WETLAND AND STREAM BUFFER MITIGATION REPORT

SR 167 - 8th Street E Vicinity to 15th Street SW Vicinity
Northbound HOT Lane Project
(Stage 5)

King and Pierce County, WA

May 2009

Prepared by:

WSDOT Urban Corridors Office

Washington State Department of Transportation

Seattle, Washington

Washington State Department of Transportation

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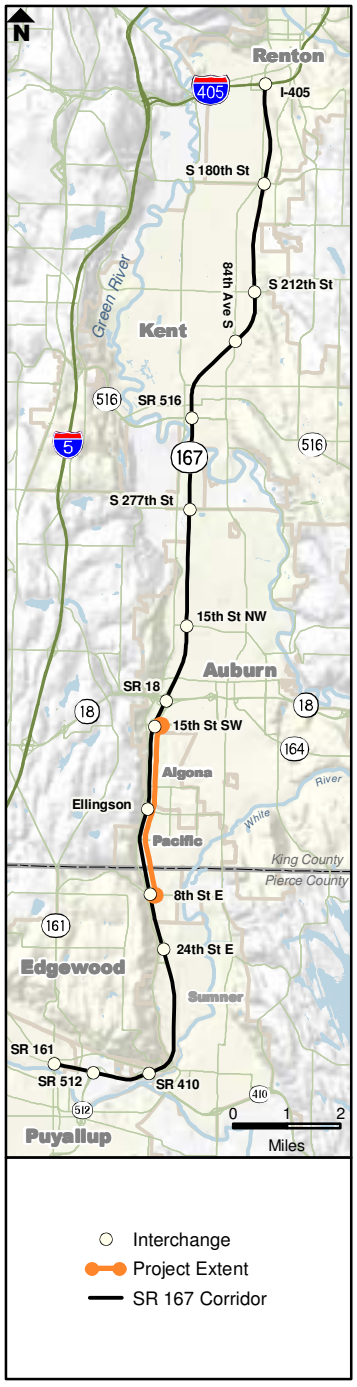
Executive Summary

The Washington State Department of Transportation (WSDOT) proposes to create a high-occupancy toll (HOT) lane for SR 167 from the north end of Pierce County to Auburn, King County, Washington (Figure 1). The SR 167 - 8th Street E Vicinity to 15th Street SW Vicinity Northbound HOT Lane Project (SR 167 Stage 5 project) will permanently impact stream buffers and temporarily impact stream and wetland buffers during construction. This report identifies the project's impacts to wetland and stream buffers, avoidance and minimization of those impacts and describes a proposal to mitigate for those unavoidable impacts.

Figure 1
Vicinity Map



The SR 167 Stage 5 project will permanently clear 0.27 acre of stream buffer and temporarily clear both 0.12 acre of stream buffer and 0.02 acre of wetland buffer.

WSDOT will use this report to comply with the Algona and Pacific Critical Areas Ordinances. The project will not fill wetlands and therefore will not need a Section 404 permit from the US army Corps of Engineers (Corps) or a Section 401 Water Quality Certification from Washington State Department of Ecology (Ecology). The project will not fill or alter any stream, only buffers, therefore WSDOT does not anticipate the need for Hydraulic Permit Approval (HPA), but will need verification that no HPA is needed from Washington Department of Fish and Wildlife (WDFW).

Avoiding impacts to wetlands and streams was the primary mitigation strategy. The project was able to limit unavoidable permanent impacts to about one-quarter of an acre of poorly functioning stream buffer. WSDOT proposes to use enhancement of stream buffer at the SR 167 Stage 4 Mitigation Site C along Mill Creek to mitigate for project impacts. The area proposed for use is located at the southern end of the site between Mill Creek and the proposed wetland enhancement area. The proposed buffer area is a seasonally inundated wetland. This area is primarily reed canarygrass with some willow and an occasional red alder. WSDOT will treat the reed canarygrass to reduce its prevalence, while still maintaining native woody cover. WSDOT will then plant the

area with native trees and shrubs.

WSDOT will mitigate for temporary buffer impacts through on-site restoration, consisting of re-seeding the grass-dominated buffers that were temporarily impacted.

Monitoring, contingency and site management plans will be the same as those described in the SR 167 Stage 4 Project Wetland and Stream Mitigation Report (Perteet, 2008b). The exception being that monitoring will only extend for five years for the SR 167 Stage 5 portion of the mitigation site rather than the ten years proposed for the SR 167 Stage 4 portion.

