

---

**Discipline Report**  
***Wildlife, Fisheries,  
and Vegetation***

Prepared by:  
HNTB Corporation

June 10, 2014



Environmental Assessment  
**Magnolia Bridge Replacement**  
City of Seattle

---

This page is intentionally blank.

# Contents

---

<b>Contents</b> .....	<b>iii</b>
<b>Introduction</b> .....	<b>1</b>
<b>What is the Magnolia Bridge Replacement Project?</b> .....	<b>1</b>
<b>What's been done so far?</b> .....	<b>1</b>
<b>What alternatives are being considered?</b> .....	<b>2</b>
<b>What is the Preferred Alternative?</b> .....	<b>2</b>
<b>What's new?</b> .....	<b>3</b>
Seattle Monorail Project .....	3
North Bay Master Plan .....	3
Terminal 91 West Yard Acquisition .....	4
<b>What's in this discipline report?</b> .....	<b>4</b>
2004 Wildlife, Fisheries, and Vegetation Discipline Report (Draft) .....	4
Wildlife, Fisheries, and Vegetation Discipline Report Addendum.....	5
<b>Introduction</b> .....	<b>63</b>
<b>Methods</b> .....	<b>65</b>
<b>Affected Environment</b> .....	<b>67</b>
<b>Vegetation</b> .....	<b>67</b>
Ornamental/Landscaped Vegetation .....	67
Wetlands.....	67
<b>Wildlife</b> .....	<b>67</b>
Birds .....	67
Marine Mammals .....	68
<b>Fish</b> .....	<b>68</b>
<b>Special Status Species</b> .....	<b>69</b>
Federally Listed Species .....	70
State-Listed Species and Habitat .....	74

<b>Studies and Coordination .....</b>	<b>77</b>
<b>Studies .....</b>	<b>77</b>
<b>Data Sources .....</b>	<b>77</b>
<b>Operational Impacts .....</b>	<b>79</b>
<b>No Build Alternative .....</b>	<b>79</b>
<b>Alternative A (Preferred Alternative) .....</b>	<b>79</b>
<b>Operational Mitigation Measures .....</b>	<b>81</b>
<b>No Build Alternative .....</b>	<b>81</b>
<b>Alternative A (Preferred Alternative) .....</b>	<b>81</b>
<b>Construction Impacts .....</b>	<b>83</b>
<b>No Build Alternative .....</b>	<b>83</b>
Impacts .....	83
Mitigation Measures .....	83
<b>Alternative A (Preferred Alternative) .....</b>	<b>83</b>
Impacts .....	83
Mitigation Measures .....	90
<b>Summary of Findings .....</b>	<b>93</b>
<b>Affected Environment .....</b>	<b>93</b>
<b>Impacts .....</b>	<b>93</b>
Operational Impacts .....	93
Construction Impacts .....	93
Secondary and Cumulative Impacts .....	93
<b>Mitigation Measures .....</b>	<b>94</b>
Operational Mitigation .....	94
Construction Mitigation .....	94
<b>References .....</b>	<b>97</b>

## List of Tables

<b>Addendum Table 1 Species of Fishes with Designated Essential Fish Habitat     Occurring in Puget Sound .....</b>	<b>68</b>
<b>Addendum Table 2 Special Status Species and Habitat .....</b>	<b>69</b>
<b>Addendum Table 3 Preferred Alternative Stormwater Pollutant Concentrations...</b>	<b>79</b>

## List of Figures

<b>Figure 1 Alternative A (Preferred Alternative) .....</b>	<b>3</b>
---	----------

## What is the Magnolia Bridge Replacement Project?

The Magnolia Bridge was constructed in 1929 and has been modified, strengthened and repaired several times. The west end of the bridge was damaged by a landslide in 1997 and was closed during repairs. Bridge columns and bracing were repaired and replaced. Construction included six additional supports and a new retaining wall north of the bridge to stabilize the bluff from further landslides. The 2001 Nisqually Earthquake also resulted in bridge closure during repairs. Nearly half of the original concrete braces on the west portion of the bridge were damaged beyond repair and were replaced with steel bracing. A partial seismic retrofit of the single-span bridge structure over 15th Avenue West was completed in 2001.

Inspections of the bridge concluded that the concrete structure is showing signs of deterioration. The concrete is cracking and spalling at many locations, apparently related to corrosion of the reinforcing steel. Currently a bridge conditions study is being completed to determine if the bridge has deteriorated further.

The Magnolia Bridge Replacement Project proposes to replace the existing Magnolia Bridge structure, approaches, and related arterial connections with facilities that maintain convenient and reliable vehicular and non-motorized access between the Magnolia community and the rest of the City of Seattle.

## What's been done so far?

The Seattle Department of Transportation (SDOT) commissioned a Type, Size, and Location (TSL) study after the 4,400-foot Magnolia Bridge sustained damage in the 2001 Nisqually Earthquake. Although the bridge was repaired and is now safe for motorists to use, it would be at risk if another seismic event were to occur.

In 2002, SDOT started identifying alternatives for replacing the Magnolia Bridge. The project team identified 25 project alternatives in both existing and new locations in the Interbay neighborhood. After two rounds of technical review and an extensive public involvement process, the team selected three build alternatives and the no build alternative for further study in a National Environment Policy Act (NEPA) environmental document.

SDOT began analyzing and comparing the impacts of the three alternatives to complete its obligations under the NEPA through the development of a draft Environmental Assessment (EA) and environmental discipline reports:

- Air Quality
- Environmental Justice
- Geology and Soils
- Hazardous Materials

- Historic, Cultural and Archaeological Resources
- Land Use
- Noise
- Public Lands, Section 4(f)
- Public Services and Utilities
- Social, Economic, and Relocation
- Traffic and Transportation
- Visual Quality
- Water Quality
- Wildlife, Fisheries, and Vegetation

Based, in part, on the technical information provided in these reports and the TSL study, SDOT recommended a preferred alternative. Other factors considered included, for example, community input and cost.

## What alternatives are being considered?

After two rounds of technical review and an extensive public involvement process, the team selected Alternatives A, C, and D for further study in a NEPA environmental document<sup>1</sup>.

- Alternative A (Preferred Alternative) will replace the bridge with a similar facility just south of the existing bridge.
- Alternative C combined bridge and surface segments, arcing to the north through the Port's property.
- Alternative D maintained the same endpoints as currently exist for the Magnolia Bridge, but arched the alignment to the north.

## What is the Preferred Alternative?

In March 2006, the Seattle Department of Transportation (SDOT) recommended Alternative A as the Preferred Alternative to replace the Magnolia Bridge. Alternative A replaces the existing bridge with a new structure immediately south of the existing bridge between Magnolia Bluff and Pier 90, and on the existing bridge alignment between Pier 90 and 15th Avenue West. Ramps would provide access from the bridge's mid-span to the waterfront and the Port of Seattle Terminal 91 uplands property. Connections at the east and west ends of the bridge would be similar to the existing bridge. In November 2006, SDOT selected a bridge structure

---

<sup>1</sup> Detailed descriptions of the three build alternatives can be found on pages 7 through 16 (pages 19 through 28 of this document) of the Wildlife, Fisheries, and Vegetation Discipline Report (draft December 2004).

type following several public outreach events and consultations with the project's Design Advisory Group<sup>2</sup> and the Seattle Design Commission<sup>3</sup>.



**Figure 1 Alternative A (Preferred Alternative)**

## What's new?

The project has been on hold for final design and construction since 2007. In 2013, DOT and the Washington State Department of Transportation decided to complete the project's environmental documentation. Since 2007, several project study area conditions have changed. Three of the more significant changes are the terminations of the Seattle Monorail Project and the Port of Seattle's North Bay Master Plan process, and the acquisition of the Terminal 91 West Yard for future expansion of Smith Cove Park and siting a King County combined sewer overflow (CSO) facility.

### *Seattle Monorail Project*

The Seattle Monorail Project Green Line was in development during the TS&L phase of the Magnolia Bridge Replacement Project. Discipline reports prepared in 2003 through 2005 considered the effects of the monorail and bridge projects. The Green Line included an elevated monorail in the 15th Avenue West/Elliott Avenue West corridor at the east end of the Magnolia Bridge. Following a November 2005 public vote that did not approve a reduced-scale project, the project was terminated prior to any construction and all purchased property was sold.

### *North Bay Master Plan*

During the TS&L phase of the Magnolia Bridge project, the Port of Seattle prepared a Master Plan for 94 acres of Port-owned upland properties at Terminal 91 and five

<sup>2</sup> The Magnolia Bridge Design Advisory Group met from 2002 to 2008 and included representatives from: Bicycle Alliance of Washington, Magnolia Chamber of Commerce, Magnolia Community Club, Magnolia/Queen Anne District Council, Port of Seattle, Queen Anne Chamber of Commerce, Queen Anne Community Council, Seattle Marine Business Coalition and BINMIC, Uptown Alliance and Friends of Queen Anne.

<sup>3</sup> The Seattle Design Commission is a citizen advisory committee appointed by the Mayor and confirmed by City Council to provide feedback and recommendations on the design of capital improvements and other projects and policies that shape Seattle's public realm.

acres of adjacent, City of Seattle-owned property. The total 99-acre area was termed the “North Bay Site” (Port of Seattle 2005). The North Bay Preferred Alternative assumed 3.75 million square feet of new building space developed over 25 years in an urban industrial campus. In addition, the North Bay Preferred Alternative assumed modifications and additions to the Seattle Comprehensive Plan and rezoning of Port-owned property. No further action on Port Commission adoption of the Master Plan has taken place since 2005 and the site remains in industrial zoning.

In 2010, the Port conducted a development options analysis of Terminal 91 (Port of Seattle 2010). The analysis focused only on uses permitted under current zoning. The analysis noted that there has been a historic demand for yard storage on the North Bay property, in the form of vehicle parking and equipment storage and concluded that this remains its current highest and best use.

Magnolia Bridge Replacement discipline report references to North Bay generally refer to the general site and not to specific future development conditions. These references are not revised in the discipline report addendum. Conditions addressed for Alternative A are the same for the Magnolia Bridge Replacement Preferred Alternative.

### *Terminal 91 West Yard Acquisition*

The City of Seattle, and King County have acquired the Port of Seattle Terminal 91 “West Yard” property. The West Yard property is the 5.38 acres south of West Garfield Street and east of 23rd Avenue West. The West Yard property contains the existing 1.1-acre Smith Cove Park water front site that will be operated by Seattle Parks and Recreation. About 0.79 acre of the West Yard property was purchased by King County for an underground storage tank and an above ground building for the South Magnolia Combined Sewer Overflow (CSO) facility. Other portions in the north part of the remaining 4.60-acre site will be permanent pipeline, surface and aerial easements to King County for the operation of the CSO facility. The design of CSO facilities on the West Yard site and adjacent Terminal 91 areas have been coordinated with the City of Seattle to accommodate the future Magnolia Bridge replacement structure including the ramps to and from 23rd Avenue West.

City of Seattle property outside of the Smith Cove Park waterfront site is vacant and fenced with no public access. King County has a construction easement from Seattle to use this area for construction staging for the CSO facility. Seattle plans to develop this site in the future for public waterfront access when funding is available.

## **What’s in this discipline report?**

### *2004 Wildlife, Fisheries, and Vegetation Discipline Report (Draft)*

A Wildlife, Fisheries, and Vegetation Discipline Report (draft 2004) for the Magnolia Bridge Replacement Project was prepared during the Type, Size and Location design phase of the project. The report describes the methods and information sources used to describe surface and groundwater conditions in the

project study area. This report also describes potential environmental impacts of the project and mitigation measures.

This draft discipline report has been available on the Seattle Department of Transportation web site for the Magnolia Bridge Replacement Project (<http://www.seattle.gov/transportation/magbridgereplace.htm>). The report is included in this document in its entirety.

### *Wildlife, Fisheries, and Vegetation Discipline Report Addendum*

Since completion of the original Wildlife, Fisheries, and Vegetation Discipline Report (draft 2004), the Seattle Department of Transportation recommended a preferred alternative alignment and bridge types in 2006 and completed the bridge design to approximately the 30 percent level in 2007 and 2008. The Wildlife, Fisheries, and Vegetation Discipline Report Addendum provides updated regulatory information and updated impact analysis for the Preferred Alternative (Alternative A – Ramps). The source for Preferred Alternative Endangered Species Act (ESA) compliance is the Biological Assessment (October 2008) and addenda (May 2009 and draft May 2014).

No further design development was done for Alternative A – Intersection, Alternative C, Alternative C – Intersection, or Alternative D – Ramps. Impact analyses have not been revised for these alternatives.

This page is intentionally blank.

---

**Discipline Report**  
***Wildlife, Fisheries,  
and Vegetation***

Prepared by:  
Shapiro and Associates, Inc.

December 2004



Seattle Department of Transportation  
Agreement No. T01-34

Draft EIS

**Magnolia Bridge Replacement**

City of Seattle

---



# Contents

<b>Contents</b> .....	<b>i</b>
<b>Purpose and Need</b> .....	<b>1</b>
<b>Purpose</b> .....	<b>1</b>
<b>Need</b> .....	<b>1</b>
Structural Deficiencies .....	1
System Linkage.....	1
Traffic Capacity .....	4
Modal Interrelationships.....	4
Transportation Demand.....	4
Legislation .....	5
<b>Description of Alternatives</b> .....	<b>7</b>
<b>No Build Alternative</b> .....	<b>7</b>
<b>Alternative A</b> .....	<b>8</b>
<b>Alternative C</b> .....	<b>8</b>
<b>Alternative D</b> .....	<b>8</b>
<b>Methods</b> .....	<b>17</b>
<b>Affected Environment</b> .....	<b>19</b>
<b>Vegetation</b> .....	<b>19</b>
Forest.....	19
Ornamental/Landscaped Vegetation.....	19
Disturbed Vegetation.....	21
Marine Vegetation .....	21
Wetlands.....	21
<b>Wildlife</b> .....	<b>21</b>
Mammals .....	22
Birds.....	23
Reptiles and Amphibians .....	26
Fish.....	26
Special Status Species .....	29
<b>Studies and Coordination</b> .....	<b>31</b>
<b>Studies</b> .....	<b>31</b>
<b>Data Sources</b> .....	<b>31</b>

<b>Major Assumptions</b> .....	<b>31</b>
<b>Operational Impacts</b> .....	<b>33</b>
<b>No Build Alternative</b> .....	<b>33</b>
<b>Alternative A</b> .....	<b>33</b>
<b>Alternative C</b> .....	<b>33</b>
<b>Alternative D</b> .....	<b>34</b>
<b>Operational Mitigation Measures</b> .....	<b>35</b>
<b>No Build Alternative</b> .....	<b>35</b>
<b>Alternative A</b> .....	<b>35</b>
<b>Alternative C</b> .....	<b>35</b>
<b>Alternative D</b> .....	<b>35</b>
<b>Construction Impacts</b> .....	<b>37</b>
<b>No Build Alternative</b> .....	<b>37</b>
Impacts.....	37
Mitigation Measures.....	37
<b>Alternative A</b> .....	<b>37</b>
Impacts.....	37
Mitigation Measures.....	39
<b>Alternative C</b> .....	<b>39</b>
Impacts.....	39
Mitigation Measures.....	40
<b>Alternative D</b> .....	<b>41</b>
Impacts.....	41
Mitigation Measures.....	41
<b>Summary of Findings</b> .....	<b>43</b>
<b>Affected Environment</b> .....	<b>43</b>
<b>Impacts</b> .....	<b>43</b>
Operational Impacts.....	43
Construction Impacts.....	43
Secondary and Cumulative Impacts.....	44
<b>Mitigation Measures</b> .....	<b>44</b>
Operational Mitigation.....	44
Construction Mitigation.....	45

**References .....47**

**List of Tables**

Table 1 Mammals that May Occur in the Study Area .....22  
 Table 2 Birds that May Occur in the Study Area .....24  
 Table 3 Fish that May Occur in the Study Area .....26  
 Table 4 Species with Designated EFH .....28  
 Table 5 Special Status Species That May Occur in the Study Area .....30

**List of Figures**

Figure 1 Vicinity Map ..... 2  
 Figure 2 Study Area..... 3  
 Figure 3 Typical Sections – No Build Alternative ..... 9  
 Figure 4 Typical Sections – Build Alternatives .....10  
 Figure 5 No Build Alternative .....11  
 Figure 6 Alternative A - Intersection .....12  
 Figure 7 Alternative A - Ramps .....13  
 Figure 8 Alternative C .....14  
 Figure 9 Alternative D - Intersection .....15  
 Figure 10 Alternative D - Ramps .....16  
 Figure 11 Fish and Wildlife Habitat Areas.....20

This page is intentionally blank.

## ***Purpose and Need***

---

### **Purpose**

The purpose of this project is to replace the existing Magnolia Bridge structure, approaches, and related arterial connections with facilities that maintain convenient and reliable vehicular and non-motorized access between the Magnolia community and the rest of the City of Seattle. The bridge provides an important link to the Magnolia community in Seattle (see Figure 1 and Figure 2). Because the existing bridge provides the only public vehicular access to the land between North Bay, also referred to as Terminal 91, Smith Cove Park, Elliott Bay Marina, and U.S. Navy property, the project purpose also includes maintenance of access to these areas.

### **Need**

#### ***Structural Deficiencies***

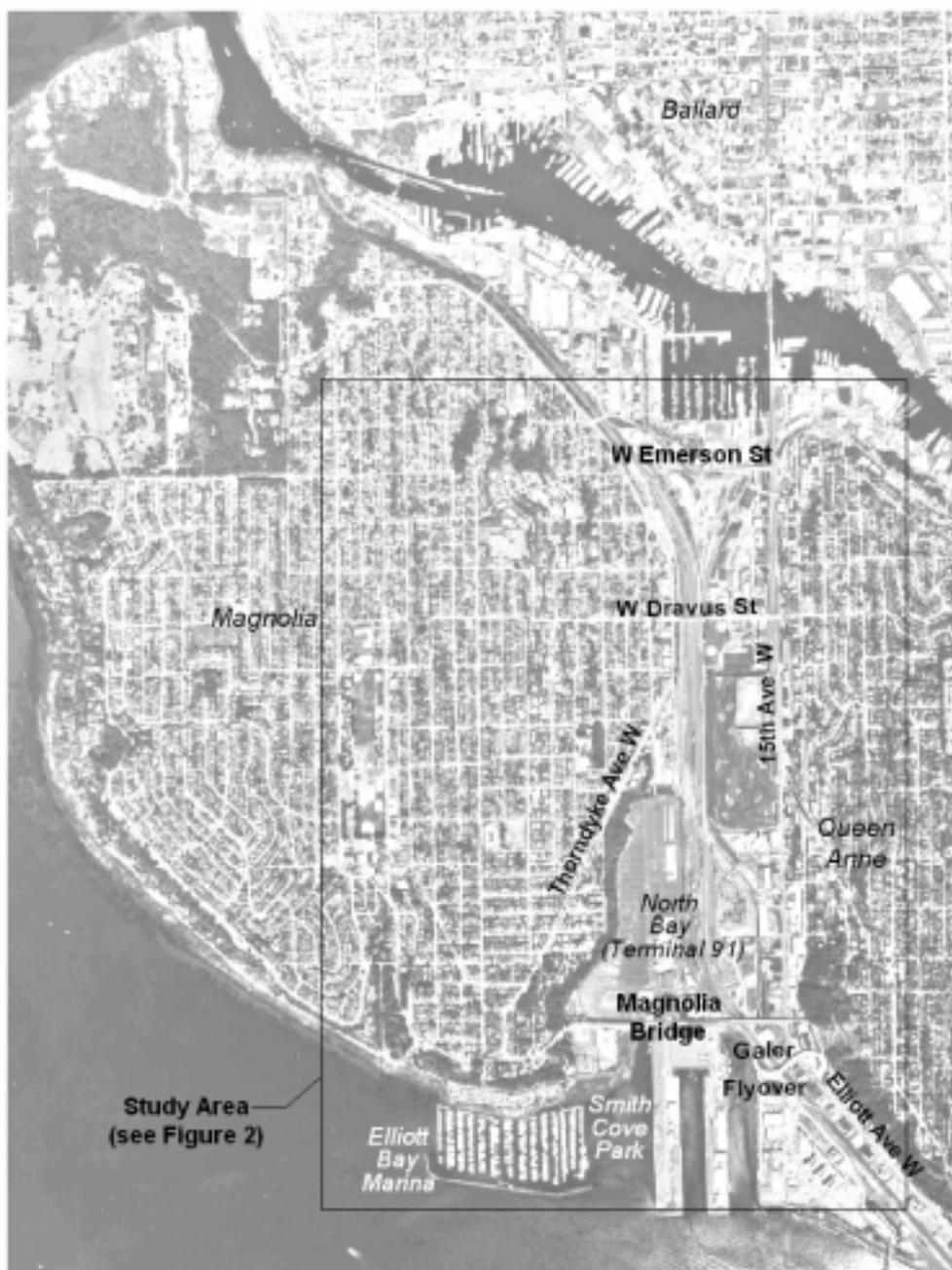
The City of Seattle has identified the Magnolia Bridge as an important bridge that should remain standing following a “design” seismic event (an earthquake with a peak ground acceleration of 0.3g that is anticipated to happen every 475 years and may measure 7.5 on the Richter scale). Even with the repairs completed following the February 2001 earthquake, the existing bridge is susceptible to severe damage and collapse from an earthquake that is less severe than the “design” seismic event.

