Northgate Pedestrian and Bicycle Bridge Project

Conceptual Wetland and Watercourse Mitigation Plan

Prepared for

Seattle Department of Transportation

Washington State Department of Transportation

Federal Highway Administration

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Seattle Department of Transportation

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Executive Summary

The Seattle Department of Transportation (SDOT) proposes to construct the Northgate Pedestrian and Bicycle Bridge Project (Project). The Project will construct a pedestrian and bicycle bridge over Interstate 5 (I-5) and pedestrian and bicycle improvements at the east and west ends of the Project that will improve connections between the surrounding neighborhoods. The Project will also provide access to the North Seattle College, King County Transit Center, and future Sound Transit Northgate Link Light Rail station. The Project will be located within the Sections 31 and 32, Township 26 North, Range 04 East in the vicinity of NE 100th and NE 103rd streets, and I-5 and 1st Avenue Northeast (Figure 1).

On the west side of I-5, on the North Seattle College (NSC) campus, there are six wetlands and one watercourse. All wetlands and the watercourse are connected hydraulically to the South Fork of Thornton Creek either by pipe, surface-flow or groundwater. These water resources drain into Wetland 6. Wetland 6 discharges to a 36-inch diameter culvert pipe that extends underneath and to the east side of I-5 where it discharges into the South Watercourse (Figure 3).

On the east side of I-5, there are four wetlands, two jurisdictional ditches, and two watercourses. The North Watercourse, Jurisdictional Ditch #2, and Wetland A are located north of NE 100th Street and receive stormwater and ground water from within the I-5 right-of-way. The South Watercourse is located south of NE 100th Street and receives water from Wetland 6 via the 36-inch pipe described earlier. The rest of the features on the east side of I-5 are located south of NE 100th Street and are not impacted by the project.

The North Watercourse and South Watercourse both discharge into an enclosed stormwater system under First Avenue NE, which then discharges into a 72-inch stormwater system flowing east under NE 100th Street (Figure 3). During low flows, all water from this 72-inch stormwater system is discharged to a water quality treatment feature just north of NE 100th Street, between 3rd Avenue NE and 5th Avenue NE before entering the South Branch of Thornton Creek near 5th Avenue NE. During storm events, high flows are routed directly to the South Branch of Thornton Creek.

All the aquatic resources to the south of the South Watercourse including wetlands A, D, F, and Jurisdictional Ditch #1, have been impacted by construction of the Sound Transit Northgate Link Light Rail Station and are included as discussion only as the function and values of those resources are being changed as construction progresses throughout that corridor. Ditch #2 and Wetland A near the north end of North Watercourse are not impacted by the Project. These are shown in Appendix A as figures A-8 through A-10.

The watercourses on both sides of I-5 have been identified as Type F waters. All impacted wetlands are Category III based on the Washington State Department of Ecology Wetland Rating System for Western Washington. Threespined stickleback (*Gasterosteus aculeatus*) and cutthroat trout (*Oncorhynchus clarkii*) have been discovered in the North Watercourse and Wetland 6 (USFWS 2010). Threespined stickleback have been sighted in Watercourse 5.

The Project will have temporary impacts on wetlands, watercourses and their buffers: Ground disturbance for the Project will involve excavation, grading, and addition of fill material. The following summarizes the ground disturbance that will occur for the main project construction activities:

- Bridge footings and columns—Ground disturbance will occur for 17 bridge support piers and abutments. The west embankment approach to the bridge will be fill supported by retaining structures up to a height of about 20 feet.
- Staging areas—On the west side of I-5, there will be ground disturbance for excavation and grading including staging areas. On the east side of I-5 there will be ground disturbance for excavation and grading including staging areas.
- Retaining walls—A portion of the east approach will be fill supported by retaining walls up to a height of about 11 feet. Fill quantity is estimated at about 460 cubic yards.

Watercourse 5 will be reconfigured to allow room for the west bridge approach. Approximately 1,182 square feet of Watercourse 5 will be filled. A portion of the North Watercourse will be filled to accommodate the east bridge landing piers and protected bike lane along 1st Avenue NE. The southern 130 feet of the North Watercourse will be filled.

The Project proposes to mitigate temporary and permanent impacts to wetlands, watercourses and their associated buffers through mitigation sequencing. Impacts were avoided where possible, minimized to the extent feasible, and mitigated to replace current function and value for fish, wildlife, and vegetation. Timing of construction activities to reduce impacts to spawning and breeding seasons for fish and wildlife, working in low flow conditions to reduce impacts due to turbidity and moving higher volumes of water, and reducing the amount of time for soil disturbance and potential impacts due to erosion or mobilizing sediment were all considerations for appropriate construction sequencing for this this project. Day light work timing restrictions will also be required due to potential tree frog impacts during mating season from (February-July). Wetland impacts within the project area, including impacts to Watercourse 5 and impacts to the wetland functions of the North Watercourse will be mitigated on-site. Impacts to the Type F water below the Ordinary High-Water Line in the North Watercourse will be mitigated for off-site at Victory Creek in northeast Seattle.

This Conceptual Wetland and Watercourse Mitigation Plan was developed to accompany permit applications. Impacts to the wetlands on the NSC campus lie within City of Seattle's Environmentally Critical Areas and are addressed and mitigated for under the Seattle Municipal

Code (SMC). Feedback obtained as part of the permitting process will be incorporated into a revised version of this plan before issuance of permits.

1 INTRODUCTION

This Conceptual Wetland and Watercourse Mitigation Plan has been drafted to support environmental documentation, permit applications, and to meet local, state, and federal requirements for mitigation for the Northgate Pedestrian and Bicycle Bridge Project (Project). This report provides a brief project overview, an assessment of impacts to wetlands, watercourse, and their associated buffers, and a summary of proposed compensatory mitigation for unavoidable permanent impacts to those resources.

2 PROJECT DESCRIPTION

2.1 PURPOSE AND NEED

The purpose of the Project is to provide a convenient and safe pedestrian and bicycle connection over I-5. The Project provides important and much-needed improvements to the area. Existing pedestrian and bicycle highway crossings in the area are separated by approximately 0.9 mile, located on Northgate Way to the north and N 92nd Street to the south. Improvements include a pedestrian and bicycle bridge that will span I-5, a link to the Washington Department of Transportation (WSDOT) park-and-ride lot, and a connection between the bridge and nearby transit facilities.

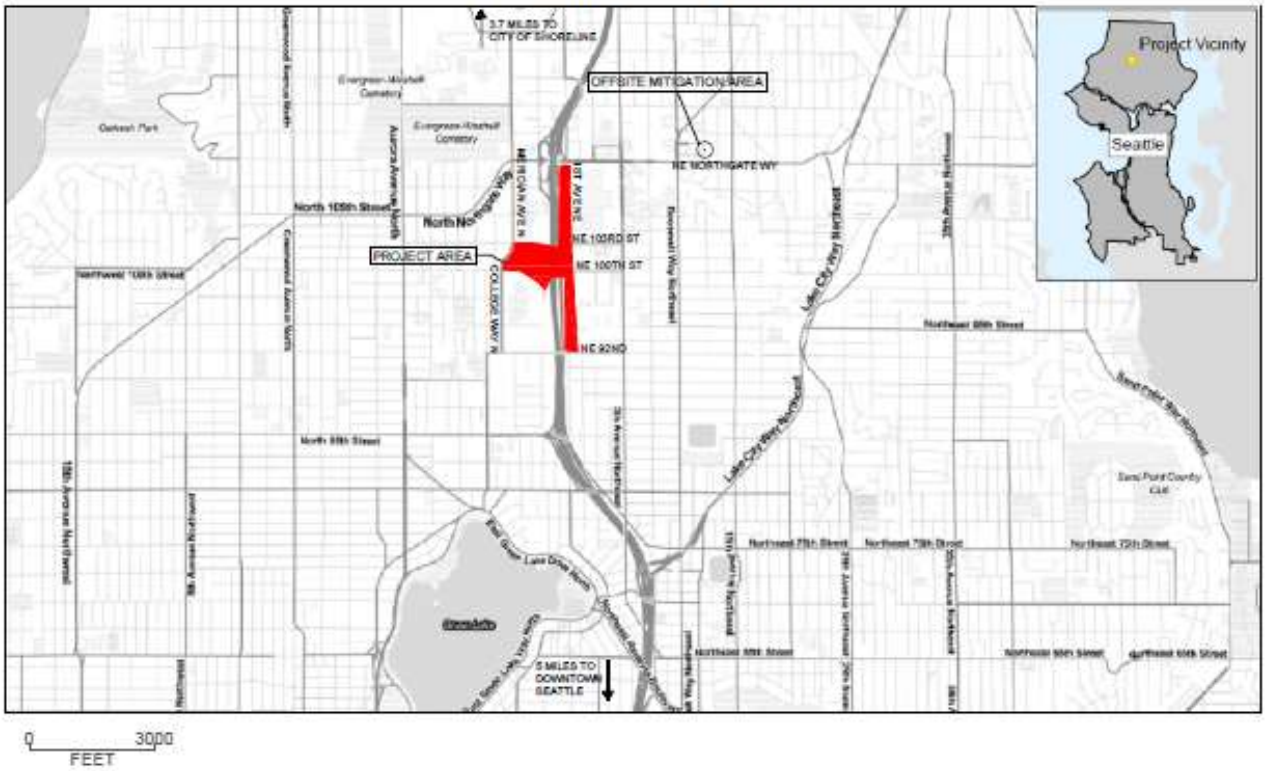
The Project is needed to support the transit development at Northgate. Northgate is the home of the Northgate Transit Center and operates as the largest facility in the King County Metro system. The transit center is helping the area to move from a community dependent on automobiles to a community embracing the benefits of active transportation. In the near future, the existing transit center will be enhanced by a new light rail station currently under construction. Residents and commuters will have access to light rail that will connect to the University of Washington, downtown Seattle, and SeaTac Airport. In the future, light rail will go as far south as Tacoma, north to Lynnwood and Everett, and east to Bellevue and Redmond.

2.2 PROJECT LOCATION

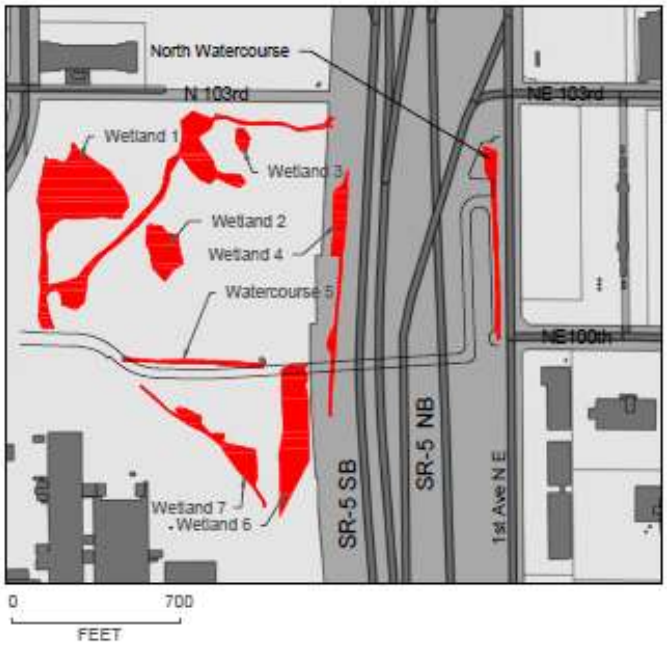
The Project is located in the Northgate area of Seattle, Washington (Figure 1). The project area is generally bounded by College Way N on the west, 1st Avenue NE on the east, Northgate Way on the north and N 92nd Street on the south. This area is bisected by the I-5 freeway. The eastern portion of the Project lies within SDOT and WSDOT rights-of-way. The western portion of the Project lies within WSDOT right-of-way and lands owned by the North Seattle College (NSC). The Project is located within the Sections 31 and 32, Township 26 North, Range 04 East.

Figure 1: Project Area Map

Project Vicinty and Location Map



Project Area Water Resources Map



Offsite Mitigation Area Map

PROJECT OVERVIEW

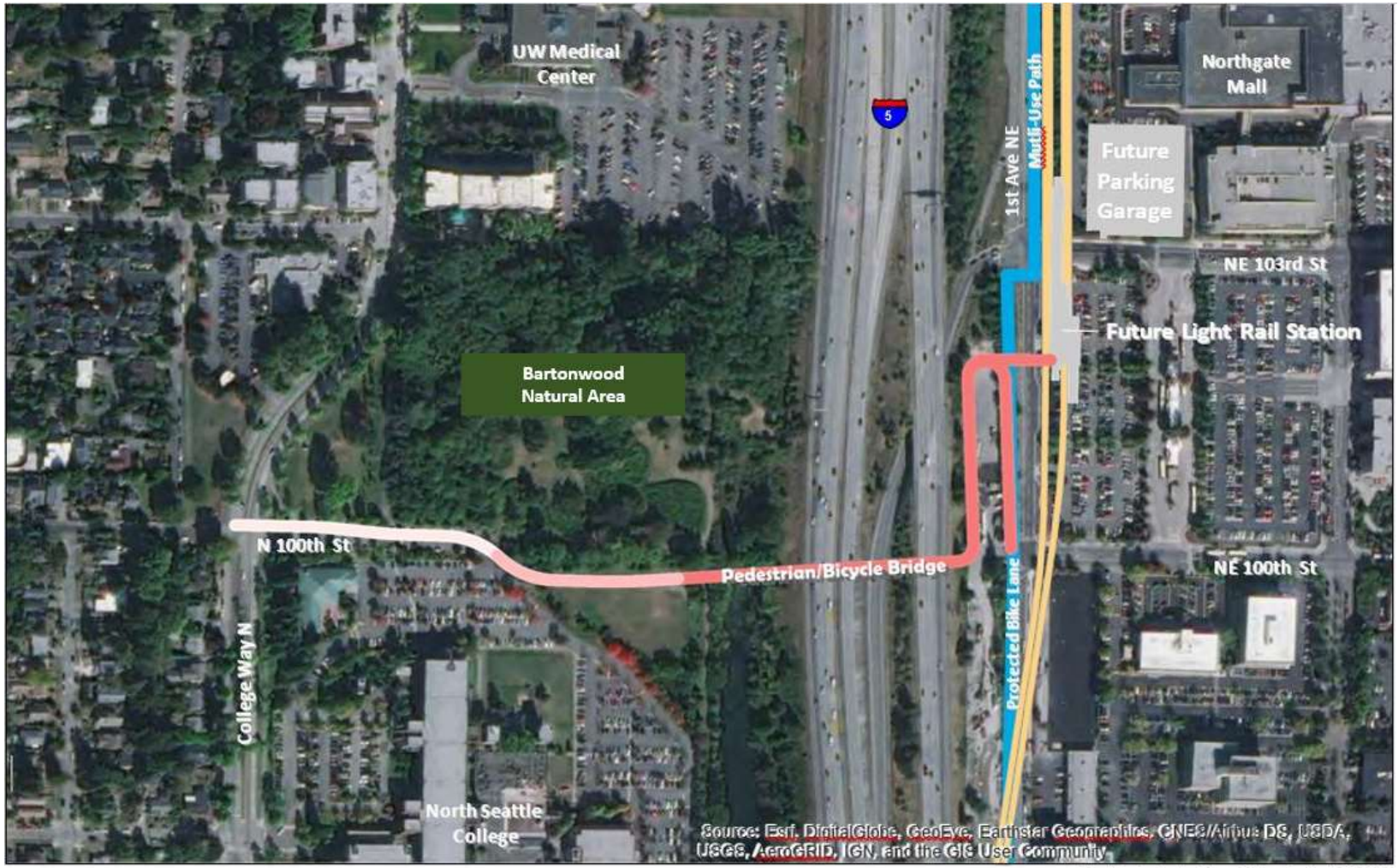
The key elements of the Project are shown in Figure 2 and include:

- Bridge: a 16-foot wide, 1,900-foot long Pedestrian and Bicycle facility, including a 360-foot section crossing I-5.
- West Approach Ramp: a ramp leading to the west side of the bridge that consists of an earthfill embankment with retaining walls located on the NSC campus.
- West-Side Multi-Use Path: a 16-foot wide multi-use path on the NSC campus linking the West Approach Ramp with College Way N.
- East Approach Ramp: a ramp leading to the east side of the bridge that starts at ground level within the WSDOT park and ride at 1st Avenue NE and NE 100th Street on the east side of I-5 and rises to the level of the bridge at I-5.
- Light Rail Spur: a bridge connection over 1st Avenue NE connecting the East Approach Ramp to the Northgate Link Light Rail station.
- East-Side Protected Bike Lane: a 10-foot wide protected bike lane that runs along the west side of 1st Avenue NE from NE 92nd Street to NE 103rd Street.
- East-Side Multi-Use Path: a multi-use path on the east side of the 1st Avenue NE that extends from NE 103rd Street to Northgate Way.
- Stormwater: 6,989 square feet of impervious surface will be added, distributed in six sub areas.

