

3.4 Wildlife, Fish, and Threatened and Endangered Species

The Tier I Environmental Impact Statement (EIS) analysis described urban areas, agricultural lands, grasslands, scrub lands, coniferous and deciduous forests, wetlands, and riparian corridors in the study area. It identified the major potential impacts to fish and wildlife as terrestrial habitat loss, water quality and aquatic habitat degradation, and disturbance from noise and activity during the construction process.

Relative impacts of roadway construction and operation can be assessed by rating the importance of the species and habitat affected. For this analysis, an interchange option is rated based on whether it adversely affects a threatened or endangered species; the area of aquatic and riparian habitat affected, whether priority species occur in this habitat; and whether mitigation occurs for the affected habitat.

This section describes the existing fish, wildlife, vegetation, and aquatic habitat in the study area. Impacts of construction and operation to these resources are quantified and a screening criteria analysis provides a quantitative means of measuring the relative impacts for each interchange option. Regulations that would likely affect construction of the project are listed along with required permits. Finally, the chapter discusses mitigation opportunities and possibilities, both those already implemented at earlier stages and those proposed for future consideration.

Additional analysis was conducted to determine potential project related impacts to migratory birds per the Migratory Bird Treaty Act (16 U.S.C. 703-711) (MBTA). The MBTA is a federal regulation managed by the U.S. Fish and Wildlife Service (USFWS) to conserve migratory bird populations and their habitats.

3.4.1 Studies Performed and Coordination Conducted

This section incorporates information compiled in the *Fish and Wildlife Discipline Report* (DEA and WSDOT 2005) and other sources.

Information from the USFWS, the Washington Department of Fish and Wildlife (WDFW), and the Washington Department of Natural Resources was used to determine if any state or federally listed proposed, threatened, or endangered animal or plant species are located in the project area. The NOAA National Marine Fisheries Services (NOAA Fisheries) provided information on Threatened and Endangered (T&E) anadromous fish species. The Puyallup Tribe was contacted to obtain information on tribal fisheries. Contacts with local experts and interpretation of aerial photography of the project area were used to identify potential habitat areas and land use as it relates to fish and wildlife habitat. Site inspections were conducted to verify the aerial photo interpretation.

Wetlands within the project area were identified and further evaluated through intensive field studies. These studies are documented in the *Wetlands Discipline Report* (WSDOT and CH2M HILL 2005) and Section 3.3 of this document.

Riparian communities were identified using National Wetland Inventory maps, United States Geological Survey (USGS) topographic quadrangle maps, aerial photographs, and field reviews of the project area.

Analysis of agency information, along with previous technical studies completed in this area, agency reports, natural resource inventories, and resource maps, allowed for an assessment of resources that could be affected by the proposed project.

Potential impacts of the Build Alternative to wildlife and habitats within the State Route (SR) 167 corridor were assessed primarily by determining the amount and characteristics of impacted habitat under the Build Alternative. The amount of habitat that would be temporarily and permanently disturbed and/or removed was estimated within the study corridor.

In accordance with the Endangered Species Act (ESA), WSDOT prepared a Biological Assessment (BA) on behalf of the Federal Highway Administration (FHWA) for submittal to the USFWS and the NOAA Fisheries. The BA provides a detailed evaluation of all federally listed species and critical habitat potentially impacted by the project.

The study area consists of a corridor centered on the project alignment. This corridor extends approximately 200-600 feet on either side of the proposed roadway centerline. Project area boundaries were determined from the preliminary design work and minor changes during final design may be necessary to support the build alternative.

Continuing consultations will result in a Biological Opinion (BO) that describes conservation and performance measures to protect ESA-listed fish and wildlife. Terms and conditions from the BO will be incorporated into the Tier II Record of Decision.

Migratory Birds

The study area for migratory birds encompasses habitat types within one mile of the project area because migratory birds often travel extended distances between nesting and wintering habitats, and briefly occupy diverse habitat types along their migration route. Others nest, winter, or forage in specific habitat types.

The potential occurrence of migratory birds in the MBTA study area was based on documented sightings and inferences based on existing habitats within 1 mile of the project area. Aerial photographs and WDFW Priority Habitat and Species (PHS) maps were evaluated to determine habitat types within the MBTA study area. Based on the review of existing information, habitats within the MBTA study area include marine/estuarine habitats (portions of Commencement Bay), rivers and streams (Puyallup River, Wapato Creek, Hylebos Creek, and Surprise Lake Drain), riparian habitat, wetlands, and conifer-hardwood forest, agricultural land, grass fields, and urban lands.

The documented occurrence of nesting species was ascertained by reviewing Smith et al. (1997). Project specific WDFW PHS maps were also reviewed for documented occurrences of priority species (WDFW, 2004). Potential species

occurrence was determined by first listing habitat types in the MBTA study area, and then comparing these with the habitat types defined by Johnson and O'Neil (2001). All species described by Johnson and O'Neil as using specific habitat types in the MBTA study area were then listed as potentially occurring in the MBTA study area based on the availability of suitable habitat. Appendix B of the *Wildlife, Fish, and Threatened and Endangered Species Discipline Report* (DEA and WSDOT 2005) includes the complete MBTA analysis and lists all documented and potential migratory bird species that could occur and type of use (feeding or breeding) in the study area.

Potential direct impacts to migratory birds resulting from habitat loss, fragmentation, and disturbance from proposed construction were assessed. These impacts are segmented into construction impacts and operational impacts. For the MBTA analysis, the loss of habitat was quantified by overlaying the proposed alignment over a base map. Existing habitat types on the base map were identified as either developed (residential/commercial/industrial), not developed (grass fields/shrub areas/forest), or agricultural. Aerial photographs were also used to identify habitat types in the MBTA study area.

3.4.2 Affected Environment

The study area (Figures 3.4-1 through 3.4-11) consists of semi-rural agricultural land, forested and shrub upland, wetlands, riparian corridors, and intensively developed land. The Puyallup River is located in the southern portion and is channelized in a generally east-west configuration. Wapato and Hylebos Creeks also occur in the project corridor along with other smaller drainages (see Section 3.2, Water Resources). The following sections provide additional information on wildlife, wildlife habitat, fisheries, and vegetation in the study area. The study area is composed of a mixture of land uses including agriculture, roadway infrastructure, single-family residences, and commercial development.

Wildlife species composition in the study area varies with habitat type, location, and level of disturbance. The project vicinity encompasses several major habitat types: (1) developed areas (including developed residential, commercial, and industrial areas); (2) agricultural lands; (3) grass/shrub lands (4) forested areas, and (5) freshwater and riparian wetlands. The *Wildlife, Fish, and Threatened and Endangered Species Discipline Report* (DEA and WSDOT 2005) contains a complete list of wildlife species that may occur in the project vicinity.

