3.3 Wetlands

Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (Environmental Laboratory 1987). This definition has been expanded in Pierce County: wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including but not limited to irrigation *and* drainage ditches, grass-lined swales, canals, detention facilities, retention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. However, wetlands include those artificial wetlands intentionally created from non-wetland sites to mitigate conversion of wetlands.

This wetland definition considers the three main attributes common to all wetlands: hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation can be defined as plant life growing in areas that are at least periodically deficient in oxygen as a result of excessive water content (Federal Interagency Committee for Wetland Delineation 1989). Hydric soils are frequently wet and often associated with wetlands. Hydric soils occupy a relatively minor portion of the project area and have been identified as Briscot loam, Puget silty clay loam, and Tisch silt. Wetland hydrology occurs where the soil is saturated with water or covered by shallow water consecutively for a substantial period (usually one to two weeks) during the growing season. Inundation and saturation lead to anaerobic soil conditions, which precipitate the development of hydric soils and hydrophytic vegetative communities.

As required by the Washington State Growth Management Act (HB 2929), Pierce County, the City of Fife, and the City of Puyallup have completed wetland inventories and passed ordinances regulating wetlands. Wetlands in the project area are classified as palustrine, which includes non-tidal wetlands dominated by trees, shrubs, or emergents such as reed canarygrass and tidal wetlands where salinity due to ocean-derived salts is below 0.5 parts per thousand (Cowardin et al. 1979).

Wetlands provide a number of functions and values in the biological, hydrological, and societal landscape. They serve to store both surface and subsurface water. This storage can reduce peak water flow after a storm or flood, recharge water tables and aquifers, and lengthen stream flow period. Because of their landscape geomorphic position and adapted vegetation, many wetlands are particularly adapted to attenuating stormwater pulses. Wetlands can remove pollutants such as zinc, lead, nitrogen, phosphorus, and some organic contaminants. The ability to treat stormwater is highly site-specific, depending greatly upon soil type, hydrologic regime, landscape position and vegetative community. Wetlands may provide breeding, foraging, resting, and migrating habitat for wildlife and may support native and rare plant species. Wetlands can also function as recreational or educational sites.

Wetlands are sensitive resources, and their functions and values may be adversely impacted by hydrologic alterations, sediment or pollutant loads, fragmentation, invasive species introductions, or filling and grading. These

activities may affect wetland hydrology, water quality, and plant and animal migration, may precipitate invasion by plant and animal pests, and may increase wildlife-vehicle collisions.

Regulatory Authority

The responsibility for wetland protection is generally shared by one or more federal, state, and local agencies. Because no universal permit requirements exist, the wetland process for this project would likely have to meet the requirements of more than one regulatory agency. The following guiding plans and policies may apply to the wetlands in the analysis area.

Federal Regulations

- Clean Water Act (CWA) (1972)
- Executive Order (EO) 11990, Protection of Wetlands

State Regulations

- Washington State Department of Transportation (WSDOT) and Washington Department of Fish and Wildlife (WDFW) Memorandum of Agreement Implementing Wetlands Protection and Management (1993)
- Alternative Mitigation Policy Guidance, Washington State Department of Ecology (Ecology) and WDFW (2000)
- Working Agreement between the U.S. Army Corps of Engineers (COE), Federal Highway Administration (FHWA), and WSDOT (1993)
- State Shoreline Management Act (SMA) (1972)

Local Regulations

- Local critical or sensitive area regulations for wetlands and streams for the cities of Puyallup and Fife as well as Pierce County

The above listed regulations define the sequencing to address impacts to wetlands due to alterations in the landscapes. This sequence for avoiding, minimizing, and mitigating for wetland impacts would be followed throughout the design and permitting process. Avoidance and minimization measures are discussed further in Section 3.3.5, Mitigation Measures.

Section 404 of the CWA requires a permit for discharging, dredging, or placing fill material within waters of the United States, including wetlands. The COE is responsible for authorizing 404 impacts. The COE requires the permittee to restore, create, enhance, or preserve nearby wetlands as compensation for impacts to existing wetlands. An individual 404(b) permit would be required for the placement of fill material. A Joint Aquatic Resource Permits Application (JARPA) is used to apply for COE wetland permits, including 404(b) permits.

Under CWA Section 401, COE Section 404(b) permits are sent to Ecology for certification of compliance with state water quality standards. The proposed project would require a certification of compliance from Ecology. Finally, a 20-day public notice period is required prior to issuance of the final COE permit that authorizes construction in waters of the U.S.

Wetlands and special aquatic sites are protected under Presidential EO 11990,"Protection of Wetlands," Governor's EO 89-10 and EO 90-04, "Protection of Wetlands," and WSDOT Directives 22-27 and 31-12. These orders and directives require the use of all practicable measures to avoid impact and provide mitigation for any unavoidable impacts.

Critical or Sensitive Areas Ordinances protect locally designated wetlands. Local agencies may regulate wetlands that are not covered by state or federal regulations, and their regulations may be more restrictive. WSDOT projects must comply with local laws, except when they conflict with state law.

Local governments are also responsible for implementing the SMA, with assistance from Ecology. Under the SMA, a permit is required for projects involving substantial development of waters or shorelines of the state. SMA requirements and guidelines are presently being revised. Applications for SMA permits are covered by JARPA.

The Tier I process concluded that the preferred corridor alternative would be the least environmentally damaging practicable alternative. This corridor alternative affects 32.9 acres of wetlands, compared to 37.89 acres and 44.08 acres for other practicable alternatives (see revised Tier I results in Section 4.1.3).

Potential wetlands were identified during the Tier I process and delineated as part of the Tier II process; acreage of wetland impact was determined for the preferred alternative. FHWA and WSDOT will apply all practicable avoidance and minimization measures during final design. The Tier II process includes a description of planned mitigation measures.

Because much of the proposed highway corridor bisects agricultural land, several of the wetlands identified during project work are located in areas that are being actively farmed. Such wetlands may be designated Farmed Wetlands or Prior Converted Cropland and are regulated by the Natural Resources Conservation Service under the Food Security Act. Wetlands that are not associated with farming activities are regulated by the COE under Section 404 of the CWA. However, because FHWA and WSDOT are proposing to convert farmland to a non-agricultural use, the COE would assert jurisdiction over all farmed wetlands in the analysis area.

In addition, Ecology regulates wetlands on the state level under their CWA Section 401 Water Quality certification program. Ecology does not differentiate wetlands associated with farming activities from those that are not. Because of these factors, WSDOT delineated all wetlands with the assumption that both the COE and Ecology would regulate all wetlands associated with this project. FHWA and WSDOT based proposed mitigation on all wetlands impacted, regardless of whether they are farmed.

3.3.1 Studies Performed and Coordination Conducted

This chapter incorporates information compiled in the *SR 167 Tier II EIS Wetlands Discipline Report* (CH2M HILL 2005). U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps; Pierce County, city of Fife, and city of Puyallup wetland inventory maps; and field studies were used to identify wetlands in the project area. NWI data identify 3,014 acres of wetlands in the lower Puyallup River Watershed (Water Resource Inventory Area [WRIA] 10).

Wetlands within the project area were delineated between 1994 and 2004. The delineation methods used in these studies were similar, but the delineations were conducted with different study areas and for different purposes. The delineated wetlands are described in the *SR 167 Tier II EIS Wetlands Discipline Report* (CH2M HILL 2005). Wetlands delineated from 1994 to 1997 are described in further detail in Null and Clay-Poole (1997). Wetlands delineated by CH2M Hill in 2003 and 2004 are described in further detail in the *Wetland Delineation Report for the Proposed Wapato Creek Restoration Area* (CH2M HILL 2004a) and the *Wetland Delineation Report for Wapato Creek Park and Ride Facility* (CH2M HILL 2004b). During final design and permitting, wetland delineation and categorizations older than three years will be revisited, and the COE will be invited upon confirmation of wetland impacts prior to construction to review final delineation and categorization in the field.

Wetland determinations were made using observable vegetation, hydrology, and soils, in conjunction with data from Soil Survey for Pierce County, Washington (USDA 1979), United States Geological Survey (USGS) topographic maps, and NWI maps of the USFWS. Wetland delineations were made in accordance with the COE *Wetland Delineation Manual* (Environmental Laboratory 1987). Wetland delineation and categorization was reviewed in the field and approved by the COE on April 27, 2000. Wetlands were classified according to the USFWS system (Cowardin et al. 1979) and categorized according to the Ecology rating system (Ecology 1993) and using the 1997 *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997). The *Wetland Functions Characterization Tool for Linear Projects* (WSDOT 2000) was used to perform a functional assessment of each wetland.

Some ditch areas dug in uplands for drainage purposes may exhibit hydrology and hydrophytic vegetation. At the time that the wetlands were delineated for this project, ditches intentionally excavated through uplands were not typically regulated as wetlands according to guidance from the regulatory agencies (COE and Ecology). Subsequently, guidance on ditches resulting from the recent U.S. Supreme Court decision (referred to as the Talent decision) has recently become available. Therefore, before initiating permitting, these areas should be examined to determine if they may now be jurisdictional under the Clean Water Act, Section 404 program.