Construction activities will include:

- Clearing and grading/ vegetation removal
- Ground disturbing activities
- Concrete and asphalt paving
- Construction and removal of temporary trestles
- In-water construction
- Temporary on-site staging
- I-5 closures

Figure 2: Project Site and Bridge Alignment



SOURCE: City of Seattle 2017; Sound Transit 2017; Esri 2016

Northgate Pedestrian Bridge Project. 130125

Bridge Structure
Earthfill Section
16' Wide Multi-Use Path
1st Avenue NE Protected Bike Lane (PBL)/Multi-Use Path

2.3 PROJECT SCHEDULE

Project construction is anticipated to begin in April 2019 and will take approximately 18 to 20 months with a target completion in December 2020, before the opening of the Sound Transit Northgate Link Light Rail Station. The station is currently under construction, with its structural facilities anticipated to be completed in 2020, and the light rail service to be connected to the system and open to the public in 2021.

2.4 GEOGRAPHIC AREA

For this analysis, the overall project area was divided into two geographic areas, one located west of I-5 and the other east of the interstate (Figure 1). Each has different geological and hydrological conditions and are described separately below. The project area lies within Water Resource Inventory Area (WRIA) 8–Lake Washington/Cedar/Sammamish Watershed.

The western geographic area is bounded by I-5 to the east, College Way North to the west, N 103rd Street to the north, and the NSC's Northeast parking lot and triangle grassy area to the south. It includes the Bartonwood Natural Area to the North of N 100th Street and a portion of the NSC campus west of I-5.

Native vegetation is found within the western geographic area primarily in association with wetlands and the Bartonwood Natural Area. Dominant native species include: Pacific madrone, Pacific and Scouler's willow, Douglas-fir, western hemlock, big-leaf maple, Pacific crabapple, red alder, black cottonwood, Nootka rose, Oregon grape, Indian plum, trailing blackberry, sword fern, Douglas spirea, common rush, and cattail.

The eastern geographic area is largely parking lots and street right-of-way, with some vegetated areas and an intersecting watercourse. It is bounded by the interstate to the west, 1st Avenue NE to the east, NE Northgate Way to the north, and NE 92nd St to the south. Native vegetation in the eastern geographic area is also associated with wetlands and watercourses but occurs in small patches. Native species include: red alder, Pacific willow, red-osier dogwood, small-fruited bulrush, common rush, and field horsetail.

3 STORMWATER

On the west side of I-5, NSC campus, there are six wetlands and one watercourse. All wetlands and the watercourse are connected hydraulically to the South Fork of Thornton Creek either by pipe, surface-flow or groundwater. These water resources drain into Wetland 6. Wetland 6 discharge to a 36-inch diameter culvert pipe that extends underneath and to the east side of I-5 where it discharges into the South Watercourse

On the east side of I-5, there are four wetlands, two ditches, and two watercourses. The North Watercourse and Wetland A are located north of NE 100th Street and receive stormwater and

ground water from within the I-5 right-of-way. The South Watercourse is located south of NE 100th Street and receives water from Wetland 6 via the 36-inch pipe described earlier. The rest of the features on the east side of I-5 are located south of NE 100th Street and are not impacted by the Project.

The North Watercourse and South Watercourse both discharge into a 48-inch stormwater system under First Avenue NE, which then discharges into a 72-inch stormwater system flowing east under NE 100th Street. During low flows, all water from this 72-inch stormwater system is discharged to a water quality treatment feature just north of NE 100th Street, between 3rd Avenue NE and 5th Avenue NE before entering the South Branch of Thornton Creek near 5th Avenue NE. During storm events, high flows are routed directly to the South Branch of Thornton Creek.

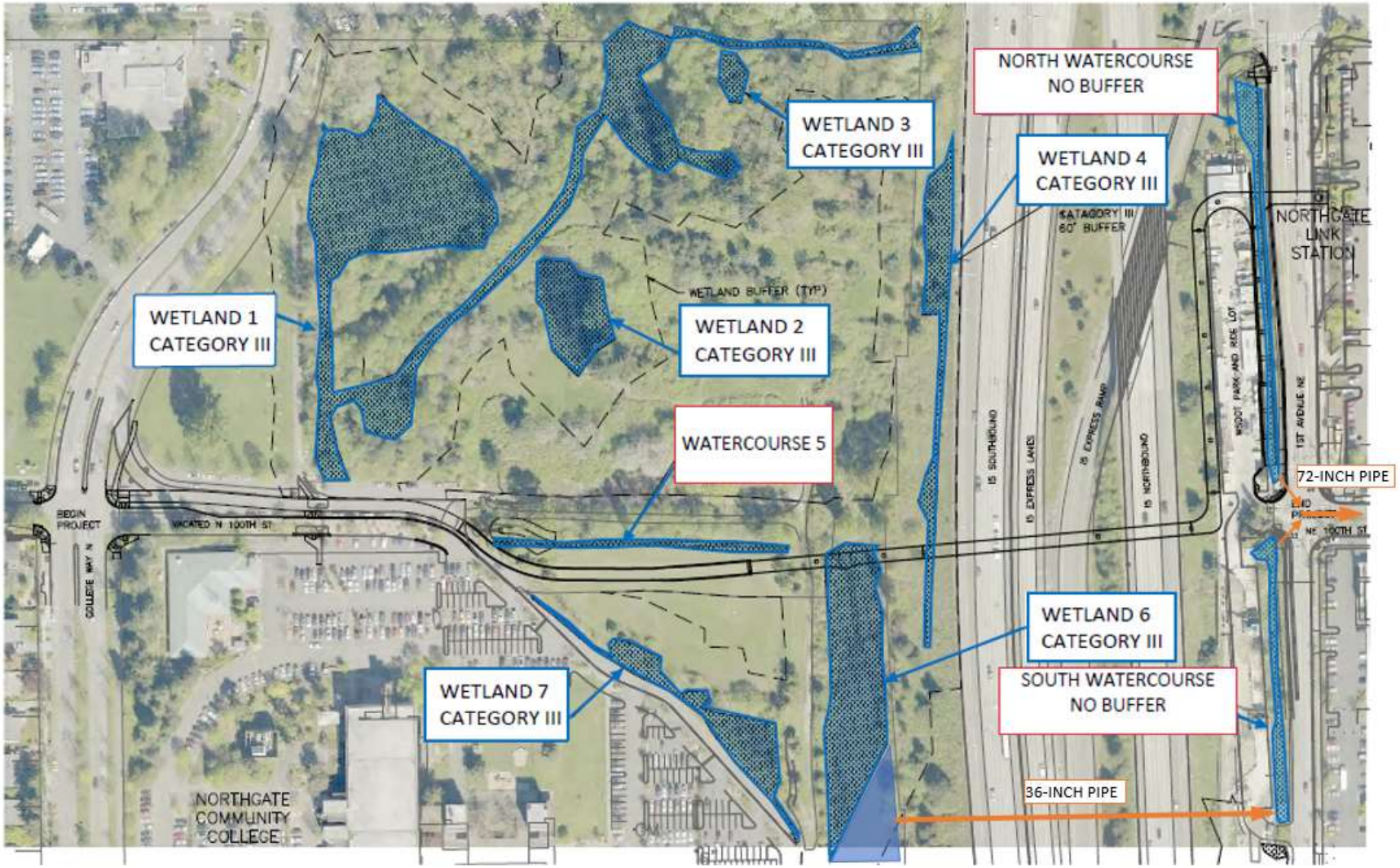
The source of runoff from the Project will be stormwater flow from new and replaced impervious surface, largely consisting of the bridge and approaches and the trail connection to College Way N. The majority of the impervious surface will be from non-pollution generating surfaces. All stormwater will continue to discharge into surface waters within the project area at the same locations as current drainage patterns and will be managed to meet the 2016 City of Seattle Stormwater Code and Manual for detention and water quality (SMC 22.800-22.808). The City of Seattle Stormwater Code is equivalent to the Washington State Department of Ecology Western Washington Stormwater Manual. No permanent surface water withdrawals or diversions are proposed. All watercourses and wetlands will continue their existing patterns of recharge and discharge. Temporary diversion of water in watercourses containing fish may be required prior to and during fill operations.

4 WETLANDS AND WATERCOURSES

4.1 WETLAND DELINEATIONS

Three wetland delineations were conducted within the project area, during 2005, 2007, and 2012 by Environmental Science Associates (ESA), Herrera, and WSDOT respectively. Wetland delineations were verified and documented with new flagging to clearly indicate wetland boundaries both east and west of I-5, by Clearway Environmental in 2017 (see Figure 3). This section describes the water resources within the project area.

Figure 3: Wetlands and Watercourses



4.2 WATER RESOURCES IN THE WESTERN GEOGRAPHIC AREA

In the western geographic area, Clearway Environmental identified six wetlands (Wetlands 1-4 and 6-7) that roughly align with wetlands identified by the National Wetland Inventory (Figure 3). Wetland boundaries are generally within the NSC parcel, but also extend into the I-5 right-of-way. There is also upland habitat in the majority of the central, southern, and eastern portions of the western geographic area, with a prominent hill situated in the southeastern quarter of the geographic area. This document does not discuss unimpacted wetlands further than general descriptions.

The following provides summary descriptions of wetlands and watercourses in the project area. Detailed information on each wetland and watercourse is provided in the Northgate Pedestrian and Bicycle Bridge Project – Wetland Discipline Report (2018).

Table 1: Wetlands and Watercourses West of I-5 – Categories, Ratings and Buffers

Wetland ID	Wetland Category	Habitat Score	City of Seattle Required Buffer
Wetland 1	Category III	4	60 feet
Wetland 2	Category III	4	60 feet
Wetland 3	Category III	3	60 feet
Wetland 4	Category III	3	60 feet
Watercourse 5	Type F	3	50 feet (limited development riparian area) 100 feet (riparian management area)
Wetland 6	Category III	5	60 feet
Wetland 7	Category III	4	60 feet

4.2.1 Wetland 1

Wetland 1 is a depressional, open water and palustrine emergent (PEM) wetland located in the western and central portion of the geographic area (Figure 3). Dominant plant species include Pacific willow (*Salix lucida* ssp. *lasiandra*), red alder (*Alnus rubra*), bluegrass (*Poa* sp.), and bentgrass (*Agrostis* spp.). Wetland hydrology indicators included ponded water, a high-water table, and saturation within 12 inches of the soil surface. Sampled soils meet hydric soil criteria F3 or F6 (redox dark surface). Wetland 1 conveys stormwater input from pipes, catch basins and flow control structures upstream. Wetland 1 is used by Tree Frogs (*Pseudacris regilla*) for foraging and rearing and as a transportation corridor to Wetland 2 where a majority of the spawning on the North Seattle College Campus occurs (John Figge, NSC Personal Communication).

<table>
<tr><th colspan="3">WETLAND 1 – INFORMATION SUMMARY</th></tr>
<tr><td colspan="2">Location: West Side</td><td>Latitude, Longitude 47.702684, -122.333195</td></tr>
<tr><td colspan="2" rowspan="9">  </td><td>Local Jurisdiction</td><td>Seattle</td></tr>
<tr><td>WRIA</td><td>8</td></tr>
<tr><td>Ecology Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>III</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>60</td></tr>
<tr><td>Wetland Size (sq. feet)</td><td>67,660</td></tr>
<tr><td>Cowardin Classification</td><td>PFO</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Flag color</td><td>N/A</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Dominant plant species include Pacific willow (Salix lucida spp. lasiandra), an unknown willow (Salix spp.), birch (Betula sp.), and Douglas spiraea (Spiraea douglasii).</td></tr>
<tr><td>Soils</td><td colspan="2">Sampled soils meet hydric soil criteria A1 (histosol) or F6 (redox dark surface).</td></tr>
<tr><td>Hydrology</td><td colspan="2">Wetland hydrology indicators include ponded water, a high-water table, saturation within 12 inches of the soil surface, and hydrogen sulfide odor.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="2">The City of Seattle classifies wetlands according to the current Ecology rating system. Wetland 1 is rated Category III using the Ecology rating system because the wetland provides high water quality functions (8), moderate hydrologic functions (7), and low</td></tr>
</table>

	habitat (4) functions, scoring 19 points on the rating form. All life stages of Pacific Tree Frogs (*Pseudacris regilla*) are found in Wetland 1.

4.2.2 Wetland 2

Wetland 2 is a large, depressional, open water and palustrine forested (PFO)/palustrine scrub-shrub (PSS) wetland located in the central portions of the geographic area (Figure 3). Dominant plant species include Pacific willow, an unknown willow (*Salix* sp.), birch (*Betula* sp.), and Douglas spiraea (*Spiraea douglasii*). Wetland hydrology indicators include ponded water, a high-water table, saturation within 12 inches of the soil surface, and hydrogen sulfide odor. Sampled soils meet hydric soil criteria A1 (histosol) or F6 (redox dark surface). Wetland 2 is spring fed and provides a larger ephemeral pool throughout the spring months and provides excellent tree frog spawning habitat.