Table 1.
Summary of project impacts and compensatory mitigation

Region	Urban Corridors Office	
Township/Range/Section (impact)	Township 21 North, Range 04 East, Section 26 and 35	
Temporary Wetland Buffer Impact	0.02 acres	
Permanent Stream Buffer Impact	0.27 acres	
Temporary Stream Buffer Impact	0.12 acres	
Jurisdictional Wetland Impact Areas	0 acres	0 acres
	Regulated by USACE and Ecology	Regulated by Ecology (Isolated)
Mitigation Location	Auburn west of SR 167 between SR 18 and West Main Street. Section 14, Township 21 North, Range 4 East.	
Total Area of Mitigation Site	0.27 acres	
Stream Buffer Enhancement	0.27 acres	
Years of Monitoring	5 Years	

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CHAPTER 1 Proposed Project

Introduction

The Washington State Department of Transportation (WSDOT) proposes to create a high-occupancy toll (HOT) lane for State Route (SR) 167 from the north end of Pierce County to Auburn, King County, Washington (Appendix A). The SR 167 - 8th Street E Vicinity to 15th Street SW Vicinity Northbound HOT Lane Project (SR 167 Stage 5 project) will permanently impact stream buffers and temporarily impact wetland and stream buffers during construction. This report identifies the project impacts to buffers, avoidance and minimization of those impacts and describes a proposal to mitigate for those unavoidable impacts.

WSDOT will use this report to comply with the Algona and Pacific Critical Areas Ordinances. The project will not fill wetlands and therefore will not need a Section 404 permit from the US Army Corps of Engineers (Corps) or a Section 401 Water Quality Certification from Washington State Department of Ecology (Ecology). The project will not fill or alter any stream, only buffers, therefore WSDOT does not anticipate the need for Hydraulic Permit Approval (HPA), but will need verification that no HPA is needed from Washington Department of Fish and Wildlife (WDFW).

Observed conditions are discussed in the State Route 167 Southbound HOT Lane 8th Street East Vicinity to South 277th Street Vicinity Wetland Delineation Report (Perteet 2008a).

Project Description

The SR 167 Stage 5 project will begin at MP 10.2 in northwest Pierce County, and will terminate at MP 14.26, in southwest King County, Washington State. The SR 167 Stage 5 Project location occurs in the following:

- Township 21 North, Range 04 East, Section 14, 23, 26, 35
- Township 20 North, Range 04 East, Section 2

The SR 167 Project is also located in Water Resource Inventory Areas (WRIA) 9 and 10, although the majority of the project is in WRIA 10.

The State Route (SR) 167 Northbound HOT lane Project (SR 167 Project) is a road-widening project which will provide a high-occupancy toll (HOT) lane for northbound SR 167. HOT lanes are managed lanes intended to increase mobility by allowing more vehicle use of the lane. HOT lanes maintain free, priority status for transit and carpools, the same as a high-occupancy vehicle (HOV) lane, but also allow single occupancy vehicles to pay a toll and use the lane. Toll rates will be variable, depending upon the level of congestion.

The project limits are from milepost (MP) 10.2 north to MP 14.26. Roadway widening will occur toward the median of SR 167 when there is sufficient room (approximately MP 10.2 to MP 11.30 and MP 13.15 to MP 14.26), and to the outside when there is not sufficient room in

the median (approximately MP 11.30 to MP 13.15). Ramp meters will be installed at the 8th street E ramp and at the northbound on-ramp at Ellingson Road. The Project will provide enhanced stormwater treatment and detention to avoid or minimize impacts on surface waters that could result from the increased impervious surfaces created by the SR 167 Project.

The project is currently unfunded, but funding is anticipated in late 2009. Project construction will begin in late spring of 2010 and will take approximately 2 years to complete.

CHAPTER 2 Existing Conditions

This chapter summarizes the landscape setting, existing wetland and stream conditions within or near the project setting, and watershed conditions.

Landscape Setting and Watershed Context

The project corridor is located in the Puget Sound trough within the floodplain of the Green River to the north and the White River to the south. Prior to 1911, both the Green River and White River flowed into the Duwamish River. In 1911, the White River was diverted into the Puyallup River also in the low-lying Puget Sound Trough. The project extends across this flat bottomed trough that crosses from the Duwamish Green River Watershed (WRIA 9) to the Puyallup White River Watershed (WRIA 10).