In order to associate migratory bird use with existing habitat elements, the MBTA study area was segmented into eight habitat types as defined by Johnson and O'Neil (2001). These habitat types are described in detail in Appendix B of the *Wildlife, Fish, and Threatened and Endangered Species Discipline Report* (DEA and WSDOT 2005) and are identified as follows:

- Herbaceous Wetlands
- Westside Lowlands Conifer-Hardwood Forest
- Open water: Lakes, Rivers, and Streams

- Marine: Bays and Estuaries
- Agriculture Pastures and Mixed Environments (at pasture margins)
- Westside Riparian Wetlands
- Urban and Mixed Environments (infrastructure, landscaping, maintained right-of-way [ROW])
- Westside Grasslands

Wildlife and Wildlife Habitat

Urban areas within the project study area provide a mosaic of pavement, buildings, maintained landscaped areas, and unmaintained shrub and grasslands that are inhabited by a variety of birds and small mammals. Common bird species occurring in this habitat type are disturbance tolerant species such as ring-billed gull (*Larus delawarensis*), American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), American crow (*Corvus corax*), violet-green swallow (*Tachycineta thalassina*), mallard (*Anas platyrhynchos*), and Canada goose (*Branta canadensis*). Mammal species expected to occur in urban lands in the project area include opossum (*Didelphis marsupialis*), raccoon (*Procyon lotor*), eastern gray squirrel (*Sciurus carolinensis*), deer mouse (*Peromyscus maniculatus*), eastern cottontail (*Sylvilagus floridanus*), striped skunk (*Mephitis mephitis*) and bats (*Myotis* spp.). Larger mammals, including black-tailed deer (*Odocoileus hemionis columbianus*) and coyote (*Canis latrans*), may occasionally be found in the study area in these habitats.

The developed habitats in the project study corridor amount to approximately 441 acres. This acreage is located primarily between SR 509 and SR 5, in the rapidly developing Fife area to the southeast of SR 5 and in the Valley Avenue/Freeman Road intersection area. For the purposes of this study, existing roadways such as SR 509 and I-5 are considered as developed habitats because wildlife species are generally not expected to use paved portions of roadways except occasionally as a source of food (carrion) or grit. Developed areas often include other habitat types such as agricultural lands and wetlands. These are generally small and disconnected from other suitable habitats, which limits their use, especially by species that prefer contiguous vegetated cover to travel between habitat blocks.

Agricultural lands, which include pastures, hayfields, and croplands, provide habitat for species living in more open environments such as California quail (*Callipepla californica*), ring-necked pheasant (*Phasianus colchicus*), white-crowned sparrow (*Zonotrichia leucophrys*), chipping sparrow (*Spizella passerina*), European starling, Canada goose, blackbirds, gulls, crows, and predators such as red tailed hawk (*Buteo jamaicensis*) and barn owl (*Tyto alba*). Mammal species expected to occur in these areas include coyote, opossum, striped skunk, eastern cottontail, meadow mouse (*Microtus* spp.), and shrew (*Sorex* spp.). Deer are expected to use agricultural lands adjacent to forested

areas. Wildlife use of these habitats varies by season, for example, waterfowl occupy flooded pastures and croplands in the wintertime.

Grasslands, shrub lands, and abandoned agricultural fields in the project area provide habitat for many small mammals and passerine birds. Bird species expected to occur in these habitats include most of those found on agricultural lands, as well as American goldfinch (*Carduelis tristis*), common bushtit (*Psaltriparus minimus*), black-capped chickadee (*Parus atricapillus*), chestnut-backed chickadee (*P. rufescens*), spotted towhee (*Pipilo erythrophthalmus*), Bewick's wren (*Thryomanes bewickii*), winter wren (*Troglodytes troglodytes*), and various warblers (*Dendroica* spp.) and flycatchers (*Epidonax* spp.). This category of habitat is the most variable. Fields that appear abandoned may temporarily be fallow between crop rotations. Abandoned fields and shrub lands are also often precursors to development. Many small blocks of habitat (less than one acre) that could be considered in this category are located within, and included in, the developed habitats acreage.

A few small sized upland forest habitats are located in the project area. A diverse group of both breeding and year-round resident birds are expected to be present in this habitat. Appendix B of the *Wildlife, Fish, and Threatened and Endangered Species Discipline Report* includes the complete MBTA analysis and lists all documented and potential migratory bird species that could occur and type of use (feeding or breeding) in the study area (DEA and WSDOT 2005).

The primary species anticipated to occur include black-capped chickadee, dark-eyed junco (*Junco hyemalis*), song sparrow (*Melospiza melodia*), golden-crowned kinglet (*Regulus satrapa*), American robin, house finch (*Carpodacus mexicanus*), pine siskin (*Carduelis pinus*), winter wren, house wren (*T. aedon*), Bewick's wren, northern flicker, American crow, and red-tailed hawk. Spring-summer residents are expected to include numerous species of warblers, vireos (*Vireo* spp.), thrushes, especially the varied thrush (*Ixoreus naevius*), flycatchers, rufous (*Selasphorus rufus*) and Anna's (*Calypte anna*) hummingbirds, violet-green and tree (*T. bicolor*) swallows, and finches (*Carpodacus* spp.). Mammals expected to occur in this habitat include deer, raccoon, and opossum. The forest leaf litter and ground cover provide good foraging habitat for omnivorous and insectivorous small mammals. These areas are expected to support long-tailed weasels (*Mustela frenata*), deer mice, voles (*Microtus* spp.), and other small mammals such as Townsend's chipmunk (*Eutamias townsendii*).

The three forested areas within the study area include a small deciduous forest located just east of 54th Avenue East, a plantation cottonwood stand in the middle of the corridor, and a deciduous forested stand located north of the Puyallup River near the terminus of the corridor.

Wetlands and riparian corridors typically have greater wildlife use than upland habitats. Mammals, including red fox (*Vulpes vulpes*) and coyote, may use the riparian corridors for foraging and travel. Many species of passerine birds use riparian areas for feeding, resting, and nesting. Resident waterfowl species, including mallard, wood duck (*Aix sponsa*), and Canada goose, are expected to use the rivers, streams and associated wetlands in the project area for nesting and brood-rearing in summer and as wintering grounds during the remainder of the

year. Amphibians, including Pacific tree frog (*Hyla regilla*), red-legged frog (*Rana aurora*), and northwestern salamander (*Ambystoma gracile*) also use the wetlands. Details on the wetlands in the corridor can be found in the *Wetlands Discipline Report* (WSDOT and CH2M HILL 2005) and Section 3.3 of this document. Riparian corridors adjacent to aquatic systems are extremely narrow and limited in the study corridor, and make up approximately five acres. Development and agricultural activities often abut the creeks leaving little to no buffer.

