

Chapter 18 Wildlife

This chapter describes existing wildlife resources in the project area, and how the project alternatives could affect these resources. Related wetland and vegetation information are in Chapter 16, Wetlands, and Chapter 17, Vegetation.

Words in **bold** and acronyms are defined in Chapter 32, Glossary and Acronyms.

18.1 Affected Environment

Wildlife species that would be affected by the project include those that occur in forest, production forest, shrubland, open, and urban/suburban habitats. These categories correspond with the general vegetation types discussed in Chapter 17, Vegetation, and shown on Maps 17-1A through 17-1D, with some minor differences (see Table 18-1).

Table 18-1 Wildlife Habitats¹ and Corresponding Vegetation Types²

Wildlife Habitat	Vegetation Types
forest	forest; mature forest
production forest	production forest
shrubland	shrubland
open	herbaceous; rural landscaped
urban/suburban	urban/suburban landscaped
Notes: 1. WDFW priority habitats are treated as a subset of general wildlife habitats. See Section 18.1.1, Wildlife Habitats and Species. 2. See Chapter 17, Vegetation, and Maps 17-1A through 17-1D.	

In addition, wildlife in the WDFW priority habitats (see Section 18.1.2, WDFW Priority Habitats) of Oregon white oak woodlands, herbaceous balds, westside prairie, old-growth/mature forest, freshwater wetlands and fresh deepwater, riparian areas, caves, cliffs, talus, and snags and logs would also be affected. These habitats are discussed in the general wildlife habitats (see Section 18.1.1, Wildlife Habitats and Species) where they are typically found. For example, westside prairie is a type of open habitat.

General wildlife habitats were identified within a 3,000-foot corridor (1,500 feet either side of the transmission line centerline). This area includes the transmission line right-of-way, new and improved access roads, substation areas, and removed, rebuilt, and new towers on existing right-of-way. For WDFW Priority Habitats, the study area covers a 2-mile corridor (1 mile either side of the transmission line centerline). This area includes the transmission line right-of-way, new and improved access roads, substation areas, and removed, rebuilt, and new towers on existing right-of-way. This study area is larger than the study area for general habitats because a broader area allows a more accurate assessment of their likelihood to occur in the affected environment, and a better description of the extent of impacts to these high-value wildlife habitats.

18.1.1 Wildlife Habitats and Species

18.1.1.1 Wildlife in Forest and Production Forest Habitats

Forest Wildlife

In the study area, forest habitat is generally about 60 years old and contains a mix of conifers and hardwoods, with conifers generally dominating. Old-growth/mature forest, Oregon white oak woodlands, forested freshwater wetlands, riparian areas, herbaceous balds, and caves are considered WDFW priority habitats and may occur within this general wildlife habitat (see Section 18.1.2, WDFW Priority Habitats).

Forest habitat occurs throughout the study area but is concentrated on either side of the Cowlitz River in the northern portion of the study area, and southwest of Lake Merwin in the central portion (see Maps 17-1A and 1C). It covers about 33 percent of the study area along the West Alternative, 25 percent along the Central Alternative, 17 percent along the East Alternative, and 30 percent along the Crossover Alternative. The Monahan Creek substation site contains some forest.

The habitat features used by forest-dependent wildlife include surface rock, logs, duff/litter, **snags**, live trees, moss, cavities, and shrubs (Johnson and O'Neil 2001). Common wildlife species include mammals such as coyotes (*Canis latrans*), black bear (*Ursus americanus*), rabbits, squirrels, chipmunks, and Columbian black-tailed deer (*Odocoileus hemionus ssp. columbianus*). Many game birds such as ruffed grouse (*Bonasa umbellus*) and pheasants (*Phasianus spp.*) are found in young conifer stands, along with other common year-round resident bird species such as Steller's jay (*Cyanocitta stelleri*), winter wren (*Troglodytes hyemalis*), and golden-crowned kinglet (*Regulus satrapa*). Some of the most broadly distributed migratory species include Swainson's thrush (*Catharus ustulatus*), Pacific-slope flycatcher (*Empidonax difficilis*), and Townsend's warbler (*Dendroica townsendii*) (Johnson and O'Neil 2001).

Thirteen special-status species could be found in forest habitat in the study area (see Section 18.1.4, Special-Status Wildlife). However, only 4 of the 13 special-status species have documented occurrences in the study area: bald eagle (*Haliaeetus leucocephalus*), elk (*Cervus elephus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and wood duck (*Aix sponsa*). At least two of these—bald eagle and wood duck—are associated with forested WDFW riparian priority areas. Additional special-status species could be found in old-growth/mature forests (see Section 18.1.2.5, Old-Growth/Mature Forest).

Production Forest Wildlife

Production forest habitat is similar to forest habitat, but can have lower species diversity due to the recurring cycle of selective tree growth and harvest—which strongly influences the structural characteristics, age, and composition of this habitat—and frequent disturbance—which creates openings for weedy species. Production forest is routinely harvested for wood products, but may also be managed for habitat. In the study area, it is dominated by Douglas fir and western hemlock (WDNR 2009c). The age and quality of production forest in the study area can vary widely, ranging from newly replanted production forest to old-growth/mature forest (a WDFW priority habitat).

Production forest also occurs frequently throughout the study area (see Maps 17-1A through 1D), being somewhat less concentrated to the south and southwest of Lake Merwin (see Map 17-1C). It is the most common general wildlife habitat in the study area along three of the action alternatives: 63 percent along the Central Alternative, 73 percent along the East Alternative, and 50 percent along the Crossover Alternative. It only makes up 10 percent of the habitat along the West Alternative. The Casey Road and Baxter Road substation sites are in production forest.

The same special-status species and habitats that can occur in forest can occur in production forest, particularly in areas that have not been logged recently or frequently (see Section 18.1.4, Special-Status Wildlife). Indeed, a similar number of old-growth/mature forests in the study area occur in both forest and production forest where logging has not yet occurred (or last occurred over 80 years ago), and 11 special-status species have been documented in production forest in the study area, including elk, bald eagle, Cascade torrent salamander (*Rhyacotriton cascadae*), Cope's giant salamander (*Dicamptodon copei*), Dunn's salamander (*Plethodon dunni*), Larch Mountain salamander (*Plethodon larselli*), Rocky Mountain tailed frog (*Ascaphus montanus*), western toad (*Anaxyrus boreas*), Columbian black-tailed deer, peregrine falcon (*Falco peregrinus*), and northern goshawk (*Accipiter gentilis*) (most of these were associated with WDFW priority habitats contained within production forest, including forested riparian areas, cliffs, and talus slopes or caves).

18.1.1.2 Wildlife in Shrubland Habitats

Shrubland includes areas dominated by shrubs or tree saplings, and typically occur in existing rights-of-way, on recently harvested production forest, and in fallow fields (see Chapter 17, Vegetation). It may include or encompass WDFW priority habitats, including scrub-shrub freshwater wetlands, riparian areas, herbaceous balds, and caves (see Section 18.1.2, WDFW Priority Habitats).

Shrubland is mixed with production forest and forest habitats in the study area and is often connected to open habitat (see Maps 17-1A through 1D). It is somewhat less concentrated in the Vancouver area (see Map 17-1D). It makes up about 7 percent of the West Alternative, 4 percent of the Crossover Alternative, and 2 percent of the Central and East alternatives. One acre of the Monahan Creek substation site is in shrubland.

Native shrubland can attract large numbers of wildlife. However, in the study area, shrubland is often highly disturbed and consequently dominated by weedy plant species, which can reduce wildlife habitat diversity. Common wildlife include birds such as willow flycatcher (*Empidonax traillii*) and bushtit (*Psaltriparus minimus*); and mammals such as coyotes, squirrels, chipmunks, and white- and black-tailed deer. Several species of neotropical migratory birds (those that breed in North America and winter in Central and South America), such as Swainson's thrush, typically nest in thickets of deciduous shrubs (Johnson and O'Neil 2001).

Five special-status species may be found in shrubland (see Section 18.1.4, Special-Status Wildlife). All five species are habitat generalists, in that they can be found in a variety of habitats, including both forested habitats and shrubland. Of these, only elk and Columbian black-tailed deer are documented in the study area.

18.1.1.3 Wildlife in Open Habitats

Open habitat includes non-forested areas dominated by herbaceous plants. It may include WDFW priority habitats including westside prairie, riparian areas, and freshwater wetlands (see Section 18.1.2, WDFW Priority Habitats). Open habitat has diverse land uses and features that distinguish it from other habitat types, including frequent disturbance from cultivation, mowing, and harvesting; monotypic landscapes from farming and grazing practices; and low-density residential and farm-related development. As such, it is generally highly disturbed and consequently dominated by weedy plant species, which can reduce wildlife habitat diversity. Similar to production forest, the quality of open habitats can vary widely across the study area.

Open habitat, like shrubland habitat, is scattered throughout forest and production forest, and in and around urban/suburban habitat (see Maps 17-1A through 1D). It is somewhat more concentrated along the Cowlitz River, in the area southwest of Lake Merwin, and in Castle Rock, Longview-Kelso, and Vancouver. Open habitat is more common along the West Alternative than the more forested Central, East, and Crossover alternatives. About 33 percent of the West Alternative crosses open habitat, compared to 12 percent of the Crossover Alternative, 8 percent of the Central Alternative, and 6 percent of the East Alternative. Open habitat makes up a majority of the habitat at the Monahan Creek substation site.

Much of the wildlife that use open habitat are habitat generalists, and have adapted to using several habitat types for feeding and breeding, including birds such as American robin (*Turdus migratorius*), wrens, jays, crows, and vultures; and mammals such as coyotes, squirrels, chipmunks, and white-tailed deer. Important habitat elements include wetlands, wells and water developments, deserted dwellings, shelterbelts (rows of trees and shrubs along the edges of agricultural fields), hedgerows, roadsides, and field borders (a band or strip of perennial vegetation established on the edge of cropland to reduce erosion). Shelterbelts and field borders are important as stopover and breeding habitats for neotropical migratory birds (Johnson and O'Neil 2001). Farm buildings and trees in farmsteads and pastures and along field edges provide potential nesting and roosting sites for common species such as owls, hawks, and bats, and many small prey mammals such as Townsend's vole (*Microtus townsendii*) and vagrant shrew (*Sorex vagrans*).

Ten special-status species can be found in open habitat in the project area (see Section 18.1.4, Special-Status Wildlife). Six have been documented within the study area, including elk, sandhill crane (*Grus canadensis*), tundra swan (*Cygnus columbianus*), Townsend's big-eared bat, Dunn's salamander, and western pond turtle (*Actinemys marmorata*). Two of these—Dunn's salamander and western pond turtle—are associated with WDFW priority habitats contained within open habitat, including riparian areas and wetlands.

18.1.1.4 Wildlife in Urban/Suburban Habitat

Urban/suburban habitat is a mix of natural and developed environments that support a relatively low diversity and density of wildlife species. However, it may include small areas of WDFW priority habitats including westside prairie, riparian areas, freshwater wetlands, and Oregon white oak woodlands (see Section 18.1.2, WDFW Priority Habitats).

Urban/suburban habitat occurs primarily in the northern and southern portions of the study area (see Maps 17-1A and 1D). It includes Castle Rock and the Longview-Kelso metro area in the north and Vancouver in the south. More urban/suburban habitat occurs along the West

Alternative than the other action alternatives (18 percent compared to 3 to 4 percent for the other three alternatives) because they cross the Longview-Kelso and Vancouver metro areas. The Sundial substation site is in an urban/suburban habitat (which includes a disturbed wetland).

Many wildlife species thrive in high density inner city areas such as Vancouver and Longview-Kelso and have a high tolerance for human activity. Habitat features in the built environment—such as rooftops, antennae, vent holes, and decorative boxes—provide holes, crevices, and ledges used by birds and mammals. Wildlife species are habitat generalists, and frequently are non-natives, such as opossum (*Didelphis virginiana*) and European starling (*Sturnus vulgaris*). Other common species could include American robin, wrens, jays, and crows. Available woody vegetation is the most important factor to support native birds (Johnson and O’Neil 2001). The proportion of native songbird species tends to decline as urban development intensifies. Some native perching birds and wildlife species that use remnant patches of forest, parks, and green belts could occur in this habitat, including four federal species of concern or state-listed species (see Section 18.1.4, Special-Status Wildlife).

In suburban areas with more vegetation, wildlife diversity increases, although most species are still typically generalists adapted to a wide range of food sources. Remnant patches of habitat left undeveloped such as riparian areas, canyons or ravines, rock outcrops, and lakes provide habitat for generalist species such as coyotes, osprey (*Pandion haliaetus*), belted kingfisher (*Megaceryle alcyon*), and occasionally cougars (*Puma concolor*) (Johnson and O’Neil 2001), and species more specialized to those habitats. Undeveloped areas in suburban areas next to rural areas may serve as wildlife corridors. Where remnant patches of habitat occur, special-status species appropriate to the type of habitat present also have the potential to occur. For example, one special-status species—purple martin (*Progne subis*)—has been documented along the West Alternative in urban/suburban habitat, likely in or near a riparian area.

18.1.2 WDFW Priority Habitats

WDFW priority habitats are those habitats “with unique or significant value to a diverse assemblage of species” (WDFW 2008) considered a conservation and management priority by the state. The WDFW priority habitats include those documented in the WDFW database (WDFW 2010b) and those that might qualify as WDFW priority habitats based on a GIS database analysis or field surveys (see Maps 18-1A through 18-1D). They include Oregon white oak woodlands, herbaceous balds, westside prairie, biodiversity areas and corridors, old-growth/mature forest, freshwater wetlands and fresh deepwater, riparian areas, caves, cliffs, talus, and snags and logs (snag-rich areas).

18.1.2.1 Oregon White Oak Woodlands

Oregon white oak woodlands are stands of Oregon white oak or oak/conifer associations where oak accounts for at least 25 percent of the canopy (WDFW 2008). Only Oregon white oak woodlands equal to or greater than 1 acre are considered priority habitat in non-urbanized areas, but even a single Oregon white oak tree can be considered priority habitat in an urbanized area if particularly valuable to wildlife (WDFW 2008).

There are two documented areas of Oregon white oak woodlands within 1 mile of the action alternatives. Both are in the southern part of the study area (see Map 18-1D). One occurrence is the Sifton/Lacamas Oregon White Oak Woodland in the Lacamas Prairie Natural Area, which is

crossed by the West Alternative (segments 25, 36, 41, 43, 40, and 48) (WNHP 2010). The other is in the Washougal Oaks woodland, which is along Segment 52 (crossed by all action alternatives) next to the Washougal River and Shepard Hill (WDFW 2012). (The Washougal Oaks Woodland is different from the Washougal Oaks NAP, which is about 5 miles to the east and not crossed by the action alternatives).

Oregon white oak woodlands provide an abundance of food and important habitat for wildlife. Species such as deer and squirrels feed on the acorns, cavity nesters and some bats nest in oak cavities, and mammals such as red fox (*Vulpes vulpes*) use cavities created by decaying root systems for denning (WFF 1997). Four special-status species could be found in this habitat (see Section 18.1.4, Special-Status Wildlife). Of these, three have been documented in the study area, including wood duck, pileated woodpecker, and Townsend's big-eared bat. A WDFW wood duck priority area encompasses much of an Oregon white oak woodland in the Lacamas Prairie Natural Area. Slender-billed white-breasted nuthatches (*Sitta carolinensis aculeata*) occur in the nearby Washougal Oaks NAP (WWRC 2010), but there are no documented occurrences of this species within the study area.

18.1.2.2 Herbaceous Balds

Herbaceous balds are areas of herbaceous vegetation growing in shallow soils over bedrock, often occurring within forested habitats or woodlands. Both WDFW and WNHP have special designations for herbaceous balds: WNHP herbaceous bald priority ecosystems consist of specific plant species associations (see Chapter 17, Vegetation); WDFW priority habitats are more general. There is no size limit for an herbaceous bald to be considered a WDFW priority habitat.

Three herbaceous balds are documented by WDFW within 1 mile of the action alternatives. They include the herbaceous bald south of Rock Creek on Larch Mountain (Segment O of the East and Crossover alternatives, see Map 18-1D); on Baldy (or Bald) Mountain south of Goble Creek (Segment 10 of the Central Alternative, see Map 18-1B); and on Little Baldy Mountain southeast of Lacamas Creek (Segment 39 of West Option 3, see Map 18-1D). Only the herbaceous bald on Larch Mountain is crossed by the project, although a new access road crosses within a few feet of the herbaceous bald on Baldy (or Bald) Mountain. The WNHP has also documented an additional herbaceous bald within the study area that is not documented by WDFW. This additional herbaceous bald has been documented as a North Pacific herbaceous bald and bluff priority ecosystem (West Alternative, West Option 1, and Crossover Alternative) (see Chapter 17, Vegetation).

Herbaceous balds provide habitat to many rare butterfly species, such as Fender's blue butterfly (*Icaricia icarioides ssp. fenderi*) and several others (see Section 18.1.4, Special-Status Wildlife). However, none of these species have been documented in the study area.

18.1.2.3 Westside Prairie

Westside prairie is an increasingly rare type of habitat. This vegetation community is dominated by native herbaceous species and is classified as wet prairie or dry prairie based on hydrologic conditions and plant species present. Although the project area (including portions of the study area) historically contained many westside prairies, most have been converted to agriculture or developed for other uses. Consequently, westside prairie is primarily found in small remnant patches along fencerows and field margins (Caplow and Miller 2004; WDNR 2008, 2009c). An

exception is the Lacamas Prairie in Clark County, which was recently designated as a Natural Area by the Washington State Commissioner of Public Lands. WDNR has plans to purchase this Natural Area for a NAP and NRCA since it is the only remaining example of an intact remnant wet prairie in Washington (see Section 17.1.2.1, WDNR Protected Areas).

Only the West Alternative, West Options, and Crossover Option 1 cross westside prairie habitat (see Map 18-1D). The affected areas include two portions of the Lacamas Prairie Natural Area, including part of the proposed NAP (crossed by West Option 1—segments 40 and 46), and part of the proposed NRCA (crossed by the West Alternative, West Options, and Crossover Option 1—segments 36, 36A, 36B, 40, 41, 45, 46, and 50).

Eleven special-status species could be found in westside prairie; five have been found in the study area: tundra swan, sandhill crane, Columbian black-tailed deer, elk, and Townsend's big-eared bat (see Section 18.1.4, Special-Status Wildlife).

18.1.2.4 Biodiversity Areas and Corridors

Biodiversity areas include habitats identified by WDFW as being important for their biological diversity. Corridors include the relatively undisturbed, unbroken tracts of vegetation that connect these areas (WDFW 2008). There are seven documented WDFW biodiversity areas and corridors in the southern half of the study area: the Upper Salmon Creek Riparian Corridor, the Burnt Bridge Creek Biodiversity Area, the Cougar Creek Riparian Corridor, the Green Mountain Biodiversity Area, the East Fork Lewis River Riparian Corridor, the Camas Biodiversity Area, and the Lady and Akerman Islands Biodiversity Area and Corridor. All are crossed by the West Alternative, while the latter three are crossed by all action alternatives (see Maps 18-1C and 18-1D). All but one are in riparian areas in either open or forested habitat (including two in old-growth/mature forest); the other—the Green Mountain Biodiversity Area—is in forest next to the Lacamas Prairie Natural Area.

Wildlife includes those species listed for forest (see Section 18.1.1.1, Wildlife in Forest and Production Forest Habitats), open habitats (see Section 18.1.1.3, Wildlife in Open Habitats), old-growth/mature forest (see Section 18.1.2.5, Old-Growth/Mature Forest), and/or riparian areas (see Section 18.1.2.8, Riparian).

18.1.2.5 Old-Growth/Mature Forest

Old-growth/mature forests in Washington have declined over the past century from timber harvest activities, but patches of these forests remain throughout the state. About 22.8 million acres of old-growth forests remain in Washington, which is about 6 percent of Washington's forests (USFS 1993). To be considered WDFW priority habitat, old growth/mature forest stands need to be at least 7.5 acres, although stands less than 7.5 acres could still be considered a biodiversity area and corridor priority area (WDFW 2008).

There are about 27 stands of old-growth/mature forests crossed by or immediately adjacent to the action alternatives, although they occur most frequently along the West Alternative, particularly Segment 9 (see Maps 18-1A and 18-11B) (Herrera 2010; WDFW 2010b). About half of the stands identified are along rivers and streams. Some larger stands occur along Monahan Creek north of the Monahan Creek substation site (Segment E), the Coweeman River (Segment 9), the Kalama River (Segment 9), the Lewis River near Lake Merwin (Segment 23), Pup Creek (just south of Segment 18), King Creek (Segment O), Lacamas Lake (Segment 40), the

Little Washougal River (Segment 51), and the Columbia River on Lady Island (Segment 52) (see Maps 18-1A through 18-1D).

Wildlife species found in old-growth/mature forests can vary from those found in forests, and generally have more specific habitat requirements. Common species in old-growth/mature forest include varied thrush (*Ixoreus naevius*) and bark-foraging birds such as brown creeper (*Certhia americana*), chestnut-backed chickadee (*Poecile rufescens*), red-breasted nuthatch (*Sitta canadensis*), and hairy woodpecker (*Picoides villosus*) (Johnson and O'Neil 2001). At least nine special-status species may be found in old-growth/mature forest, including two federally listed species—marbled murrelet (*Brachyramphus marmoratus*) and northern spotted owl (*Strix occidentalis*) (see Section 18.1.4, Special-Status Wildlife). Of the nine species, five have been documented in the study area: northern spotted owl, bald eagle, northern goshawk, pileated woodpecker, and Vaux's swift.

18.1.2.6 Snags and Logs (Snag-Rich Areas)

Snags and logs can occur within any forest or woodland habitat, although they tend to be less frequent in managed forests. They support similar wildlife as the other forest and woodland habitats, but increase habitat structural diversity. Snag-rich areas occur infrequently in the project area, partly due to the large amount of managed (production) forest. They are only found in the study areas of the East, Central, and Crossover alternatives. WDFW-documented snag-rich areas occurring within the study area include the Rock Creek Snag-Rich Area, crossed by Segment K (East Alternative, see Map 18-1B); the North Fork Lacamas Snags crossed by Segment P (Central Alternative and East Option 2, see Map 18-1D); and an unnamed snag-rich area in the Rock Creek Watershed near Segment O (East and Crossover alternatives, see Map 18-1D).

18.1.2.7 Freshwater Wetlands and Fresh Deepwater

Freshwater wetlands include the transitional areas between aquatic and terrestrial habitats where the water table is at or near the soil surface, or where the land is covered by shallow water (WDFW 2008). They include emergent, scrub-shrub, and forested wetlands.

