4.8 WETLANDS

Wetlands are areas where water is present at or near the ground surface either all year or for varying periods of time during the year. Wetlands are important because they provide essential ecological functions and also help protect human communities. Wetlands improve water quality in streams, rivers and lakes by filtering pollutants, they protect neighboring areas by retaining flood waters, and they often recharge groundwater. Wetlands provide fish and wildlife habitat, and host a wider variety of plant and animal species compared to other land types. Wetlands are protected in the environment by wetland buffers, land encircling the wetland that helps protect it from human disturbance.

4.8.1 What Methods, Assumptions and Resources Were Considered in the Evaluation of Wetlands?

How Was the Wetland Study Area Determined?

The wetland delineation study area was defined using a 300 foot offset from the Build Alternative footprint. Wetlands within the Build Alternative footprint were delineated in the field. In order to identify potential impacts of the Build Alternative to offsite wetlands, wetland boundaries beyond the Build Alternative footprint but within 300 feet from the Build Alternative were visually estimated. The distance of 300 feet was used because it is the maximum buffer width possible for the highest category wetland, as identified in the critical areas codes of the municipalities with jurisdiction in the study area. Therefore, any wetlands more than 300 feet beyond the Build Alternative footprint would not be directly impacted.

How Are Wetlands Identified?

Wetland delineation fieldwork was completed in February, March, April, and August of 2015 to identify aquatic areas protected under local, state, and federal regulations. Wetlands were delineated using the routine methodology described in the U.S. Army Corps of Engineer's *1987 Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region Version 2.0* (May 2010). A wetland and stream delineation report that describes the existing wetlands present within the study area was completed in October 2015. A conceptual mitigation memorandum describing anticipated impacts to the study area wetlands and wetland buffers, and associated potential mitigation measures was also prepared in March 2016.

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

How Is the Value of Wetlands Measured?

The Washington State Department of Ecology (DOE) has developed a wetland rating system to differentiate between wetlands. Wetlands are categorized based on their sensitivity to disturbance, their rarity, the ability to replace them, and the functions they provide (http://www.ecy.wa.gov/programs/sea/wetlands/ratingsystems/). Four categories have been established numbered I through IV. On the rating continuum, Category I wetlands have the highest value, have very high wetland function, and are difficult to replace, while Category IV wetlands are generally disturbed and have the lowest levels of wetland function.

Wetlands within the study area were rated using DOE's 2014 *Washington State Wetland Rating System for Western Washington*

(Hruby, 2014). Wetlands within the study area were also evaluated using the WSDOT's *Wetland Functions Characterization Tool for Linear Projects* to qualitatively assess wetland function (Null et al., 2000).

4.8.2 What Wetlands Currently Exist in the Study Area?

There are 14 wetlands located within the study area. These wetlands are depicted in Figure 4.8-1 through Figure 4.8-4. The wetlands include depressional areas that are located in topographic depressions and riverine wetlands that receive over bank flooding from adjacent streams. Wetlands within the study area have a combination of forested, shrub, and herbaceous vegetation. Wetlands were identified on both sides of the Thorne Lane interchange, along Murray Creek, and in the vicinity of the Steilacoom-DuPont Road interchange.

One of the wetlands in the study area, Bell Marsh, was rated as a Category I wetland. Three other wetlands were rated as Category II and 10 wetlands were rated as Category III. No Category IV wetlands were identified.

Overall, the wetland buffers of the 14 wetlands within the study area are highly disturbed by noise, trash and general human activity associated with the I-5 corridor, JBLM, Camp Murray, and the communities of Lakewood, Tillicum, and DuPont. Buffers associated with the Thorne Lane interchange (Wetlands 1, 2, 3, and 4) are particularly fragmented by paved roads, on- and off-ramps to I-5, trash dumps and business and residential areas, and have lost much of their natural vegetation. Of the wetlands associated with Murray Creek, the Wetland 5 buffer is less disturbed while the buffers associated with Wetlands 6, 7, and 8 consist predominantly of buildings, the railroad right of way, and paved areas. The buffers associated with Wetlands 9 through 14 are in the Bell Marsh area the least disturbed.

Table 4.8-1 summarizes the wetlands delineated and associated buffers within the study area.