The original bridge was constructed in 1929 and has been modified, strengthened, and repaired several times. The west end of the bridge was damaged by a landslide in 1997, requiring repair and replacement of bridge columns and bracing, the construction of six additional supports, and a retaining wall north of the bridge to stabilize the bluff from further landslides. Repairs after the 2001 earthquake included replacement of column bracing at 27 of the 81 bridge supports. A partial seismic retrofit of the single-span bridge structure over 15th Avenue West was completed in 2001. The other spans were not upgraded.

Inspections of the bridge conclude that the concrete structure is showing signs of deterioration. The concrete is cracking and spalling at many locations, apparently related to corrosion of the reinforcing steel. The bridge requires constant maintenance in order to maintain its load capacity, but there does not appear to be any immediate load capacity problem. The existing foundations have insufficient capacity to handle the lateral load and uplift forces that would be generated by a “design” seismic event. The existing foundations do not extend below the soils that could liquefy during a “design” seismic event. If the soils were to liquefy, the foundations would lose their vertical-load-carrying ability and the structure would collapse.

#### ***System Linkage***

There are three roadway connections from the Magnolia community, with more than 20,000 residents, to the rest of Seattle. As the southernmost of the three connections, the Magnolia Bridge is the most direct route for much of south and west Magnolia to downtown Seattle and the regional freeway system.



**Figure 1**  
**Vicinity Map**

In meetings with the public and the Seattle Fire Department, the importance of this route for emergency services has been emphasized. The loss of use of this bridge in 1997 and again in 2001 demonstrated to the City that the remaining two bridges do not provide acceptable operation. During the bridge closure following the February 2001 earthquake, the City addressed community concerns about reduced emergency response time to medical facilities outside of Magnolia by stationing paramedics at Fire Station 41 (2416 34th Avenue West) 24 hours a day.

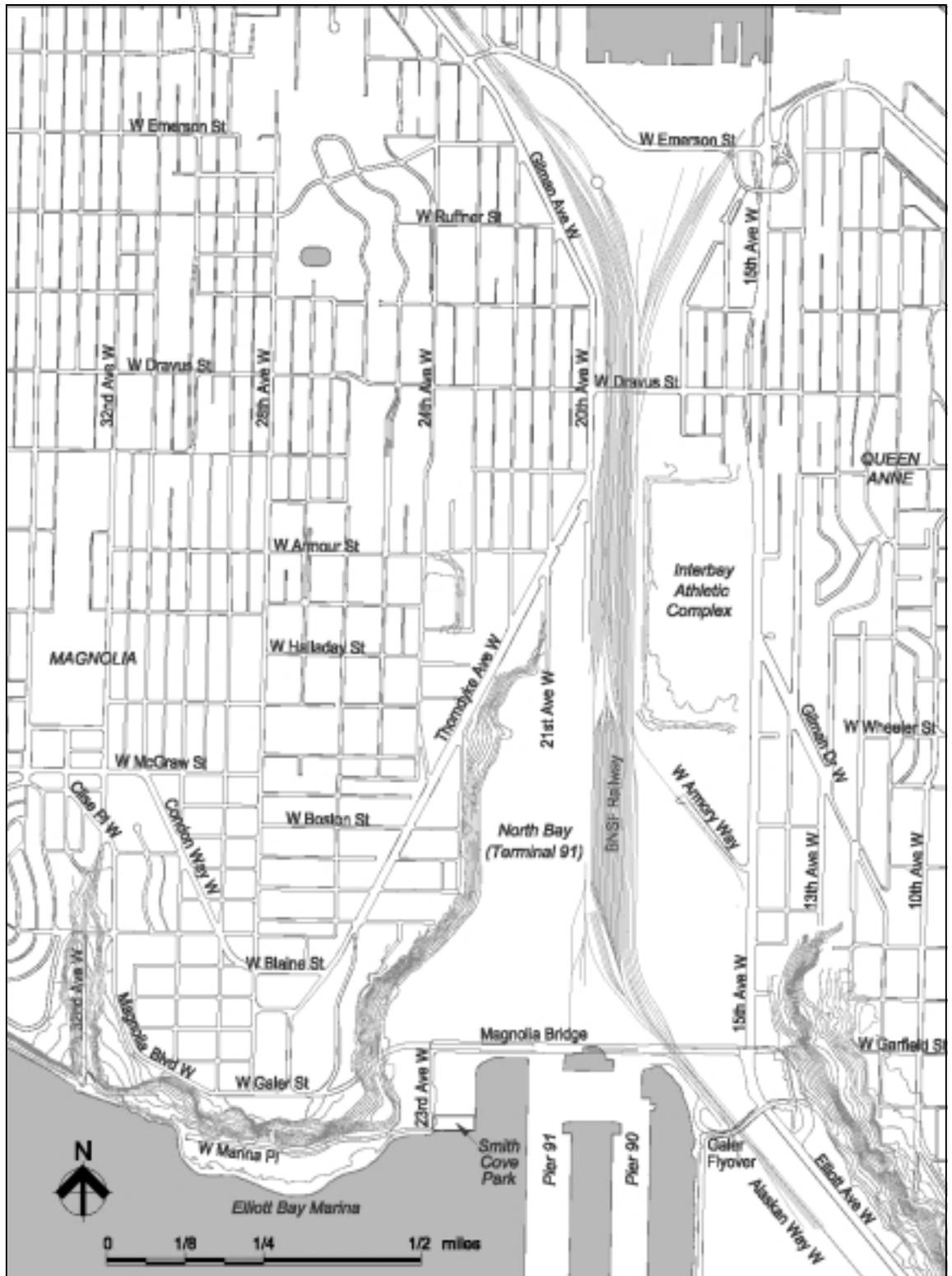


Figure 2  
Study Area

## *Traffic Capacity*

The three Magnolia community connections to the 15th Avenue West corridor are adequate for the present volume of traffic. Each of the three connections carries 30 to 35 percent of the 60,100 daily vehicle trips (2001 counts) in and out of the Magnolia community. Loss of the use of the Magnolia Bridge for several months after the February 2001 earthquake, and in 1997 following the landslide at the west end of the bridge, resulted in lengthy 15- to 30-minute delays and increased trip lengths for many of the users of the Magnolia Bridge. These users were required to use one of the two remaining bridges at West Dravus Street and West Emerson Street. Travel patterns in the Magnolia community changed substantially resulting in negative impacts on local neighborhood streets. The increase of traffic through the West Dravus Street and West Emerson Street connections also resulted in congestion and delay for the regular users of these routes. Losing the use of any one of these three bridges would result in redirected traffic volumes that would overwhelm the capacity of the remaining two bridges.

## *Modal Interrelationships*

The Magnolia Bridge carries three of the four local transit routes serving Magnolia and downtown Seattle destinations. The topography of the east side of Magnolia, East Hill, would make access to the 15th Avenue West corridor via the West Dravus Street Bridge a circuitous route for transit. Use of the West Emerson Street connection to 15th Avenue West would add significant distance and travel time for most trips between Magnolia and downtown Seattle.

The Magnolia Bridge has pedestrian facilities connecting the Magnolia neighborhood to Smith Cove Park and Elliott Bay Marina as well as to 15th Avenue West/Elliott Avenue West. These facilities need to be maintained. The Elliott Bay multi-use trail connects Magnolia with downtown Seattle through Myrtle Edwards Park. The trail passes under the Magnolia Bridge along the west side of the BNSF rail yard, but there are no direct connections to the bridge.

Bicycle facilities on Magnolia Bridge need to be maintained or improved. Even with the steep (about 6.3 percent) grade, bicyclists use the Magnolia Bridge in both directions. There are no bike lanes on the bridge, so cyclists use the traffic lanes and sidewalks. Once cyclists cross the bridge, they must either travel with motor vehicles on Elliott Avenue West or find a way back to the Elliott Bay Trail using local east-west streets such as the Galer Flyover.

## *Transportation Demand*

The existing Magnolia Bridge provides automobile access for Port of Seattle North Bay (Terminal 91) to and from Elliott Avenue West/15th Avenue West. Truck access between Terminal 91 and Elliott Avenue West/15th Avenue West is accommodated via the Galer Flyover. Future planned expansion of the Amgen facility on Alaskan Way West and redevelopment of underutilized portions of North Bay and other areas of Interbay will increase demand for traffic access to the Elliott Avenue West/15th Avenue West corridor. The Port of Seattle has a master planning process under way (July 2003) for its North Bay (Terminal 91) property and the Washington National Guard property east of the BNSF Railway between West Garfield Street and West Armory Way. This area contains 82 acres available for redevelopment. There are also 20 or more acres of private property available for

redevelopment east of the BNSF Railway between West Wheeler Street and West Armory Way. Redevelopment of the North Bay property will include public surface streets with connections to the replacement for the Magnolia Bridge. Forecasts of future (year 2030) traffic demand indicate that the access provided by the Galer Flyover and West Dravus Street would be inadequate. The capacity provided by the existing Magnolia Bridge or its replacement would also be needed.

## *Legislation*

Seattle Ordinance 120957, passed in October 2002, requires that the Magnolia Bridge Replacement Study: (1) identify possible additional surface roads from Magnolia to the waterfront (avoiding 15th Avenue West and the railroad tracks); (2) obtain community input on the proposed roads; and (3) identify the cost for such roads and include it in the total cost developed in the Magnolia Bridge Replacement Study.

This page is intentionally blank.

## Description of Alternatives

---

An alignment study process was implemented to help identify the specific bridge replacement alternatives to be studied in the EIS. Twenty-five concepts were developed and screened against the project goals and objectives. This resulted in nine alignment alternatives, identified as A through I, that merited further analysis. These nine went through an extensive public review and comment process as well as project screening criteria and prioritization. Initially, the top four priority alternatives, A, B, D, and H, were identified to be studied in the EIS. Early on, Alternative B was eliminated because it became clear that it violated City shoreline policies and Federal Section 4(f) criteria. Upon detailed traffic analysis, Alternative H was eliminated because two key intersections were predicted to function at a level of service F and could not be mitigated. The next priority, Alternative C, was then carried forward for analysis in the EIS.

Independent of this project, a new north-south surface street will be constructed on Port of Seattle property connecting 21st Avenue West at the north end of North Bay with 23rd Avenue West near Smith Cove Park. In addition, a southbound ramp will be added to the Galer Flyover to accommodate eastbound to southbound Elliott Avenue West traffic movements. The Galer Flyover ramp has been identified as a needed improvement for expected future development of property west of the railroad tracks. Locations for new surface streets through the Port of Seattle property will be determined through the Port's master planning process for the North Bay property. The north-south surface street and ramp are assumed to exist under any build alternative, but they are not part of this environmental process.

Typical cross sections and plans of the build and no build alternatives are located at the end of this section.

### No Build Alternative

The No Build Alternative, shown in Figure 3 and Figure 5, would maintain the existing bridge structure in place with the existing connections at the east and west ends. Long-term strategies for maintaining the existing structure would be required for the No Build Alternative. To keep the existing bridge in service for over 10 years, the following would need to be accomplished:

- An in-depth inspection of the bridge would be required to determine needed repairs and a long-term maintenance program.
- Concrete repairs would be required. These repairs could include injection of epoxy grout into cracks, repair of spalled concrete, and replacement of deficient concrete and grout.
- Preservation measures to slow corrosion of the reinforcement would be required. These measures could include a cathodic protection system.
- Any structural elements that lack the capacity to carry a tractor-trailer truck with a 20-ton gross trailer weight would need to be identified, modeled, and strengthened.

## Alternative A

Alternative A would replace the existing bridge with a new structure immediately south of the existing bridge as shown in Figure 4 and Figure 6. The alternative would construct a signalized, elevated intersection (Alternative A – Intersection) in the bridge’s mid-span to provide access to the waterfront and the Port of Seattle North Bay property from both the east and west. Connections at the east and west ends of the bridge would be similar to the existing bridge.

An optional half-diamond interchange (Figure 7, Alternative A – Ramps) could be constructed in lieu of the elevated intersection to provide access to the waterfront and the Port of Seattle North Bay property to and from the east only.

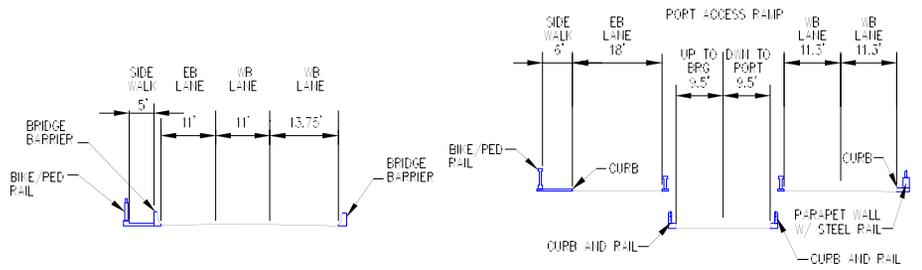
## Alternative C

Alternative C would provide 2,200 feet of surface roadway within the Port of Seattle North Bay property between two structures as shown in Figure 4 and Figure 8. The alternative alignment would descend from Magnolia Bluff on a structure running along the toe of the slope. The alignment would reach the surface while next to the bluff before turning east to an intersection with the north-south surface street. The alignment would continue east from the intersection, turning south along the west side of the BNSF rail yard. The alignment would rise on fill and structure, turning east to cross the railroad tracks and connect to 15th Avenue West.

## Alternative D

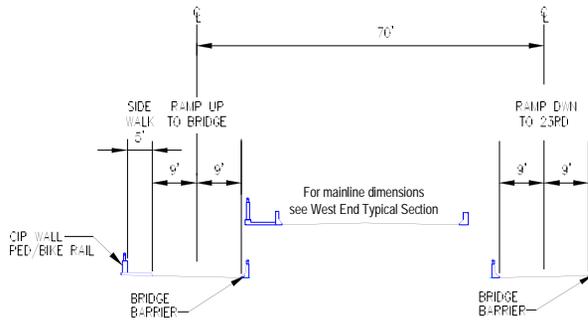
Alternative D would construct a new bridge in the form of a long arc north of the existing bridge as shown in Figure 4 and Figure 9. Connections at the east and west ends of the bridge would be similar to the existing bridge. This alternative would construct a signalized, elevated intersection (Alternative D – Intersection) in the bridge’s mid-span to provide access to the waterfront and Port of Seattle North Bay property from both the east and west.

An optional half-diamond interchange (Figure 10, Alternative D – Ramps) could be constructed in lieu of the elevated intersection to provide access to the waterfront and the Port of Seattle North Bay property to and from the east only.

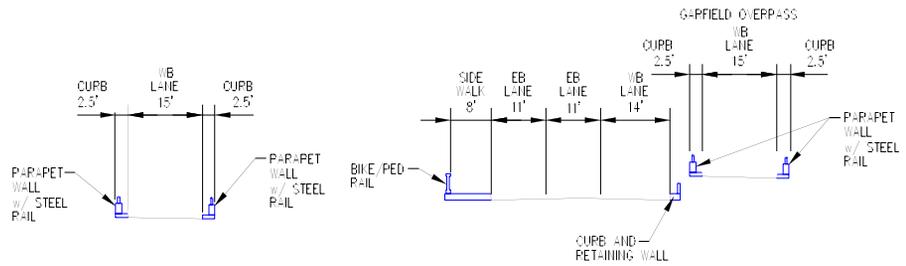


Bridge West End

Ramp to Port Access



Ramps to 23rd Avenue West

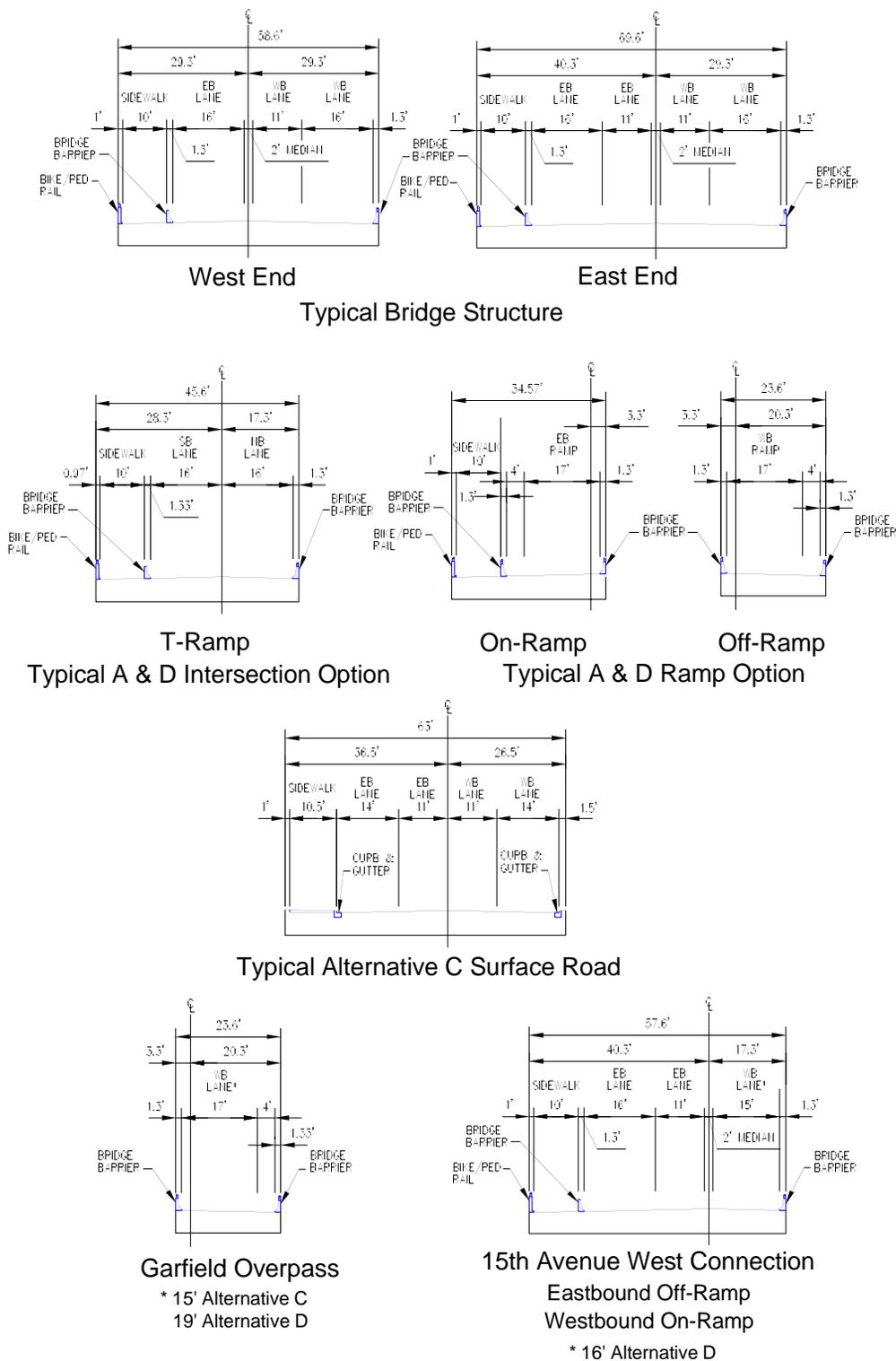


Garfield Overpass

15th Avenue West Connection  
Eastbound Off-Ramp  
Westbound On-Ramp

NOTE:  
Dimensions are approximate and obtained from construction plans and aerial photographs. The information shown has not been field verified.