Wetland habitat occurs frequently along all action alternatives, although most frequently along the West Alternative (see Maps 18-1A, 1C, and 1D). Many wetlands found along the action alternatives are associated with the floodplains of large river systems, including the Cowlitz, Coweeman, Lewis, Kalama, and Columbia rivers. Wetland habitats are also found within smaller stream corridors, such as Salmon Creek. Although they can vary in their value to wildlife based on various attributes—such as size, structural complexity, connectivity, etc.—WDFW considers all wetlands to be priority habitat (WDFW 2010a). However, only three have been documented by WDFW in the study area to date. These include the Coweeman Wetland along the Coweeman River (Segment 9 of the West and Crossover alternatives), the Fraser Creek Wetland north of Yale Lake (Segment K of the East Alternative), and the Mill Creek Wetland south of the East Fork Lewis River (Segment 9 of the West Alternative,). These wetlands are valuable to wildlife for various reasons, as noted by WDFW (WDFW 2012).

Birds, including species such as Bullock's oriole (*Icterus bullockii*), red-tailed hawk (*Buteo jamaicensis*), Virginia rail (*Rallus limicola*), belted kingfisher, red-winged blackbird (*Agelaius phoeniceus*), cavity nesting ducks, and breeding and wintering concentrations of waterfowl, typically use low-elevation herbaceous wetlands for foraging and refuge more than any other

wetland type (WDFW 2010b). Mink (*Mustela vison*) and beaver (*Castor canadensis*) are common in wetlands. Emergent and scrub-shrub wetlands are used for breeding by most semi-aquatic amphibian species; even very small wetlands can be important habitat for amphibians (Johnson and O'Neil 2001). Nineteen special-status species can be supported by freshwater wetlands (see Section 18.1.4, Special-Status Wildlife). At least 7 of these have been documented in either wetland, riparian, or fresh deepwater habitat in the study area, including great blue heron (*Ardea herodias*), tundra swan, elk, Cope's giant salamander, Dunn's salamander, western toad, and western pond turtle.

Fresh deepwater includes the deep water habitat beyond the emergent wetland boundary in permanently flooded lands such as rivers and lakes (WDFW 2008). They support non-emergent **hydrophytic** plant species and fish and serve as foraging habitat for waterfowl, waterbirds, raptors, and bats. A similar number of fresh deepwater habitats are crossed by the action alternatives and include the Coweeman and Cowlitz rivers in the northern portion of the study area (see Maps 18-1A and 1B), the Kalama, Lewis, and East Fork Lewis rivers in the central portion (see Maps 18-1B and 1C), and the Columbia and Washougal rivers in the southern portion (see Map 18-1D).

Eleven special-status species could be found in fresh deepwater (see Section 18.1.4, Special-Status Wildlife). Of these, the California floater mussels (*Anodonta californiensis*), tundra swan, and western pond turtle are documented as occurring either in open water or wetlands in the study area.

18.1.2.8 Riparian

Riparian habitats occur in the lower-lying areas extending from the streamside vegetation along rivers and streams out to the edge of the floodplain (see also Chapter 15, Water and Chapter 19, Fish). Wetlands are commonly found within riparian zones. Riparian woodlands dominated by deciduous tree species are common, as are riparian areas in early- to late-successional coniferous forest.

Streams and rivers occur frequently throughout the study area (see Maps 18-1A through 18-1D). Riparian habitat would be cleared for the transmission line corridor at 46 to 70 fish-bearing stream crossings, depending on the action alternative (see Tables 15-2 and 19-2). This would likely include habitat along seven to nine larger rivers and streams. All action alternatives would cross the Cowlitz, Coweeman, Kalama, Lewis, East Fork Lewis, Washougal, and Columbia rivers; while the West Alternative would also cross Salmon Creek (also part of the Clark County Regional Conservation and Greenway System) and Lacamas Creek.

Riparian zones generally contain more mammal, bird, and amphibian species than surrounding uplands. Mammals may include such habitat generalists as coyotes, squirrels, chipmunks, and white-tailed deer. Riparian habitats also provide abundant high-quality food for neotropical migratory birds, which use riparian areas for breeding and as stopovers during migration. Other bird species that use these areas include osprey, red-winged blackbird, red-tailed hawk, American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), and song sparrow (*Melospiza melodia*). Amphibians such as Pacific giant salamanders (*Dicamptodon* spp.) and western redback salamander (*Plethodon vehiculum*) use riparian zones for foraging, and most amphibian species require an aquatic habitat for part of their life cycle.

In the study area, riparian areas are important habitats to special-status species. Fifteen special-status species with potential to occur in the study area are those that use riparian habitats (see Section 18.1.4, Special-Status Wildlife). Thirteen of these have been documented as occurring in riparian or wetland habitat: Barrow's goldeneye (*Bucephala islandica*), Tundra swan, wood duck, great blue heron, bald eagle, pileated woodpecker, purple martin, elk, Cascade torrent salamander, Cope's giant salamander, Dunn's salamander, Rocky Mountain tailed frog, and western toad.

18.1.2.9 Caves

Caves are naturally occurring cavities, recesses, voids, or systems of interconnected passages that are large enough for a person and that occur under or into the earth in soils, rock, ice, or other geological formations. Mine shafts may mimic caves and provide similar wildlife habitat (WDFW 2008).

Several WDFW cave-rich priority areas occur near Yale Lake (see Map 18-1C). They include a WDFW cave-rich priority area crossed by the East and Crossover alternatives in the portion of Segment O nearest to Yale Lake. Two others occur near Yale Lake within 1 mile of an action alternative: one near Segment K of the East Alternative, and one near Segment U of East Option 2. In addition, a cave occurs between segments 41 and 38 near the West Alternative and West Options 2 and 3 (see Map 18-1D).

Caves could provide habitat for seven special-status species (see Section 18.1.4, Special-Status Wildlife). Three have been documented in the study area: Townsend's big-eared bat, peregrine falcon, and Larch Mountain salamander.

18.1.2.10 Talus

Talus is a homogenous area of rock rubble, including riprap slides and mine tailings. Talus may be associated with cliff habitat, a WDFW priority habitat that has not been documented or quantified by WDFW (WDFW 2008).

Talus occurs where the East and Crossover alternatives cross Larch Mountain on Segment O (see Map 18-1D), which may also cross cliff habitat (also not yet documented by WDFW).

Common species such as red-legged frog (*Rana aurora*), Pacific tree frog (*Pseudacris regilla*), northwestern salamander (*Ambystoma gracile*), and long-toed salamander (*Ambystoma macrodactylum*) sometimes use talus slopes for winter hibernation. Cliffs provide vantage points and unique nesting and roosting habitat for birds, and roosting habitat for bats. Mammals such as fishers use cliffs for denning.

Talus slopes may provide habitat for two special-status species: Larch Mountain salamander and Van Dyke's salamander (*P. vandykei*) (see Section 18.1.4, Special-Status Wildlife). Cliffs may support three special-status species: peregrine falcons, long-eared myotis, and long-legged myotis. Only Larch Mountain salamander and peregrine falcon have been documented to occur in the study area.

18.1.3 ODFW Strategy Habitats

In Oregon, strategy habitats are native habitats considered to be conservation priorities due to high losses over the last century and the risk of future losses (ODFW 2006). ODFW guides habitat mitigation by rating and categorizing strategy habitats based on quality and importance to wildlife. These habitat categories are designated as categories 1 through 6, with 1 being the highest quality (OAR 635-415-0025). Oregon strategy habitats in the study area (defined the same as WDFW priority habitats) include wetland and riparian habitats. These habitats have been highly disturbed and would likely be considered ODFW habitat categories 5 and 6, including the herbaceous emergent wetlands surrounding the Sundial substation site. The ODFW Sandy River Conservation Opportunity Area (COA) may contain higher quality habitat, but is 0.25 mile east of the proposed right-of-way for all action alternatives and 0.5 mile east of the Sundial substation site (see Map 18-1D), and would not be affected.

18.1.4 Special-Status Wildlife

Special-status wildlife include those species protected under the federal Endangered Species Act as threatened, endangered, or proposed species; those listed by the USFWS as candidate species or species of concern; and those listed for protection by the states of Oregon and Washington. Special-status species also include WDFW priority (non-listed) species and specific wildlife groups, such as waterfowl. These are species identified as conservation priorities due to their dependency on specific habitats for important aggregations (e.g., heron rookeries), or based on their recreational, commercial, and/or tribal importance coupled with various vulnerabilities to decline (WDFW 2008). Special status wildlife species with documented occurrences and/or potential suitable habitat within the study area (defined the same as WDFW priority habitats and ODFW strategy habitats) are identified in Table 18-2. The following discussion describes federally listed wildlife species with the potential to occur in the study area, and other special-status wildlife species.

18.1.4.1 Federally Listed Wildlife Species

The potential for a certain federally-listed wildlife species to occur in the study area is determined by documented occurrences and suitable habitat. Suitable habitat occurs for one federally endangered species (Columbian white-tailed deer) and two federally threatened species (northern spotted owl and marbled murrelet) along all action alternatives.

Columbian White-Tailed Deer

Suitable habitat for Columbian white-tailed deer includes a mix of open habitat and forest or woodland habitat (see Section 18.1.2, WDFW Priority Habitats). Although suitable habitat exists along all action alternatives for Columbian white-tailed deer, they are not likely found in the study area. There are only two known populations of this species: one in Washington along the Columbia River west of the project area, and one in Roseburg, Oregon (USFWS 1983). The eastern extent of the Columbia River population is about 5 miles west of the study area (WDFW 2009c). There is no federally designated critical habitat for Columbian white-tailed deer in the study area (USFWS 2010b, 2010c).

Table 18-2 Special-Status Wildlife Species with the Potential to Occur in the Study Area¹

Species (Scientific Name)	Status	Potential Habitat in Study Area	Documented Occurrences by Action Alternative
Birds			
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Federal (SOC) WA (S)	Open water; Riparian; Forest; Production forest; Old- growth/mature forest	All Action Alternatives
Band-tailed pigeon (<i>Columba fasciata</i>)	WA (Priority)	Forest; Production forest	–
Barrow's goldeneye (<i>Bucephala islandica</i>) ²	WA (Priority)	Wetlands; Riparian	West, West Options 1–3, Crossover, Crossover Options 1–3
Bufflehead (<i>Bucephala albeola</i>) ²	WA (Priority)	Wetlands; Riparian; Oregon white oak woodlands; Open water	–
Cavity-nesting ducks	WA (Priority Areas)	Riparian	West Alternative and Options Central Option 3
Common Goldeneye (<i>Bucephala clangula</i>) ²	WA (Priority)	Wetlands; Riparian; Oregon white oak woodlands; Open water	–
Golden eagle (<i>Aquila chrysaetos</i>)	WA (C)	Open habitat; Prairie	–
Great blue heron (<i>Ardea herodias</i>)	WA (Priority)	Wetlands; Riparian	West Alternative and Options Crossover Alternative and Options
Harlequin duck (<i>Histrionicus histrionicus</i>)	WA (Priority)	Wetlands	–
Hooded Merganser (<i>Lophodytes cucullatus</i>) ²	WA (Priority)	Wetlands; Riparian; Oregon white oak woodlands; Open water	–
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Federal (T) OR (T) WA (T)	Old-growth/ mature forest	–
Northern goshawk (<i>Accipiter gentilis</i>)	Federal (SOC) OR (S-V) WA (C)	Old-growth/mature forest	West Alternative and Options Central Alternative and Options Crossover Alternative and Options
Northern spotted owl (<i>Strix occidentalis</i>)	Federal (T) OR (T) WA (E)	Old-growth/mature forest	All Action Alternatives
Olive-sided flycatcher (<i>Contopus cooperi</i>)	Federal (SOC) OR (S-V)	Shrubland; Forest; Production Forest; Open water	–
Peregrine falcon (<i>Falco peregrinus</i>)	Federal (SOC) OR (S-V) WA (S)	Urban/suburban; Caves; Cliffs	East Alternative and Options Crossover Alternative and Options
Pileated woodpecker (<i>Dryocopus pileatus</i>)	OR (S-V) WA (C)	Old-growth/mature forest; Riparian; Oregon white oak woodlands	West Alternative and Options Crossover Alternative and Options
Purple martin (<i>Progne subis</i>)	Federal (SOC) OR (S-CR) WA (C)	Riparian	All Action Alternatives
Sandhill crane (<i>Grus canadensis</i>)	OR (S-V) WA (E)	Open habitat; Open water; Wetlands	West Alternative and Options
Slender-billed white- breasted nuthatch (<i>Sitta carolinensis aculeata</i>)	Federal (SOC) OR (S-V) WA (C)	Old-growth/mature forest; Oregon white oak woodlands	–

Species (Scientific Name)	Status	Potential Habitat in Study Area	Documented Occurrences by Action Alternative
Sooty grouse (formerly blue grouse) (<i>Dendragapus fuliginosus</i>)	WA (Priority)	Forest; Production forest	–
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Federal (C) OR (S-CR) WA (C)	Riparian; Open Habitat; Prairie	–
Trumpeter swan (<i>Cygnus bucinator</i>)	WA (Priority)	Open water; Wetlands	–
Tundra swan (<i>Cygnus columbianus</i>)	WA (Priority)	Open habitats; Open water; Riparian	West Alternative and Options
Vaux's swift (<i>Chaetura vauxi</i>)	WA (C)	Old-growth/mature forest	All Action Alternatives except Central Option 3
Waterfowl Concentrations (Ducks, Geese, and Swans)	WA (Priority Areas)	Wetlands; Riparian; Oregon white oak woodlands; Open water	West Alternative and Options East Alternative, East Options 2 and 3
Western grebe (<i>Aechmophorus occidentalis</i>)	WA (C)	Open water; Wetlands	–
Wood duck (<i>Aix sponsa</i>) ²	WA (Priority)	Wetlands; Riparian; Oregon white oak woodlands	West Alternative and Options Crossover Option 1
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Federal (C) OR (S-CR) WA (C)	Forest; Production forest; Riparian	–
Mammals			
Big brown bat (<i>Eptesicus fuscus</i>)	WA (Priority)	Urban/suburban; Forest; Production forest	–
Brush prairie pocket gopher (<i>Thomomys mazama</i> spp. <i>Oregonus</i>)	Federal (C) WA (T)	Open habitat; Prairie	–
Columbian black-tailed deer (<i>Odocoileus hemionus</i> ssp. <i>columbianus</i>)	WA (Priority)	Open habitat; Shrubland; Forest; Production forest	West Alternative and Options East Alternative and Options Crossover Alternative and Options
Columbian white-tailed deer (<i>Odocoileus virginianus</i> ssp. <i>leucurus</i>)	Federal (E) OR (S-V) WA (E)	Open habitat; Shrubland; Forest; Production forest; Wetlands; Riparian; Prairie	–
Elk: Rocky Mountain Elk (<i>Cervus elephus nelsoni</i>) and Roosevelt Elk (<i>Cervus elephus roosevelti</i>)	WA (Priority)	Open habitat; Shrubland; Forest; Production forest; Wetlands	All Action Alternatives
Fisher (<i>Martes pennanti</i>)	Federal (C) OR (S-CR) WA (E)	Forest; Production forest; Cliffs	–
Fringed myotis (<i>Myotis thysanodes</i>)	Federal (SOC) OR (S-V) WA (Monitor)	Forest; Production forest; Caves	–
Gray-tailed vole (<i>Microtus canicaudus</i>)	WA (C)	Open habitat	–
Keen's myotis (<i>Myotis keenii</i>)	WA (C)	Urban/suburban; Old-growth/mature forest	–
Long-eared myotis (<i>Myotis evotis</i>)	Federal (SOC) WA (Monitor)	Shrubland; Forest; Production forest; Open water; Riparian; Caves; Cliffs	–

Species (<i>Scientific Name</i>)	Status	Potential Habitat in Study Area	Documented Occurrences by Action Alternative
Long-legged myotis (<i>Myotis volans</i>)	Federal (SOC) OR (S-V) WA (Monitor)	Urban/suburban; Forest; Production forest; Caves; Cliffs	–
Marten (<i>Martes americana</i>)	OR (S-V) WA (Priority)	Old-growth/mature forest; Wetlands	–
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Federal (SOC) OR (S-CR) WA (C)	Caves; Forest; Production forest; Oregon white-oak woodland; Open habitat; Riparian	West Alternative and Options
Amphibians			
Cascade torrent salamander (<i>Rhyacotriton cascadae</i>)	Federal (SOC) OR (S-V) WA (C)	Wetlands; Riparian	All Action Alternatives
Cope's giant salamander (<i>Dicamptodon copei</i>)	OR (S-V) WA (Monitor)	Wetlands; Riparian	West Alternative and Options Central Alternative and Options Crossover Alternative and Options
Dunn's salamander (<i>Plethodon dunnii</i>)	WA (C)	Wetlands; Riparian	Central Option 1
Larch Mountain salamander (<i>Plethodon larselli</i>)	Federal (SOC) OR (S-V) WA (S)	Caves; Talus	–
Northern red-legged frog (<i>Rana aurora</i>)	OR (S-V)	Open water; Wetlands; Riparian	–
Oregon spotted frog (<i>Rana pretiosa</i>)	Federal (C) OR (S-CR) WA (E)	Open water; Wetlands; Riparian	–
Rocky Mountain tailed frog (<i>Ascaphus montanus</i>)	OR (S-V) WA (C)	Riparian	East Alternative and Options Crossover Alternative and Options
Van Dyke's salamander (<i>Plethodon vandykei</i>)	Federal (SOC) WA (S)	Wetlands; Riparian; Caves; Talus	–
Western toad (<i>Anaxyrus boreas</i>)	Federal (SOC) OR (S-V) WA (C)	Open water; Wetlands; Riparian; Open Habitat; Forest	Central Alternative and Options
Reptiles			
Western pond turtle (<i>Actinemys marmorata</i>)	Federal (SOC) OR (S-CR) WA (E)	Open water; Wetlands; Riparian; Open habitat; Forest	All Action Alternatives
Invertebrates			
Blue-gray taildropper (snail) (<i>Prophysaon coeruleum</i>)	WA (C)	Old-growth/mature forest	–
California floater (mussel) (<i>Anodonta californiensis</i>)	Federal (SOC) WA (C)	Open water; Wetlands	All Action Alternatives
Valley silverspot (butterfly) (<i>Speyeria zerene bremnerii</i>)	Federal (SOC) WA (C)	Open habitats; Prairie	–
Notes: C = Candidate; E = Endangered; T = Threatened; S = Sensitive; S-CR = Sensitive, Critical; S-V = Sensitive, Vulnerable; SOC = Species of Concern. 1. Documented occurrences are within a 2-mile-wide corridor (1 mile on each side of the action alternatives). 2. These five species make up the WDFW priority species group "Cavity-Nesting Ducks." Sources: ORBIC 2010; USFWS 2010b, 2011; WDFW 2008, 2010b			

Northern Spotted Owl

Suitable habitat for northern spotted owl is multi-layered, species diverse old-growth forest dominated by large overstory trees. Old-growth/mature forest stands of varying condition occur in the study area along all action alternatives (see Map 18-1A through 18-1D). In addition, northern spotted owls and their foraging territory (referred to as **northern spotted owl circles**, and including all territorial owls) are known to occur throughout the project area, with northern spotted owl circles crossed by or occurring within 1 mile of the Central, East, and Crossover alternatives. There is no federally designated critical habitat for northern spotted owl in the study area (USFWS 2010b, 2010c).

Marbled Murrelet

Suitable habitat for marbled murrelet is old-growth/mature forest within about 50 miles of the coast that contains trees with large branches capable of providing nesting platforms (USFWS 1997). Since the western-most portions of the action alternatives are over 50 miles from the coast, they are at the furthest edge of the region expected to support marbled murrelet. Because of the distance from the coast and the small amount of mature forest (see Map 17-1A), it is unlikely that marbled murrelet would nest in the study area. However, there is a documented occurrence about 3 miles northeast of the Casey Road substation site, so it is possible that marbled murrelet could be found in the small patches of mature forest that occur in the northwest portion of the project area. In addition, the eastern extent of the Western Washington Coast Range Conservation Zone, or Conservation Zone 2, for marbled murrelet (marbled murrelet conservation zone) is crossed by all action alternatives and the three Castle Rock substation sites. As stated in the Marbled Murrelet Recovery Plan, maintaining suitable habitat within each of the six marbled murrelet conservation zones is important for the recovery of the species (USFWS 1997). There is no federally designated critical habitat for marbled murrelet in the study area (USFWS 2010b, 2010c).

18.1.4.2 Other Special-Status Wildlife Species

In addition to the 3 federally listed species, 46 other special-status species have the potential to occur in the study area (see Table 18-2). Twenty-one have documented occurrences in the study area and are discussed in Appendix N.

Birds

Bald Eagle. All action alternatives have areas of suitable bald eagle habitat. They include large trees in riparian areas (or within 0.5 mile of water) for nesting and foraging habitat, and mature conifer stands for shelter at night (Stinson, et. al 2007; USFWS 2012). Throughout the study area, there are 12 documented occurrences of bald eagle nests and 3 WDFW bald eagle priority areas in riparian habitats: the Cowlitz Bald Eagle Feeding Habitat, (see Map 18-1A), the Lewis River Winter Eagle Habitat, and the Yale Tailrace Foraging Area by Lake Merwin (see Map 18-1C). Each action alternative crosses within 1 mile of at least one WDFW bald eagle priority area (the Crossover Alternative crosses two), and all cross within 1 mile of at least three nests. The West and Crossover alternatives cross by the most nests.

Cavity-Nesting Ducks. Cavity-nesting ducks is a WDFW priority species group including wood duck, Barrow's goldeneye, common goldeneye (*Bucephala clangula*), bufflehead (*Bucephala albeola*), and hooded merganser (*Lophodytes cucullatus*). Priority areas are areas that provide

high-quality breeding habitat (WDFW 2008). There are two WDFW cavity-nesting duck priority areas in the study area: one is within 1 mile of Central Option 3 along Segment M (specific name unknown); and the other is the Woodland Cavity Nesting Habitat Priority Breeding Area within 1 mile of the West Alternative along Segment 25 (see Map 18-1C). In addition, there are priority areas specific to two of these species in the study area:

- **Barrow's Goldeneye.** There is one documented occurrence of Barrow's goldeneye within 1 mile of both the West and Crossover alternatives in high-value wetland habitat, which is also a WDFW waterfowl concentration priority area (see Waterfowl Concentrations, this section).
- **Wood Duck.** There are two WDFW wood duck priority areas in the study area in riparian areas crossed by the West Alternative, one of which also comes within 1 mile of Crossover Option 1.

