

4.9 FISH, WILDLIFE AND VEGETATION

The federal Endangered Species Act of 1973 (ESA), as amended, was enacted to protect the natural environment upon which threatened and endangered species depend. The ESA provides programs for the conservation of those species and the prevention of extinction of plants and animals. The law is administered by the USFWS and the Commerce Department's NOAA Fisheries, also known as National Marine Fisheries Service (NMFS), depending on the species. Any project using federal funds, occurring on federal lands, or obtaining a federal permit must adhere to the requirements of the ESA regarding consultation with appropriate federal agencies named above. Projects must also adhere to the requirements of the Migratory Bird Treaty Act (MBTA) which protects migratory bird populations. Therefore, as part of the Environmental Assessment, the presence of and potential impacts to fish, wildlife and vegetation were evaluated. Analysis focused on mapping and characterizing habitat, and evaluating the potential for fish, wildlife and vegetation to be present.

4.9.1 What Methods, Assumptions and Resources Were Considered in the Evaluation of Fish, Wildlife and Vegetation?

How was the Study Area Defined?

The study area (see Figure 4.9-1) is an offset of 300 feet from the potential Build Alternative footprint, and includes the vegetation communities likely to be affected. In addition, the study area includes the extent of potential downstream effects during construction and operation, as well as areas within 2.5 miles of impact pile driving (near Thorne Lane) and 0.29 miles of other construction activities, where construction noise is anticipated to occasionally exceed ambient noise or traffic noise, respectively.

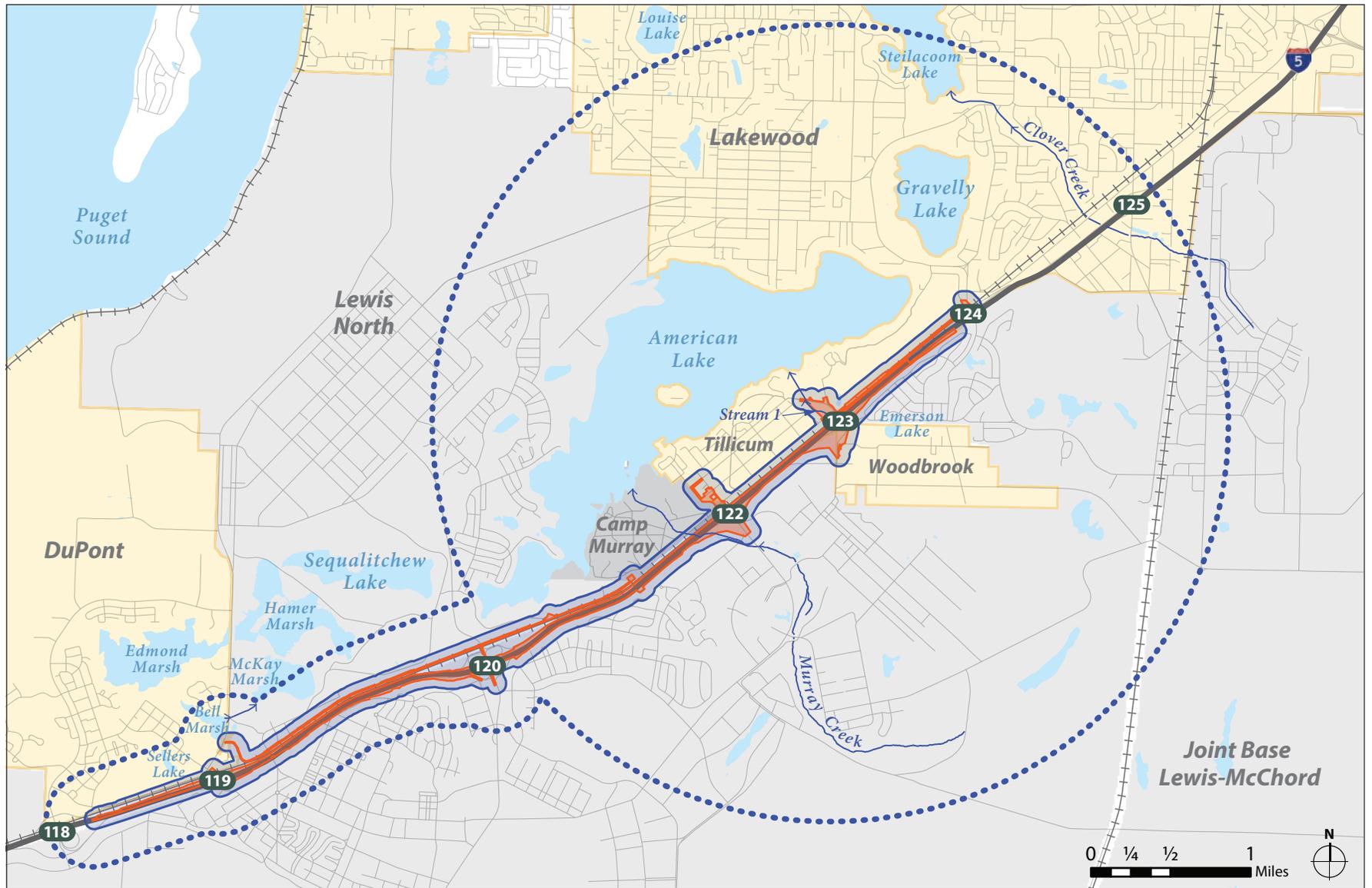
Information on fish, wildlife, and vegetation was collected using three primary methods: background research and review of available studies and agency and local government mapping resources; interviews of scientific experts at JBLM, Camp Murray, Washington Department of Fish and Wildlife, and United States Fish and Wildlife Service; and site visits in May and July 2013, November 2014, February 2015, May through September 2015, and June 2016.

