Biological Evaluation

Yelm Highway Expansion
Phase V

Prepared for

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KEY TERMS

BE	Biological Evaluation
BMPs	best management practices
DPS	distinct population segment
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	evolutionarily significant unit
NMFS	National Marine Fisheries Service
NMFS	National Marine Fisheries Service (also known as NOAA Fisheries)
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
PHS	Priority Habitats and Species
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WSDOT	Washington State Department of Transportation

EXECUTIVE SUMMARY

On behalf of Thurston County Department of Roads and Transportation Services, biologists from Parametrix conducted a biological evaluation to determine the effects of the Phase V construction of the expansion of Yelm Highway on listed threatened or endangered species and their habitat. Analyses of potential impacts were made based on review of plans for the proposed action, an on-site evaluation of aquatic habitat at the project site, the current and historical distribution of each species, and consultation with local experts. Based on this review, determinations of impacts were made for the proposed highway construction.

The proposed project is in the completion phase for expanding capacity along a major east/west traffic corridor traversing southern Olympia and Lacey, Washington. Yelm Highway has been widened in various locations several times over the past 20 years. This project will expand Yelm Highway to four lanes between Henderson Boulevard and Rich Road, completing the plan to widen all of Yelm Highway to four lanes between Lacey and Tumwater. The design includes construction of curb, gutter, and sidewalk; planter strips; bicycle lanes; drainage and stormwater treatment; traffic signals; intersection realignment; roundabouts; illumination; and signing.

The Yelm Highway expansion project is located within the Deschutes River basin. Within the action area the river flows through gently sloping terrain, and the adjacent land is developed for residential and agricultural use. The project area of Yelm Highway does not cross any streams or wetlands and is 0.5 mile north of the Deschutes River at its nearest point. Chambers Ditch is the closest stream to the project area, crossing Yelm Highway about 200 yards east of the eastern boundary of the project site. This seasonal stream originates from Chambers Lake and flows south and west, joining Chambers Creek, its confluence with the Deschutes River. Chambers Creek originates at Chambers Lake and is approximately 600 feet east of the project.

Within the project or action area, listed fish species addressed include Puget Sound Chinook salmon and bull trout. There is currently no designated critical habitat for Chinook salmon (as defined by the National Oceanic and Atmospheric Administration Fisheries Service [NOAA Fisheries]), since the courts vacated the previous designation. Recently, NOAA Fisheries has proposed critical habitat for Chinook salmon; however, it does not include either Chambers Creek or the Deschutes River. Likewise, Chambers Ditch, Chambers Creek, and the Deschutes River do not contain proposed critical habitat for Puget Sound bull trout.

Chinook and coho salmon, steelhead, and cutthroat trout inhabit the Deschutes River. Chambers Creek, near its confluence with the Deschutes River, may support cutthroat trout and provide seasonal rearing habitat for other salmonids, but the reach adjacent to the Yelm Highway corridor dewaters during the summer and is not known to support even seasonal use by salmonids.

The U.S. Fish and Wildlife Service (USFWS) indicates that wintering bald eagles are within Thurston County. No known communal roosts or wintering concentration areas are known to be located within the action area. The closest bald eagle nest is over 2 miles from the project area. Eagles may forage along the Deschutes River and at Ward and Hewitt Lakes; these lakes are within 0.25 mile of the proposed project.

Potential direct effects of the proposed project upon listed fish species would include impacts to the water quality of Chambers Ditch or the Deschutes River resulting from project-generated erosion and sedimentation or from the release of untreated stormwater runoff into project-area streams. However, this

project is not expected to negatively affect fish species because all stormwater from the new and existing impervious surface will be treated for water quality and infiltrated, as per the Washington State Department of Transportation's 2004 *Highway Runoff Manual* and Washington State Department of Ecology's (Ecology) 2004 *Stormwater Runoff Manual for Western Washington*. Water quality in surrounding streams and lakes is expected to improve from baseline conditions. In addition, appropriate BMPs will be applied during project construction that will minimize or eliminate erosion or sedimentation from the project. Indirect effects could potentially include induced growth, which in turn could potentially affect surface water quality and the integrity of critical habitat in residential or commercial areas served by the highway. However, this project is not expected to have a substantial effect on population growth or land-use patterns, and existing county regulations, such as Thurston County's critical area ordinance and stormwater treatment guidelines, are adequate to ensure that adverse direct or indirect effects on listed species are avoided.

Potential direct effects on bald eagles could include disturbance to foraging and nesting. However, construction activities will not affect nesting behavior since the nearest bald eagle nest is over 2 miles away from the project area. Any disturbance to foraging behavior would be temporary, and other suitable foraging habitat exists in the surrounding areas.

Based on Parametrix's review of the plans for the proposed action, an on-site evaluation of aquatic habitat at the project site, the current and historical distribution of each species, and consultation with local experts (as would be required through Endangered Species Act [ESA] Section 7 consultation), it was concluded that construction and operation of this project will have **no effect** on Chinook salmon, bull trout, or bald eagles (Table ES-1).

Table ES-1. Summary of Findings for Listed Threatened or Endangered Species that Occur in the Project Area

Common/Scientific	ESA Status	Life Stages Considered	Impacts Analysis Determination
Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	All freshwater phases	No Effect
Bull Trout (Salvelinus confluentus)	Threatened	All freshwater phases	No Effect
Bald eagle (*Haliaeetus leucocephalus*)	Threatened	Wintering	No Effect

1. INTRODUCTION

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions do not jeopardize listed species or their habitat. In this regard, federal actions include providing funding or issuing federal permits for a project. To initiate review of a project or action under Section 7, an agency or its representative requests a list of endangered or threatened species from the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service (also referred to as the National Marine Fisheries Service or NMFS). If a listed species is known to occur in the project vicinity, the lead agency or its designee must complete a Biological Evaluation (BE) describing how the project would affect the species. If the evaluation determines that a listed species is likely to be harmed by the project, the agency must enter formal consultation with USFWS and/or NOAA Fisheries to ensure that its actions will conserve the species and its critical habitat.