Great Blue Heron. Potential habitat for great blue heron includes emergent and forested wetlands, open habitats, riparian areas, and shallow water along ponds and lakes (NatureServe 2012). Great blue herons are colonial breeders that nest in a variety of tall deciduous and evergreen trees in forested wetlands, establishing rookeries that usually exist in the same location for many years. Foraging habitat includes fields, meadows, and shallow water (NatureServe 2012). There are three documented occurrences of great blue heron in the study area. They are located within 1 mile of the West Alternative in three distinct areas, one of which is also within 1 mile of the Crossover Alternative.

Northern Goshawk. This species requires mature/old-growth forest habitat. Individuals typically nest in the largest trees in dense forests with sparse groundcover (NatureServe 2012). There is one documented occurrence of an immature northern goshawk in the study area, located in production forest within 1 mile of where the West, Central, and Crossover alternatives also cross production forest.

Peregrine Falcon. Potential habitat for peregrine falcon includes urban and suburban areas, caves, and cliffs. Peregrine falcons often nest on ledges or holes in rocky cliffs, riverbanks, large stick nests of other species, tree hollows, and man-made structures. Ideal locations include undisturbed areas with a wide view, near water, and close to an abundant food source (NatureServe 2012). There is one documented occurrence of peregrine falcon in the study area, located in WDFW cliffs/bluffs priority habitat within 1 mile of both the East and Crossover alternatives.

Pileated Woodpecker. Potential habitat for pileated woodpecker primarily includes old-growth/mature forest (including forested freshwater wetlands and forested riparian areas), although it may also include younger forests and Oregon white oak woodlands for foraging habitat if snags are present. There is one documented occurrence of pileated woodpecker in the study area within 1 mile of the West and Crossover alternatives where they cross forested freshwater wetlands.

Purple Martin. Purple martin nest in tree cavities in riparian areas and require open habitats (fields, marshes, or open water) to forage for insects (NatureServe 2012). There is one documented occurrence in the study area, located in riparian habitat within 1 mile of where all action alternatives cross the Columbia River.

Sandhill Crane. Potential habitat for sandhill crane includes open habitats such as agricultural areas, prairie habitat, emergent wetlands, and shallow ponds. Nesting habitat includes wet meadows and the edges of wetlands, while during the non-breeding season, sandhill cranes roost at night in shallow water (NatureServe 2012). Open habitats provide forage. There is one documented occurrence of sandhill crane in open habitat within 1 mile of the West Alternative.

Vaux's Swift. Potential habitat for Vaux's swift includes old-growth/mature forests, where they nest in hollow and broken-top trees and snags, although they sometimes use chimneys for nesting (NatureServe 2012). They generally use the same nest site each year. Vaux's swifts also need open habitats nearby, where they feed on insects (NatureServe 2012). There is one documented occurrence of Vaux's swift in the study area: a nesting Vaux's swift found in a chimney in urban-suburban habitat about 0.5 mile away from the Central Alternative. Vaux's swift has also been reported in a WDFW biodiversity area and corridor priority habitat (WDFW 2012) within 1 mile of all action alternatives.

Waterfowl Concentrations (Ducks, Geese, and Swans). WDFW waterfowl concentration priority areas are those known to support large numbers of ducks, geese, and swans, including those that are significant breeding areas or support regular concentrations of these birds in winter. There are five WDFW waterfowl concentration priority areas in the study area. Two are crossed by the West Alternative on Segment 25 along and just south of the East Fork Lewis River, one is within 1 mile of the West Alternative on Segment 25 along Mill Creek (see Map 18-1C), and one is within 1 mile of the East Alternative near the Cowlitz River on Segment F (see Map 18-1A). In addition, at least two WDFW priority (waterfowl) species are documented to occur in these areas:

- **Barrow's Goldeneye** (see Cavity-Nesting Ducks).
- **Tundra Swan.** This species only occurs in the study area during the winter (non-breeding) season (NatureServe 2012). Open habitats, including shallow lakes and ponds, slow-moving rivers, flooded fields, prairies, and agricultural fields provide foraging and roosting habitat for tundra swan (NatureServe 2012; Seattle Audubon Society 2012). There are two documented occurrences of tundra swan in the study area. They are at two separate locations in riparian/wetland habitats within 1 mile of the West Alternative. One occurrence is in a WDFW Waterfowl Concentration Priority Area.

Mammals

Columbian Black-Tailed Deer. Columbian black-tailed deer is a subspecies of mule deer, and is classified as a state game species. Their preferred habitat includes a mix of shrubland and coniferous forest; as such, they are an "edge" species, finding food in forest openings and shelter in the forest. There are two known concentrations of this species in the study area. The Crossover and East alternatives cross a WDFW Columbian black-tailed deer winter range priority area, and there is a small concentration of this species in a WDFW biodiversity area and corridor—known as the Green Mountain Urban Natural Open Space (WDFW 2012), that is crossed by the West Alternative (including West Options 2 and 3).

Elk. There are two subspecies of elk in the project area: Roosevelt elk, indigenous to Washington, and Rocky Mountain elk, introduced from the Rocky Mountain region (WDFW 2006). Both are game species in Washington. Elk are also considered an edge species because ideal habitat for elk consists of open habitat interspersed with closed-canopy forest (WDFW

2005). There are 10 to 11 recognized elk herds in Washington (WDFW 2006, 2012), three have known ranges and WDFW winter range priority areas crossed by all action alternatives: the Willapa Herd (WDFW Roosevelt Elk Winter Range Priority Area) and the Mt. St. Helen's and Mt. Rainier herds (WDFW Rocky Mountain and Roosevelt Elk Winter Range Priority Area). The range of the Willapa Herd extends to the northwest portion of the study area. The Mt. St. Helen's/Mt. Rainier's herds range extends to the east and southern portions of the study area. WDFW priority areas for both herds occur only in the northern portion of the study area.

Townsend's Big-Eared Bat. Townsend's big-eared bats may be found in forest habitats or in areas with a mosaic of forest, open, and/or shrubland habitats (NatureServe 2010). They establish maternity and hibernation colonies in caves and mine tunnels, roost in trees, and feed on insects near the foliage of trees and shrubs. There is one documented occurrence of Townsend's big-eared bat in the study area in a cave within about 0.15 mile of the West Alternative (including the West Options) (WDFW 2010b).

Amphibians

Cascade Torrent Salamander. Suitable habitat for Cascade Torrent Salamander includes riparian areas in moist coniferous forests, primarily in and around streams (NatureServe 2012). There are 12 documented occurrences of Cascade torrent salamander in the study area, primarily along the Central, East, and Crossover alternatives, but also one along the West Alternative (WDFW 2010b).

Cope's Giant Salamander. Suitable habitat for Cope's giant salamander includes riparian areas, moist coniferous forests, and in and around streams, rivers, and ponds (NatureServe 2012). There are two documented occurrences of Cope's giant salamander in the study area. One occurs in the study areas of both the Crossover and West alternatives, while the other only occurs in the study area of the Crossover Alternative.

Dunn's Salamander. Suitable habitat for Dunn's salamander would be riparian areas along shady streams or stream seepages in wet rocky areas, talus slopes, moss-covered outcrops, and under rocks, logs, and leaf litter (NatureServe 2012). Dunn's salamanders have been documented twice in the study area, both occurrences are near access roads of Central Option 1 near the Casey Road substation site.

Larch Mountain Salamander. The range of Larch Mountain salamanders extends from the Columbia River Gorge northward in the Cascades to central Washington. Potential habitat for Larch Mountain salamander includes steep slopes (usually north-facing, mossy slopes) associated with talus, gravelly soils, or other types of rocky substrate. There is one documented occurrence in the study areas of the East and Crossover alternatives.

Rocky Mountain Tailed Frog. Rocky Mountain tailed frogs require clear, cold, swift-moving mountain streams with a coarse substrate—most commonly found in forested riparian areas (NatureServe 2012). Rocky Mountain tailed frogs have moderate mobility and may be found in forest or open habitat away from streams in wet weather. There are five documented occurrences of this species in the study area. Two are located exclusively along the East Alternative; three others are along both the East and Crossover alternatives.

Western Toad. The western toad migrates seasonally between aquatic breeding and terrestrial non-breeding habitat. Potential breeding habitat for the western toad includes emergent

wetlands, ponds and lakes, or pools of slow-moving streams (NatureServe 2012). Non-breeding habitat occurs in a variety of disturbed and undisturbed open and forest habitats. There is one documented occurrence of this species in the study area along the Central Alternative.

Reptiles

Western Pond Turtle. Potential habitat for the western pond turtle includes riparian areas, emergent wetlands, ponds and small lakes, and adjacent upland habitat for nesting and hibernation (NatureServe 2012). There are three documented occurrences of this species in the study area. One is in Washington along the Central Alternative. Two are along all action alternatives in Oregon, including one occurrence near the Sundial substation site. The population in Washington is a captive population (WDFW 2010b); its potential range is therefore limited to that specific site, which is about 0.25 mile away from the proposed right-of-way and access road.

Invertebrates

California Floater. Potential habitat along the action alternatives for this freshwater mussel includes shallow water in primarily silty or sandy substrates of various aquatic habitats, although they have also been found in gravelly substrates (Xerces 2012). There is one documented occurrence of California floater in the Columbia River within 1 mile of the action alternatives.

18.2 Environmental Consequences

General impacts that would occur for the action alternatives are discussed below, followed by impacts unique to each alternative.

18.2.1 Impact Levels

Impacts would be **high** where project activities would cause the following:

- Mortality, a temporary decline in reproduction, or habitat loss of known occurrences of a federally listed species under the ESA that adversely affects population recovery
- Mortality, a temporary decline in reproduction, or habitat loss of known occurrences of a non-federally listed species with an at-risk population that contributes to the need for federal listing
- Permanent removal or alteration of WDFW priority habitats of high value to wildlife such that most or all relevant attributes of the original habitat are lost

Impacts would be **moderate** where project activities would cause the following:

- Mortality, a temporary decline in reproduction, or habitat loss of known occurrences of a federally listed species under the ESA that does not adversely affect population recovery
- Mortality, a temporary decline in reproduction, or habitat loss of known occurrences of a non-federally listed special-status species with an at-risk population that does not contribute to the need for federal listing
- Mortality of common wildlife species

- Disturbance of federally designated critical habitat under the ESA or high value WDFW priority habitats such that all or most of the relevant attributes of the original habitat are altered but will be restored
- Permanent removal or alteration of WDFW priority habitats of moderate value to wildlife such that most or all relevant attributes of the original habitat are lost
- Long-term or continued intermittent reduction of local food sources including prey species

Impacts would be **low** where project activities would cause the following:

- Minimal disturbance of federally designated critical habitat under the ESA or high value WDFW priority habitat such that all or most of the relevant attributes of the original habitat are maintained
- Permanent removal or alteration of WDFW priority habitats or ODFW strategy habitats of low value to wildlife such that most or all relevant attributes of the original habitat are lost
- Permanent removal or alteration of common wildlife habitats
- Loss of potential habitat of a federally listed species under the ESA where there is a greater likelihood that individuals could be present, but where none have been documented to occur.
- Habitat loss or temporary decline in reproduction of known occurrences of WDFW priority species with stable populations and of common species
- Temporary and minor disturbance of special-status species with at-risk populations that does not affect reproduction or cause injury or mortality
- Temporary disturbance of common wildlife species that does not cause mortality
- Short-term reduction to local food sources including prey species

No impact would occur when there is no degradation of habitat, or any mortality, injury, or reduced reproductive capacity of any wildlife species.

18.2.2 Impacts Common to Action Alternatives

18.2.2.1 Construction

Habitat Removal and Alteration

Project construction would remove or alter forest, forest production, shrubland, open, and urban/suburban habitats, and certain WDFW priority habitats.

Wildlife forested habitats—including Oregon white oak woodlands, old-growth/mature forests, and some urban/suburban habitats with trees—would be lost by clearing the right-of-way of vegetation for the new line. Most trees and shrubs taller than 4 feet would be removed. These impacts

Habitat removal includes the loss of habitats due to towers, access roads, and substations; or where right-of-way clearing removes forested habitats.

Habitat alteration includes areas where right-of-way clearing removes taller vegetation, but does not eliminate the main attribute of the habitat: e.g., in riparian and shrubland habitats.

would be permanent since the right-of-way would need to remain clear of tall-growing vegetation for the life of the line to maintain operational safety. The loss of wildlife breeding, roosting, nesting, and foraging sites characteristic of forested habitats would change the composition of the wildlife community within and at the edge of the right-of-way, substation, and access roads. Typically, the forested habitats would be converted to shrubland, and Oregon white oak woodlands to prairie. This change in habitat within the right-of-way would also create habitat fragmentation that could reduce and isolate wildlife populations, such as Cope's giant salamander and Dunn's salamander. Fragmentation can negatively affect a species' ability to access seasonal habitats and interbreed.

Habitat loss of forest and production forest from right-of-way clearing would generally have **low** impacts on wildlife because impacts would be spread out along a relatively narrow corridor, and affected habitats are fairly common in the project area, with the exception of WDFW priority habitats (see further discussion, this section). Where special-status species, such as northern spotted owl, are known to be present and would lose habitat, impacts would be **moderate**. Impacts would not be higher since habitat loss would be distributed along the corridor and not greatly affect any single wildlife population. Also, right-of-way clearing would not affect the listing status of any special-status species based on the documented occurrences in the study area and their conservation status (see Special-Status Species, this section). For wildlife species that are habitat generalists (including one federally listed species [Columbian white-tailed deer] and two WDFW priority species [elk and Columbian black-tailed deer]), there would be **no** permanent adverse impacts from right-of-way clearing since they could still use shrubland or prairie habitat as foraging habitat.

Forested riparian areas and forested freshwater wetlands would be extensively altered although they would persist as scrub-shrub riparian areas or scrub-shrub freshwater wetlands (also see WDFW Priority Habitats, this section). This alteration would have a **low-to-high** impact to these WDFW priority habitats depending on the condition of the affected areas and the proportion of shrubs and trees removed.

Shrublands (including scrub-shrub wetlands) would also be altered by right-of-way clearing since they would lose taller vegetation, which could reduce nesting habitat for some bird species. However, these areas would persist as shrubland habitats. In addition, new shrubland would be created through right-of-way clearing of forest and production forest. Therefore, right-of-way clearing would either have beneficial impacts to shrubland wildlife, or **low** adverse impacts to wildlife in existing shrubland.

Other habitats less affected by right-of-way clearing include caves, open habitat, talus fields, and cliff habitat (also see WDFW Priority Habitats, this section). Caves in forested areas would lose adjacent forest habitat, but many wildlife species that rely on caves—such as bats—are habitat generalists that could use the resulting shrublands as foraging habitat. Adverse impacts would include the loss of small amounts of roosting habitat. Right-of-way clearing would therefore be beneficial or have **low** adverse impacts to both wildlife and habitat. Wildlife in open habitat, talus fields, and cliff habitat would experience **no** impacts from right-of-way clearing.

All types of wildlife habitat would be reduced by towers, access roads, and substations. Tree, shrub, groundcover, woody debris, and soil or rock removal would create habitat losses for mammals, reptiles, birds, and invertebrates in all wildlife habitat types. The loss of these resources could also decrease prey populations and other food such as acorns and seeds. Conversely, habitat could be enhanced for raptors since towers could provide new or additional

perches, roosts, and nest sites. This could benefit raptor populations, but may adversely affect their prey, which would experience **moderate** impacts from mortality (e.g., small mammals, lizards, and snakes).

Habitat loss would generally have a **low** impact on wildlife given that impacts would be spread out along a relatively narrow corridor, and affected habitats are fairly common in the project area, with the exception of WDFW priority habitats (see WDFW Priority Habitats, this section). Where special-status species, such as western pond turtle, could be present and lose habitat, impacts would range from **low-to-high** depending on the value of the affected area, the extent of the disturbance, and the potential to affect a species' listing status based on documented occurrences and conservation status.

Not all impacts from right-of-way clearing would be negative, however. Species such as Columbian white-tailed deer, elk, black bear, beaver, rabbits, hares, mice, a variety of songbirds, migratory birds, and raptors frequent transmission line corridors and would be positively affected by right-of-way clearing of forested habitats (Harriman and Baker 2003). Shrubs can provide nesting habitat for some bird species (Bramble, et al. 1994), and the shrubs and herbaceous plants that grow in the cleared right-of-way are desirable for deer, elk, and other species (Loft and Menke 1984).

Construction Activities

In addition to habitat modification and loss that would take place during construction, construction activities themselves could temporarily affect wildlife habitat and species. These activities involve clearing for the right-of-way, installing towers, constructing or improving access roads, and building substations. Resulting disturbances would include noise and physical hazards from heavy equipment, helicopters, blasting, vehicles, chainsaws, falling trees, and general human activity.

Construction disturbances could harm individual animals and temporarily displace or elevate stress levels for many wildlife species in or near construction areas. Increased stress from noise and construction activities could temporarily disrupt foraging, breeding, and other normal activities, generally a **low** impact. Most invertebrates, reptiles, and amphibians living in wetlands, riparian areas, woodlands, and open habitats are not highly mobile and would be less able to flee construction disturbance. Because of this, these species would experience increased stress during construction and disproportionate impacts from decreased reproduction, injury, and mortality—**low-to-high** impacts depending on a species' status, although mortality of most wildlife, including special-status species would result in **moderate** impacts. For more mobile species such as birds and mammals, displacement within and near construction sites would occur; however, their mobility would decrease the likelihood that they would be harmed, and impacts would be **low**. For example, potential habitat for Columbian white-tailed deer occurs along all action alternatives (see Table 18-2), but because these deer are highly mobile and are habitat generalists, they would mostly be displaced by construction with no mortality or injury (a **low** impact).

Impacts would increase for special-status species if project-related stress or displacement should occur during the breeding season and cause decreased reproduction or the abandonment and loss of a nest or young, which would have **moderate** impacts to the affected wildlife. Where needed, construction would be limited during the breeding or nesting season to

avoid mortality or nest abandonment for federally listed species and migratory birds (see Section 18.2.8, Recommended Mitigation Measures).

Construction activities along access roads and around substations and towers could also have temporary or permanent impacts on wildlife habitat by crushing, removing, or trampling vegetation, spreading weeds, and compacting soils (see Chapter 17, Vegetation and Chapter 14, Geology and Soils). BPA would attempt to restore the vegetation, soils, and hydrology in these areas as needed to mitigate impacts. In some cases, complete restoration may not be possible, and impacts to wildlife from habitat loss would range from **low-to-moderate** depending on the extent of the impacts, the listing and conservation status of the affected species, and the condition of the preconstruction habitat.

WDFW Priority Habitats

Impacts to WDFW priority habitats are assessed in terms of their effect on the habitats because of their importance to a rich diversity and number of wildlife. All action alternatives would impact at least three types of WDFW priority habitats: riparian areas, wetlands, and old growth/mature forest. These habitats would also have the most acreage impacted of all WDFW Priority Habitats affected by the project. The project, regardless of the action alternative, would cause impacts to at least seven major riparian areas (the West Alternative would cross an additional two: Salmon Creek and Lacamas Creek riparian areas) (see Section 18.1.2.8, Riparian). Impacts to special-status habitats would range from **low-to-high** depending on their value as wildlife habitat and the extent of the disturbance.

ODFW Strategy Habitats and COA

The project is outside of the ODFW Sandy River Conservation Opportunity Area and would create **no** impacts to the COA. The only Oregon strategy habitats affected by the project would be the disturbed wetland at the Sundial substation site (see Section 18.2.2.3, Sundial Substation). No other habitats in Oregon designated as conservation priorities would be impacted by the project.

Special-Status Species

Disturbances have the potential to affect two federally listed species: northern spotted owl and marbled murrelet. Impacts to northern spotted owl would range between **low** and **moderate** depending on the action alternative. Impacts to marbled murrelet would be **low** for all action alternatives. All action alternatives also come within 1 mile of documented occurrences of 10 to 16 other special-status species (see Table 18-2), which indicates an increased likelihood that they could be affected by the project. Four of these species are found along all action alternatives and would experience similar types and levels of impacts, though documented occurrences may vary: bald eagle, Cascade torrent salamander, Vaux's swift, and elk. Three other species—California floater, purple martin, and western pond turtle—have the same documented occurrences and would experience the same impacts along all action alternatives:

California Floater (Federal SOC, WA Candidate, OR Sensitive). Since there is a documented occurrence of California floater in the Columbia River within 1 mile of all action alternatives, and towers would be installed on a reef in the Columbia River, there is some potential for impacts to this species from temporary increased turbidity during construction. Direct impacts to individual mussels would not be as likely since this species most frequently occurs in shallow

water in silty or sandy substrates, whereas the towers would be installed in the hard surface of the basalt reef adjacent to the deep channel of the river (see Section 3.2.4, Tower Construction in the Columbia River). If construction occurs in the finer substrates of the river, direct mortality could occur. Although its conservation status is imperiled in Oregon and Washington and vulnerable at the national level (NatureServe 2012), impacts would range from **low-to-moderate** given the factors listed above.

Purple Martin (Federal SOC, WA Candidate). Since there is a documented occurrence of purple martin within 1 mile of all action alternatives, there is a greater chance that individuals could be present and affected by the project. Impacts could include loss of riparian habitat caused by tree removal for right-of-way clearing and towers and access roads. BPA would use mitigation measures to avoid harm to a nest or young during the breeding season, if necessary. Since purple martin rely on trees in riparian areas, tree removal from right-of-way clearing in an urban/suburban area would remove valuable habitat in an area where such habitats are scarce. Conversely, because of this scarcity, any impacts would likely be isolated, potentially affecting only a small number of purple martin. Loss of individuals or habitat in this area would not likely affect its overall conservation status, which is listed as vulnerable in Washington but secure nationally (NatureServe 2012); impacts would be **moderate**.

Western Pond Turtle (Federal SOC, OR Sensitive-Critical). All action alternatives cross wetland habitat within 1 mile of two documented occurrences of western pond turtle in Oregon (both near the Sundial substation site [see Section 18.2.2.4, Sundial Substation]). Given this proximity, there is an increased chance that this species would be affected by the project. (The Central Alternative also crosses wetland/riparian habitat within 1 mile of a third [captive] population, which would not be impacted since it is a captive population about 0.25 mile away from the construction area). Impacts could include temporary construction disturbance, construction mortality, and loss of a nest or young if construction takes place during the breeding/nesting season, and degradation or loss of wetland habitat from the placement of towers or an access road. Because western pond turtle is rated as imperiled in Oregon and vulnerable-to-apparently secure federally (NatureServe 2012), and since its population is in decline in Oregon (ODFW 2011), mortality or loss of breeding habitat potentially affecting two populations could contribute to a need for federal listing, which would be a **moderate-to-high** impact.