Open water lake, river, and stream habitats were included in the extended MBTA study area. This incorporates sections of Wapato and Hylebos creeks, and the Puyallup River. Appendix B of the *Wildlife, Fish, and Threatened and Endangered Species Discipline Report* lists all migratory birds that can potentially use open water habitats in the study area for feeding, breeding, or both (DEA and WSDOT 2005). Common species associated with open water habitats include waterfowl such as western grebes (*Aechmophorus occidentalis*), spotted sandpiper (*Acititis macularia*), violet-green swallow, double-crested cormorant (*Phalacrocorax auritus*), common loon (*Gavia immer*), kingfisher (*Ceryle alcyon*), great blue heron (*Ardea herodias*), and ring-billed gulls. Additionally, river otter (*Lontra canadensis*) and western pearlshell mussels (*Margaritifera falcata*) can occur in these habitats.

Marine bay and estuarine habitats were included in the extended MBTA study area. This incorporates Port of Tacoma waterways associated with Commencement Bay. Species associated with marine habitats are similar to those mentioned for open water habitats. The USFWS, the WDFW PHS Program, and the Washington Natural Heritage Program maintain records of sensitive, threatened, and endangered species occurring in the state. No such species were observed on the site during field investigations conducted on November 24, 2003; March 15 and 16, 2004; and April 13, 2004; but the possibility of them occurring still exists.

Wintering bald eagles (*Haliaeetus leucocephalus*) (a state and federal threatened species) may occur in the project vicinity from October 31 to March 31. Wintering eagles forage along the Puyallup River in low numbers and Hylebos Creek may provide some foraging opportunity. Within the project area, the Puyallup River is located within a rapidly developing zone and receives heavy exposure to traffic, fishermen and other urban related activities. Eagles accustomed to noise and human activities are likely to forage along this portion of the river. Due to the project duration (up to 13 years) the extended exposure of foraging eagles to project-related disturbance is expected to result in additional acclimation.

The spotted frog (*R. pretiosa*), a USFWS candidate species, may occur in the vicinity. However, spotted frogs have been virtually eliminated from the Puget Sound lowlands likely due to wetland destruction and the introduction of non-native species. There are no wetlands in the project area that provide suitable permanent open water habitat for spotted frogs. Spotted frogs prefer ponds, lakes, slough-like streams, and springs.

Special Federal Status Migratory Birds

The MBTA was originally created in 1916 to stop the “indiscriminate slaughter” by market hunters targeting birds that migrate between the United States and Canada. The MBTA specifies that no one may take, possess, import, export, transport, sell, purchase, or barter, any migratory bird, or parts including nests and eggs unless authorized by a valid permit.

The MBTA includes 861 protected species. The MBTA list has been refined for the MBTA study area and is presented in its entirety in Appendix B of the *Wildlife, Fish, and Threatened and Endangered Species Discipline Report* (DEA and WSDOT 2005). Based on the analysis of existing information on species distribution and occurrence, and habitat preference and availability in the study area, up to 211 species of birds could potentially occur in the vicinity of the proposed project. Occurrence includes nesting, foraging, wintering, and seasonal migration throughout the study area. Some migratory birds protected under the MBTA are also listed as either endangered, threatened, proposed, candidate, or species of concern by the USFWS. Species with dual listings that could occur in Western Washington are described below.

Endangered Species

Migratory birds listed as an endangered species by the USFWS that could occur in western Washington include the brown pelican (*Pelecanus occidentalis*) and short-tailed albatross (*Phoebastria albatrus*). Because neither of these species or their habitat occurs in the MBTA study area, no further analysis is warranted.

Threatened Species

Migratory birds listed as threatened by the USFWS that could occur in western Washington include the bald eagle, marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), and western snowy plover (*Charadrius alexandrinus nivosus*). Neither the northern spotted owl nor western snowy plover are expected to occur in the MBTA study area. Therefore, they will not be further analyzed.

Bald Eagle

Bald eagles are commonly observed along salt and freshwater bodies of Puget Sound. They typically nest in the largest Douglas-fir (*Pseudotsuga menziesii*) or black cottonwood (*Populus balsamifera*) trees within a stand, often near a water source that supports potential prey. Three nest sites are located over 1 mile from the project area. Although nesting habitat is generally lacking in the project area, the MBTA study area does contain suitable nesting trees. The Puyallup River and Puget Sound provide a potential feeding and migration corridor. Foraging activities and over flights can be expected to occur in the MBTA study area.

Marbled Murrelet

The marbled murrelet is a small seabird that utilizes the near shore marine environment for foraging. Nesting habitat is typically associated with low elevation and mature or old growth trees. They are known to forage in South Puget Sound and possible breeding evidence has been recorded in eastern Pierce County. Only marginally suitable foraging habitat is present in Commencement

Bay, because it is largely developed in the study area and disturbance levels are high. Therefore, murrelets are not expected to forage in marine waters within the MBTA study area. Marbled murrelets could utilize portions of the MBTA study area as a travel corridor between suitable nesting habitat in the Cascade foothills and foraging habitat in Puget Sound. However, no suitable nesting habitat currently exists in the MBTA study area.

Proposed Species

No bird currently proposed by the USFWS for listing as either threatened or endangered occur in the MBTA study area.

Candidate Species

Migratory birds listed as a candidate species by the USFWS that could occur in western Washington include the streaked horned lark (*Eremophila alpestris strigata*) and yellow-billed cuckoo (*Coccyzus americanus*). Yellow-billed cuckoos are not expected to occur in the MBTA study area as they are believed to extirpated from western Washington. Therefore, they won't be analyzed further.

Streaked Horned Lark

The streaked horned lark is a very local and rare breeder in Washington State. Breeding habitat is referred to as remnant grasslands in prairie habitat and beaches. The only documented nesting occurrence in Pierce County is limited to Fort Lewis/McChord Air Force Base. However, other sightings have occurred in Pierce County (McKenna), but nesting status outside the remnant prairie habitat on Fort Lewis and McChord Air Force Base is uncertain. The lack of remnant prairie habitat in the MBTA study area suggests nesting is unlikely. Migrants traveling between suitable nesting habitat and wintering habitat could occasionally be present in the MBTA study area.

Species of Concern

Migratory birds listed as a species of concern by the USFWS that could occur in western Washington include the Aleutian Canada goose (*B. canadensis leucopareia*), Cassin's auklet (*Ptychoramphus aleuticus*), Northern goshawk (*Accipiter gentilis*), olive-sided flycatcher (*Contopus cooperi*), Oregon vesper sparrow (*Pooecetes gramineus affinis*), peregrine falcon (*Falco peregrinus*), and tufted puffin (*Fratercula cirrhata*). Since the Aleutian Canada goose, Cassin's auklet, Northern goshawk, and tufted puffin are not expected to occur in the study area they will not be further analyzed.

Olive-Sided Flycatcher

The olive-sided flycatcher could occur in the MBTA study area during the spring, summer, and fall either nesting in suitable habitat or during migration. Most occurrences in the MBTA study area are likely migrants due to the scarcity of large-diameter coniferous trees, but nesting is possible. They are fairly common in Washington State from early May through mid August. Breeding has been confirmed in numerous areas of Pierce County, but not in the MBTA study area (Smith et al. 1997). However, possible breeding evidence has been documented in the northwest Pierce County.