The Thurston County Roads and Transportation Department is proposing to expand Yelm Highway to four lanes between Henderson Boulevard and Rich Road, completing the plan to widen all of Yelm Highway to four lanes between Lacey and Tumwater. The project is located between Lacey and Tumwater, Washington in unincorporated Thurston County (Figure 1-1).

Parametrix was contracted by Thurston County Roads and Transportation Department to prepare a BE to assess the effects of the project on fish, wildlife, and plant resources in the project vicinity and to document protection measures included in the proposed action. Information on listed species and habitats known to occur or potentially occurring in the project vicinity was provided by state and federal agencies (Appendix A). This information is summarized in Table 1-1.

Table 1-1. Data and Data Sources for Information on Listed Species in the Vicinity of the Yelm Highway Expansion Phase V Project

Species and Habitats	Agency/Data Source	Data Provided
Endangered, threatened, rare, and sensitive plant species and high-quality plant communities	Washington Department of Natural Resources (WDNR)	No such species or communities occur in the project vicinity.
Federally threatened and endangered plants, fish, and wildlife species	USFWS http://westernwashington.fws.gov/se/SE_List/THURSTON.htm	Two threatened species could occur in the project vicinity: 1. Coastal Puget Sound distinct population segment (DPS) of bull trout (*Salvelinus confluentus*) (threatened). 2. Bald eagle (*Haliaeetus leucocephalus*) (threatened)
Federally threatened and endangered fish species	NOAA Fisheries http://www.nwr.noaa.gov/1salmon/salmesa/index.htm	One threatened species could occur in the project vicinity: 1. Puget Sound evolutionarily significant unit (ESU) of Chinook salmon (*Oncorhynchus tshawytscha*).
Federally threatened and endangered marine mammal	NOAA Fisheries http://www.nwr.noa.gov/mammals/whales/kwfactsheet.htm	One threatened species could occur in the project vicinity: 1. Orca (*Orcinus orca*).

(Table Continues)

Table 1-1. Data and Data Sources for Information on Listed Species in the Vicinity of the Yelm Highway Expansion Phase V Project (Continued)

Critical habitat for federally threatened and endangered species	U.S. Fish and Wildlife Service and NOAA Fisheries Federal Register 69:35768–35857 Federal Register 69:74571–74846	Critical habitat is currently proposed for the Puget Sound DPS of bull trout. No bull trout critical habitat is proposed in either Chambers Creek or the Deschutes River. Critical habitat is currently proposed for the Puget Sound ESU of Chinook salmon. No Chinook salmon critical habitat is proposed in either Chambers Creek or the Deschutes River.
Priority Habitats and Species (PHS)	Washington Department of Fish and Wildlife (WDFW)	No bald eagle wintering concentrations or bald eagle nests within 2 miles of the project. Chinook and coho salmon, cutthroat trout, and steelhead in the Deschutes River. Coho and cutthroat in Chambers Creek.

Currently, USFWS provides a species list based on listed species that are present within the county in which the project occurs. The majority of the species on the USFWS species list for Thurston County were either not historically distributed within the action area and/or the action area (in an urban, lowland setting) does not contain suitable habitat to support these species. Therefore, those species will not be addressed in this BE. They include marbled murrelets (*Brachyramphus marmoratus*) and northern spotted owls (*Strix occidentalis*).

This BE addresses direct and indirect project-related impacts on habitat and foraging base for Chinook salmon, bull trout, orca, and bald eagles. The effects determinations are based on life-history analysis, habitat requirements, literature review, agency consultation, and field reconnaissance studies conducted by Parametrix biologists. Effects on Essential Fish Habitat (EFH) as defined by NMFS (1999b) are also examined.

Figure 1-1 Vicinity and Action Area Map of the Yelm Highway Expansion Phase V Project

2. PROPOSED ACTION

2.1 LOCATION AND PRIMARY FEATURES

The proposed project is the final project (Yelm Highway Widening Phase V) in a 20-year plan for widening and improving Yelm Highway from Capitol Boulevard in Olympia to Lacey. Yelm Highway is a major east/west arterial highway crossing Tumwater, southern Olympia, and Lacey, in Thurston County, Washington. The project is located in T18N, R2W, Section 31, and T18N, R1W, Section 36 (see Figure 1-1).

This phase will expand 1.2 miles of Yelm Highway between Henderson Boulevard and Rich Road, including some realignment. The existing road is three lanes (two travel lanes and a two-way left-turn lane) between Henderson Boulevard and Boulevard Road, and four lanes (three travel lanes and a two-way left -turn lane) between Boulevard Road and Rich Road. Yelm Highway is currently four travel lanes on each end of this project. This project will create two lanes in each direction with bike lanes and sidewalks between Henderson Boulevard and Rich Road, thus completing the four lane section of the corridor in this region. A two-way left-turn lane is included on both the east and west ends of the project limits, and a planted median is included in the middle portion between Village Drive and Stratford Lane. Roundabouts will be constructed at the intersection with Brassfield Street and Boulevard Road. The intersections with Henderson Boulevard and Rich Road will be modified to provide u-turns. The road alignment will be shifted northward near Brassfield Street, and the intersection with Boulevard Extension will be moved to the east. Both realignments will improve the safety of the corridor. Planted medians, planter strips, and noise walls are included in the project where they are feasible.

A portion of the project lies within the city of Olympia and the remainder lies within Thurston County limits. The Thurston County section lies within the growth management boundary for the city of Olympia.