18.2.2.2 Operation and Maintenance

Operation

Transmission lines can be obstacles to bird flight. Bird fatalities along the right-of-way could occur from collisions with the 500-kV transmission line conductors or ground wires. The frequency of collisions typically depends on line placement and configuration, and the numbers and species of birds present (Hunting 2002). The proximity of lines to areas of high bird use or migration is the biggest factor in avian collisions. Waterfowl, shorebirds, and other water birds such as egrets and cranes appear to be more susceptible to collision where lines span open water, wetlands, and riparian areas, or where lines are between waterfowl feeding and roosting areas (McNeil et al. 1985). The risk of collisions with power lines also increases when birds are migrating in groups at night or in low-visibility conditions such as fog. Other important factors in determining the risk of collisions for a bird species include body size, maneuverability, age of the birds, and the height at which the birds fly (Crowder and Rhodes 1999). Mountain quail, pheasant, and other low-flying birds do not typically fly high enough to collide with conductors. Raptors and passerines appear to be most susceptible in upland habitats (Hunting 2002).

Because the project would be within the Pacific Flyway, migrating birds could also collide with the lines. Bats do not tend to collide with transmission lines because they can easily echolocate the conductors.

Transmission lines with a flat configuration (where the conductors are on the same horizontal plane) are easier for birds to avoid. Lines that have the conductors stacked (the same vertical plane), or that parallel other transmission lines strung at a different height, can create a fence effect and are harder for birds to avoid (these conditions exist for this project along existing right-of-way). Typically, the conductors of 500-kV transmission lines are relatively large and more visible to birds and they fly higher to avoid them. Birds flying into transmission lines often collide with the smaller ground wire that is sometimes strung at the top of the towers.

The areas of primary concern for potential bird collisions with the proposed transmission line are riparian areas where the action alternatives would cross over the Cowlitz, Coweeman, Kalama, Lewis, East Fork Lewis, and the Columbia rivers, and in larger wetland areas, though collisions could occur in all habitats. Migratory, raptor, and federally-listed birds could experience mortality from collision with the transmission line. Historically, raptors—including eagles, hawks, owls, etc.—were known to have a high incidence of mortality from power lines, primarily from electrocution; however, current design standards have greatly reduced the probability of this occurring (APLIC 2006). Most transmission line collisions involve waterfowl, pelicans, and cranes, while raptor collisions are relatively rare (APLIC 2012; Kochert and Oldendorff 1999; Oldendorff and Lehman 1986). To avert possible collisions, bird diverters (devices placed on transmission lines to make the lines more visible to birds) could be installed on overhead ground wires spanning the open water in these areas, or in other areas of high bird use. In most habitats under most conditions, and with the use of bird diverters, collisions would be infrequent and impacts to birds **low**. Impacts would be more frequent and **low-to-moderate** where transmission lines are near water bodies or other areas of high bird use, or where the new line would parallel existing lines of a different height. Where the latter two situations occur together, impacts would be **moderate** due to the increased number of collisions that could occur.

Electrocution of birds is not an issue with high-voltage transmission lines, even for birds with large wingspans, because electrocution is considered in the line design and the conductors are spaced far enough apart that birds cannot touch two conductors at the same time to complete an electric circuit.

Previous studies have found that EMF from transmission lines generally does not affect the health, behavior, or productivity of large animals, including wildlife and livestock (Exponent 2011). However, some limited research has suggested possible effects of low frequency EMF on the navigation abilities of honeybees, birds, and bats. For example, some studies report that honeybees and some bird species use magnetic navigation and can detect EMF. Some recent experiments suggest magnetic field exposure might affect these magnetic navigation systems in birds and bees (Fernie and Reynolds 2005; Hsu et al. 2007). However, there is no conclusive evidence that quantifies these effects or determines if such effects are found in high-voltage transmission line environments.

Maintenance

Typical operation and maintenance activities would have **low** temporary impacts on most wildlife for all action alternatives, except where there is mortality, in which case the impact

would be **moderate** (if mortality would contribute to a need for federal listing, the impact would be **high**). Tower, line, and substation maintenance activities would impact wildlife from noise (see Chapter 9, Noise), the presence of workers and vehicles, and habitat damage. Vehicle noise would create a low, infrequent, and brief disturbance along the right-of-way during annual ground inspections with one or two maintenance vehicles and during bi-annual aerial inspections with a helicopter. Maintenance vehicles would typically use established access roads; if off-road work should be required, habitat in these areas could be damaged, particularly with the use of large equipment. BPA would revegetate these areas as needed to mitigate impacts.

Vegetation management, which can require mechanical and chemical controls, could take place in the right-of-way as often as every 2 years in areas with fast-growing vegetation. Mowing along roadsides could take place more regularly. Impacts to wildlife would be temporary and primarily include disturbance from the noise from spraying, mowing, or cutting.

18.2.2.3 Sundial Substation

Construction activities would affect wildlife dependent on wetlands and open habitat by permanently filling 40 acres of open habitat that includes 11 acres of freshwater wetland habitat. The site is within an industrial park, and the wildlife habitat on site has been degraded by construction and operation of the Reynolds Aluminum plant, levee construction, drainage improvements, and agricultural activities (DEA 2009). Because of these disturbances, both habitats are low-value habitats for wildlife. Although wetlands are ODFW strategy habitats, the wetlands at the site would likely only be rated as a category 5 or 6 habitat given their condition. Impacts to wildlife would include displacement, habitat loss, and temporary construction disturbance to wildlife in the surrounding open and wetland habitats. Because of the condition of the affected habitat, the project would likely not affect a large diversity or number of wildlife species, so impacts would be **low**. In the wetland areas, impacts could also include injury or mortality of less mobile species, which would have **low** or **moderate** impacts.

There are two documented occurrences of western pond turtle within 1 mile of the site, indicating an increased likelihood that it could be present and affected by substation construction (these are the same occurrences as those listed for all action alternatives: see Sections 18.2.4.3, 18.2.5.3, 18.2.6.3, and 18.2.7.3, Special-Status Species). However, the high degree of disturbance already at the site makes this area poor nesting habitat for western pond turtle (ODFW 2011), and its presence is unlikely. If present, loss of suitable habitat or harm to individuals in a population at the Sundial site, with potential additional impacts from new towers and new access roads along the right-of-way approaching the substation, would have a **moderate-to-high** impact on the turtle given its declining population and its conservation status of imperiled in Oregon and vulnerable-to-apparently secure status in the United States (ODFW 2011; NatureServe 2012).

18.2.3 Castle Rock Substation Sites

All three Castle Rock substation sites are in the northern portion of the project area (see Maps 17-1A and 18-1A), which is within the marbled murrelet conservation zone (USFWS 1997). However, only one site has the potential to affect marbled murrelets (see Section 18.2.3.3, Monahan Creek). The three sites are also within the WDFW winter range priority area of the Willapa Roosevelt elk herd.

Impacts common to action alternatives are in Section 18.2.2. The remaining sections discuss impacts unique to each alternative, and recommended mitigation measures.

Impacts to elk from habitat loss in this WDFW priority area would be **low** for all substation sites based on their secure conservation status (NatureServe 2012) and the relatively small portion of the total WDFW priority area that would be affected (the relative acreages affected are given below). No special-status species have been documented within 1 mile of the Castle Rock substation sites.

18.2.3.1 Casey Road

The substation and substation access road would permanently displace forest and shrubland wildlife by removing and permanently occupying 38 acres of production forest, 24 acres of shrubland, and 1 acre of open habitat. Displacement, habitat loss, and temporary construction disturbance to wildlife in surrounding production forest and shrubland would generally have **low** impacts on wildlife because the amount of habitat affected is small relative to the total amount present in the project area. Also, though the area is documented by USFWS as potentially having old-growth forest habitat suitable for northern spotted owl, recent high resolution imagery shows no old-growth forest currently present in the affected area (BPA 2011). Construction would have **no** impact on marbled murrelet or northern spotted owl.

18.2.3.2 Baxter Road

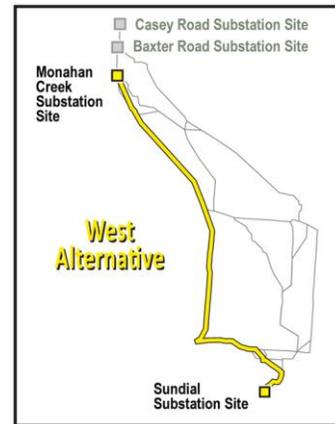
The substation and substation access road would permanently displace production forest wildlife by removing and permanently occupying 47 acres of production forest with a small amount of shrubland. This would be less than 1 acre of mostly forested wetland. Impacts on wildlife in production forest would essentially be the same as those described for the Casey Road site, although different types and numbers of wildlife would be affected (see Section 18.2.3.1, Casey Road). Impacts to the scrub-shrub wetland as a WDFW priority habitat could be **low-to-high** depending on the value of the wetland as wildlife habitat. Construction would have **no** impact on marbled murrelet or northern spotted owl because there is no suitable old-growth forest habitat currently present within the affected area (BPA 2011).

18.2.3.3 Monahan Creek

The substation and substation access road would permanently displace wildlife typically found in open habitat, production forest, old-growth/mature forest, and shrubland. The Monahan site would remove and permanently occupy 46 acres of open habitat, 18 acres of production forest, 2 acres of old-growth/mature forest, and 1 acre of shrubland. Impacts to wildlife in open habitat, production forest, and shrubland would essentially be the same as those described for the Casey Road site, although different types and numbers of wildlife would be affected (see Section 18.2.3.1, Casey Road). The loss of old-growth/mature forest would be a **high** impact due to its importance as a WDFW priority habitat. Also, it could provide suitable nesting habitat for marbled murrelet or northern spotted owl, although there are no documented occurrences nearby, and the large amount of open habitat and immature production forest surrounding the site reduce the quality of the habitat, particularly for northern spotted owl (BPA 2011). Potential impacts to marbled murrelet and northern spotted owl would include a small amount of potential habitat loss. This would be a **low** impact due to the small amount of habitat removed, the poor quality of the surrounding habitat, the lack of documented occurrences, and, for marbled murrelet, the low likelihood for nesting at the site due to the distance from the coast.

18.2.4 West Alternative

Because 65 miles of the West Alternative parallels an existing transmission line(s) on existing right-of-way, the new line would not create new fragmentation although it could expand existing fragmentation where the right-of-way would need to be widened, primarily in forested habitats (see Chapter 4, Proposed Action and Alternatives). In addition, since the new line would be taller than the parallel existing line(s), the higher conductors would increase the fence effect to bird flight paths and increase the risk of collision in many areas.



18.2.4.1 Wildlife Habitats and Species—West Alternative

The following discussion describes the impact levels for wildlife in habitats that are not considered to be WDFW priority habitats; impact levels generally could be higher where WDFW priority habitats or special-status species would be affected (see Section 18.2.4.2, WDFW Priority Habitats—West Alternative, and Section 18.2.4.3, Special-Status Species—West Alternative).

Discussing Impacts in Sections 18.2.4–18.2.7

Sections 18.2.4, 18.2.5, 18.2.6, and 18.2.7 provide the amount of wildlife habitat (in acres) that would be altered or removed by each action alternative. They also give the length (in miles) of the transmission line in each habitat. The amount of habitat altered or removed by right-of-way clearing is in Table 18-3 exclusive of the footprints of access roads, towers, and substations, which are in Table 18-4.

Where right-of-way clearing and access road, tower, and substation footprints have similar effects on the resource (i.e., for woodland and forest habitats), acreages from the two tables are added together in the discussion.

Wildlife in Open Habitat

The proposed transmission line would cross 25 miles of open habitat—more than any other habitat (see Table 18-3). Towers, access roads, and substations would cause a permanent loss of 171 acres (see Table 18-4), although 3 acres of open habitat would also be created by clearing Oregon white oak woodlands (see Table 18-5). The wildlife most affected by the project in open habitat would likely be ground-dwelling animals. They would experience both a decrease in available habitat and an increase in mortality from the increased number of perches available to predatory raptors (raptors, conversely, would experience mostly positive effects, with some potential for mortality from transmission line collisions). Impacts to wider-ranging wildlife would include a small reduction in breeding or grazing

habitat. Wildlife mortality from construction and transmission-line bird collisions would also occur. Because the project would be long and narrow, any single population of animals would lose very little habitat and experience a small increase in mortality. These would cause **low** impacts from habitat loss and construction disturbance, and **moderate** impacts from mortality, since mortality of individual animals would not affect the conservation status of most species.

Table 18-3 General Wildlife Habitats Impacted by Right-of-Way Clearing (Acres) and Transmission Line Crossing (Miles)^{1,2,3,4}

Alternatives and Options	Forest		Production Forest		Shrubland ⁵		Urban/Suburban ⁵		Open	
	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles
West Alternative	308	17	0	0	307	18	87	5	0	25
West Option 1	-14	-1	N/C	N/C	+3	+<1	N/C	-<1	N/C	+1
West Option 2	-5	-1	+9	+1	+2	+<1	N/C	+<1	N/C	+1
West Option 3	+30	+2	+21	+1	+22	+1	N/C	-<1	N/C	+2
Central Alternative	240	13	910	54	42	3	20	1	0	5
Central Option 1	+1	+<1	+39	+3	+2	+<1	N/C	N/C	N/C	+<1
Central Option 2	+40	+2	-76	-5	+4	+<1	-6	-<1	N/C	-<1
Central Option 3	+56	+3	-175	-10	-3	-<1	-1	-<1	N/C	+1
East Alternative	173	10	961	56	34	2	19	1	0	5
East Option 1	+18	+1	-56	-3	+3	+<1	-8	-1	N/C	+1
East Option 2	+15	+1	N/C	+<1	+1	+<1	N/C	N/C	N/C	+<1
East Option 3	-6	-1	+22	+2	+3	+<1	N/C	N/C	N/C	N/C
Crossover Alternative	276	14	588	35	208	12	21	1	0	9
Crossover Option 1	+15	+1	N/C	N/C	+16	+1	+1	+<1	N/C	+3
Crossover Option 2	+3	+<1	N/C	N/C	+54	+3	N/C	N/C	N/C	+1
Crossover Option 3	+29	+1	+16	+2	+6	+<1	N/C	N/C	N/C	+1

Notes:

N/C – No net change from the action alternative.

1. To avoid double counting impacts, the acreages for access roads, towers, and substations that occur within the right of way were subtracted from right-of-way acreages. These acreages are in Table 18-4.

2. 150-foot wide right-of-way

3. The value for each option represents the net change from the action alternative. It was calculated as the acres added by the option minus the acres in the segments the option replaces.

4. Clearing for danger trees outside the right-of-way is unknown at this time and not included in these calculations.

5. Right of way clearing would only affect portions of the acreages given for these general vegetation types; i.e., where trees and tall shrubs are present.

Sources: Herrera 2010, USGS 2011

Table 18-4 General Wildlife Habitat Converted to Towers, Access Roads, and Substations (Acres)¹

Alternatives and Options	Forest					Production Forest					Shrubland					Open					Urban/Suburban				
	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total
West Alternative	7	20	17	20	64	0	5	8	0	13	7	29	22	1	59	13	42	30	86	171	3	4	3	0	10
West Option 1	N/C	N/C	-1	N/C	-1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+2	<-1	N/C	+1	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+1	N/C	+1	N/C	+1	<+1	N/C	+2	N/C	+2	<-1	N/C	+1	<+1	+3	-6	N/C	-1	N/C	N/C	N/C	N/C	N/C
West Option 3	<+1	+1	+2	N/C	+4	<+1	+7	+4	N/C	+12	N/C	+4	+2	N/C	+6	<+1	-2	-4	N/C	-5	N/C	N/C	N/C	N/C	N/C
Central Alternative	5	26	45	0	76	19	100	185	47	351	2	7	23	0	32	4	12	26	40	82	0	<1	2	0	3
Central Option 1	N/C	N/C	<-1	N/C	<-1	<+1	+2	+9	-9	+3	<-1	<+1	+2	+24	+26	N/C	N/C	+8	+1	+9	N/C	N/C	N/C	N/C	N/C
Central Option 2	<+1	+12	-5	+20	+28	-2	+1	-12	-47	-60	<-1	N/C	-3	+1	-3	N/C	<-1	<-1	+46	+44	N/C	N/C	N/C	N/C	N/C
Central Option 3	+2	+6	-4	N/C	+4	-4	-11	-18	N/C	-33	N/C	-1	-2	N/C	-3	N/C	+3	+4	N/C	+7	N/C	N/C	N/C	N/C	N/C
East Alternative	3	17	34	0	54	19	84	275	47	425	2	5	48	0	55	4	13	57	40	114	0	<1	2	0	3
East Option 1	<+1	+6	-3	+20	+24	-1	<+1	-11	-47	-58	N/C	<+1	-7	+1	-5	N/C	+1	-3	+46	+44	N/C	N/C	<-1	N/C	-1
East Option 2	<+1	N/C	-3	N/C	-2	N/C	-5	-45	N/C	-50	N/C	N/C	-15	N/C	-15	N/C	N/C	-2	N/C	-2	N/C	N/C	N/C	N/C	N/C
East Option 3	N/C	-3	N/C	N/C	-3	<+1	N/C	N/C	N/C	<+1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Alternatives and Options	Forest					Production Forest					Shrubland					Open					Urban/Suburban				
	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total	Towers	New Access Roads	Improved Access Roads ²	Substations	Total
Crossover Alternative	6	23	35	20	84	12	65	122	0	199	5	16	44	1	66	5	14	21	86	126	<1	1	2	0	4
Crossover Option 1	N/C	+2	<1	N/C	+1	N/C	N/C	N/C	N/C	N/C	<1	+2	N/C	N/C	+3	+1	+7	+3	N/C	+12	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	+3	-20	-17	N/C	N/C	+5	+47	+52	+3	+2	+9	-1	+13	N/C	+1	+4	-46	-41	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	<1	+3	-20	-16	<1	<1	+4	+47	+53	<1	+2	+10	-1	+12	N/C	+1	+4	-46	-41	N/C	N/C	N/C	N/C	N/C
Notes:																									
N/C – No net change from the action alternative.																									
1. The value for each option represents the net change from the action alternative. It was calculated as the acres added by the option minus the acres in the segments the option replaces.																									
2. Many improved access roads could be overgrown or would need to be widened; habitat would need to be removed.																									
Sources: Herrera 2010, USGS 2011																									

Wildlife in Forest and Production Forest Habitats

Although fewer miles of transmission line would cross forest habitat than open habitat (see Table 18-3), forest wildlife would experience more extensive impacts from clearing. Construction would clear 372 acres of forest for right-of-way, towers, substations, and access roads, and 13 acres of production forest for towers and access roads (see Tables 18-3 and 18-4). Forest-dependent wildlife would be most affected by habitat loss. Habitat generalists would be less affected since they would be able to use the altered “edge” habitat within the cleared right-of-way for foraging or hunting (shrubland and open habitat species could experience positive impacts by an increase in habitat) (see Section 18.2.2, Impacts Common to Action Alternatives). Because forest and production forest are common in the project area, and since impacts would be spread out along the corridor, most forest wildlife species would experience **low** impacts from habitat loss and construction disturbance. Wildlife mortality from construction and transmission-line bird collisions would occur but would be **moderate**, since mortality of individual animals would not affect the conservation status of most species (see Section 18.2.4.2, WDFW Priority Habitats—West Alternative, and Section 18.2.4.3, Special-Status Species—West Alternative, for potentially higher impacts).

Wildlife in Shrubland Habitat

Although total affected acreage is similar to the affected acreage in forest habitat, shrubland wildlife would experience fewer adverse effects, partly since more shrubland would be created than lost. Only 59 acres of existing shrubland would be removed for towers, access roads, and substations, with 307 acres of existing tall shrubland habitat altered by right-of-way clearing (see Tables 18-3 and 18-4). Conversely, they could benefit from the creation of 308 acres of shrubland habitat from right-of-way clearing in forest habitat (see Table 18-3). Also, raptors would experience a positive effect from the increase in available perches. Nonetheless, adverse impacts would occur, particularly to those animals in existing shrubland, including temporary construction disturbance; the loss of existing habitat; the loss of some tall shrub nesting habitat for birds; potential construction mortality for less mobile species; and a possible increase in mortality caused by an increase in predation by raptors using the transmission lines and towers as perches, and by bird/transmission line collisions. Since impacts would be spread out along the corridor and affect a relatively small amount of habitat, the levels of adverse impacts would be similar to those for open habitat, including **low** impacts from loss of existing habitat and construction disturbance, and **moderate** impacts from mortality.

Wildlife in Urban/Suburban Habitat

Wildlife found in urban/suburban habitat would experience some of the least amount of disturbance in both miles of transmission line and lost or altered habitat. The West Alternative would alter 87 acres of habitat by right-of-way clearing (see Table 18-3) and remove 10 acres of habitat for towers and access roads (see Table 18-4). Impacts to wildlife would range among those impacts listed for open, shrubland, forest, and production forest habitats, depending on which habitats might be present in any given urban/suburban area. Given the small amounts of habitat lost and the general tolerance of urban/suburban wildlife to human disturbance, impacts related to construction and habitat loss or alteration would be **low**, while those related to an increase in mortality (such as for prey species of raptors and bird/transmission line collisions) would be **moderate**.

18.2.4.2 WDFW Priority Habitats—West Alternative

This section provides the amount of WDFW priority habitats altered or removed by the West Alternative, and the length in miles of the transmission line crossing in each habitat.

Riparian Areas. Along the West Alternative, more habitat loss or alteration would occur in riparian areas than any other WDFW priority habitat: 135 acres would be altered by right-of-way clearing (see Table 18-5) and 25 acres would be lost to towers, access roads, and substations (see Table 18-6). Habitat loss would be a **low-to-high** impact to these WDFW priority habitats, depending on their condition. In addition, transmission line bird collisions could increase across 8 miles of riparian habitat, particularly with the increased fence effect caused by parallel lines. This would also be a **low-to-high** impact depending on bird use and the effectiveness of mitigation measures, since it could reduce the ability of these habitats to safely support waterfowl, waterbirds, and raptors: an essential attribute for these habitats.

Riparian areas also encompass other priority habitats affected by the project, including biodiversity areas and corridors, wetlands, and old-growth/mature forest.