<table>
<tr><th colspan="4">WETLAND 2 – INFORMATION SUMMARY</th></tr>
<tr><td colspan="2">Location: West Side</td><td colspan="2">Latitude, Longitude 47.702175, -122.332464</td></tr>
<tr><td colspan="2" rowspan="8">  </td><td>Local Jurisdiction</td><td>Seattle</td></tr>
<tr><td>WRIA</td><td>8</td></tr>
<tr><td>Ecology Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>III</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>60</td></tr>
<tr><td>Wetland Size (sq. feet)</td><td>10,359</td></tr>
<tr><td>Cowardin Classification</td><td>PEM</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td colspan="2"></td><td>Flag color</td><td>N/A</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Dominant plant species include Pacific willow (Salix lucida spp. lasiandra), red alder (Alnus rubra), bluegrass (Poa sp.), and bentgrass (Agrostis sp.).</td></tr>
<tr><td>Soils</td><td colspan="3">Sampled soils at DP-2 and DP-3 meet hydric soil criteria F3 or F6 (redox dark surface).</td></tr>
<tr><td>Hydrology</td><td colspan="3">Wetland hydrology indicators included ponded water, a high-water table, and saturation within 12 inches of the soil surface.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="3">The City of Seattle classifies wetlands according to the current Ecology rating system. Wetland 2 is rated Category III using the Ecology rating system because the wetland provides moderate water quality (7) functions, moderate hydrologic functions (6), and</td></tr>
</table>

	low habitat functions (4), scoring 17 points on the rating form. All life stages of Pacific Tree Frogs (*Pseudacris regilla*) are found in Wetland 2.

4.2.3 Wetland 3

Wetland 3 is a relatively small depressional PFO/PSS wetland located in the northeastern portion of the geographic area, adjacent to a narrow segment of Wetland 2 (Figure 3). Dominant plant species include red alder and Nootka rose (*Rosa nutkana*). Wetland hydrology indicators include saturated soil at 3 inches deep. Sampled soils meet hydric soil criteria F7 (depleted dark surface).

WETLAND 3 – INFORMATION SUMMARY			
Location: West Side	**Latitude, Longitude** 47.702949, -122.332105		
		**Local Jurisdiction**	Seattle
		WRIA	8
		Ecology Rating (Hruby, 2014)	III
		Local Jurisdiction Rating	III
		Local Jurisdiction Buffer Width	60
		Wetland Size (sq. feet)	1,843
		Cowardin Classification	PFO/PSS
		HGM Classification	Depressional
		Flag color	N/A
Dominant Vegetation	Dominant plant species at Wetland 3 include red alder and Nootka rose (*Rosa nutkana*).		
Soils	Sampled soils at DP-100 meet hydric soil criteria F7 (depleted dark surface).		
Hydrology	Wetland hydrology indicators include saturated soil at 3 inches deep.		
Rationale for Local Rating	The City of Seattle classifies wetlands according to the current Ecology rating system. Wetland 3 is rated Category III using the Ecology rating system because the wetland provides moderate water quality (7) functions, moderate hydrologic functions (6), and low habitat functions (3), scoring 16 points on the rating form.		

4.2.4 Wetland 4

Wetland 4 is a long, narrow depressional PEM wetland located along the eastern boundary of the geographic area, adjacent to I-5 (Figure 3). This wetland continues outside of the geographic area to the south. Dominant plant species include bentgrass. Wetland hydrology indicators include saturation within the top 8 inches of soil. Sampled soils meet hydric soil criteria F6 (redox dark surface).

WETLAND 4 – INFORMATION SUMMARY			
Location: West Side	**Latitude, Longitude** 47.702001, -122.330459		
		**Local Jurisdiction**	Seattle
		WRIA	8
		Ecology Rating (Hruby, 2014)	III
		Local Jurisdiction Rating	III
		Local Jurisdiction Buffer Width	60
		Wetland Size (sq. feet)	11,132
		Cowardin Classification	PEM
		HGM Classification	Depressional
		Flag color	N/A
Dominant Vegetation	Dominant plant species include bentgrass (*Agrostis* sp.).		
Soils	Sampled soils at DP-104 meet hydric soil criteria F6 (redox dark surface).		
Hydrology	Wetland hydrology indicators include saturation within the top 8 inches of soil.		
Rationale for Local Rating	The City of Seattle classifies wetlands according to the current Ecology rating system. Wetland 4 is rated Category III using the Ecology rating system because the wetland provides moderate water quality (7) functions, moderate hydrologic functions (7), and low habitat functions (3), scoring 17 points on the rating form.		

4.2.5 Watercourse 5

Watercourse 5 is a Type F water and is also classified as a slope PFO wetland. Dominant plant species include black cottonwood (*Populus trichocarpa*), Pacific willow, soft rush (*Juncus effusus*) and bentgrass. Hydric soils were assumed present; no soil pit was dug in Watercourse 5 because the area contained approximately 3 inches of standing water during the site visit. Wetland hydrology indicates surface water.

<table>
<tr><th colspan="4">Watercourse 5 – Information Summary</th></tr>
<tr><td>Stream Name</td><td colspan="3">Watercourse 5 Latitude, Longitude 47. 420468, - 122. 195520</td></tr>
<tr><td colspan="2" rowspan="3">  </td><td>DNR Stream Type</td><td>Type F</td></tr>
<tr><td colspan="2">Jurisdiction for portion of stream in geographic area</td></tr>
<tr><td>City of Seattle Buffer</td><td>50 feet (limited development riparian area)
100 feet (riparian management area)</td></tr>
<tr><td>Location of Stream Relative to Project</td><td colspan="3">Western side of project on the North Seattle College campus property. Adjacent to vacated North 100th Street.</td></tr>
<tr><td>Connectivity
(where stream flows from/to)</td><td colspan="3">Watercourse flows to Wetland 6 (surge pond), under I-5 through culverts and eventually to stormwater feature downstream at Thornton Place and to the South Fork of Thornton Creek.</td></tr>
<tr><td>Fish Presence</td><td colspan="3">Type F stream with documented threespined stickleback. Numerous fish passage barriers downstream.</td></tr>
<tr><td>Habitat</td><td colspan="3">Limited habitat complexity, few pools and refuge areas. Intact mature riparian corridor provides some shade and nutrient input. Sediment primarily fine-grained silt and sand. Stormwater driven system.</td></tr>
<tr><td>Riparian/Buffer Condition</td><td colspan="3">Riparian corridor intact with mature vegetation, areas of bank erosion and unstable eroding slopes.</td></tr>
</table>

Threespined stickleback have been observed in Watercourse 5 and is Type F water. Threespined stickleback and cutthroat trout have been observed in the North and South Watercourses and Wetland 6 and are also Type F regulated water. All life stages of Pacific Tree Frogs (*Pseudacris regilla*) are found primarily in Wetlands 1 and 2. More detailed descriptions of the vegetation and wildlife within the project area is documented in the Fish, Wildlife, and Vegetation Technical Memorandum (Clearway Environmental 2018).

4.2.6 Wetland 6

Wetland 6 is a large, depressional, open water/PFO wetland located between the college campus and I-5 (Figure 3; Photo 5). This wetland continues outside of the geographic area to the south. A portion of Wetland 6 is likely excavated and retains stormwater input from the college campus and surrounding area. Fish have been observed in Wetland 6. Dominant plant species include Pacific willow, broadleaf cattail (*Typha latifolia*), and reedcanary grass (*Phalaris arundinacea*). Like Watercourse 5, hydric soils were assumed to be present and no soils were examined due to standing water during the site visit.

<table>
<tr><th colspan="4">WETLAND 6 – INFORMATION SUMMARY</th></tr>
<tr><td colspan="2">Location: West Side</td><td colspan="2">Latitude, Longitude 47.700031, -122.330845</td></tr>
<tr><td colspan="2" rowspan="9">  </td><td>Local Jurisdiction</td><td>Seattle</td></tr>
<tr><td>WRIA</td><td>8</td></tr>
<tr><td>Ecology Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>III</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>60</td></tr>
<tr><td>Wetland Size (sq. feet)</td><td>25,377</td></tr>
<tr><td>Cowardin Classification</td><td>PFO/PEM “open water”</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Flag color</td><td>N/A</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Dominant plant species include Pacific willow, broadleaf cattail (Typha latifolia), and reedcanary grass (Phalaris arundinacea).</td></tr>
<tr><td>Soils</td><td colspan="3">Hydric soils were assumed to be present and no soils were examined due to standing water during the site visit.</td></tr>
<tr><td>Hydrology</td><td colspan="3">Wetland hydrology indicators surface water.</td></tr>
</table>

Rationale for Local Rating	The City of Seattle classifies wetlands according to the current Ecology rating system. Wetland 6 is rated Category III using the Ecology rating system because the wetland provides moderate water quality (7) functions, moderate hydrologic functions (7), and moderate habitat functions (5), scoring 19 points on the rating form.

4.2.7 Wetland 7

Wetland 7 is a depressional PFO/PEM wetland located adjacent to the northeast corner of the college parking lot (Figure 3). The wetland is an excavated feature that conveys stormwater along much of its length to its southern extent where the water ponds with regularity. At the southeastern portion of the wetland, water overflows the wetland boundary to the east, flowing into Wetland 6 during storm events. Dominant plant species include Western red cedar (*Thuja plicata*), red-osier dogwood (*Cornus sericea*), Nootka rose, creeping buttercup (*Ranunculus repens*), small-fruited bulrush (*Scirpus microcarpus*), bentgrass, birdsfoot trefoil (*Lotus corniculatus*), red fescue (*Festuca rubra*), and field horsetail (*Equisetum arvense*). Wetland hydrology indicators were absent during the late July 2017 field visit but were assumed present earlier during the growing season and the location and functions of the wetland as a stormwater facility. Sampled soils meet hydric soil criteria F6 (depleted dark surface) and F2 (Loamy Gleyed Matrix), respectively.

<table>
<tr><th colspan="3">WETLAND 7 – INFORMATION SUMMARY</th></tr>
<tr><td colspan="2">Location: West Side</td><td>Latitude, Longitude 47.700706, -122.331731</td></tr>
<tr><td colspan="2" rowspan="8">  </td><td>Local Jurisdiction</td><td>Seattle</td></tr>
<tr><td>WRIA</td><td>8</td></tr>
<tr><td>Ecology Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>III</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>60</td></tr>
<tr><td>Wetland Size (sq. feet)</td><td>10,862</td></tr>
<tr><td>Cowardin Classification</td><td>PFO/PEM</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Flag color</td><td>N/A</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Dominant plant species include Western red cedar (Thuja plicata), red-osier dogwood (Cornus sericea), Nootka rose, creeping buttercup (Ranunculus repens), small-fruited</td></tr>
</table>

	bulrush (*Scirpus microcarpus*), bentgrass, birdsfoot trefoil (*Lotus corniculatus*), red fescue (*Festuca rubra*), and field horsetail (*Equisetum arvense*).
Soils	Sampled soils meet hydric soil criteria F6 (depleted dark surface) and F2 (Loamy Gleyed Matrix), respectively.
Hydrology	Wetland hydrology indicators were absent during the late July 2017 field visit but were assumed present earlier during the growing season and the location and functions of the wetland as a stormwater facility.
Rationale for Local Rating	The City of Seattle classifies wetlands according to the current Ecology rating system. Wetland 7 is rated Category III using the Ecology rating system because the wetland provides moderate water quality (8) functions and moderate hydrologic function (6) and low habitat function (4) functions, scoring 18 points on the rating form.

4.3 WATER RESOURCES IN THE EASTERN GEOGRAPHIC AREA

In the eastern geographic area, Clearway Environmental identified three wetlands (Wetlands D-F,) two jurisdictional ditches (Ditch 1 and 2), and two watercourses (North Watercourse and South Watercourse). These are shown in Appendix A, in figures A-8 to A-10. The North and South Watercourses are identified in Figure 3. These open water areas of the upper reaches of Thornton Creek help provide cover, food, hydraulic connectivity, and water quality treatment for downstream resources. Fish have been observed in both waterways. With the exception of the North Watercourse, no other wetlands or watercourses will be impacted by the Project in the Eastern Geographic Area.

Table 2: Wetlands and Watercourses East of I-5 – Categories, Types, and Buffers

Aquatic Resource ID	Wetland Category/ Watercourse Type	Required Buffer
North Watercourse	Type F	0 feet
South Watercourse	Type F	0 feet
Wetland D	Category IV	50 feet
Wetland E	Category IV	50 feet
Wetland F	Category IV	0 feet[1]
Ditch 1[2]	Seasonal	—
Ditch 2[2]	Seasonal	—

4.3.1 North Watercourse

The North Watercourse is a Type F water and is located adjacent to the WSDOT park and ride on the east side of I-5. The North Watercourse has perennial flows and is confined within a steep-sided ditch for 550 feet between the park-and-ride lot and 1st Ave NE. Water from the North Watercourse flows into the stormwater system beneath 1st Ave NE and NE 100th St. The water eventually flows to the South Branch Thornton Creek east of 5th Ave NE. The watercourse has a wetted width from three to six feet and flows southward through the project area. The watercourse bed substrate is primarily silt and sand. Buffer vegetation consists of a mix of native trees and shrubs and invasive weeds. Narrow (less than 1- foot-wide) strips of wetland vegetation occur in places along the edges of the watercourse. Shrubs and small trees provide some shade to moderate water temperatures in the watercourse. The watercourse supports resident cutthroat and threespined stickleback. The upland areas directly adjacent to the watercourse include a mix of vegetated areas, paved roads, and parking lots. Vegetated upland areas along the watercourses are narrow (1 to 10 feet) and contain a mix of native plants (red alder and shore pine) and nonnative plants (Himalayan blackberry and pasture grasses). Wildlife use of the surrounding upland area is limited to foraging and nesting by bird and mammal species typically adapted to urban environments such as American robins, European starlings, and eastern gray squirrels. The South and North watercourses are regulated as watercourses by the City of Seattle (SMC 22.801.240). Both watercourses are indicated as wetlands on City and federal wetland inventory maps.

[1] Wetland F is Category IV, less than 1,000 square feet in size, and is not adjacent to a watercourse or other wetland, therefore the City of Seattle does not require buffers on Wetland F (SMC 25.09.160.B).

<table>
<tr><th colspan="4">North Watercourse – Information Summary</th></tr>
<tr><td>Stream Name</td><td colspan="3">North Watercourse Latitude, Longitude 47. 420804, - 122.194319</td></tr>
<tr><td colspan="2" rowspan="3">  </td><td>DNR Stream Type</td><td>Type F</td></tr>
<tr><td colspan="2">Jurisdiction for portion of stream in geographic area</td></tr>
<tr><td>City of Seattle Buffer</td><td>0 feet</td></tr>
<tr><td>Location of Stream Relative to Project</td><td colspan="3">East side of project area near I-5 and the Northgate Mall.</td></tr>
<tr><td>Connectivity (where stream flows from/to)</td><td colspan="3">Watercourse flows to the stormwater feature downstream at Thornton Place and eventually to the South Fork of Thornton Creek.</td></tr>
<tr><td>Fish Presence</td><td colspan="3">Type F stream with documented threespined stickleback and resident cutthroat trout. Numerous fish passage barriers downstream.</td></tr>
<tr><td>Habitat</td><td colspan="3">Limited habitat complexity, few pools and refuge areas. Gabion wall forms the east bank with vegetation growing on top. A 25-foot riparian corridor provides some shade and nutrient input. Sediment primarily fine-grained silt and sand.</td></tr>
<tr><td>Riparian/Buffer Condition</td><td colspan="3">Mix of immature native and non-native vegetation.</td></tr>
</table>

4.3.2 South Watercourse

The South Watercourse receives water from Jurisdictional Ditch 1 and from a surge pond (Wetland 6) on the North Seattle Community College Campus west of I-5. Water flows from the surge pond to the South Watercourse through a 36-inch culvert beneath I-5. The watercourse has a wetted width from three to six feet and flows northward through the project area. The bed substrate of the watercourse was not visible but is assumed to be primarily silt, based on the low landscape position and the slow flow. Buffer vegetation on the steep banks consists of a mix of native trees and shrubs such as red alder, dogwood, and willow, and invasive weeds such as Himalayan blackberry and reed canary grass. A narrow (less than 1-foot-wide) strip of wetland vegetation (small-fruited bulrush and soft rush) occurs in places along the edges of the watercourse. Shrubs and small trees provide some shade to moderate water temperatures in the watercourse. Vegetation along the southern 100 linear feet of the watercourse appears to have been disturbed in recent years and has very little woody vegetation. This South Watercourse contains suitable habitat for aquatic invertebrates, amphibians, wetland-associated mammals and birds, and fish. Permanent surface water with overhanging native shrubs and trees provides a moderate level of wildlife habitat function. Fish use has been documented in the watercourse. USFWS documented the presence of sticklebacks and cutthroat in the NSC ponds upstream of the South Watercourse, and cutthroat and rainbow trout were observed downstream east of 5th Ave NE, as reported in the Thornton Creek Watershed Characterization (TCWMC, 2000).