**Figure 3**  
**Typical Sections – No Build Alternative**



**Figure 4**  
**Typical Sections – Build Alternatives**

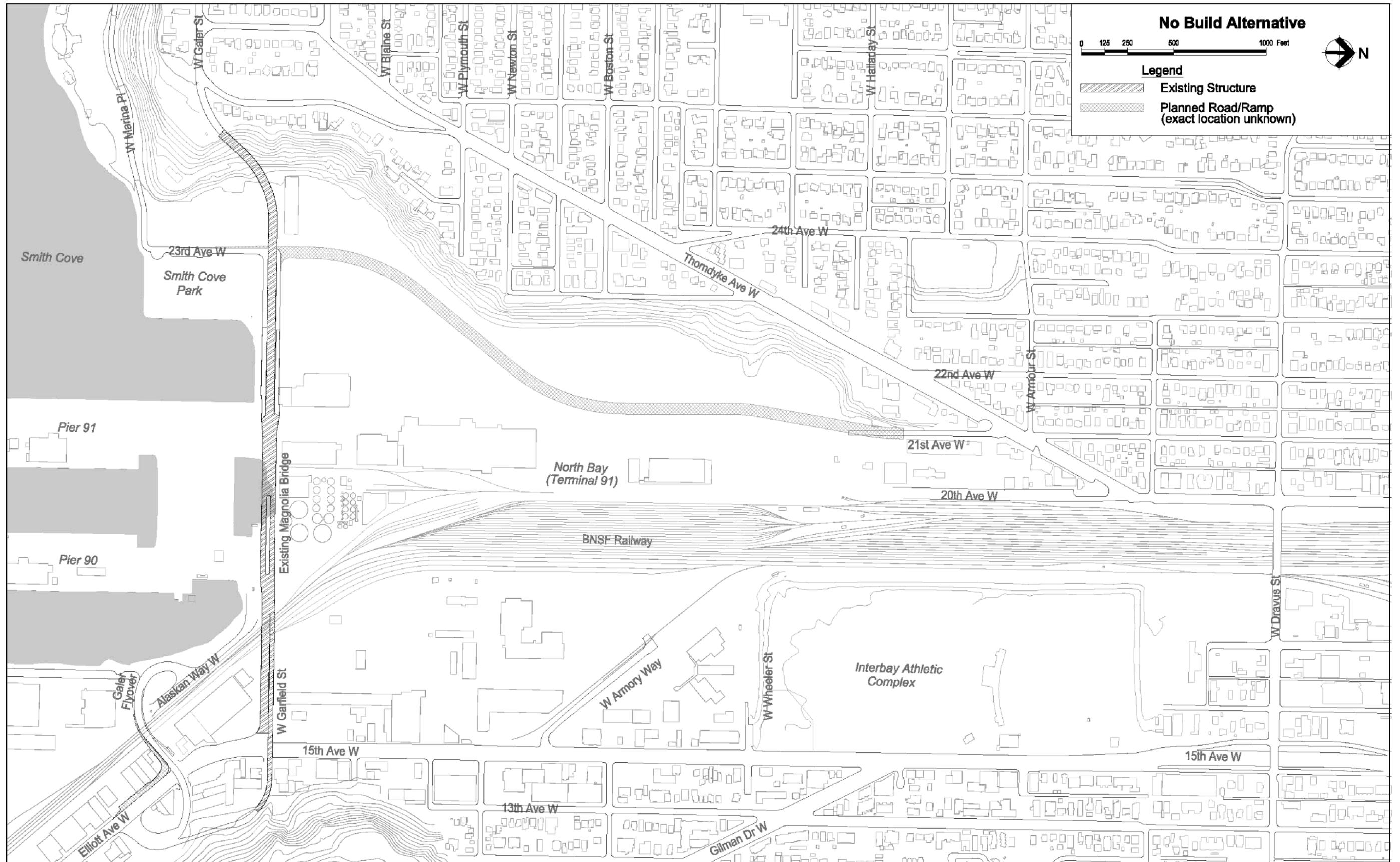


Figure 5 No Build Alternative

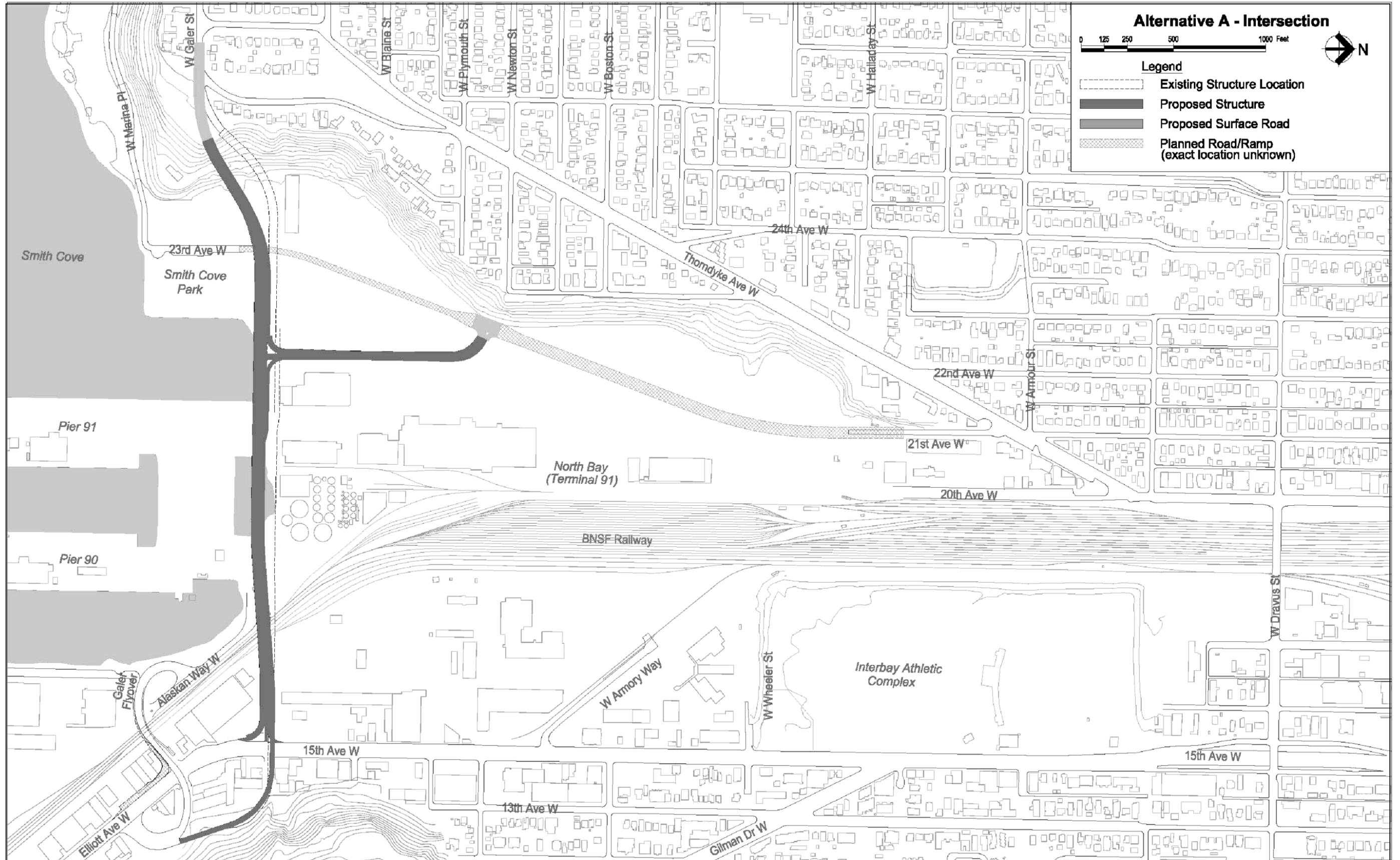


Figure 6 Alternative A - Intersection

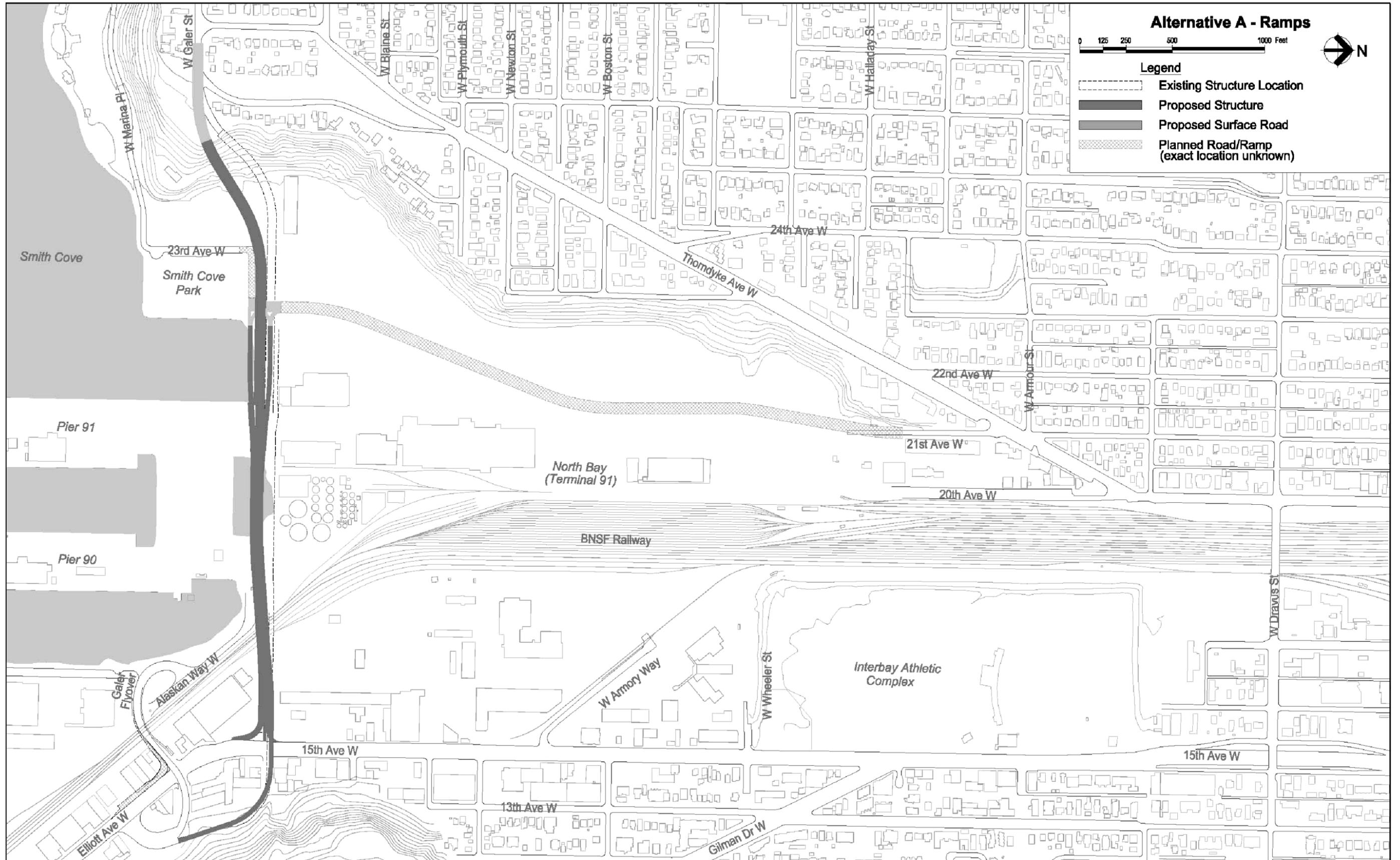


Figure 7 Alternative A - Ramps

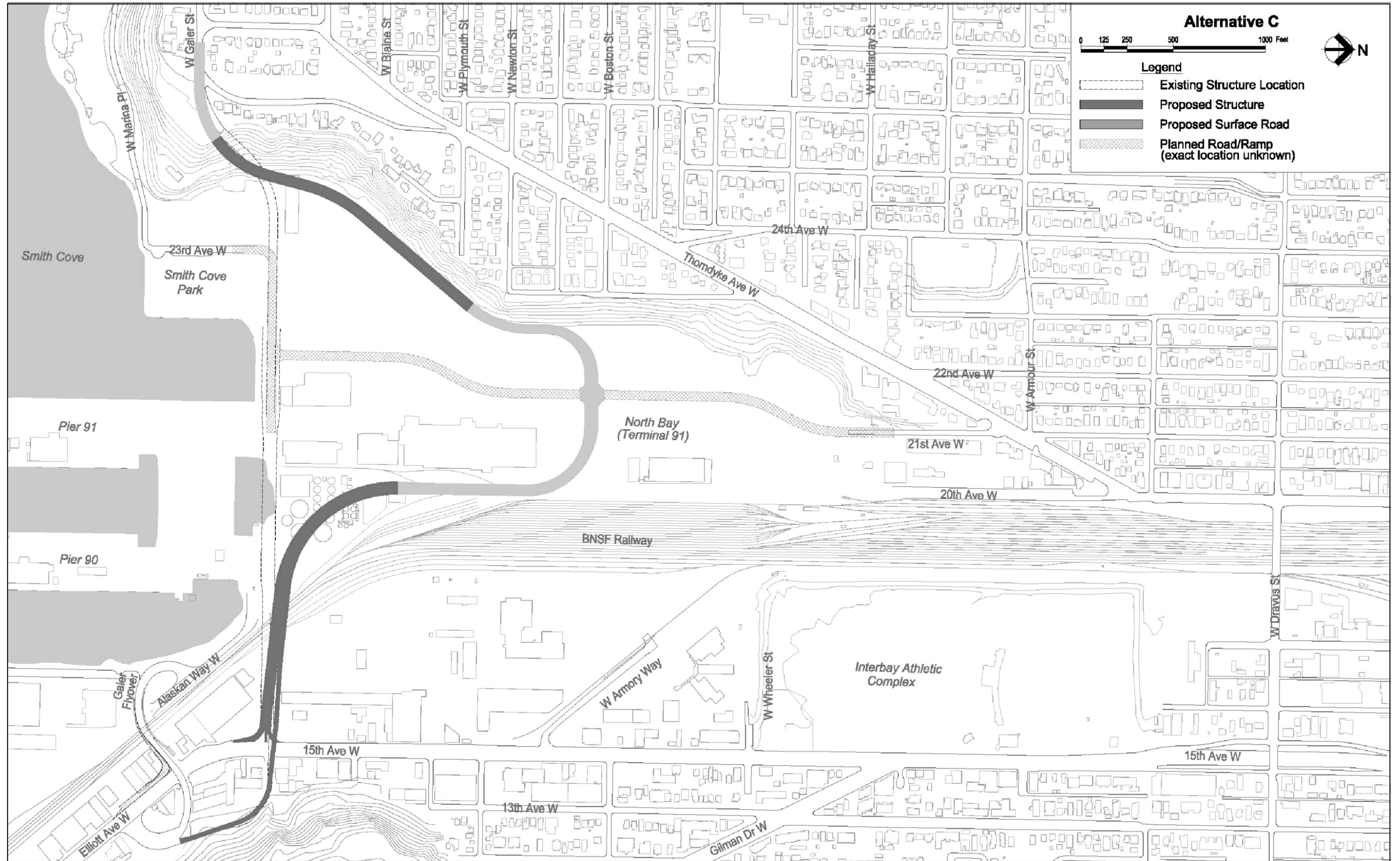


Figure 8 Alternative C

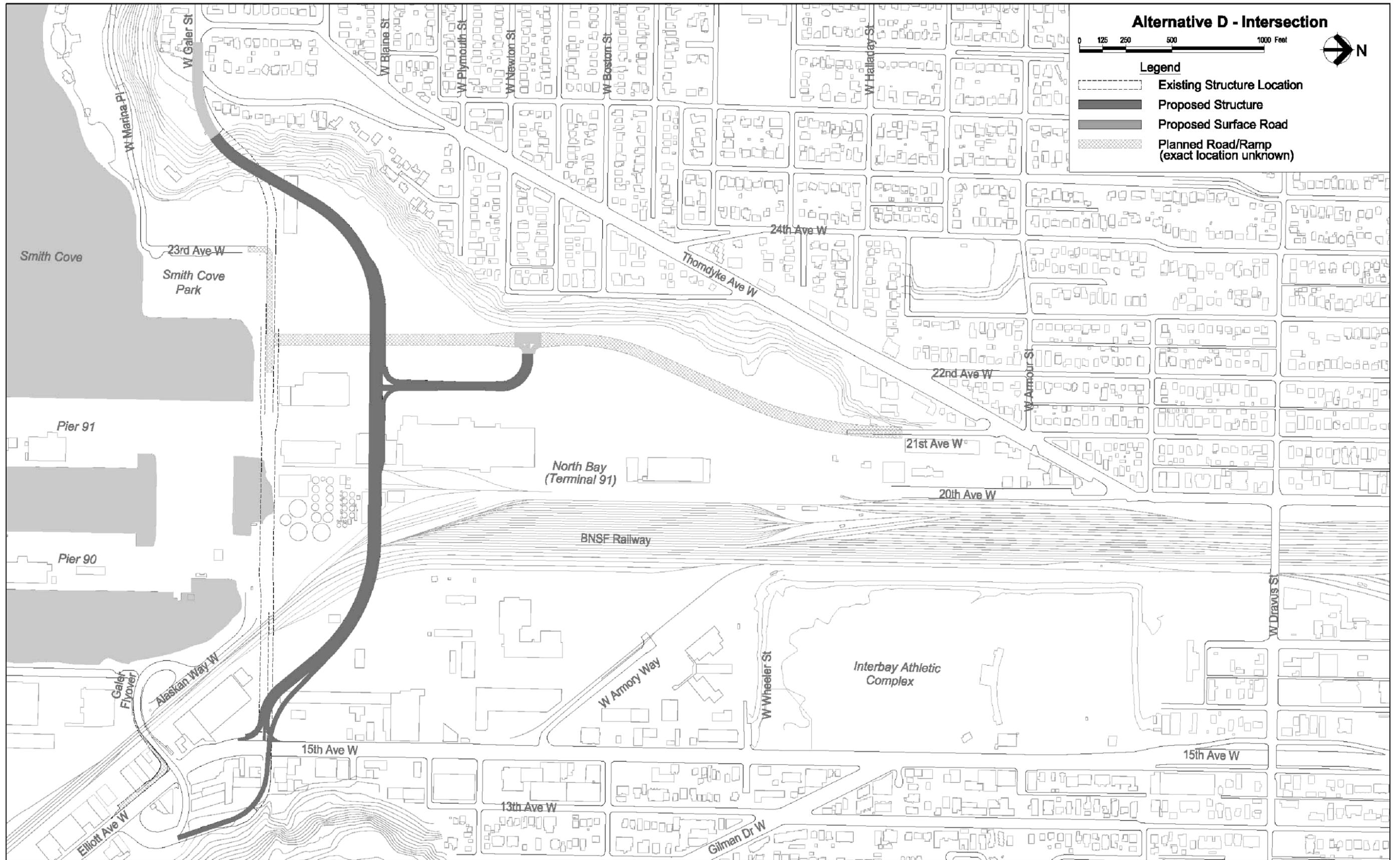


Figure 9 Alternative D - Intersection

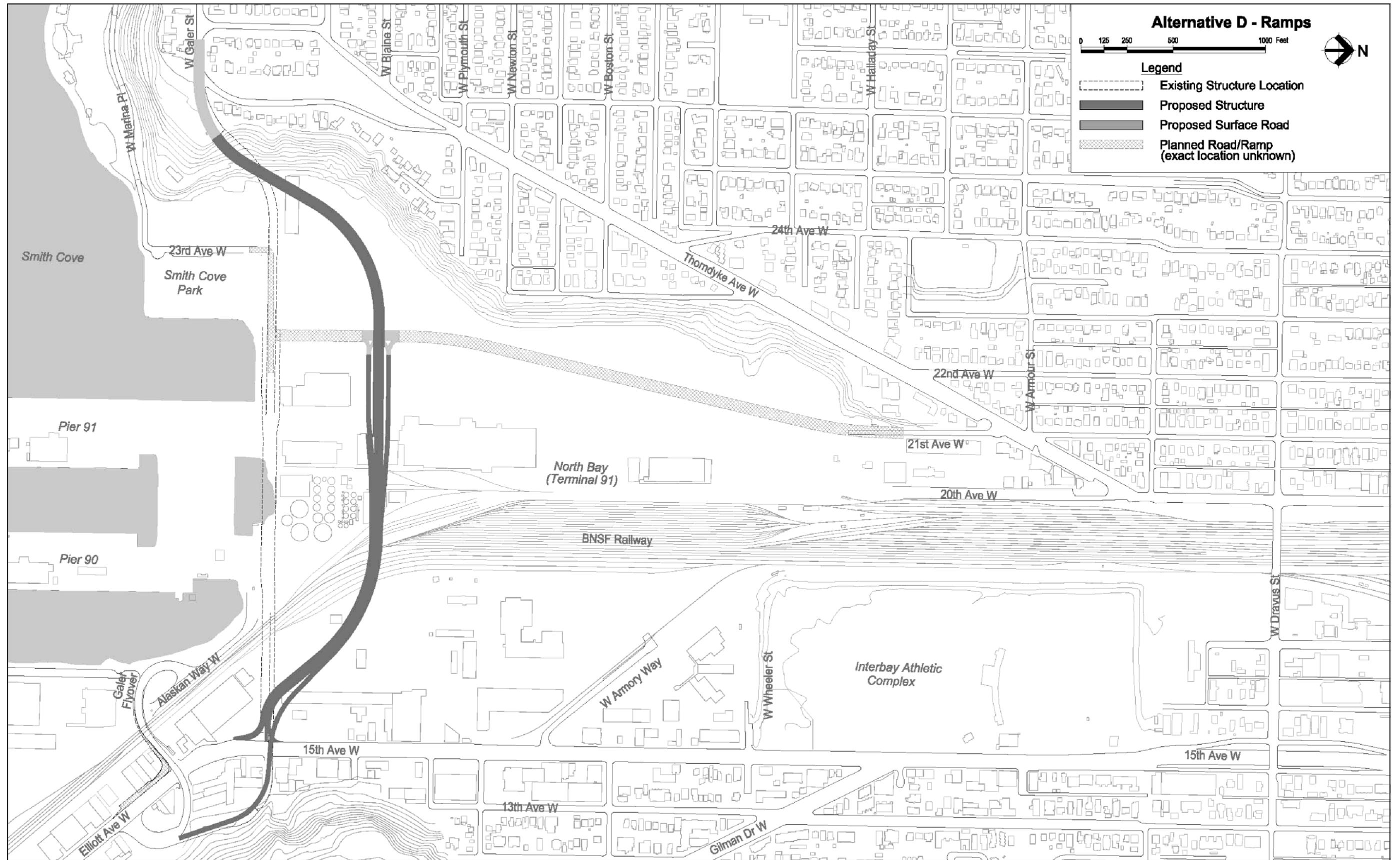


Figure 10 Alternative D - Ramps

## Methods

---

Literature on wildlife, fish, and vegetation available for the study area was collected and reviewed. This literature included studies conducted by public agencies, including the U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Oceanographic and Atmospheric Administration (NOAA) Fisheries Service; Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (Ecology), Natural Resources (WDNR), and Transportation (WSDOT), Port of Seattle, City of Seattle, the former Municipality of Metropolitan Seattle (METRO), and King County. Other sources include the Elliott Bay/Duwamish Restoration Panel, University of Washington, local environmental groups (e.g., the local chapter of the Audubon Society), and local water-dependent business. In addition, recent environmental impact statements (EISs) and/or other studies of the marine systems conducted for any private or public developments in the area that contained useful information on plants and animals were reviewed. Priority Habitats and Species (PHS) maps and lists of special status species were obtained from WDFW.

A reconnaissance-level survey of the terrestrial and intertidal areas was conducted in areas of potential habitat that may be affected by the project alternatives. Information collected included a classification of habitat types and a general assessment of wildlife use of the study area. No diving or other field sampling or surveys or species-specific surveys (such as for forage fish spawning habitat or for bald eagles) were conducted.

Fish resources are of particular concern in Puget Sound, Elliott Bay, and the Duwamish/Green River Basin. Therefore, local, state and federal agencies were contacted to obtain up-to-date information on salmonid and marine fish stocks that could be in the vicinity of the study area, their habitat needs, and timing of occurrence. Accommodations were made for the inclusion of issues important to the Muckleshoot and Suquamish Tribes, especially related to maintenance of “access to usual and accustomed fishing grounds and stations.” Non-tribal commercial and recreational fisheries are also characterized. Salmonid use of Elliott Bay and the impacts from additional shading receive particular emphasis in the impact analysis.

The field reconnaissance also included locating all potential wetlands in the study area according to visible vegetation, soil, and hydrology features.

This page is intentionally blank.

## Affected Environment

---

### Vegetation

Vegetation in the study area is typical of a heavily urbanized city. Most of the study area is fully developed with a combination of industrial, commercial, and residential development. Figure 11 shows areas of natural vegetation in the study area. Much of the central Interbay area is covered by impervious surfaces such as roads, parking lots, warehouses, and piers. Historically, much of the Port's North Bay/Terminal 91 property in this area was intertidal mudflats and marshes (HistoryLink 2003). This area was filled in the early 1900s. Remnant hardwood forests remain on steep slopes on the east and west sides of the study area. Non-native invasive and weedy species dominate along property fringes and on undeveloped parcels scattered throughout the study area. Ornamental and landscaped vegetation dominate residential properties surrounding the study area, as well as public properties such as Smith Cove Park and the Terminal 91 Bicycle Path. Some intertidal marine vegetation exists in the shallow, undredged fringes of Smith Cove. These vegetation types are described in more detail below.

### Forest

The steep slope located above the Terminal 91 Bicycle Path and below Thorndyke Avenue supports a mature hardwood forest. The overstory of this forest is dominated by big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), and black cottonwood (*Populus balsamifera*). Conifers such as Douglas fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*) are present but uncommon. The understory is dominated by Himalayan blackberry (*Rubus procerus*), English ivy (*Hedera helix*), Indian plum (*Oemlaria cerasiformis*), willow (*Salix* spp.), swordfern (*Polystichum munitum*), holly (*Ilex aquifolium*) and Oregon grape (*Mahonia nervosa*). Many of the big-leaf maples on this slope are in excess of 21 inches diameter at breast height.

### Ornamental/Landscaped Vegetation

Smith Cove Park and the Terminal 91 Bicycle Path are planted with a variety of native and non-native ornamental plants. Small trees, shrubs, and herbaceous plants line the Terminal 91 Bicycle Path and the walking path in Smith Cove Park. Many of the plants found along the bike path are native wetland plants, including spirea (*Spira douglasii*), red-osier dogwood (*Cornus sericea*), soft rush (*Juncus effusus*), and red alder. Pin oak (*Quercus palustris*), Lombardy poplar (*Populus nigra*), tulip poplar (*Liriodendron tulipifera*), and domesticated plum (*Prunus insititia*) were also noted in the study area. Lawn grasses are found in patches throughout the study area. The largest lawn area is on the former Naval Supply Depot property south of the western terminus of Magnolia Bridge.



**Figure 11**  
**Fish and Wildlife Habitat Areas**

## Disturbed Vegetation

Throughout the study area, undeveloped, disturbed areas are dominated by a combination of invasive and weedy species. These species include Himalayan blackberry, English ivy, evergreen blackberry (*Rubus lacianatus*), butterfly bush (*Buddleia* sp.), tansy ragwort (*Senecio jacobaea*), honeysuckle (*Lonicera* sp.), field bindweed (*Convolvulus arvensis*), western waterhemlock (*Cicuta douglasii*), Scot's broom (*Cytisus scoparius*), common vetch (*Vicia sativa*), Japanese knotweed (*Polygonum cuspidatum*), and introduced grasses. These areas are common along roadside ditches, adjacent to the railroad tracks, and in other fringe areas.

## Marine Vegetation

Smith Cove supports a narrow band of intertidal marine vegetation and scattered salt marsh plants in the upper intertidal zone. The intertidal plants observed during the site visit included sea lettuce (*Ulva* sp.) and rockweed (*Fucus* sp.). Scattered individuals of silver burweed (*Ambrosia chamissonis bipinnatisecta*), American dunegrass (*Elymus mollis*), and saltbush (*Atriplex patula*) were observed among driftwood collected in the northwest corner of the cove between Smith Cove Park and the westernmost Terminal 91 pier. The *Elliott Bay Small Craft Harbor Final EIS* (Corps of Engineers 1987) reported *Ulva* and *Fucus* as the dominant plants in the upper midtidal zone, with the red alga *Endocladia* more common in the lower portions. That report also noted that brown algae such as *Laminaria*, *Costaria*, *Alaria*, and *Sargassum* dominated the lower intertidal zone. Floating leaves of some of these genera were found on the beach during the August 29, 2003, site visit.

## Wetlands

No areas with potential wetland characteristics were identified during the field reconnaissance.

## Wildlife

This section describes the mammals, birds, reptiles, and amphibians that are found or could occur in the study area, including special status species. In general, the study area provides limited habitat for wildlife species because of the extensive residential and industrial development in the Interbay area and surrounding communities as well as the high levels of human disturbance. The primary fish and wildlife habitat areas remaining in the study area are:

- The Magnolia Bluff greenbelt (west of the Port North Bay/Terminal 91 property)
- The Kinneer Park greenbelt (east of the Port North Bay/Terminal 91 property)
- Smith Cove
- Puget Sound