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

The No Build Alternative assumes I-5, associated connector roads, and overpasses within the study area would remain in their current configuration except for the funded improvements identified in Chapter 3. The No Build Alternative would not affect wetlands or wetland buffers.

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

The Build Alternative would result in unavoidable permanent direct and indirect impacts and temporary impacts to wetlands and their buffers. Permanent wetland impacts are generally defined as a disturbance that affects the existing wetland soils, such as fill placement or excavation.

Indirect wetland impacts are disturbances that impact wetland function without directly filling or excavating wetland soil. Examples of indirect wetland impacts include changing wetland hydrology by diverting existing water sources or shading wetlands with an overhead structure so that wetland vegetation is negatively affected. Temporary wetland impacts are addressed in Section 4.8.5.

The Build Alternative would permanently impact two riverine wetlands in the vicinity of the Thorne Lane interchange, resulting in 0.06 acre of permanent wetland impact from support structures for an overpass associated with the Thorne Lane interchange improvements. The Build Alternative would result in 1.09 acres of permanent impact to the wetland buffer. Permanent

Build Alternative Footprint

Figure Callouts

Refer to the figures listed for detailed information on wetland and stream delineation in these areas

INTERCHANGES

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

Figure 4.8-1
Wetlands Key Map

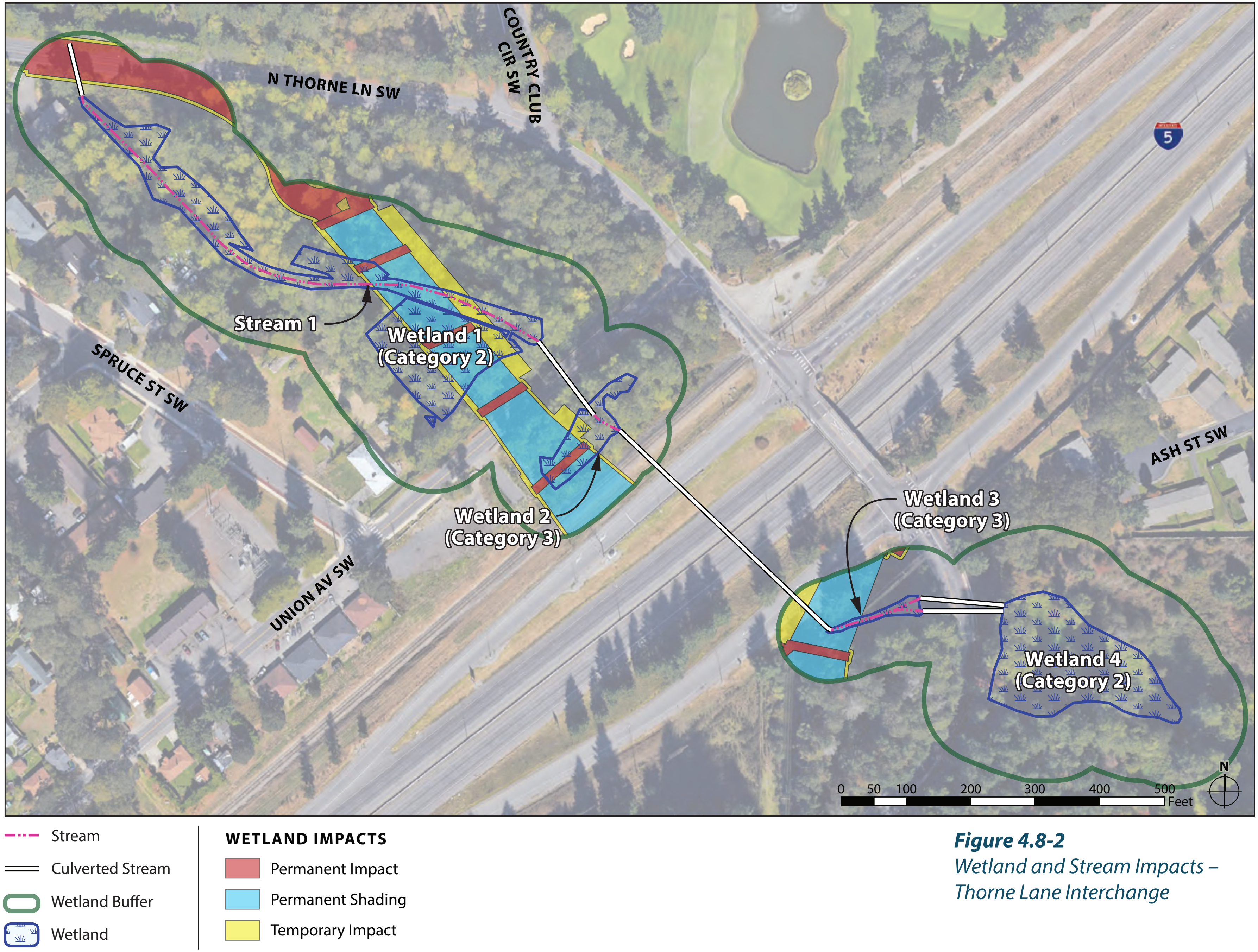
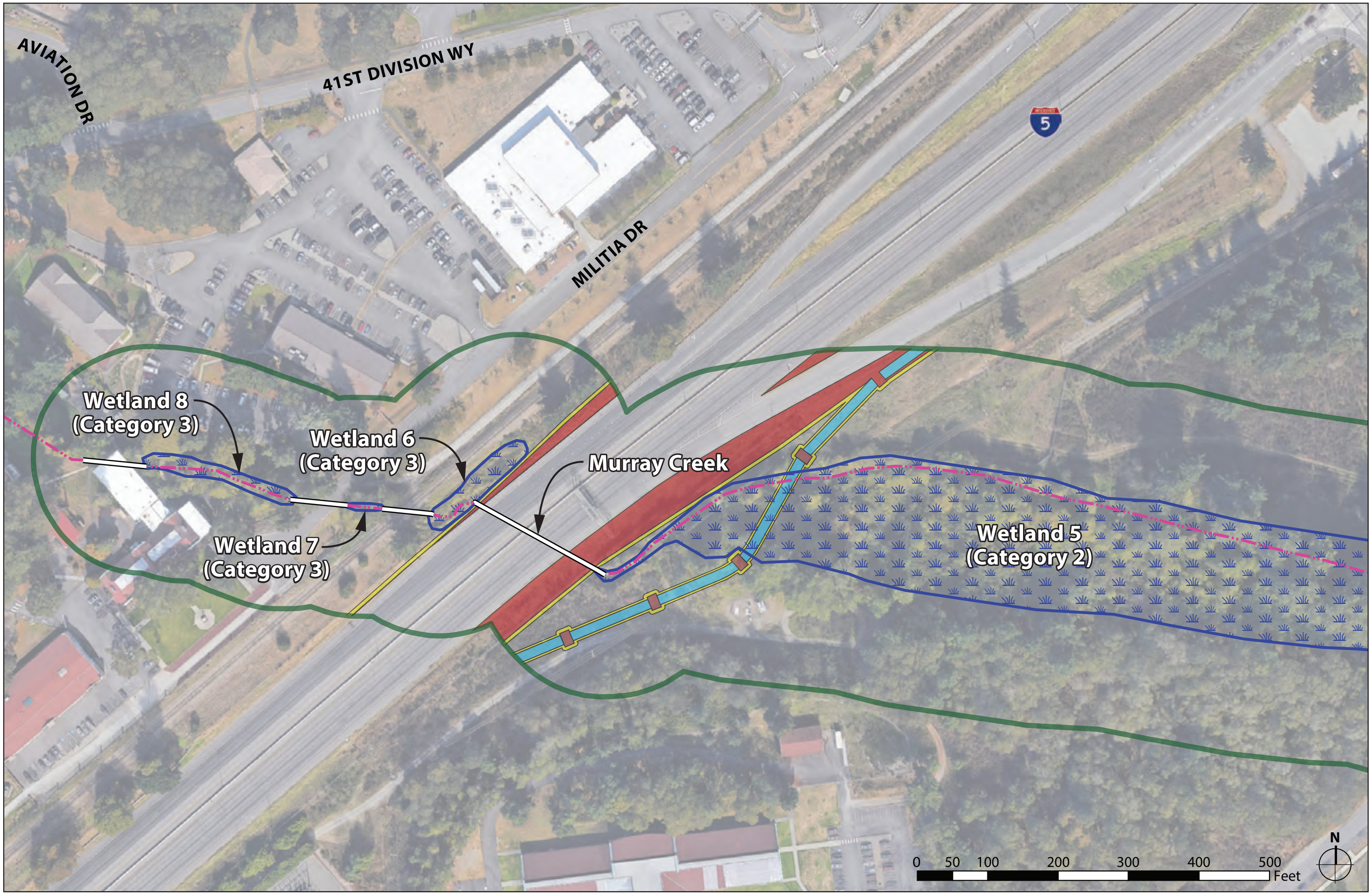