NOTE TO READER: *This EA provides a tiered environmental review. Chapter 4 evaluates the project specific environmental impacts associated with construction of the North Study Area Build Alternative (See Section 3.4 for description). Chapter 5 provides a corridor level discussion of the South Study Area (See Section 3.5). Specific project footprint improvements are not currently defined for the South Study Area.*

Background Research

The following data sources were reviewed to determine the potential for fish, wildlife, and vegetation resources to occur in the study area:

- ◆ United States Fish and Wildlife Service (USFWS) – Official species list (2016a) and IPaC Trust Resource Report (2016b).
- ◆ Washington Department of Fish and Wildlife (WDFW) Species of Concern list.
- ◆ WDFW Priority Habitats and Species geospatial database.
- ◆ Joint Base Lewis-McChord (JBLM) military installation – digital geospatial information system (GIS) data on natural resources.
- ◆ Sensitive species distribution maps (Taylor's checkerspot, Oregon spotted frog, streaked horned lark, water howellia, and pocket gopher) (JBLM, 2015).



- 300 Feet from Physical Disturbance
- Extent of Construction Noise
- Build Alternative Footprint

INTERCHANGES

- 118** Center Drive interchange
- 119** Steilacoom-DuPont Road interchange
- 120** Main Gate interchange
- 122** Berkeley Street interchange
- 123** Thorne Lane interchange
- 124** Gravelly Lake Drive interchange
- 125** Bridgeport Way interchange

Figure 4.9-1
Fish, Vegetation and Wildlife
Study Area

- ◆ Washington State Department of Natural Resources (WDNR) Natural Heritage Program (NHP) – data on rare plant species.
- ◆ National Oceanic and Atmospheric Administration (NOAA) Fisheries – Endangered Species Act (ESA) status of West Coast salmon and steelhead.
- ◆ WDFW Salmon and Steelhead Stock Inventory – occurrence of threatened, endangered, and sensitive fish species.
- ◆ WDFW SalmonScape database – digital GIS data on fish presence.
- ◆ Pacific States Marine Fisheries Commission StreamNet – resident fish presence.
- ◆ National Bald Eagle Management Guidelines.
- ◆ WDFW Bald Eagle Territory History.
- ◆ Pierce County Noxious Weed List.
- ◆ Literature on fish life history and distribution from various federal sources.
- ◆ Aerial photography.

Table 4.9-1 Expert Agency Contacts

Agency	Contact	Area of Expertise
Joint Base Lewis-McChord (JBLM)	David Clouse ³	Sensitive species/habitats on JBLM
	Todd Zuchowski	Water howellia
Camp Murray	Peggy Ulman	Potential habitat on Camp Murray for pocket gopher, western gray squirrel, and Taylor's checkerspot
	Rowena Valencia-Gica	
Washington Department of Fish and Wildlife (WDFW)	Matt Vander Haegen	Western gray squirrel
	Jane Jenkerson	Marbled murrelet
	Darric Lowery	Fish use of streams
Washington State Department of Transportation (WSDOT)	Jeff Dreier	All species
	Marion Carey ²	
Washington Department of Natural Resources (WDNR)	Joseph Arnett ¹	Torrey's peavine and white-top aster
U.S. Fish and Wildlife Service (USFWS)	Ted Thomas ⁴	Taylor's checkerspot, white-top aster, water howellia, Torrey's peavine, streaked horned lark, golden paintbrush, marsh sandwort, and western gray squirrel
	Ryan McReynolds	Oregon spotted frog, and Roy Prairie pocket gopher
	Teal Waterstrat ⁵	Oregon spotted frog

Notes:

1 Arnett, 2015

2 Carey, 2015

3 Clouse, 2015

4 Thomas, 2015

5 Waterstrat, 2015

Experts

Experts were consulted in person, or by phone or email regarding their specific knowledge of potential species or suitable habitat presence in the fish, wildlife and vegetation study area. Staff from JBLM, Camp Murray, WDFW, WSDOT, WDNR, and USFWS were consulted as part of the analysis. These contacts are listed in Table 4.9-1.