Ecology staff at the Wetlands Section and Environmental Review Section was contacted and apprised of the project in advance of Tier I completion. Coordination with federal, state, and local agencies, and the Puyallup Tribe of Indians continued as part of the Tier II process. This coordination included

opportunities to comment on revisions to the discipline report between the DEIS and FEIS.

3.3.2 Affected Environment

Seventy-two jurisdictional wetlands were located and delineated in the project area (Figures 3.3-1 and 3.3-2). There are 12 Category II, 59 Category III, and 1 Category IV wetlands. Wetlands in the project area are found in the Hylebos, Wapato, and Lower Puyallup Basins. Wetlands in the project area include riverine and palustrine systems, which are defined by Cowardin (1979) as follows:

- Riverine systems include all wetlands and deepwater habitats contained within a channel, which is further defined as an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

- Palustrine systems include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent.

Most delineated wetlands are palustrine. These include palustrine emergent (i.e., Cowardin codes that start PEM), palustrine forested (PFO), palustrine scrub-shrub (PSS), and palustrine (PUS). Some of the wetlands in the project area are associated with ditches and dredged stream channels. Existing conditions of project area wetlands in each Basin are summarized below.

Biologists categorized wetlands in the analysis area according to Ecology's rating system (Ecology 1993). This rating system was designed to differentiate between wetlands based on wetland functions and values, sensitivity to disturbance, rarity of the wetland type, and whether the wetland can be replaced. Category I is the highest rating and refers to only a small percentage of wetlands in Washington State. Category II wetlands are those that provide habitat for very sensitive or important plants or animals, are difficult to replace, or have very high function values, particularly for wildlife. These wetlands occur more commonly than Category I wetlands, but still need a high level of protection (buffer). Category III wetlands provide important functions and values but are more common than the Category II wetlands. Category III wetlands require a moderate level of protection. Category IV wetlands are the smallest, most isolated, have the least diverse vegetation, and are often dominated by invasive or exotic species.

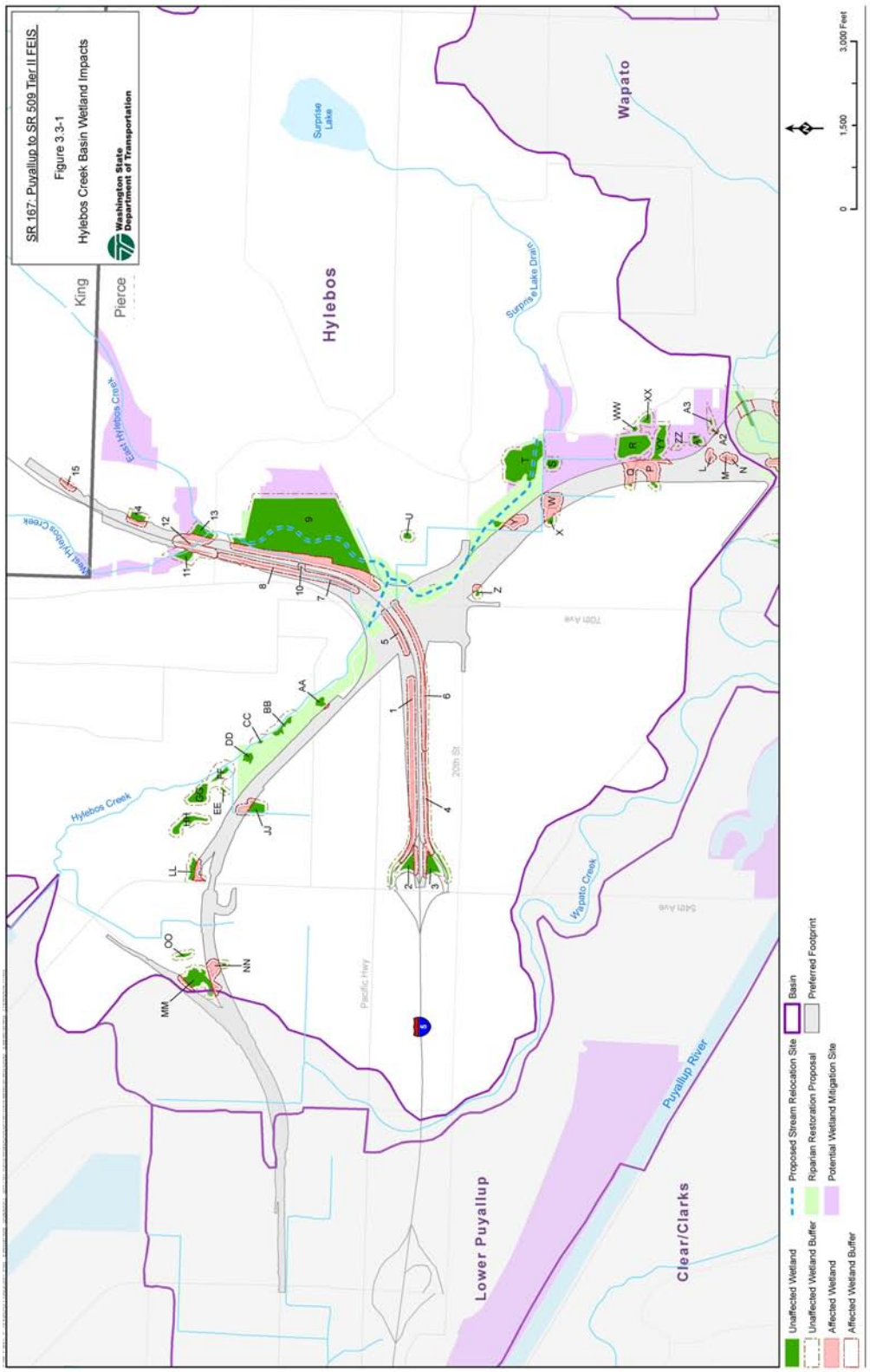
Hylebos Basin

Most of the wetlands in the project area are found in the Hylebos basin (Table 3.3-1). Many of these wetlands are associated with either Hylebos Creek or Surprise Lake Drain. Representative wetland conditions are shown in the photographs that follow Figure 3.3-1.

Four of these wetlands are Category II wetlands and the remaining 44 are Category III, according to the Ecology rating system. Wetlands 1 through 15 are all primarily palustrine emergent wetlands that are adjacent to I-5 between the county line and 54th Avenue East (Figure 3.3-1). Many other wetlands are farmed.

Table 3.3-1: Wetland Classes and Ratings for Hylebos Basin

Wetland	Area (acres)	Cowardin Class	Ecology Category	Prior Converted / Farmed Wetland
L	0.17	PUS3E	III	FW
M	0.14	PUS3E	III	FW
N	0.14	PUS3E	III	FW
P	1.9	PFO1E	III	NA
Q	1.2	PFO1E	III	NA
R	4.3	PUS3E	III	FW
S	0.78	PUS3E	III	FW
T	8.2	PUS3E	III	FW
U	0.34	PUS3E	III	PC
W	1.3	PUS3E	III	FW
X	0.85	PUS3E	III	FW
Y	1.4	PUS3E	III	FW
Z	0.22	PUS3E	III	PC
AA	0.57	PUS3E	III	FW
BB	0.84	PFO1E	II	NA
CC	0.13	PEM1E	III	NA
DD	0.66	PEM1E	III	NA
EE	0.12	PUS3E	III	FW
FF	0.56	PEM1E	II	NA
GG	1.8	PUS3E	III	FW
HH	1.5	PUS3E	III	FW
JJ	1.5	PUS3E	III	PC
LL	1.2	PFO1E	III	NA
MM	3.2	PEM1E	III	NA
NN	0.79	PEM1E	III	NA
OO	0.32	PEM1E	III	NA
WW	0.20	PEM2Ef	III	FW
XX	0.60	PEM1E	III	FW
YY	2.3	PEM2Ef	III	FW
ZZ	0.06	PEM2Ef	III	FW
1	3.2	PEM1E	III	NA
2	1.2	PEM1E	III	NA
3	1.6	PEM1E	III	NA
4	1.5	PEM1E	III	NA
5	0.35	PEM1E	III	NA
6	1.3	PEM1E	III	NA
7	0.49	PEM1E	III	NA
8	0.51	PEM1E	III	NA
9	49.7	PEM1E	III	NA
10	0.02	PEM1E	III	NA
11	1.3	PEM1E	II	NA
12	0.26	PEM1E	II	NA
13	2.2	PEM1E	III	NA
14	0.92	PEM1E	III	NA
15	0.14	PEM1E	III	NA
A1	0.50	PEM2Ef	III	FW
A2	0.10	PEM2Ef	III	FW
A3	0.12	PEM2Ef	III	FW
Total	**102.7**			


SR 167: Puyallup to SR 509 Tier II FEIS
Figure 3.3-1
Hylebos Creek Basin Wetland Impacts
Washington State Department of Transportation
King
Pierce
Hylebos
Wapato
Surprise Lake
Surprise Lake Drain
East Hylebos Creek
West Hylebos Creek
Hylebos Creek
Wapato Creek
Puyallup River
Lower Puyallup
Clear/Clarks
Pacific Hwy
20th St
70th Ave
54th Ave
0
1,500
3,000 Feet
Unaffected Wetland
Unaffected Wetland Buffer
Affected Wetland
Affected Wetland Buffer
Proposed Stream Relocation Site
Riparian Restoration Proposal
Potential Wetland Mitigation Site
Basin
Preferred Footprint

Existing Hylebos Creek in the Vicinity of I-5

Existing Surprise Lake Drain West of Freeman Road

Wetland 9 East of I-5, Dominated by Reed Canarygrass

Wetland CC between Hylebos Creek and 62nd Avenue East

Wapato Basin

Eight of the wetlands in the Wapato Basin are classified as Category II, eight as Category III, and one as Category IV, according to the Ecology rating system (Table 3.3-2). Seven of the wetlands are closely associated with the riparian corridor of Wapato Creek (Figure 3.3-2). Representative conditions are shown in the photographs following Figure 3.3-2.