Biodiversity Areas and Corridors. Seven documented WDFW biodiversity area and corridor priority habitats would be affected by the West Alternative. They include the East Fork Lewis River Riparian Corridor, the Upper Salmon Creek Riparian Corridor, the Burnt Bridge Creek Biodiversity Area, the Cougar Creek Riparian Corridor, the Green Mountain Biodiversity Area, the Camas Biodiversity Area, and the Lady and Akerman Islands Biodiversity Area and Corridor (WDFW 2012). Fragmentation of these habitats from right-of-way clearing could adversely affect the movement of many wildlife species across a biologically diverse and relatively undisturbed area. A total of 3 miles of these habitats would be crossed at approximately 10 locations by new transmission line, with 53 acres altered from right-of-way clearing, and 8 acres lost to transmission towers and access roads (see Tables 18-5 and 18-6). Impacts to these WDFW priority habitats would be **high** since fragmentation would diminish one of their main attributes, which is to be a “relatively undisturbed and unbroken tract of vegetation” that connects high-value habitats (WDFW 2008).

Freshwater Wetlands and Fresh Deepwater. About 113 acres of forested, scrub-shrub, and emergent freshwater wetlands would be lost to right-of-way clearing (forested wetland) and/or towers, access roads, and substations (see Tables 18-5 and 18-6). Sixty-two acres of scrub-shrub wetland would be altered by right-of-way clearing (see Table 18-5). Impacts to wildlife from the alteration and loss of wetland habitat would range from **low-to-high**, depending on the condition of each wetland. Habitat alteration and removal could occur at the Coweeman Wetlands, and would likely be **moderate-to-high** impacts given the description of their value to wildlife by WDFW (WDFW 2012). In addition, transmission line bird collisions may become more frequent over 16 total miles of all three types of freshwater wetlands (see Table 18-6); similar to riparian areas, an increase in transmission line collisions could reduce the value of these areas for wildlife habitat, a **low-to-high** impact.

The only impacts to fresh deepwater would be from transmission line bird collisions, which may increase across 1 mile of this habitat (see Table 18-5). As for freshwater wetlands and riparian areas, impacts to this WDFW priority habitat would be **low-to-high**.

Old-Growth/Mature Forest. Twenty-seven acres of old-growth/mature forest would be removed by right-of-way clearing, towers, substations, and existing access roads (see

Tables 18-5 and 18-6). Impacts to these WDFW priority habitats would be **high** since tree clearing would remove the main attributes of this habitat: long-lived trees and the associated understory vegetation, which have become uncommon in the Pacific Northwest and could not be easily or quickly replaced.

Westside Prairie. Six acres of westside prairie in the Lacamas Prairie Natural Area would be removed by towers and access roads, a **high** impact due to the rarity of this habitat in Washington (see Table 18-6). In addition, the transmission line would cross 2 miles of westside prairie parallel to the existing line, which together may increase transmission line bird collisions (see Table 18-5). Impacts to this habitat would be **low-to-moderate** depending on bird use and mitigation. This is higher than in other types of open areas, since Lacamas Prairie Natural Area is a wet prairie and could have a higher level of waterbirds and waterfowl than dry prairies (see Section 18.2.4.3, Special-Status Species—West Alternative, for a discussion of WDFW wood duck priority area in the Lacamas Prairie Natural Area).

Oregon White Oak Woodlands. Three acres total from the Sifton/Lacamas Oregon White Oak and Washougal Oak woodlands would be removed by right-of-way clearing (see Table 18-5). Impacts to these WDFW priority habitats would be **high** since tree clearing would remove the main attributes of this habitat: Oregon white oak trees and the associated understory vegetation, which are becoming less common in the Pacific Northwest.

Table 18-5 WDFW Priority Habitats Impacted by Right-of-Way Clearing (Acres) and Transmission Line Crossing (Miles)^{1,2,3}

Alternatives and Options	Oregon White Oak Woodlands		Snag-Rich Area		Old-Growth/Mature Forest		Riparian		Forested Freshwater Wetlands		Scrub-Shrub Freshwater Wetlands		Emergent Freshwater Wetlands		Fresh Deepwater		Westside Prairie		Biodiversity Areas and Corridors		Talus		Caves or Cave-Rich Habitat	
	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles
West Alternative	3	<1	0	0	23	1	135	8	54	3	62	4	0	9	0	1	0	2	53	3	0	0	0	0
West Option 1	N/C	+<1	N/C	N/C	N/C	N/C	+<1	-<1	+5	+<1	+2	+<1	0	+1	0	N/C	0	+1.6	-11	N/C	0	N/C	0	N/C
West Option 2	-1	-<1	N/C	N/C	+5	+<1	N/C	-<1	-8	-1	-3	-<1	0	-<1	0	N/C	0	-1	+12	+2	0	N/C	0	N/C
West Option 3	-1	-<1	N/C	N/C	+3	+<1	+12	+<1	-5	-1	-2	-<1	0	-<1	0	N/C	0	-1	+11	+1	0	N/C	0	N/C
Central Alternative	2	<1	2	<1	12	1	105	6	69	4	16	1	0	1	0	1	0	0	10	1	0	0	0	0
Central Option 1	N/C	N/C	N/C	N/C	N/C	N/C	+4	+<1	+1	+<1	+0.5	+<1	0	+<1	0	N/C	0	N/C	N/C	N/C	0	N/C	0	N/C
Central Option 2	N/C	N/C	N/C	N/C	+5	+<1	-2	+<1	+5	+<1	-0.7	-<1	0	+<1	0	+<1	0	N/C	N/C	N/C	0	N/C	0	N/C
Central Option 3	N/C	N/C	N/C	N/C	+3	+<1	-10	-1	-2	-1	-0.5	-<1	0	+<1	0	+<1	0	N/C	-2	+<1	0	N/C	0	N/C
East Alternative	2	<1	31	2	10	1	94	5	61	3	23	1	0	1	0	1	0	0	9	1	0	<1	0.05	0
East Option 1	N/C	N/C	N/A	N/A	+5	+<1	-3	-<1	+2	+<1	+8	+<1	0	+1	0	+<1	0	N/C	N/C	N/C	0	N/C	0	N/C
East Option 2	N/C	N/C	+2	+<1	-6	-<1	+2	+<1	+4	+<1	-7	-<1	0	N/C	0	+<1	0	N/C	+1	+<1	0	-<1	0	N/C
East Option 3	N/C	N/C	N/A	N/A	N/C	N/C	N/C	+<1	+1	+<1	-<1	-<1	0	N/C	0	N/C	0	N/C	N/C	N/C	0	N/C	0	N/C
Crossover Alternative	2	<1	0	0	37	2	125	7	53	3	35	2	0	2	0	1	0	0	9	1	0	<1	0.05	<1
Crossover Option 1	N/C	N/C	N/C	N/C	-<1	-<1	+8	+1	+8	+1	+1	+<1	0	+<1	0	N/C	0	+1	N/C	N/C	0	N/C	0	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	+1	+1	+9	+1	+1	+<1	+3	+<1	0	N/C	0	N/C	0	N/C	N/C	N/C	0	N/C	0	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	+1	+1	+7	+<1	+3	+<1	+2	+<1	0	N/C	0	N/C	0	N/C	N/C	N/C	0	N/C	0	N/C

Notes:
 N/C – No net change from the action alternative.
 1. To avoid double counting impacts, the acreages for access roads, towers, and substations that occur within the right of way were subtracted from right-of-way acreages. See Table 18-8 for impacts from access roads, towers, and substations.
 2. 150-foot wide right-of-way
 3. The value for each option represents the net change from the action alternative. It was calculated as the acres added by the option minus the acres in the segments the option replaces.
 Sources: Herrera 2010, WDFW 2010b

Table 18-6 WDFW Priority Habitat Converted to Towers, Access Roads, and Substations (Acres)^{1,2}

Alternatives and Options	Old-Growth/Mature Forest					Snag-Rich Areas					Riparian					Forested, Scrub-Shrub, and Emergent Freshwater Wetlands ³					Westside Prairie					Biodiversity Areas and Corridors					Talus					Herbaceous Balds									
	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total	Tower	New Access Roads	Improved Access Roads ⁴	Substations	Total					
West Alternative	<1	0	<1	2	4	0	0	0	0	0	2	6	8	9	25	7	23	18	11	59	1	3	2	0	6	1	6	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+1	+<1	N/C	+2	N/C	+3	<1	N/C	+4	N/C	+3	+3	N/C	+6	<1	<1	-1	N/C	-2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
West Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	<1	+2	N/C	+1	<1	-3	-3	N/C	-7	<1	-2	+2	N/C	<1	+<1	+2	+1	N/C	+4	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
West Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+2	N/C	+2	N/C	-3	-3	N/C	-6	<1	-2	+2	N/C	<1	+<1	+1	+1	N/C	+3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
Central Alternative	0	<1	0	0	<1	<1	<1	<1	0	1	1	3	7	0	11	2	6	7	12	27	0	0	0	0	0	<1	<1	0	0	<1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Central Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+<1	N/C	+<1	N/C	N/C	N/C	<1	<1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
Central Option 2	N/C	N/C	N/C	+2	+2	N/C	N/C	N/C	N/C	N/C	N/C	+<1	N/C	+9	+10	N/C	+2	-2	<1	<1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
Central Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+1	N/C	N/C	+1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
East Alternative	0	<1	2	0	3	1	2	11	0	14	1	3	9	0	13	2	5	10	12	29	0	0	0	0	0	<1	<1	0	0	<1	0	1	0	0	1	0	0	0.5	0	0.5					
East Option 1	N/C	N/C	N/C	+2	+2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	<1	+9	+8	N/C	+3	N/C	<1	+2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
East Option 2	N/C	N/C	-2	N/C	-2	+<1	+<1	+<1	0	+1	N/C	<1	-2	N/C	-3	N/C	N/C	-3	N/C	-3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	-1	N/C	N/C	-1	N/C	N/C	-0.5	N/C	-0.5					
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+<1	N/C	+<1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
Crossover Alternative	<1	2	3	2	8	0	0	0	0	0	1	3	11	9	24	3	7	13	11	34	0	0	0	0	0	<1	<1	0	0	10	0	1	0	0	1	0	0	0.5	0	0.5					
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+1	+<1	N/C	+2	N/C	+<1	N/C	N/C	+<1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
Crossover Option 2	N/C	N/C	N/C	-2	-2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	<1	-9	-10	N/C	N/C	N/C	<1	<1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					
Crossover Option 3	N/C	N/C	N/C	-2	-2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	-9	-9	N/C	N/C	N/C	<1	<1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C					

Notes:
 N/C – No net change from the action alternative.
 1. The value for each option represents the net change from the action alternative. It was calculated as the acres added by the option minus the acres in the segments the option replaces.
 2. Oregon white oak woodlands are not included in this table as they would not be affected by towers, access roads, or substations.
 3. Freshwater wetlands are part of the WDFW priority habitat “freshwater wetlands and fresh deepwater”. Fresh deepwater areas are not included in this table as they would not be affected by towers, access roads, or substations.
 4. Many improved access roads could be overgrown or would need to be widened; habitat would need to be removed.
 Sources: Herrera 2010, WDFW 2010b

18.2.4.3 Special-Status Species—West Alternative

Two federally listed species and 19 other special-status species or species groups could be affected by the West Alternative. All documented occurrences of these species are found in Washington with the exception of California floater mussel—found in the Columbia River—and western pond turtle—found in Oregon.

Federally Listed Species

Marbled Murrelet (Threatened). Although there are no documented occurrences of marbled murrelet within 1 mile of the West Alternative, right-of-way clearing and towers, substations, and access roads would remove 377 acres of habitat within the marbled murrelet conservation zone. Therefore, impacts to the species would include loss of potential habitat. However, at most only 27 acres of this conservation zone is suitable old-growth/mature forest habitat (see Tables 18-5 and 18-6) and they are outside the general range of marbled murrelet from the coast, so the available habitat would not likely be used for nesting. In addition, the old-growth/mature forest within this area primarily occurs in small patches, so any potential habitat loss would be minor in any particular area. Given the small amount of potential habitat affected, the distance from the coast, and the lack of any documented occurrences, potential habitat loss would be a **low** impact.

Special-Status Species State and Global Conservation Rankings

- **Critically Imperiled:** 5 or fewer known occurrences
- **Imperiled:** 6–20 known occurrences
- **Vulnerable:** 21–100 known occurrences

Source: WNHP 2011a

Northern Spotted Owl (Threatened). The West Alternative route comes within 0.4 mile of a northern spotted owl circle (WDFW 2010b). The adjacent habitat that would be removed for the right-of-way includes a mix of old-growth/mature forest, forest, and production forest. In addition, the loss of 27 acres of old-growth/mature forest along the entire action alternative would remove potential nesting habitat for this species, although recent high resolution imagery shows most of the area is marginal habitat for the owl (BPA 2011). Impacts to the species would include the loss of potential habitat. Given that potential habitat is generally low quality; there is only one documented northern spotted owl circle within 1 mile; and a relatively small amount of potential habitat would be removed, with impacts spread out along the corridor, **low** impacts on this species would occur.

Other Special-Status Wildlife Species—Birds

Bald Eagle (Federal SOC, WA Sensitive) and WDFW Bald Eagle Priority Area. Bald eagles would be impacted by the project because there are eight documented occurrences of bald eagles, and two WDFW bald eagle priority areas—the Cowlitz Bald Eagle Feeding Habitat and Lewis River Winter Eagle Habitat—within 1 mile of the West Alternative. New transmission line would cross a little less than 1 mile of a WDFW bald eagle priority area, and right-of-way clearing, towers, and access roads would remove tree habitat from a total of 13 acres. Impacts would include temporary construction disturbance and loss of potential nesting and roosting habitat through tree removal in riparian areas along the West Alternative (see 18.2.4.3, Special-Status Habitats), particularly where it occurs in a WDFW priority area. As for other raptors, transmission line collisions are typically uncommon, but could occur. Mitigation measures would be used to ensure individual nests and young are not harmed or disrupted during the

breeding season, and to reduce the risks of transmission line collisions throughout the year. Impacts to this species would be **moderate** since the species is still listed as sensitive by WDFW, is monitored by USFWS following its delisting in 2010, and impacts would not be expected to contribute to a need for federal relisting of this species based on a conservation status of secure at both the state and federal levels (NatureServe 2012).

Cavity-Nesting Ducks (also see Waterfowl, this section). The West Alternative could affect cavity-nesting ducks since it crosses within 1 mile of the WDFW Woodland Cavity Nesting Habitat Priority Breeding Area along the Lewis River. Impacts could include habitat removal, increased transmission line collisions, and temporary construction disturbance. Mitigation measures would be used to avoid harm to a nest or young during the breeding season, if necessary. These areas are important to a wide diversity and number of cavity-nesting ducks, but because mortalities would not contribute to a need for federal listing for any of the associated species (see further discussion of specific species that follows), and since the WDFW priority area itself would not be crossed, impacts to cavity-nesting ducks would be **low-to-moderate**.

- **Barrow's Goldeneye (WDFW Priority).** Given that the West Alternative crosses wetland habitat within 1 mile of a documented occurrence of Barrow's goldeneye, there is a greater chance that individuals could be present and affected by the project (this is the same occurrence listed for the Crossover Alternative). Impacts would be the same as those listed for the WDFW cavity-nesting duck priority area. Since the conservation status is vulnerable (breeding) to secure (non-breeding) at the state level and secure at the federal level (NatureServe 2012), and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.
- **Wood Duck (WDFW Priority).** It is highly likely that wood duck would be adversely impacted by the West Alternative since it crosses two WDFW wood duck priority areas: the WDFW Lacamas Lake Bottoms Priority Breeding Area, and the Mill Creek Tributary Priority Breeding Area. Impacts would be the same as those listed for the WDFW cavity-nesting duck priority area. A little less than 1 mile of the WDFW wood duck priority area would be crossed by the West Alternative transmission line at Lacamas Lake Bottoms, with 14 acres lost to right-of-way tree removal, towers, and access roads (WDFW 2009). These losses would be in addition to any occurring in other riparian or wetland areas where wood duck could occur, particularly near the one documented occurrence. These would likely cause just **moderate** impacts to the species, however, since the impacts would not contribute to a need for federal listing given the relatively small area affected and the relatively stable conservation status of the species (ranges between vulnerable [non-breeding] to apparently secure [breeding] at the state level, and secure at the federal level [NatureServe 2012]).

Great Blue Heron (WA Priority). Since the West Alternative crosses either wetlands or riparian habitats within 1 mile of three documented occurrences of great blue heron, there is a greater chance that individuals could be present and affected by the project. Impacts would include mortality from transmission line collisions over open habitats and open water, and lost habitat due to towers and access roads placed in riparian areas and open habitat. Since the conservation status is apparently secure to secure at the state level and secure at the federal level (NatureServe 2012), impacts would not contribute to a need for federal listing and would be **moderate**.

Northern Goshawk (Federal SOC, WA Candidate). Because the West Alternative crosses production forest within 1 mile of a documented occurrence of northern goshawk (also in production forest), there is a greater chance the project could affect this species (this is the same documented occurrence as the one along the Central and Crossover alternatives). Impacts would include loss of old-growth/mature forest habitat and temporary construction disturbance, although mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if necessary. Although the conservation status of this species is imperiled-to-vulnerable in Washington (NatureServe 2012), it is listed as apparently secure at the federal level, and so the small amount of suitable mature/old-growth forest habitat affected (see Section 18.2.4.2, WDFW Priority Habitats—West Alternative) would be a **moderate** impact to the species. As for other raptors, transmission line collisions are typically uncommon, the rare occurrence of mortality of an individual would not affect the overall conservation status, and impacts would be **moderate**.

Pileated Woodpecker (WA Candidate). Since the West Alternative crosses high-value riparian habitat within 1 mile of a documented occurrence of pileated woodpecker (the same occurrence listed for the Crossover Alternative), there is a greater chance that individuals of this species could be present and affected by the project. Impacts could include habitat loss through right-of-way tree clearing, towers, and access roads, mortality through collisions with transmission lines, and temporary construction disturbance. Mitigation measures would be used to avoid harm to a nest or young during the breeding season, if necessary. Since the conservation status is apparently secure at the state level and secure at the federal level (NatureServe 2012), and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Purple Martin (Federal SOC, WA Candidate). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

Sandhill Crane (WA Endangered). Since the West Alternative crosses either wetlands, open water, or open habitats within 1 mile of one documented occurrence of sandhill crane, there is a greater chance that individuals could be present and affected by the project. Impacts would include mortality from transmission line collisions over open habitats and open water, and lost habitat due to towers and access roads placed in riparian areas and open habitat. Since the conservation status is vulnerable to critically imperiled at the state level but secure at the federal level (NatureServe 2012), and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Tundra Swan (WDFW Priority). Since the West Alternative crosses either riparian, open water, or open habitats within 1 mile of two documented occurrences of tundra swan, there is a greater chance that individuals could be present and affected by the project. Impacts would include mortality from transmission line collisions over open habitats and open water, and lost habitat due to towers and access roads placed in riparian areas and open habitat. Since the conservation status is apparently secure at the state level and secure at the federal level (NatureServe 2012), and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Vaux's Swift (WA Candidate). The mention of Vaux's swift in the description of a WDFW biodiversity area and corridor priority habitat that is crossed by the West Alternative indicates

an increased likelihood for impacts to this species (see Section 18.1.4.2, Other Special-Status Wildlife Species). Impacts could include habitat loss through tree removal, temporary construction disturbance, and transmission line collisions, although collisions are not very likely for this species (see Section 18.2.2, Impacts Common to Action Alternatives). Mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if nests occur near the construction area. Since the conservation status of this species is vulnerable-to-apparently secure at the state level and secure at the federal level (NatureServe 2012), mortality or loss of habitat would not likely contribute to a need for federal listing and **moderate** impacts could occur.

Waterfowl Concentrations (WDFW Priority). A little more than 1 mile of new transmission line would cross over two WDFW waterfowl concentration priority areas: the East Fork Lewis Wintering Waterfowl Area and the Pioneer Wetlands Waterfowl Concentration Area (WDFW 2012). The right-of-way would also come within 1 mile of the Kennedy Dairy WDFW Waterfowl Concentration Priority Area. Impacts could include habitat removal, increased transmission line collisions, and temporary construction disturbance. Right-of-way tree removal, towers, and access roads would remove 30 acres of habitat from these important habitats. WDFW priority waterfowl concentration areas could support five special-status species: wood duck, Barrow's goldeneye, harlequin duck, tundra swan, and trumpeter swan, although only tundra swan has been documented in a WDFW waterfowl concentration priority area within 1 mile of the West Alternative (see Tundra Swan, this section). These areas are important to a wide diversity and number of waterfowl, but because mortalities would not contribute to a need for federal listing for any of the associated species, impacts would be **moderate**.

Mammals

Columbian Black-Tailed Deer (WA Priority). The population in a WDFW biodiversity area and corridor priority habitat would experience both positive and adverse effects from the West Alternative. These would include adverse effects from the loss of habitat to towers and access roads, and positive effects from right-of-way clearing, which could help diversify the habitats available to this population. Impacts would be **low** since a relatively small portion of the habitat occupied by this population would be affected, and since the species has a secure conservation status at both state and federal levels (NatureServe 2012).

Elk (WDFW Priority Species) and WDFW Elk Priority Area. Adverse effects to elk would include temporary construction disturbance and habitat loss within the two WDFW elk winter range priority areas. Towers, substations, and access roads would remove about 147 acres of habitat. This would have a **low** impact on elk since a relatively small portion of the total WDFW elk winter range priority area would be affected, impacts would be spread out along the corridor, and the species has a secure conservation status at both state and federal levels (NatureServe 2012). Impacts from 382 acres of right-of-way clearing could be beneficial to elk since it would create a corridor of shrubland or open habitat adjacent to forested habitat.

Townsend's Big-Eared Bat (Federal SOC, WA Candidate). Since the West Alternative crosses forest within about 0.15 mile of a documented occurrence of this species, there is a greater chance that individuals could be present and affected by the project. Adverse impacts would include temporary construction disturbance and loss of forest habitat due to towers and access roads. Right-of-way clearing could benefit this species since it can use open and shrubland habitats for foraging. Although the species is listed as imperiled to vulnerable at the state level

(NatureServe 2012), impacts would be **low** because of the small area impacted, potential benefits, and the species is apparently secure at the federal level (NatureServe 2012).