Site Visits

Field investigations were limited to accessible portions of the study area. Where feasible, features were mapped or delineated after physical examination. Some areas of the I-5 mainline right of way and interchanges could not be accessed safely; those areas were reviewed from vehicles and aerial photography.

Specific tasks conducted during the site visits included:

- ◆ Mapping of vegetation communities.
- ◆ Delineation and characterization of wetlands and streams.
- ◆ Review of areas containing potentially suitable habitat for listed species.

4.9.2 What Fish, Vegetation and Wildlife Currently Exist in the Study Area?

A *Fish, Vegetation and Wildlife Discipline Report* (see Appendix B for access information) was completed in February 2016. It provides more detailed descriptions of the existing resources present in the study area. Highlights of information about existing species are included in this section.

FISH HABITAT AND PRESENCE

All waterbodies within the Build Alternative are located in Water Resource Inventory Area (WRIA) 12 – Chambers-Clover (see the Water Resources section 4.7 for additional information on WRIA's), American Lake sub-basin, Hydrologic Unit Code 171100190304 (Sequalitchew Creek-Frontal Cormorant Passage). Two freshwater streams, Murray Creek and Stream 1, are partially located in the study area. These streams ultimately drain to Puget Sound at the north end of DuPont via a constructed diversion canal exiting Sequalitchew Lake. The stream characteristics, stream types, and required buffers are summarized below in Table 4.9-2.

Table 4.9-2 Streams Within the Study Area

Stream Name	Associated Wetlands	Receiving Waterbody	Fish Presence ¹	Stream Type ²	Stream Buffer
Stream 1	1, 2, 3, and 4	American Lake	None Documented	Stream type not shown	35 feet (City of Lakewood)
Murray Creek	5, 6, 7, and 8	American Lake	Kokanee west of I-5, cutthroat on both sides of I-5; sculpin and cutthroat observed during site visit.	F	150 feet (Pierce County), 164 feet (JBLM)

Source: Interstate 5 (I-5) Joint Base Lewis-McChord (JBLM) Vicinity Congestion Relief Study Wetland and Stream Delineation Report (Shannon & Wilson, 2015)

¹ Based on Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species mapping system (WDFW, 2015a), SalmonScape mapping system (WDFW, 2015b), Murray Creek site description report (Gatchell, 2015), Fort Lewis Directorate of Public Works (2010), conversations with WDFW Habitat Biologist Darric Lowery (2015), and observation.

² Based on Washington Department of Natural Resources (WDNR) stream typing definitions (Washington Administrative Code 222-16-030).

F = Known to be used by fish or meet physical criteria to potentially be used by fish.

WILDLIFE HABITAT

The study area encompasses the I-5 corridor and the commercial and residential properties, golf course and other active recreational spaces, state and federal military bases, railroad, and parallel and perpendicular roadways. As a result, most of the habitat within the study area is a fragmented mosaic of isolated patches, primarily second-growth forest, open grassy areas, and wetlands, that are subject to high levels of noise and other human disturbance. Except for wetlands, the study area contains suitable habitat primarily for species with high tolerances for noise and human activity, or species that are attracted by some of the byproducts of development. Wildlife likely to be observed in terrestrial habitats in the study area includes, but is not limited to: birds, squirrels and other rodents, deer, raccoons, opossum, coyotes, and feral cats and dogs. Wetland habitats contain a variety of amphibian species; red-legged frog, northwestern salamander, and long-toed salamander were observed in several of the wetlands during site visits. One perennial and one seasonal stream (Stream 1 and Murray Creek) that cross the Build Alternative footprint provide limited connectivity to extensive forest, prairie and wetland habitats outside of the study area.

There are four WDFW priority habitats that occur within the study area: (a) freshwater wetlands, (b) riparian, (c) instream habitats, and (d) Oregon white oak woodlands. Freshwater wetland habitats were mapped by the WDFW Priority Habitat and Species Database (WDFW, 2015a). Two other WDFW priority habitats, riparian and instream, are not mapped in the WDFW Priority Habitat and Species Database, but are, by definition, the on-site streams and their associated wetlands and vegetation communities.