Table 3.3-2: Wetland Classes and Ratings for Wapato Basin

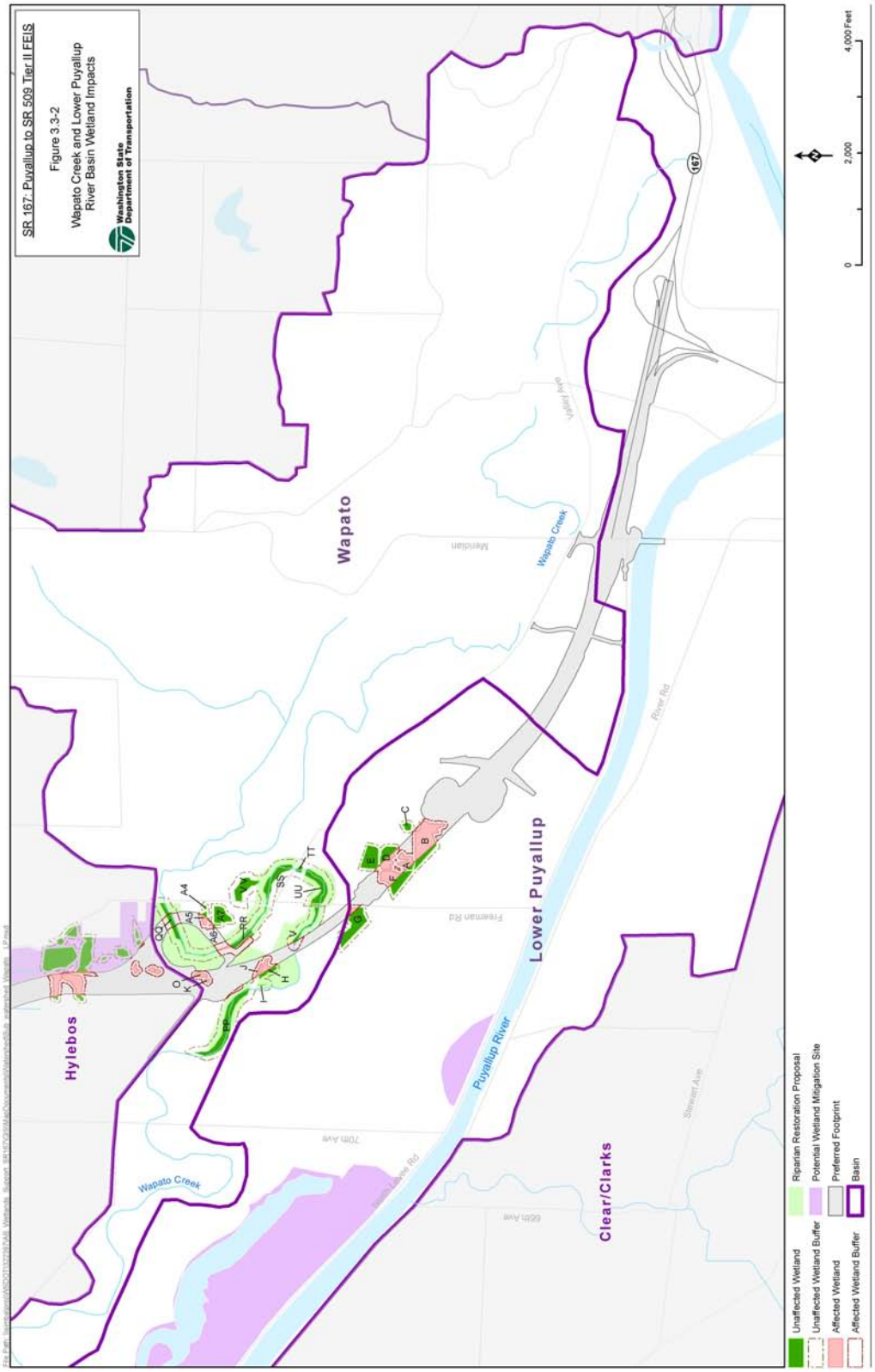
Wetland	Area (acres)	Cowardin Class	Ecology Category	Prior Converted / Farmed Wetland
H	0.96	PUS3E	III	FW
I	0.01	PSS1E	II	NA
J	0.18	PEM1E	III	NA
K	0.09	PUS3E	III	PC
O	0.28	PUS3E	III	PC
V	0.68	PEM1E	II	NA
PP	3.8	PEM1C, PFO1C	II	NA
QQ	1.5	PSS1E, PEM1E	II	NA
RR	1.8	PEM1E, PFO1E	II	NA
SS	2.0	PFO1E	II	NA
TT	0.2	PFO1E	II	NA
UU	2.3	PEM1E	II	NA
VV	1.8	PEM1E	III	FW
A4	0.04	PEM2Ef	III	FW
A5	0.38	PEM2Ef	III	FW
A6	0.08	PEM2Ef	IV	FW
A7	1.4	PEM2Ef, PSS1E	III	FW
Total	**17.5**			

Lower Puyallup Basin

Seven of the delineated wetlands in the Lower Puyallup basin are classified as Category III wetlands under the Ecology rating system (Table 3.3-3). Six of these wetlands are associated with agricultural fields. The seventh, Wetland G, is a mixed PEM/PSS wetland located west of Freeman Road (Figure 3.3-2).

Table 3.3-3: Wetland Classes and Ratings for Lower Puyallup Basin

Wetland	Area (acres)	Cowardin Class	Ecology Category	Prior Converted / Farmed Wetland
A	1.2	PUS3E	III	FW
B	5.0	PEM1E	III	NA
C	0.32	PUS3E	III	PC
D	2.0	PUS3E	III	PC
E	2.2	PUS3E	III	FW
F	2.8	PEM1E	III	NA
G	3.2	PEM1E/PSSE	III	NA
Total	**16.72**			


SR 167: Puyallup to SR 509 Tier II FEIS
Figure 3.3-2
Wapato Creek and Lower Puyallup River Basin Wetland Impacts
Washington State Department of Transportation
Wapato
Lower Puyallup
Hylebos
Clear/Clarks
Wapato Creek
Puyallup River
Freeman Rd
River Rd
70th Ave
Stewart Ave
Meridian
Valley Ave
Unaffected Wetland
Unaffected Wetland Buffer
Affected Wetland
Affected Wetland Buffer
Riparian Restoration Proposal
Potential Wetland Mitigation Site
Preferred Footprint
Basin
0
2,000
4,000 Feet

Wetland QQ Looking Southwest from Freeman Road

Wetland PP and Wapato Creek in Horse Pasture

Wetland V and Wapato Creek

Wetland UU and Wapato Creek

Wetland Vegetation

In general, three types of plant communities exist within wetlands in the project area: emergent, scrub-shrub, and forested wetlands. Freshwater emergent communities occur in wetlands within wet croplands and wet pastures. Freshwater emergent wetland communities within the project area are frequently dominated by reed canarygrass (*Phalaris arundinacea*) a non-native invasive weed, bentgrass (*Agrostis* spp.), fescue (*Festuca* spp.), soft rush (*Juncus effusus*), or creeping buttercup (*Ranunculus repens*). Slough sedge (*Carex obnupta*), Douglas' spiraea (*Spiraea douglasii*), Himalayan blackberry (*Rubus procerus*), and trailing blackberry (*R. ursinus*) are often found in scattered patches within freshwater emergent communities.

Scrub-shrub wetlands in the project area are typically dominated by willow, redosier dogwood (*Cornus sericea*), Douglas' spiraea, salmonberry (*Rubus spectabilis*), or Himalayan blackberry. The groundcover often contains creeping buttercup, lady fern (*Athyrium filix-femina*), reed canarygrass, and bentgrass. Forested wetlands are dominated by red alder, Oregon ash (*Fraxinus latifolia*), and black cottonwood (*P. balsamifera* ssp. *trichocarpa*) in the overstory and salmonberry in the understory. The groundcover is composed of slough sedge, creeping buttercup, false lily-of-the-valley (*Maianthemum dilatatum*), lady fern, and occasional skunk cabbage (*Lysichiton americanum*).