The northern portion of the project corridor drains into the Mill Creek, which flows north into the Green River. The southern portion of the project drains into Milwaukee ditch that flows into the White River.

Mill Creek, which parallels the project corridor from approximately 8th Avenue N in Algona to the northern extent of the project and discharges to the Green River, has experienced substantial modifications in the form of rerouting, ditching, channelizing, and draining of adjacent and connected wetlands.

In the White River Watershed, the project corridor is parallel to and intersects Milwaukee Ditch. Milwaukee Ditch runs south from just north of 1st Avenue N in Algona, flowing south adjacent to SR 167 before discharging to the White River near the city of Sumner. The Milwaukee Ditch was constructed by early settlers, most likely to drain wetlands for agricultural development. Jovita Creek is the primary tributary draining to Milwaukee Ditch.

Extensive urban growth, heavy and light industry, a large modern marine port, an extended revetment and levee system, agriculture, commercial and residential development, and roadway and railroad construction have combined to significantly alter the natural landscape of both the Green/Duwamish and the White/Puyallup River Basins.

The remaining open space within the corridor is mostly wetland. These wetlands are often associated with Mill Creek, Milwaukee Ditch or their tributaries. They are large and flat. Most were once drained, plowed and flattened for use in agriculture. Gradually these wetlands have re-established themselves when the drainage efforts of farmers lapsed or failed. Many of these wetlands have been modified, enhanced or expanded as mitigation for development. Cottonwood, red alder and reed canarygrass dominate the forested wetland areas. Willow, red osier dogwood and reed canarygrass dominated the scrub shrub wetlands and reed canarygrass, cattail and creeping buttercup dominate the emergent wetland areas.

The Natural Resource Conservation Service, (NRCS) mapped the soils in the area as mucks (Seattle and Semiahmoo), silt loams (Briscott, Snohomish and Puyallup) and urban land.

Streams

Chinook salmon, chum salmon, coho salmon, winter steelhead and resident trout are documented in Mill Creek.

Chum salmon, coho salmon and steelhead are documented in Milwaukee Ditch. Resident trout are likely also present in Milwaukee Ditch.

Wetlands

Wetlands in the area are primarily large Category II wetlands along streams. The wetlands are dominated by reed canarygrass, willows, read alder, black cottonwood and cattails (Wetland and Stream Assessment Report, Perteet 2008).

Buffers/Uplands

The areas that contain upland habitat including buffers are dominated by Himalayan blackberry, Scots broom, grasses and herbaceous weeds.

CHAPTER 3 Wetland Buffer Impact Assessment

This chapter summarizes the landscape setting, the existing conditions of the wetlands to be impacted, and the assessment of impacts to wetlands and functions related to the proposed project.

Existing Conditions of Wetlands and Buffers to be Impacted

The project will not directly impact wetlands or streams. The project will temporarily impact wetland buffers for two wetlands. The characteristics of these two wetlands are summarized below.

Wetland 11.50R

Wetland 11.50R is a small seasonally or intermittently flooded/saturated palustrine scrub-shrub (PSS), palustrine emergent (PEM) wetland. It is a Category III wetland under the DOE four tier rating system, and a Class 2 wetland under the City of Pacific's critical areas regulations.

This wetland is located east of SR 167 between 8th Avenue East and 3rd Avenue SW both in Pacific, WA (Figure 2). It is confined to an area between SR 167 and an historic access road to the east. The wetland is 4.33 acres in size and includes shrub and emergent habitats. Much of Wetland 11.50R extends to the east of the study area.

Hydrology

Hydrology appears to be driven primarily by high groundwater. Connectivity to Milwaukee Creek offsite to the east was not confirmed, but it appeared likely that culverts (conveying flow under access road) could discharge into the creek during periods of high inundation. The wetland soils were saturated.

Vegetation

Wetland 11.50R has shrub and emergent habitat types. The emergent community is dominated by reed canarygrass, with stinging nettle and scattered willow. The shrub community is dominated by willow species. Blackberry is scattered throughout; it is not clear whether growing in wetland or part of an upland mosaic.