2.2 CONSTRUCTION ACTIVITIES AND WORK TIMING

The project design includes the construction of curbs, gutters, sidewalks, planter strips, planted medians, bicycle lanes, drainage and stormwater treatment, noise walls, traffic signals, intersection realignment, roundabouts, illumination, and signing. Surfacing will consist of asphalt for the roadway and portland cement for the sidewalks and driveways.

In the existing right-of-way at the project site there are 5.71 acres of pervious surface and 9.12 acres of impervious surface. The proposed highway expansion will increase impervious surface to 14.88 acres, an increase of 5.76 acres. Stormwater detention, treatment, and infiltration facilities for the new right-of-way are designed to provide treatment for all of the existing impervious surface and the new impervious surface, equating to treatment of over 140 percent of the new impervious surface.

Stormwater infiltration ponds will be located at three locations along the corridor. All stormwater from Yelm Highway will be directed away from Hewitt Lake. Stormwater will be collected in catch basins along the curb lines and piped to the infiltration locations.

Stormwater treatment and infiltration facilities will be designed in accordance with Washington State Department of Transportation's 2004 *Highway Runoff Manual*, a document compatible with Ecology's 2001 *Stormwater Manual for Western Washington*. Stormwater will be collected, treated, and infiltrated in three discrete basins. One basin will have two treatment systems that discharge to an existing infiltration gallery west of Rich Road. Water quality treatment will use two wet ponds that discharge to two infiltration ponds. Half of the discharge to the existing infiltration gallery will be treated by a swirl concentrator, and the other half will use a bioinfiltration swale. Facilities were sized using methods described in the *Drainage Design and Erosion Control Manual*, based on the area of each contributing basin.

At this time, the start date for the project is the summer of 2007.

3. DESCRIPTION OF THE PROJECT AND ACTION AREAS

3.1 PROJECT SITE AND ACTION AREA

The project site is defined as the area where the majority of the proposed action will occur. Descriptions of existing conditions for aquatic, terrestrial, and wetland resources are discussed in detail below.

An action area is "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR §402.02). Effects from the project are not expected beyond the action area directly affected by the construction. Therefore, the action area for the project is defined as the immediate work and construction area and all terrestrial and aquatic habitats within a 1/2-mile radius of the project site (see Figure 1-1). This action area would be appropriate for all fish and terrestrial species potentially present within the action area during construction activities. We believe this is a conservative estimate of the extent to which water quality impacts could result from the proposed project should best management practices (BMPs) fail. Additionally, noise disturbance from construction activities is not expected to affect wildlife species beyond the 1/2-mile radius action area.

3.2 GENERAL SITE CHARACTERISTICS

The Deschutes River originates in the Bald Hills of southeastern Thurston and northeastern Lewis counties, and runs 57 miles north to Budd Inlet on Puget Sound. The headwaters are partially within the Mount Baker-Snoqualmie National Forest, and partially in privately owned timberlands. Six tributaries enter the Deschutes River, including Spurgeon Creek and Percival Creek. In the action area, the river flows through gently sloping terrain, and the adjacent land is developed for residential and agricultural use. The meandering, moderate-gradient channel offers broad gravel riffles and pools suitable for fish habitat. However, the banks have been contoured and armored, particularly in the lower 4.5 miles. The riparian zone is typically forested by deciduous trees and second-growth conifers interspersed with sections cleared for agricultural or residential use (Williams et al. 1975). Throughout the project site, Yelm Highway is bounded to the north and south by residential areas; the main intersections at Henderson Road and Rich Road are zoned for light industrial development.

The portion of Yelm Highway proposed for expansion does not cross any streams or wetlands. At its nearest point the Deschutes River channel is 0.5 mile south of the roadway. In the wet season Chambers Lake (to the north of Yelm Highway) drains through Chambers Ditch, which crosses Yelm Highway about 200 yards east of the eastern boundary of the proposed project site, and flows south and then west to its confluence with the Deschutes River. Ward Lake is a glacial kettle that lies north of Yelm Highway (approximately 800 feet at its closest point), east of Henderson Boulevard. Hewitt Lake is another glacial kettle immediately south of Yelm Highway (less than 100 feet at its closest point) and west of the intersection with Boulevard Road. Neither Ward Lake nor Hewitt Lake has outlet streams; therefore, these lakes do not provide habitat for anadromous fish.

Chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*O. kisutch*), steelhead trout (*O. mykiss irideus*), and cutthroat trout (*O. clarki*) inhabit the Deschutes River. Ward and Hewitt Lakes support introduced populations of rainbow trout (*O. mykiss*), smallmouth bass (*Micropterus dolomieui*), and bluegill (*Lepomis macrochirus*). Chambers Lake also supports bass and other warmwater fish species. Chambers Creek near its confluence with the Deschutes River may support cutthroat trout and provide seasonal rearing habitat for other salmonids, but the reach adjacent to the Yelm Highway corridor

dewaters during the summer and is not known to support even seasonal use by salmonids (Williams et al. 1975). The Olympic mudminnow (*Novumbra hubbsi*) has been collected from the Deschutes River, close to the confluence of Chambers Creek (WDFW PHS data). Mazama (western) pocket gophers (*Thomomys mazama*) are also known to be in the vicinity (WDFW PHS data, September 23, 2004). The riparian corridor along the river provides important habitat for a diverse wildlife community that includes birds, mammals, reptiles, and amphibians.