<table>
<tr><th colspan="4">South Watercourse – Information Summary</th></tr>
<tr><td>Stream Name</td><td colspan="3">South Watercourse Latitude, Longitude 47.420299, -122.194317</td></tr>
<tr><td colspan="2" rowspan="3">  </td><td>DNR Stream Type</td><td>Type F</td></tr>
<tr><td colspan="2">Jurisdiction for portion of stream in geographic area</td></tr>
<tr><td>City of Seattle Buffer</td><td>0 feet</td></tr>
<tr><td>Location of Stream Relative to Project</td><td colspan="3">East side of project area near I-5 and the Northgate Mall.</td></tr>
</table>

Connectivity (where stream flows from/to)	The watercourse receives water from Jurisdictional Ditch 1 and from a surge pond (Wetland 6) on the North Seattle Community College Campus west of I-5. Water flows from the surge pond to the South Watercourse through a 36-inch culvert beneath I-5. The watercourse has a wetted width from 3 to 6 feet and flows northward through the project area.
Fish Presence	Fish have been observed in the South Watercourse. USFWS also documented the presence of sticklebacks and cutthroat in the North Seattle Community College pond up watercourse of the South Watercourse, and cutthroat and rainbow trout were observed down watercourse east of 5th Ave NE, as reported in the Thornton Creek Watershed Characterization.
Habitat	The bed substrate of the watercourse was not visible but is assumed to be primarily silt, based on the low landscape position and the slow flow. Buffer vegetation on the steep banks consists of a mix of native trees and shrubs such as red alder, dogwood, and willow, and invasive weeds such as Himalayan blackberry and reed canary grass.
Riparian/Buffer Condition	Mix of immature native and non-native vegetation.

4.3.3 Wetland D

Wetland D is a depressional wetland located just north of Wetland E and adjacent to a paved parking area. The wetland is 430 square feet in size and is associated with a roadside ditch (Jurisdictional Ditch 1). Water leaves the wetland through a culvert that discharges to a watercourse (South Watercourse) along 1st Ave NE. Under the Cowardin classification system, Wetland D is a palustrine emergent wetland with saturated soils (PEMB). Wetland D merits a Category IV rating, based on a total score of 25 points. Wetland D has been impacted by the North Link Northgate Sound Transit construction project and has changed since 2017 (please see Sound Transit Northgate Link Extension Wetland and Watercourse Mitigation Plan, 2012)

WETLAND D – INFORMATION SUMMARY		
Location: East Side	**Latitude, Longitude** 47.700706, -122.331731	
	**Local Jurisdiction**	Seattle
	WRIA	8
	Ecology Rating (Hruby, 2014)	IV
	Local Jurisdiction Rating	IV
	Local Jurisdiction Buffer Width	50
	Wetland Size (sq. feet)	430
	Cowardin Classification	PEMB
	HGM Classification	Depressional
	Flag color	N/A

4.3.4 Wetland E

Wetland E is located southwest of Northgate Shopping Mall within the I-5 ROW, east of 1st Ave NE. The wetland is located just south of the Northgate Park and Ride on a narrow, gently sloping hillside within a fenced area between the freeway and 1st Ave NE. Wetland E is a slope wetland and is 11,009 square feet (0.25 acre) in size. Under the Cowardin system, Wetland E is a palustrine emergent wetland with saturated soils (PEMB). A small area of palustrine scrub-shrub (PSS) vegetation is also present in a portion of this wetland that connects to a ditch (Jurisdictional Ditch 1) on the west side of 1st Ave NE. Dominant plants include fescue and colonial bentgrass. Meadow foxtail and common dandelion are also present. The PSS portion

includes Hooker's willow and Himalayan blackberry, which comprises only a small portion (less than 10 percent) of the wetland area and therefore was not used for Wetland E categorization.

<table>
<tr><th colspan="4">WETLAND E – INFORMATION SUMMARY</th></tr>
<tr><td colspan="2">Location: East Side</td><td colspan="2">Latitude, Longitude 47.700706, -122.331731</td></tr>
<tr><td colspan="2" rowspan="8">  </td><td>Local Jurisdiction</td><td>Seattle</td></tr>
<tr><td>WRIA</td><td>8</td></tr>
<tr><td>Ecology Rating (Hruby, 2014)</td><td>IV</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>IV</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>50</td></tr>
<tr><td>Wetland Size (sq. feet)</td><td>11,009</td></tr>
<tr><td>Cowardin Classification</td><td>PSS/PEMB</td></tr>
<tr><td>HGM Classification</td><td>Slope</td></tr>
<tr><td>Flag color</td><td>N/A</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Dominant plants include fescue and colonial bentgrass. Meadow foxtail and common dandelion are also present. The PSS portion includes Hooker's willow and Himalayan blackberry, which comprises only a small portion (less than 10 percent) of the wetland area and therefore was not used for Wetland E categorization.</td></tr>
</table>

4.3.5 Wetland F

Wetland F is located southwest of Northgate Shopping Mall within the I-5 ROW, east of 1st Ave NE. The wetland is located just north of the Northgate Park and Ride on a narrow, gently sloping hillside within a fenced area between the freeway and 1st Ave NE. Wetland F is a slope wetland and is 315 square feet (0.01 acre) in size. Under the Cowardin system, Wetland F is a palustrine emergent wetland with saturated soils (PEMB). A small area of palustrine scrub-shrub (PSS) vegetation is also present in a portion of this wetland that connects to the North Watercourse on the west side of 1st Ave NE. Dominant plants include fescue and colonial bentgrass. The PSS portion includes Hooker's Willow and Himalayan blackberry, which comprises only a small portion (less than 10 percent) of the wetland area and therefore was not used for Wetland F categorization.

<table>
<tr><th colspan="4">WETLAND F – INFORMATION SUMMARY</th></tr>
<tr><td colspan="2">Location: East Side</td><td colspan="2">Latitude, Longitude</td></tr>
<tr><td colspan="2" rowspan="8">  </td><td>Local Jurisdiction</td><td>Seattle</td></tr>
<tr><td>WRIA</td><td>8</td></tr>
<tr><td>Ecology Rating (Hruby, 2014)</td><td>IV</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>IV</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>50</td></tr>
<tr><td>Wetland Size (sq. feet)</td><td>11,009</td></tr>
<tr><td>Cowardin Classification</td><td>PSS/PEMB</td></tr>
<tr><td>HGM Classification</td><td>Slope</td></tr>
<tr><td colspan="2"></td><td>Flag color</td><td>N/A</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Dominant plants include fescue and colonial bentgrass and reed canary grass. The PSS portion includes Hooker’s willow and Himalayan blackberry, which comprises only a small portion (less than 10 percent) of the wetland area and therefore was not used for Wetland F categorization.</td></tr>
</table>

4.3.6 Jurisdictional Ditch 1

Jurisdictional Ditch 1 is a 1- to 2-foot-wide roadside ditch with little vegetative cover and an asphalt or concrete liner in some places. This watercourse drains northward for approximately 830 feet beginning mid-slope just north of the intersection of 1st Ave NE and North 95nd St. Jurisdictional Ditch 1 is associated with Wetland E and drains runoff from 1st Ave NE and adjacent upland areas along its boundary with the WSDOT ROW. Soft rush and reed canarygrass are present in the area of ditch adjacent to Wetland E. A small patch of woody vegetation occurs on the north end and primarily consists of Himalayan blackberry and Hooker’s willow. This ditch provides limited habitat functions because it is in a highly degraded condition, located immediately adjacent to a roadway, receives sheet flow from 1st Ave NE, and the substrate in some areas is asphalt. Water flows through a culvert beneath a driveway and connects to a Type F watercourse (South Watercourse). Based on seasonal flows (surface flow not present part of year), narrow width (less than 2 feet wide), and the conditions within the watercourse (concrete lined bed), this watercourse is non-fish habitat as described in the State of Washington interim watercourse typing (WAC 222-16-031).

4.3.7 Jurisdictional Ditch 2

Jurisdictional Ditch 2 is a 1- to 2-foot-wide roadside ditch with little vegetative cover and an asphalt or concrete liner in some places. This watercourse drains northward for approximately 150 feet beginning mid-slope just north of the intersection of 1st Ave NE and the onramp to the express lanes of I-5. Jurisdictional Ditch 2 is associated with the North Watercourse and drains runoff from I-5 and adjacent upland areas along its boundary with the WSDOT ROW and park and ride lot to the North Watercourse. Soft rush and reed canarygrass are present in the area of ditch. A small patch of woody vegetation occurs on the north end and primarily consists of Himalayan blackberry and Hooker's willow. This ditch provides limited habitat functions because it is in a highly degraded condition, located immediately adjacent to a roadway, receives sheet flow from I-5 and the express lane runoff, and the substrate in some areas is asphalt. Water flows through a culvert beneath the park and ride and connects to a Type F watercourse (North Watercourse). Based on seasonal flows (surface flow not present part of year), narrow width (less than 2 feet wide), and the conditions within the ditch (concrete lined bed), this watercourse is non-fish habitat as described in the State of Washington interim watercourse typing (WAC 222-16-031).

4.4 WETLAND FUNCTIONS

Wetlands perform many valuable functions typically grouped into three categories: functions that improve water quality, functions that change the water regime in a watershed such as flood storage, and functions that provide habitat for plants and animals[3]. Wetlands as a whole are rated on their rarity, sensitivity, and ability to replace the wetland and their functions. Wetland functions are rated on their ability and the opportunity to improve water quality, reduce flooding and stream degradation and habitat (Brinson 1993; Hruby 2014). These functions are scored in relation to their site potential, landscape potential, and overall value.

Wetlands 1-4, 6 and 7 and Watercourse 5 receive stormwater inputs and are located adjacent to developed areas. Their main function is flood storage, because they impound water that would otherwise flow to streams, parking lots or roadways. They also have limited ability improve water quality and hydrologic functions because of limited vegetation within the wetlands and watercourse to trap sediment and pollutants, reduce flow velocities, and detain flood flows.

Wetlands 1-4 and Wetland 7 exhibit relatively low habitat function due to generally simple vegetation structure, few hydroperiods, limited species richness, relatively disturbed buffers and connections, and lack of nearby priority habitats. Wetland 6 has the highest habitat score of all wetlands due to the presence of multiple vegetation classes and hydroperiods, moderate

[3] Ecology, 2006: Wetland Mitigation in Washington State Part 2, Version 1

interspersion of habitats, several special habitat features, and fish use including three spined stickleback and cutthroat trout (WDFW 2005).

Fish have been observed in Watercourse 5, which is a Type F regulated water of the State of Washington. Resident cutthroat and three-spined stickle were observed in the North Watercourse and Wetland 6, which is also regulated as a Type F water (WDFW 2005). These open water areas of the upper reaches of Thornton Creek help provide cover, food, hydraulic connectivity, and water quality treatment for downstream resources.

5 MITIGATION PLANNING

5.1 MITIGATION REQUIREMENTS

The U.S. Army Corps of Engineers (Corps), the Washington Department of Ecology (Ecology) and City of Seattle require a sequence of actions (mitigation sequencing) be taken for proposals that will impact wetlands (Ecology et al. 2006). Mitigation sequencing includes actions to avoid, minimize, rectify, reduce, or compensate for impacts. Washington Department of Fish and Wildlife (WDFW) also has similar requirements for mitigation sequencing.

The Corps, Ecology, WDFW, and City of Seattle all have policies of no-net-loss of ecological functions, requiring the Project to provide compensatory mitigation for wetland impacts. The Project proposes mitigation actions that meet each of the agencies requirements including Washington Administrative Code (WAC) 365-196-830(8)(a), Washington State Hydraulic Code (RCW 77.55), and City of Seattle, Seattle Municipal Code (SMC) 25.09.065.

Ecology and WDFW (RCW 90-74-005 through 90-74-020) require stream mitigation which provides equal or better biological functions and values, compared to the existing conditions.

5.1.1 Mitigation Sequencing

Mitigation sequencing is a series of steps used during site design planning in order to avoid and minimize impacts to the wetland and wetland buffer area, as required by Seattle Municipal Code (SMC) 25.09.065.B.1 and WAC 197-11-768:

1. Avoiding the impact altogether by not taking a certain action or parts of actions;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
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 impacts by replacing or providing substitute resources or environments the site;

6. Monitoring the impact and the compensation projects undertaken and taking appropriate corrective measures.

5.1.2 Prioritizing Mitigation Actions

Preference for the location of mitigation actions under SMC 25.09.065.B goes as follows:

1. At the site;
2. Within the same creek watershed;
3. Within Seattle city limits;
4. Within the same Watershed Resource Inventory Area.

Lower priority restoration locations are allowed if the higher priority locations are infeasible or there will be greater ecological benefit if a lower priority site is used.

Figure 4: Bridge Alignment Options

5.2 IMPACT AVOIDANCE AND MINIMIZATION

The environmental team worked closely with the design team from the start of the project to decrease environmental impacts to the geographic area. Wetland impacts were avoided and minimized to the greatest extent feasible through evaluation of alternative alignments, construction timing restrictions, Best Management Practices, construction sequencing, and selection of staging and construction areas that have the least impact to these environmentally critical areas.

5.2.1 Alignment Selection

Three different alignments for the bridge were proposed and examined at the beginning of the Project (King County Department of Transportation 2012; SDOT 2017). The alignments are listed below and shown in Figure 4:

- Alignment 1 with an eastern approach from NE 103rd Street
- Alignment 2 with an eastern approach in between NE 103rd Street and NE 100th Street
- Alignment 3 with an eastern approach from NE 100th Street

Each alignment was evaluated against several parameters: potential bridge span lengths, clearance from I-5 lanes, American with Disabilities Act requirements, and construction and environmental impacts. Environmental considerations during evaluation of alignments included designs that avoided or minimized impacts to wetlands, Bartonwood Sanctuary, and land resources (trees & vegetation).

Alignments 2 and 3 were advanced for further study. Alignment 2 was renamed as the North Alignment and Alignment 3 was renamed as the South Alignment. After advancing the design of these alternatives, SDOT ultimately selected the South Alignment to cross I-5, at approximately NE 100th Street (Integrity 2017; KPFF 2014).