Finally, Oregon white oak is a priority habitat in stands where the canopy coverage of oak is greater than 25 percent, or in stands with less than 25 percent canopy coverage where the oak makes up at

least half of the tree canopy. In urban areas, such as the study area, a single native oak tree may be classified as priority. Oak trees and stands of oak trees provide an important source of food, cover, nest sites, and arboreal movement routes for more than 200 species of vertebrate wildlife, including species listed by the State of Washington as threatened, such as the western gray squirrel or designated for protection under the MBTA, such as the rufous hummingbird (Larsen and Morgan, 1998). Based on coarse field mapping of vegetation communities in the Build Alternative footprint, approximately 7 percent of the landscape contains native oak vegetation communities with a significant component of native oak in either remnant naturalized forest or urban forest.

WILDLIFE PRESENCE

Table 4.9-3 lists sensitive wildlife species potentially occurring within the study area. identified by the USFWS (2016a and 2016b) and WDFW (2015a) under state law, federal ESA, and the MBTA. The birds listed for consideration in Table 4.9-3 under the MBTA are those identified in the USFWS IPaC Trust Resource Report (USFWS, 2016b) as migratory Birds of Conservation Concern.

In addition to what is shown in Table 4.9-3, documented state priority bird or large mammal occurrences within 2.5 miles of construction activities are limited to bald eagle nest and foraging sites, great blue heron rookeries, and purple martin nests. The osprey is not a priority species or a Bird of Conservation Concern, but is protected by the MBTA. The nearest mapped osprey nest location is immediately adjacent to the I-5 corridor, just outside the Build Alternative footprint, approximately 0.7 miles southwest of the 41st Division Drive/Main Gate Interchange (WDFW, 2015a).

Table 4.9-3 Potential State and Federal Sensitive Wildlife Species in the Study Area

Species	Status	Potential Presence of Species or Suitable Habitat
State and Federal Threatened or Endangered Species		
Oregon spotted frog <i>Rana pretiosa</i>	FT, SE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Site evaluations and agency experts (McReynolds, 2015a and Waterstrat, 2015) indicate that the species and suitable habitat are not present in the study area.
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT, ST	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Habitat evaluation, agency experts (Jenkerson, 2015), and agency data sources indicate that the species and suitable breeding habitat are not present in the study area.
Northern spotted owl <i>Strix occidentalis caurina</i>	FT, SE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Habitat evaluation and agency data sources indicate that the species and suitable breeding habitat are not present in the study area, including within ¼ mile of the Build Alternative footprint and construction activity.
Streaked horned lark <i>Eremophila alpestris strigata</i>	FT, SE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Habitat evaluation, agency experts (Thomas, 2015), and agency data sources indicate that the species and suitable breeding habitat are not present in the study area.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	FT, SC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe According to USFWS, there have been consistent and confirmed sightings annually throughout Washington State with one occurring as recently as 2012 in Pend Orielle County (Teachout, 2013). The cuckoo selectively breeds in riparian woodlands at least 50 acres in size (USFWS, 2013), which are not present in the study area.
Canada lynx <i>Lynx canadensis</i>	FT, ST	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Habitat evaluation and agency data sources indicate that the species and its habitat are not found in the study area.
Gray wolf <i>Canis lupus</i>	PE, SE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Habitat evaluation and agency data sources indicate that the species and its habitat are not found in the study area.
Roy Prairie pocket gopher <i>Thomomys mazama glacialis</i>	FT, ST	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Maybe Surveys in larger expanses of potentially suitable habitat were conducted by USFWS-led teams in August and October, 2015. No signs of gopher activity were noted in examined areas during the surveys (McReynolds, 2015b). Gopher presence in suitable, unexamined areas cannot be determined without additional surveys, but is not expected.
Western gray squirrel <i>Sciurus griseus griseus</i>	FSC, ST	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Agency experts (Thomas, 2015 and Vander Haegen, 2015) and agency data sources indicate that the species is not documented in the study area, and is unlikely to be found near development, and more specifically unlikely within 200-300 yards of I-5.
Taylor's checkerspot <i>Euphydryas editha taylora</i>	FE, SE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Habitat evaluation, agency experts (Thomas, 2015), and agency data sources indicate that the species and suitable breeding habitat (high-quality prairie) are not present in the study area.
Mardon skipper <i>Polites mardon</i>	FSC, SE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe A small population is known to occur on JBLM on the native prairies of the Artillery Impact Area, 4 miles or more from the Build Alternative footprint (USFWS, no date). Native prairie, with an abundance of bunch grasses and nectar-producing flowers, is not found in the study area.