The greenbelts are isolated patches of habitat surrounded by urban development. Wildlife using these terrestrial habitat "islands" will likely be limited to mobile species such as birds or urban wildlife that are adapted to surviving in this highly developed environment.

## Mammals

Table 1 lists wildlife species that would be expected to use the limited, disturbed habitats available in the study area.

Most of the species listed in Table 1 would be limited to the isolated forest fragments in the study area for foraging, breeding, or cover habitat. Some of these species (such as opossum, raccoon, and the Norway rat) forage widely in residential areas, feeding on garbage, bird seed, and any other food sources available. Bats may roost in trees, snags, buildings, and bridges in the study area. It is possible that the existing structure of Magnolia Bridge supports roosting bats, particularly as there are numerous crevices and interior spaces in the existing bridge superstructure. The Magnolia Bluff greenbelt has numerous decadent trees with snags and loose bark that could be used as roost sites by bats. These sites would most likely be used during the spring and summer.

Aquatic mammals, including muskrat and river otter, would access the study area from the marine waters. They could use the intertidal zone while foraging for clams, mussels, and other prey.

Marine mammals that are commonly observed in Elliott Bay include California sea lions, harbor seals, and harbor porpoise. These animals would not be expected to use shallow nearshore habitats in the study area. The only known seal or sea lion haulout sites in Elliott Bay are the navigation buoys west of West Point, Alki Point, and Shilshole Bay Marina (Jeffries et al. 2000).

**Table 1**  
**Mammals that May Occur in the Study Area**

Common Name	Scientific Name	Habitat
Big brown bat	<i>Eptesicus fuscus</i>	Crevices, hollow trees, buildings, wooded areas
Black rat	<i>Rattus rattus</i>	Urban and undeveloped habitats; nests in trees, roofs, and building tops
California myotis bat	<i>Myotis californicus</i>	Hollow trees, loose rocks, buildings, bridges
California sea lion	<i>Zalophus californianus</i>	Elliott Bay
Common opossum	<i>Didelphis marsupidis</i>	Woodlands and along streams
Coyote	<i>Canis latrans</i>	Open woodlands, brushy areas
Deer mouse	<i>Peromyscus maniculatus</i>	Forests, grassland, dry-land habitat
Domestic cat	<i>Felis domesticus</i>	--
Domestic dog	<i>Canis familiaris</i>	--
Domestic rabbit	<i>Oryctolagus cuniculus</i>	Meadows and lawns
Douglas squirrel	<i>Tamiasciurus douglasii</i>	Conifers
Dusky shrew	<i>Sorex monticolus</i>	Marshes, coniferous forests, hillsides
Eastern cottontail	<i>Silvilagus floridanus</i>	Brush, forests, weed patches

Note: This list is intended as a general guideline for species that may be present in the area.

Sources: U.S. Coast Guard 2003; Corps of Engineers 1987; WDFW Washington GAP Data 1999

**Table 1**  
**Continued**

Common Name	Scientific Name	Habitat
Eastern gray squirrel	<i>Sciurus carolinensis</i>	Hardwood forests with nut trees, floodplains, parks
Harbor seal	<i>Phoca vitulina</i>	Elliott Bay
Hoary bat	<i>Lasiurus cinereus</i>	Wooded areas
House mouse	<i>Mus musculus</i>	Buildings, fields
Little brown bat	<i>Myotis lucifugus</i>	Hollow trees and buildings
Long-eared myotis bat	<i>myotis evotis</i>	Around buildings or trees
Long-tailed vole	<i>Microtus longicaudus</i>	Streambanks, brushy areas
Long-tailed weasel	<i>Mustela frenata</i>	land habitats near water
Mink	<i>Mustela vison</i>	Along streams and lakes
Muskrat	<i>Ondatra zibethicus</i>	Lakes, streams, open water, lake and stream banks
Northern flying squirrel	<i>Glaucomys sabrinus</i>	Coniferous and mixed forests
Northern water shrew	<i>Sorex palustris</i>	Small streams with bank cover
Norway rat	<i>Rattus norvegicus</i>	Building foundations, rubbish piles
Oregon vole	<i>Microtus oregoni</i>	Forest, brush, grassy areas
Pacific water shrew	<i>Sorex bendirii</i>	Wooded areas, beach debris, and Pacific Coast
Raccoon	<i>Procyon lotor</i>	Stream and lake borders, wooded areas
Short-tailed weasel	<i>Mustela erminea</i>	Brushy or wooded areas near water
Shrew-mole	<i>Neurotrichus gibbsii</i>	Moist areas in shady ravines and streams
Silver-haired bat	<i>Lasionycteris noctilvagens</i>	Forested areas and buildings
Spotted skunk	<i>Spilogale putorius</i>	Brushy or sparsely wooded areas, along streams
Striped skunk	<i>Mephitis mephitis</i>	Mixed wood, brushland near water
Townsend chipmunk	<i>Tamias townsendii</i>	Coniferous forests
Townsend Mole	<i>Scapanus orarius</i>	Moist areas, gardens, and coniferous forests
Townsend vole	<i>Microtus townsendii</i>	Moist fields, tidewater
Trowbridge Shrew	<i>Sorex trowbridgii</i>	Coniferous forests and wooded areas
Vagrant shrew	<i>Sorex vagrans</i>	Marshes, wet meadows, streams, and forests
Yuma myotis bat	<i>Myotis yumanensis</i>	Buildings

Note: This list is intended as a general guideline for species that may be present in the area.

Sources: U.S. Coast Guard 2003; Corps of Engineers 1987; WDFW Washington GAP Data 1999

## Birds

Birds are the most commonly observed wildlife in the study area. The isolated forest fragments in the study area could support breeding songbirds. There are large snags and some decadent trees that could provide nesting cavities for raptors, owls, woodpeckers, bats, and other cavity-nesting species. No raptors or raptor nests were observed during the site visit. Ravens and pigeons appear to be nesting and/or roosting in the undersides of the existing Magnolia Bridge. The pigeons provide a source of food for peregrine falcons that nest on the West Seattle Bridge and the grain terminal (Falcon Research Group 2003). The eyrie at the grain terminal

fledged four young (three females and one male) during the 2003 nesting season. These young falcons were observed soaring over the east side of the study area during the summer of 2003 (Falcon Research Group 2003). The nest at the West Seattle Bridge has not produced young. Both of these nest sites are constructed nest boxes. Table 2 below lists bird species that may occur in the study area. Special status bird species, including bald eagle, are discussed in a later section.

**Table 2**  
**Birds that May Occur in the Study Area**

Common Name	Scientific Name	Habitat
American coot	<i>Fulica americana</i>	Fresh water and salt water
American crow	<i>Corvus brachyrhynchos</i>	Various
American robin	<i>Turdus migratorius</i>	Lawns, moist woods, fruit-bearing trees
Anna's hummingbird	<i>Calypte anna</i>	Gardens, open woods
Black scoter	<i>Melanitta nigra</i>	Coast
Bald eagle	<i>Haliaeetus leucocephalus</i>	Along shores and large lakes
Band-tailed pigeon	<i>Columba fasciata</i>	Western oak and pine woods
Barn swallow	<i>Hirundo rustica</i>	Nests on buildings
Belted kingfisher	<i>Ceryle alcyon</i>	Streams, bays, coasts
Bewick's wren	<i>Thryomanes bewickii</i>	Brush and fencerows
Black-capped chickadee	<i>Parus atricapillus</i>	Mixed and deciduous woods, feeders, shade trees
Brown-headed cowbird	<i>Molothrus ater</i>	Farmland
Bufflehead	<i>Bucephala albeola</i>	Tidewater, rivers, and lakes
Bushtit	<i>Psaltriparus minimus</i>	Scrub, open woodlands, and suburbs
Canada goose	<i>Branta canadensis</i>	Lake shores, coastal marshes, and open fields
Cedar waxwing	<i>Bombycilla cedrorum</i>	Berry-bearing trees and shrubs
Chestnut-backed chickadee	<i>Parus rufescens</i>	Pacific lowlands, conifers
Cliff swallow	<i>Hirundo pyrrhonota</i>	Eaves, cliffs, and bridges
Common goldeneye	<i>Bucephala clangula</i>	Coasts, lakes, and rivers
Common merganser	<i>Mergus merganser</i>	Freshwater
Dark-eyed junco	<i>Junco hyemalis</i>	Conifers, suburbs, brush, and wood margins
Double-crested cormorant	<i>Phalacrocorax auritus</i>	Coasts, inland lakes, and rivers
Downy woodpecker	<i>Picoides pubescens</i>	Suburbs, shade trees, and woods
European starling	<i>Sturnus vulgaris</i>	City parks and suburbs
Glaucous-winged gull	<i>Larus glaucescens</i>	Harbors
Golden-crowned kinglet	<i>Regulus satrapa</i>	Conifers
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>	Conifers
Great blue heron	<i>Ardea herodias</i>	Fresh water and salt water
Greater scaup	<i>Aythya marila</i>	Saltwater

Note: This list is intended as a general guideline for species that may be present in the area.