The South Alignment (Figure 4), was further refined and moved south of Watercourse 5. This City's 'preferred alignment' was based on site constraints, regulatory requirements, and stakeholder and NSC feedback. The current alignment was selected to avoid and minimize impacts to NSC wetlands, watercourses, recreational and historic resources.

As design progressed the preferred alignment was adjusted, and further avoidance and minimization measures were considered. As a baseline requirement, the safety requirements of vertical and horizontal alignments (i.e. speed, sight-lines) were identified. Additional site constraints were also identified, such as the requirement to avoid and minimize impacts to a historic site, recreational trails, several different natural resources including mature trees.

5.2.2 Site Constraints

The major site constraint on the NSC campus is where the bridge touches down and connects with a multi-use path (See Appendix A, figures A-1 to A-3). Space at this location is limited. It was difficult fitting the bridge between the existing parking lot and Watercourse 5 (See Appendix A, Figure A-1). After coordination with representatives from the Corps, Ecology, and WDFW on avoidance and minimization options, the Project selected the currently proposed alignment.

Specific avoidance and minimization actions on the eastern portion of the NSC campus include locating bridge piers outside of wetlands, revising initial construction staging and temporary construction areas to avoid permanent impacts and minimize temporary impacts, and re-aligning the western end of Watercourse 5 instead of placing it in a culvert. Additional avoidance and minimization measures to reduce impacts to wetlands, buffers, and watercourses include:

- **Wetland 1:** Staging areas were relocated to eliminate staging area impacts. Only impacts due to permanent features and limited clearing and grubbing/grading are proposed.
- **Wetland 2:** Staging areas initially proposed included temporary impacts to Wetland 2. Relocation of staging areas resulted in avoidance of all impacts to Wetland 2.
- **Wetland 3:** Staging areas initially proposed included temporary impacts to Wetland 2. Relocation of staging areas resulted in avoidance of all impacts to Wetland 3.
- **Wetland 4:** Construction and staging areas initially proposed included more temporary impacts within Wetland 4. Staging areas were relocated to reduce temporary construction and staging area impacts. Permanent impacts were eliminated.
- **Watercourse 5:** Re-alignment of the western end of Watercourse 5 increased the amount of open water compared to previous options evaluated.
- **Wetland 6:** Staging areas initially proposed included more temporary and permanent impacts to Wetland 6. Relocation of staging areas reduced buffer impacts and resulted in avoidance of most impacts to Wetland 6.
- **Wetland 7:** Staging areas initially proposed included temporary and permanent impacts to Wetland 7. Relocation of staging areas resulted in avoidance of all impacts to Wetland 7.
- **North Watercourse:** Vertical retaining walls are proposed to allow for and minimize the impact from construction of the protected bike lane along the west side of 1st Avenue NE. Various options were evaluated to avoid or minimize the impacts at the southern end of the North Watercourse. However, those options were found to create significant maintenance

challenges, including confined spaces at typical maintenance access locations, and were determined to be not feasible.

6 PROJECT IMPACTS

6.1 AMPHIBIAN HABITAT

Pacific Tree Frogs (*Pseudacris regilla*), present on the NSC campus, use Wetlands 1 and 2 for spawning and rearing (John Figge, NSC personal communication). Wetland 1 receives flows from upstream stormwater facilities including pipes, catch basins, and flow control devices. It is primarily used by tree frogs as a migration corridor, as well as for foraging and rearing. Wetland 2 is spring fed and provides an ephemeral pool during the spring months for excellent tree frog spawning habitat (Figge 2017). Tree frogs and other terrestrial wildlife will have access to the whole NSC site under the elevated bridge segment directly east of the western approach.

Tree frogs are monitored by students as part of the NSC Ecology curriculum (Figge 2017) and are primarily found in and adjacent to Wetland 2. The travel corridors from Wetland 1 and Wetland 2 are heavily used by tree frogs for all life stages. Tree frogs are impacted by noise pollution during the mating season (February-July) when frogs are calling for mates so efforts to minimize noise impacts during the tree frog spawn timing will be made. The NSC has expressed concerns about Pacific Tree Frog impacts. All efforts will be made to minimize the impacts to both their life history requirements and migration.

6.2 FISH HABITAT

On the North Seattle College or west side of the project, native populations of threespined stickleback occur in Watercourse 5 and Wetland 6. Wetland 6 also supports a resident population of cutthroat trout. These fish will be impacted by direct channel impacts due to fill being placed and habitat loss in areas used by those species. The prey base in those areas will also be impacted. During construction, these areas will be de-watered and fish exclusion protocols will be followed that will removed those fish that are occupying the habitat in those areas. Fish will be moved downstream following fish removal protocols in Watercourse 5 because it is fed only by stormwater and there is no fish habitat upstream. Water sources above the fill locations in Watercourse 5 are in pipes and no fish habitat exists to release them upstream. Wetland 6 will have fish released into downstream resources in deeper water within the Wetland 6 surge pond following capture and removal for pier placement (Figure A-2).

6.3 BIRD AND OTHER HABITAT

Bald eagles, protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Act, have mapped breeding areas in several locations around the project geographic areas. Within several miles of the geographic area, one nesting territory is mapped near the mouth of Pipers

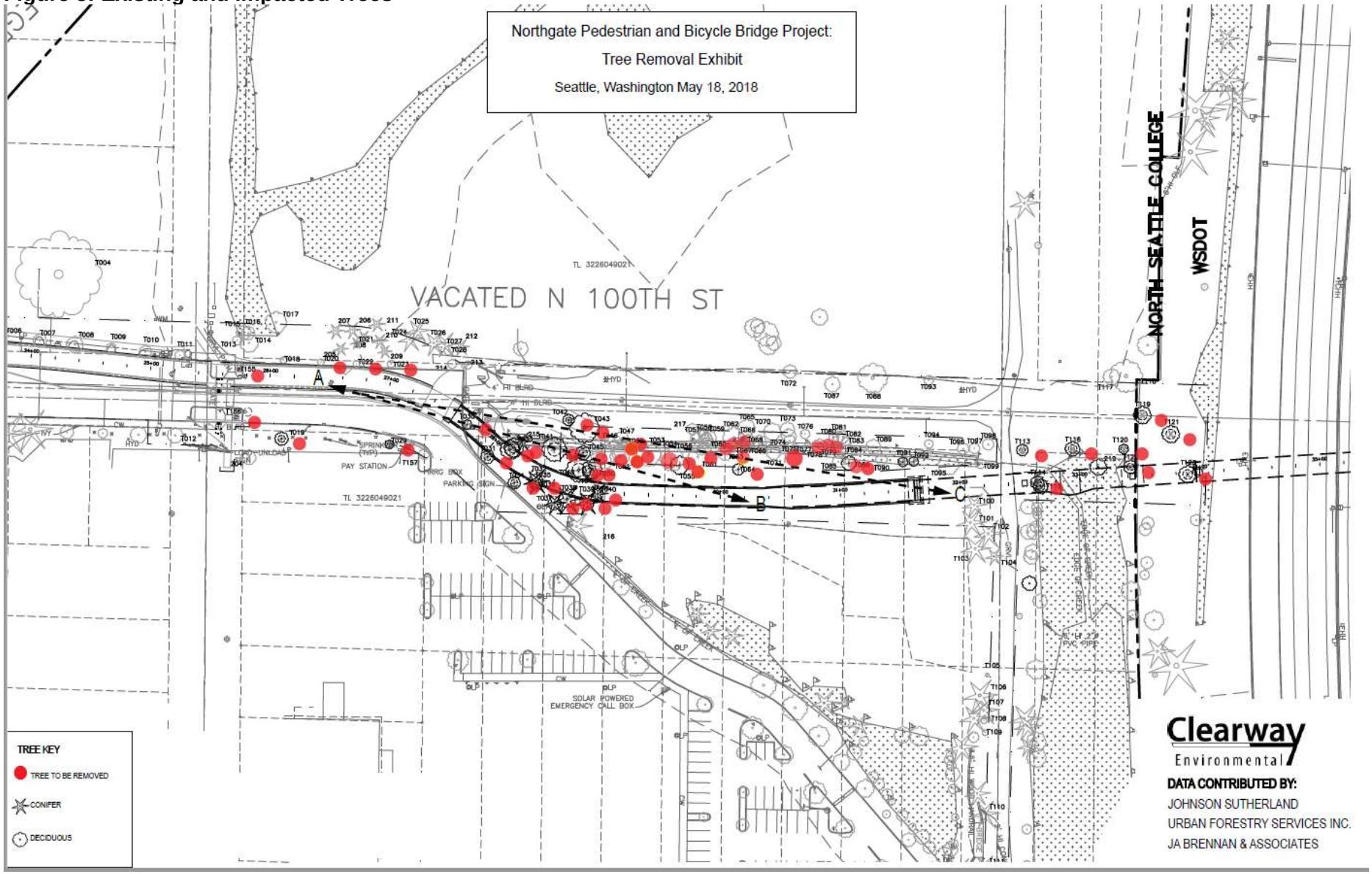
Creek and two nesting territories are mapped adjacent to Green Lake. Clearway Environmental biologists did not observe eagles using the site during visits to the project area.

The large, open water wetland (Wetland 6) likely attracts a variety of water-associated bird species, such as gulls, ducks, geese, cormorants, herons, martins, and swallows. These species are likely to use the wetland for foraging, rather than nesting, due to the proximity of I-5. Clearway Environmental biologists did not observe any of these water-associated birds during the site visits to the project geographic areas.

Numerous other species of birds and small mammals likely use the project area. These include species that can tolerate or benefit from human disturbance by using landscape vegetation, structures, garbage cans, and other human features for foraging, movement, shelter, and even breeding sites. Examples include common songbirds such as house sparrows; and mammals such as Norway rats, raccoons, Western grey squirrels, and coyotes.

Terrestrial habitat in the eastern geographic area is limited because of residential and commercial development, including Northgate Mall and the residential community of the Northgate neighborhood. Commercial properties are sparsely vegetated and residential properties are moderately vegetated with urban landscaping. Wildlife use is limited to foraging and nesting by bird and mammal species typically adapted to urban environments such as American robins, European starlings, and eastern gray squirrels. Figure 5 depicts how existing trees in the along the bridge alignment will be impacted during project construction.

Figure 5: Existing and Impacted Trees



6.4 WETLAND AND WATERCOURSE IMPACTS

The Project will have permanent and temporary impacts to wetlands and watercourse area and functions. These impacts are described below and shown in Tables 4 and 5.

Wetland 1

Clearing and grading along the south end of the wetland will result in 305 square feet of permanent impact. See Appendix A (Figure A-1).

Wetland 4

At Wetland 4, temporary construction equipment access will result in 443 square feet of temporary impact. Pier placement will result in 72 square feet of permanent wetland impact. See Appendix A (Figure A-4, A-5).

Wetland 6

Clearing and grading for pier placement in Wetland 6 will permanently impact 79 square feet (Figure A-3).

Watercourse 5

Permanent impacts will occur in Watercourse 5. The western portion of Watercourse 5 will be re-aligned to the north. Fill will be placed within the existing western portion of Watercourse 5 to facilitate the bridge transition to the multi-use path resulting in 465 square feet of permanent impact and 109 square feet of temporary impact. Permanent wetland impacts will occur in Watercourse 5.

Impacts to Watercourse 5 will be mitigated on-site through a combination of channel and riparian improvements. Steep eroding stream banks will be graded back, closer to 2:1 slopes, to reduce the chance for stream bank erosion and bank failure. These slopes will be planted with native vegetation and large woody debris (LWD) may be incorporated into the design. Larger trees removed for construction will be kept and used on-site for use as terrestrial and aquatic habitat features. Whole or topped trees or snags will be retained on site where feasible.

Temporary wetland, wetland buffer, and Watercourse 5 impacts will be restored on-site to replace wetland and watercourse functions temporarily lost during construction and to protect wetland functions into the future by re-establishing buffer vegetation. Compensation will occur at various mitigation ratios depending upon the specific nature of the impact and proposed mitigation. All temporary impact areas will be restored to pre-construction conditions following completion of project work.

Side slopes of the re-aligned watercourse will be planted with native vegetation. Approximately 15 cubic yards of fill material will be placed in Watercourse 5 to recreate the south bank that will be lost, and to bed the new culvert outfall when the inlet of Watercourse 5 is moved to the north to create room for the pedestrian bridge approach on the North Seattle College. On the south side of Watercourse 5, grading will occur to reduce the steepness of side slopes at

locations where native vegetation is being removed. Vegetation density will be increased near potential access areas to deter unauthorized access. Large woody material from trees removed on the NSC site will be incorporated into this area as snags or logs on the bank to increase habitat diversity. On the north side of Watercourse 5, grading will occur to reduce the steepness of slopes. This grading will be designed to preserve existing native vegetation in some locations where the ecological value of the trees is deemed greater than the reduction of channel sloughing or downcutting due to steep slopes.

Tree replacement on the NSC site will occur adjacent to Watercourse 5 and Wetland 6 to meet Seattle Department of Construction and Inspection (SDCI) tree replacement requirements. Tree replacement on WSDOT and SDOT right-of-way will occur near the tree removal areas and meet the respective tree replacement requirements of each.

Excavation at the north end of the surge pond is proposed to create new wetland area and will also increase the storage capacity of this wetland. Wetland creation offers the best mitigation ratio and is especially valuable at this site since several other potential mitigation opportunities are constrained due to existing trail locations and the proposed bridge alignment. A 3:1 slope will be placed adjacent to the new wetland creation area and this area will be replanted with native vegetation.

All permanent and temporary Watercourse 5 impacts will be mitigated onsite within Watercourse 5 and the north end of Wetland 6 (Figure 6).

North Watercourse

Permanent wetland impacts will occur in the North Watercourse. Portions of the North Watercourse will be filled to facilitate construction of the protected bike lane from the intersection of 1st Avenue NE and NE 103rd Street to the east bridge approach and pier placement to support the pedestrian bridge. Approximately 150 cubic yards of material will be placed within the watercourse, permanently impacting 6,269 square feet of habitat. This fill will be placed below the ordinary highwater mark within the watercourse and will be a combination of fill placed in the south end of the watercourse, pier placement, and the retaining wall along the eastern edge of the watercourse. The riparian vegetation along the North Watercourse will also be impacted.

Temporary impacts to the riparian corridor along the North Watercourse include clearing of trees and brush to allow construction of the bridge. Approximately 130 feet of existing stream channel will be filled. The existing outfall from the North Watercourse will be replaced at the revised southern end of the watercourse but will still discharge to the same drainage system as the existing outfall culvert. The loss of approximately 130 feet of existing stream will impact the amount of potential available prey (such as aquatic macroinvertebrates) and reduce the amount of nutrients and organic matter produced in the geographic area that feeds downstream. The filled section of stream channel will reduce the amount of cover and rearing habitat available to the threespined stickleback and resident cutthroat trout that are found at

this location. Mitigation for the loss of fish habitat due to impacts at the North Watercourse will be provided off-site.