Amphibians

Cascade Torrent Salamander (Federal SOC, WA Candidate). Since the West Alternative crosses riparian habitat within 1 mile of a documented occurrence of Cascade torrent salamander, there is a greater chance that individuals could be present and affected by the project. Impacts could include temporary construction disturbance, construction mortality or stress from both physical injury and increased water turbidity from in-water work, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Since its conservation status is only listed as vulnerable at both the state and federal levels (NatureServe 2012), and since only one documented occurrence of this species occurs near the affected environment, habitat loss coupled with increased mortality would not be likely to adversely affect many individuals or lead to a need for federal listing; impacts would be **moderate**.

Cope's Giant Salamander (WA Monitor Species). Since the West Alternative crosses riparian habitat within 1 mile of a documented occurrence of Cope's giant salamander, there is an increased likelihood that individuals could be present and affected by the project (this is one of the same occurrences as along the Crossover Alternative). Impacts to a population of this species could include temporary construction disturbance, construction mortality or stress from physical injury and increased water turbidity, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Since the conservation status is vulnerable-to-apparently secure at both the state and federal levels (NatureServe 2012,) and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Reptiles

Western Pond Turtle (Federal SOC, OR Sensitive-Critical). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

Invertebrates

California Floater (Federal SOC, WA Candidate, OR Sensitive). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

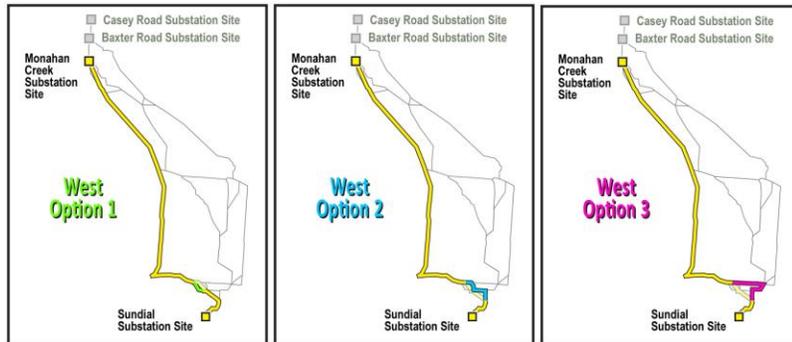
18.2.4.4 West Options 1, 2, and 3

The levels of the impacts to wildlife and WDFW priority habitats would be the same as for the West Alternative, except where stated otherwise.

Impacts to wildlife from the West Options occur near the Lacamas Prairie Natural Area (see Map 18-1D and Tables 18-3 through 18-6). West Option 1 would remove or alter 11 additional acres of the three freshwater wetland habitat types, 2 additional acres of riparian habitat, and would double the westside prairie removed (from 6 to 12 acres) (see Tables 18-5 and 18-6). However, it would

Impacts to WDFW priority habitats and special-status species are discussed for each option. See Maps 18-1A through 18-1D and Tables 18-3 through 18-6 for all impacts.

also remove or alter 13 fewer acres of biodiversity areas and corridors. For special-status species, the option would cross an additional 3 miles of one of the two WDFW wood duck priority areas, removing 7 acres of habitat from this



important area, a **moderate** impact. However, it would also avoid the Columbian black-tailed deer population in the WDFW biodiversity area and corridor priority habitat crossed by the West Alternative.

West Options 2 and 3 would have similar effects, with West Option 2 affecting slightly more acreages in each case. They would remove or alter fewer acres of freshwater wetlands (18 and 13 acres), but remove more acres of old-growth/mature forest (5 and 3 acres) and a WDFW biodiversity area and corridor that supports a population of Columbian black-tailed deer (12 and 11 acres). West Option 3 would also remove or alter 14 more acres of riparian habitat and remove 34 more acres of forest (see Tables 18-3 through 18-6).

18.2.5 Central Alternative

The Central Alternative would require mostly new right-of-way (see Chapter 4, Proposed Action and Alternatives), which would increase habitat fragmentation primarily in forested habitats. However, since most of the new line would not parallel existing lines, there would be less of a fence effect to increase the collision risk for birds.



18.2.5.1 Wildlife Habitats and Species—Central Alternative

Impacts would be higher where WDFW priority habitats or special-status species would be affected (see Section 18.2.5.2, WDFW Priority Habitats—Central Alternative, and Section 18.2.5.3, Special-Status Species—Central Alternative).

Wildlife in Open Habitat

Wildlife in open habitat would be less affected by the Central Alternative than wildlife in forest habitat. The proposed transmission line would cross 5 miles of open habitat—much less than in forest habitat, but similar to shrubland and urban/suburban habitats (see Table 18-3). Towers, access roads, and substations would cause the permanent loss of 82 acres of open habitat (see Table 18-4), although 2 acres of open habitat would also be created through the clearing of Oregon white oak woodlands (see Table 18-5). The wildlife most affected by the project in open habitat would likely be ground-dwelling animals. They would experience both a decrease in available habitat and an increase in mortality from the increased number of perches available to predatory raptors (raptors, conversely, would experience mostly positive effects, with some potential for mortality from transmission line collisions). Impacts to wider-ranging wildlife would include a small reduction in breeding or grazing habitat. Wildlife mortality from

construction and transmission-line bird collisions would also occur. Because the project would be long and narrow, any single population of animals would lose very little habitat and experience a small increase in mortality. These would cause **low** impacts from habitat loss and construction disturbance, and **moderate** impacts from mortality, since mortality of individual animals would not affect the conservation status of most species.

Wildlife in Forest and Production Forest Habitats

Forest-dependent wildlife would be more affected than other wildlife by the Central Alternative since these species would lose the most habitat. The proposed transmission line would cross 54 miles of production forest, and 13 miles of forest (see Table 18-3). Production forest habitat would be reduced by 1,261 acres from right-of-way clearing, towers, access roads, and substations, and forest would be reduced by 316 acres from the same disturbances (see Tables 18-3 and 18-4). Forest-dependent wildlife would be most affected by habitat loss. Habitat generalists would be less affected since they would be able to use the altered “edge” habitat within the cleared right-of-way for foraging or hunting (shrubland and open habitat species could experience positive impacts by an increase in habitat) (see Section 18.2.2, Impacts Common to Action Alternatives). Because forest and production forest are common in the project area, and since impacts would be spread out along the corridor, most forest wildlife species would experience **low** impacts from habitat loss and construction disturbance (see Section 18.2.4.2, WDFW Priority Habitats—West Alternative, for a discussion of potentially higher impacts in old-growth/mature forests). Wildlife mortality from construction and transmission-line bird collisions would occur, but would be **moderate**, since mortality of individual animals would not affect the conservation status of most species.

Wildlife in Shrubland Habitat

Wildlife that use shrubland habitat could benefit from the creation of 1,150 acres of shrubland habitat from right-of-way clearing in forest and production forest, and raptors would experience a positive effect from the increase in available perches (see Table 18-3). Conversely, with 3 miles of new transmission line crossing existing shrubland habitat, wildlife would also experience some adverse effects from the project, including the alteration of 42 acres of tall shrubland, and the loss of 32 acres of habitat to towers, access roads, and substations (see Tables 18-3 and 18-4). Adverse effects would include temporary construction disturbance; the loss of existing habitat; the loss of some tall shrub nesting habitat for birds; potential construction mortality for less mobile species; and a possible increase in mortality caused by an increase in predation by raptors using the transmission lines and towers as perches, and by bird/transmission line collisions. Since impacts would be spread out along the corridor and affect a relatively small amount of habitat, the levels of adverse impacts would be similar to those for open habitat, including **low** impacts from loss of existing habitat and construction disturbance, and **moderate** impacts from mortality.

Wildlife in Urban/Suburban Habitat

Wildlife found in urban/suburban habitat would be the least affected, with just 1 mile of new transmission line crossing this habitat. The Central Alternative would clear 20 acres of urban/suburban habitat for the right-of-way and remove 3 acres of habitat for access roads (see Tables 18-3 and 18-4). Impacts to wildlife would range among those impacts listed for open, shrubland, forest, and production forest habitats, depending on which habitats might be present in any given urban/suburban area. Given the small amounts of habitat lost and the general

tolerance of urban/suburban wildlife to human disturbance, impacts related to construction and habitat loss or alteration would be **low**, while those related to an increase in mortality (such as for prey species of raptors and bird/transmission line collisions) would be **moderate**.

18.2.5.2 WDFW Priority Habitats—Central Alternative

This section provides the amount of WDFW priority habitats altered or removed by the Central Alternative, and the length in miles of the transmission line located in each habitat.

Riparian Areas. Along the Central Alternative, most impacts from habitat alteration or removal would occur in riparian habitats with 105 acres altered by right-of-way clearing (see Table 18-5) and 11 acres lost to towers, access roads, and substations (see Table 18-6.). Habitat loss would be a **low-to-high** impact to these WDFW priority habitats, depending on their condition. In addition, transmission line bird collisions would increase across 6 miles of riparian areas. This would also be a **low-to-moderate** impact depending on bird use and the effectiveness of mitigation measures, since it could reduce the ability of these habitats to safely support waterfowl, waterbirds, and raptors: an essential attribute for these habitats.

Riparian areas also encompass other priority habitats affected by the project, including biodiversity areas and corridors, wetlands, and old-growth/mature forest.

Biodiversity Areas and Corridors. Three documented WDFW biodiversity area and corridor priority habitats would be affected by the Central Alternative: the East Fork Lewis River Riparian Corridor (crossed in three places at Big Tree Creek, the East Fork Lewis River, and Rock Creek); the Camas Biodiversity Area; and the Lady and Akerman Islands Biodiversity Area and Corridor (WDFW 2012). Fragmentation of these habitats from right-of-way clearing could adversely affect the movement of many wildlife species across a biologically diverse and relatively undisturbed area. One mile of these habitats would be crossed in three places by new transmission line, with 10 acres altered due to right-of-way clearing, and less than 1 acre lost to a transmission tower and new access road (see Tables 18-5 and 18-6). Impacts to these WDFW priority habitats would be **high** since fragmentation would diminish one of their main attributes, which is to be a “relatively undisturbed and unbroken tract of vegetation” that connects high-value habitats (WDFW 2008).

Freshwater Wetlands and Fresh Deepwater. Altogether, 96 acres of forested, scrub-shrub, and emergent freshwater wetlands would be lost to right-of-way clearing (forested wetland) and/or towers, access roads, and substations (see Table 18-5 and 18-6). Sixteen acres of scrub-shrub wetlands would be altered by right-of-way clearing (see Table 18-5). Impacts to wildlife from the alteration and loss of wetland habitat would range from **low-to-high**, depending on the condition of each wetland. In addition, transmission line bird collisions would become more frequent over 6 total miles of all three types of freshwater wetlands (see Table 18-5). Similar to riparian areas, an increase in transmission line collisions could reduce the value of these areas for wildlife habitat, a **low-to-moderate** impact.

The only impacts to fresh deepwater would be from transmission line bird collisions, which would increase across 1 mile of fresh deepwater (see Table 18-5). As for freshwater wetlands and riparian areas, impacts would be **low-to-moderate**.

Old-Growth/Mature Forest. A little over 12 acres of old-growth/mature forest would be removed by right-of-way clearing and a new access road (see Tables 18-5 and 18-6). Impacts to

these WDFW priority habitats would be **high** since tree clearing would remove the main attributes of this habitat: long-lived trees and the associated understory vegetation, which have become uncommon in the Pacific Northwest and could not be easily or quickly replaced.

Oregon White Oak Woodlands. Two acres of the Washougal Oaks Woodland would be removed by right-of-way clearing (see Table 18-5). Impacts to these WDFW priority habitats would be **high** since tree clearing would remove the main attributes of this habitat: Oregon white oak trees and the associated understory vegetation, which are becoming less common in the Pacific Northwest.

Snag-Rich Areas. Three acres of the WDFW North Fork Lacamas Snags priority habitat would be removed by right-of-way clearing, towers, and new and improved access roads along the Central Alternative (see Tables 18-5 and 18-6). Impacts would include the permanent loss and fragmentation of snag tree habitat. Because of the scarcity of this habitat in the project area, impacts would be **high**.

18.2.5.3 Special-Status Species—Central Alternative

There are 2 federally listed species and 10 other special-status species potentially affected by the Central Alternative. All documented occurrences are found in Washington with the exception of California floater mussel—found in the Columbia River—and western pond turtle—found in Oregon and Washington.

Federally Listed Species

Marbled Murrelet (Threatened). Although there are no documented occurrences of marbled murrelet within 1 mile of the Central Alternative, right-of-way clearing and towers, access roads, and substations would affect 458 acres of habitat within the marbled murrelet conservation zone. However, at most only 13 acres of this is suitable old-growth/mature forest habitat (see Table 18-5 and Table 18-6), and is outside the general range of marbled murrelet from the coast, so the available habitat would not likely be used for nesting. In addition, the old-growth/mature forest within this area primarily occurs in small patches, so any potential habitat loss would be minor in any particular area. Given the small amount of potential habitat affected, the distance from the coast, and the lack of any documented occurrences, potential habitat loss would be a **low** impact.

Northern Spotted Owl (Threatened). An improved access road for the Central Alternative would remove 4 acres of production forest habitat from one northern spotted owl circle, and the right-of-way would pass through production forest within 1 mile of another circle. In addition, the loss of 13 acres of old-growth/mature forest along the entire action alternative would remove potential nesting habitat for this species, although recent high resolution imagery shows most of the area along the Central Alternative to be of marginal habitat (BPA 2011). Impacts would include temporary construction disturbance and the loss of known and potential habitat. Mitigation measures would be used to prevent loss of a nest or mortality of young. Given that the overall potential habitat is generally low quality for northern spotted owl; there is a low number of documented occurrences in the study area; a relatively small amount of known and potential habitat would be removed, with impacts spread out along the corridor; and mitigation measures would reduce construction disturbance, impacts on this species would not affect species recovery, and would therefore be **moderate**.

Other Special-Status Wildlife Species — Birds

Bald Eagle (Federal SOC, WA Sensitive) and WDFW Bald Eagle Priority Areas. Three documented occurrences of bald eagle nests and one WDFW bald eagle priority area—the Lewis River Winter Eagle Habitat—are within 1 mile of the Central Alternative. New transmission line would cross less than 1 mile of these priority areas, and right-of-way clearing would remove tree habitat from 5 acres. Impacts would include temporary construction disturbance and loss of potential nesting and roosting habitat through tree removal in riparian areas along the Central Alternative (see 18.2.5.3, Special-Status Habitats), particularly where it occurs in a WDFW priority area. As for other raptors, transmission line collisions are typically uncommon, but could occur. Mitigation measures would be used to ensure individual nests and young are not harmed or disrupted during the breeding season, and to reduce the risks of transmission line collisions throughout the year. Impacts to this species would be **moderate** since the species is still listed as sensitive by WDFW, is monitored by USFWS following its delisting in 2010, and impacts would not be expected to contribute to a need for federal relisting of this species based on a conservation status of secure at both the state and federal levels (NatureServe 2012).

Northern Goshawk (Federal SOC, WA Candidate). Because the Central Alternative crosses production forest within 1 mile of a documented occurrence of northern goshawk (also in production forest), there is a greater chance the project could affect this species. Impacts would include loss of old-growth/mature forest habitat and temporary construction disturbance, although mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if necessary. Although the conservation status of this species is imperiled-to-vulnerable in Washington (NatureServe 2012), it is listed as apparently secure at the federal level, and so the small amount of suitable mature/old-growth forest habitat affected (see Section 18.2.5.2, WDFW Priority Habitats—Central Alternative) would be a **moderate** impact to the species. As for other raptors, transmission line collisions are typically uncommon, the rare occurrence of mortality of an individual would not affect the overall conservation status, and impacts would be **moderate**.

Purple Martin (Federal SOC, WA Candidate). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

Vaux's Swift (WA Candidate). The Vaux's swift nest documented within 1 mile of the Central Alternative in a chimney in urban-suburban habitat indicates an increased chance that individuals could be present and affected by the project. However, the Central Alternative does not cross any known suitable nesting habitat within 1 mile of the occurrence, reducing the chance that Vaux's swift habitat would be affected in this area. Observations of Vaux's swift in a WDFW biodiversity area and corridor priority habitat that is crossed by the Central Alternative indicates an increased likelihood for impacts. Impacts in this area could include habitat loss through tree removal, temporary construction disturbance, and transmission line collisions, although collisions are not very likely for this species (see Section 18.2.2, Impacts Common to Action Alternatives). Mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if nests occur near the construction area. Since the conservation status of this species is vulnerable-to-apparently secure at the state level and secure at the federal level (NatureServe 2012), mortality or loss of habitat would not likely contribute to a need for federal listing and **moderate** impacts could occur.

Mammals

Elk (WA Priority Species) and WDFW Elk Priority Area. Adverse effects to elk would include temporary construction disturbance and habitat loss within the two WDFW elk winter range priority areas. Towers, substations, and access roads would remove 274 acres of habitat within the two WDFW elk priority area. This would have a **low** impact on elk since a relatively small portion of the total WDFW elk winter range priority area would be affected, impacts would be spread out along the corridor, and the species has a secure conservation status at both state and federal levels (NatureServe 2012). Impacts from 519 acres of right-of-way clearing could be beneficial to elk since it would create a corridor of shrubland or open habitat adjacent to forested habitat.

Amphibians

Cascade Torrent Salamander (Federal SOC, WA Candidate). Given that the Central Alternative crosses riparian habitat within 1 mile of five documented occurrences of Cascade torrent salamander, there is a high likelihood that this species could be affected by the project. Impacts could include temporary construction disturbance, construction mortality or stress from both physical injury and increased water turbidity from in-water work, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Although there are a high number of occurrences near the affected area, they mainly occur along two main streams/ivers. Also, the conservation status of the species is listed as vulnerable at the state and federal levels (NatureServe 2012). Given the limited distribution and conservation status, habitat loss coupled with increased mortality would not likely contribute to a need for federal listing; impacts to this species would be **moderate**.

Cope's Giant Salamander (WA Monitor Species). Since the Central Alternative crosses riparian habitat within 1 mile of a documented occurrence of Cope's giant salamander, there is a greater chance that individuals could be present and affected by the project. (This is the same occurrence identified for the Crossover Alternative [see Section 18.2.7.3, Special-Status Species—Crossover Alternative]). Impacts to a population of this species could include temporary construction disturbance, construction mortality or stress from physical injury and increased water turbidity, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Since the conservation status is vulnerable-to-apparently secure at both the state and federal levels (NatureServe 2012,) and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Western Toad (Federal SOC, WA Candidate). The Central Alternative crosses riparian habitat within 1 mile of a documented occurrence of western toad, increasing the chance that individuals could be affected by the project (this is the same occurrence identified for the Crossover Alternative, see Section 18.2.7.3, Special-Status Species—Crossover Alternative). Impacts could include temporary construction disturbance, construction mortality, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from towers and access roads. Right-of-way clearing would convert forested riparian and wetland habitats to scrub-shrub riparian and wetland habitat, which would still be suitable habitat for this species.

Although this species is rated as vulnerable at both the state and federal levels, not many individuals would likely be affected based on just one documented occurrence. Impacts would not likely contribute to a need for federal listing and would be **moderate**.

Reptiles

Western Pond Turtle (Federal SOC, WA Endangered, OR Sensitive-Critical). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

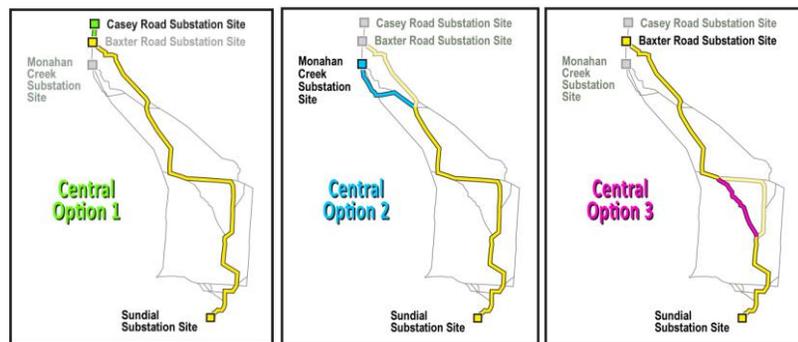
Invertebrates

California Floater Mussel (Federal SOC, WA Candidate, OR Sensitive). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

18.2.5.4 Central Options 1, 2, and 3

The levels of the impacts to wildlife and WDFW priority habitats would be the same as for the Central Alternative, except where stated otherwise.

Central Option 1 would alter or remove a little over 4 additional acres of riparian habitat (see Tables 18-5 and 18-6), and 78 additional acres of the WDFW Roosevelt Elk Winter Range Priority Area. An access road would also cross riparian habitat within 1 mile of



two documented occurrences of Dunn's salamander, the only occurrence of this species among all action alternatives. With a conservation status of vulnerable at the state level and apparently secure at the federal level (NatureServe 2012), potential impacts would be **moderate**.

Central Option 2 would remove 7 additional acres of old-growth/mature forest, 10 additional acres of riparian habitat, and 68 additional acres of forest.

Central Option 3 would remove 3 additional acres of old-growth/mature forest and 60 additional acres of forest, but would alter 10 fewer acres of riparian habitat. It would also cross a forested riparian area within 1 mile of a WDFW cavity-nesting duck priority area. Impacts would be the same as those given for the West Alternative (**moderate**) (see Section 18.2.4.3, Special-Status Species—West Alternative). Central Option 3 would avoid two of the five documented occurrences of Cascade torrent salamander, one of three documented occurrence of western pond turtle (the one occurrence in Washington), and the one documented occurrence of Vaux's swift.

18.2.6 East Alternative

The East Alternative would require mostly new right-of-way (see Chapter 4, Proposed Action and Alternatives), which would increase habitat fragmentation primarily in the forested

habitats. However, since most of the new line would not parallel existing lines, there would be less of a fence effect to increase the collision risk for birds.

18.2.6.1 Wildlife Habitats and Species— East Alternative

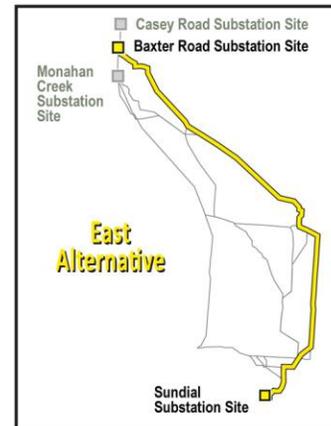
Impacts could be higher where WDFW priority habitat or special-status species would be affected (see Section 18.2.6.2, WDFW Priority Habitats—East Alternative and Section 18.2.6.3 Special-Status Species—East Alternative).