Soils

Most of the soils within the project area formed in alluvium. The Natural Resource Conservation Service Soil Survey of Pierce County Area, Washington, has mapped several soil series within the project area, including: Sultan silt loam, Briscot loam, Puyallup fine sandy loam, and Xerothents, fill area. Sultan soils dominate the project area, while the Briscot and Puyallup soils are mapped in scattered locations throughout the corridor. Minor amounts of other soil series, including Tisch silt, Puget silty clay loam, and Pilchuck fine sand, also occur within the preferred alignment. The Xerothents, fill areas are mapped at the northern end of the project, on the Port of Tacoma property that abuts SR 509. Of these soil series, Briscot loam, Tisch silt, and Puget silty clay loam are classified as a hydric soil by the Natural Resource Conservation Service. Actual soils observed in the area of the project are generally consistent with the soil survey.

Hydrology

Hydrology in the project area is mainly driven by floodwater and groundwater in the Puyallup River, its tributaries, and the independent drainages (Hylebos Creek, Wapato Creek, Surprise Lake Drain) in the project area. Many of the wetlands within the project area are supported by surface water retention, due to impermeable soils within the upper 12 to 18 inches of the soil profile.

Some ditched areas were observed to have hydrology and hydrophytic vegetation, but were not flagged as wetlands. Recent guidance on ditches resulting from the Talent decision was not available at the time wetlands and streams were delineated on this project. The ditches in the project area will be assessed and delineated as appropriate prior to initiation of project construction.

Wetland Rating System

No Category I wetlands occur in the analysis area. Twelve Category II wetlands occur in the study area, although only three would be impacted by proposed construction (see Section 3.3.3).

All but one remaining wetlands in the analysis area are Category III. One Category IV wetland is found in the project area – Wetland A6 in the Wapato Basin.

Before initiating permitting or preparing a final wetland mitigation plan, wetlands and ditches affected by this project will be reevaluated. Ecology recently released a new wetland rating system for Western Washington (Hruby 2004).

Functions and Values

Functions were described using two accepted methods: (1) the *Washington State Wetlands Rating System for Western Washington* (Ecology 1993) and (2) the *Wetland Functions Characterization Tool for Linear Projects* (WSDOT 2000). As described above, most of the wetlands being impacted are Category III, reflecting the decreased potential for providing functions because many of the wetlands are disturbed by farming or remain disturbed by past land uses such as farming. The existing functions of the wetlands in the project footprint are generally impaired.

The water quality and flood storage functions of these wetlands are generally moderate. The habitat functions are generally low. Using the WSDOT (2000) method, functions for wetlands to be impacted by the SR 167 Extension project were identified and are described in the *Wetlands Discipline Report* (CH2M HILL 2005). The primary functions of the Category III wetlands based on the functions assessment completed would be flood flow alteration, sediment and heavy metals retention, and nutrient and toxicant removal. Three of the Category III wetlands (P, Q, and LL) were classified as forested. Wetlands P and Q, which occur in a hybrid black cottonwood plantation previously owned by the Washington State University Cooperative Extension, may also have educational or scientific value as a publicly owned site that is used for biological research. Wetland LL was the only wetland that was rated as having a moderate potential for general habitat suitability and native plant richness.

The functions of the Category II wetlands associated with Wapato and Hylebos Creeks (i.e., 11, 12, RR, and V) are flood flow alteration, sediment and heavy metals retention, nutrient and toxicant removal, and erosion control and shoreline stabilization.

Due to the farmed nature of many of the wetlands within the project corridor, the functions of the wetlands are generally impaired, and appear to provide moderate physical functions (water quality and flood storage) but low biological functions (habitat). This results from the fact that many of these wetlands lack vegetation, have little or no vegetated buffers, are intensively farmed, and are located within a relatively developed setting. The biological functions of many of these wetlands are limited, but are provided at a higher level by other wetlands which

are vegetated and not being farmed (tilled). The wetlands within the corridor that provide higher levels of biological function are associated with or near Hylebos and Wapato Creeks, which is why they were rated as Category II. The farmed, unvegetated wetlands were rated as Category III wetlands. The functions of these wetlands have been evaluated in a similar fashion to other projects, and although the description of functions for each wetland may be brief, the primary functions likely to be provided are identified for each wetland.

3.3.3 Impacts of Construction

This section discusses short-term and long-term construction impacts to wetlands, wetland buffers, and wetland functions and values for the No Build and Build Alternatives.

No Build Alternative

No direct construction-related impacts to wetlands are expected under this alternative. However, the area would continue to undergo industrial, commercial, and residential development, with associated construction-related impacts. The existing rate of development under the No Build Alternative would not necessarily be the rate at which development would occur near the new interchanges under the Build Alternative.

Impacts on wetlands would be incremental in association with numerous small- and medium-sized commercial, industrial, and residential developments, which are expected on undeveloped lands throughout the project area. Mitigation of impacts would likely be small, isolated, and fragmented. Despite the goal of "no net loss" required by regulatory agencies and local jurisdictions, studies show that the goal is not being met. A recent study by Ecology found that 46 percent of the 24 mitigation projects evaluated were fully or moderately successful while 54 percent were judged to be minimally or not successful (Johnson et al. 2002). The study, however, did not include mitigation projects conducted by WSDOT, which have generally been successful.

Build Alternative (Preferred)

Direct impacts to wetlands under the Build Alternative would consist of a combination of temporary and permanent impacts. For the SR 167 Extension project, temporary wetland disturbances are those that will be necessary for implementing the stream relocation and restoration of wetlands within the riparian restoration areas (see Section 3.3.6, Riparian Restoration Proposal). Under the Build Alternative, a total of approximately 6.6 acres of wetlands could be temporarily impacted (Table 3.3-4).

Table 3.3-4: Temporary Wetland Impacts

Wetland	Wetland Acreage	Impacts (acres)	% of Wetland Impacted	Ecology Category	Cowardin Class	Sub-Basin
T	8.2	1.7	21	III	PEM2Ef	Surprise Lake Drain
Y	1.4	0.5	36	III	PUS3Ef	Surprise Lake Drain
9	50	4.4	9	III	PEM1E	Lower Hylebos
Total	**59.6**	**6.6**	**11**			

Under the Build Alternative, the area of wetland that could be permanently impacted ranges from 32.8 to 33.6 acres depending on the interchange options selected (Table 3.3-5). Impacts of the interchanges would vary depending upon the project option constructed. The maximum wetland buffer area that would be impacted, including both the mainline and highest-impact options, is approximately 58 acres.

Impacts of each option on wetlands and wetland buffers were compared using the environmental screening criteria described in Table 2-4 (Section 2.3).

All the wetland impacts occur within the Puyallup River watershed (WRIA 10). Approximately 72 percent (23.7 acres) of the impacts on wetlands occur in the Hylebos Basin. Approximately 23 percent (7.6 acres) of the impacts on wetlands occur in the Lower Puyallup Basin. Approximately five percent (1.6 acres) of the impacts on wetlands occur in the Wapato Basin.

The wetland impacts for each interchange and associated options are summarized below. Mainline impacts on wetlands are included with each associated interchange option. The *Wetlands Discipline Report* (CH2M HILL 2005) describes impacts on individual wetlands for each option.

SR 509/SR 167 Connection

No construction impacts are expected to be associated with the connection of SR 167 to SR 509.

54th Avenue East Partial Interchange

Wetland impacts for the two interchange options range from 1.7 acres for the Loop Ramp Option (preferred) to 2.1 acres for the Half Diamond Option. All the affected wetlands are Category III wetlands located in the Hylebos Basin.

Table 3.3-5: Range of Permanent Wetland Impacts

Interchange	Interchange Option Impacts (acres)	Mainline Impacts (acres)	Total Impacts (acres)
SR 509 / SR 167 Connection	0.0	0.0	0.0
54th Avenue East Partial Interchange			
- Loop Ramp Option – Preferred	0.38	1.30	1.68
- Half Diamond Option	0.81	1.30	2.11
Interstate 5 Interchange	0.0	18.8	18.8
Valley Avenue Interchange			
- Freeman Road Option	1.56	5.62	7.18
- Valley Avenue Option – Preferred	1.67	5.62	7.29
- Valley Avenue Realignment Option	1.91	5.62	7.53
SR 161 / SR 167 Interchange			
- Urban Interchange Option – Preferred	0.0	5.12	5.12
- Low Diamond Option	0.0	5.12	5.12
- Medium Diamond Option	0.0	5.12	5.12
Total Range of Wetland Impacts	1.94 – 2.72	30.84	32.78 – 33.56

Interstate 5 Interchange

Wetland impacts for the Interstate 5 interchange are 18.8 acres. This includes 16.4 acres of impact from road fill, and an additional 1.8 acres from channel excavation in wetlands to construct the relocated Hylebos Creek (1.1 acres in Wetland 9) and Surprise Lake Drain (0.7 acre in Wetland T). In addition, a berm to contain the floodplain will impact 0.6 acre of Wetland T. All of these impacts are located within the Hylebos Basin. All but 0.5 acre of the impact are to Category III wetlands. Wetlands 11 and 12 are Category II wetlands.

Valley Avenue Interchange

Wetland impacts for the three Valley Avenue interchange options include 7.18 acres for the Freeman Road Option, 7.53 acres for the Valley Avenue Realignment Option, and 7.29 acres for the Valley Avenue Option (preferred). Impacts under all three options are distributed throughout all three basins. The Freeman Road option would have the most impact to Category II wetlands (0.38 acre), and the Valley Avenue Option the least (0.12 acre).