Table 3: Impacted Wetland Functions

Function/Value[a]	Wetland 1	Wetland 4	Wetland 6	Watercourse 5	N Watercourse
Flood Flow Alteration	L	L	L	L	L
Sediment Removal	L	L	L	L	L
Nutrient and Toxicant Removal	L	L	L	L	L
Erosion Control & Shoreline Stabilization	NP	NP	NP	L	NP
Production & Export of Organic Matter	NP	NP	L	L	L
General Habitat Suitability	NP	NP	L	L	L
Habitat for Aquatic Invertebrates	NP	NP	L	L	L
Habitat for Amphibians	L	L	L	L	L
Habitat for Wetland-Associated Mammals	NP	NP	L	L	L
Habitat for Wetland-Associated Birds	L	NP	L	L	L
General Fish Habitat	NP	NP	L	L	L
Native Plant Richness	NP	NP	NP	NP	L
Educational or Scientific Value	NP	NP	L	NP	NP
Uniqueness and Heritage	L	NP	NP	NP	NP

[a] "NP" means that the function is not present; "L" means that the function is present and is of low quality; and "H" means the function is present and is of high quality.

Table 4: Wetland and Buffer Impact Summary

Activity (fill, drain, excavate, flood, etc.)	Wetland Name[1]	Wetland type and rating category[2]	Impact area (sq. ft. or Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)
Excavate (clearing and grading)/Fill	Wetland 1	Depressional / Category III	305 sq. ft	Permanent	C/E	1,220 sq. ft
Excavate (clearing and grading)/ Fill	Wetland 4	Depressional / Category III	443 sq. ft	Temporary 18 months	C/E	886 sq. ft
Excavate (clearing and grading)/ Fill	Wetland 4	Depressional / Category III	72 sq. ft	Permanent	C/E	144 sq. ft
Excavate (clearing and grading)/ Fill	Wetland 6	Depressional / Category III	79 sq. ft	Permanent	C/E	158 sq. ft

Table 5: Watercourse and Buffer Impact Summary

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cubic yards) to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
Fill	North Watercourse	In	Permanent	135	6,269 sq. ft
Excavation	North Watercourse	In	Permanent	30	800 sq. ft
Fill	Watercourse 5	In	Permanent	15	465 sq. ft
Excavation/Fill	Watercourse 5	In	Temporary	2.5/2.5	109 sq. ft

6.5 WETLAND AND WATERCOURSE BUFFER IMPACTS

Wetland buffers are areas that surround a wetland and reduce adverse impacts to the wetland functions and values from adjacent development. City of Seattle ECA regulations require buffers for certain size and types of wetlands (SMC 25.09). The regulations require that buffers be retained to protect wetlands, or if they must be impacted, require that buffers be restored and/or impacts mitigated. Sixty-foot buffers have been designated for Wetlands 1, 2, 3, 4, 6, and 7. Impacts due to construction of the Project have been limited to Wetlands 1, 4, and 6.

6.5.1 Wetland 1 Buffer

The southwestern buffer of Wetland 1 will be impacted both permanently and temporarily. A new section of sidewalk that connects an existing north-south oriented trail with N 100th Street will permanently impact 2,441 square feet of buffer. In addition, improvements associated with the path in this area will result in 1,056 square feet of temporary buffer impact due to clearing, grading and tree removal.

6.5.2 Wetland 4 Buffer

Temporary impacts to wetland buffer vegetation due to fill and construction equipment access will total 443 square feet.

6.5.3 Wetland 6 Buffer

Bridge construction and installation of Piers 2 and 3 will permanently impact 1,115 square feet of the buffer in Wetland 6. Staging of the bridge truss and construction access will result 8,757 square feet of temporary buffer impact to the north end of Wetland 6.

6.5.4 Watercourse 5 Buffer

Watercourse buffers are areas that surround a watercourse. Watercourse buffers are defined as part of a riparian corridor and are protected under City of Seattle ECA regulations (SMC 25.09). The regulations require that buffers be retained to protect riparian habitat, or if they must be impacted, require that buffers be restored and/or impacts mitigated. Watercourse 5 has a fifty-foot limited development riparian area and a 100-foot riparian management area.

The buffer on the south side of Watercourse 5 will be impacted by clearing and grading activities as well excavation required to reach structurally suitable soils and will result in 4,012 square feet of temporary impact and 22,049 square feet of permanent impact. Other impacts to the Watercourse 5 buffer are due to mitigation work which includes sloping the banks back and creating wetland terraces or alcoves, and incorporation of LWD into the channel and as terrestrial habitat.

7 PROPOSED MITIGATION

Based on project impacts, a mitigation ratio of 2:1 was selected for all temporary and permanent wetland and buffer impacts. Specific wetland mitigation proposed for the site will include both wetland creation and enhancement that will increase the functions and values of those resources to justify the mitigation ratio. Table 6 summarizes the amount of land required for permanent and temporary wetland impacts.

Table 6: Summary of Wetland Mitigation Required

Wetland	Permanent Impacts		Mitigation Required for Permanent Impacts 2:1	Temporary Impacts		Mitigation Required for Temporary Impacts 2:1
	Wetland	Buffer		Wetland	Buffer	
Wetland 1	305	2,441	5,492	0	1,056	2,112
Wetland 4	72	0	144	443	0	886
Wetland 6	79	1,115	2,388	0	8,757	17,514
TOTAL	384	3,682	8,024	443	9,813	20,512

Based on project impacts, a mitigation ratio of 1:1 was selected for all temporary and permanent watercourse and watercourse buffer impacts. Specific watercourse mitigation proposed for the site will include both Type F habitat creation and enhancement that will increase the functions and values of those resources to justify this 1:1 mitigation ratio. Table 7 summarizes the amount of land required for permanent and temporary watercourse impacts.

Table 7: Summary of Watercourse Mitigation Required

Watercourse	Permanent Impacts		Mitigation Required for Permanent Impacts 1:1	Temporary Impacts		Mitigation Required for Temporary Impacts 1:1
	Watercourse	Buffer		Watercourse	Buffer	
North Watercourse	6,269	0	6,269	0	0	0
Watercourse 5	465	22,049	22,514	109	4,012	4,121
TOTAL	6,734	22,049	28,783	109	4,012	4,121

7.1 PROPOSED WETLAND/WATERCOURSE MITIGATION

7.1.1 On-Site Mitigation

The Project will mitigate all impacts to wetlands, watercourses and buffers on the west side of I-5 through a combination of invasive vegetation control, native vegetation plantings within the buffers of Wetlands 1 and 4, channel/habitat enhancement within Watercourse 5 and wetland establishment and enhancement within Wetland 6 (Figure 6).

Temporary wetland, wetland buffer, and Watercourse 5 impacts will be restored on-site to replace wetland and watercourse functions temporarily lost during construction and to protect wetland functions into the future by re-establishing buffer vegetation. Compensation will occur at various mitigation ratios depending upon the specific nature of the impact and proposed mitigation.

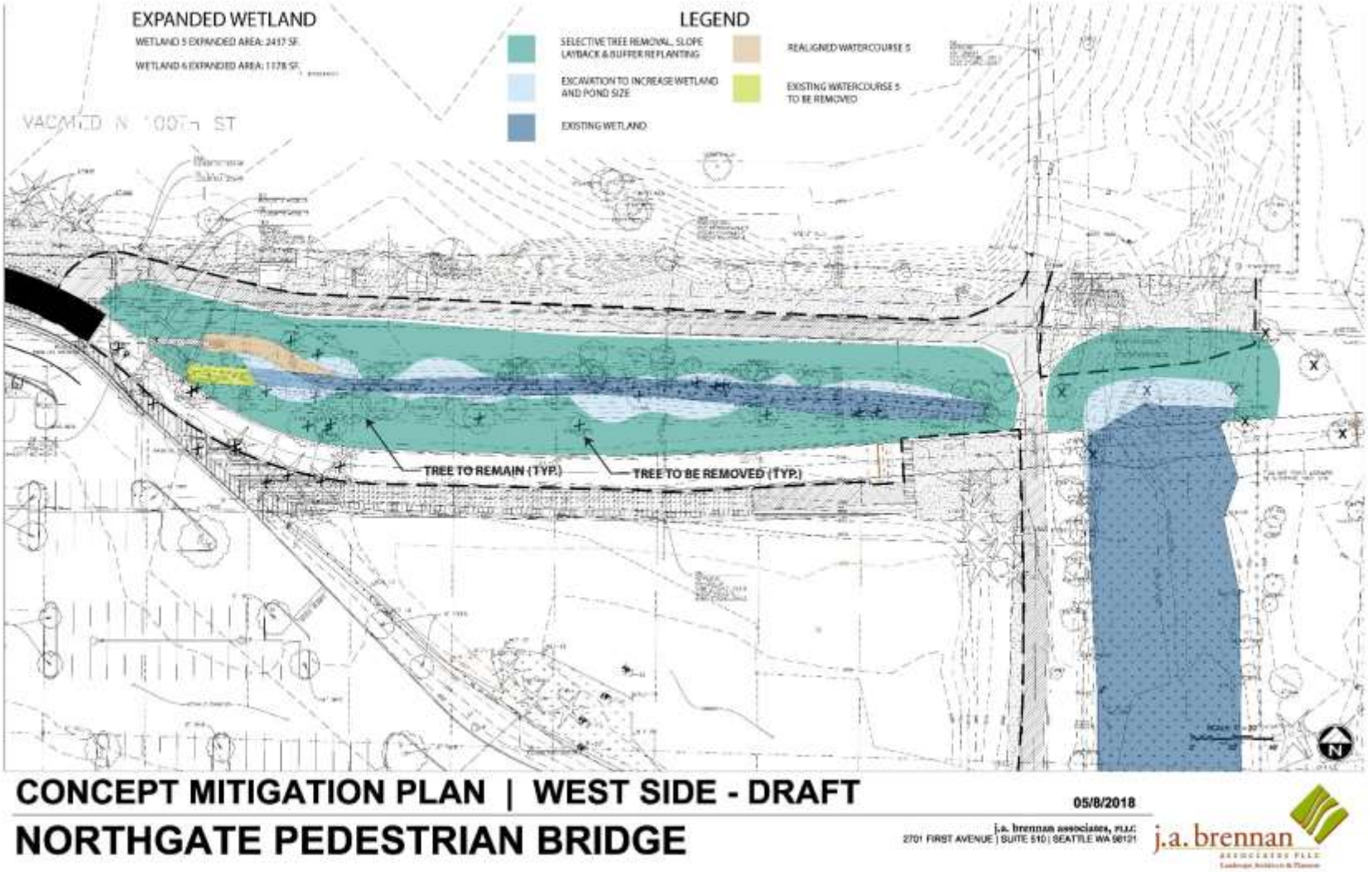
All temporary impact areas will be restored to pre-construction conditions following completion of project work. The west end of Watercourse 5 will be re-aligned to allow safe trail width, gradient, and turning radius. Side slopes of the re-aligned watercourse will be planted with native vegetation. On the south side of Watercourse 5, grading will occur to reduce the steepness of side slopes at locations where native vegetation is being removed. Vegetation types and spacing will be selected to allow periodic inspection of the abutment. Vegetation density will be increased near potential access areas to deter unauthorized access. Large woody material from trees removed on the NSC site will be incorporated into this area as snags or logs on the bank to increase habitat. On the north side of Watercourse 5, grading will occur to reduce the steepness of slopes. This grading will be designed to preserve existing native vegetation in some locations where the ecological value of the trees is deemed greater than the reduction of channel sloughing or downcutting due to steep slopes.

Tree replacement on the NSC site will occur adjacent to Watercourse 5 and Wetland 6 to meet SDCI tree replacement requirements. Tree replacement on WSDOT and SDOT right-of-way will occur near the tree removal areas and meet the respective tree replacement requirements of each. Up to about 52 trees will be removed to accommodate construction of the west approach ramp.

Excavation at the north end of the Wetland 6 is proposed to create new wetland area and will also increase the storage capacity of this wetland. Wetland creation offers the best mitigation ratio and is especially valuable at this site since several other potential mitigation opportunities are constrained due to existing trail locations and the proposed bridge alignment. A 3:1 slope will be placed adjacent to the new wetland creation area and this area will be replanted with native vegetation, tree replacement will occur both on-site at Watercourse 5 and Wetland 6 and off-site at Victory Creek (Figure 7) to mitigation for vegetation removal impacts.

The Project will mitigate a portion of the impacts to the North Watercourse on-site through a combination of habitat enhancement by invasive vegetation control, and native vegetation plantings.

Figure 6: Mitigation Concepts



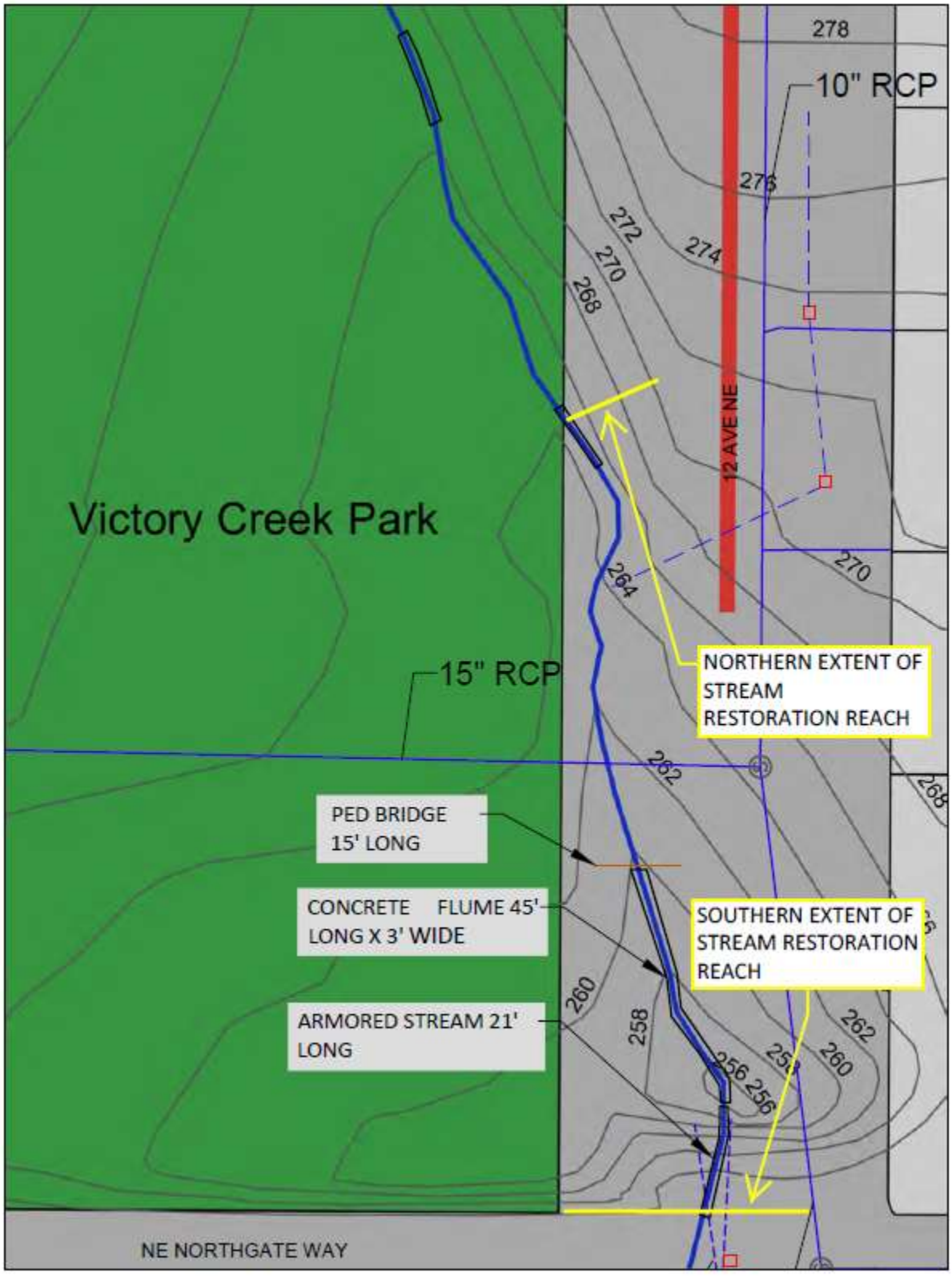
7.1.2 Off-Site Mitigation

Off-site mitigation is proposed for loss of channel habitat due to installation of the retaining wall, piers, and filling in the lower 130 feet of channel at North Watercourse (Type F water). Off-site mitigation opportunities have been investigated to counter this loss. Project impacts will reduce the amount of potential prey base to downstream resources, by reducing terrestrial and aquatic macroinvertebrates, and allochthonous material produced in this area. Impacts will also reduce the amount of cover and rearing habitat available to the three spined stickleback and resident cutthroat trout found in this habitat. There is not adequate on-site mitigation opportunity for the loss of channel habitat.