Notes:

*(BCC) Bird of Conservation Concern, (FC) Federal Candidate, (FE) Federal Endangered, (FSC) Federal Species of Concern, (FT) Federal Threatened, (SE) State Endangered, (ST) State Threatened, (SC) State Candidate, (SS) State Sensitive.

Table 4.9-3 Continued. Potential State and Federal Sensitive Wildlife Species in the Study Area

Species	Status	Potential Presence of Species or Suitable Habitat
Migratory Bird Treaty Act		
Bald eagle <i>Haliaeetus leucocephalus</i>	SS, BCC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Maybe Nest sites have been documented on American Lake; the closest mapped site is approximately 0.3 mile from the Build Alternative footprint. There are also numerous sightings posted on eBird in the Eagles Pride Golf Course, on MacKay Marsh, American Lake, Sellers Lake, Gravelly Lake, Sequalitchew Lake, Edmond Marsh, and in and near the Nisqually National Wildlife Refuge.
Black swift <i>Cypseloides niger</i>	BCC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Maybe Likely as fly-overs or making a brief rest or forage stop ¹ Sighting reported on eBird (May 2013) more than 2 miles west of the west end of the study area, off of Mounts Road.
Caspian tern <i>Hydroprogne caspia</i>	BCC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Likely only as fly-overs. Numerous sightings reported on eBird in and near the Nisqually National Wildlife Refuge.
Fox sparrow <i>Passerella iliaca</i>	BCC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Maybe Netted at Morse Wildlife Preserve ^{1, 2} Numerous reports on eBird in residential yards on JBLM near 41st Division Drive less than ¼ mile from the study area, in DuPont near Sellers Lake less than ¼ mile from the study area, in Eagles Pride Golf Course, and off of Mounts Road.
Olive-sided flycatcher <i>Contopus cooperi</i>	BOCC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Maybe Netted at Morse Wildlife Preserve ^{1, 2} There are also numerous sightings posted on eBird in the Eagles Pride Golf Course, on MacKay Marsh, in and near the Nisqually National Wildlife Refuge, and at various locations on JBLM.
Peregrine falcon <i>Falco peregrinus</i>	SS, FSC, BOCC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Maybe There are numerous sightings posted on eBird in the Eagles Pride Golf Course, on American Lake, and in and near the Nisqually National Wildlife Refuge.
Purple finch <i>Carpodacus purpureus</i>	BCC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Maybe Netted at Morse Wildlife Preserve ^{1, 2} There are also numerous sightings posted on eBird in the Eagles Pride Golf Course, on American Lake, in and near the Nisqually National Wildlife Refuge, and at various locations on JBLM.
Rufous hummingbird <i>Selasphorus rufus</i>	BCC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Maybe Netted at Morse Wildlife Preserve ^{1, 2} There are also numerous sightings posted on eBird in the Eagles Pride Golf Course, on MacKay Marsh, in and near the Nisqually National Wildlife Refuge, and at various locations in DuPont and on JBLM.
Short-billed dowitcher <i>Limnodromus griseus</i>	BCC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Maybe Likely only as fly-overs. Numerous sightings reported on eBird in and near the Nisqually National Wildlife Refuge.
Short-eared owl <i>Asio flammeus</i>	BCC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Maybe Likely as fly-overs or making a brief rest or forage stop. ¹

Notes:

*(BCC) Bird of Conservation Concern, (FC) Federal Candidate, (FE) Federal Endangered, (FSC) Federal Species of Concern, (FT) Federal Threatened, (SE) State Endangered, (ST) State Threatened, (SC) State Candidate, (SS) State Sensitive.

Table 4.9-3 Continued. Potential State and Federal Sensitive Wildlife Species in the Study Area

Species	Status	Potential Presence of Species or Suitable Habitat	
Vesper sparrow <i>Pooecetes gramineus ssp. affinis</i>	BCC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Maybe	Sightings reported on eBird "on the prairie/Ponderosa edge at Ft. Lewis", "vagrant possibly migrating to breeding grounds further north" at a JBLM prairie restoration site.
Willow flycatcher <i>Empidonax traillii</i>	BCC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Maybe	Netted at Morse Wildlife Preserve ^{1, 2} There are also numerous sightings posted on eBird in the Eagles Pride Golf Course, on American Lake, on MacKay Marsh, in and near the Nisqually National Wildlife Refuge, and at various locations on JBLM.

Notes:

*(BCC) Bird of Conservation Concern, (FC) Federal Candidate, (FE) Federal Endangered, (FSC) Federal Species of Concern, (FT) Federal Threatened, (SE) State Endangered, (ST) State Threatened, (SC) State Candidate, (SS) State Sensitive.