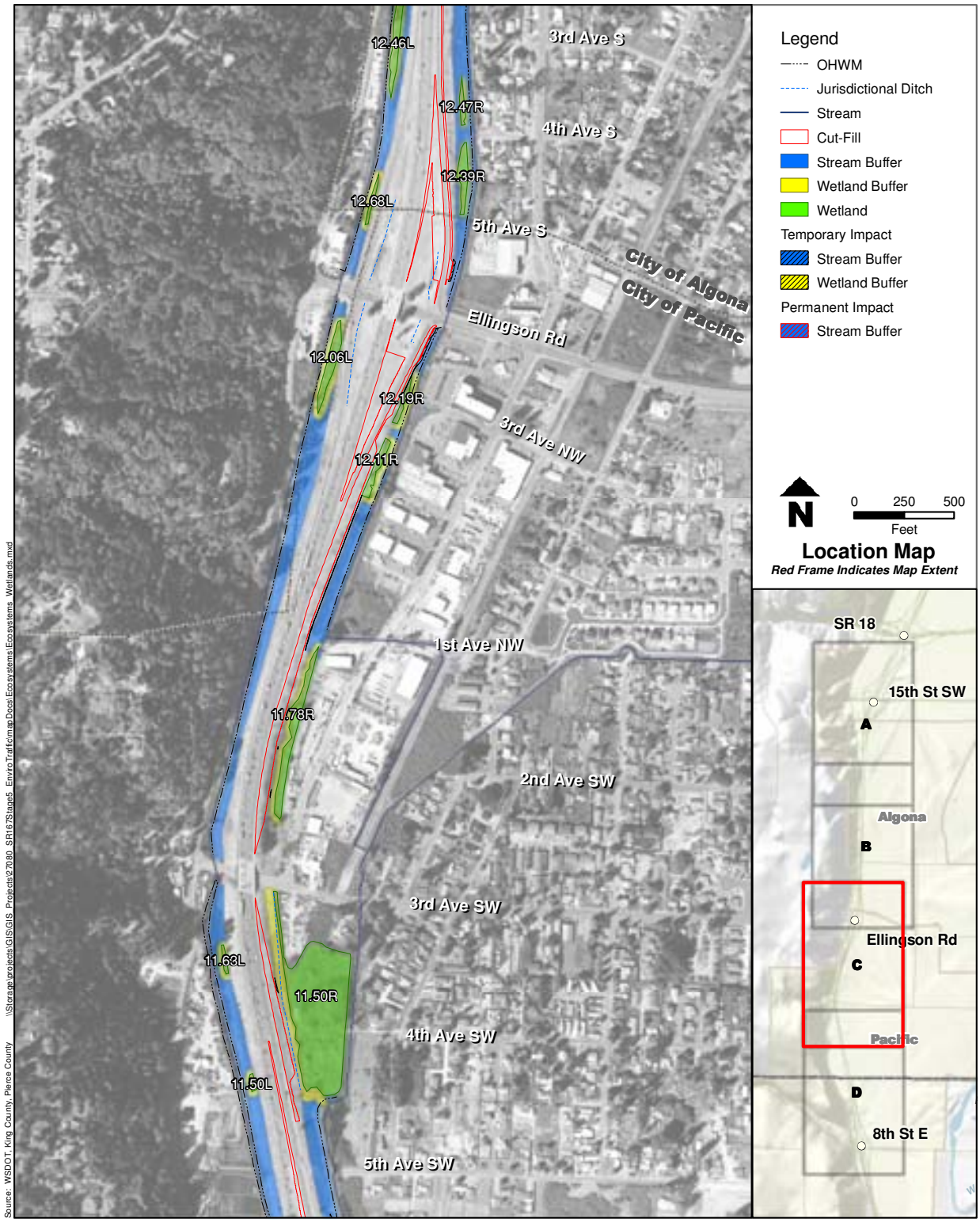
Soils

Soil in Wetland 11.50R is a gravelly silt loam.

Buffers

Buffers are a combination of grasses, including reed canarygrass, patches of Himalayan blackberry and occasional red alder or black cottonwood.

Figure 2
Wetlands and Streams



Functions

This wetland provides some water quality and hydrologic functions; because it has no outlet and a high density of vegetation allows it to retain stormwater long enough to let sediment and pollutants settle out and reduce downstream peak flows. It does not have the clay or organic soils that allow for the best retention of pollutants and it ponds seasonally reducing its potential for high water quality improvement. The small size of the wetland compared to the watershed and its shallow depth limit the potential of the wetland to provide hydraulic functions such as reduced peak flows. The wetland provides almost no wildlife habitat function. The wetland is located in an urban setting, lacks adequate buffer widths, has buffers that provide almost no screening of the wetland and is dominated by non-native vegetation.