Wildlife in Open Habitat

Wildlife in open habitat would be less affected by the East Alternative than wildlife in forest habitat. The proposed transmission line would cross 5 miles of open habitat—much less than in forest habitat, but similar to shrubland and urban/suburban habitats (see Table 18-3). Towers, access roads, and substations would cause the permanent loss of 114 acres of open habitat (see Table 18-4). The wildlife most affected by the project in open habitat would likely be ground-dwelling animals. They would experience both a decrease in available habitat and an increase in mortality from the increased number of perches available to predatory raptors (raptors, conversely, would experience mostly positive effects, with some potential for mortality from transmission line collisions). Impacts to wider-ranging wildlife would include a small reduction in breeding or grazing habitat. Wildlife mortality from construction and transmission-line bird collisions would also occur. Because the project would be long and narrow, any single population of animals would lose very little habitat and experience a small increase in mortality. These would cause **low** impacts from habitat loss and construction disturbance, and **moderate** impacts from mortality, since mortality of individual animals would not affect the conservation status of most species.

Wildlife in Forest and Production Forest Habitats

Forest-dependent wildlife would be more affected than other wildlife by the East Alternative since they would lose the most habitat. The proposed transmission line would cross 56 miles of production forest, and 10 miles of forest (see Table 18-3). Production forest habitat would be reduced by 1,386 acres from right-of-way clearing, towers, access roads, and substations, and forest would be reduced by 227 acres from the same disturbances (see Tables 18-3 and Table 18-4). Forest-dependent wildlife would be most affected by habitat loss. Habitat generalists would be less affected since they would be able to use the altered “edge” habitat within the cleared right-of-way for foraging or hunting (shrubland and open habitat species could experience positive impacts by an increase in habitat) (see Section 18.2.2, Impacts Common to Action Alternatives). Because forest and production forest are common in the project area, and since impacts would be spread out along the corridor, most forest wildlife species would experience **low** impacts from habitat loss and construction disturbance. Wildlife mortality from construction and transmission-line bird collisions would occur but would be **moderate**, since mortality of individual animals would not affect the conservation status of most species.



Wildlife in Shrubland Habitats

Wildlife that use shrubland habitat could benefit from the creation of 1,134 acres of shrubland habitat through right-of-way clearing in forest and production forest, and raptors would experience a positive effect from the increase in available perches (see Table 18-3). Conversely, with 2 miles of new transmission line crossing existing shrubland habitat, wildlife would also experience some adverse effects from the project, including the alteration of 34 acres of tall shrubland, and the loss of 55 acres of existing habitat to towers and access roads (see Tables 18-3 and 18-4). Adverse effects would include temporary construction disturbance; the loss of existing habitat; the loss of some tall shrub nesting habitat for birds; potential construction mortality for less mobile species; and a possible increase in mortality caused by an increase in predation by raptors using the transmission lines and towers as perches, and by bird/transmission line collisions. Since impacts would be spread out along the corridor and affect a relatively small amount of habitat, the levels of adverse impacts would be similar to those for open habitat, including **low** impacts from loss of existing habitat and construction disturbance, and **moderate** impacts from mortality.

Wildlife in Urban/Suburban habitat

Wildlife found in urban/suburban habitat would be the least affected, with just 1 mile of new transmission line crossing this habitat (see Table 18-3). The East Alternative would alter 19 acres of urban/suburban habitat by right-of-way clearing and remove 3 acres of habitat for access roads (see Tables 18-3 and 18-4). Impacts to wildlife would range among those impacts listed for open, shrubland, forest, and production forest habitats, depending on which habitats might be present in any given urban/suburban area. Given the small amounts of habitat lost and the general tolerance of urban/suburban wildlife to human disturbance, impacts related to construction and habitat loss or alteration would be **low**, while those related to an increase in mortality (such as for prey species of raptors and bird/transmission line collisions) would be **moderate**.

18.2.6.2 WDFW Priority Habitats—East Alternative

This section provides the amount of WDFW priority habitats altered or removed by the East Alternative, and the length in miles of the transmission line in each habitat.

Riparian Areas. Along the East Alternative, riparian areas would have more impacts than other WDFW priority habitats, with 94 acres of habitat altered by right-of-way clearing and 13 acres lost to towers, access roads, and substations (see Tables 18-5 and 18-6). Habitat loss would be a **low-to-high** impact to these WDFW priority habitats, depending on their condition. In addition, transmission line bird collisions would increase across 5 miles of riparian areas. This would also be a **low-to-moderate** impact depending on bird use and the effectiveness of mitigation measures, since it could reduce the ability of these habitats to safely support waterfowl, waterbirds, and raptors: an essential attribute for these habitats.

Riparian areas may encompass other priority habitats affected by the project, including biodiversity areas and corridors, wetlands, and old-growth/mature forest.

Biodiversity Areas and Corridors. Three documented WDFW biodiversity area and corridor priority habitats would be affected by the East Alternative: the East Fork Lewis River Riparian Corridor (crossed in two places at the East Fork Lewis River and a tributary to King Creek); the

Camas Biodiversity Area; and the Lady and Akerman Islands Biodiversity Area and Corridor (WDFW 2012). (These are the same as those affected by the Crossover Alternative). Fragmentation of these habitats from right-of-way clearing could adversely affect the movement of a diversity of wildlife across a biological diverse and relatively undisturbed area. A little less than 1 mile of this habitat would be crossed in four places by new transmission line, with 9 acres altered due to right-of-way clearing, and about 1 acre lost to a transmission tower and new access road (see Tables 18-5 and 18-6). Impacts to these WDFW priority habitats would be **high** since fragmentation would diminish one of their main attributes, which is to be a “relatively undisturbed and unbroken tract of vegetation” that connects high-value habitats (WDFW 2008).

Freshwater Wetlands and Fresh Deepwater. In total, 90 acres of forested, scrub-shrub, and emergent freshwater wetlands would be removed by right-of-way clearing (forested wetlands) and/or towers, access roads, and substations (see Tables 18-5 and 18-6). Twenty-three acres of scrub-shrub wetlands would be altered by right-of-way clearing (see Table 18-5). Habitat alteration and removal at the Fraser Creek Wetland would be a **high** impact, since it is known to be of high value to wildlife (WDFW 2012). Impacts to wildlife from the alteration and loss of other wetlands would range from **low-to-high**, depending on the condition of each wetland. In addition, transmission line bird collisions would become more frequent over 5 miles of freshwater wetlands (see Table 18-5). Similar to riparian areas, an increase in transmission line collisions could reduce the value of these areas for wildlife habitat, a **low-to-moderate** impact.

The only impacts to fresh deepwater would be from transmission line bird collisions, which would increase across 1 mile of fresh deepwater (see Table 18-5). As for freshwater wetlands and riparian areas, impacts would be **low-to-moderate**.

Caves or Cave-Rich Areas. The right-of-way would cross through about 0.05 acre along the edge of a WDFW cave-rich priority area in production forest (see Table 18-5) (the same area that would be impacted by the Crossover Alternative). Impacts could include permanent removal of production forest habitat surrounding a cave—which could remove some roosting habitat; the presence of a tower, transmission line, or access road; and temporary construction disturbance. These disturbances would generally have **low** impacts to this habitat given the small area of disturbance and the likelihood that actual cave habitat would not be permanently altered. Also, the effects on wildlife (such as Townsend’s big-eared bat) that rely on caves would not likely prevent them from using this cave habitat, while the addition of shrubland from right-of-way clearing could be beneficial for foraging purposes. Also, the placement of the disturbance along the edge of the cave-rich area would mean that the area would not be fragmented.

Herbaceous Bald. About 0.5 acre of an improved access road would cross the southern edge of the Larch Mountain WDFW herbaceous bald priority habitat (see Table 18-6). Impacts could include permanent vegetation removal from possible widening of the access road, and temporary construction disturbance such as soil compaction. These disturbances would have **low** impacts to this WDFW priority habitat given the small areas of disturbance, the placement of the disturbance along the edge of the habitats—meaning the habitat would not be fragmented—and the existing disturbed conditions from the existing access road.

Old-Growth/Mature Forest. Thirteen acres of old-growth/mature forest would be removed by right-of-way clearing and new and improved access roads (see Tables 18-5 and 18-6). Impacts to these WDFW priority habitats would be **high** since tree clearing would remove the main

attributes of this habitat: long-lived trees and the associated understory vegetation, which have become uncommon in the Pacific Northwest and could not be easily or quickly replaced.

Oregon White Oak Woodlands. Two acres of the Washougal Oaks Woodland would be removed by right-of-way clearing (see Table 18-5). Impacts to this WDFW priority habitat would be **high** since tree clearing would remove the main attributes of this habitat: Oregon white oak trees and the associated understory vegetation, which are becoming less common in the Pacific Northwest.

Snag-Rich Areas. The East Alternative would remove 45 acres from the WDFW Rock Creek Snag-Rich Area priority habitat (see Tables 18-5 and 18-6). Habitat loss would be caused by right-of-way clearing, towers, and access roads. Impacts would include the permanent loss and fragmentation of snag tree habitat. Because of the scarcity of this habitat in the project area, impacts would be **high**.

Talus. One acre of a talus field would be permanently removed by a new access road (see Table 18-6), and less than 1 mile would be crossed by the new transmission line (see Table 18-5). Impacts would include permanent loss of habitat, potential transmission-line collisions by raptors, and temporary construction disturbance. Impacts would be **high** due to the scarcity of this wildlife habitat, and since these areas are relatively inaccessible and more likely to be in pristine (undisturbed) condition prior to construction.

18.2.6.3 Special-Status Species—East Alternative

There are 2 federally listed species and 12 other special-status species or species groups potentially affected by the East Alternative. All documented occurrences are found in Washington with the exception of California floater mussel—found in the Columbia River—and western pond turtle—found in Oregon.

Federally Listed Species

Marbled Murrelet (Threatened). Although there are no documented occurrences of marbled murrelet within 1 mile of the East Alternative, it would remove 424 acres of marginal habitat within the marbled murrelet conservation zone, although at most only 13 acres of this is suitable old-growth/mature forest habitat (see Table 18-5 and Table 18-6), and they are outside the general range of marbled murrelet from the coast, so the available habitat would not likely be used for nesting. In addition, the old-growth/mature forest within this area primarily occurs in small patches, so any potential habitat loss would be minor in any particular area. Given the small amount of potential habitat affected, the distance from the coast, and the lack of any documented occurrences, potential habitat loss would be a **low** impact.

Northern Spotted Owl (Threatened). Right-of-way clearing, towers, substations, and access roads would remove 220 acres of mostly production forest from within four northern spotted owl circles, and the right-of-way would pass within a mile of three others. In addition, about 13 acres of potentially suitable old-growth/mature forest habitat would be removed by the project. This includes habitat from the WDFW Rock Creek Snag-Rich Area priority habitat near Yale Dam (also see Section 18.2.6.2, WDFW Priority Habitats—East Alternative). This area contains potential high-quality habitat for northern spotted owl and occurs near the western edge of a northern spotted owl Conservation Support Area (CSA) designated by the USFWS (2008a). Otherwise, recent high resolution imagery shows most of the area along the East

Alternative to be of marginal habitat (BPA 2011). Impacts to individuals of this species would include temporary construction disturbance and loss of known and high-quality potential habitat. Mitigation measures would be used to prevent loss of a nest or mortality of young. Although there are a relatively high number of documented occurrences in the affected environment and both known and potential high-quality habitat would be lost, since the amount of habitat lost is relatively small and of generally poor quality, with impacts spread out among a number of northern spotted owl circles and along the corridor; and since mitigation measures would reduce construction disturbance, impacts on this species would not affect species recovery and would therefore be **moderate**.

Other Special-Status Wildlife Species — Birds

Bald Eagle (Federal SOC, WA Sensitive) and WDFW Bald Eagle Priority Areas. Bald eagle would be impacted by the project given that within 1 mile of the East Alternative, there are three documented occurrences of bald eagle nests and one WDFW bald eagle priority area—the Yale Tailrace Foraging Area. New transmission line would cross about 1 mile of the WDFW bald eagle priority area, and right-of-way clearing, towers, and access roads would remove tree habitat from 37 acres of this area. Impacts would include temporary construction disturbance and loss of potential nesting and roosting habitat through tree removal in riparian areas along the East Alternative (see 18.2.6.3, Special-Status Habitats), particularly where it occurs in a WDFW priority area. As for other raptors, transmission line collisions are typically uncommon, but could occur. Mitigation measures would be used to ensure individual nests and young are not harmed or disrupted during the breeding season, and to reduce the risks of transmission line collisions throughout the year. Impacts to this species would be **moderate** since the species is still listed as sensitive by WDFW, is monitored by USFWS following its delisting in 2010, and impacts would not be expected to contribute to a need for federal relisting of this species based on a conservation status of secure at both the state and federal levels (NatureServe 2012).

Peregrine Falcon (Federal SOC, WA Sensitive). Although there is one documented occurrence of peregrine falcon in WDFW cliffs/bluffs priority habitat within 1 mile of the East Alternative, the East Alternative does not cross any known suitable habitat (cliffs/bluffs or caves) within 1 mile of the occurrence, indicating a decreased likelihood that peregrine falcon habitat would be affected (this is the same occurrence as along the Crossover Alternative). However, the presence of a new transmission line in the area could increase the chance for mortality through transmission line collisions. If suitable habitat does occur along the right-of-way or access roads, additional impacts could include habitat loss from towers and access roads and temporary construction disturbance. Mitigation measures would be used to ensure individual birds are not harmed or disrupted during the breeding season, if necessary. Positive impacts could also result from the addition of new perch sites on towers and lines from which individual birds could hunt prey. Since the conservation status of this species is imperiled (breeding) to vulnerable (non-breeding) at the state level, and apparently secure at the federal level (NatureServe 2012), mortality or loss of habitat in one location would not likely contribute to a need for federal listing, and impacts would be **moderate**.

Purple Martin (Federal SOC, WA Candidate). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

Vaux's Swift (WA Candidate). Observations of Vaux's swift in a WDFW biodiversity area and corridor priority habitat that is crossed by the East Alternative indicates an increased likelihood of impacts. Impacts could include habitat loss through tree removal, temporary construction

disturbance, and transmission line collisions, although collisions are not very likely for this species (see Section 18.2.2, Impacts Common to Action Alternatives). Mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if nests occur near the construction area. Since the conservation status of this species is vulnerable-to-apparently secure at the state level and secure at the federal level (NatureServe 2012), mortality or loss of habitat would not likely contribute to a need for federal listing and **moderate** impacts could occur.

Waterfowl Concentrations. Because there is a WDFW waterfowl concentration priority area (at the Whittle Creek Wetlands) within 1 mile of the East Alternative, and since the right-of-way would cross between the waterfowl concentration area and the Cowlitz River, there is a chance that waterfowl would be impacted by an increase in transmission line collisions. Because of the importance of these areas to a wide diversity and number of waterfowl, but because mortalities would not contribute to a need for federal listing for any of the associated species, impacts would be **moderate**.

Mammals

Columbian Black-Tailed Deer (WA Priority) and WDFW Columbian Black-Tailed Deer Priority Habitat. Impacts to this species would be similar to those for elk, including negative impacts from loss of 6 acres of habitat in a WDFW Columbian black-tailed deer wintering and migration priority area, and positive impacts from right-of-way clearing across 15 acres of this priority area. As for elk, impacts would be **low** since a relatively small portion of the total WDFW Columbian black-tailed deer wintering and migration priority area would be affected and the species has a secure conservation status at both state and federal levels (NatureServe 2012).

Elk (WA Priority) and WDFW Elk Priority Area. Adverse effects to elk would include temporary construction disturbance and habitat loss within the two WDFW elk winter range priority areas. Towers, substations, and access roads would remove 357 acres of habitat from within the two WDFW elk winter habitat priority areas. This would have a **low** impact on elk since a relatively small portion of the total WDFW elk winter range priority area would be affected, impacts would be spread out along the corridor, and the species has a secure conservation status at both state and federal levels (NatureServe 2012). Impacts from 655 acres of right-of-way clearing could be beneficial to elk since it would create a corridor of shrubland or open habitat adjacent to forested habitat.

Amphibians

Cascade Torrent Salamander (Federal SOC, WA Candidate). Given that the East Alternative crosses riparian habitat within 1 mile of six documented occurrences of Cascade torrent salamander, there is a high likelihood that this species could be affected by the project. Impacts could include temporary construction disturbance, construction mortality or stress from both physical injury and increased water turbidity from in-water work, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Although there are a high number of occurrences near the affected area, they mainly occur in two areas. Also, the conservation status of the species is listed as vulnerable at the state and federal levels (NatureServe 2012). Given the limited distribution and conservation status, habitat loss coupled with increased mortality would not likely contribute to a need for federal listing; impacts to this species would be **moderate**.

Larch Mountain Salamander. There is one documented occurrence of this species within 1 mile of the East Alternative. However, the East Alternative does not cross any known suitable habitat (talus or caves) within 1 mile of the occurrence, indicating a decreased likelihood that individuals would be affected. If a population of Larch Mountain salamander does occur near the project near unmapped talus or caves, impacts could include temporary construction disturbance, construction mortality, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of talus habitat from towers and access roads. Since the conservation status of this species is vulnerable at the state and federal levels (NatureServe 2012), mortality or loss of habitat would not likely contribute to a need for federal listing. This, along with the low likelihood for adverse effects, indicates that impacts to this species would be **low-to-moderate**.

Rocky Mountain Tailed Frog (WA Candidate). Given that the East Alternative crosses riparian habitat within 1 mile of five documented occurrences of this species, all occurring along three main streams/streams, there is a high likelihood that it could be affected by the project (three of these are also along the Crossover Alternative). Impacts to a population of this species could include temporary construction disturbance, construction mortality, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Although its conservation status is imperiled in the state of Washington (NatureServe 2012) and there are a relatively high number of occurrences near the affected environment, its federal conservation status is apparently secure, and so impacts would not likely contribute to a need for federal listing and would be **moderate**.

Reptiles

Western Pond Turtle (Federal SOC, OR Sensitive-Critical). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

Invertebrates

California Floater (Federal SOC, WA Candidate). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

18.2.6.4 East Options 1, 2, and 3

The levels of the impacts to wildlife and WDFW priority habitats would be the same as for the East Alternative, except where stated otherwise.

East Option 1 would remove an additional 4 acres of the three freshwater wetland types,

7 acres of old-growth/mature forest, 8 acres of riparian habitat, and 42 acres of forest habitat; and alter 3 fewer acres of riparian habitat (see Tables 18-5 and 18-6). Regarding special-status species, it would avoid the WDFW waterfowl concentration priority area. However, it would



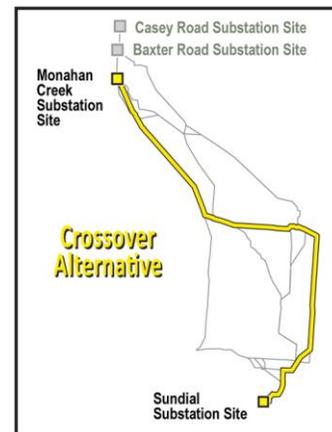
remove 3 acres from an additional WDFW bald eagle priority area—the Cowlitz Bald Eagle Feeding Habitat—and cross within the buffers of two additional bald eagle nests (though another nest would be avoided).

East Option 2 would alter 7 fewer acres of scrub-shrub wetlands, remove 8 fewer acres of old-growth/mature forest (see Tables 18-5 and 18-6), and remove 75 fewer acres from northern spotted owl circles. It would also avoid affecting the talus slope, the Larch Mountain herbaceous bald, and the cave-rich area that are all affected by the East Alternative, although it would remove 3 acres from a second snag-rich area—the North Fork Lacamas Snags. It would also avoid crossing within 1 mile of a number of special-status species occurrences that are all near the East Alternative, including three of the five occurrences of Rocky Mountain tailed frog, and three of the six occurrences of Cascade torrent salamander. It would remove about half the amount (12 of 24 acres) of WDFW Columbian black-tailed deer priority area.

East Option 3 would be similar to the East Alternative.

18.2.7 Crossover Alternative

The Crossover Alternative would require new right-of-way along much of its southern half (see Chapter 4, Proposed Action and Alternatives), which would cause increased habitat fragmentation primarily in the forested habitats. In much of its northern half, it would parallel existing transmission lines, which would not create new fragmentation, although it could expand existing fragmentation where the right-of-way would need to be widened. In addition, since the new lines would be higher than the existing lines, the parallel right-of-way would create an increased fence effect to bird flight paths and increase the risk of bird collisions in many areas.



18.2.7.1 Wildlife Habitats and Species—Crossover Alternative

Impacts would be higher where WDFW priority habitats or special-status species would be affected (see Section 18.2.7.2, WDFW Priority Habitats—Crossover Alternative, and Section 18.2.7.3, Special-Status Species—Crossover Alternative).

Wildlife in Open Habitat

Wildlife in open habitat would be less affected by the Crossover Alternative than wildlife in forest habitat. The proposed transmission line would cross 9 miles of open habitat—much less than in forest habitat, but similar to shrubland (see Table 18-3). Towers, access roads, and substations would cause the permanent loss of 126 acres of open habitat (see Table 18-4), although 2 acres of open habitat would also be created through the clearing of Oregon white oak woodlands (see Table 18-5). The wildlife most affected by the project in open habitat would likely be ground-dwelling animals. They would primarily experience both a decrease in available habitat and an increase in mortality from the increased number of perches available to predatory raptors (raptors, conversely, would experience mostly positive effects, with some potential for mortality from transmission line collisions). Impacts to wider-ranging wildlife would include a small reduction in breeding or grazing habitat. Wildlife mortality from

construction and transmission-line bird collisions would also occur. Because the project would be long and narrow, any single population of animals would lose very little habitat and experience a small increase in mortality. These would cause **low** impacts from habitat loss and construction disturbance, and **moderate** impacts from mortality, since mortality of individual animals would not affect the conservation status of most species.

Wildlife in Forest and Production Forest Habitats

Forest-dependent wildlife would be more affected than other wildlife by the Crossover Alternative since they would lose the most habitat. The proposed transmission line would cross 35 miles of production forest, and 14 miles of forest (see Table 18-3). Production forest habitat would be reduced by 787 acres from right-of-way clearing, towers, access roads, and substations, and forest would be reduced by 360 acres from the same disturbances (see Tables 18-3 and 18-4). Forest-dependent wildlife would be most affected by habitat loss. Habitat generalists would be less affected since they would be able to use the altered “edge” habitat within the cleared right-of-way for foraging or hunting (shrubland and open habitat species could experience positive impacts by an increase in habitat) (see Section 18.2.2, Impacts Common to Action Alternatives). Because forest and production forest are common in the project area, and since impacts would be spread out along the corridor, most forest wildlife species would experience **low** impacts from habitat loss and construction disturbance. Wildlife mortality from construction and transmission-line bird collisions would occur but would be **moderate**, since mortality of individual animals would not affect the conservation status of most species.