Sources: Seattle Audubon Society 2002; Corps of Engineers 1987; Local observation; WDFW Washington GAP Data 1999

**Table 2**  
**Continued**

Common Name	Scientific Name	Habitat
Horned grebe	<i>Podiceps auritus</i>	Ponds, lakes, and saltwater
House finch	<i>Carpodacus mexicanus</i>	Bottomlands and suburbs
House sparrow	<i>Passer domesticus</i>	Cities and suburbs
Killdeer	<i>Charadrius viciferus</i>	Fields and pastures
Mallard	<i>Anas platyrhynchos</i>	Ponds and fresh water marshes
Northern flicker	<i>Colaptes auratus</i>	Open country with large trees
Osprey	<i>Pandion haliaetus</i>	Lakes and shorelines
Peregrine falcon	<i>Falco peregrinus</i>	Coasts, mountains, and woods
Pileated woodpecker	<i>Dryocopus pileatus</i>	Deciduous or mixed forests
Red-breasted merganser	<i>Mergus serrator</i>	Seacoasts
Red-breasted nuthatch	<i>Sitta canadensis</i>	Conifers
Red-tailed hawk	<i>Buteo jamaicensis</i>	Woodlands and open country
Rock dove	<i>Columba livia</i>	City parks
Sharp-shinned hawk	<i>Accipiter striatus</i>	Open woodlands and wood margins
Song sparrow	<i>Melospiza melodia</i>	Bushes, hedgerows, and wood margins
Spotted towhee	<i>Pipilo erythrophthalmus</i>	Brush, heavy undergrowth, and hedgerows
Steller's jay	<i>Cyanocitta stelleri</i>	Coniferous forests
Surf scoter	<i>Melanitta perspicillata</i>	Ocean surf, bays, marinas
Violet-green swallow	<i>Tachycineta thalassina</i>	Mountains and towns
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Thickets, hedgerows, and wood margins
White-winged scoter	<i>Melanitta fusca</i>	Inland
Wilson's warbler	<i>Wilsonia pusilla</i>	Willow thickets
Winter wren	<i>Troglodytes troglodytes</i>	Brush piles and thick undergrowth
Yellow-rumped warbler	<i>Dendroica coronata</i>	Coasts and coniferous forests

Note: This list is intended as a general guideline for species that may be present in the area.

Sources: Seattle Audubon Society 2002; Corps of Engineers 1987; Local observation; WDFW Washington GAP Data 1999

The most common birds in the study area include starlings, black-capped chickadees, spotted towhee, robin, crow, pigeon, and song sparrow. These and other urban-adapted birds can find limited breeding sites in the terrestrial habitat in the study area and abundant forage in surrounding residential areas, where numerous homes provide bird feeding platforms.

Most of the waterfowl listed above have been observed in or near the nearshore area of the project. These birds may also fly over the study area on their way to Lake Union and associated waterways, but it is unlikely that they forage in the study area. The exception is the gulls, which nest and roost on top of the large warehouses on the Port's North Bay/Terminal 91 property. These birds are discouraged by the use of deterrents such as predator calls, owl statues, and netting. WDFW reports in its PHS database (WDFW 2003) that approximately 240 glaucous-winged gulls breed at the Terminal 91 piers.

## Reptiles and Amphibians

The study area provides extremely limited habitat for reptiles and amphibians. The lack of freshwater in the study area means that most amphibians would have nowhere to breed in the vicinity. Also, the isolation of the forest fragments in the study area would limit the amount of dispersal from other areas. Nonetheless, it is possible that the Pacific chorus frog (*Hyla regilla*), long-toed salamander (*Ambystoma macrodactylum*), western toad (*Bufo boreas*), and northwestern garter snake (*Thamnophis ordinoides*) could be found in the forest fragments.

## Fish

There are no streams in the study area. The closest fish-bearing water is Puget Sound, specifically Smith Cove and Smith Cove Waterway, which are immediately south of the existing Magnolia Bridge. Table 3 lists resident and anadromous marine fish species that are common to nearshore waters adjacent to the study area. The active berth areas of the Smith Cove docks are routinely dredged to maintain access for large beam vessels, so it is unlikely that these waters are routinely used by large numbers of fish.

Forage fish are not known to spawn in the nearshore areas of Elliott Bay (Kerwin and Nelson 2000). The WDFW Priority Habitats and Species program (2003) reports that no forage fish spawning areas have been identified in the project area. WDFW confirmed this information (Pentila, pers. comm., 2004). Juvenile and adult salmon are known to migrate and rear along the shorelines of Elliott Bay (Kerwin and Nelson 2000), including the nearshore areas of the undeveloped portions of Smith Cove. Larger fish, including adult salmon, flatfish, and others, are more likely to occur in deeper water. The piles and pier structures of Terminal 91 are likely to support fish such as pile perch, rockfish, and cabezon. These fish would also be more common along the Elliott Bay Marina rubble breakwater, southwest of the proposed project.

WDFW (2003) reports that the nearshore areas from Smith Cove north are a concentration area for Dungeness crab. However, it is unlikely that Dungeness crab use the upper intertidal zone of Smith Cove adjacent to the project because of the lack of macroalgae (e.g., *Zostera* and *Nereocystis*) and high level of human disturbance.

**Table 3**  
**Fish that May Occur in the Study Area**

Common Name	Scientific Name	Habitat
Bay pipefish	<i>Sygnathus griscoleatus</i>	saltwater
Brown rockfish	<i>Sebastes auriculatus</i>	saltwater
Buffalo sculpin	<i>Enophrys bison</i>	saltwater
Bull trout	<i>Salvelinus confluentus</i>	anadromous
Cabezon	<i>Scorpaenichthys marmoratus</i>	saltwater
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	anadromous
Chum salmon	<i>Oncorhynchus keta</i>	anadromous
C-O sole	<i>Pleuronichthys coenosus</i>	saltwater
Coho salmon	<i>Oncorhynchus kisutch</i>	anadromous

Note: This list is intended as a general guideline for species that may be present in the area.  
Sources: Kerwin and Nelson 2000; Corps of Engineers 1987; Windward Environmental 2003

**Table 3  
Continued**

Common Name	Scientific Name	Habitat
Copper rockfish	<i>Sebastes caurinus</i>	saltwater
Crescent gunnel	<i>Pholis laeta</i>	saltwater
Cutthroat trout	<i>Oncorhynchus clarki</i>	anadromous
Dover sole	<i>Microstomus pacificus</i>	saltwater
English sole	<i>Parophrys vetulus</i>	saltwater
Flathead sole	<i>Hippoglossoides elassodon</i>	saltwater
Kelp perch	<i>Brachyistius frenatus</i>	saltwater
Longfin smelt	<i>Spirinchus thaleichthys</i>	anadromous
Northern pikeminnow	<i>Mylocheilus caurinus</i>	fresh and saltwater
Northern spearnose poacher	<i>Agonopsis vulsa</i>	saltwater
Pacific cod	<i>Gadus macrocephalus</i>	saltwater
Pacific herring	<i>Clupea harengus pallasi</i>	saltwater
Pacific lamprey	<i>Lampetra tridentata</i>	fresh and saltwater
Pacific sanddab	<i>Citharichthys sordidus</i>	saltwater
Pacific sandlance	<i>Ammodytes hexapterus</i>	saltwater
Pacific staghorn sculpin	<i>Leptocottus armatus</i>	saltwater
Pacific tomcod	<i>Microgadus proximus</i>	saltwater
Penpoint gunnel	<i>Apodichthys flavidus</i>	saltwater
Pile perch	<i>Rhacochilus vacca</i>	saltwater
Pink salmon	<i>Oncorhynchus gorbuscha</i>	anadromous
Rainbow trout (steelhead)	<i>Oncorhynchus mykiss</i>	anadromous
Rattfish	<i>Hydrolagus colliei</i>	saltwater
Red gunnel	<i>Pholis schultzi</i>	saltwater
Rock sole	<i>Lepidopsetta blineata</i>	saltwater
Shiner perch	<i>Cymatogaster aggregata</i>	saltwater
Sockeye salmon	<i>Oncorhynchus nerka</i>	anadromous
Speckled sanddab	<i>Citharichthys stigmatæus</i>	saltwater
Starry flounder	<i>Patichthys stellatus</i>	saltwater
Striped seaperch	<i>Embiotoca lateralis</i>	saltwater
Surf smelt	<i>Hypomesus pretiosus</i>	saltwater
Threespine stickleback	<i>Gasterosteus aculeatus</i>	fresh and saltwater
Tubesnout	<i>Aulorhynchus flavidus</i>	saltwater
Whitespotted greenling	<i>Hexagrammos stelleri</i>	saltwater
Yellowtail rockfish	<i>Sebastes flavidus</i>	saltwater

Note: This list is intended as a general guideline for species that may be present in the area.  
Sources: Kerwin and Nelson 2000; Corps of Engineers 1987; Windward Environmental 2003

An Essential Fish Habitat (EFH) assessment is necessary for the proposed project to satisfy the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and the 1996 Sustainable Fisheries Act. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of EFH, “waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate. “Substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities. “Necessary” means the habitat

required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. "Spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

EFH is described by fishery management councils in amendments to fishery management plans, and is approved by the U.S. Secretary of Commerce acting through NOAA Fisheries (50 CFR 600.10). Salmonid EFH is discussed in Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Species with EFH in the study area are presented in Table 4 below.

**Table 4**  
**Species with Designated EFH**

Common Name	Scientific Name
Groundfish Species	
<b>arrowtooth flounder</b>	<i>Atheresthes stomias</i>
<b>big skate</b>	<i>Raja binoculata</i>
<b>black rockfish</b>	<i>Sebastes melanops</i>
bocaccio	<i>S. paucispinis</i>
<b>California skate</b>	<i>Raja inornata</i>
curlfin sole	<i>Pleuronichthys decurrens</i>
Dover sole	<i>Microstomus pacificus</i>
<b>English sole</b>	<i>Parophrys vetulus</i>
<b>flathead sole</b>	<i>Hippoglossoides elassodon</i>
<b>hake</b>	<i>Merluccius productus</i>
<b>longnose skate</b>	<i>R. rhina</i>
<b>Pacific cod</b>	<i>Gadus macrocephalus</i>
petrale sole	<i>Eopsetta jordani</i>
<b>ratfish</b>	<i>Hydrolagus colliei</i>
<b>redstriped rockfish</b>	<i>S. proriger</i>
<b>rex sole</b>	<i>Glyptocephalus zachirus</i>
<b>rock sole</b>	<i>Lepidopsetta bilineata</i>
<b>rosethorn rockfish</b>	<i>S. helvomaculatus</i>
rosy rockfish	<i>S. rosaceus</i>
rougheye rockfish	<i>S. aleutianus</i>
<b>sand sole</b>	<i>Psettichthys melanostictus</i>
sharpchin rockfish	<i>S. zacentrus</i>
splitnose rockfish	<i>S. diploproa</i>
<b>starry flounder</b>	<i>Platichthys stellatus</i>
striptail rockfish	<i>S. saxicola</i>
<b>tiger rockfish</b>	<i>S. nigrocinctus</i>
vermillion rockfish	<i>S. miniatus</i>
<b>yelloweye rockfish</b>	<i>S. ruberrimus</i>

Note: Species in bold are more common in Puget Sound.

**Table 4  
Continued**

Common Name	Scientific Name
Coastal Pelagic Species	
<b>brown rockfish</b>	<i>S. auriculatus</i>
<b>butter sole</b>	<i>Isopsetta isolepis</i>
<b>cabezon</b>	<i>Scorpaenichthys marmoratus</i>
<b>canary rockfish</b>	<i>S. pinniger</i>
<b>China rockfish</b>	<i>S. nebulosus</i>
<b>copper rockfish</b>	<i>S. caurinus</i>
darkblotch rockfish	<i>S. crameri</i>
<b>greenstriped rockfish</b>	<i>S. elongatus</i>
jack mackerel	<i>Trachurus symmetricus</i>
<b>kelp greenling</b>	<i>Hexagrammos decagrammus</i>
<b>lingcod</b>	<i>Ophiodon elongatus</i>
market squid	<i>Loligo opalescens</i>
Northern anchovy	<i>Engraulis mordax</i>
Pacific mackerel	<i>Scomber japonicus</i>
Pacific ocean perch	<i>S. alutus</i>
<b>Pacific sanddab</b>	<i>Citharichthys sordidus</i>
Pacific sardine	<i>Sardinops sagax</i>
<b>quillback rockfish</b>	<i>S. maliger</i>
redbanded rockfish	<i>S. babcocki</i>
<b>sablefish</b>	<i>Anoplopoma fimbria</i>
shortspine thornyhead	<i>Sebastolobus alascanus</i>
<b>yellowtail rockfish</b>	<i>S. flavidus</i>
Salmonid Species	
<b>chinook salmon</b>	<i>Oncorhynchus tshawytscha</i>
<b>coho salmon</b>	<i>O. kisutch</i>
<b>pink salmon</b>	<i>O. gorbuscha</i>

Note: Species in bold are more common in Puget Sound.

The species in bold type are more common in Puget Sound. Of the 35 groundfish species listed as common in Puget Sound, most of their EFH is predominantly rocky substrate. The skates and flatfish (soles and sanddab) are the exception. They require soft bottom substrates for cover and foraging. The salmonid species require access to shallow nearshore estuarine EFH for rearing. Most of the groundfish species are found over rocky or hard substrates. The only salmonid EFH in the project area occurs in the extreme nearshore of Smith Cove.

### *Special Status Species*

Table 5 below lists the special status species that have been identified as potentially occurring in the study area.

**Table 5**  
**Special Status Species That May Occur in the Study Area**

Common Name	Scientific Name	State Status	Federal Status	Occurrence
Chinook	<i>Oncorhynchus tshawytscha</i>	Candidate	Threatened	Migration and rearing
Bull trout	<i>Salvelinus confluentus</i>	Candidate	Threatened	Migration and rearing
Coho	<i>Oncorhynchus kisutch</i>	None	Species of Concern	Migration and rearing
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Threatened	Foraging
Great blue heron	<i>Ardea herodias</i>	Monitor		Foraging
Osprey	<i>Pandion haliaetus</i>	Monitor		Nesting and foraging
Peregrine falcon	<i>Falco peregrinus</i>	Sensitive	Species of Concern	Foraging
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Threatened	Foraging
Pileated woodpecker	<i>Dryocopus pileatus</i>	Candidate		Foraging
Western grebe	<i>Aechmophorus occidentalis</i>	Candidate		Foraging
Western toad	<i>Bufo boreas</i>	Candidate	Species of Concern	Foraging

Note: In addition to the state and federal status listings above, most raptors, migratory birds, and bats are considered protected species in Washington.

Source: Shapiro and Associates, Inc. 2003

The nearest known bald eagle nest territory is approximately 2 miles northwest of the study area in Discovery Park (WDFW 2003; Corps 2001). Eagles breeding at this nest may use the study area for foraging, but it is not likely given the high level of disturbance. Bald eagles need large trees in proximity to large bodies of water for perching and roosting. There are trees large enough to support perching eagles along Magnolia Bluff in the study area.

Juvenile chinook and bull trout can be assumed to occur in the nearshore areas of Elliott Bay during periods of migration and rearing (Kerwin and Nelson 2000). Juvenile chinook, coho, pink, and chum salmon were collected during trawl surveys around Terminal 91 in the early 1980s (Corps 1987).

WDFW also reports that there is an active osprey nest at the Interbay Golf Course and an active peregrine falcon eyrie in an artificial nest box at the grain terminal (WDFW 2003). Four peregrine young were fledged there in the summer of 2003 and have been reported foraging in the area (Falcon Research Group 2003). It is likely that these breeding adult birds would feed on the pigeons roosting on Magnolia Bridge.

Great blue herons occasionally forage in the intertidal areas of Smith Cove. Marbled murrelets have been known to forage in marine waters of Puget Sound, but they are more common along the outer coastline of Washington.

## Studies and Coordination

---

### Studies

No specific studies or surveys were conducted for plants or animals. A reconnaissance-level survey of the terrestrial and intertidal areas was conducted in areas of potential habitat that may be affected by the project alternatives. Information collected included a classification of habitat types and a general assessment of wildlife use of the study area. No diving or other field sampling or surveys, or species-specific surveys (such as for forage fish spawning habitat or for bald eagles) were conducted.

The field reconnaissance was conducted on August 29, 2003. Weather conditions were calm and sunny. The survey included walking a public bicycle path that bisects the Port's North Bay/Terminal 91 property (Terminal 91 Bicycle Path), turns west, then follows the base of the steep slope below Magnolia (Elliott Bay Trail); walking through Smith Cove Park, around the intertidal zone of Smith Cove to the edge of Terminal 91; and driving all of the public roads adjacent to the proposed alternatives, including 15th Avenue West, Magnolia Bridge, West Galer Street, and the 21st Avenue West surface street. Photographs were taken of each proposed alternative alignment; major vegetation types and dominant plant species were identified; and incidental wildlife observations were made.

### Data Sources

Primary data sources that were used for this analysis include the following:

- Seattle Monorail Green Line EIS
- WDFW Priority Habitats and Species Database
- City of Seattle GIS Layers
- Water Resource Inventory Area (WRIA) 9 Limiting Factors Report
- Elliott Bay Small Craft Harbor EIS
- Falcon Research Group
- Seattle Audubon Society
- Bats Northwest
- NOAA Fisheries Habitat Division Web site

### Major Assumptions

This analysis makes the following assumptions:

- Stormwater would be routed to existing outfalls, and these outfalls can handle any additional volume produced by the proposed alternatives.
- Proposed bridge elevations on Alternatives A and D would be similar to the existing bridge.

This page is intentionally blank.

## Operational Impacts

---

### No Build Alternative

Under the No Build Alternative, the operation of the existing Magnolia Bridge would remain unchanged. Traffic volumes would be expected to increase over time, and ongoing maintenance activities would be required to upgrade the existing bridge. These maintenance activities could have direct and indirect effects on vegetation if they require removal of native vegetation for laydown areas or construction buffers.

Fish in the study area are not directly affected by operation of the existing bridge. Stormwater runoff can indirectly affect water quality in the nearshore environment of Smith Cove. The No Build Alternative would not change current stormwater treatment methods. Water quality stressors would remain unchanged.

Operation of the No Build Alternative would not have direct impacts on wildlife.

### Alternative A

Alternative A would have similar operation impacts on vegetation, fish, and wildlife as the No Build Alternative. However, depending on the type of bridge design ultimately constructed, removing the existing bridge could result in long-term loss of bat roosting habitat in the study area.

Under Alternative A, there would be potential minor long-term impacts to upper intertidal vegetation at the north end of Smith Cove due to increased shading from the proposed bridge structure.

Stormwater coming off the new bridge would be similar in volume to existing conditions. Currently, stormwater generated by this alternative is proposed to be collected by a formal conveyance network including catch basins and then routed through a treatment facility such as an oil and water separator prior to being discharged to an existing outfall. In the long term, the project would have a potential beneficial effect on EFH for all aquatic species using the nearshore environment of Smith Cove if new stormwater treatment facilities are constructed that improve water quality over existing conditions.

Forage fish are not known to spawn in the study area, so no impacts to these prey species of salmon would be expected. Habitat for offshore fish species and those fish that inhabit the piers would remain unchanged. Noise from traffic using the bridge would be expected to be similar to current conditions.

### Alternative C

Wildlife using previously undisturbed portions of the Magnolia Bluff greenbelt would be exposed to traffic noise resulting from the relocation of the bridge. Compared to Alternative A, Alternative C would require a longer ramp diagonally across the face of the Magnolia Bluff greenbelt. Alternative C is predicted to increase noise levels adjacent to the bluff over existing conditions. However, given the level of existing disturbance, an increase in noise levels is not expected to have significant effects on wildlife in this area of high human activity. Noise disturbance

from traffic on nearshore flora and fauna would be reduced under Alternative C by moving the bridge away from the shoreline.

The proposed surface road north of the existing bridge would create traffic disturbances across a portion of Interbay where they do not currently exist. However, the existing disturbance from the railroad, neighborhood businesses, and Port activities is high enough that operation of a new Interbay surface crossing would have a negligible effect on vegetation, fish, or wildlife.

Depending on the type of elevated structures ultimately constructed as part of Alternative C, removing the existing bridge could result in long-term loss of bat roosting habitat in the study area.

Stormwater that would be generated by this alternative is currently proposed to be collected by a formal conveyance network (including catchbasins) and routed through a treatment facility such as an oil-water separator prior to being discharged to an existing outfall. Therefore, this alternative would have a potential beneficial effect on EFH and other aquatic species using Smith Cove if new stormwater treatment facilities are constructed that improve water quality over existing conditions.