Wetland 11.78R

Wetland 11.78R is a small seasonally or intermittently flooded/saturated palustrine forested (PFO) and palustrine emergent (PEM) wetland. It is a Category III wetland under the DOE four tier rating system, and a Class 3 wetland under the City of Pacific's critical areas regulations.

This wetland is located east of SR 167 between 3rd Avenue SW and Ellingson Road both in Pacific, WA (Figure 2). It appears to be formed on fill or disturbed soils, and is confined to a narrow section of right-of-way (ROW) between SR 167 and commercial development to the east. The wetland is 0.65 acres in size and includes forested and emergent habitats. Wetland 11.78R is fully contained within the study area.

Hydrology

Hydrology appears to be driven primarily by surface runoff. During periods of inundation, it appears that it would sheetflow through a swale to the north and ultimately into Milwaukee Creek.

Vegetation

Wetland 11.78R contains a forested and an emergent plant community. It is characterized as a monoculture of reed canarygrass, aside from a few black cottonwood trees that comprise the forest class.

Soils

Soil in Wetland 11.78R is a gravelly silt loam.

Buffers

Buffers consist of a combination of grasses, including reed canarygrass, patches of Himalayan blackberry and occasional red alder or black cottonwood.

Functions

This wetland provides some water quality and hydrologic functions, because it has intermittent outlet and high density of vegetation allows it to retain stormwater long

enough to let sediment and pollutants settle out and reduce downstream peak flows. It does not have the clay or organic soils that allow for the best retention of pollutants and is only seasonally ponded reducing its potential for high water quality improvement. The small size of the wetland compared to the watershed and its shallow depth limit the potential of the wetland to provide hydraulic functions such as reduced peak flows. The wetland provides almost no wildlife habitat function. The wetland is located in an urban setting, lacks adequate buffer widths, has buffers that provide almost no screening of the wetland and is dominated by non-native vegetation.

Wetland Buffer Impacts

The project will have only temporary impacts to wetland buffers covering 0.02 acres (Table 2). The buffer areas impacted are dominated primarily by non-native herbaceous weeds and grasses. These areas provide some water quality benefits to the wetland but no wildlife screening or adjacent upland wildlife habitat. Construction of the project will remove the vegetation in these areas, but soils will remain.

Table 2.
Wetland buffer size, classification and area impacted by the proposed project

Wetland [A]	Wetland Classification		Buffer Width (feet) [D]	Buffer Impact Area (acre) [D]	
	Ecology [B]	Local Jurisdiction [C]		Permanent	Temporary
11.50 R	III	2	50	0	0.01
11.78 R	III	3	25	0	0.01
Total				**0**	**0.02**

A. Wetland locations from project beginning to end: RT = right side of the highway and LF = left side of highway.
B. Hruby (2004).
C. Wetland rating according to City of Pacific wetlands ordinance (City of Pacific, 2009).
D. Wetland buffers according to City of Pacific wetlands ordinance (City of Pacific, 2009).

The project will result in only temporary and permanent impacts to the stream buffer of Milwaukee ditch. No direct impacts to any stream are anticipated.

Existing Conditions of Streams to be Impacted

The Milwaukee Ditch is a south-flowing creek that runs parallel to SR 167 through a series of ditches and culverts. From 5th Avenue N in Algona, the creek generally runs along the east side of the roadway to south of 16th Street E in Pacific where the flow is conveyed under SR 167 (Culvert 73) to the west side. The creek continues south on the west side of the roadway to about milepost 8, just north of Sumner. At this point, it crosses back to the east under SR 167 and continues to flow east under a rail line before entering a short channel extending to the White River. Flow from the White River backs up into Milwaukee Ditch when the White River is at flood stage.

Milwaukee Ditch collects natural waters and is therefore classified as a stream. But it receives much of its flow from urban runoff. The stream channel has been straightened and is periodically cleared of vegetation by heavy equipment that utilizes a gravel road along its shore. The slow moving stream, for the most part, has a sediment lined channel and lacks gravel.