The olive-sided flycatcher is an edge species that prefers forest habitat adjacent to clearings such as water bodies or fields. They will occasionally breed in city parks or developed areas if suitable large trees are present. Nest trees are typically coniferous, but sometimes deciduous. They build a shallow twig nest on a horizontal branch within a cluster of needles 7 to 50 feet above ground. Nests are usually built in conifer trees near the end of large horizontal branches. Three to four eggs are typically laid between May and July, incubate in two weeks, and fledglings leave the nest in an additional three to four weeks.

Oregon Vesper Sparrow

The Oregon vesper sparrow could occur in the MBTA study area during the spring, summer, and fall either nesting in suitable habitat or during migration. Although breeding has been documented in southwestern Pierce County, vesper sparrows are primarily associated with steppe habitats of eastern Washington. They are a rare breeder in western Washington where they typically utilize remnant prairie habitat. They nest on the ground in or adjacent to shrubby cover.

Peregrine Falcon

The peregrine falcon could occur in the MBTA study area during the spring, summer, and fall. The peregrine falcon typically nests on high cliffs or rock faces, but will nest on bridges or tall buildings. They have nested in downtown Seattle and in Tacoma. Suitable nesting habitat is sparse but present in the MBTA study area. Peregrine falcons have been documented nesting in the MBTA study area and will also migrate through and forage in the study area.

The WDFW PHS Program database did not indicate the presence of any other species in addition to those previously indicated by the USFWS to potentially be within the project area. The PHS database did document the occurrence of an individual western pond turtle (*Clemmys marmorata*) near Commencement Bay in the 1980s outside of the study corridor. It also documented the presence of a bald eagle nesting territory, and two great blue heron (*Ardea herodias*) rookeries, all three of which are located outside the project area. However, both of these species may occasionally be found foraging in wetlands located in the project area or observed flying over.

Due to existing development, there are no substantial wildlife habitat linkages in the project area. Minor linkages, such as limited riparian corridors, do exist. These small remaining corridors are very important because of the continuing loss of habitat in the study area.

Fisheries

The proposed SR 167 corridor lies within Water Resource Inventory Area (WRIA) 10, which sustains populations of all Pacific salmon except sockeye (*Oncorhynchus nerka*). Populations of steelhead (*O. mykiss*) and char (Dolly Varden [*Salvelinus malma*] and bull trout [*S. confluentus*]) also live within the watershed. Existing fish-bearing waters within the study area, which may be affected by the project, include the Puyallup River, Hylebos Creek, Wapato Creek, and Surprise Lake Drain.

Special Status Species and Habitat

Presently, there are two federally protected fish species that potentially occur within the project area. These are Chinook salmon (*O. tshawytscha*) of the Puget Sound Evolutionarily Significant Unit (ESU) and bull trout of the Coastal/Puget Sound Distinct Population Segment (DPS). They are listed as “threatened” under the ESA by NOAA Fisheries and USFWS, respectively. The ESU includes all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound. In 2005, critical habitat was designated for the Puget Sound Chinook salmon ESU. The Puyallup River, the Hylebos Creek mainstem, and West Hylebos Creek are included in the designation as part of Unit 12, “Puyallup Sub-Basin.” In January 2001, USFWS proposed to list Dolly Varden under the “Similarity of Appearance” provisions of the ESA, for the Coastal/Puget Sound DPS of bull trout. The proposal to list Dolly Varden, due to the similarity of appearance of bull trout, includes all 34 “native char” subpopulations described in the bull trout rule (64 FR 58910). In 2005, USFWS designated critical habitat for the Coastal/Puget Sound DPS of bull trout (71 FR 56212). In 2006, the Puget Sound steelhead DPS was proposed for a listing as threatened (71 FR 15666). The Puyallup River is included in the Puyallup critical habitat sub-unit.

The Pacific Fisheries Management Council (PFMC) has designated Essential Fish Habitat (EFH) for federally managed groundfish and coastal pelagic fisheries (NOAA Fisheries 1999). The PFMC has also recommended an EFH designation for the Pacific Salmon Fishery (PFMC 1999). The EFH designation for groundfish and coastal pelagics is defined as those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery. The marine extent of groundfish and coastal pelagic EFH includes those waters from the near shore and tidal submerged environment within Washington, Oregon, and California state territorial waters out to the exclusive economic zone 231.5 miles offshore between Canada and the Mexican border.

The EFH proposed designation for the Pacific Salmon Fishery includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassible barriers identified by PFMC (1999). In the estuarine and marine areas, proposed designated EFH for salmon extends from near shore and tidal submerged environments within state territorial waters out of the exclusive economic zone offshore of Washington, Oregon, and California north of Point Conception (PFMC 1999). An impact assessment for EFH regulated groundfish and salmonids has been conducted for this project. Table 3.4-1 illustrates the preliminary effect determination for categories regulated under EFH.

Table 3.4-1: EFH Categories That May Occur Within the Action Area.

Common Name	Effect Determination
Groundfish	No Adverse Effect
Salmonids	Adverse Effect

Puyallup River

The Puyallup River drains approximately 970 square miles and is divided into two watersheds: the upper Puyallup River watershed and the lower Puyallup River watershed. The river drains agricultural, industrial, commercial, and residential areas. The headwaters of the upper Puyallup River are located at the base of a glacier along the heavily forested flank of Mt. Rainier. The lower Puyallup River begins at the river's convergence with its first major tributary, the Carbon River, near the City of Orting. Below the City of Orting the Puyallup River primarily drains agricultural land until it meets up with the White (Stuck) River, near the City of Sumner. The Carbon and White Rivers convey flow from 75 percent of the lower Puyallup River watershed's drainage area. The following smaller streams discharge directly or indirectly into the Puyallup River below the City of Orting but are outside of the project area: Canyon Falls Creek, Fennel Creek, Rody Creek, Deer Creek, Squally Creek, Diru Creek, Clarks Creek, and Swan Creek. Biological and physical features of the river are described in detail in Section 3.2, Water Resources.

The lower Puyallup River's channel within the project area has been dredged, straightened and stabilized with riprap, concrete and earthen levees. FHWA and WSDOT intend to improve the Puyallup watershed by implementing riparian restoration in sections of the Hylebos, Wapato, and Surprise Lake drainages.

Chinook Salmon

Puyallup River Chinook salmon stocks consist of spring, summer/fall and fall runs. Chinook salmon stocks within the Puyallup basin have been grouped together based on geographic separation from other Puget Sound Chinook salmon stocks (WDFW et al. 1993). Spawning Chinook salmon in the Puyallup River basin occur primarily in the major tributaries, including the lower White River, west fork of the White River, lower Clearwater River, lower Greenwater River, and Huckleberry Creek (Warren 1994; WDFW et al. 1993). Limited numbers of spring Chinook salmon also utilize the upper reaches of the Puyallup and Carbon Rivers.