Figure 4.8-2
Wetland and Stream Impacts – Thorne Lane Interchange



Stream
Culverted Stream
Wetland Buffer
Wetland

WETLAND IMPACTS

Permanent Impact
Permanent Shading
Temporary Impact

Figure 4.8-3
Wetland and Stream Impacts – Berkeley Street Interchange

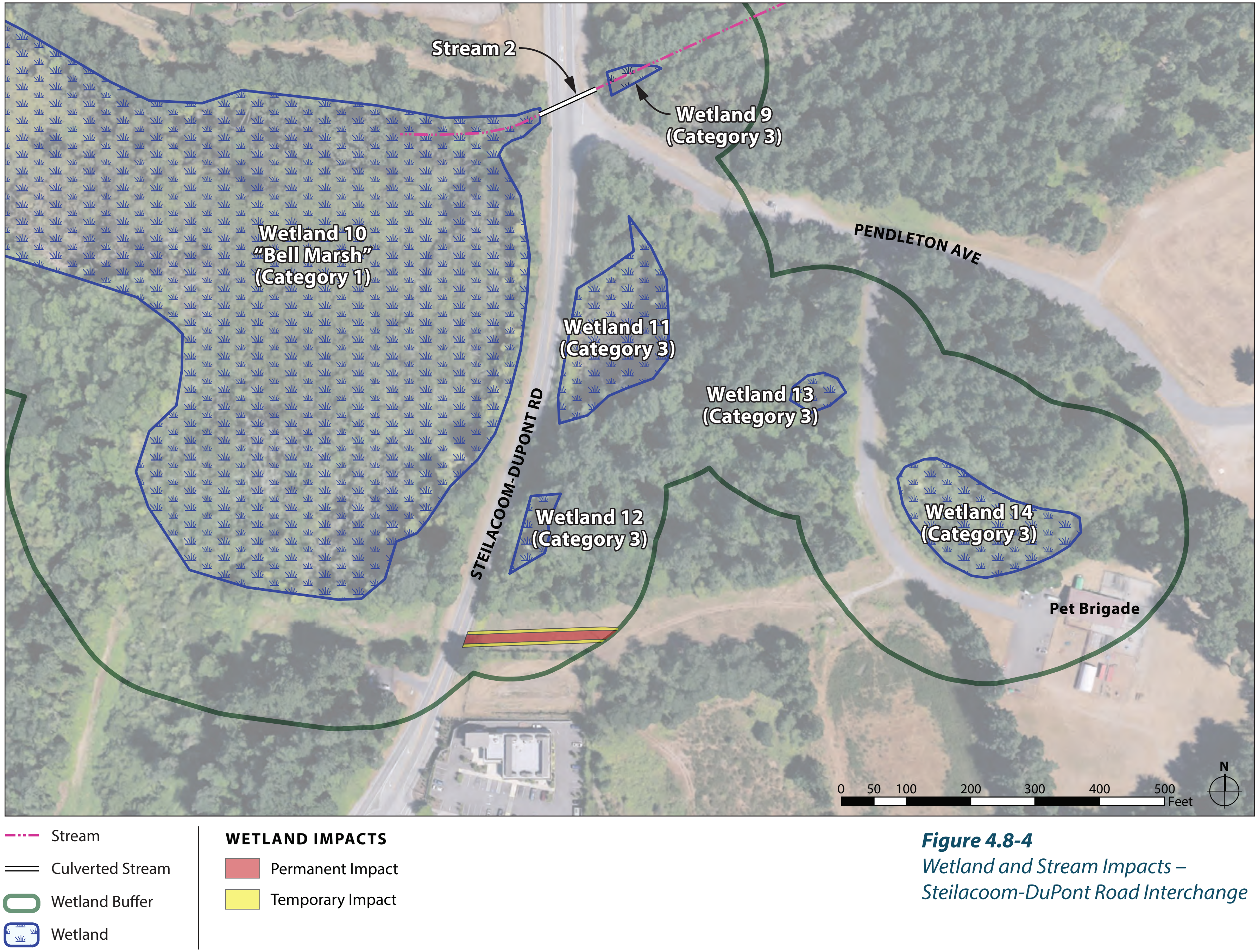


Figure 4.8-4
Wetland and Stream Impacts – Steilacoom-DuPont Road Interchange

wetland and wetland buffer impacts are summarized in Table 4.8-2 and Table 4.8-3.