1 Avia Environmental (Suzanne Tomassi, MSc., CWB), pers. comm., October 14, 2015.

2 Morse Wildlife Preserve is approximately 12 miles southeast of the study area, and is a Monitoring Avian Productivity and Survivorship bird banding site.

USFWS = United States Fish and Wildlife Service

3 Teachout, Emily, 2013, Yellow-billed cuckoo presence or absence information in Washington State: Personal communication between Emily Teachout, USFWS service and P. Johnson, Shannon and Wilson Inc., Seattle, WA November 12.

4 USFWS 2013, Engendered and threatened wildlife and plants: Proposed threated status for the western distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*). 78FR 61621-61666, October 3.

Table 4.9-4 Distribution of Land Cover Within the Build Alternative Footprint

Land Cover Type	Acres of Disturbance	Percent of Disturbance
Unvegetated (pavement, dirt, gravel, etc.)	84.29	56.67
Lawn	0.86	0.58
Grass (not lawn)	19.85	13.35
Shrubs (native)	1.96	1.32
Shrubs (invasive)	9.66	6.49
Urban Forest	6.22	4.18
Remnant/Naturalized Forest		
Conifer-dominated	12.24	8.23
Oak Community	10.93	7.35
Riparian/Wetlands	2.72	1.83
TOTAL	148.73	100

Note: Based on Interstate 5 Joint Base Lewis-McChord Vicinity Congestion Relief Study Land Cover Map Folio (Shannon & Wilson, 2016)

Table 4.9-5 Listed or Priority Plant Species Potentially in the Build Alternative Footprint

Species	Status*	Suitable Habitat in Project's Potential Disturbance Footprint	Known Presence in Project's Potential Disturbance Footprint
Golden paintbrush, <i>Castilleja levisecta</i>	FT, SE	No	No
Marsh sandwort, <i>Arenaria paludicola</i>	FE, X	No	No
Water howellia, <i>Howellia aquatilis</i>	FT, ST	Yes, Marginal	No
Torrey's peavine, <i>Lathyrus torreyi</i>	FSC, ST	Yes, Marginal	No
White-top aster, <i>Aster curtus</i>	FSC, SS	Yes, Marginal	No

Notes: *(FC) Federal Candidate, (FE) Federal Endangered, (FSC) Federal Species of Concern, (FT) Federal Threatened, (SC) State Candidate, (SE) State Endangered, (SS) State Sensitive, (ST) State Threatened, and (X) possibly extinct or extirpated from Washington

WETLAND HABITAT

Fourteen wetlands were identified along I-5 between Mounts Road and Gravelly Lake Drive interchanges. Wetlands are addressed in Section 4.8 of this Environmental Assessment.

VEGETATION

The existing land cover within the Build Alternative footprint was identified and mapped based on aerial photo interpretation, supplemented with reconnaissance-level surveys (Table 4.9-4). The land cover types are divided into unvegetated (pavement and other impervious surfaces) and six vegetation communities that represent habitat types or qualities. The communities are differentiated primarily by degree of habitat structure and the presence of native plant species. More than half of the Build Alternative's footprint is developed with pavement and structures, lawn, and other maintained landscapes (Table 4.9-4). However, there are patches of forest that have experienced some alteration, but also resemble historic communities in their primary species composition.

LISTED AND PRIORITY SPECIES IN STUDY AREA

Table 4.9-5 shows listed or priority plant species identified by the USFWS (2016a and 2016b) or WDNR (2015) as potentially occurring within the Build Alternative footprint.

There are no federally-listed fish or amphibians, or suitable habitat, in the study area. The potential for listed mammals (Roy Prairie pocket gopher) and listed or priority plants (water howellia, white-top aster, Torrey's peavine) to be in the Build Alternative's footprint is low, but still feasible. A Biological Assessment (BA) has been prepared for the Build Alternative to assess impacts on listed species and their habitat.

4.9.3 What Would Be the Impact of the No Build Alternative?

No permanent direct, indirect, temporary or cumulative effects to fish, wildlife, or vegetation would result from the No Build Alternative. Only transportation projects that are already planned or funded (as described in Chapter 3) would occur if the No Build Alternative is selected.

4.9.4 What Would Be the Long-Term Impact of the Build Alternative?

Long-term impacts of the Build Alternative include: conversion of land cover from potential habitat area such as forested areas to pavement, other impervious area, or grass; potential water quality impacts; and fill or tree removal within stream or wetland buffers.

