shift in bird populations, habitat, prey availability, or other factors. For example, a distribution line adjacent to an open farm field may have had no prior waterfowl collisions, however, a change in land use practices causes this field to be flooded. The flooded field now attracts concentrations of migratory swans, and numerous collisions with the adjacent distribution line have occurred. This area may be considered a hot spot. In addition to changes in the landscape, hot spots may emerge due to changes in prey populations. For example, cyclical jackrabbit populations may result in large differences in golden eagle numbers in an area over several years. When rabbit and eagle numbers are low, no electrocutions may occur; however, in years when rabbit and eagle numbers are high, if numerous eagle electrocutions occurred, this would be considered a hot spot.

Environmental Services regularly monitors bird mortality records input into the Bird Mortality Tracking System. If numerous mortality events are documented in close geographic proximity

within a short period of time, Environmental Services would work with the local T&D Field Operations district to assess the hazard. Likewise, T&D Field Operations may raise areas of concern as potential hot spots due to mortalities, outages, or other observations. If an area is identified as a hot spot, the location will be evaluated and appropriate remedial action taken. Remedial actions at hot spot areas will be completed in addition to proactive survey work. However, the prioritization of a hot spot circuit may be modified in the APP survey/retrofitting schedule as appropriate to reflect the new risk category.

Substations

In 2009, PacifiCorp finalized and published its bird/animal protection standards and policy for substations. New distribution substations will be built using avian-safe construction practices and applying bird/animal protection materials. Likewise, avian protection devices are installed (or the presence of existing avian protection devices is verified) at all substations (34.5 kV and below) during routine maintenance. Such avian protection devices would include covers at equipment locations where there is an increased risk of electrocution (e.g., circuit breaker bushings, substation transformer bushings and arresters, and station service transformers, cutouts, and arresters). Avian electrocution risk at substations will likely be greatly reduced through this proactive measure. However, if a need for additional retrofitting at high electrocution risk substations is identified, these substations would be included in this APP and added to the retrofit schedule in Figure 24.

Figure 26. 2014 implementation schedule for risk assessments and proactive retrofitting.

Action Items:	Responsible Department:	Milestone (Due Date)	Status
Meet with USFWS to discuss Pacific Power APP.	Executive Management Environmental Services T&D Field Operations T&D Substation Operations	October 9, 2014	
Conduct risk assessment surveys of identified circuits to evaluate electrocution risk.	Environmental Services	Start March 2015 End December 2015	
Conduct follow-up surveys at 25% of poles previously surveyed and retrofitted in Alturas, California and Walla Walla, Washington.	Environmental Services	December 2015	
Develop remedial action work plans that identify actions to be completed, materials needed, and target date of completion for each survey location.	Environmental Services Procurement Logistics T&D Field Operations T&D Substation Operations	December 31, 2015	
Conduct actions at facilities identified in 2014 remedial action work plans. Inspect work to ensure that it meets avian-safe standards.	T&D Field Operations	December 31, 2015	
Report all documented mortalities of protected avian species as part of USFWS Special Purpose Permit annual report (see Figure 12).	Environmental Services	January 31, 2015	
Continue to implement Pacific Power's Bird Management Program.	All affected Pacific Power employees	Ongoing	Ongoing

IX. AVIAN ENHANCEMENT OPTIONS

Pacific Power works in partnership with agencies, environmental organizations, scout groups, and others to identify and implement projects to improve wildlife habitat or further wildlife conservation research. Examples include the installation of nest platforms and boxes for various species, including ferruginous hawks, ospreys, American kestrels, and great blue herons.

X. QUALITY CONTROL

System Monitoring

Pacific Power will improve its system monitoring to better identify mortality "hot spots" as they occur throughout Pacific Power. Environmental Services will conduct field spot checks and communicate with USFWS and T&D Field and Substation Operations to identify areas that may emerge as mortality "hot spots." USFWS will also communicate with Pacific Power if they observe or are otherwise informed of increased mortalities or other areas of concern that need to be remediated. By improving our monitoring, Pacific Power will be able to respond quickly to mortality problem areas as they arise and modify our Pacific Power APP survey and retrofit schedules accordingly. In addition, by retrofitting five distribution poles in each direction of eagle mortalities, the electrocution risk in these areas will be reduced.