Typically, runoff from SR 167 is collected in large ditches that run parallel to the roadway on the opposite side of the road from the Milwaukee Ditch. These ditches eventually join and contribute flow to the Milwaukee Ditch. In addition, several large drainages from the valley slopes enter the Milwaukee Ditch along SR 167, including the drainage from Trout Lake near 3rd Avenue SW in Pacific, and Jovita Boulevard E (Culvert 65) just south of the King-Pierce County line.

Water quality data for Milwaukee Ditch is not available. Milwaukee Ditch is not listed on Ecology's 2004 303(d) list. Overall, much of the natural surrounding vegetation has been removed. Most low gradient, slow moving channels of this type tend to have high temperatures and low dissolved oxygen.

Chum salmon, coho salmon and steelhead are documented in Milwaukee Ditch (Washington Department of Fish and Wildlife 2007a and 2007b). Resident trout are likely also present in Milwaukee Ditch.

The buffers lining the stream are narrow and dominated by reed canarygrass, Scots broom, Himalayan Blackberry and herbaceous weeds and grasses. Scattered red alder and black cottonwood are also found in the buffer. Willow occurs along the stream channel.

Stream Buffer Impacts

Permanent

The project permanently fills 0.27 acre of stream buffer located in the upper part of the Milwaukee Ditch sub-basin. The buffer vegetation consists of Himalayan blackberry, Scots broom and herbaceous weeds and grasses. The stream buffer is about 25-50 feet from the stream Figure 3. A maintenance road for use by heavy equipment used to keep the ditch clear of vegetation and other obstructions runs between the stream and the buffer impacts.

The buffer impact area provides little in the way of riparian functions for the stream. This area does not shade the stream, and is unlikely to provide a future shade or a source of woody debris because of the maintained nature of the site. There is little allochthonous input of detritus and insects from the grass and Himalayan blackberry dominated riparian habitat to support the streams food web. The vegetation provides some water quality benefit to the stream trapping sediment and associated pollutants from runoff before it enters the stream.

Temporary

The project temporarily impacts 0.12 acre of an area similar to the permanent impact areas described above. Only minor, if any grading will occur in these areas but the vegetation will be cleared.

Figure 3. Typical stream buffer that the project will impact.

CHAPTER 5 Mitigation Strategy

The mitigation strategy described in this chapter involves avoidance, minimization of wetland impacts, and compensatory mitigation for unavoidable wetland and stream impacts.

Avoidance and Minimization of Impacts

WSDOT added capacity to a highway bounded by wetlands and streams, avoiding direct impacts to either type of habitat, some impacts to buffers were unavoidable.

WSDOT has avoided and minimized impacts to stream and wetland buffers to the greatest extent practicable. Total avoidance was not possible due to constraints associated with safety and design guidelines. Impacts were avoided or minimized primarily through site-specific design techniques such as locating stormwater water quality facilities along the existing roadway fill to avoid impacts that would have occurred using more common water quality treatment features.

Permanent impacts were limited to 0.27 acre of stream buffer. The buffer area impacted was low quality buffer providing little benefit to the stream habitat.

Compensatory Mitigation

Regulatory Requirements

WSDOT will need to comply with the Algona and Pacific City Critical Areas Ordinances. The project will not fill wetlands and therefore will not need a Section 404 permit from the US Army Corps of Engineers (Corps) or a Section 401 Water Quality Certification from Washington State Department of Ecology (Ecology). The project will not fill or alter a stream, only buffers, so WSDOT does not anticipate the need for Hydraulic Permit Approval (HPA), but will need verification that no HPA is needed from Washington Department of Fish and Wildlife (WDFW)

Recommended Mitigation Ratios

The cities of Algona and Pacific do not have recommended mitigation ratios for stream buffer impacts, but have general provisions for replacement of affected functions (City of Algona 2009 and City of Pacific 2009).

Mitigation Strategy

Avoiding impacts to wetlands and streams was the primary mitigation strategy. The project was able to limit unavoidable permanent impacts to about one-quarter of an acre of poorly functioning stream buffer. WSDOT could effectively mitigate for this small area on WSDOT property. An existing site with surplus mitigation would be the most practical method to achieve compensatory mitigation. WSDOT will mitigate for temporary impacts through on-site restoration, consisting of re-seeding the grass dominated buffers temporarily impacted.

WSDOT chose the proposed SR 167 Southbound HOT Lane 8th Street East Vicinity to S 277th Street Vicinity (SR 167 Stage 4) Mitigation Site (Site C) for use as compensatory mitigation (Perteet 2008b). The Site C Mitigation Site provides surplus mitigation consistent with the impacts proposed by the SR 167 Stage 5 project.