SR 161 / SR 167 Interchange

Wetland impacts for the SR 161 / SR 167 interchange are 5.1 acres, which are the same for all three options. This impact includes two Category III wetlands, Wetlands A and B.

Wetland Impacts By Ecology Category

The wetland impacts by Ecology (1993) wetland category are summarized for the preferred alternative in Table 3.3-6. Only two percent (0.8 acre) of the wetlands to be impacted are Category II wetlands, which are associated with Wapato and Hylebos Basins. The overwhelming majority (98 percent or 32.1 acres) of the wetlands impacted are Category III wetlands. A very minor amount of Category IV wetlands (0.04 acre) would also be impacted.

Table 3.3-6: Wetland Impacts by Category for the Build Alternative

Wetland Category (Ecology, 1993)	Wetland Impacts (acres)	Percent of Total
II	0.8	2
III	32.1	98
IV	0.04	<1
Total	**32.94**	

Wetland Buffer Impacts

Under the Build Alternative, the area of wetland buffer that could be impacted ranges from 56.5 to 58.2 acres depending on the interchange options selected (Table 3.3-7). In most cases, existing buffers are in a state equally as degraded as the wetlands themselves. For example, some of the buffers lack vegetation entirely because they are regularly disturbed by farming. Others are regularly mowed during maintenance within the I-5 right-of-way or are regularly grazed by livestock. Others are dominated by non-native noxious weeds such as reed canarygrass. Virtually none of the existing buffers are dominated by native trees and shrubs.

Table 3.3-7: Range of Wetland Buffer Impacts for the SR 167 Extension Project

Interchange	Impacts in Acres (Mainline + Option)
SR 509 / SR 167 Connection	0.0
54th Avenue East Partial Interchange - Loop Ramp Option – Preferred - Half Diamond Option	 2.70 2.99
Interstate 5 Interchange	37.24
Valley Avenue Interchange - Valley Avenue Option – Preferred - Valley Avenue Realignment Option - Freeman Road Option	 13.84 14.73 15.28
SR 161 / SR 167 Interchange - Urban Interchange Option – Preferred - Low Diamond Option - Medium Diamond Option	 2.71 2.71 2.71
Total Range of Wetland Impacts	56.5 – 58.2

3.3.4 Impacts of Operation

No Build Alternative

No direct, project-related operation effects on wetlands would occur under this alternative.

Build Alternative (Preferred)

Potential operational impacts of the Build Alternative to wetlands are limited to those wetlands located immediately adjacent to roadway sections without stormwater collection or compost-amended fill slopes. Sediment and heavy metals retention, and nutrient and toxicant removal are primary functions of many of the wetlands in the project area. Stormwater BMPs will substantially reduce the potential for operational impacts on wetlands.

Many of these wetlands lack vegetation, have no vegetated buffers, are intensively farmed, and are located within a relatively developed setting. The wetlands within the corridor that provide higher levels of biological function are associated with or are near Hylebos and Wapato Creeks, which is why they were rated as Category II.

Increased vehicular noise could permanently disturb or deter wildlife from some of these higher quality, proximate wetlands, thereby lowering the wetland's habitat value. Providing wildlife habitat is not a primary function of most of the wetlands in the immediate corridor, however. Section 3.6 provides further discussion of noise impacts.

Wetland hydrology may be altered through the placement of fill and the reduction of storage volume, through changes in permeable surface area, or through rerouting of drainage that currently supports wetlands. Increases in impervious surface may alter groundwater hydrologic regimes within the study area and affect the ability of wetlands to provide flood flow alteration, a primary function of many of the wetlands in the project area. Floodplain and water storage impacts are described in Section 3.2.

3.3.5 Indirect Wetland Impacts

Indirect impacts are those effects caused by the proposed action that are later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Considerable population growth has occurred in the project area and is forecasted to continue through 2030 in Pierce County. This continual growth in combination with the SR 167 Extension project would result in indirect impacts on wetlands in the project area.

No Build Alternative

Development would continue in the project area according to land use plans, zoning designations, and regulations adopted by affected communities. The population increase will result in conversion of low-intensity land use, such as agriculture and open space to higher intensity land uses such as residential, commercial, and industrial. Under the No Build Alternative, development will not be focused first in the area of the proposed roadway. Instead, development would occur in more of a piece-meal fashion resulting in fewer opportunities to provide for the type of large-scale mitigation projects that are proposed for the

SR 167 Extension project (i.e., restoration of streams, riparian wetlands, and riparian uplands).

Build Alternative (Preferred)

Indirect impacts on wetlands beyond the project corridor are difficult to quantify because wetlands were only delineated within the proposed project corridor. As a result, information about wetlands needed to conduct an indirect analysis is limited to what is available in the *SR 167 Tier 1 Final Environmental Impact Statement* (WSDOT and FHWA 1999). These maps include wetland inventory information from the Cities of Fife and Puyallup, Pierce County, and the National Wetland Inventory. In addition, color aerial photos taken in June 2002 by the United States Geological Survey (USGS) were used to interpret the extent of recent development within the project area (TerraServer 2004). The geographic boundary considered when addressing indirect impacts for the project includes the area up to one-quarter mile from the right-of-way boundaries of the interchange options.

Indirect wetland impacts associated with this project are not considered to be substantial. The proposed project, by substantially improving travel and accessibility, may serve to accelerate short-term planned development in the vicinity of the new freeway interchanges. Some indirect impacts on wetlands related to the Build Alternative may result, but they would be limited to the vicinity of the Valley Avenue interchange.

The Build Alternative would not be expected to induce unplanned regional growth. However, it may influence the pattern development within the study area. For instance, the SR 167 Extension project could accelerate the planned transition of the North Fife area from residential/agricultural to industrial/ commercial use and the Fife/Puyallup Valley from agricultural/vacant to mixed commercial-residential and industrial. Although a similar overall level of growth and development would be expected by the year 2030 compared to the No Build Alternative, the proposed project could alter the rate, timing, and location of development within the corridor area as planned by local and regional jurisdictions. The Build Alternative is compatible with planned and anticipated urban growth in the Fife and Puyallup area according to adopted local and regional plans (Cities of Fife and Puyallup, Pierce County, and Puget Sound Regional Council) by reducing congestion and travel time, especially in the Fife area.

The long-term indirect effect of the Build Alternative to wetlands may be considerably less than under the No Build Alternative because the environmental mitigation associated with the Build Alternative would likely be more extensive and more successful than under the No Build Alternative. The Build Alternative would provide high quality restoration of streams, riparian wetlands, and riparian uplands from existing habitats that are substantially disturbed and not properly functioning. The scope and scale of habitat proposed to be restored or enhanced at one or more of the potential wetland mitigation sites will be a substantial benefit to wildlife in the area in the long term. The stream relocations and associated benefits from riparian restoration at Hylebos Creek, Wapato Creek, and Surprise Lake Drain may not otherwise occur. Not only would the Build

Alternative provide larger wetland mitigation than ongoing development. Historically, its success is more likely because WSDOT owns, maintains, monitors, and ensures success of our mitigation sites, which according to Johnson et al. (2002) has not consistently been the case for private developers.

A substantial increase in wetland area and function is expected from the riparian restoration of the Wapato Creek, Surprise Lake Drain, and Hylebos Creek. The RRP would convert a substantial area of agricultural lands, zoned for industrial and commercial development, into riparian areas and wetlands, which would be protected from development (See Section 3.3.6). The wetland mitigation, stream mitigation, and riparian restoration offer opportunities to connect to other habitat restoration projects occurring in the Puyallup River valley.

Indirect impacts of the Build Alternative are discussed for each Basin and interchange below.

Hylebos Basin

SR 509 / SR 167 Connection. Indirect impacts on wetlands within the vicinity of the proposed SR 509 / SR 167 connection are not expected. The area within one-quarter mile of the proposed connection is already generally developed, and WSDOT and FHWA (1999) did not identify any wetlands in the area.

54th Avenue East Partial Interchange. The 54th Avenue East interchange is expected to provide direct local access that could promote development and result in limited indirect impacts on wetlands. Within one-quarter mile of the interchange are wetlands mapped by WSDOT and FHWA (1999) and the Hylebos Creek floodplain. However, much of this area is already developed and the land use is predominantly industrial. As part of the proposed project, 8th Street East east of SR 167 would be closed, thus limiting local access somewhat in this case. Removal of portions of 8th Street East, 62nd Avenue, 67th Avenue, and adjoining residential buildings within the RRP should increase the floodplain and result in re-establishment of some riparian wetlands.

Interstate 5 Interchange. Indirect impacts on wetlands within the vicinity of the proposed Interstate 5 interchange are not expected because no direct local access will result. Approximately 116 acres along Hylebos Creek and the Surprise Lake Drain (a tributary to Hylebos Creek) just north along Freeman Road would also be acquired in the proposed Hylebos Creek Riparian Restoration Area, of which 61.8 acres have been delineated as wetlands. The effect of restoring undeveloped uplands and wetlands to riparian habitat should help protect wetlands in the area and result in a net environmental benefit that would not result from the No Build Alternative.