Site Audits

Pacific Power will conduct site audits as needed to ensure that avian-safe construction requirements are being met and that retrofitting in response to mortalities and nest management are being conducted according to current company policies and standards. These efforts will be done as needed for distribution and transmission lines as well as substations. Pacific Power will continue to evaluate its avian-safe construction standards to ensure that current best practices and bird protection materials are used.

Inspections During Proactive Retrofitting

Training and inspections will be conducted during proactive retrofitting to ensure that bird protection materials are installed properly and appropriate and complete remedial actions are taken. At the beginning of a retrofitting job, the line crew (either contract or internal) will be trained by Environmental Services and/or T&D Field Operations on what materials are being used, proper installation, and avian-safe designs. In addition, each job will have an inspector responsible for ensuring that all identified poles are retrofitted, appropriate and complete remedial actions are taken, bird protection devices are installed correctly, and photographs are taken of each completed pole. Jobs will not be signed off on without approval by the inspector, T&D Field Operations, and/or Environmental Services.

For substation retrofits, Environmental Services will work with T&D Substation Operations to identify material needs, proper installation, and avian-safe designs. In addition, manufacturers of bird protection devices may provide on-site guidance on appropriate cover-up materials and proper installation.

Risk Assessment Follow-up Surveys

Follow-ups surveys at circuits where risk assessments and proactive retrofitting were conducted can also be used as a method of quality control (see Section VII). Data from the follow-up surveys is analyzed to evaluate the effectiveness of risk assessments in predicting high risk locations and the effectiveness and durability of bird protection devices for poles and substations. Information obtained from these surveys is used to enhance future surveys, prioritizations, and retrofitting.

XI. PUBLIC OUTREACH

For many years, Pacific Power has been an active leader in educating the public, wildlife and natural resource professionals, and other utilities on avian/power line interactions. PacifiCorp was a founding member of the Avian Power Line Interaction Committee (APLIC) and continues to be an active APLIC member and instructor at APLIC-led courses and workshops. Pacific Power also participates in other professional organizations including Partners in Flight (PIF) and The Wildlife Society (TWS). Outreach is also conducted with the public and our customers through events, classroom presentations, and as needed or requested. The following table summarizes professional and public outreach activities in which Pacific Power may participate.

Figure 27. List of Pacific Power professional and public activities/organizations.

Group/Organization/Event	Audience Type	Frequency
Avian Power Line Interaction Committee (APLIC)	Utilities, state and federal wildlife agencies	Meetings twice per year (spring and fall) Short courses twice per year or as needed Conference calls and other meetings, etc. as needed
Partners in Flight (PIF)	Bird conservation professionals including state and federal agencies, academia, NGOs, environmental consultants	International conferences held every five years Other/local meetings as appropriate
The Wildlife Society (TWS)	State and federal wildlife agencies, academia, NGOs, environmental consultants	Annual national conferences and state meetings as appropriate
Agency meetings	USFWS, Bureau of Land Management (BLM), U.S. Forest Service (USFS), and state resource agencies	As needed to discuss avian/environmental issues associated with existing lines, new projects, permit renewals, etc.
Winter Wings Festival, Klamath Falls	Public	Annual
Yakima Greenway Festival	Elementary school students	Annual
Other	Public and schools	As appropriate

XII. KEY RESOURCES

The successful implementation of this Pacific Power Avian Protection Plan relies on the efforts of Pacific Power employees with support from external resources such as the U.S. Fish and Wildlife Service. The following tables identify internal departments and their responsibilities to APP commitments and external resources that provide guidance, support, or other assistance. The identified responsibilities for company personnel is not an exhaustive list. All responsible departments will communicate and work together to implement Bird Management Program Policy and Pacific Power Avian Protection Plan commitments.