## Alternative D

Operational impacts of Alternative D would be similar to those described above for Alternative C. Wildlife using previously undisturbed portions of the Magnolia Bluff greenbelt would be exposed to traffic noise resulting from the relocation of the bridge. However, the proposed bridge structure under Alternative D would traverse a shorter distance along the greenbelt compared to Alternative C (300 versus approximately 2,250 feet). Alternative D is predicted to increase noise levels on the western bluff by 1 to 2 decibels over existing conditions (see Noise Discipline Report). This small increase is not expected to have a significant effect on wildlife in this area of high human activity. Similar to Alternative C, noise disturbance from traffic to nearshore flora and fauna would be reduced under Alternative D by moving the bridge away from the shoreline.

Depending on the type of bridge design ultimately constructed removing the existing bridge could result in long-term loss of bat roosting habitat in the study area. Similar to Alternative C, Alternative D would have a potential beneficial effect on EFH and other aquatic species using Smith Cove if new stormwater treatment facilities are constructed that improve water quality over existing conditions.

# Operational Mitigation Measures

---

## No Build Alternative

No mitigation would be required to offset operation impacts of the No Build Alternative. Industry standard Best Management Practices (BMPs) are recommended for any maintenance activities proposed for repair of the existing bridge.

## Alternative A

The following mitigation measures are recommended to offset potential impacts to vegetation, fish, and wildlife from operation of Alternative A:

- The existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. If potential bat roosting habitat is identified by this survey, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss by incorporating bat habitat into the new bridge design. Potential mitigation could include use of mounting brackets or expansion joints in the bridge design or placement of artificial bat roost sites.
- Some portion of the Smith Cove beach would be daylighted, if feasible.
- Native shoreline vegetation would be planted where conditions are appropriate.

## Alternative C

The following mitigation measure is recommended to offset potential impacts on vegetation, fish, and wildlife from operation of Alternative C:

- The existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. If potential bat roosting habitat is identified by this survey, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss by incorporating bat habitat into the two new elevated structures. Potential mitigation could include use of mounting brackets or expansion joints in the bridge design or placement of artificial bat roost sites.

## Alternative D

The following mitigation measure is recommended to offset potential impacts to vegetation, fish, and wildlife from operation of Alternative D:

- The existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. If potential bat roosting habitat is identified by this survey, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss by incorporating bat habitat into the new bridge design. Potential mitigation could include use of mounting brackets or expansion joints in the bridge design or placement of artificial bat roost sites.

This page is intentionally blank.

## Construction Impacts

---

### No Build Alternative

#### *Impacts*

Construction impacts from the No Build Alternative would be limited to whatever maintenance activities are determined as necessary by the engineering inspections proposed under this alternative.

#### *Mitigation Measures*

No mitigation would be required to offset impacts of the No Build Alternative. Industry standard BMPs would be mitigation for any maintenance activities proposed for repair of the existing bridge.

### Alternative A

#### *Impacts*

##### **Vegetation**

Construction of Alternative A would remove approximately 0.5 acre of forest at the west end of the new proposed bridge, just south of the existing western bridge terminus. This impact would include the removal of at least two large big-leaf maples in excess of 24 inches in diameter. Any trees on the undeveloped slope west of the North Bay/Terminal 91 property fall under the regulation of Section 25.11 of the Seattle Municipal Code (SMC), which generally prohibits removal of all trees 6 inches or greater in diameter (measured 4.5 feet above the ground) on undeveloped land within the City limits. An exception to this prohibition is tree removal shown as part of an issued building or grading permit, which would be required for the Magnolia Bridge.

In addition to the forest impacts, the Alternative A – Intersection option would extend a new ramp structure over approximately 0.1 acre of upper intertidal beach habitat that is currently open. This impact would result from the placement of up to three piers, with two columns each, in the intertidal zone of Smith Cove. The Alternative A – Ramps option would have ramps on both the north and south sides of the new bridge. The southern ramp would potentially have more direct impacts to the intertidal vegetation than the Alternative A – Intersection option because it would require two piers to support the on-ramp as well as two piers for the main bridge structure in the intertidal zone of Smith Cove. Currently, the beach in this location extends north underneath an access road to Terminal 91 that is supported by large piers and concrete footings. It is unknown how the configuration of this area would change, but it is likely that all of the proposed structures in Smith Cove would be located where this access road is currently located. There may be opportunity to daylight some of the beach in this area.

For Alternative A, one temporary equipment laydown area is proposed on Port of Seattle property north of Smith Cove and east of 23rd Avenue West, both north and

south of the existing bridge. This area is currently paved, and there would be no impacts to vegetation.

## **Fish**

Impacts to the intertidal zone described above would affect fish as well. Up to four piers would be located in the intertidal zone of Smith Cove to support proposed on-ramps and the new bridge. Pile driving could have serious, potentially lethal effects on fish in the immediate vicinity (i.e., within 50 feet) of the activity. Pulse noise and turbidity created by drop hammer pile driving could have significant, deleterious effects on fish physiology. Any juvenile fish migrating along the shoreline during construction would likely move offshore to avoid disturbance. While this would limit the potential physiological effects of pile driving, the movement could expose juvenile fish to greater predation risk. Disturbance would be created by constructing proposed bridge and on-ramp piers as well as by construction access for personnel and equipment by waterfront barges. This impact would not be substantial compared to the barriers that already exist in the immediate project vicinity, including the Terminal 91 piers and Elliott Bay Marina.

EFH would not be significantly affected during in-water and nearshore construction activities because nearshore habitat conditions for salmonid migration are very poor in the study area from past and ongoing disturbances and the presence of a pile-supported access road at the head of Smith Cove. BMPs for construction would be implemented to minimize turbidity and water quality degradation during in-water activities.

Forage fish are not known to spawn in the study area, so no construction impacts to these salmon prey species would be expected. Habitat for offshore fish species and those fish that inhabit the piers would remain unchanged.

## **Wildlife**

Any wildlife using the 0.5 acre of forest on the east slope of the Magnolia Bluff for breeding, foraging, or cover would be permanently displaced by this alternative. The noise and disturbance of construction equipment and activities would temporarily displace wildlife in the immediate vicinity of the project during construction. Construction of Alternative A is expected to take approximately 39 months, with work on or adjacent to the Magnolia Bluff occurring over approximately 10 months. Any bats, pigeons, or other birds using the existing Magnolia Bridge for nesting or roosting would be displaced. These animals would be expected to reestablish nesting sites in the new bridge structure. Animals displaced along Magnolia Bluff would be expected to move to other open spaces in the project area. Potential spills or releases of petroleum, concrete, paint, or other toxic materials could occur during construction. If toxic materials enter Smith Cove, they could have deleterious effects on intertidal invertebrates and animals foraging along the beach. However, BMPs for construction would be followed to minimize the potential for releases of hazardous materials.

## **Special Status Species**

Alternative A has the potential to remove breeding and foraging habitat for some special status species, including bats and pileated woodpeckers, when small amounts of forest are removed from the undeveloped slope above the Port property. Construction of the nearshore portion of Alternative A could discourage some

special status species from foraging in the immediate vicinity of the project, including great blue heron, bald eagle, and peregrine falcon. Pigeons nesting in the existing bridge structure, which are prey species for peregrine falcons nesting at the grain terminal, would be temporarily displaced by construction. They would be expected to return soon after construction is complete. A small amount of potential migrating habitat for juvenile chinook salmon and bull trout would be temporarily disturbed by construction of Alternative A. This construction is considered insignificant compared to existing sources of ongoing activity associated with Terminal 91.

## *Mitigation Measures*

Other than BMPs, the following mitigation measures are recommended to offset potential impacts to vegetation, fish, and wildlife from construction of Alternative A:

- All disturbed areas would be revegetated with native species.
- All significant trees that would be removed would be identified in accordance with SMC 25.11 and, where feasible, these trees and their drip line would be protected.
- The existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. The forested habitat at the west end of the proposed bridge would also be visually surveyed prior to construction to determine the extent of bat roosting habitat in this area. If potential bat roosting habitat is identified by these surveys, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss in the project area. Potential mitigation could include bridge design measures and use of artificial bat roost sites on the new bridge.
- Construction during the critical juvenile salmon migration and rearing period (summer to late fall) should be avoided to the extent feasible.
- A sheet pile cofferdam would be installed in the intertidal zone during pile-driving activities. This dam would keep water out of the area where pile driving would occur. Any fish caught within the cofferdam would be trapped and released before pile driving would commence.

## **Alternative C**

### *Impacts*

#### **Vegetation**

Under Alternative C, there would be no construction impacts on waterbodies or intertidal habitat. A small amount of forest habitat and disturbed habitat north of the western terminus of the existing bridge would be displaced.

For Alternative C, the temporary equipment laydown area is currently proposed on paved Port of Seattle property north of the existing bridge and adjacent to and east of the proposed elevated structure at the toe of the Magnolia Bluff. The Northwest Harvest warehouse currently occupies the southern part of this area. Any loss of vegetation would be limited to weeds.

## **Fish**

This alternative would have no impacts on fish because no waterbodies would be affected.

## **Wildlife**

The noise and disturbance from construction equipment and activities would temporarily displace wildlife in the immediate vicinity of the project during construction. Construction of Alternative C is expected to take approximately 41 months, with work occurring on or adjacent to Magnolia Bluff requiring approximately 24 months. Animals displaced along Magnolia Bluff would be expected to move to other open spaces in the project area.

Alternative C would potentially displace bats that may be roosting in the existing Magnolia Bridge structure. Under Alternative C, the new roadway and elevated structures would be moved farther away from the shoreline, thereby decreasing the disturbance to wildlife using Smith Cove.

## **Special Status Species**

Alternative C would have few direct impacts on special status species. Removal of the existing bridge would remove a source of prey species (i.e., pigeons) for peregrine falcons nesting at the grain terminal. Some species, such as pileated woodpecker, bat, and others species that may be using forested habitat in the study area, may move away from the immediate vicinity of the project during construction.

## *Mitigation Measures*

Other than BMPs, the following mitigation measures are recommended to offset potential impacts on vegetation, fish, and wildlife from construction of Alternative C:

- All disturbed areas would be revegetated with native species.
- All significant trees that would be removed would be identified in accordance with SMC 25.11 and, where feasible, these trees and their drip line would be protected.
- The existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. The forested habitat north of the western terminus of the existing bridge would also be visually surveyed prior to construction to determine the extent of bat roosting habitat in this area. If potential bat roosting habitat is identified by these surveys, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss in the project area. Potential mitigation could include bridge design measures and use of artificial bat roost sites on the two new elevated structures.

## Alternative D

### *Impacts*

#### **Vegetation**

Under Alternative D, there would be no construction impacts to waterbodies, intertidal habitat, or forest habitats. A small amount of disturbed habitat immediately north of the western terminus of the existing bridge would be displaced by this alternative when it swings to meet the existing terminus.

For Alternative D, the temporary equipment laydown area is currently proposed on paved Port of Seattle property north of the existing bridge and on both sides of the proposed bridge at the toe of the Magnolia Bluff. The Northwest Harvest warehouse currently occupies the southern part of this area. Any loss of vegetation would be limited to weeds.

#### **Fish**

This alternative would have no impacts on fish because no waterbodies would be affected.

#### **Wildlife**

The noise and disturbance of construction equipment and activities would temporarily displace wildlife in the immediate vicinity of the project during construction. Construction of Alternative D is expected to take approximately 45 months, with work occurring on or adjacent to Magnolia Bluff requiring approximately 12 months. Alternative D would potentially displace bats that may be roosting in the existing Magnolia Bridge structure. Animals displaced along Magnolia Bluff would be expected to move to other open spaces in the project area. Under Alternative D, the new bridge would be moved farther away from the shoreline, thereby decreasing the disturbance to wildlife using Smith Cove.

#### **Special Status Species**

Direct impacts on special status species under Alternative D would be similar to those described above for Alternative C.

### *Mitigation Measures*

Other than BMPs, the following mitigation measures are recommended to offset potential impacts to vegetation, fish, and wildlife from construction of Alternative D:

- All disturbed areas would be revegetated with native species;
- All significant trees that would be removed would be identified in accordance with SMC 25.11 and, where feasible, these trees and their drip line would be protected; and
- The existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. If potential bat roosting habitat is identified as a result of this survey, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss in

the existing bridge. Potential mitigation could include bridge design measures and use of artificial bat roost sites on the new bridge.

## Summary of Findings

---

### Affected Environment

Most of the study area is fully developed with a combination of industrial, commercial, and residential development. Vegetation in the study area is typical of a heavily urbanized city. Smith Cove supports a narrow band of intertidal marine vegetation and scattered salt marsh plants in the upper intertidal zone. No areas with potential wetland characteristics were identified during the field reconnaissance.

In general, the study area provides limited habitat for wildlife species because of the extensive residential and industrial development in the Interbay area and surrounding communities as well as the high levels of human disturbance. Most of the species in the area would be limited to the isolated forest fragments in the study area for foraging, breeding, or cover habitat. The only habitat for aquatic species in the study area is the nearshore water of Smith Cove. This is also the only EFH in the study area.

The special status species that have been identified as potentially occurring in the study area include bald eagles, juvenile chinook salmon, bull trout, osprey, peregrine falcons, and great blue herons.

### Impacts

#### *Operational Impacts*

Under the No Build Alternative, ongoing maintenance activities would be required to upgrade the existing bridge. These maintenance activities could have direct and indirect effects on vegetation if they require removal of native vegetation for laydown areas or construction buffers. The No Build Alternative would have no direct impacts on wildlife or fish.

Operational impacts common to the proposed build alternatives include improved water quality from newly constructed stormwater facilities, increased disturbance to some wildlife species resulting from new road alignments, and long-term loss of bat roosting habitat.

Operation of Alternative A would result in altered intertidal habitat as a result of new bridge piers at the head of Smith Cove.

Under Alternatives C and D, wildlife using previously undisturbed portions of the Magnolia Bluff greenbelt would experience exposure to traffic noise, but this effect would not be substantial because these wildlife species are acclimated to high levels of disturbance. Moving the bridge away from the shoreline under Alternatives C and D would also reduce ongoing disturbance to fish and wildlife in Smith Cove.

#### *Construction Impacts*

##### **No Build Alternative**

No construction impacts related to wildlife, fisheries, or vegetation would occur under the No Build Alternative.

## Alternative A

Construction of Alternative A would remove approximately 0.5 acre of forest and approximately 0.1 acre of upper intertidal beach habitat. Up to four piers would be located in the intertidal zone of Smith Cove to support proposed on-ramps and the new bridge. Fish in the immediate vicinity of pile driving could experience deleterious physiological effects. Any juvenile fish migrating along the shoreline during construction would tend to move offshore to avoid disturbance, which could expose them to greater predation risk. This impact would not be substantial compared to the barriers that already exist in the immediate project vicinity. The noise and disturbance of construction equipment and activities would temporarily displace wildlife in the immediate vicinity of the bridge during construction.

## Alternative C

This alternative would have little construction impact on vegetation, fish, or wildlife. There would be no impact on waterbodies or intertidal habitat. This alternative would have no impact on fish because no waterbodies would be affected. A small amount of forest habitat and disturbed habitat north of the western terminus of the existing bridge would be displaced by this alternative.

## Alternative D

This alternative would have little construction impact on vegetation, fish, or wildlife. There would be no impact on waterbodies, intertidal habitat, or forest habitats. This alternative would have no impact on fish because no waterbodies would be affected. A small amount of disturbed habitat immediately north of the western terminus of the existing bridge would be displaced by this alternative alignment when it swings to meet the existing terminus.

## *Secondary and Cumulative Impacts*

Portions of the study area are currently being considered for redevelopment. While the nature of any future projects in the study area are unknown, it is reasonable to conclude that any commercial development would increase traffic and human activity in the study area, thus further discouraging even temporary or transient use of the area by fish and wildlife.

The Alternative A – Ramps option would increase indirect disturbance effects on fish and wildlife using the nearshore zone at the north edge of Smith Cove because there would be increased traffic noise from a ramp on the waterward side of the bridge. However, this effect would be minor because the proposed project is not expected to increase traffic volumes on the new structure. Also, the southernmost access ramp would increase shade to the nearshore environment, which may have indirect behavioral effects on migrating fish at high tide, as well as on vegetation growing in the intertidal zone.

## Mitigation Measures

### *Operational Mitigation*

The following mitigation measures are proposed to minimize operational impacts to vegetation, fish, and wildlife:

- For Alternatives A and D, the existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. If potential bat roosting habitat is identified by this survey, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss by incorporating bat habitat into the new bridge design. Potential mitigation could include use of mounting brackets or expansion joints in the bridge design or placement of artificial bat roost sites.
- For Alternative C, the existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. If potential bat roosting habitat is identified by this survey, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss by incorporating bat habitat into the two new elevated structures. Potential mitigation could include use of mounting brackets or expansion joints in the bridge design or placement of artificial bat roost sites.
- Under Alternative A, some portion of the Smith Cove beach would be daylighted, if feasible.
- Under Alternative A, native shoreline vegetation would be planted where conditions are appropriate.

### *Construction Mitigation*

Other than BMPs, the following mitigation measures are recommended to offset potential construction impacts to vegetation, fish, and wildlife:

- For all build alternatives, all disturbed areas would be revegetated with native species.
- For all build alternatives, all significant trees that would be removed would be identified in accordance with SMC 25.11 and, where feasible, these trees and their drip line would be protected.
- For all build alternatives, the existing Magnolia Bridge would be visually surveyed prior to demolition to determine the extent of bat roosting habitat in this structure. Adjacent habitat areas would also be visually surveyed prior to construction to determine the extent of potentially affected bat roosting habitat. If potential bat roosting habitat is identified by these surveys, WSDOT and SDOT would collaborate to consider ways to mitigate for habitat loss in the project area. Potential mitigation could include bridge design measures and use of artificial bat roost sites on new bridge structures.
- Under Alternative A, construction during the critical juvenile salmon migration and rearing period (summer to late fall) should be avoided to the extent feasible.
- Under Alternative A, a sheet pile cofferdam would be installed in the intertidal zone during pile-driving activities. This dam would keep water out of the area where pile driving would occur. Any fish caught within the cofferdam would be trapped and released before pile driving would commence.

This page is intentionally blank.

## References

---

- Falcon Research Group. 2003. Mid-Winter Field Notes – Seattle Peregrine Project. URL <http://www.frg.org/frg/fieldnotes/seanotes.html> (visited July 13, 2003).
- HistoryLink. 2003. History of Interbay Area. URL <http://www.historylink.org>. (visited on October 17, 2003).
- Jeffries, S.J., P.J. Gearin, H.R. Huber, D.L. Saul, and D.A. Pruett. February 2000. Atlas of seal and sea lion haulout sites in Washington. Washington Department of Fish and Wildlife, Wildlife Science Division.
- Kerwin, J. and T.S. Nelson (Eds.). 2000. Habitat limiting factors and reconnaissance assessment report, Green/Duwamish and Central Puget Sound watersheds (WRIA 9 and Vashon Island). Washington Conservation Commission and the King County Department of Natural Resources.
- Pacific Fisheries Management Council (PFMC). 1999. Identification and description of Essential Fish Habitat, adverse impacts, and recommended conservation measures for salmon. Appendix A of Amendment 14 to the Pacific Coast Salmon Plan. Portland, Oregon. URL <http://www.pcouncil.org> (visited 2003).
- Pentila, Dan. April 13, 2004. WDFW Forage Fish Program. Personal communication.
- Seattle Audubon Society. 2002. Seattle Christmas Bird County Results. URL <http://www.seattleaudubon.org> (visited 2003).
- U.S. Army Corps of Engineers (Corps). 1987. Elliott Bay small craft harbor final environmental impact statement. Seattle District.
- U.S. Army Corps of Engineers. May 31, 2001. Draft environmental assessment – Fort Lawton Area 500 demolition, restoration, and land transfer. Seattle, Washington.
- U.S. Coast Guard. August 2003. Green Line draft environmental impact statement – Seattle monorail project. 2003.
- Washington Department of Fish and Wildlife (WDFW). 1999. Washington GAP Data Products, Vertebrate Distribution Models. URL: <http://www.wdfw.wa.gov/wlm/gap/vdm.htm> (visited November 17, 2004).
- Washington Department of Fish and Wildlife (WDFW). October 7, 2003. Priority Habitats and Species Database query for Magnolia Bridge Project.
- Windward Environmental. 2003. Lower Duwamish Waterway Remedial Investigation – Appendix A in Phase 1 ecological risk assessment. Final Report prepared for the U.S. EPA, Region 10, and Washington Department of Ecology, Northwest Region.