Wapato and Lower Puyallup Basins

Valley Avenue Interchange. The Valley Avenue interchange is expected to provide direct local access that could promote development and result in some indirect impacts on wetlands. Wetlands mapped in the area by WSDOT and FHWA (1999) and delineated by CH2M HILL (2004a and 2004b) are generally associated with Wapato Creek, which is protected under the City of Fife's Critical Areas Ordinance (Fife 2003). Indirect impacts to other wetlands in the

area are expected to be minimized by FHWA and WSDOT's proposal to acquire 73 acres in the vicinity of Valley Avenue and Freeman Road as part of the Wapato Creek Riparian Restoration Area, of which 12.4 acres have been delineated as wetlands.

SR 161 / SR 167 Interchange. Indirect impacts on wetlands within the vicinity of the proposed SR 161 / SR 167 interchange are not expected. The area within one-quarter mile of the proposed interchange is generally developed, and WSDOT and FHWA (1999) did not identify any wetlands in the area.

3.3.6 Cumulative Wetland Impacts

Cumulative impacts are effects on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively substantial actions taking place over a period of time.

The geographic boundary for this analysis includes the land within and adjacent to the project area. The temporal analysis includes information from 1780 to the impacts anticipated by 2030, as described in the growth management plans for county and city governments and Destination 2030 (PSRC 2001).

Urbanization is the primary cause of wetland loss within the central Puget Sound region and the project area. According to a 1997 Washington State Department of Natural Resources (DNR) report, more than 90 percent of the wetlands in urban areas in Washington have been lost (1997). Despite the goal of "no net loss," studies show that these goals are not being met. The magnitude of impacts on wetland functions is unknown. Primary wetland functions lost in the project area are due to an increase of impervious surfaces, which reduces aquifer recharge and alters wetland hydrology, and a decrease in overall wetland area and functional capability. These functions primarily include fish and wildlife habitat, stormwater retention, and sediment and toxics retention.

As future planned development for the area is constructed, wetlands will be impacted and habitat for wetland-associated species will be fragmented. The fragmentation of habitat results in more pressure on wildlife within the remaining habitat. Stresses can include reduced access to food and overcrowding, which can result in increased disease and/or aggression. Some of these impacts may be offset through requirements for compensatory mitigation.

Offsetting the impacts of ongoing and future development are several organizations that are involved with planning and implementing habitat restoration projects in the project area. These organizations include local governments, the Puyallup River Watershed Council, the Pierce County Conservation District, the Commencement Bay Natural Resources Trustees, and citizen groups such as the Friends of the Hylebos Wetlands (FOHW). Some of the wetland and riparian restoration projects currently planned in the vicinity of the proposed SR 167 Extension project include:

Hylebos Basin

- Lower Hylebos Nature Park (Jordan Site)—The City of Fife in cooperation with the Commencement Bay Natural Resources Trustees is developing a 15.3-acre stream and wetland restoration project adjacent to lower Hylebos Creek.

- Spring Valley Ranch—As mitigation for the I-5 HOV-lane construction project from Port of Tacoma Road to the King-Pierce County Line, WSDOT acquired in late 2004 a 27-acre site along the West Branch of Hylebos Creek. WSDOT is working with project partners to develop a restoration plan for this site.

Lower Puyallup Basin

- Frank Albert Site—The Puyallup Tribe of Indians in cooperation with the Commencement Bay Natural Resources Trustees are developing a 20-acre intertidal freshwater off-channel wetland next to the Puyallup River.

- Gog-Le-Hi-Te Expansion—The Puyallup Tribe of Indians is developing plans to expand the existing Gog-Le-Hi-Te site by approximately 9 acres. The site is connected to the Puyallup River.

To avoid and minimize cumulative impacts on wetlands from projects such as the SR 167 Extension project and other future development, effective as of March 2005, Pierce County implemented *Directions for Protecting and Restoring Habitat* (Pierce County 2005). This comprehensive regulatory package established new regulations and amended existing regulations to provide enhanced habitat protection and restoration. It was added to Title 18E of the Pierce County Code and implemented on March 1, 2005. The package formalized wetland review procedures and policies previously provided in several documents. These procedures and policies included wetland delineation methodology, a rating and certification form, and wetland review. The package also expanded the hydrology requirements associated with mitigation plans. The regulations pertain to development activities in the unincorporated portions of Pierce County (Pierce County 2004). Incorporated areas of Pierce County include Fife, Milton, Puyallup, Edgewood, and Tacoma. Development in these areas will be guided by local ordinances.

The current and future context of wetlands conversion and development is radically different from the historical lack of regulation, which allowed the substantial loss of wetlands in the Pierce County and Commencement Bay area. Wetlands are now recognized as an important and valuable natural resource, and their protection is a matter of public interest. As a result, rates and amounts of wetland losses in the proposed project area for the near future may be substantially less than past trends indicate. Many agencies and jurisdictions are responsible for permitting, regulating, and protecting wetlands. Federal wetland regulations do not allow fill or activities in COE jurisdictional wetlands unless there are no practical alternatives. Wetland regulations adopted by the Cities of Tacoma, Puyallup, and Fife stipulate mitigation performance standards when regulated activities occur in wetlands, and call for no net loss of wetland area, functions, and values. Such policies regarding no net loss and replacement of

wetlands will provide much greater protection of wetlands than in the past, and thereby limit future loss of wetlands from indirect and cumulative impacts of the proposed project.

No Build Alternative

The cumulative wetland impacts over time that are associated with commercial, industrial, and residential development under the No Build Alternative would likely be similar to what would occur with the Build Alternative.

Build Alternative (Preferred)

Cumulative wetland impacts associated with this project are not considered to be substantial. The current high conversion rate of wetlands in the Puyallup River Basin will continue irrespective of the proposed project. The lack of available data on wetland loss and replacement as a result of compensatory mitigation makes it difficult to determine the extent of ecological impacts due to wetland loss. In addition, the long-term impacts on wetlands associated with this project are not considered substantial due to the degree of mitigation provided and the innovative use of riparian restoration for stormwater management. Without mitigation, the Build Alternative would remove a substantial amount of disturbed wetland habitat in the Puyallup River Basin. It would be expected to lead to some degradation of wetland functions due to the direct filling of wetlands and their buffers and the addition of impervious surface.

The incremental effect on wetlands from this project along with other land use effects and transportation improvement projects in the region (i.e., Canyon Road extension project and Valley Avenue reconstruction project) would contribute to and hasten the build out of high-density uses within the project area. The conversion to higher intensity land uses is consistent with and supports the policy framework for future development as identified in the comprehensive plans and development regulations adopted by the Cities of Fife and Puyallup.

3.3.7 Mitigation Measures

Mitigation Requirements

Wetlands and special aquatic sites are protected under Presidential Executive Order 11990, Protection of Wetlands (President of the United States 1977), Governor's Executive Orders EO 89-10 and EO 90-04, Protection of Wetlands (Governor of the State of Washington 1989), and WSDOT Directives 22-27 and 31-12 (HR) (WSDOT 1979). These orders and directives require the use of all practicable measures to avoid impacts and provide mitigation for any unavoidable impacts.

The executive orders stipulate that all state agencies shall use the following definition of mitigation, and in the following order of preference:

1. Avoiding the impact altogether by not taking a certain action or part of an action

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or minimize impacts
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments
6. Monitoring the impact and taking appropriate corrective measures

Mitigation for individual actions may include a combination of these measures.

Both the COE and Ecology generally require compensatory mitigation for fills in "waters of the United States" (including wetlands) greater than 0.1 acre (COE 2002) through the 404 permit program. Moreover, most local governments have mitigation requirements for wetland impacts under their critical area ordinances. At this time, there are no universal rules that establish mitigation requirements that will meet the requirements of all agencies in advance of actual project permitting. In this instance FHWA and WSDOT expect that federal, state, and local regulatory agencies would require FHWA and WSDOT's wetland mitigation plan to be consistent with mitigation ratios established by Ecology.

Table 3.3-8 lists the current guidelines for mitigation ratios to be applied for a given impact. These ratios are based on the Implementing Agreement that WSDOT has with Ecology (WSDOT and Ecology 1993). Compensation acreage is dependent on the quality of the wetland impacted and the category of wetland being restored, created, or enhanced.

Table 3.3-8: Applicable Mitigation Ratios (from Implementing Agreement [WSDOT and Ecology 1993])

Impact	Mitigation Type			
Wetland Category	Restoration and Creation		Enhancement	
	Category II	Category III	Category II	Category III
I	4:1	6:1	8:1	10:1
II	2:1	3:1	3-4:1	4-6:1
III	1-1.5:1	1.5-2:1	1.5-3:1	2-4:1
IV	0.75-1.25:1	1-1.5:1	1-2:1	2-3:1

The final wetland mitigation plan would compensate for any unavoidable impact on wetlands, including buffer impacts, which would require mitigation under the critical area ordinance of the City of Fife. Mitigation may also include establishing a buffer area at the selected wetland mitigation site(s) and enhancing buffers adjacent to the residual wetlands (remaining parts of impacted wetlands).