4. FISH SPECIES EVALUATIONS

4.1 CHINOOK SALMON

4.1.1 ESA and Stock Status

NOAA Fisheries completed an ESA status review of Chinook salmon populations from Washington, Oregon, Idaho, and California and defined 15 ESUs, each of which is considered a species under the ESA. Spring, summer, and fall Chinook salmon populations from the Puget Sound ESU were considered likely to become endangered in the foreseeable future (Myers et al. 1998). The abundance of Chinook salmon in the Puget Sound ESU has declined substantially from historical levels, and there was concern over the effects of hatchery supplementation on genetic fitness of stocks, as well as severely degraded spawning and rearing habitats throughout the area (Myers et al. 1998). There was also concern that harvest exploitation rates have been excessive for some Puget Sound Chinook salmon stocks. Subsequent to this status review, NMFS listed the Puget Sound ESU as threatened (NMFS 1999a) and designated their critical habitat to include all marine, estuarine, and freshwater habitats accessible to Puget Sound Chinook salmon (NMFS 2000b).

Fall Chinook salmon were introduced to the Deschutes River in 1964 as part of an enhancement program operated by Washington Department of Fisheries. Tumwater Falls was an impassable natural barrier until a fish ladder was constructed in 1954. Since the inception of the hatchery program some adult Chinook salmon that ascended the Tumwater Falls ladder and entered the trap, if not required for hatchery brood stock, were released into the upper Deschutes River. The adults that spawn naturally in the upper Deschutes River, and their progeny, are included in the listed ESU. Natural-origin adult Chinook salmon may also stray into the Deschutes River from other Puget Sound systems.

4.1.2 Critical Habitat

On April 30, 2002, the U.S. District Court vacated the rule designating critical habitat for 19 ESUs of salmon and steelhead on the West Coast, including the Puget Sound Chinook salmon ESU. NOAA Fisheries has recently proposed new critical habitat the Puget Sound Chinook Salmon ESU. No portion of Chambers Creek or the Deschutes River is proposed as Chinook salmon critical habitat.

4.2 BULL TROUT

4.2.1 ESA and Stock Status

USFWS (1998b) recently completed a determination of the status of bull trout, identifying five distinct population segments (DPSs) in the coterminous United States. The Coastal-Puget Sound bull trout DPS is composed of 34 subpopulations (USFWS 1998a, 1999). USFWS listed bull trout in the Coastal-Puget Sound DPS as threatened under ESA on November 1, 1999 (USFWS 1999).

The closest bull trout core area to the project site is the Puyallup core area, which plays a vital role in maintaining anadromous bull trout distribution in the Puget Sound management unit, since it is the only major watershed in south Puget Sound supporting a population with this life history form (USFWS 2004). Historically, anadromous bull trout were described entering the Nisqually River. However, it is currently unknown whether a remnant bull trout population continues to persist in the lower Nisqually River drainage, and there have been only rare observations of bull trout in recent years (WDFW 1998; J. Barr *in* USFWS 2004).

The current distribution of bull trout within Puget Sound marine waters is not completely known but has been documented from the Canadian border to at least Commencement Bay to the south (Kraemer 1994; McPhail and Baxter 1996; WDFW 1998; Pacific International Engineering 1999; KCDNRP 2002). As late as 1978, their marine distribution was still identified as far south as the Nisqually River Delta (Fresh et al. 1979). A more recent observation made at the Clear Creek Hatchery would indicate that bull trout still occasionally migrate in marine waters to at least the Nisqually River (WDFW 1998).

Bull trout are believed to be foraging on juvenile salmonid downstream migrants or other fish species while occupying nearshore areas of Puget Sound and potentially overwintering there as well. The extent of past and present bull trout use of smaller independent creek drainages that discharge directly into Puget Sound is not well known, with only a few known reported observations.

Bull trout and Dolly Varden are not known to be present within Water Resource Inventory Area 13 streams, including the action area, and no known record of historic presence is known to exist (Haring and Konovsky 1999). Chambers Creek originates at Chambers Lake north of the Yelm Highway and is approximately 600 feet east of the project; from there, the creek flows south then west to its confluence with the Deschutes River. Within Chambers Creek, the water temperatures are likely too high and the substrate conditions too degraded (an excess of fine sediments) to support resident populations or spawning populations of anadromous fish. At most, anadromous migratory char originating from more northern drainages in Puget Sound may occasionally stray into the Deschutes River during migration activities or use the marine nearshore areas of south Puget Sound for foraging or overwintering.

4.2.2 Critical Habitat

Critical habitat for the Coastal-Puget Sound bull trout DPS was proposed by the USFWS on June 25, 2004. It is expected that USFWS will publish a final critical habitat designation rule in the Federal Register in the near future. Neither Chambers Creek nor the Deschutes River is proposed as critical habitat.

5. WILDLIFE SPECIES EVALUATION

5.1 ESA STATUS AND DISTRIBUTION – BALD EAGLE

Bald eagles were first protected by the Bald Eagle Protection Act of 1940 and later listed as endangered under the Endangered Species Act of 1973. In 1978 the eagle was reclassified as threatened in five states, including Washington. Once numbering between 250,000 and 500,000 in the continental U.S., human development and the use of the pesticide DDT reduced the population to a low of about 400 pairs by the early 1960s. With the banning of DDT in 1972, and a number of subsequent recovery efforts, the continental U.S. population of bald eagles has since made a dramatic recovery, and by 1998 breeding pairs numbered approximately 6,000. Because of this recovery, USFWS has proposed that the bald eagle be delisted.

Recovery has been especially dramatic in Washington State where there are now over 600 nesting pairs, with approximately 300 pairs in Puget Sound alone. Bald eagle nesting territories are now found along much of the Puget Sound and Lake Washington shorelines. Washington State also supports the largest wintering population of bald eagles in the conterminous United States. A few thousand birds can be found throughout the state where waterfowl and fish congregate, including along the shoreline of Puget Sound.