Internal Communication

Pacific Power will improve its internal communications to ensure that Executive Management, T&D Field Operations, T&D Substation Operations, Environmental Services, Logistics, Asset Management, and Legal are sharing information on bird mortalities, survey results, retrofitting efforts, material needs, budgets, and other aspects/commitments of the Bird Management Program and Pacific Power APP. In 2010, Pacific Power held "Environmental Boot Camps" for its Operations managers, in which detailed training and exercises regarding environmental compliance (bird management, spill response, hazardous waste disposal, etc.) was covered by Pacific Power management and Environmental Services.

Pacific Power has developed an APP Steering Group, comprised of individuals responsible for successful APP implementation. The group includes the Pacific Power Vice President, T&D Operations Directors (for NW Wires, SW Wires, and Substations), Logistics, Asset Management, and Environmental Services. The group meets regularly to discuss APP progress, current and upcoming projects, material needs, bird mortality "hot spots", risk assessment survey progress, APP budget, and other relevant topics.

Figure 28. List of internal resources and responsibilities.

Department	Responsibilities
Executive Management	• Ensure compliance with Bird Management Program Policies (see Figures 1 and 2), USFWS Special Purpose permit requirements (see Figure 12), and APP commitments • Allocate appropriate budgets for bird-related commitments • Participate in meetings with USFWS • Participate in APP Steering Group
Transmission and Distribution Field Operations	• Ensure compliance with Bird Management Program Policy (see Figure 1), USFWS Special Purpose permit requirements (see Figure 12), and APP commitments • Apply avian-safe construction requirements identified in Bird Management Program Policy • Implement proactive remedial action plans • Inspect proactive retrofitting efforts to ensure that complete and appropriate bird protection is installed • Participate in meetings with USFWS

Department	Responsibilities
	• Report protected bird mortalities, bird-caused outages, and problem nests; track related expenditures through SAP notifications and bird work orders • Complete remedial actions at poles with eagle mortalities within 30 days and within 90 days for other protected bird mortalities. Work with Environmental Services to develop remedial action plans in response to eagle mortalities that include 5 distribution poles in each direction. • Participate in Bird Program Training as needed. Training may be delivered via bulletins, online information, or instructor/hands-on. • Provide input on effectiveness of bird protection products • Collaborate with Procurement and Environmental Services to identify bird protection material needs • Ensure that contract line crews are appropriately trained on Bird Management Program procedures, e.g. bird protection standards and retrofitting products, nest management, and reporting of protected bird mortalities • Consult with Environmental Services and ensure that avian issues are considered during siting and construction of new transmission and distribution lines • Participate in APP Steering Group
T&D Substation Operations	• Ensure compliance with Bird Management Program Policy (see Figure 2), USFWS Special Purpose permit requirements (see Figure 12), and APP commitments • Apply avian-safe construction requirements identified in Bird Protection Policy for Substations • Inspect proactive retrofitting efforts to ensure that complete and appropriate bird protection is installed • Participate in meetings with USFWS as needed • Report protected bird mortalities, bird-caused outages, and problem nests; track related expenditures through SAP notifications and bird work orders • Participate in Bird Program Training as needed. Training may be delivered via bulletins, online information, or instructor/hands-on. • Provide input on effectiveness of bird protection products • Collaborate with Procurement and Environmental Services to identify bird protection material needs • Collaborate with Environmental Services to implement remedial actions at high risk substations identified in APP • Ensure that contract substation crews are appropriately trained on Bird Management Program procedures, e.g. bird protection standards and retrofitting products, nest management, and reporting of protected bird mortalities • Consult with Environmental Services and ensure that avian issues are