This page is intentionally blank.

---

**Discipline Report  
Addendum**

***Wildlife, Fisheries,  
and Vegetation***

Prepared by:  
HNTB Corporation

June 10, 2014



**Seattle Department of Transportation  
Agreement No. T12-64**

Environmental Assessment

**Magnolia Bridge Replacement**

**City of Seattle**

---

See the Table on Contents on page *iii*.

# ***Introduction***

---

Alternative A – Ramps evaluated in the Wildlife, Fisheries, and Vegetation Discipline Report (draft 2004) was selected by the Seattle Department of Transportation (SDOT) as the Preferred Alternative in 2006. The Plans, Specifications and Estimates (PS&E) phase of the Magnolia Bridge Replacement Project advanced the Preferred Alternative design to the 30 percent level.

Because build Alternatives C and D are no longer under consideration, the impacts and mitigation updates are limited to the Alternative A (Preferred Alternative) alignment. Alternative A had two design options: Alternative A – Intersection with an intersection on the bridge connected to a north-south roadway direct north into the Terminal 91 North Bay property; and Alternative A – Ramps with half-diamond interchange ramps at 23rd Avenue West to and from the east. The Preferred Alternative includes only 23rd Avenue West ramps to and from the east.

This page is intentionally blank.

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) for methodology for literature review, data collection, and the reconnaissance-level survey.

After completion of the draft Wildlife, Fisheries, and Vegetation Discipline Report, the Preferred Alternative (Alternative A – Ramps) was design was developed to approximately 30 percent completion. This design was evaluated in a Biological Assessment (BA) prepared to comply with the consultation requirements of Section 7 of the Endangered Species Act (ESA). The BA (Anchor 2008), an amendment prepared in May 2009 (Anchor 2009), and a draft amendment in May 2014 (Anchor 2014) provide material for this discipline report amendment.

Environmental studies for King County’s South Magnolia Combined Sewer Overflow project were reviewed and updated Priority Habitats and Species (PHS) maps and lists of special status species were obtained from Washington Department of Fisheries and Wildlife (WDFW).

This page is intentionally blank.

## **Vegetation**

The Wildlife, Fisheries, and Vegetation Discipline Report (draft 2004) Figure 11 shows areas of natural vegetation in the study area. These areas remain the substantially the same in 2014 with forested areas on the east Queen Anne and west Magnolia slopes above Terminal 91 and Interbay. The following describes the limited changes in vegetation since the 2004 draft report.

### ***Ornamental/Landscaped Vegetation***

The Ursula Judkins Viewpoint south of West Galer Street has ornamental/landscaped vegetation with lawn areas in the northern portion of the site and forest on the southern slope. The lawn area described in the 2004 report as former Naval Supply Depot property is Smith Cove Park property acquired by the City of Seattle in 2003 as part of the Smith Cove Acquisition. Since acquisition, pavement areas have been removed and planted with turf grass. The site is used as an unscheduled playfield.

### ***Wetlands***

No upland areas with potential wetland characteristics were identified during the field reconnaissance. The South Magnolia Combined Sewer Overflow (CSO) Project will have a new sewer gravity line that will be located near the Preferred Alternative west of 23rd Avenue West. Environmental documentation (King County 2011) for the CSO project delineated one wetland outside of the Magnolia Bridge study area and no wetlands or wetland buffers near the Magnolia Bridge project.

National Wetlands Inventory mapping identifies Smith Cove and Elliott Bay as estuarine and marine wetlands. The nearshore and intertidal habitats provided by these wetlands are discussed in the Biological Assessment and addenda prepared in 2009 and 2014 (draft).

## **Wildlife**

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) pages 33 through 42 of this report for descriptions of the limited habitats for wildlife species available in the project area. Habitat conditions reported in the 2004 report are substantially unchanged. The limited wooded areas are in public ownership as parkland or greenbelt open space, and on the private residential property on the Magnolia Bluff hillside.

### ***Birds***

The draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) described glaucous-winged gulls as breeding at the Terminal 91 piers. This information was

obtained in 2003 from the WDFW PHS database. The “PHSPlusPublic” dataset queried in June 2014 no longer lists glaucous-winged gulls in the project vicinity.

Special status bird species, including bald eagle, peregrine falcon, and purple martin, are discussed in a later section.

## Marine Mammals

Special status marine mammals include Steller sea lion and Southern Resident killer whale and are discussed in a later section.

## Fish

See the draft Wildlife, Fisheries, and Vegetation Discipline Report, pages 38 through 41 of this report, for a discussion of study area fish species and habitat. The following information supplements the draft report.

An Essential Fish Habitat (EFH) assessment was included in the October 2008 Biological Assessment. This provided the consultation required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The project area includes habitat which has been designated as EFH for various life stages of 46 species of groundfish, four species of coastal pelagics, and three species of Pacific salmon (see Addendum Table 1). The National Marine Fisheries Service determined that the conservation measures proposed for the Magnolia Bridge Replacement project to address Endangered Species Act concerns would be adequate to avoid, minimize, or otherwise offset potential adverse effects to the EFH of the project area species. Additional conservation measures pursuant to MSA are not necessary.

**Addendum Table 1 Species of Fishes with Designated Essential Fish Habitat Occurring in Puget Sound**

Groundfish Species		
spiny dogfish <i>Squalus acanthias</i>	quillback rockfish <i>S. maliger</i>	kelp greenling <i>Hexagrammos decagrammus</i>
big skate <i>Raja binoculata</i>	redbanded rockfish <i>S. babcocki</i>	sablefish <i>Anoplopoma fimbria</i>
California skate <i>Raja inornata</i>	redstripe rockfish <i>S. proriger</i>	Pacific sanddab <i>Citharichthys sordidus</i>
longnose skate <i>Raja rhina</i>	rosethorn rockfish <i>S. helvomaculatus</i>	butter sole <i>Isopsetta isolepis</i>
ratfish <i>Hydrolagus colliei</i>	rosy rockfish <i>S. rosaceus</i>	curlfin sole <i>Pleuronichthys decurrens</i>
Pacific cod <i>Gadus macrocephalus</i>	rougheye rockfish <i>S. aleutianus</i>	Dover sole <i>Microstomus pacificus</i>
Pacific whiting (hake) <i>Merluccius productus</i>	sharpchin rockfish <i>S. zacentrus</i>	English sole Parophrys vetulus
black rockfish <i>Sebastes melanops</i>	splitnose rockfish <i>S. diploproa</i>	flathead sole <i>Hippoglossoides elassodon</i>
bocaccio <i>S. paucispinis</i>	striptail rockfish <i>S. saxicola</i>	petrale sole <i>Eopsetta jordani</i>
brown rockfish <i>S. auriculatus</i>	tiger rockfish <i>S. nigrocinctus</i>	rex sole <i>Glyptocephalus zachirus</i>
canary rockfish <i>S. pinniger</i>	vermillion rockfish <i>S. miniatus</i>	rock sole <i>Lepidopsetta bilineata</i>

China rockfish <i>S. nebulosus</i>	yelloweye rockfish <i>S. ruberrimus</i>	sand sole <i>Psetichthys melanostictus</i>
copper rockfish <i>S. caurinus</i>	yellowtail rockfish <i>S. lavidus</i>	starry flounder <i>Platichthys stellatus</i>
darkblotch rockfish <i>S. crameri</i>	shortspine thornyhead <i>Sebastolobus alascanus</i>	arrowtooth flounder <i>Atheresthes stomias</i>
greenstriped rockfish <i>S. elongatus</i>	cabezon <i>Scorpaenichthys marmoratus</i>	
Pacific ocean perch <i>S. alutus</i>	lingcod <i>Ophiodon elongatus</i>	
<b>Coastal Pelagic Species</b>		
anchovy <i>Engraulis mordax</i>	Pacific mackerel <i>Scomber japonicus</i>	
Pacific sardine <i>Sardinops sagax</i>	market squid <i>Loligo opalescens</i>	
<b>Pacific Salmon Species</b>		
Chinook salmon <i>Oncorhynchus tshawytscha</i>	coho salmon <i>O. kisutch</i>	Puget Sound pink salmon <i>O. gorbuscha</i>

Source: U.S. Department of Commerce, National Marine Fisheries Service and U.S. Department of the Interior, Fish and Wildlife Service. 2009. Table 3.

Special status fish species are discussed in a later section.

## Special Status Species

The draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) Table 5 lists the special status species that have been identified as potentially occurring in the study area. Addendum Table 2 provides updated (2014) federally-listed species and critical habitat, and Washington Department of Fish and Wildlife Priority Habitats and Species (PHS) listings.

**Addendum Table 2 Special Status Species and Habitats**

Common Name	Scientific Name	Status <sup>1</sup>	Occurrence in Project Area	Critical Habitat <sup>2</sup>
<b>Federally-Listed Species</b>				
Puget Sound Chinook salmon	<i>Oncorhynchus tshawytscha</i>	FT, SC	Confirmed in Smith Cove	Designated, occurs in project area
Puget Sound steelhead	<i>Oncorhynchus keta</i>	FT	Confirmed in Smith Cove	Designated (revised 2010), occurs in project area
Coastal Puget Sound bull trout	<i>Salvelinus confluentus</i>	FT, SC	Confirmed in Smith Cove	Designated, occurs in project area
Bocaccio	<i>Sebastes paucispinus</i>	FE, SC	May be in the project area	Proposed in 2013, occurs in the project area
Yelloweye rockfish	<i>Sebastes ruberrimus</i>	FT, SC	May be in the project area	Proposed in 2013, occurs in the project area
Canary rockfish	<i>Sebastes pinniger</i>	FT, SC	May be in the project area	Proposed in 2013, occurs in the project area
Steller sea lion	<i>Eumetopias jubatus</i>	FT, ST	May be in the project area	None in project area
Southern resident killer whale	<i>Orca orcinus</i>	FE, SE	May be in the project area	Designated, occurs in project area
Marbled murrelet	<i>Brachyramphus marmoratus</i>	FT, ST	May be in the project area	Designated, none in project area
<b>State-Listed Species and Habitat</b>				

Common Name	Scientific Name	Status <sup>1</sup>	Occurrence in Project Area	Critical Habitat <sup>2</sup>
Bald eagle	<i>Haliaeetus leucocephalus</i>	SS, FCo, PHS	Magnolia Bluff	N/A
Dungeness crab		PHS	Elliott Bay and nearshore	N/A
Pacific herring	<i>Clupea pallasii</i>	FCo, SC, PHS	Elliott Bay nearshore habitat, Pier 70 to Pier 86	N/A
Peregrine falcon	<i>Falco peregrinus</i>	FCo, SS, PHS	Pier 86	N/A
Purple martin	<i>Progne subis</i>	SC, PHS	Pier 90	N/A
Biodiversity corridor (terrestrial habitat)	N/A	PHS	West Queen Anne greenbelt	N/A
Estuarine zone (aquatic habitat)	N/A	PHS	Elliott Bay	N/A
Estuarine intertidal (aquatic habitat)	N/A	PHS	Elliott Bay nearshore	N/A

1 FE = Federal Endangered; FT= Federal threatened; FCo = Federal Species of Concern; State Endangered; ST = State Threatened; SC = State Candidate; SS = State Sensitive; PHS = WDFW Priority Habitats and Species Listed (June 2014)

2 Critical habitat that is ESA-listed or proposed.

## Federally-Listed Species

### **Puget Sound ESU Chinook Salmon (*Oncorhynchus tshawytscha*)**

#### *Species Presence*

Puget Sound Chinook salmon were listed as threatened on August 2, 1999 (64 Fed. Reg. 41835). Adult Chinook could be present in the action area from mid-June to mid-October. Sub-adults could be present any time of year. The majority of juvenile outmigration to the Duwamish estuary occurs in May and early June, with the peak juvenile presence in Smith Cove occurring 15 to 20 days after the peak in the upper estuary.

#### *Critical Habitat*

Smith Cove lies within the Nearshore Marine Areas critical habitat unit for Chinook salmon. Smith Cove provides shallow water rearing habitat with macroalgae cover.

### **Puget Sound DPS Steelhead (*Oncorhynchus mykiss*)**

#### *Species Presence*

Puget Sound steelhead were listed as threatened on June 11, 2007 (72 Fed. Reg. 26722). The closest steelhead-bearing stream to Smith Cove is the Duwamish River system. Adult winter-run steelhead migrate through Elliott Bay toward the Duwamish River from November through April, while summer-run steelhead enter the river from May through October (Appendix A). Rearing juveniles are not likely to use the Smith Cove habitat at any time of year.

### *Critical Habitat*

Critical habitat was proposed for Puget Sound steelhead on January 14, 2013 (78 Fed. Reg. 2726). Critical habitat elements are the same as those listed for Puget Sound Chinook salmon.

### **Bull Trout (*Salvelinus confluentus*)**

#### *Species Presence*

Bull trout were listed as threatened on November 1, 1999 (64 Fed. Reg. 58909). The Duwamish River system, which feeds into Elliott Bay, supports bull trout. There have been infrequent and isolated observations of bull trout in Elliott Bay.

#### *Critical Habitat*

The revised rules designating critical habitat for the Coastal-Puget Sound DPS of bull trout became effective November 17, 2010. (70 Fed. Reg. 56211). The project falls within the geographical boundaries of critical habitat unit 2 – Puget Sound Marine. It provides rearing and foraging habitat to support existing local populations. Elliott Bay serves as a migratory corridor for bull trout.

### **Bocaccio (*Sebastes paucispinus*)**

#### *Species Presence*

The Georgia Basin bocaccio (rockfish) was listed as endangered on April 28, 2010 (75 FR 22276). In Puget Sound, bocaccio have always been rare in the north Puget Sound surveys of the recreational fishery. Smith Cove is not ideal habitat for bocaccio due to its lack of natural rocky reefs or substrate, but large rock occurs as riprap near the shore of the project area, and therefore, juvenile bocaccio could be presumed to occur there. Juvenile bocaccio could occur in the nearshore, and adults could be present in the deeper waters of Puget Sound outside the immediate area of the bridge.

#### *Critical Habitat*

On August 6, 2013, NMFS published proposed rules for designating critical habitat for Puget Sound/Georgia Basin bocaccio including approximately 1,185 square miles of marine habitat in Puget Sound. The project area provides the required water quality for bocaccio and some of the rocky habitat needed for juvenile bocaccio. Substrates of the type and depth preferred by adult bocaccio are not available. Prey plankton and invertebrate species are likely not available in quantities and qualities for optimal conditions due to the urban nature of the shoreline and lack of habitat complexity. No kelp or eelgrass is present to support prey species and provide juvenile refugia.

### **Yelloweye Rockfish (*Sebastes ruberrimus*)**

#### *Species Presence*

The Georgia Basin yelloweye rockfish was listed as threatened on April 28, 2010 (75 FR 22276). Yelloweye rockfish occur in waters 80 to 1,560 feet deep, but are

most commonly found between 300 to 590 feet in depth. This deep, rocky habitat does not exist in the project footprint but may occur in patches offshore in Elliott Bay, and yelloweye rockfish could be present there.

Juvenile yelloweye rockfish are not typically found in intertidal waters but are most frequently observed in waters deeper than 98 feet (30 meters). Typically, NMFS presumes that larval rockfish could be present if any one of these three habitat features is present: 1) kelp beds; 2) eelgrass; or 3) large rock. Large rock (riprap) is present along the shoreline, but because juvenile yelloweye rockfish do not typically occupy shallow waters, they are unlikely to be present in the nearshore zone of the project area.

Based on the depth, substrate preferences, and geographical range information presented above, juvenile yelloweye rockfish would not occur in the nearshore of the project action area, but adults and juveniles could be present in the deeper waters of Puget Sound outside the immediate area of the bridge.

### ***Critical Habitat***

On August 6, 2013, NMFS published proposed rules for designating critical habitat for Puget Sound/Georgia Basin yelloweye rockfish including approximately 575 square miles of marine habitat in Puget Sound.

Proposed critical habitat elements are the same as for Bocaccio, except that nearshore critical habitat does not apply to juvenile yelloweye rockfish.

### **Canary Rockfish (*Sebastes pinniger*)**

#### ***Species Presence***

The Georgia Basin canary rockfish was listed as threatened on April 28, 2010 (75 FR 22276). Canary rockfish most commonly occur in waters 160 to 820 feet deep, but may be found up to 1,400 feet in depth. Canary rockfish adults are generally associated with hard bottom areas and along rocky shelves and pinnacles. This deep, rocky habitat does not exist in the project footprint but may occur in patches offshore in Elliott Bay, and canary rockfish could be present there.

Juvenile canary rockfish settle into tide pools, rocky reefs, kelp beds, low rock, and cobble areas. NMFS presumes that larval rockfish could be present if any one of these three habitat features is present: 1) kelp beds; 2) eelgrass; or 3) large rock. Smith Cove is not ideal habitat for canary rockfish due to its lack of natural rocky reefs or substrate, but large rock occurs as riprap near the shore of the project area. Juvenile canary rockfish could be presumed to occur there.

Based on the depth, substrate preferences, and geographical range information presented above, juvenile canary rockfish could occur in the nearshore, and adults could be present in the deeper waters of Puget Sound outside the immediate area of the bridge.

### *Critical Habitat*

On August 6, 2013, NMFS published proposed rules for designating critical habitat for Puget Sound/Georgia Basin canary rockfish including approximately 1,185 square miles of marine habitat in Puget Sound.

Proposed critical habitat elements are the same as for Bocaccio.

### **Steller Sea Lion (*Eumetopias jubatus*)**

#### *Species Presence*

Steller sea lions were listed as threatened on April 10, 1990 (55 Fed Reg. 13488). Steller sea lions occur year-round in Washington waters, but do not breed in Washington. Steller sea lions have only occasionally been sighted in southern Puget Sound. Steller sea lions do not depend on Puget Sound nearshore habitat to support any life stage. Smith Cove does not provide the rocky haulout habitat preferred by Steller sea lions.

#### *Critical Habitat*

No critical habitat has been designated in Washington. Critical habitat is associated with breeding and haulout areas in Alaska, California, and Oregon.

### **Southern Resident Killer Whale (*Orcinus orca*)**

#### *Species Presence*

Southern resident killer whales were listed as endangered on February 16, 2006 (70 Fed. Reg. 66903). In the fall, the J pod of Southern resident killer whales migrates into Puget Sound, while the rest of the population makes extended trips through the Strait of Juan de Fuca. The J pod generally remains in inland waterways throughout the winter, with most of their activity in Puget Sound.

Killer whales do not generally use extremely shallow waters (under 20 feet deep) such as those found in the project area. Whales would not be expected to enter a shallow, confined harbor such as Smith Cove.

#### *Critical Habitat*

Critical habitat was designated for Southern Resident killer whales on November 29, 2006 (71 Fed. Reg. 69054). The project area lies within critical habitat Area 2 - Puget Sound, considered to be used by killer whales for fall feeding. Extremely shallow waters of Puget Sound are not considered to be within the geographical area occupied by the species and areas with water less than 20 feet deep are not included in the proposed critical habitat.

### **Marbled Murrelet (*Brachyramphus marmoratus*)**

#### *Species Presence*

The marbled murrelet is listed as threatened. Marbled murrelets do not commonly forage in intertidal areas, preferring to forage for prey in deeper waters, and are not known to forage in the waters of Elliott Bay. Marbled murrelets are more abundant

in the less urbanized areas of western Bainbridge Island, the Olympic Peninsula, and the far-northern Puget Sound.

### ***Critical Habitat***

The USFWS designated critical habitat for the marbled murrelet in 1996. Designated critical habitat includes old growth stands and other suitable nesting areas. No critical habitat has been designated near the project area.