Definitions for mitigation types are:

- **Restoration**—Actions taken to intentionally reestablish wetland area, and functions and values where wetlands previously existed, but are currently absent due to the absence of wetland hydrology or hydric soils.
- **Creation**—Actions taken to intentionally establish a wetland at a site where none previously existed (as far as can be determined from historical information).
- **Enhancement**—Actions taken to intentionally improve wetland functions, processes, and values of existing but degraded wetlands where all three defining wetland criteria are currently met (i.e., hydrology, vegetation, soils).

Mitigation Analysis for SR 167 Extension Project

Through conceptual project design, impacts to wetlands have been avoided or minimized as much as possible, but future opportunities for avoidance and minimization will be pursued in final design. The mainline was shifted away from Hylebos Creek north of I-5. This minimized impacts and allowed for a large buffer. Each project option being considered was reviewed by the WSDOT Environmental Services Office and refined based on this review. During final design, site-specific design criteria will be applied to each interchange, mainline segment, and bridge. These can include realignment of the mainline and ramps to minimize impacts to wetlands, adjustment of bridge lengths to avoid wetlands for one stream crossing at Valley Avenue, and revegetating Hylebos and Wapato Creeks, and Surprise Lake Drain to improve habitat. The Hylebos Creek relocation will remove an existing bottleneck along I-5, increase capacity, and improve riparian habitat.

Specific functions lost in each impacted wetland are identified in the *Wetlands Discipline Report* (CH2M HILL). All these lost functions would not necessarily be replaced in the basin in which the impact occurs. FHWA and WSDOT have analyzed impacts by basin and are proposing mitigation for the Build Alternative in the Puyallup River watershed in accordance with regulatory requirements. The Hylebos basin impacts make up approximately 60 percent of the total wetland impact. The primary functions identified in the Hylebos basin are flood flow alteration, sediment and heavy metals retention, nutrient and toxicant removal, water storage, erosion control, food web productivity, and wildlife habitat.

Ten sites identified within the project vicinity offer the potential to compensate for unavoidable project impacts on wetlands. The sites shown in Figure 3.3-3 and summarized in Table 3.3-9 have potential for wetland mitigation. One or more sites may be needed to meet the wetland mitigation needs of the project. These sites are described in more detail in the *Conceptual Mitigation Plan* (CH2M HILL and MWG 2005).

The general criteria used to identify and evaluate potential wetland mitigation sites in the *Conceptual Mitigation Plan* that will continue to be used in the final mitigation plan are:

- Watershed Focus – The mitigation site(s) shall be located in the Puyallup River watershed (WRIA 10). Regulatory guidelines require FHWA and WSDOT to analyze and mitigate impacts by watershed. Sites should be prioritized, if possible, to occur within the project area (on-site) and occur within the sub-watershed where substantial impacts to wetlands occur.

- Replacement of Functions and Values Lost – The mitigation site(s) will provide "in kind" replacement of lost wetland functions and values.

- Habitat Connectivity – Sites adjacent to existing restoration sites, or providing connectivity to otherwise fragmented smaller wetland areas should be prioritized if possible. Large, linked sites tend to be more successful and provide greater levels of ecological function.

- Reliable Hydrology – The site(s) should have reliable, on-site source(s) of groundwater and/or surface water hydrology capable of supporting wetlands.

- Undeveloped Condition – The site(s) should he generally undeveloped to minimize the number of displacements and to minimize cost. Also, fewer landowners simplifies the process and increases the likelihood of success.

- Uncontaminated – The site should be relatively free of hazardous materials.

- Stakeholder Support – Sites that are considered a restoration priority among stakeholders should be favored.

- Satisfies Regulatory Requirements – Any site needs to be capable of satisfying regulatory requirements for wetland creation/restoration and/or enhancement.

Off-channel habitat potential will be identified at the sites. Off-channel habitat for fish is the top limiting factor in the Puyallup River watershed.

FHWA and WSDOT will select one or more preferred wetland mitigation site(s) after the Record of Decision is issued and before permitting and a final mitigation plan are completed. A number of additional sites were also considered for mitigation but were not evaluated further due to various causes. These included sites that had been acquired as mitigation for other projects (e.g., Spring Valley Ranch, Gog-Le-Hi-Te Expansion) or were not considered to be suitable for wetland mitigation. These additional sites are summarized in Appendix A of the *Conceptual Mitigation Plan* (CH2M HILL and MWG 2005).

The mitigation wetlands to be restored/created and enhanced at the potential wetland mitigation sites are expected to substantially exceed the area and function of the moderate- to low-function, disturbed wetlands to be impacted by the Preferred Build Alternative. The mitigation wetlands at the potential wetland mitigation sites are expected to be Category II wetlands.

The potential mitigation wetland sites will result in substantial habitat value as characterized by:

- Large wetland area;
- Numerous wetland classes (emergent, scrub-shrub, forested);
- High plant species diversity (multiple species in each wetland class);
- High structural diversity (multiple vegetation strata—herb, shrub, tree);
- High degree of interspersion among wetland classes;
- Stream segments that would also provide habitat for fish at several of the potential wetland mitigation sites;
- Forest, shrub, or grassland buffers present for the majority of the wetland circumference.

Applying the *Wetland Functions Characterization Tool for Linear Projects* (WSDOT 2000), the potential wetland mitigation sites would rate high for most of the wetland functions. On the other hand, the wetlands to be impacted as part of the Preferred Build Alternative at best rated moderate for 5 of 14 wetland functions, and rated low or unlikely to provide the remaining functions.

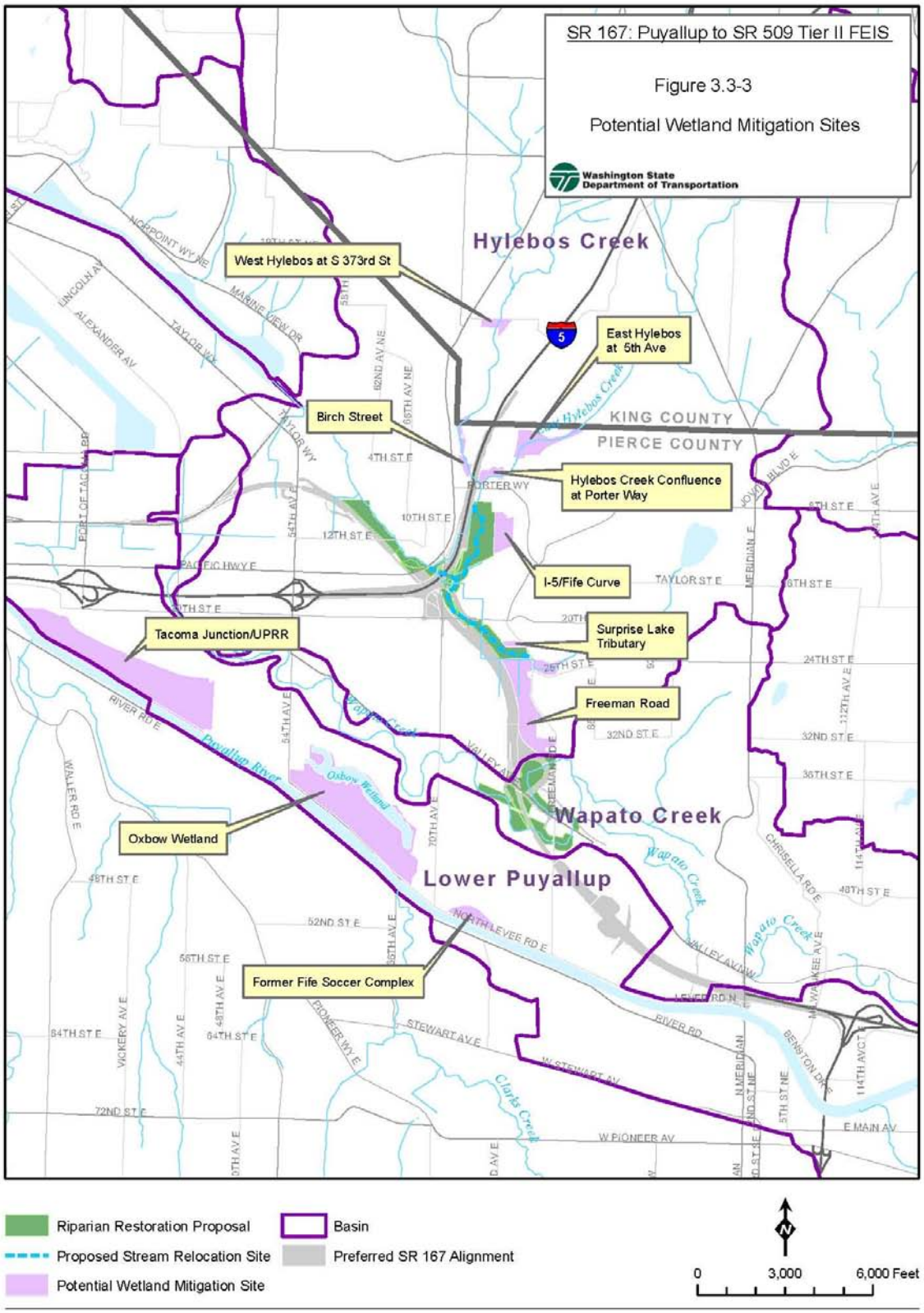

SR 167: Puyallup to SR 509 Tier II FEIS
Figure 3.3-3
Potential Wetland Mitigation Sites
Washington State Department of Transportation
Hylebos Creek
West Hylebos at S 373rd St
East Hylebos at 5th Ave
Birch Street
Hylebos Creek Confluence at Porter Way
I-5/Fife Curve
Tacoma Junction/UPRR
Surprise Lake Tributary
Freeman Road
Oxbow Wetland
Wapato Creek
Lower Puyallup
Former Fife Soccer Complex
KING COUNTY
PIERCE COUNTY
Riparian Restoration Proposal
Proposed Stream Relocation Site
Potential Wetland Mitigation Site
Basin
Preferred SR 167 Alignment
0
3,000
6,000 Feet