Based on evaluation of impacts and mitigation opportunities, the Corps, Ecology, and WDFW indicated support for off-site restoration to mitigate for the loss of channel habitat at the North Watercourse. Recommendations included looking for opportunities that also address specific limiting factors and needs within the Thornton Creek watershed, including water quality and in-stream habitat.

Off-site mitigation is proposed at Victory Creek in northeast Seattle located near in 12th Ave NE near NE Northgate Way (Figure 7). The current stream condition throughout Victory Creek is degraded. The lower Victory Creek stream reach lies within SDOT right-of-way and includes approximately 200 feet of riparian corridor, a walkway, a pedestrian bridge over the stream, and benches. The stream is a tributary to the South Branch of Thornton Creek.

Figure 7: Victory Creek (SDOT rights-of-way – 12th Ave NE)



The portion of the stream on SDOT property has been channelized in an 18" half-pipe resulting in a flume width of approximately three feet wide and 40 feet long (Figure 7). The upper portion of the concrete flume is 70 feet upstream of a trash-rack installed on the upstream end of the culvert under NE Northgate Way. The concrete stream lining increases water velocity creating a fish passage impediment and impacting natural stream processes. The stream flows north to south and are year-round at this location, although in the summer months there is approximately 1 cubic foot per second. Fish passage barriers exist downstream of this location but the up- and down-stream riparian corridors are still intact to some extent. In addition to the flume removal and stream restoration opportunity, there is ample opportunity for invasive vegetation removal and control as well as native riparian planting opportunity throughout this stream reach.

Stream habitat restoration opportunities will allow natural stream processes to take place by removing of the concrete flume and creating a roughened natural channel. Benefits will include increased macroinvertebrate production within the stream substrate, increased water quality treatment through the natural substrate and additional vegetation. Education opportunities in the park include viewing opportunities for wildlife, vegetation, and the stream. Signs could potentially be installed to describe improvements of natural stream processes. There may be mitigation monitoring and maintenance opportunities for interested citizens or interest groups. Additional opportunities include: replacement of an existing pedestrian bridge to allow a more natural stream width at the crossing; moving a pedestrian path further from the stream to allow stream widening and replanting; and removal of additional small concrete structures that

alter the stream upstream from the concrete flume area. Education opportunities also exist at this site.

8 MONITORING AND SITE MANAGEMENT

City of Seattle requires a minimum of a five-year monitoring period for mitigation (SMC 25.09.200.A). Ecology requires a 10-year monitoring period and WDFW requires at least a 5-year monitoring period. Monitoring requirements will be established by permit.

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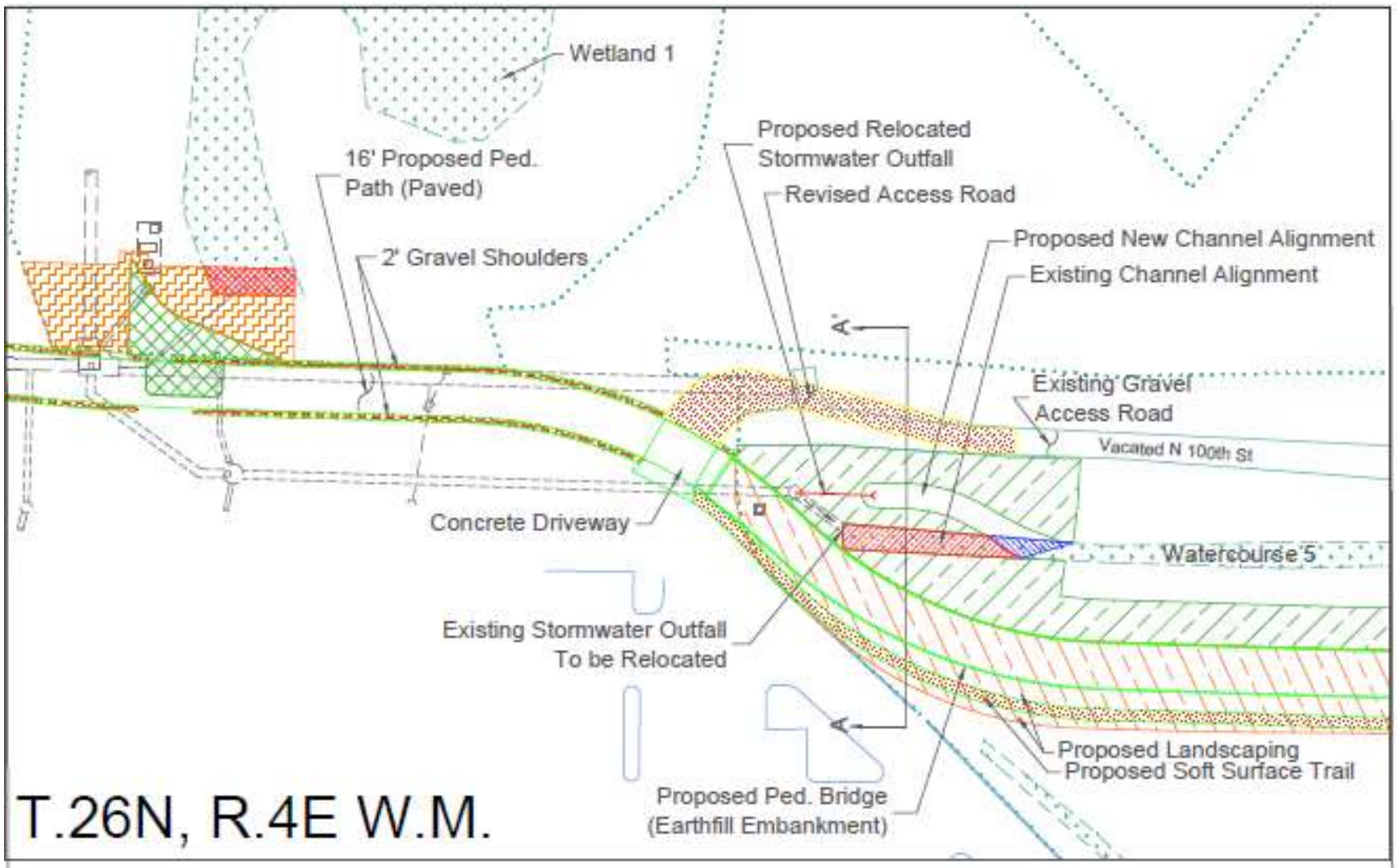
APPENDIX A: WETLAND, WATERCOURSE, AND BUFFER IMPACT SHEETS

Figure A-1 Western Geographic Area Aquatic Resources



WETLAND IMPACTS

WETLAND 1 (CAT III)	**SQ. FT.**	**ACRES**
WETLAND AREA	67,660	1.55
PERM. WETLAND IMPACT	305	0.01
WATERCOURSE 5	**SQ. FT.**	**ACRES**
WATERCOURSE AREA	3,718	0.09
PERM. WATERCOURSE IMPACT	465	0.01

LEGEND

- WETLAND OR WATERBODY
- PERMANENT WETLAND BUFFER IMPACT
- TEMPORARY WETLAND BUFFER IMPACT
- PERMANENT WETLAND IMPACT
- TEMPORARY WETLAND IMPACT
- PERMANENT WATERCOURSE IMPACT
- TEMPORARY WATERCOURSE IMPACT
- PERMANENT WATERCOURSE BUFFER IMPACT
- TEMPORARY WATERCOURSE BUFFER IMPACT
- WETLAND BOUNDARY
- WETLAND BUFFER
- PROPOSED BRIDGE / TRAIL CENTERLINE
- EXISTING CURB FACE
- PROPOSED STORM PIPE
- EXISTING STORM PIPE
- FLOW DIRECTION

0 30 60
SCALE IN FEET

N

PROJECT NAME: NORTHGATE PEDESTRIAN AND BICYCLE BRIDGE PROJECT

PURPOSE: CONSTRUCT PEDESTRIAN BRIDGE & TRAIL

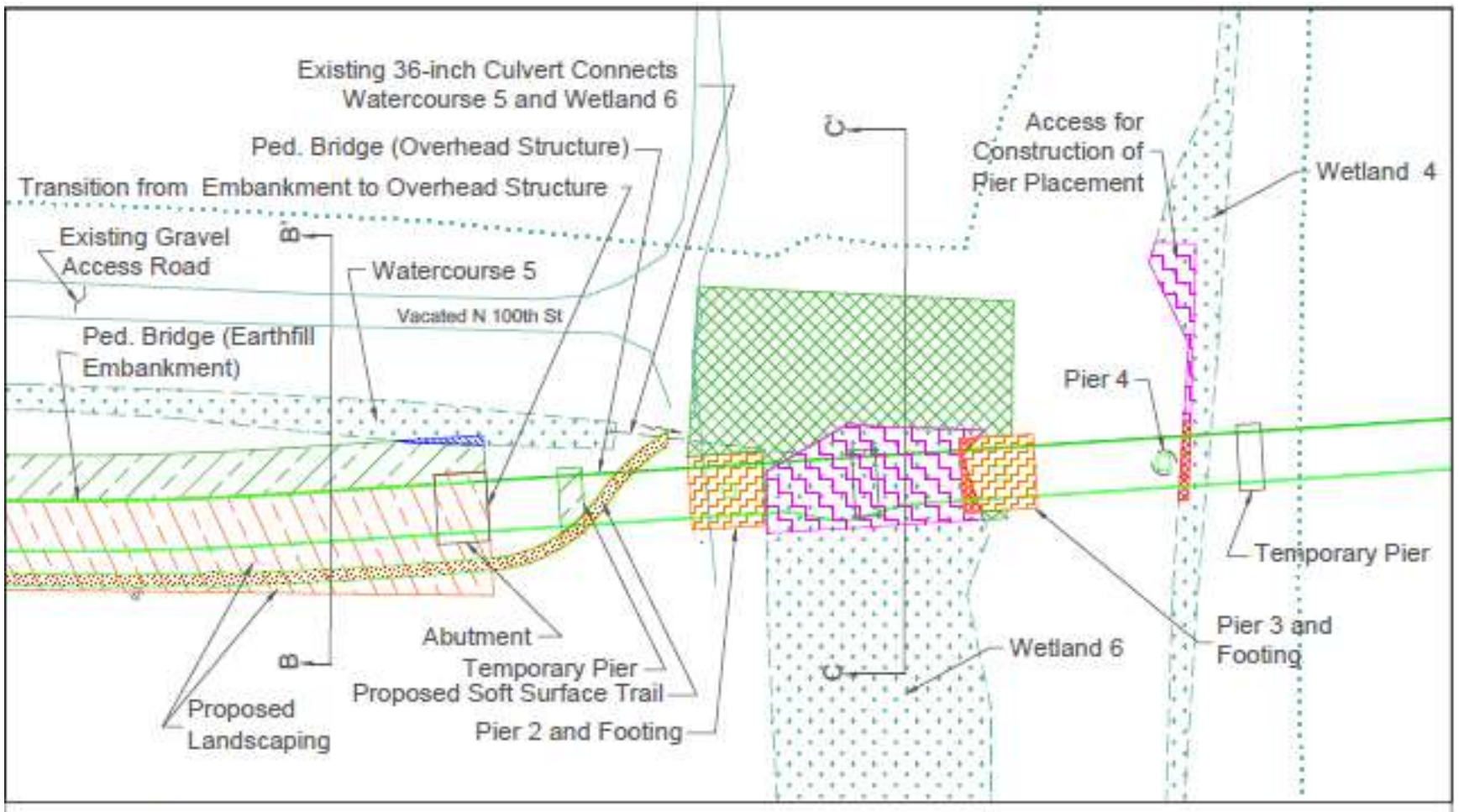
LOCATION: NORTHGATE AREA, SEATTLE WA
DATUM: NAVD 88

REFERENCE: NWS - 2018 - 1S1 - WRD
APPLICANT: SDOT
COUNTY: KING
NEAR: SEATTLE
WATER BODY: THORNTON CREEK, WRIA 8 & WETLANDS

Seattle Department of Transportation

SHEET: 2 OF: 8

Figure A-2 Western Geographic Area Aquatic Resources



WETLAND IMPACTS

WETLAND 4 (CAT III)	**SQ. FT.**	**ACRES**
WETLAND AREA	11,132	0.26
PERM. WETLAND IMPACT	72	>0.01
WATERCOURSE 5	**SQ. FT.**	**ACRES**
WATERCOURSE AREA	3,718	0.09
PERM. WATERCOURSE IMPACT	465	0.01
WETLAND 6 (CAT III)	**SQ. FT.**	**ACRES**
WETLAND AREA	25,377	0.58
PERM. WETLAND IMPACT	79	>0.01

T.26N, R.4E W.M.