To avoid and minimize wetland and buffer impacts, elevated structures are proposed as part of the Thorne Lane interchange improvements and the pedestrian path crossing at Murray Creek.

Elevated structures spanning wetlands and buffers would prevent light from reaching vegetation below, inhibiting vegetation growth and survival. The Build Alternative would indirectly impact 0.4 acre of wetland and 0.89 acre of wetland buffer due to shading.

***Table 4.8-1** Wetlands Delineated Within the Study Area*

Wetland	Wetland Classification			Total Wetland Acreage[4]	Jurisdiction	Buffer Width (feet)
	Cowardin[1]	HGM[2]	Ecology[3]			
1	PFO/SS	Riverine	II	1.22	Lakewood	100
2	PFO	Riverine	III	0.20	Lakewood	75
3	PEM	Riverine	III	0.05	Lakewood	75
4	PEM/FO	Depressional Outlet	II	0.83	Lakewood	100
5	PEM/SS/FO	Riverine	II	4.43	JBLM	164
6	PEM	Riverine	III	0.12	Pierce County	150
7	PSS	Riverine	III	0.01	Pierce County	150
8	PSS/FO	Riverine	III	0.11	Pierce County	150
9	PFO	Riverine	III	0.05	JBLM	164
10	PAB/EM SS/FO	Depressional Outlet and Riverine	I	15.13	DuPont	200
11	PAB/SS/FO	Depressional Closed	III	0.73	JBLM	164
12	PFO	Depressional Closed	III	0.11	JBLM	164
13	PAB/FO	Depressional Closed	III	0.08	JBLM	164
14	PSS/FO	Depressional Closed	III	0.70	JBLM	164

Notes:
1 Cowardin and others (1979) or National Wetland Inventory Class based on vegetation: PAB = palustrine aquatic bed, PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub-shrub
2 Brinson (1993)
3 Washington State Department of Ecology (Ecology) rating according to Ecology (Hruby, 2014)
4 Wetlands that extend beyond the delineated boundary were approximated based on observations made from public right of way and aerial imagery.
HGM = hydrogeomorphic
JBLM = Joint Base Lewis-McChord

Table 4.8-2 *Total Impacts to Wetlands as a Result of the Build Alternative*

Wetland	Total Wetland Acreage[1]	Ecology Category[2]	Permanent Wetland Impacts (Acres)	Indirect Wetland Impacts (Acres)	Temporary Wetland Impacts (Acres)
1	1.22	II	0.037	0.292	0.115
2	0.20	III	0.026	0.057	0.019
3	0.05	III	0	0.010	0
5	4.43	II	0	0.042	0.018
Total	5.9	--	0.06	0.40	0.15

Notes:
1 Wetlands that extend beyond the delineated boundary were approximated based on observations made from public right of way and aerial imagery.
2 Washington State Department of Ecology (Ecology) rating according to Ecology (Hruby, 2014).

Table 4.8-3 *Total Impacts to Wetland Buffers as a Result of the Build Alternative*

Wetland	Jurisdiction	Buffer Width (Feet)	Total Buffer Area (Acres)	Permanent Buffer Impacts (Acres)	Indirect Buffer Impacts (Acres)	Temporary Buffer Impacts (Acres)
1	City of Lakewood	100	4.678	0.376	0.294	0.238
2	City of Lakewood	75	0.649	0.006	0.170	0.026
3	City of Lakewood	75	0.790	0.041	0.265	0.023
5	JBLM	164	9.521	0.529	0.167	0.163
6	Pierce County	150	0.459	0.072	0	0.050
12	JBLM	164	2.013	0.073	0	0.052
Total	--	--	18.11	1.09	0.89	0.55

Note: JBLM = Joint Base Lewis-McChord

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

Short-term, temporary impacts are impacts that are able to be restored over time and would not result in a permanent change or alteration of the wetlands or associated buffers. Short-term impacts last for a finite period of time and the impacted wetland function generally returns. Examples of temporary impacts include vegetation removal or temporary fill or excavation associated with construction of support structures located within the wetland. The Build Alternative would temporarily impact a total of 0.15 acre of wetland and 0.55 acre of wetland buffer as shown on Table 4.8-2 and Table 4.8-3.