Department	Responsibilities
	considered during siting and construction of new substations • Participate in APP Steering Group
Asset Management	• Allocate appropriate budgets for bird-related commitments (including proactive retrofitting, risk assessments, "hot spot" response, and mortality pole/problem nest response) • Participate in APP Steering Group
Environmental Services	• Ensure compliance with Bird Management Program Policies (see Figures 1 and 2), USFWS Special Purpose permit requirements (see Figure 12), and APP commitments • Provide technical support and resources to aid in implementation of Bird Management Program/APP • Track and report bird mortalities, problem nests, bird-caused outages, and retrofitting efforts • Conduct risk assessment surveys and prepare proactive remedial action plans • Work with T&D Field Operations to develop remedial action plans in response to eagle mortalities that include 5 distribution poles in each direction. • Develop and update training resources and guidance documents including Avian Protection Plans, Bird Management Program Guidelines, etc. • Collaborate with T&D Field Operations and Standards to update bird protection standards as needed • Collaborate with T&D Field Operations, Logistics, and Procurement to identify bird protection material needs • Renew federal permit and submit required annual report • Notify USFWS per SPUT permit timeline in regards to eagle mortalities • Contact USFWS as needed for active nest management permits • Conduct Bird Program Training and/or provide training resources as needed. Training may be delivered via bulletins, online information, or instructor/hands-on. • Collaborate with T&D Substation Operations to implement remedial actions at high risk substations • Participate in APLIC and other stakeholder, professional, or outreach activities • Participate in meetings with USFWS • Participate in APP Steering Group
Logistics and Procurement	• Maintain appropriate inventory levels of bird protection products for day-to-day use and large-scale proactive projects • Participate in APP Steering Group
Standards	• Review bird protection materials and modify standards as needed to include current state-of-the-art products

Department	Responsibilities
	• Review bird protection standards and modify as needed to ensure that standards meet or exceed recommended APLIC guidelines • Add standards for avian-safe new designs as needed or requested • Participate in APP Steering Group as needed
Vegetation Management	• Conduct training as needed with tree trimming crews regarding protection of bird nests
Information Technology and GIS Department	• Work with Environmental Services to identify and implement updates to Bird Mortality Tracking System as needed • Evaluate integration of bird data into Power Map
Legal	• Ensure compliance with Bird Management Program Policies (see Figures 1 and 2), USFWS Special Purpose permit requirements (see Figure 12), and APP commitments • Provide expertise on legal issues

Communication with U.S. Fish and Wildlife Service
While Pacific Power and USFWS have a history of working together, efforts will be made to improve communication. Pacific Power will schedule meetings with USFWS to ensure that we are coordinating and communicating on our bird protection efforts. Meetings will be held annually (more often if needed) between Pacific Power Executive Management, T&D Operations, and Environmental Services personnel and USFWS to review Pacific Power's progress on its APP and Bird Management Program commitments. Local meetings will also be held annually or as needed with USFWS and Pacific Power T&D Operations and Environmental Services personnel to review retrofitting work completed and upcoming surveys and work plans.

Figure 29. Schedule of annual USFWS Meetings.

Meeting Attendees	Frequency
• USFWS (Office of Law Enforcement) • Pacific Power (Executive Management, T&D Operations, Environmental Services)	Annual
• USFWS (Office of Law Enforcement) • Pacific Power (T&D Operations, Environmental Services)	Annual or as needed

Figure 30. List of external resources.

Agency/Group/ Organization	Resources Provided
U.S. Fish and Wildlife Service	• Notification of protected bird mortalities and nests • Guidance in selection of priority areas for risk assessment surveys and proactive retrofitting • Feedback on Bird Management Program/Avian Protection Plan efforts • Retrieval of eagle carcasses • Management of Special Purpose Permit
State fish and wildlife agencies	• Notification of protected bird mortalities and nests
APLIC	• Information on current avian-protection practices • Training materials and guidance documents
Manufacturers of avian protection products	• Development of new products and improvement of existing products to meet our needs • Training on product installation
Licensed wildlife rehabilitators	• Rehabilitation of injured wildlife • List of rehabilitators included in Bird Management Program Guidelines and on Environmental Services website

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APPENDIX A

Examples of Common Avian Protection Standards

Review and Amendment Record

DOCUMENT AMENDMENT RECORD			
Version	**Date Issued**	**Date Effective**	**Purpose of Issue and Description of Amendment**
005	7/14/2010		
006	10/17/2013		Updated Figures 10, 11, 13, 14, 22 and 24. Removed figure 21. Updated contact information Updated VIII. Mortality Reduction Efforts (Proactive retrofitting)
007	10/1/2014		Updated Background information (Page i) Updated Figure 9,10,11,12,13,14,15,22,23,and 26 Updated VI. Reporting (Data Entry) Updated Figure 28 (Environmental Services) Updated contact information Updated table of contents