USFWS affirms that wintering bald eagles are present in the project area vicinity (Appendix A). The winter period occurs from October 31 through March 31. The nearest bald eagle nest site is located in T18N, R02W, Section 47, over 2 miles from the project area. Foraging eagles most commonly occur near Capitol Lake and Budd Inlet, over 2 miles from the project area. Eagles may also forage along the Deschutes River and at Ward and Hewitt Lakes. These lakes are within 200 feet of the proposed highway construction.

5.2 CRITICAL HABITAT – BALD EAGLE

Critical habitat has not been designated for bald eagles. While foraging may occur at nearby lakes or streams, no nesting or wintering sites have been documented in the action area.

5.3 ESA STATUS AND DISTRIBUTION – ORCA

On December 16, 2004, NOAA Fisheries proposed listing the Southern Resident killer whale (*Orcinus orca*) distinct population segment (DPS) as threatened under the ESA (NOAA 2005).

The Southern Resident killer whale population possibly numbered between 100 and 200 prior to 1960. Live captures of Southern Residents, for display, reduced the number to fewer than 70 when an annual killer whale census of the population began in 1973. The peak number reached was 97 in 1996. There is no comprehensive worldwide estimate of the total number of orcas.

Southern Resident killer whales have a seasonal (summer) home range that includes Washington and southern British Columbia waters (Puget Sound, the Strait of Juan de Fuca, and the southern Strait of Georgia). In the Pacific Northwest, the two closest resident pods are the Southern Residents and the Northern Residents, which live in northern British Columbia and Alaska.

5.4 CRITICAL HABITAT – ORCA

Most of the information about the Southern Resident killer whale population has been collected in Puget Sound during the summer months. Very little is known about their wintering habitat.

6. EFFECTS DETERMINATIONS FOR LISTED SPECIES

6.1 EFFECTS ANALYSIS FOR CHINOOK SALMON

6.1.1 Direct Effects

The Yelm Highway project does not cross or run adjacent to any streams or surface waters that support Chinook salmon, so the potential for direct effects is only associated with the possibility that the project could affect water quality in a drainage that drains into salmon-bearing waters. WSDOT has established conservative criteria for determining whether a transportation project has the potential to directly affect aquatic habitat if the project is sited within a Water Resource Inventory Area that supports listed species (WSDOT 1998). The criteria for a "no effect" determination are:

- 100 percent of the stormwater runoff from any new impervious surface must be detained and pretreated before it is allowed to infiltrate.
- Stormwater detention and pretreatment must be provided for an additional 40 percent of the new impervious area.
- Clearing, grading, or grubbing must occur more than 300 feet away from any water body that supports or drains into water that supports listed species.
- A Temporary Erosion and Sediment Control and Stormwater Site Plan, with a spill plan, must be fully implemented.

Based on the *Yelm Highway Phase V Design Report* (Parametrix 2000) and discussion with the Parametrix project team, these conditions will be met by the proposed Yelm Highway project.

6.1.2 Indirect Effects

In the case of the proposed Yelm Highway project, indirect effects implies the need to examine whether "induced growth" will occur due to improvements and potential affects to surface water quality and the integrity of habitat in residential or commercial areas served by the highway that are part of either the Deschutes River or Nisqually River watersheds.

In examining the feasibility of seven different road corridors that could provide increased traffic capacity between Olympia, Tumwater, and southeast Lacey, Thurston County specifically assessed the potential impacts of each corridor on induced residential development in rural areas, as well as potential impacts to wetlands, floodplains, and sensitive species. The study concluded that the Yelm Highway corridor had the least impact of all corridors examined for all criteria, including induced residential growth. Existing land-use zoning and planning calls for low-density residential uses for the area served by the Yelm Highway. Among other advantages of the Yelm Highway corridor over the other corridors that were evaluated is that it would not require taking any rural lands or impact any rural parcels. No wetlands or floodplains would be crossed, and no sensitive species were known to occupy land or waters in the corridor (Parametrix and SCA 1998).

The Yelm Highway corridor serves a wider radius of potential development in southeastern Thurston County extending toward the City of Yelm and surrounding rural areas. This region has experienced rapid development over the last 10 years, and further development has the potential to degrade water

quality or critical areas in other portions of the Deschutes River basin. However, this project is not expected to substantially induce growth or alter land-use patterns. Furthermore, Thurston County's critical areas ordinances and stormwater guidelines are adequate to protect the quality of any surface waters or critical areas that either directly support Chinook salmon or drain into those salmon-bearing waters. The project will comply with the most recent WSDOT *Highway Runoff Manual*. The Yelm Highway expansion will not have adverse indirect effects on Chinook salmon or their habitat.

(Although not affecting Chinook salmon directly or indirectly, project plans to divert existing stormwater from Hewitt Lake may have a beneficial effect on the water quality of the lake, thereby potentially conferring a benefit to foraging bald eagles, as well as other lake uses by people and other fish and wildlife.)

6.1.3 Cumulative, Interrelated, or Interdependent Effects

For the reasons stipulated in Section 6.1.2, no cumulative, interrelated, or interdependent effects on Chinook salmon are anticipated as a result of this project.

6.1.4 Determination

Parametrix biologists concluded that the proposed project will neither affect adult or juvenile Chinook salmon in the Deschutes River or the Nisqually River nor substantially degrade their current or potential habitat. Therefore, Parametrix has determined that the project will have **no effect** on Chinook salmon. Furthermore, if critical habitat for Chinook salmon is finalized as proposed by NOAA Fisheries, the project **will not result in the destruction or adverse modification** of Chinook salmon critical habitat. The "Checklist for Documenting Environmental Baseline and Effects of Proposed Actions(s) on Relevant Indicators" form, which is typically used to help guide a determination, is not used in this case since no streams, rivers, or other significant bodies of water are located within the project area.