Land Cover Conversion

As discussed in Section 4.9.2, habitat for several listed or priority plants and a small mammal species could be located in the Build Alternative's footprint. The potential nature and extent of adverse permanent impacts to those species or their habitats is described in Table 4.9-6, which summarizes the anticipated alterations to existing land cover within the Build Alternative's footprint.

Water Quality Impacts

The Build Alternative could have adverse effects on water quality and aquatic life if construction-related stormwater runoff were allowed to reach stream and wetland systems without proper control and treatment. A project-specific Stormwater Pollution Prevention Plan (SWPPP) and accompanying Temporary Erosion and Sediment Control (TESC) plan would be prepared and implemented prior to beginning

Table 4.9-6 Permanent Alteration of Land Cover (Acres) in the Build Alternative Footprint

Existing Land Cover Category	Permanent Conversion to:			Total Acres of Conversion
	Pavement/Other Impervious	Grass (Not Lawn)	Shaded/Tree Removal	
Lawn	0.49	0	0	0.49
Grass (not lawn)	10.63	0	0.44	11.07
Shrubs (native)	0.76	0.05	0	0.81
Shrubs (invasive)	4.02	1.86	0.31	6.19
Urban Forest	3.45	0.94	0.04	4.43
Remnant Naturalized Forest				
Conifer-dominated	3.28	2.15	0.48	5.91
Oak Community	5.62	2.03	0	7.65
Riparian/Wetland	1.12	0.02	0.89	2.03
TOTAL	29.38	7.05	2.16	38.59

earthwork under the Build Alternative's National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit. It is anticipated that the sediment and flow control Best Management Practices (BMPs) described in the TESC and SWPPP would minimize the potential for water quality impacts to wetland and stream resources within the study area.

To the extent feasible, the Build Alternative would use low impact development BMPs to capture runoff at least equivalent to the area of new pollution-generating impervious surface, consistent with the design standards in the *Highway Runoff Manual* (WSDOT, 2014). As noted in Osborn Consulting Incorporated's *Preliminary Stormwater Management Memorandum* (2016), the currently anticipated flow control and runoff treatment measures for the Build Alternative would meet or exceed the minimum requirements.

Fill or Tree Removal

Table 4.9-7 quantifies the types of permanent impacts (direct fill or tree removal and indirect shading) to streams and their buffers, which are generally found within the Remnant Naturalized Forest vegetation community. Murray Creek, Stream 1, and their stream buffers are encompassed by the wetlands and the wetland buffers, so they are not separately calculated. See Table 4.8-2 and Table 4.8-3 for additional information about the type and magnitude of wetland and wetland buffer impacts.

Based on the current information available, the Build Alternative would restore as many of the disturbed areas to an equivalent or better condition over time consistent with the *Roadside Policy Manual* (WSDOT, 2015b). Permanent impacts to the vegetation communities within the Build Alternative's footprint would eliminate some

Table 4.9-7 Potential Permanent Wetland/Stream and Wetland/Stream Buffer Impacts in the Build Alternative Footprint

Wetland	Permanent Wetland Impacts		Permanent Buffer Impacts	
	Acre	Type	Acre	Type
Wetland 1/ Stream 1	0.29	Shading/Tree Removal ¹	0.29	Shading/Tree Removal
	0.04	Fill	0.38	Fill
Wetland 2/ Stream 1	0.06	Shading/Tree Removal	0.17	Shading/Tree Removal
	0.03	Fill	0.01	Fill
Wetland 3/ Stream 1	0	--	0.27	Shading/Tree Removal
			0.04	Fill
Wetland 5/ Murray Creek	0.04	Shading/Tree Removal	0.17	Shading/Tree Removal
	0	--	0.53	Fill
Wetland 6/ Murray Creek	0	--	0.07	Fill
Wetland 12	0	--	0.07	Fill
TOTAL	0.46	--	2.00	--

¹ Per Washington State Department of Transportation (WSDOT) (2008), shading is a permanent, indirect impact. WSDOT standards require that trees beneath bridges and overpasses be removed.

potentially suitable, although marginal, habitat for water howellia, white-top aster, Torrey's peavine, and Roy Prairie pocket gopher. Based on the existing conditions, opinions of agency experts, and lack of observations during surveys, these species are not likely to be found in the Build Alternative footprint.

Operational Impacts

No additional negative effects on fish, vegetation, or wildlife habitat are expected during operation of the completed Build Alternative. Vegetated areas located within the right of way and presently subject to routine maintenance activities would likely continue to be affected by these practices and conditions. Some of the vegetated areas that would be impacted during construction of the Build Alternative

would be included in routine future vegetation maintenance to meet safety and operation standards as set forth by WSDOT.