Coho Salmon

Coho salmon (*O. kisutch*) utilize almost all of the accessible tributaries in the Puyallup River basin. They generally enter the Puyallup from August through November and spawn October through January (WDFW et al. 1993). They rear year round within the Puyallup River system and generally out-migrate after one year. Two coho salmon stocks, the Puyallup coho and the White coho, have been identified within the Puyallup River basin.

Chum Salmon

Three stocks of chum salmon (*O. keta*) return to the Puyallup River starting in late September and extending through December (Williams et al. 1975). The Puyallup/ Carbon River stock status and escapement are unknown (WDFW et al. 1993).

The chum salmon stocks of the Puyallup River spawn low in the Puyallup River. Most spawning occurs in the lower White, Puyallup, Carbon, Canyon Falls,

Fennel, Clark and South Prairie creeks. The Puyallup/Carbon River stock is believed to be geographically isolated and has been identified as a unique native stock.

Pink Salmon

There is only one Puyallup River pink salmon (*O. nerka*) stock. It is considered to be distinct from other Puget Sound stocks based on geographical separation of the spawning grounds (WDFW 1993). Puyallup pink salmon spawn in the Puyallup and Carbon rivers as well as some of the larger tributaries.

Steelhead

Three distinct steelhead populations exist in the Puyallup River system. They are the Puyallup, White River, and Carbon River stocks. All three are winter run steelhead. Stock status was considered healthy for all three stocks in 1992 (SASSI 1992), but has been on a steady decline over the past decade.

Bull Trout/Dolly Varden

Five local bull trout/Dolly Varden populations exist, including the upper Puyallup and Mowich Rivers, White River, West Fork White River, Greenwater River, and Carbon River (USFWS 2004). The Puyallup core area is critical for maintaining the distribution of the anadromous life history because it is the only major watershed in south Puget Sound supporting a breeding population.

Habitat for three of the four bull trout/Dolly Varden life histories is available. These include resident, fluvial and anadromous life forms. Spawning occurs in the upper reaches of the basin, primarily in September. Rearing also occurs primarily in the upper basin (USFWS 2005).

The status of bull trout in the Puyallup River is largely unknown. However, trap counts in the White River system indicate that the number of bull trout are extremely low relative to other anadromous core populations within the Puget Sound Management Unit (USFWS 2004).

Cutthroat Trout

Coastal cutthroat trout (*O. clarki clarki*) occur in virtually all-perennial streams of the Puyallup River system, assuming no passage barriers. They are considered distinct due to the geographical separation of spawning grounds (WDFW 2000). Anadromous cutthroat trout generally utilize the mainstem Puyallup, White River, Carbon River, and their major tributaries. Resident lake trout occur throughout the anadromous zone in small numbers, and large coastal river cutthroat may be present in Kapowsin Lake and in Greenwater Lake. As with most systems, the resident form is present throughout most perennial coastal streams.

Limiting Factors

The Puyallup River has four reaches listed on the Washington Department of Ecology's (Ecology) 2002 303(d) water quality list. Two of the reaches are listed due to high fecal coliform levels, one from high levels of arsenic, and one due to low summer in-stream flows.

The headwaters of the White River are located at the glaciers of Mt. Rainier. Hence, the Puyallup River has higher turbidity levels, shifting braided channels, and naturally colder water temperatures downstream of the confluence with the White River. Although these natural limiting factors occur, human-induced disturbances still have a greater impact on fish production. Human-induced habitat impacts include: sedimentation and flood potential due to encroachment by urban and industrial development and logging; fish passage blockage from dams and impassable culverts; extensive floodplain disconnection caused by dikes; fine sediment loading from bank instability; insufficient quantity and size of large woody debris (LWD); damage to side channel habitat and pools; widespread riparian destruction; and violations of Ecology's water quality and quantity regulations (Kerwin 1999).

Hylebos Creek

The Hylebos Creek watershed drains over 18 square miles of land from the City of Federal Way to the Hylebos Waterway and Commencement Bay in the City of Tacoma (King County 1990). The watershed consists of three sub-basins: the East Fork Hylebos Creek, the West Fork Hylebos Creek, and Lower Hylebos Creek/Surprise Lake Tributary.

The headwaters of the West Fork Hylebos Creek sub-basin originate near Sea-Tac Mall at South 320th Street and Pacific Highway. The Panther Lake tributary to the West Fork Hylebos Creek begins at Panther Lake (near the corner of South 348th Street and 1st Avenue). Tributaries north of 348th Street drain highly urbanized areas, consisting primarily of commercial businesses, multifamily housing, individual residences, and roads, into the 93-acre West Fork Hylebos wetland. These developed areas have a high percentage of impervious surface and often lack adequate stormwater detention or are served by undersized detention ponds. Additionally, flash discharges from the urbanized sub-catchments to the north are conveyed to this system. It is estimated that flood peaks on the West Fork Hylebos Creek have increased 80 percent over the pre-developed forested condition. The headwaters of the East Fork Hylebos Creek sub-basin originate at Killarney Lake, North Lake, and north of 320th Street. The tributary originating west of I-5 conveys runoff from highly urbanized areas of commercial development. Between the lakes and SR 161, the tributaries experience gentle gradients and slow velocities.

The Lower Hylebos Creek sub-basin originates at the confluence of the East and West Forks of Hylebos Creek. It conveys runoff from areas featuring light manufacturing, residential, industrial, and commercial uses. Section 3.2, Water Resources, details the biological and physical features of Hylebos Creek.

Chinook Salmon

A few observations have indicated that there is a very small Chinook salmon population within the Hylebos watershed. Friends of the Hylebos Wetlands (FOHW) report that adults generally enter the system in September. Most spawning occurs immediately below 373rd Street up to SR 99 (Nauer, pers comm. 2001). No stock status is available (WDFW et al. 1993). No salmon redds or adult Chinook salmon were observed during 2001 surveys on two reaches of the West and North forks. Fall 2000 surveys documented spawning

Chinook salmon in several locations (Table 3.4-2). FOHW reported that in 2001, one Chinook salmon was observed at Birch Street, 0.5 mile upstream from the project area. In 2002, nine Chinook salmon were observed at 373rd Street, over 1 mile upstream from the project area. In 2003, two Chinook salmon were observed at 8th Street East, approximately 0.6 mile downstream of the I-5 interchange. In 2004, no redds were observed between S. 373rd Street and SR 99, though several adults were sighted there. Nine adults and six redds were observed upstream of SR 99 and S. 360th Street.

Coho Salmon

The Hylebos system provides fair to good spawning habitat for coho salmon (Williams et al. 1975). Adults generally enter the watershed via the Hylebos Waterway from October through November. Spawning occurs from mid-October to December between 373rd Street and SR 99 (Nauer, pers comm. 2001). No stock status information is available (WDFW et al. 1993). Due to the adaptive rearing capabilities of coho salmon, juvenile coho salmon can virtually be found in all of Hylebos Creek and its tributaries year around, assuming accessibility.