Site Location

Site C is located in the city of Auburn west of SR 167 between SR 18 and West Main Street. It is bound by West Valley Highway to the west. It is further located in Section 14, Township 21 North, Range 4 East.

Rationale for Site Selection

The site was selected because it is a proposed WSDOT mitigation site with surplus mitigation close to project impacts.

Mitigation Site Existing Conditions and Design Details

See SR 167 Stage 4 Wetland and Stream Mitigation Report for site details (Perteet 2008b).

Surplus Mitigation Area

WSDOT proposes to use enhancement of stream buffer at Site C and along Mill Creek to mitigate for project impacts. The area proposed for use is located at the southern end of the site between Mill Creek and the proposed wetland enhancement area. The proposed buffer area is seasonally inundated wetland. This area is primarily reed canarygrass with some willow and an occasional red alder. WSDOT will treat the reed canarygrass to reduce its prevalence while still maintaining native woody cover. Then WSDOT will plant the area with native trees and shrubs (Table 3).

Table 3.
Plant list proposed for upland buffer areas

Common Name	Scientific Name
Black Cottonwood	*Populus balsamifera*
Red Alder	*Alnus rubra*
Oregon Ash	*Fraxinus latifolia*
Sitka Spruce	*Picea sitchensis*
Western Red Cedar	*Thuja plicata*

Ecological Benefits

Stream Buffer Functions

The native trees will provide shading, future sources of large woody debris (LWD), and allochthonous inputs to the stream food web. The shading will keep summer water

temperatures cool and dissolved oxygen content high favoring native salmonids. The large woody debris will provide fish habitat including providing refuge and modifying the current to create riffles, pools, cut banks, and other habitat features. Inputs of leaf litter and insects from the trees will add important inputs into the stream food web.

The proposed mitigation site will be monitored for five years to demonstrate that the intended goals and objectives are established. Goals describe the overall intent of mitigation efforts, and objectives describe individual components of the mitigation site in detail. Performance measures and performance standards describe specific on-site characteristics that indicate a function is being provided. Performance measures are used to guide management of the mitigation site. Performance standards are used to evaluate compliance with regulatory permits in the final year of monitoring. Contingency plans describe what actions can be taken to correct site deficiencies.

WSDOT uses the adaptive management process to improve mitigation success. Adaptive management involves learning from monitoring and implementing management activities, such as implementing parts of the site management or contingency plans. Information from monitoring is used to direct subsequent site management activities. As part of the adaptive management process, mid-course corrections may necessitate a change in vision for the site if nature takes its course and things turn out differently than planned. A change in vision may require renegotiation with regulators for a new set of performance standards.

Goals

The proposed mitigation is intended to enhance 0.27 acre of stream buffer.

Objectives

Increase tree cover along Mill Creek on 0.27 acre of buffer.

Performance Criteria

Vegetation Performance Measures

Year-1 and Year-3

Native woody species (planted and volunteer) will achieve a stem density of at least four plants per one hundred square feet in the forested communities of the enhanced buffer areas.

Performance Standard – Year 5 (final year of monitoring)

Aerial cover of native woody species will be at least 50 percent in the forested communities of the enhanced buffer areas

Monitoring, Contingency and Site Management Plans

Monitoring, contingency and site management plans will be the same as those described in the Wetland and Stream Mitigation Report for the SR 167 Stage 4 Project (Perteet, 2008b). Except monitoring will only extend for five years for this portion of the mitigation site rather than the ten years proposed for the SR 167 Stage 4 portion.

CHAPTER 8 References

City of Algona. 2009. Algona City Code Chapter 16.18. Environmentally Sensitive Areas. http://nt5.scbbs.com/cgi-bin/om_isapi.dll?clientID=115240518&headingswithhits=on&hitsperheading=on&infobase=algona42.nfo&jump=16.18&softpage=PL_frame#JUMPDEST_16.18.

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Washington State Department of Transportation (WSDOT). 2008. Wetland Guidelines. Washington State Department of Transportation, Environmental Affairs Office. Olympia, WA. http://www.wsdot.wa.gov/Environment/Biology/Wetlands/guidelines.htm.

Appendix A — Wetland Impact Plan Sheets

Appendix B — Mitigation Site Plan Sheets

- **Schematic Mitigation Plan**
- **Planting Plan**