6.2 EFFECTS ANALYSIS FOR BULL TROUT

6.2.1 Direct and Indirect Effects

Any direct and indirect effects on bull trout that may result from the Yelm Highway Phase V expansion are similar to those described above for Chinook salmon (Sections 6.1.1 and 6.1.2).

6.2.2 Cumulative, Interrelated, or Interdependent Effects

For the reasons stipulated in Section 6.1.2, no cumulative, interrelated, or interdependent effects on bull trout are anticipated as part of this project.

6.2.3 Determination

The determination for bull trout would be the same as that for Chinook salmon (Section 6.1.4). Based on the project design, project activities, and the BMPs discussed in Section 7, it was concluded that the project would have **no effect** on bull trout. Furthermore, if critical habitat for bull trout is finalized as proposed by USFWS, the project **will not result in the destruction or adverse modification** of bull trout critical habitat.

6.3 EFFECTS ANALYSIS FOR BALD EAGLES

6.3.1 Direct and Indirect Effects

There will be no direct or indirect effects upon bald eagles. The nearest bald eagle nest site is over 2 miles away from the Yelm Highway construction project area; therefore, construction activities will not affect the eagles' nesting behavior. Construction will not require any pile driving or activities that cause extensive vibration. Construction will not involve the removal of potential roosting trees nor will it influence the quality of any water bodies that support the forage base upon which eagles depend. Construction may disturb eagles as they hunt in the project vicinity, particularly at Hewitt Lake or Ward Lake, but any disturbance would be temporary in nature; other suitable foraging habitat exists in the surrounding area. Stormwater will not affect water quality in any adjacent water body or the groundwater aquifer because runoff from the highway will be retained and infiltrated according to guidelines in the WSDOT *Highway Runoff Manual*.

6.3.2 Cumulative, Interrelated, and Interdependent Effects

The project has no interrelated or interdependent actions that would have a negative effect on bald eagles. Because there are no direct, indirect, or interrelated negative effects, there would be no negative cumulative effects.

Project plans to divert existing stormwater from Hewitt Lake may have a beneficial effect on the water quality of the lake, thereby potentially conferring a benefit to foraging bald eagles, as well as other lake uses by people and other fish and wildlife.

6.3.3 Determination

Based on the above assessment, the Phase V expansion of Yelm Highway will have **no effect** on bald eagles.

6.4 EFFECTS ANALYSIS FOR ORCA

NMFS has completed an update on the status review of Southern Resident killer whales (*Orcinus orca*) under ESA (NMFS 2004). Based on the review of the best available science, NMFS is proposing to list the Southern Resident killer whales as threatened. Because of the project location (nearshore and upland areas) and the fact the project will not degrade water quality or result in impacts to killer whale prey species, the project does not have the potential to present an adverse effect. If listed as threatened, the effects determination for Southern Resident killer whales would be **no effect**.

7. CONSERVATION MEASURES

Conservation measures and general BMPs that will be implemented for the proposed project include the following:

- Employ Best Management Practices (BMPs) during construction of the road corridor to minimize the potential for fine sediment to enter Hewitt Lake. These BMPs may include deployment of silt fences and swales, timely stabilization of cuts and fills by covering with landscape cloth, and re-establishing cover vegetation as quickly as possible.

- Install inserts to catch sediment at all existing catch basins affected by the project.

- Comply with the most recent WSDOT stormwater manual.

- Locate equipment staging areas 100 feet or more away from Hewitt Lake, stream channels, wetlands, or drainage structures. Servicing and refueling of vehicles will not occur within 100 feet of streams and wetlands to reduce potential spills of petroleum and hydraulic fluids in sensitive areas.

- Spill control and emergency response plans will be implemented for fueling and concrete activity areas.

- No wet or curing concrete, including wash-out of equipment, will enter project waters. Any runoff from activities involving wet or curing concrete activities will be isolated from sensitive areas and drainage features.

- Clearing limits will be delineated with fencing or flags prior to any ground-disturbing activities and maintained throughout construction.

- Boulders, rock, woody materials, and other natural construction materials used for the project must be obtained from outside of the riparian area.

- BMPs will be monitored during and after the intersection improvements.

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APPENDIX A

Agency Response Letters

APPENDIX B

Essential Fish Habitat

ESSENTIAL FISH HABITAT

EFFECTS ANALYSIS FOR ESSENTIAL FISH HABITAT

Essential Fish Habitat

The Magnuson-Stevens Act requires proposed projects with a federal nexus to be evaluated as to impacts on habitat of commercially managed fish populations. EFH has been defined for the purposes of the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NMFS 2000a). NOAA Fisheries has further added the following interpretations to clarify this definition:

- "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate;
- "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities;
- "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and
- "Spawning, breeding, feeding, or growth to maturity" covers the full life cycle of a species.

NOAA Fisheries has recently proposed EFH for Pacific Coast salmon, including Chinook and coho salmon, within Amendment 14 to the Pacific Coast Salmon Plan (NMFS 2000a). Chinook and coho salmon are potentially present within the action area. Therefore, EFH for this species exists within the action area.

EFFECTS ANALYSIS FOR ESSENTIAL FISH HABITAT

The determination of the effects of the proposed project on EFH is made pursuant to Section 305(b)(2) of the Magnuson-Stevens Act. Under this act, federal agencies are required to consult with NOAA Fisheries regarding any of their actions or proposed actions authorized, funded, or undertaken that may "adversely affect" EFH. "Adverse effect" means any impact that reduces the quality and/or quantity of EFH, that can include 1) direct (e.g., contamination or physical disruption), 2) indirect (e.g., loss of prey, reduction in fecundity of the species), or 3) site-specific/habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Cumulative impacts are incremental impacts occurring within a watershed or marine ecosystem context that may result from individually minor but collectively significant actions. The assessment of cumulative impacts is intended in a generic sense to examine actions occurring within the watershed or marine ecosystem that adversely affect the ecological structure or function of EFH. The assessment should specifically consider the habitat variables that control or limit a managed species' use of a habitat. It should also consider the effects of all impacts that affect either the quantity or quality of EFH. For any federal action that may adversely affect EFH (except those activities covered by a General Concurrence) federal agencies must provide NMFS with a written assessment of the effects of that action on EFH. Federal agencies may incorporate an EFH Assessment into documents prepared for other purposes such as Section 7 Biological Evaluations or Assessments.