Table 3.4-2: Chinook Salmon Observed in the Hylebos System in 2000

Location	Date	Number of Fish Observed
S. 373 Street	10/5/2000	2
	10/6/2000	3
	10/11/2000	1
	10/13/2000	1
	10/17/2000	1
S. 364th Street	10/21/2000	3
Brook Lake	11/6/2000	1

Source: Bowditch 2001.

In 2000, the Hylebos Stream Team observed 128 coho salmon throughout various segments of the basin, including West Hylebos (Bowditch, pers. comm. 2001). Ten live coho salmon and several carcasses were identified in the vicinity of South 373rd and nearly a dozen more coho salmon were reported in Brook Lake (Urabeck, pers. comm. 2001). FOHW reported that in 2001, 73 coho salmon were observed upstream of the project area in West Hylebos Creek and 74 coho salmon were observed in West Hylebos Creek upstream of the project area in 2002. A total of 103 coho salmon were observed upstream of the project area in West Hylebos Creek in 2003.

Chum Salmon

The Hylebos also provides fair to good spawning habitat for chum salmon (Williams et al. 1975). Generally, spawning chum salmon are in Hylebos Creek only during the month of November (Bowditch, pers. comm. 2001). FOHW reported that adult chum salmon could also be present in December. Juveniles emigrate to Puget Sound following emergence. Irregular spawning surveys indicate the presence of a naturally spawning population of chum. No chum

salmon were documented during 1999 surveys (Urabeck, pers. comm. 2001). However FOHW reported that in 2000, 7 chum salmon were observed in West Hylebos Creek upstream of the project area (at 373rd Street). No chum salmon were observed in 2001 but a total of 11 were recorded at and upstream of 373rd Street in 2002. FOHW report 2 chum salmon at 373rd Street in 2003. Existing survey information is not adequate to assess total spawning population, timing, or distribution, and therefore stock origin and stock status are unknown for Hylebos fall chum (WDFW, et al. 1993).

Pink Salmon

One pink salmon was documented by FOHW in West Hylebos Creek at 373rd Street in 2003. Pink salmon were not detected in previous surveys.

Steelhead

Occasionally, steelhead trout have been observed within the Hylebos Creek watershed (Bowditch, pers. comm. 2001). Run timing is generally from December through May. Spawning occurs from March to mid-June. The majority of steelhead trout rear for two years and then emigrate in May and late July. Spawning has been observed between 373rd Street and SR 99 (Nauer, pers. comm. 2001). No origin or stock status is available.

Bull Trout/Dolly Varden

No bull trout have been observed in Hylebos Creek. Foraging Puyallup River strays of the anadromous form is possible, although unlikely due to insufficient habitat (e.g., LWD, cold groundwater influences). Bull trout could use the area near the mouth of Hylebos Creek on a seasonal basis to forage, as long as the water temperatures are conducive and prey is available (Chan, pers. comm. 2004). Prey is most likely to be present during the spring juvenile salmon outmigration.

Cutthroat Trout

Resident coastal cutthroat trout are present throughout Hylebos Creek (Nauer, pers. comm. 2001). Populations have most likely declined due to typical problems associated with urbanization, such as increased stream temperatures and sediment loading.

Limiting Factors

There are two sections of Hylebos Creek listed on the Ecology 2002 303(d) list (see Figure 3.2-7), one on the West Fork of Hylebos and one on the mainstem Hylebos. Both are due to high levels of fecal coliform. Due to intense urbanization of the Hylebos watershed, stormwater runoff is quickly conveyed to Hylebos Creek and its tributaries, resulting in short duration, high volume flows. Elevated peak flows have caused erosion of channel substrate, substantially impacting Hylebos Creek and the associated aquatic species.

Currently, documented habitat limiting factors include fish passage (e.g. culverts and dams), floodplain connectivity (e.g. dike construction), bank instability (e.g. fine sediment loading), insufficient quantity and size of LWD, lack of side channel habitat and pools, widespread riparian destruction, and violations of

Ecology's water quality and quantity recommendations (Kerwin 1999). King County documented fecal coliform, copper, and zinc level which exceeded state water quality standards (King County 1990).

The majority of the stream has been affected by human alteration, including dredging, removal of associated riparian habitat, and/or installation of culverts. Some culverts have become impassable to fish over time due to increased flow/velocities from development within the watershed (e.g., SR 99) (Nauer, pers. comm. 2001). Inventories in the Hylebos drainage, including information from FOHW, identified 11 definite partial or complete fish barriers (WDFW 2000 criteria) (namely culverts), and an additional 6 that were most likely partial barriers but required hydraulic analysis (PCCD 2001). Stream crossings on the Hylebos Creek system and associated fish passage status are shown in Figure 3.4-1.

Wapato Creek

Wapato Creek drains 3.5 square miles of land from north of the City of Puyallup, the City of Fife, and the Port of Tacoma to the Blair Waterway and Commencement Bay in the City of Tacoma. Wapato Creek receives a substantial amount of runoff directly from adjacent agricultural, residential, commercial, and industrial lands in the cities of Puyallup and Fife. Wapato Creek has been greatly altered from its natural condition, and riparian cover along most of the system is sparse to nonexistent. Section 3.2, Water Resources, provides a detailed description of the Creek.

Chinook Salmon

There are no confirmed occurrences of Chinook salmon within the Wapato Creek system.

Coho Salmon

Spawning habitat for coho salmon in Wapato Creek is limited, although spawning does occur in at least one Wapato Creek tributary. Low numbers of coho salmon utilize substantial portions of Wapato Creek, Simons Creek, and the majority of their tributaries for rearing.