LEGEND

- WETLAND OR WATERBODY
- PERMANENT WETLAND BUFFER IMPACT
- TEMPORARY WETLAND BUFFER IMPACT
- PERMANENT WETLAND IMPACT
- TEMPORARY WETLAND IMPACT
- PERMANENT WATERCOURSE IMPACT
- TEMPORARY WATERCOURSE IMPACT
- PERMANENT WATERCOURSE BUFFER IMPACT
- TEMPORARY WATERCOURSE BUFFER IMPACT
- WETLAND BOUNDARY
- WETLAND BUFFER
- PROPOSED BRIDGE / TRAIL CENTERLINE
- EXISTING CURB FACE
- PROPOSED STORM PIPE
- EXISTING STORM PIPE
- FLOW DIRECTION

0 30 60
SCALE IN FEET

N

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LOCATION: NORTHGATE AREA, SEATTLE WA
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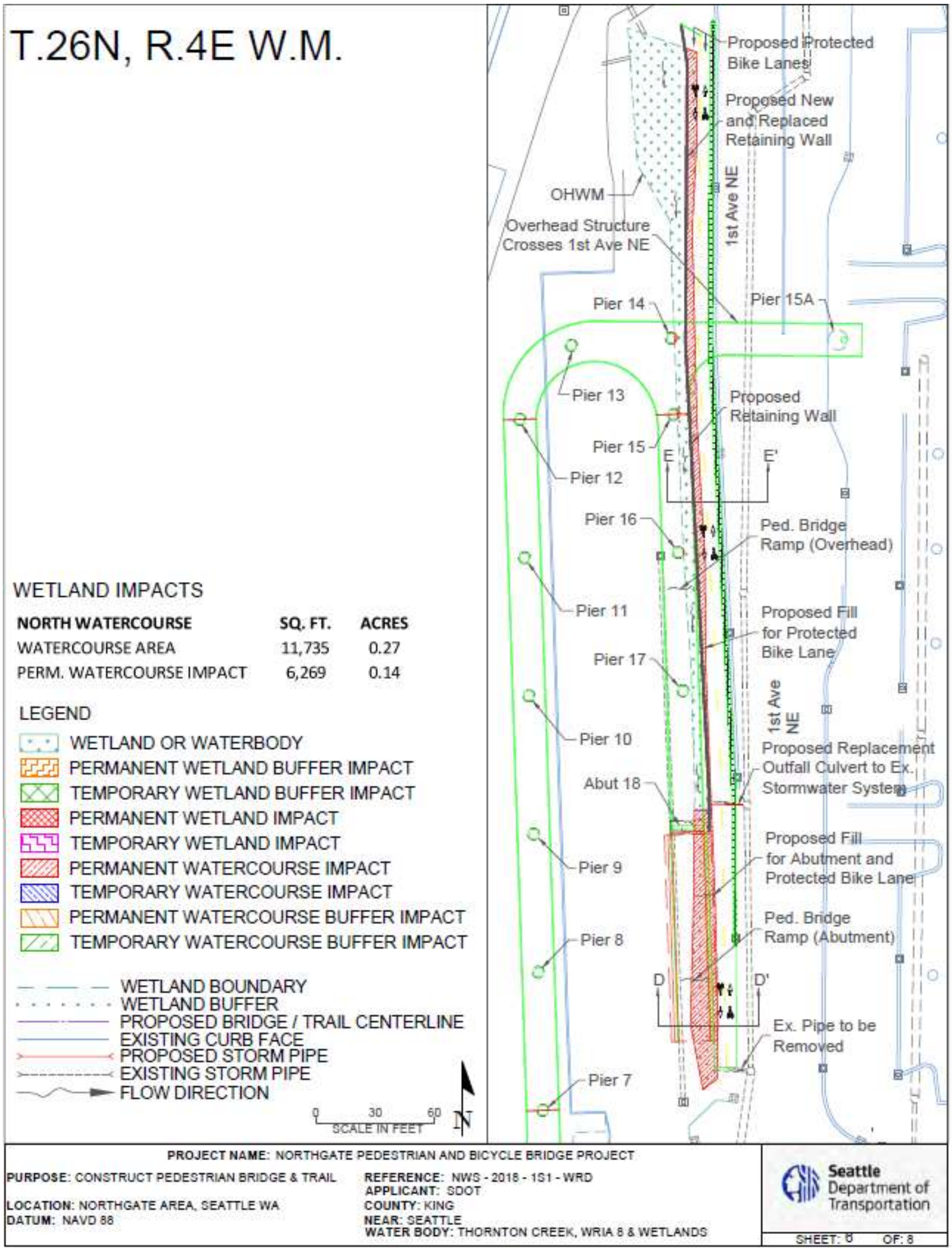
COUNTY: KING
NEAR: SEATTLE
WATER BODY: THORNTON CREEK, WRIA 8 & WETLANDS

Seattle Department of Transportation

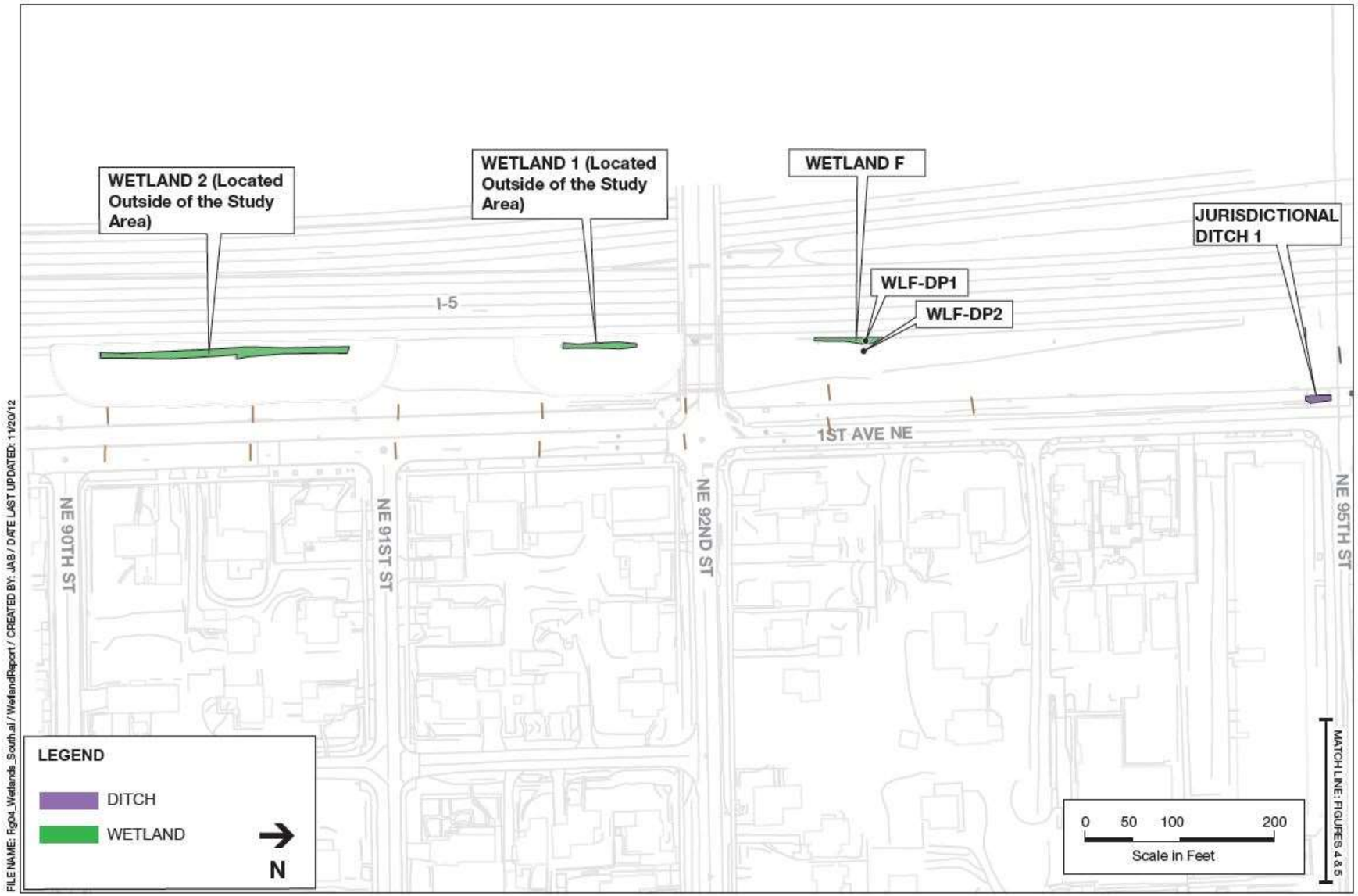
SHEET: 4 OF: 8

Figure A-3 Western Geographic Area Aquatic Resources



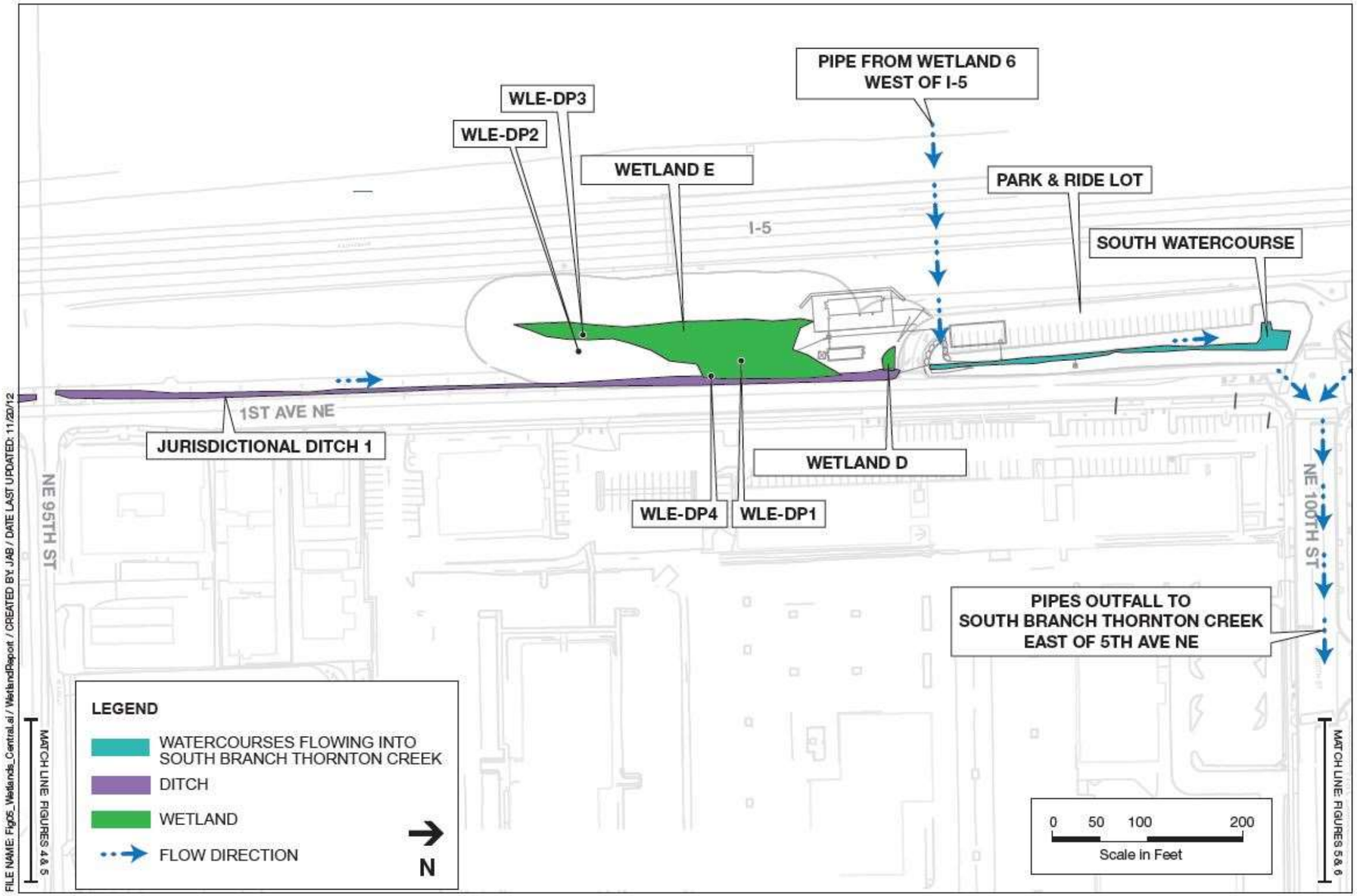
Source: City of Seattle—SDOT 2017

Figure A-8 Eastern Geographic Area Aquatic Resources—South



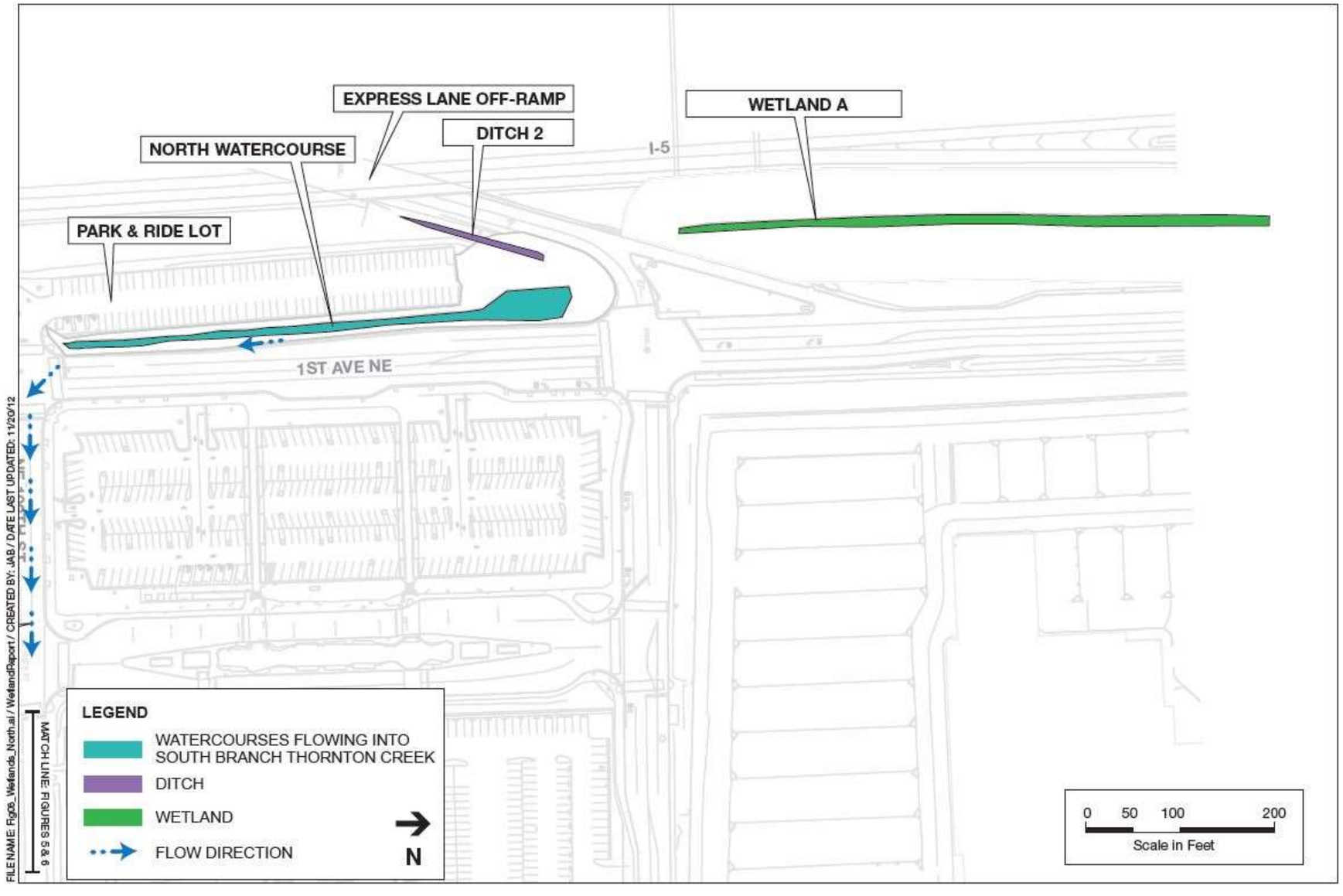
Source: City of Seattle—SDOT 2017

Figure A-9 Eastern Geographic Area Aquatic Resources—Middle



Source: City of Seattle—SDOT 2017

Figure A-10 Eastern Geographic Area Aquatic Resources—North



Source: City of Seattle—SDOT