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

The Build Alternative would impact wetlands and wetland buffers within the city of Lakewood, Pierce County and JBLM. In accordance with the *Lakewood Municipal Code* Chapter 14A.162.100, *Pierce County Code* Chapter 18E.30.050 and the *2006 Interagency Wetland Mitigation Guidance for Washington State,* Part 1 and 2, the conceptual mitigation strategy for the Build Alternative was developed in the following priority order:

1. Avoid impact.
2. Minimize impact.
3. Rectify by repair, rehabilitation or restoration.
4. Reduce impact over time.
5. Compensate – such as purchase credits from an In-lieu Fee (ILF) program or mitigation bank.
6. Monitor the impact, compensate, and take corrective measures.

Mitigation planned to address wetland impacts of the Build Alternative is described in the following paragraphs.

Avoidance and Minimization

The Build Alternative would avoid and minimize impacts to wetlands to the greatest extent practical to achieve the least environmentally damaging alternative. However, total avoidance would not be possible due to the purpose and need for the Build Alternative, the landscape position, and physical constraints associated with the I-5 corridor. Wetland impacts that could not be avoided or minimized would be offset through compensatory mitigation. Impacts to wetland functions that could not be avoided would be replaced.

Compensatory Mitigation

Impacts that cannot be avoided or minimized would be offset through compensatory mitigation per the Federal Wetland Mitigation Rule. The Federal Wetland Mitigation Rule has three mechanisms for providing compensatory mitigation. These, in order of preference, are:

- Mitigation Banks.
- In-lieu Fee programs.
- Permittee-responsible mitigation.

Compensatory mitigation would be provided through the Pierce County In-Lieu Fee (ILF) program. The Pierce County program offers wetland mitigation credits of the same wetland types that would be impacted by the Build Alternative. In-Lieu Fee mitigation allows the permit holder to make a one-time payment to a third party instead of conducting their own mitigation project. In-Lieu Fee mitigation programs are approved by DOE and implement mitigation that is specifically designed to meet a watershed's ecological needs (Pierce

County, 2016). The Pierce County In-Lieu Fee program services the area where Build Alternative impacts would take place.

Mitigation would offset the Build Alternative's 0.06 acre of permanent wetland impacts and 1.09 acres of permanent wetland buffer impacts. Short-term temporary wetland impacts such as vegetation clearing to facilitate construction would be mitigated through restoration of the impacted areas. For example, native plant species would be planted in wetlands and buffers where existing vegetation is cleared due to construction activity.

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

The design team has sought to avoid and minimize wetland impacts during the scoping and design phase of the Build Alternative. For example, at the Wetland 5-Murray Creek wetland system and at Wetland 6, retaining walls would be used to limit the extent of fill placement that would otherwise have encroached into the wetlands and stream.

Other strategies to avoid wetland impacts include locating stormwater facilities in upland areas, and moving proposed improvements away from wetlands where possible. For example, at the Thorne Lane interchange where wetland and stream systems are present, the design layout was altered to shift it away from the wetland and stream areas to the extent possible.

Where avoidance would not be possible, impacts would be minimized by incorporating elevated structures in or over the wetland areas and maximizing pier spans to avoid wetland fragmentation and minimize wetland fill. For example, where the Thorne Lane interchange improvements are unable to avoid Wetlands 1, 2, and 3, the improvements would occur as an overpass. At Wetland 5-Murray Creek, the pedestrian path would completely span the wetland system.

Permanent Impacts

Unavoidable permanent wetland impacts to two wetlands (totaling 0.06 acre) and wetland buffer permanent impacts to six wetlands (totaling 1.09 acres) would be mitigated. Therefore, the Build Alternative would not result in unavoidable adverse effects on wetlands that cannot be mitigated.