Chum Salmon

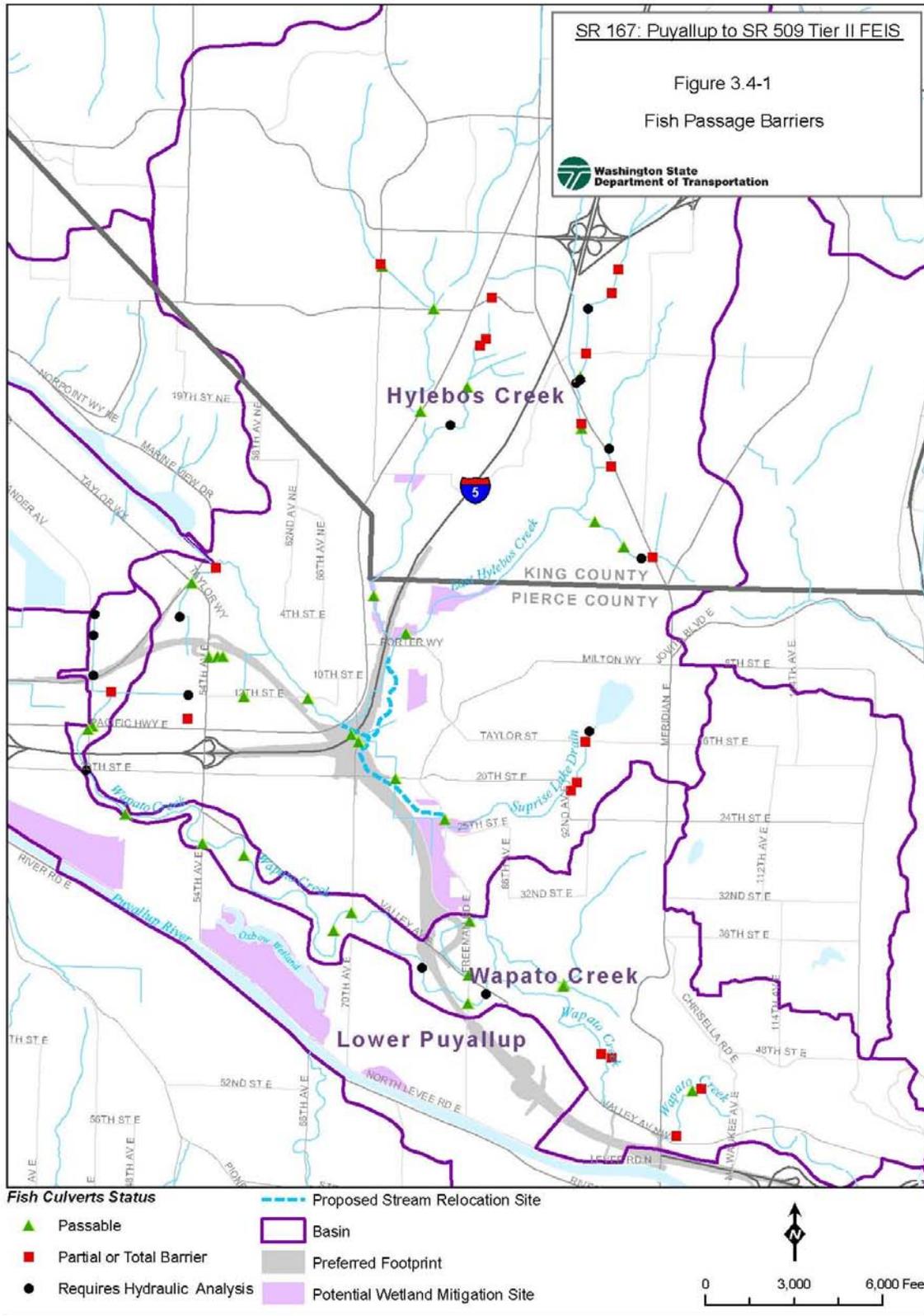
Chum salmon use is now extremely limited in the Wapato Creek system. Spawning is virtually non-existent due to severe habitat degradation.

Pink Salmon

There is no documented pink salmon use of Wapato Creek.

Steelhead

Spawning steelhead has occasionally been observed in Wapato Creek and Simons Creek (Nauer, pers. comm. 2001). Rearing habitat is limited due to water temperature increases and substrate limitations.



Bull Trout/Dolly Varden

Bull trout use of Wapato Creek is very unlikely due to the low elevations of the Wapato drainage basin and increased temperatures due to sparse or non-existent riparian cover (Nauer, pers. comm. 2001).

Cutthroat Trout

Coastal cutthroat trout are present in Wapato Creek (Nauer, pers. comm. 2001). Populations have most likely declined due to the typical problems associated with urbanization, such as increased stream temperatures and sediment loading to the system.

Limiting Factors

Wapato Creek is severely degraded. Eight sections of the stream in the project area are on the Ecology 2002 303(d) list, four from low summer in-stream flows, two due to high levels of fecal coliform, and two from low dissolved oxygen levels.

Urbanization and stormwater runoff have had detrimental effects on Wapato Creek. Impervious surfacing has reduced infiltration during rain events in turn affecting the groundwater storage capacity. Due to a lack of riparian buffer and groundwater recharge during the dry season the stream experiences extremely low flows (with resultant high temperature regimes) occasionally drying up in the summer (Nauer, pers. comm. 2001). Wapato Creek also has limited spawning habitat. Currently, documented limiting factors include fish passage (e.g., culverts), floodplain connectivity, bank stability (as a result of agricultural practices), LWD, side channel habitat, pools, excessive fines, riparian destruction, and water quality and quantity (Kerwin 1999).

The Pierce County Conservation District inventoried the Wapato drainage and recorded five definite fish impassable barriers (WDFW 2000 criteria) (namely culverts outside the project limits) and an additional six that were most likely partial barriers, but required hydraulic analysis. Road crossings on Wapato Creek and their associated fish passage status are shown in Figure 3.4-1.

Surprise Lake Drain

Surprise Lake Drain originates at the spring fed Surprise Lake, north of the Puyallup River Valley. Although the name of the stream implies that it is not a natural drainage, above Freeman Road it is considered a natural stream system that historically flowed into Wapato Creek. The stream conveys runoff from roughly two square miles of agricultural fields and residential areas in the City of Edgewood south to the valley below through a series of ditches to lower Hylebos Creek.

Above the Freeman Road crossing of Surprise Lake Drain, riparian vegetation provides an average of 80 percent canopy cover upstream to Surprise Lake. The land use is primarily residential with scattered livestock pastures. Downstream of the Freeman Road crossing, land use is mainly agricultural and the stream has been ditched and continually dredged. The system is fully described in Section 3.2, Water Resources.

Coho Salmon

Coho is the only salmon species documented in Surprise Lake Drain. Spawning coho salmon have been observed near Freeman Road (Nauer, pers. comm. 2001). Approximately one dozen coho salmon juveniles were observed immediately below the Taylor Street crossing in a Spring 2001 survey (WSDOT 2001).

Cutthroat Trout

The coastal cutthroat trout population is limited in the Surprise Lake Drain system due to low summer flows (Nauer, pers. comm. 2001). Some individuals most likely move in or out of the system to forage during periods of higher flows.

Limiting Factors

Due to severely degraded riparian habitat conditions, the most apparent limiting factors in the Surprise Lake Drain system are high summer temperature conditions and lack of complex habitat throughout the creek/ditch. Except for the headwater extremes, virtually the entire creek/ditch riparian zone is agricultural field. Personal observations revealed that habitat limiting factors would most likely include; temperature, fish passage, floodplain connectivity, bank stability, LWD, side channel habitat, pools, fines, riparian destruction, water quality and quantity and sediment contamination. Current land use within the Surprise Lake Drain subbasin is primarily agricultural, with scattered livestock pasture and high-density residential development.

Vegetation

A variety of plant communities occur within the project boundary. These include agricultural and pasture lands, grasslands, shrub lands, landscaped areas, forested lands and wetlands. Invasive weed species such as Himalayan blackberry (*Rubus procerus*) and reed canarygrass (*Phalaris arundinacea*) are prevalent within most of these vegetative communities. Native vegetation is a fundamental component of a naturally functioning ecosystem, providing food and shelter to wildlife in in-stream habitat complexity for native fish. Therefore, the majority of the habitat in the study area is considered degraded.