PACIFIC COAST SALMON

NOAA Fisheries has recently proposed EFH for Pacific Coast salmon, including Chinook and coho salmon, within Amendment 14 to the Pacific Coast Salmon Plan (NMFS 2000a). Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside of EFH, such as upstream and upslope activities that may have an adverse effect on EFH.

Chapter 3, Section 3.2.5.5 of Amendment 14 (NMFS 2000a) addresses construction/urbanization impacts upon salmon habitat. Construction projects can significantly alter the land surface, soil, vegetation, and hydrology, and adversely impact salmon EFH through habitat loss or modification. Among numerous types of non-fishing activities that may affect EFH (should BMPs fail), those possibly applicable to the project area include those that would:

- Alter sediment delivery to, and quantity in, streams and estuaries.
- Alter water flow, quantity, timing, temperature, or chemistry.
- Alter the amount or types of nutrients or prey.
- Discharge pollutants, nutrients, or contaminants.

The construction timing, nature of construction work, and the use of BMPs during construction will avoid and minimize any potential effects upon salmon. Examples of BMPs, as stated in the NMFS (1999b) EFH guidance, include minimizing the time that disturbed lands are left exposed; using erosion prevention and sediment control methods; minimizing vegetation disturbance; maintaining buffers of vegetation around wetlands, streams, and drainage ways; avoiding building activities in areas of steep slopes with highly erodible soils; and using methods such as sediment ponds, sediment traps, or other facilities designed to slow water runoff and trap sediment and nutrients. Specific conservation measures taken are addressed in Section 7, and potential effects on EFH are listed in Section 6.

Direct and Indirect Effects

Potential impacts of the proposed project to ESA listed fish species are discussed in Section 4 in this BA. Enhanced stormwater treatment and infiltration will eliminate negative effects to the water quality and quantity of project area streams. Strict adherence to BMPs (see Section 7) will also protect water quality and habitat. As such, there should be no direct, indirect, or cumulative adverse effects upon Pacific Coast salmon EFH during project construction.

Determination

Based on the EFH requirements of Pacific Coast salmon species, BMPs, and conservation and mitigation measures proposed as part of the project, the determination for EFH is **no effect**.

APPENDIX C

Pertinent Life History: Chinook Salmon, Bull Trout, and Bald Eagle

PERTINENT LIFE HISTORY

Chinook Pertinent Life History

Adult Chinook salmon return to the Deschutes River in August and September and spawn as late as October (Wydoski and Whitney 1979). All adult Chinook salmon die after spawning (Wydoski and Whitney 1979). Following spawning, Chinook salmon eggs hatch in about 2 months, though the amount of time required for incubation depends primarily upon water temperatures (Wydoski and Whitney 1979; Healey 1991). Alevins emerge from redds in the river bed and may emigrate immediately downstream toward Puget Sound or rear for a period of months before emigrating in late summer. Newly emerged Chinook salmon fry readily select territories along stream margins with abundant brush and woody debris for cover. Low-velocity nonturbulent habitats are important for initial rearing of Chinook salmon fry; as they grow, they tend to select faster and deeper water, using brush cover when it is available (Hillman and Chapman 1989).

Typically, juvenile Chinook salmon in Puget Sound rivers migrate to the marine environment during their first year of life (Myers et al. 1998). These Chinook salmon are called "ocean-type" due to their short freshwater residence and because the majority of their rearing occurs in the nearshore marine environment. Ocean-type Chinook salmon generally migrate downstream in the spring, just months after emerging from the gravel, or during the summer and autumn after a brief period of rearing in freshwater (Healey 1991; Myers et al. 1998). Juvenile Chinook salmon that remain in freshwater after emergence may migrate to the ocean any time of year, though most Chinook salmon within a population tend to migrate at similar times and ages (Healey 1991).

The majority of the diet of juvenile Chinook salmon while in fresh water consists of invertebrates. Chinook salmon generally feed on insects in the water column or drifting at the surface (Healey 1991). After emigrating from freshwater, these ocean-type Chinook salmon tend to use estuaries and coastal areas for rearing where they feed on small crustaceans and insects (Wydoski and Whitney 1979; Healey 1991). As juvenile Chinook salmon grow, they tend to eat more larval and juvenile fishes, including herring (*Clupea pallasi*), anchovies (*Engraulis mordax*), sand lance (*Ammodytes hexapterus*), surf smelt (*Hypomesus pretiosus*), and rockfish (*Sebastes spp*.).

Bull Trout Pertinent Life History

Bull trout are found in a variety of habitats including lakes, reservoirs, large rivers, and small streams, but primarily inhabit colder streams (Rieman and McIntyre 1993). Habitat components that influence bull trout distribution and abundance include temperature, cover, channel form and stability, valley form, spawning and rearing substrates, and migratory corridors (Rieman and McIntyre 1993; USFWS 1998a). Migratory bull trout move between multiple habitats during their life cycle, while the nonmigratory form maintains a relatively small home range, typically completing their life cycle in small headwater streams.