4.9.5 What Would Be the Short-Term or Construction Impact of the Build Alternative?

Land Cover Conversion and Fill and Tree Removal

The Build Alternative would also have temporary, short-term impacts to land cover and fill or tree removal. Table 4.9-8 and Table 4.9-9 summarize the anticipated alterations related to land cover and fill or tree removal. Additionally, there would be temporary impacts related to noise.

What Is the Effect of Noise?

Based on quantitative noise analysis using the methodology in the *Biological Assessment Preparation for Transportation Projects Advance Training Manual* (WSDOT, 2015a), areas within 2.5 miles of construction activity at the Thorne Lane interchange that includes an impact hammer, and within 0.29 mile from construction activities in the remainder of the area, are where construction noise is anticipated to occasionally exceed ambient noise or traffic noise, respectively. The species vulnerable to adverse effects from noise are generally birds and larger mammals.

As indicated in Section 4.9.2, there are no federally-listed bird or large mammal species documented or expected to be found within 2.5 miles of construction activity. Documented state priority bird or large mammal occurrences within 2.5 miles of construction activities are limited to bald eagle nests and foraging sites, great blue heron rookeries, and purple martin nests. However, all of the known locations of these species are outside of state or federal recommended management buffers. As mentioned earlier, an osprey nest is located just outside the Build Alternative footprint.

Table 4.9-8 Temporary Alteration of Land Cover (Acres) in the Build Alternative Footprint

Existing Land Cover Category	Build Alternative Footprint	Temporarily Impacted/ Restored
Lawn	0.86	0.34
Grass (not lawn)	19.85	8.78
Shrubs (native)	1.96	1.15
Shrubs (invasive)	9.66	3.47
Urban Forest	6.22	1.79
Remnant/Naturalized Forest		
Conifer-dominated	12.24	6.34
Oak Community	10.93	3.27
Riparian/Wetlands	2.72	0.62
TOTAL	64.44	25.76

Table 4.9-9 Temporary Wetland/Stream and Wetland/Stream Buffer Impacts in the Build Alternative Footprint

Wetland	Temporary Wetland Impacts		Temporary Buffer Impacts	
	Acre	Type	Acre	Type
Wetland 1/ Stream 1	0.12	Clearing	0.24	Clearing
Wetland 2/ Stream 1	0.02	Clearing	0.03	Clearing
Wetland 3/ Stream 1	0	--	0.02	Clearing
Wetland 5/ Murray Creek	0.02	Clearing	0.16	Clearing
Wetland 6/ Murray Creek	0	--	0.05	Clearing
Wetland 12	0	--	0.05	Clearing
TOTAL	0.16		0.55	

4.9.6 How Can Impacts of the Build Alternative Be Minimized or Mitigated?

The following measures for the Build Alternative focus on minimization of potential construction effects:

- ◆ Construction effects would be confined to the minimum area necessary to complete the Build Alternative and clearing limits would be clearly marked by staking done by the contractor's surveyor. Areas of landscape or vegetative preservation would be protected with construction fencing.
- ◆ Removal of native vegetation would be minimized to the greatest extent possible.
- ◆ To the extent practicable, the alignment of the shared use path would be modified as needed to avoid native tree removal.
- ◆ A TESC Plan and SWPPP would be developed and implemented. The BMPs in the plans would be used to control sediments from all vegetation- or ground-disturbing activities.
- ◆ When feasible, contractor staging areas would be at least 300 feet from any jurisdictional wetland, stream, river, or drainage, unless site-specific review indicates that no effects to the sensitive resource areas would occur due to topography or other factors.
- ◆ Additional surveys for the Roy Prairie pocket gopher, water howellia, Torrey's peavine, and white-top aster should be completed prior to construction in potentially suitable habitat areas. If found, appropriate state or federal natural resource agencies should be contacted and plans should be modified, as feasible, to avoid any identified locations of these species. Where avoidance is not feasible, coordination with natural resources agencies to relocate or salvage the species should occur.

- ◆ To the extent practicable, construction activities around the osprey nest should be timed to avoid the breeding season.
- ◆ Any work below the Ordinary High Water Mark (OHWM) should be timed to occur during the summer dry season "in the dry."
- ◆ Based on the current information available, the Build Alternative would restore as many of the temporarily disturbed areas to an equivalent or better condition over time consistent with the *Roadside Policy Manual* (WSDOT, 2015b). Impacts to wetlands and wetland buffers would be mitigated as described in Section 4.8 of this Environmental Assessment.

4.9.7 Would There Be Any Unavoidable Adverse Impacts from the Build Alternative?

The Build Alternative would not have any adverse effects on fish, wildlife and vegetation that could not be mitigated.