Farmland in the project area occurs in small parcels adjacent to residences, small businesses, and industrial parks, as well as larger agricultural parcels. A number of edible and non-edible crops are produced in the project area. Pasture lands support a community of mixed herbaceous plants including fescue (*Festuca* spp.), bentgrass (*Agrostis* spp.), bluegrass (*Poa* spp.), orchard grass (*Dactylus* spp.), ryegrass (*Lolium perrene*), clover (*Trifolium* spp.), plantain (*Plantago* spp.), thistle (*Cirsium* spp.), creeping buttercup (*Ranunculus repens*), and chickweed (*Stellaris* spp.). Thickets of Himalayan (an invasive plant) and evergreen blackberry (*R. vitifolius*) frequently occur along the edges of pasture areas.

Grasslands and shrub lands are common in the project area. Most of these communities occur on abandoned agricultural fields. In open grassy communities, the vegetation includes fescue, bentgrass, ryegrass, orchard grass, clover, fireweed (*Epilobium angustifolium*), thistle, foxglove (*Digitalis purpurea*), tansy (*Tanacetum vulgare*), vetch (*Vicia* spp.), creeping buttercup,

mustard (*Brassicaceae*), and dandelion (*Taraxacum officinale*). Shrub species commonly invading this community include Himalayan and evergreen blackberry and Scot's broom (*Cytissus scoparius*).

Shrubs and tree saplings are the dominant vegetation in agricultural parcels that have been lying idle for many consecutive growing seasons and in clear-cut areas. Invasive shrub species, primarily Himalayan and evergreen blackberry, typically dominate, although some drier areas are dominated by Scot's broom. Red alder (*Alnus rubra*) and black cottonwood are the most common tree saplings. Groundcover in these shrub/sapling communities is composed primarily of grassland species.

Coniferous, deciduous, and mixed upland forest occurs in the project area. Because most of the original forestlands in the project area have been cleared for agriculture, the remaining forested areas are small, isolated parcels. Coniferous forests are found mainly along the east side of the project area, above the valley floor. Douglas-fir, western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) are the dominant tree species. Madrona (*Arbutus menziesii*) trees are frequently dominant species in the slopes above Hylebos Creek. Deciduous forests occupy riparian corridors and recently disturbed areas. Black cottonwood and red alder are dominant in these communities; big leaf maple (*Acer macrophyllum*) also occurs in many areas. Mixed deciduous/coniferous forests occur in previously disturbed areas where sufficient time has elapsed since disturbance to allow conifers to become established beneath a deciduous overstory. These mixed forests are also located along the eastern portion of the project area. In these communities, black cottonwood, red alder, big leaf maple, Douglas fir, western hemlock, and western red cedar make up the forest canopy.

Shrub species found in all upland forest types include snowberry (*Symphoricarpos albus*), vine maple (*A. circinatum*), Indian plum (*Oemleria cerasiformis*), hazelnut (*Corylus cornuta*), red huckleberry (*Vaccinium parvifolium*), red elderberry (*Sambucus racemosa*), oceanspray (*Holodiscus discolor*), salal (*Gaultheria shallon*), Himalayan blackberry, and evergreen blackberry. The groundcover is commonly composed of bentgrass, fescue, sword fern (*Polystichum munitum*), bleeding heart (*Dicentra formosa*), piggy back (*Tolmiea menziesii*), and creeping buttercup.

Forested wetlands also exist in the project area. These wetlands support deciduous plant communities typically dominated by black cottonwood and red alder trees. Big leaf maple trees are common on the upland edge of mature wetland forests in the project area. Understory vegetation in forested wetlands typically comprises salmonberry, willow (*Salix* spp.), spiraea (*Spiraea* spp.), Himalayan blackberry, and trailing blackberry (*R. ursinus*).

Riparian plant communities occur in the analysis area immediately adjacent to Wapato and Hylebos creeks and portions of the Puyallup River. In many of these areas, the shrub community is dominated by Himalayan blackberry and reed canarygrass, which forms a dense thicket along the shoreline. In other areas, willow dominates the riparian community. Riparian shrub lands also may contain scattered hawthorn (*Crataegus douglassi*) and red alder saplings. Black cottonwood and red alder in the overstory and willow, Himalayan blackberry and

red elderberry in the understory dominate the forest community in disturbed riparian areas.

Habitat in the immediate vicinity of the proposed corridor is primarily large blocks of abandoned agricultural lands and shrub lands, with the limited undisturbed riparian corridors along Wapato and Hylebos creeks and some vegetative communities within developed areas.

3.4.3 Impacts of Construction

Construction-related impacts to vegetation, wildlife, migratory birds, and fisheries expected to occur in this proposed corridor are described in the following sections. General mitigation concepts are included in Section 3.4.7, Mitigating Measures.

No Build Alternative

No direct construction-related effects on wildlife, wildlife habitat, fisheries, fish habitat, migratory birds, or vegetation are expected to occur under this option. Impacts are currently occurring, however, and would continue to occur, as non-project related urban development continues in the project area. Expected impacts of continuing development include terrestrial and aquatic habitat loss and degradation, increased disturbance to wildlife and their prey (including freshwater invertebrates), and reductions in plant species diversity.

Build Alternative (Preferred)

Wildlife and Wildlife Habitat

The Build Alternative invariably results in the elimination of some existing habitat in the project area. However it will also result in conversion to habitats both more suitable (riparian restoration areas and wetland mitigation areas) and less suitable (isolated vegetated areas, stormwater detention ponds) to wildlife. Figures 3.4-2 through 3.4-11 show impacted and converted habitat within the project footprint. Overall, there is a net loss in usable wildlife habitat. A maximum of 221.1 acres of moderate to low quality agricultural, grassland/shrub, forested wildlife habitat, out of a total of over 800 acres in the study corridor, may be permanently impacted (Table 3.4-3). Permanent impacts include new roadway and cut and fill slopes. Cut and fill slopes will be reseeded, as necessary, and stabilized. Therefore, these areas will not become impervious surface but will be revegetated. However, cut and fill slopes were not considered wildlife habitat. A maximum of 94.2 acres may be temporarily impacted (Table 3.4-4). Temporary impacts include areas outside the project footprint that will or may be impacted by moving/operating heavy construction equipment.

The impacts of new roadways to wildlife, aside from the direct loss of habitat, can include habitat fragmentation, reduction in population sizes, lower population viability, displacement mortality, changes in hydrology including increased stormwater runoff, an increase in invasive plant species, increased erosion and sedimentation, increases in air pollution, light and glare impacts, noise disturbance, road avoidance, and road kill.

SR 167: Puyallup to SR 509 Tier II FEIS

Figure 3.4-2

Wildlife Habitat Impact 54th Avenue East Interchange Loop Ramp Option (Preferred)



Date: Aerial Photo 2003

- Developed
- Agricultural
- Grass/Shrub
- Forested
- Fill Impact
- Shading Impact
- Riparian Restoration