Four life history forms are generally recognized for bull trout, which include resident (non-migratory), adfluvial (lake dwelling), fluvial (migratory stream and river dwelling), and anadromous fish (saltwater migratory). The Coastal-Puget Sound population segment of bull trout is unique because it is thought to contain the only anadromous forms of bull trout within the coterminous United States (USFWS 1998b). The status of the migratory (fluvial, adfluvial, and anadromous) forms are of greatest concern throughout most of their range. The majority of the remaining populations in some areas may be largely composed of resident bull trout (Leary et al. 1991; Williams and Mullan 1992).

Bull trout have a wide but very patchy distribution across their range, even in pristine environments (Rieman and McIntyre 1993). Bull trout have been extirpated from many of the large rivers within their historic range and exist primarily in isolated headwater populations. The decline of bull trout has been attributed to habitat degradation, blockage of migratory corridors by dams, poor water quality, the introduction of non-native species, and the effects of past fisheries management practices (USFWS 1998b). Anadromous bull trout are known to migrate extensively and to enter rivers other than their natal system to feed or spawn (Armstrong 1984). These migrant fish are less likely to reach upstream tributaries.

Information on the extent and distribution of migrating char is limited. Sub-adult char return to the rivers at 9.8 to 13.8 inches in length. After overwintering in freshwater, some re-enter marine waters in late February. Most anadromous char appear to reach maturity after their second migration to marine waters. Many of these fish return to freshwater from late May through early July to begin their spawning migration to upstream areas (Kraemer 1994).

The anadromous life-history form of bull trout is poorly studied (USFWS 1999). For many years, it was thought that anadromous char in Washington were Dolly Varden and that freshwater char were bull trout. There is conclusive evidence that anadromous bull trout populate Puget Sound (Kraemer 1994), and anecdotal evidence suggests these native char were once much more abundant (USFWS 1999). In Washington State, bull trout and Dolly Varden, two closely related char species, coexist and are managed as a single species. Separate inventories are not maintained by WDFW due to the considerable biological similarities in life history and habitat requirements that exist between the two species. Although historical reports of char may have specified either bull trout or Dolly Varden, methodologies for reliably distinguishing between the two have only recently been developed and have not yet been widely applied (WDFW 1998).

Bull trout are considered to be optionally anadromous (i.e., the survival of individuals is not dependent upon whether they can migrate to sea), in contrast to obligate anadromous species like pink (*Oncorhynchus gorbuscha*) and chum salmon (Pauley 1991). Nonetheless, the anadromous life history form is important to the long-term persistence of bull trout and their metapopulation structure. Anadromous fish are generally larger and more fecund than their freshwater counterparts, and migratory forms play an important role in facilitating gene flow among subpopulations.

Bull trout are believed to be restricted in their spawning distribution by water temperature. Bull trout spawn in late summer and early fall (Bjornn 1991). Locally, anadromous forms typically return to fresh water in late summer and fall to spawn in upper tributaries and headwater areas. Puget Sound stocks typically initiate spawning in late October or early November as water temperature falls below 7ºC to 8ºC. Spawning habitat almost invariably consists of very clean gravel, often in areas of groundwater upwelling or cold spring inflow (Goetz 1994). Egg incubation temperatures needed for survival have been shown to range from 2ºC to 4ºC (Willamette National Forest 1989). Bull trout eggs require approximately 100 to 145 days to hatch, followed by an additional 65 to 90 days of yolk-sac absorption during alevin incubation. Thus, in-gravel incubation spans more than 6 months. Hatching occurs in winter or late spring, and fry emergence occurs from early April through May (Rieman and McIntyre 1993).

Generally, for their first 1 to 2 years, bull trout juveniles rear near their natal tributary and exhibit a preference for cool-water temperatures (Bjornn 1991), although they appear less restricted by temperature than spawners. Newly emerged bull trout fry are often found in shallow, backwater areas of streams that contain woody debris. Later, or in other habitats lacking woody debris for refugia, fry are bottom dwellers and may occupy interstitial spaces in the streambed (Brown 1992).

Bald Eagle Pertinent Life History

Nesting, foraging, and perching habitat for bald eagles is typically associated with water features such as rivers, lakes, and coast shorelines where eagles prey upon fish, waterfowl, and seabirds (Stalmaster 1980, 1983, 1987). During breeding season, eagles establish and maintain territorial boundaries, and breeding birds will rarely be found in high numbers. Breeding eagles show strong fidelity to a particular nesting territory and will prevent other eagles from entering it (Grubb 1980). Territories frequently contain two or more nests but will be used exclusively by one breeding pair, thereby reducing competition for local food resources. Suitable nesting habitat for bald eagles is typically found in mature forests that contain large, dominant trees for nesting and that are located in close proximity to aquatic foraging habitat (Anthony and Isaacs 1989). Douglas fir appears to be the most common tree species used for nesting in forests of western Oregon and Washington. Lack of suitable nesting habitat has been shown to be limiting a factor for population growth in some raptors (Newton 1979). Unoccupied nests may indicate suitable physical habitat attributes are available, but human activity precludes their successful use (Anthony and Isaacs 1989).

Foraging and perching habitat in winter is typically the same as the nesting season. Bald eagles prefer high structures for perching such as large trees along the shoreline but will also use cliffs, pilings, and open ground. They are usually seen foraging in open areas having wide views (Stalmaster and Newman 1979). Perch sites may be used for a number of activities including hunting, prey consumption, and resting. Perches are most often associated with food sources near water and will have visual access to adjacent habitats (Stalmaster and Newman 1979).

Bald eagles may spend nights together in communal roosts, especially during extreme weather. Many roosts are traditional sites that are used repeatedly and are typically located in areas where the eagles have protection from the weather and are away from human activity (Hansen et al. 1980).

APPENDIX D

Project Plans

APPENDIX E

Project Area Photos