Table 3.3-9: Potential Wetland Mitigation Sites Identified for the SR 167 Extension Project

No.	Site Name	Basin	Approx Site Size (acres)	Estimated Restoration/ Creation Acres	Estimated Enhance-ment Acres	Within SR 167 Project Area	Connectivity Potential	Stream Restor-ation Potential	Approx No. of Parcels	General Comments
1	Freeman Road	Hylebos	50	40	10	X	High	-	8	Good wetland restoration potential, large site, within SR 167 project area and Hylebos Basin, connects to SR 167 RRP, shallow groundwater, seasonal surface water, few owners, portions of most of the parcels at this site are within the preferred road alignment and could simplify acquisition.
2	Surprise Lake Tributary (Mortenson Farm)	Hylebos	9	2.5	5	X	High	X	7	Good wetland enhancement and stream restoration potential, small site, within SR 167 project area and Hylebos Basin, connects with SR 167 RRP, primary owner (City of Edgewood) is a potential restoration partner.
3	I-5 / Fife Curve	Hylebos	18	-	18	X	High	-	6	Good wetland enhancement/restoration potential, large site, hydrology unknown but shallow groundwater assumed, reed canarygrass dominates, within SR 167 project area and Hylebos Basin, could connect with SR 167 RRP, public and private owners, areas of known arsenic contamination.
4	West Hylebos Creek at S. 373rd Street	Hylebos	8	1	7	-	High	X	2	Good wetland enhancement and stream restoration potential, small site, beyond SR 167 project area, two parcels with one owner, important spawning habitat, connects to WSDOT Spring Valley Ranch restoration site and the General Metals restoration site.
5	Hylebos Creek Confluence at Porter Way	Hylebos	8	-	8	-	High	X	12	Good wetland enhancement and stream restoration potential, small site, just upstream of SR 167 project area, reed canarygrass dominates, includes important habitat at confluence of East and West Hylebos Creek.
6	Former Fife Soccer Complex	Lower Puyallup	15	12	-	-	Low	-	6	Good wetland restoration potential, off channel river habitat, medium-sized site, substantial excavation needed.
7	Tacoma Junction (UPRR) *	Lower Puyallup	150	75	75	-	Medium	-	8	Good wetland restoration potential, large site, substantial off-channel river habitat, good hydrology, substantial excavation needed.
8	Oxbow Wetland	Lower Puyallup	189	100	15	-	Medium	-	40	Good wetland restoration potential—Large site, substantial potential off-channel river habitat, good hydrology, substantial residential displacements, substantial excavation needed, opportunities to coordinate with Puyallup Tribe of Indians. Also approximately 30 acres of preservation.
9	Birch Street	Hylebos	11	-	11	-	High	X	18	Good wetland enhancement/restoration and stream restoration potential, beyond SR 167 project area, numerous parcels and owners.
10	East Hylebos Creek east of 5th Ave	Hylebos	25	-	25	-	High	X	12	Good wetland enhancement and stream restoration potential, medium-sized site, connects to existing FOHW restoration sites at West Milton Nature Reserve.

3.3.8 Benefits of the Riparian Restoration Proposal

In an effort to manage stormwater from 184.6 acres of new impervious surface from the construction of the SR 167 Extension project, approximately 189 acres of existing farmlands, residences, buildings, and roads are proposed to be converted into a riparian landscape. The RRP is being proposed to Ecology as an alternative stormwater management practice for stormwater flow control for the SR 167 Extension project. Although the RRP cannot provide compensatory wetland mitigation, it will offer substantial benefits to wetlands, salmon, and a variety of upland and aquatic species in the project area.

The RRP would enhance a substantial amount of wetlands and protect them by enhancing the surrounding uplands that would serve as wetland buffers. The RRP will also provide wildlife habitat and other essential elements beneficial to this rapidly urbanizing area. The RRP would acquire the property necessary to reestablish riparian buffers along 4.4 miles of existing and relocated streams and allow for more natural floodplain processes to occur within a channel migration zone. Buildings, roads, culverts, and other infrastructure would be removed and the land use would be converted back to a riparian forest planted with native vegetation. Existing fill materials that were placed in the floodplain would be removed in some areas to improve floodplain capacity. Replanting the banks with native riparian vegetation would minimize streambank erosion more directly than conventional detention ponds. In addition to stabilizing the channels, this proposal would develop 189 acres of habitat and establish wildlife linkages between fragmented upland habitats. The RRP would also provide opportunities for passive recreation and environmental education.

The RRP would result in considerable benefits to streams, such as increasing shade to maintain cooler water temperatures, establish woody vegetation which increases bank stability, and helps form habitat for fish and wildlife. The riparian habitat created by the RRP will be a mix of riparian wetland, wetland buffer, and upland habitats.

Table 3.3-10: Riparian Restoration Proposal Areas by Stream

Stream	Area (acres)
Hylebos Creek	87
Surprise Lake Drain	29
Wapato Creek	73
Total	**189**

The RRP would develop 29 acres of new riparian habitat along Hylebos Creek between 8th Street East and Highway 99 by removing existing portions of surface streets and residential buildings that are within the floodplain of the stream (Figure 3.3-3). Between Highway 99 and Porter Way, the RRP would establish 4,010 linear feet of new stream channel and 58.0 acres of new riparian habitat by moving the stream to the opposite side of I-5. About 650 linear feet of existing Hylebos Creek would remain as off-channel habitat. FHWA and

WSDOT are also proposing to restore the entire length of Surprise Lake Drain from its confluence with mainstem Hylebos Creek to the crossing at Freeman Road, which will develop 29 acres of new riparian habitat. In the Wapato Basin, the RRP includes restoring riparian vegetation along approximately 9,000 feet of Wapato Creek, and converting about 73 acres of developed land back to habitat that will likely be a mix of riparian wetland, wetland buffer, and upland habitat. Work in both Basins includes replacing under-sized culverts, restoring riparian buffers, and restoring connectivity with adjacent upland habitats.

The RRP would substantially increase wetland functions for habitat and water quality in the Hylebos and Wapato Basins. The RRP would improve the function of an estimated 74.2 acres of existing wetlands onsite and within the Basins of those being impacted (i.e., Hylebos and Wapato). Of that amount, habitat and water quality functions for approximately 61.8 acres of existing wetlands would be increased within in the Hylebos Basin, where the proposed project affects 23.7 acres of wetlands.

In addition, approximately 12.4 acres of wetland functions would be increased within existing wetlands in the Wapato Basin, where the project impacts 1.6 acres of wetlands. The wetlands near Wapato Creek are currently disturbed by grazing and farming practices. These existing wetlands in the RRP would function to better provide floodwater storage and water quality enhancement.

An undetermined amount of additional wetlands would also likely be established in the process of stream stabilization in the riparian areas by restoring hydrology. In addition, buffers at wetland sites adjacent to Hylebos Creek, Surprise Lake Drain, and Wapato Creek would also be enhanced under the RRP.

The RRP would also have beneficial effects on the agricultural wetlands and riparian areas adjacent to Wapato Creek and Surprise Lake Drain. This would be accomplished by acquiring some agricultural lands and removing structures and impervious surfaces, and filling ditches and severing drain tiles and pipes that increase runoff (for example, in the vicinity of Wetland T). Through the acquisition, these lands would be conserved rather than converted to commercial or industrial development, and the riparian areas could become wetland and wetland buffer areas. Water quality in Hylebos and Wapato Creeks could directly benefit from reduced input of fertilizer, herbicides, insecticides, and other chemicals used in farming. The RRP would improve the functions in farmed wetlands by allowing them to revert back to a variety of wetland types. The Surprise Lake Drain RRP will convert an area of agricultural lands, which the City of Fife has zoned for industrial and commercial development.

Additional information is needed to confirm the RRPs positive or negative effects on adjacent wetlands. This information should include current and proposed topography, confirmation of wetland locations, and functions assessments for these wetlands.

Improvements in wetland functions within the RRP may be supported by information that details where the following would occur in the RRP:

- Wetlands have been re-established (likely where drain tiles are broken in drained farmed areas).

- Wetlands have been rehabilitated so that they function at a higher level (restore natural hydroperiod, re-connect with flood plain of active channel).

- Wetlands have been enhanced by development of riparian vegetation.

The RRP will be used for stormwater treatment and mitigation for project impacts on streams. Therefore, credit will not be applied towards mitigation for wetland fill activities. However, the environmental benefits should be considered over and above the compensatory wetland mitigation proposed at the potential wetland mitigation sites (see Section 3.3.5, Mitigation Measures).

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