Wildlife in Shrubland Habitats

Wildlife that use shrubland habitat could benefit from the creation of 864 acres of shrubland habitat through right-of-way clearing in forest and production forest, and raptors would experience a positive effect from the increase in available perches (see Table 18-3). Conversely, with 12 miles of new transmission line crossing existing shrubland habitat, wildlife would also experience some adverse effects from the project, including the alteration of 208 acres of tall shrubland, and the loss of 66 acres of existing habitat to towers, access roads, and substations (see Tables 18-3 and 18-4). Adverse effects would include temporary construction disturbance; the loss of existing habitat; the loss of some tall shrub nesting habitat for birds; potential construction mortality for less mobile species; and a possible increase in mortality caused by an increase in predation by raptors using the transmission lines and towers as perches, and by bird/transmission line collisions. Since impacts would be spread out along the corridor and affect a relatively small amount of habitat, the levels of adverse impacts would be similar to those for open habitat, including **low** impacts from loss of existing habitat and construction disturbance, and **moderate** impacts from mortality.

Wildlife in Urban/suburban habitat

Wildlife found in urban/suburban habitat would be the least affected, with just 1 mile of new transmission line crossing this habitat. The Crossover Alternative would alter 21 acres of urban/suburban habitat by right-of-way clearing and remove 4 acres of habitat for access roads (see Tables 18-3 and 18-4). Impacts to wildlife would range among those impacts listed for open, shrubland, forest, and production forest habitats, depending on which habitats might be present in any given urban/suburban area. Given the small amounts of habitat lost and the general tolerance of urban/suburban wildlife to human disturbance, impacts related to

construction and habitat loss or alteration would be **low**, while those related to an increase in mortality (such as for prey species of raptors and bird/transmission line collisions) would be **moderate**.

18.2.7.2 WDFW Priority Habitat—Crossover Alternative

This section provides the amount of WDFW priority habitats that would be altered or removed by the Crossover Alternative, and the length in miles of the transmission line in each habitat.

Riparian Areas. Along the Crossover Alternative, most impacts to WDFW priority habitat from habitat alteration or removal would be in riparian areas, with 125 acres of habitat altered by right-of-way clearing and 24 acres lost to towers, access roads, and substations (see Tables 18-5 and 18-6). Habitat loss would be a **low-to-high** impact to these WDFW priority habitats, depending on their condition. In addition, transmission line bird collisions would increase across 7 miles of riparian habitat, particularly in the northern portion of the alternative, where the transmission line would parallel an existing line (see Table 18-5). This would also be a **low-to-high** impact depending on bird use and the effectiveness of mitigation measures, since it could reduce the ability of these habitats to safely support waterfowl, waterbirds, and raptors: an essential attribute for these habitats (In the southern portion of the alternative where there would be no parallel existing line, impacts would be **low-to-moderate**).

Riparian areas may encompass other priority habitats affected by the project, including biodiversity areas and corridors, wetlands, and old-growth/mature forest.

Biodiversity Areas and Corridors. Three documented WDFW biodiversity area and corridor priority habitats would be affected by the Crossover Alternative: the East Fork Lewis River Riparian Corridor (crossed in two places at the East Fork Lewis River and a tributary to King Creek); the Camas Biodiversity Area; and the Lady and Akerman Islands Biodiversity Area and Corridor (WDFW 2012). A little less than 1 mile of this habitat would be crossed in four places by new transmission line, with 9 acres altered due to right-of-way clearing, and about 1 acre lost to a transmission tower and new access road (see Tables 18-5 and 18-6). (These are the same areas as those affected by the East Alternative) Impacts would be **high** since fragmentation would diminish one of the main attributes of these priority habitats, which is to be a “relatively undisturbed and unbroken tract of vegetation” that connects high-value habitats (WDFW 2008).

Freshwater Wetlands and Fresh Deepwater. In total, 87 acres of forested, scrub-shrub, and emergent freshwater wetlands would be removed by right-of-way clearing (forested wetlands) and/or towers, access roads, and substations (see Table 18-5 and 18-6). Thirty-five acres of scrub-shrub wetland would be altered by right-of-way clearing (see Table 18-5). Impacts to wildlife from the alteration and loss of wetlands would range from **low-to-high**, depending on the condition of each wetland. In addition, transmission line bird collisions would become more frequent over 5 total miles of all three types of freshwater wetlands (see Table 18-5). Similar to riparian areas, impacts to these WDFW priority habitats from transmission line collisions would be **low-to-high** where there would be a parallel existing line, and mostly **low-to-moderate** where there would be no parallel line.

The only impacts to fresh deepwater would be from transmission line bird collisions, which would increase across 1 mile of fresh deepwater (see Table 18-5). As for freshwater wetlands and riparian areas, impacts would be **low-to-high** where there would be a parallel line and **low-to-moderate** where there would be no parallel line.

Caves or Cave-Rich Areas. The right-of-way would pass through the edge of about 0.05 acre of a WDFW cave-rich area priority habitat in production forest (see Table 18-5). (This is the same cave-rich area affected by the East Alternative). Impacts could include permanent removal of production forest habitat surrounding a cave—which could remove some roosting habitat; the presence of a tower, transmission line, or access road; and temporary construction disturbance. These disturbances would generally have **low** impacts to this habitat given the small area of disturbance and the likelihood that actual cave habitat would not be permanently altered. Also, the effects on wildlife (such as Townsend’s big-eared bat) that rely on caves would not likely prevent them from using this cave habitat, while the addition of shrubland from right-of-way clearing could be beneficial for foraging purposes. Also, the placement of the disturbance along the edge of the cave-rich area would mean that the area would not be fragmented.

Herbaceous Bald. About 0.5 acre of an improved access road would cross the southern edge of the Larch Mountain WDFW herbaceous bald priority habitat (see Table 18-6). (This is the same herbaceous bald affected by the East Alternative). Impacts could include permanent vegetation removal from possible widening of the access road, and temporary construction disturbance such as soil compaction. These disturbances would have **low** impacts to this WDFW priority habitat given the small areas of disturbance, the placement of the disturbance along the edge of the habitats—meaning the habitat would not be fragmented—and the existing disturbed conditions from the existing access road.

Old-Growth/Mature Forest. Forty-five acres of old-growth/mature forest would be removed by right-of-way clearing and new and improved access roads (see Tables 18-5 and 18-6). Impacts to these WDFW priority habitats would be **high** since tree clearing would remove the main attributes of this habitat: long-lived trees and the associated understory vegetation, which have become uncommon in the Pacific Northwest and could not be easily or quickly replaced.

Oregon White Oak Woodlands. Two acres of the Washougal Oaks Woodland would be removed by right-of-way clearing (see Table 18-5). (This is the same Oregon white oak woodlands area affected by the East Alternative). Impacts to this WDFW priority habitat would be **high** since tree clearing would remove the main attributes of this habitat: Oregon white oak trees and the associated understory vegetation, which are becoming less common in the Pacific Northwest.

Talus. One acre of a talus field would be permanently removed by a new access road (see Table 18-6), less than 1 mile of which would be crossed by new transmission line (see Table 18-5). (This is the same talus field affected by the East Alternative). Impacts would include permanent loss of habitat, potential transmission-line collisions by raptors, and temporary construction disturbance. Impacts would be **high** due to the scarcity of this wildlife habitat, and since these areas are relatively inaccessible and more likely to be in pristine (undisturbed) condition prior to construction.

18.2.7.3 Special-Status Species—Crossover Alternative

There are 2 federally listed species and 15 other special-status species potentially affected by the Crossover Alternative. All documented occurrences are found in Washington with the exception of California floater mussel—found in the Columbia River—and western pond turtle—found in Oregon.

Federally Listed Species

Marbled Murrelet (Threatened). Although there are no documented occurrences of marbled murrelet within 1 mile of the Crossover Alternative, it would remove 377 acres of marginal habitat within the marbled murrelet conservation zone. At most only 45 acres are suitable old-growth/mature forest habitat (see Table 18-5 and 18-6), and they are outside the general range of marbled murrelet from the coast, so the available habitat would not likely be used for nesting. In addition, the old-growth/mature forest within this area primarily occurs in small patches, so any potential habitat loss would be minor in any particular area. Given the small amount of potential habitat affected, the distance from the coast, and the lack of any documented occurrences, potential habitat loss would be a **low** impact.

Northern Spotted Owl (Threatened). Right-of-way clearing, towers, substations, and access roads would remove 70 acres from a documented northern spotted owl circle. The right-of-way would also come within 1 mile of three other northern spotted owl circles that occur in mostly production forest. In addition, about 45 acres of potentially suitable old-growth/mature forest habitat would be removed by the project, although recent high resolution imagery shows most of the area along the Crossover Alternative to be of marginal habitat (BPA 2011). Impacts would include temporary construction disturbance and the loss of known and potential habitat. Mitigation measures would be used to prevent loss of a nest or mortality of young. Given that the overall potential habitat is generally low quality for northern spotted owl; a relatively small amount of known and potential habitat would be removed, with impacts spread out along the corridor; and mitigation measures would reduce construction disturbance; impacts on this species would not affect species recovery and would therefore be **moderate**.

Other Special-Status Wildlife Species — Birds

Bald Eagle (Federal SOC, WA Sensitive) and WDFW Bald Eagle Priority Areas. Bald eagle would be impacted by the project given that within 1 mile of the Crossover Alternative there are five documented occurrences of bald eagle nests and three WDFW bald eagle priority areas—the Cowlitz Bald Eagle Feeding Habitat, the Lewis River Winter Eagle Habitat, and the Yale Tailrace Foraging Area. In total, new transmission line would cross 2 miles of WDFW bald eagle priority areas, and right-of-way clearing, towers, and access roads would remove tree habitat from 31 acres. Impacts would include temporary construction disturbance and loss of potential nesting and roosting habitat through tree removal in riparian areas along the East Alternative (see 18.2.6.3, Special-Status Habitats), particularly where it occurs in a WDFW priority area. As for other raptors, transmission line collisions are typically uncommon, but could occur. Mitigation measures would be used to ensure individual nests and young are not harmed or disrupted during the breeding season, and to reduce the risks of transmission line collisions throughout the year. Impacts to this species would be **moderate** since the species is still listed as sensitive by WDFW, is monitored by USFWS following its delisting in 2010, and impacts would not be expected to contribute to a need for federal relisting of this species based on a conservation status of secure at both the state and federal levels (NatureServe 2012).

Barrow's Goldeneye (WDFW Priority). Given that the Crossover Alternative crosses wetland habitat within 1 mile of a documented occurrence of Barrow's goldeneye, there is a greater chance that individuals could be present and affected by the project (this is the same occurrence as that listed for the West Alternative). Impacts could include habitat removal, increased transmission line collisions, and temporary construction disturbance. Mitigation measures would be used to avoid harm to a nest or young during the breeding season, if necessary. Since

the conservation status is vulnerable (breeding) to secure (non-breeding) at the state level and secure at the federal level (NatureServe 2012), and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Great Blue Heron (WA Priority). Since the Crossover Alternative crosses either wetlands or riparian habitats within 1 mile of one documented occurrence of great blue heron, there is a greater chance that individuals could be present and affected by the project. Impacts would include mortality from transmission line collisions over open habitats and open water, and lost habitat due to towers and access roads placed in riparian areas and open habitat. Since the conservation status is apparently secure to secure at the state level and secure at the federal level (NatureServe 2012), impacts would not contribute to a need for federal listing and would be **moderate**.

Northern Goshawk (Federal SOC, WA Candidate). Because the Crossover Alternative crosses production forest within 1 mile of a documented occurrence of northern goshawk (also in production forest), there is a greater chance the project could affect this species. Impacts would include loss of old-growth/mature forest habitat and temporary construction disturbance, although mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if necessary. Although the conservation status of this species is imperiled-to-vulnerable in Washington (NatureServe 2012), it is listed as apparently secure at the federal level, and so the small amount of suitable mature/old-growth forest habitat affected (see Section 18.2.7.2, WDFW Priority Habitats—Crossover Alternative) would be a **moderate** impact to the species. As for other raptors, transmission line collisions are typically uncommon, the rare occurrence of mortality of an individual would not affect the overall conservation status, and impacts would be **moderate**.

Peregrine Falcon (Federal SOC, WA Sensitive). Although there is one documented occurrence of peregrine falcon in WDFW cliffs/bluffs priority habitat within 1 mile of the Crossover Alternative, the Crossover Alternative does not cross any known suitable habitat (cliffs/bluffs or caves) within 1 mile of the occurrence, indicating a decreased likelihood that peregrine falcon habitat would be affected (this is the same occurrence as along the East Alternative). However, the presence of a new transmission line in the area could increase the chance for mortality through transmission line collisions. If suitable habitat does occur along the right-of-way or access roads, additional impacts could include habitat loss from towers and access roads and temporary construction disturbance. Mitigation measures would be used to ensure individual birds are not harmed or disrupted during the breeding season, if necessary. Positive impacts could also result from the addition of new perch sites on towers and lines from which individual birds could hunt prey. Since the conservation status of this species is imperiled (breeding) to vulnerable (non-breeding) at the state level, and apparently secure at the federal level (NatureServe 2012), mortality or loss of habitat in one location would not likely contribute to a need for federal listing, and impacts would be **moderate**.

Pileated Woodpecker (WA Candidate). The Crossover Alternative crosses high-value riparian habitat within 1 mile of a documented occurrence of pileated woodpecker (the same occurrence as that listed for the West Alternative); therefore, there is a greater chance that individuals of this species could be present and affected by the project. Impacts could include habitat loss through right-of-way tree clearing, towers, and access roads, mortality through collisions with transmission lines, and temporary construction disturbance. Mitigation measures would be used to avoid harm to a nest or young during the breeding season, if necessary. Since the

conservation status is apparently secure at the state level and secure at the federal level (NatureServe 2012), and since not many individuals would likely be affected based on just one documented occurrence, impacts would not contribute to a need for federal listing and would be **moderate**.

Purple Martin (Federal SOC, WA Candidate). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

Vaux's Swift (WA Candidate). Observations of Vaux's swift in a WDFW biodiversity area and corridor priority habitat that is crossed by the Crossover Alternative indicates an increased likelihood for impacts. Impacts could include habitat loss through tree removal, temporary construction disturbance, and transmission line collisions, although collisions are not likely for this species (see Section 18.2.2, Impacts Common to Action Alternatives). Mitigation measures would be used to avoid mortality of young or loss of nests during the breeding season, if nests occur near the construction area. Since the conservation status of this species is vulnerable-to-apparently secure at the state level and secure at the federal level (NatureServe 2012), mortality or loss of habitat would not likely contribute to a need for federal listing and **moderate** impacts could occur.

Mammals

Columbian Black-Tailed Deer (WA Priority) and WDFW Columbian Black-Tailed Deer Priority Habitat. Impacts to this species would include negative impacts from the loss of 6 acres of habitat in a WDFW Columbian black-tailed deer wintering and migration priority area, and positive impacts from right-of-way clearing across 15 acres of this priority area. As for elk, impacts would be **low** since a relatively small portion of the total WDFW Columbian black-tailed deer wintering and migration priority area would be affected and the species has a secure conservation status at both state and federal levels (NatureServe 2012).

Elk (WA Priority) and WDFW Elk Priority Area. Adverse effects to elk would include temporary construction disturbance and habitat loss within the two WDFW elk winter range priority areas. Towers, substations, and access roads would remove 168 acres of habitat within the two WDFW elk priority areas. This would have a **low** impact on elk since a relatively small portion of the total WDFW elk winter range priority area would be affected, impacts would be spread out along the corridor, and the species has a secure conservation status at both state and federal levels (NatureServe 2012). Impacts from 485 acres of right-of-way clearing could be beneficial to elk since it would create a corridor of shrubland or open habitat adjacent to forested habitat.

Amphibians

Cascade Torrent Salamander (Federal SOC, WA Candidate). Given that the Crossover Alternative crosses riparian habitat within 1 mile of six documented occurrences of Cascade torrent salamander in three separate areas, there is a high likelihood that this species could be affected by the project. Impacts could include temporary construction disturbance, construction mortality or stress from both physical injury and increased water turbidity from in-water work, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Although there are a high number of occurrences near the affected area, they mainly occur in two areas. Also, the conservation status of the species is listed as vulnerable at the state and federal levels (NatureServe 2012). Given the limited distribution and conservation

status, habitat loss coupled with increased mortality would not likely contribute to a need for federal listing; impacts to this species would be **moderate**.

Cope's Giant Salamander (WA Monitor Species). Since the Crossover Alternative crosses riparian habitat within 1 mile of two documented occurrences of Cope's giant salamander, there is an increased likelihood that individuals could be present and affected by the project (this is one of the same occurrences as along the West Alternative). Impacts to a population of this species could include temporary construction disturbance, construction mortality or stress from physical injury and increased water turbidity, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Since the conservation status is vulnerable-to-apparently secure at both the state and federal levels (NatureServe 2012,) and since not many individuals would likely be affected based on just two documented occurrences, impacts would not contribute to a need for federal listing and would be **moderate**.

Rocky Mountain Tailed Frog (WA Candidate). Given that the Crossover Alternative crosses riparian habitat within 1 mile of three documented occurrences of this species, all occurring within one general area, there is a greater chance that it could be affected by the project (the same three occurrences also occur along the East Alternative). Impacts to a population of this species could include temporary construction disturbance, construction mortality, reduced reproduction or loss of young if construction takes place during the breeding season, and degradation or loss of habitat from right-of-way clearing, towers, and access roads. Although its conservation status is imperiled in the state of Washington (NatureServe 2012) and there are a relatively high number of occurrences near the affected environment, its federal conservation status is apparently secure, and so impacts would not likely contribute to a need for federal listing and would be **moderate**.

Reptiles

Western Pond Turtle (Federal SOC, WA Endangered, OR Sensitive-Critical). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives).

Invertebrates

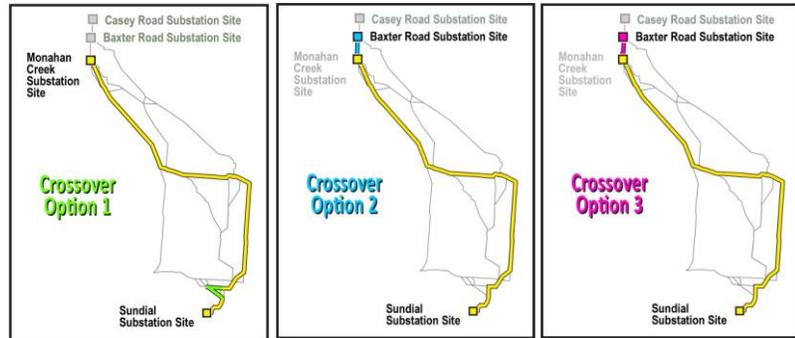
California Floater (Federal SOC, WA Candidate). (See Special-Status Species in Section 18.2.2, Impacts Common to Action Alternatives.)

18.2.7.4 Crossover Options 1, 2, and 3

The levels of the impacts to wildlife and WDFW priority habitats would be the same as for the Crossover Alternative, except where stated otherwise.

Crossover Option 1 would alter 8 additional acres of riparian habitat and remove or alter 11 additional acres total of the three freshwater wetland types (see Tables 18-5 and 18-6). For special-status species, this option would come within 1 mile of a WDFW wood duck priority area that is avoided by the Crossover Alternative. The WDFW wood duck priority area would not be crossed so impacts would be **low-to-moderate**.

Crossover Options 2 and 3 would have similar effects to each other, with Crossover Option 2 affecting slightly more acreages in each case. They would both remove fewer acres of riparian habitat (10 and 9 acres) (see Table 18-6), but alter more of this habitat



through right-of-way clearing (9 and 7 acres) (see Table 18-5). Regarding special-status species, both Crossover Options 2 and 3 would increase the amount of WDFW Roosevelt Elk Winter Range Priority Area altered by right-of-way clearing, including an additional 70 acres by Crossover Option 2 and 66 acres by Crossover Option 3.

18.2.8 Recommended Mitigation Measures

Mitigation measures included as part of the project are identified in Table 3-2. The following additional mitigation measures have been identified to further reduce or eliminate adverse wildlife impacts by the action alternatives.

- Consult with USFWS as required under the ESA to assess impacts and identify any necessary mitigation measures for marbled murrelet and northern spotted owl.
- Determine mitigation measures needed for marbled murrelet and northern spotted owl on WDNR lands or private timber company lands based on existing Habitat Conservation Plans for those lands.
- Coordinate with WDFW for all construction during winter on elk and Columbian black-tailed deer winter range to eliminate any significant interference with big game wintering.
- Gate and sign any new or existing roads to prevent human encroachment into elk and Columbian black-tailed deer wintering areas or significant migration corridors.
- Where possible, locate new towers in line with existing towers to minimize vertical separation between conductors.
- Install appropriate bird flight diverters on overhead ground wires or fiber optic line in areas at high risk for bird collisions, such as at the crossing of the Cowlitz, Coweeman, Kalama, Lewis, East Fork Lewis, and the Columbia rivers; in wetland and riparian areas with high bird use; in WDFW waterfowl concentration priority areas; in WDFW bald eagle priority areas, and where the transmission line traverses steep slopes.
- Avoid construction activities within 0.25 mile of any active nests of peregrine falcon, bald eagle, and golden eagle during the breeding season, as determined in consultation with the USFWS and WDFW.
- Gate and sign new or existing roads at appropriate locations to prevent human encroachment into areas containing significant wildlife populations or relatively undisturbed wildlife habitat.

- Time construction, operation, and maintenance activities to avoid entry into sensitive wildlife habitats, such as blue heron rookeries and wood duck nest sites during critical breeding or nesting periods, as determined in consultation with the USFWS and WDFW.
- Limit vegetation removal to only the amount required to safely construct and operate the transmission line, substations, and new and existing access roads. Remove riparian vegetation only where necessary for safe line clearance purposes.

18.2.9 Unavoidable Impacts

Construction of towers, substations, access roads, and other facilities would cause permanent loss of wildlife habitat and temporary displacement of individuals or groups, and could harm or kill individuals. An increase in avian collisions with transmission lines could occur at river crossings, and in areas with high concentrations of waterfowl and other birds.

18.2.10 No Action Alternative

The No Action Alternative would have **no** impact on wildlife because no new transmission lines, towers, or substations would be constructed. Impacts from operation and maintenance of existing lines and substations, and vegetation management activities would continue unchanged.

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