## ***State-Listed Species and Habitat***

### **Bald eagle (*Haliaeetus leucocephalus*)**

Bald eagles no longer have a “threatened” federal status under the Endangered Species Act (ESA) but remain a Federal species of special concern. Bald eagles are a Washington State sensitive species. There is a known (2013) bald eagle nest in Magnolia Park east of 32nd Avenue West and about 1,640 feet west of the project construction limits (West Galer Street at Thorndyke Avenue West). While not listed under the ESA, the bald eagle is still protected under the Bald and Golden Eagle Protection Act (Eagle Act).

### **Dungeness crab (*Metacarcinus magister*)**

The WDFW Priority Habitats and Species (PHS) database maps the presence of Dungeness crabs in Elliott Bay and Puget Sound extending west of Smith Cove and north to Boeing Creek in the City of Shoreline.

### **Pacific herring (*Clupea pallasii*)**

Pacific herring is a federal species of concern and a Washington candidate species. Pacific herring breeding habitat is PHS-listed in approximately one mile of the Elliott Bay nearshore between Pier 70 and the Pier 86 grain terminal. The habitat is about 0.51 mile from the project footprint.

### **Peregrine falcon (*Falco peregrinus*)**

The Peregrine falcon is a federal species of concern and a Washington sensitive species. A breeding area is PHS-listed, with a May 2009 source date, at the Pier 86 grain terminal about one-half mile from the project footprint.

### **Purple martin (*Progne subis*)**

Purple martins are a Washington candidate species. Two occurrences are listed in the PHS database: an artificial nesting structure at Terminal 91 Pier 91; and a breeding colony at Pier 90. The Pier 91 structure has a database source date of 2000 and is mapped about 0.44 mile south of the existing Magnolia bridge. The Pier 90 colony has a 2004 source date and is mapped about 0.27 mile south of the existing bridge.

### **Biodiversity areas and corridor (terrestrial habitat)**

A biodiversity corridor is PHS-listed and mapped along the southwest slope of Queen Anne Hill between and including Kinnear Park and the Southwest Queen

Anne Greenbelt. This area provides a continuous corridor of stands of deciduous and mixed deciduous-broadleaf evergreen trees. Snags, downed logs, and seeps are present on the steep west-southwest facing slopes. A portion of the northwest border of the corridor is adjacent to the Magnolia Bridge 15th Avenue West overpass ramp from Elliott Avenue West.

### **Estuarine zone (aquatic habitat)**

Elliott Bay east of approximately 15th Avenue West in the project vicinity is PHS-listed and mapped as an estuarine zone. This designation includes Elliot Bay along the entire downtown Seattle waterfront and Port of Seattle waterfront facilities south of downtown and on Harbor Island and West Seattle. The project footprint is about 0.43 mile from the closest part of the mapped estuarine zone.

### **Estuarine intertidal zone (aquatic habitat)**

The Elliott Bay and Puget Sound intertidal area along Magnolia Bluff between Smith Cove and about one-half mile southeast of West Point is PHS-listed and mapped as an estuarine intertidal zone. In the project vicinity, the zone includes the intertidal area along the east and south sides of the West Yard property. It does not include the intertidal area at the north end of Smith Cove near Pier 91.

This page is intentionally blank.

# ***Studies and Coordination***

---

## **Studies**

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) for the studies and coordination (page 43 of this report).

The Biological Assessment (Anchor 2008) describes the construction sequence of activities involving in-water work for the Preferred Alternative. This is based on the 30 percent level of design completed in 2007 and 2008.

During the 30 percent design, trees were surveyed for type, and trunk and dripline diameter on the Admiral's House historic property and adjacent portions of the upper and lower Smith Cove Acquisition properties, and along the ramp to the 15th Avenue West overpass east of 15th Avenue West.

## **Data Sources**

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) for the data sources (page 43 of this report).

Additional data sources that were used for this addendum include the WDFW Priority Habitats and Species database (accessed June 2014) and the Magnolia Bridge Replacement Biological Assessment (Anchor 2008) and addenda (Anchor 2009, and Anchor 2014 [draft]).

This page is intentionally blank.

## No Build Alternative

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 45 of this report.

## Alternative A (Preferred Alternative)

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 45 of this report for a general discussion of the Preferred Alternative Operational impacts.

The Preferred Alternative will increase the pollution-generating impervious surface from 6.08 acres to 7.72 acres. Stormwater from approximately one acre will discharge to a sanitary sewer and be treated at the King County West Point Treatment Plant. Stormwater from the remaining area will be treated by canister filters and will discharge to Elliott Bay through an existing outfall. The canister filters will provide basic water quality treatment.

An addendum to the Biological Assessment (Anchor 2009) was prepared to address stormwater effects on Puget Sound Chinook salmon and steelhead, both ESA-listed as threatened. This analysis was based on the Preferred Alternative stormwater treatment conveyance and treatment facilities that were designed to the 30 percent level. Addendum Table 3 shows the results of this analysis. The project will treat all stormwater and is expected to result in a net reduction for pollutants of concern for salmonids, and in the discharge of total suspended solids (TSS) which carry persistent organic pollutants (Services 2009). The water quality benefit provided to ESA-listed species would also benefit fish species with essential fish habitat (EFH) in the project area (see Addendum Table 1).

**Addendum Table 3**  
**Preferred Alternative Stormwater Pollutant Concentrations**

Pollutant of Concern	Pre-Project	Post-Project
TSS (mg/L)	79.18	6.4
Total Zinc (µg/L)	152.62	40
Dissolved Zinc (µg/L)	56.42	27
Total Copper (µg/L)	27.17	7
Dissolved Copper (µg/L)	7.19	5

Notes: Concentrations are 90th percentile effluent concentrations at the stormwater outfall to Elliott Bay.

TSS – total suspended solids

Source: Anchor 2009. Table 2.

The Preferred Alternative will remove about 30,000 square feet of the wood wharf at the north end of Smith Cove between Pier 91 and the West Yard. About 17,000

square feet of this wharf is over water. About 400 square feet of timber wall below the wharf will be removed. Removal of the wharf and timber wall will open up areas of Smith Cove to light that will benefit terrestrial and aquatic plants, thereby increasing productivity in the project area (Services 2009).

# ***Operational Mitigation Measures***

---

## **No Build Alternative**

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 47 of this report.

## **Alternative A (Preferred Alternative)**

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 47 of this report.

The removal of the wood wharf and wall at the north end of Smith Cove will open up areas of Smith Cove to light. This will benefit terrestrial and aquatic plants, thereby increasing productivity in the project area (Services 2009).

Best management practices will be followed in the maintenance of the Preferred Alternative stormwater collection and treatment facilities to maintain the effectiveness of TSS and effluent pollutant removal.

This page is intentionally blank.

## No Build Alternative

### *Impacts*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 49 of this report.

### *Mitigation Measures*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 49 of this report.

## Alternative A (Preferred Alternative)

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) Alternative A on pages 49 through 51 of this report for construction impacts. The following describes changed conditions and supplemental information for the Preferred Alternative.

### *Impacts*

#### **Vegetation**

Removal of existing wharf decking and face timbers will open about 17,000 square feet of nearshore/intertidal habitat that is currently shaded to light penetration. This area is expected to colonize naturally with vegetation within the first year after wharf removal.

The Preferred Alternative will place two columns and foundations for the eastbound on-ramp from 23rd Avenue West in the Smith Cove intertidal area between the West Yard and Pier 91. The mainline structure will have one column and foundation in this intertidal area. Construction of these columns and foundation will require a temporary work bridge, equipment support trestles, and bridge superstructure falsework supports in the intertidal area. These will be supported by temporary steel piles that will be vibrated and impact driven.

The Preferred Alternative will require the acquisition of about 0.33 acre of a private residential property (Admiral's House historic property) on the Magnolia Bluff hillside west of the Smith Cove Park playfield, and about 0.59 acre of Smith Cove Park playfield. Most of the private residential property is wooded. Vegetation will be removed where necessary for bridge construction and future maintenance. Construction of the bridge west abutment and the bridge structure immediately east of the abutment will require clearing for foundation and temporary support falsework. Construction over the east portion of this property may be by balanced cantilevered construction from the bridge column immediately east of the property.

The Smith Cove Park playfield is primarily turf grass where the Preferred Alternative will cross overhead. One foundation and column will be placed in a

small partly wooded area near the east property line and one foundation and column will be placed just inside the east property line west of 23rd Avenue West.

Trees were surveyed in January 2008 by individual trees and tree groupings with multiple adjacent trunks of the same tree type. Approximately 30 trees or tree groups may be removed on the private residential property. The numbers and tree types are: 19 maples, 8 cedars, 2 alders, and 1 fir. Six surveyed trees or tree groups were identified for removal on the Ursula Judkins Viewpoint property. These are in a non-publicly accessible area where the bridge approach and west abutment will be constructed. Tree types are 3 maples, 2 cedars, and 1 unidentified deciduous type. Seven surveyed trees/tree groups were identified for removal on the west side of the Smith Cove playfield where a bridge foundation and columns will be constructed. These consist of 2 maples, 1 alder, 1 hemlock, 1 holly, and 1 unidentified evergreen type.

There are 12 trees/tree groups along the south and west sides of the existing ramp to the 15th Avenue West overpass. The Preferred Alternative will replace this ramp. The 12 trees/tree groups are in the construction work area and most may be removed. Tree types are 4 madronas, 4 firs, 2 maples, and 2 cedars. The existing retaining wall along the east side of this ramp will be retained and will protect trees and other vegetation east of the wall.

In addition to the surveyed trees, five deciduous street trees along 23rd Avenue West have been identified for removal where a bridge foundation and column will be constructed and the bridge will cross over 23rd Avenue West.

Temporary equipment laydown areas have not been identified at this time. These areas will be identified when final design is completed or may be proposed by the contractor. There is no present schedule for design completion.

## **Fish**

See the fish discussions in the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 50 of this report. Special status fish species are discussed in a separate section.

## **Wildlife**

See the wildlife discussion in the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 50 of this report. Special status bird and marine mammal species are discussed in the following section.

## **Special Status Species**

Potential effects to salmonids include short-term negative effects from noise and turbidity, long-term effects of removal of approximately 200 square feet of intertidal habitat where the bridge foundations will be replaced, and positive effects to water quality from stormwater treatment, removal of creosote-treated wood piles, and increased nearshore light penetration.

In-water impact installation of up to 115 temporary steel piles, placement of 11 in-water falsework support bents, and installation of temporary cofferdams for in-water foundation construction will cause noise impacts possible exceeding disturbance thresholds. Removal of temporary piles, falsework bents and cofferdams will create noise impacts not likely to exceed disturbance thresholds.

Removal of the existing wood wharf will require the removal of approximately 200 wood piles and a timber wall, and will create temporary turbidity impacts. Removal of temporary piles, falsework bents and cofferdams will cause temporary turbidity impacts probably not exceeding disturbance thresholds.

The footprint of the new bridge foundations will cover approximately 200 square feet of intertidal beach habitat. This loss will be offset by demolition of the wood wharf will result in a permanent increase in light penetration to the intertidal area and an increase in habitat productivity.

### *Federally-listed species*

#### **Puget Sound ESU Chinook Salmon (*Oncorhynchus tshawytscha*)**

The project may affect the Puget Sound ESU of Chinook salmon because:

- Chinook salmon and their suitable migration and rearing habitats are present within the action area
- nearshore habitat productivity is likely to improve with the opening of about 17,000 square feet of nearshore habitat to light penetration
- water quality will improve as the result of removing approximately 200 creosote-treated piles and facing timbers from the aquatic environment
- temporary turbidity will result from pile removal and other in-water work

The project may affect Puget Sound Chinook salmon critical habitat because:

- short-term effects to Puget Sound Chinook salmon critical habitat, extending no more than 150 feet from the project area shoreline, will result from temporary turbidity during in-water work
- short-term effects to critical habitat will result from partial shading of an approximately 16,000-square-foot area due to the temporary work bridge being in place for one year or more
- long-term effects to critical habitat will result from the removal of 140 square feet of intertidal habitat to accommodate the bridge foundations, and restoration of about 17,000 square feet (0.4 acre) of nearshore habitat from removal of the wharf pilings and increased light penetration
- long-term improvement to water quality will result from the removal of creosote and the treatment of stormwater runoff that is currently untreated.

The project may affect, and is not likely to adversely affect Puget Sound Chinook salmon and critical habitat (Services 2009).

#### **Puget Sound DPS Steelhead (*Oncorhynchus mykiss*)**

The project may affect Puget Sound steelhead because:

- suitable migration habitat is present within the action area
- sound pressure peaks during impact proofing of steel piles may cause injury to fish present within a 1,600-foot radius of the pile being driven
- temporary turbidity will result from pile removal and other in-water work.

Puget Sound steelhead critical habitat elements are the same as for Puget Sound Chinook salmon. Therefore, the project may affect Puget Sound steelhead critical habitat for the same conditions described for Puget Sound Chinook salmon.

The project may affect, and is not likely to adversely affect Puget Sound steelhead and critical habitat (Services 2009, Anchor 2014).

**Bull Trout (*Salvelinus confluentus*)**

The project may affect bull trout because:

- suitable migration and rearing habitat is present within the action area
- short-term effects to critical habitat will result from partial shading of an approximately 16,000-square-foot area due to the temporary work bridge being in place for one year or more
- nearshore habitat productivity is likely to improve with the opening of about 17,000 square feet of nearshore habitat to light penetration
- water quality will improve as the result of removing approximately 200 creosote-treated piles and facing timbers from the aquatic environment.
- temporary turbidity will result from pile removal and other in-water work

The project may affect bull trout critical habitat because:

- short-term effects to bull trout critical habitat will result from temporary turbidity during in-water work
- long-term beneficial effects to critical habitat will result from the removal of 200 square feet of intertidal habitat to accommodate the bridge foundations, and restoration of about 17,000 square feet (0.4 acre) of nearshore/intertidal habitat from removal of the wharf pilings and increased light penetration
- long-term improvement to water quality will result from the removal of creosote and the treatment of stormwater runoff that is currently untreated.

The project may affect, and is not likely to adversely affect bull trout and critical habitat (Services 2009).

**Bocaccio (*Sebastes paucispinus*)**

The project may affect bocaccio because:

- rocky (riprap) habitat is present within the action area
- short-term effects to habitat will result from partial shading of an approximately 16,000-square-foot area due to the temporary work bridge being in place for one year or more
- nearshore habitat productivity is likely to improve with the opening of about 17,000 square feet of nearshore habitat to light penetration

- water quality will improve as the result of removing approximately 200 creosote-treated piles and facing timbers from the aquatic environment
- temporary turbidity will result from pile removal and other in-water work

This project is likely to adversely affect bocaccio because:

- sound pressure peaks during impact proofing of steel piles may cause injury to juveniles that may occur within a 1,600-foot radius of the pile being driven

For proposed critical habitat, the project is not likely to jeopardize the continued existence of the species and the effects of the project will improve the conservation value of the action area over the long term. The project will not adversely modify proposed bocaccio critical habitat. In the event that critical habitat becomes designated in the future, the provisional determination is that the project may affect, but is not likely to adversely affect designated bocaccio critical habitat.

#### **Yelloweye Rockfish (*Sebastes ruberrimus*)**

Project effects on yelloweye rockfish are the same as those for bocaccio. The project may affect, and is likely to adversely affect yelloweye rockfish.

The determination for proposed yelloweye rockfish critical habitat is the same as for bocaccio. The project will not adversely modify proposed yelloweye rockfish critical habitat.

#### **Canary Rockfish (*Sebastes pinniger*)**

Project effects on canary rockfish are the same as those for bocaccio. The project may affect, and is likely to adversely affect canary rockfish.

The determination for proposed canary rockfish critical habitat is the same as for bocaccio. The project will not adversely modify proposed canary rockfish critical habitat.

#### **Steller Sea Lion (*Eumetopias jubatus*)**

Steller sea lions do not depend on Puget Sound nearshore habitat to support any life stage. Smith Cove does not provide the rocky haulout habitat preferred by Steller sea lions. The project will have no identified direct effects to Steller sea lions or their prey.

The project may affect Steller sea lions because:

- pile driving noise may reach the disturbance threshold for Steller sea lions for 1.2 miles from pile driving activity
- while Steller sea lion occurrence is not common in Puget Sound, they are occasionally sighted

The project may affect, and is not likely to adversely affect Steller sea lions (Services 2009). There is no critical habitat in Washington.

### **Southern Resident Killer Whale (*Orcinus orca*)**

The project may affect Southern resident killer whales because:

- sound pressure levels from impact pile driving may reach the whale disturbance threshold (160 dBA) (WSDOT 2007b) for a 6,400-foot radius in- water around the pile being driven
- Southern Resident killer whales have been sighted in Elliott Bay during the months when in-water work will take place
- the project is likely to adversely affect Puget Sound Chinook salmon, the whales' favored food source

The project may affect Southern Resident killer whale critical habitat because:

- project effects related to water quality and prey availability will extend into designated critical habitat.

The project may affect, and is not likely to adversely affect Southern Resident killer whale critical habitat (Services 2009).

### **Marbled Murrelet (*Brachyramphus marmoratus*)**

Marbled murrelets are not expected to use the action or project area of Elliott Bay. The discharge of treated stormwater into Elliott Bay will not have measureable effects on murrelet prey species since the project area does not contain forage fish spawning areas. Effects of the project to marbled murrelets are expected to be discountable (Services 2009).

### ***State-listed species and habitat***

#### **Bald eagle (*Haliaeetus leucocephalus*)**

The bald breeding area in Magnolia Park could be affected by construction noise from roadway and bridge west approach construction on Magnolia Bluff within one-half mile of the nest, and pile driving east of 23rd Avenue West for in-water construction. Vibratory pile driving in Smith Cove would be more than one-half mile from the nest and would be allowed during breeding season. Disturbance of eagles is considered a take under the "Bald and Golden Eagle Act" and would require a permit through the USFWS.

#### **Dungeness crab (*Metacarcinus magister*)**

In-water project construction will occur outside of the area mapped by the PHS database for the presence of Dungeness crab. This area is in Elliott Bay west of Pier 91 and does not extend into the Smith Cove intertidal area where bridge construction will occur. The project will provide a water quality benefit to Elliott Bay by treating project stormwater runoff. Runoff from the existing bridge is not treated before discharge into Elliott Bay. Construction turbidity impacts will be short term and localized to the construction area.

**Pacific herring (*Clupea pallasii*)**

The project will not modify the nearshore herring habitat located about 0.51 mile from the project footprint. The project will provide a water quality benefit by treating stormwater runoff from the new bridge that currently is untreated from the existing bridge. In-water construction in Smith Cove will be about one mile from the habitat area. Construction turbidity impacts will be short term and localized to the construction area.

**Peregrine falcon (*Falco peregrinus*)**

The project is not anticipated to affect the PHS-listed Peregrine falcon breeding area at the Pier 86 grain terminal. See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on pages 50 and 51 of this report for discussion of short-term construction impacts to foraging prey.

**Purple martin (*Progne subis*)**

The known purple martin PHS-listed breeding areas are outside of the construction footprint. The wharf and pilings removed for Smith Cove bridge construction are not known to be used by purple martins.

**Biodiversity areas and corridor (terrestrial habitat)**

Project construction will create temporary noise impacts in the PHS-listed and mapped biodiversity area and corridor along the southwest slope of Queen Anne Hill. Construction of the ramp to the 15th Avenue West overpass will be adjacent to the corridor. There will not be any acquisition of the corridor and the existing retaining wall between the ramp and corridor will be retained.

**Estuarine zone (aquatic habitat)**

Project in-water construction in Smith Cove will be about 0.7 mile from the PHS-listed and mapped Elliott Bay estuarine zone. Construction turbidity impacts will be short term and localized to the construction area. The project will provide a water quality benefit by treating stormwater runoff from the new bridge that currently is untreated from the existing bridge.

**Estuarine intertidal zone (aquatic habitat)**

Eastbound on-ramp and mainline bridge construction will occur over a portion of the PHS-listed and mapped intertidal zone east of the West Yard property. One permanent on-ramp column will be in the intertidal zone. Temporary work bridge and equipment platform steel pilings, and bridge falsework supports will be placed in the intertidal zone.

The project will have short-term effects to intertidal habitat from partial shading of due to the temporary work bridge being in place for one year or more. There will be long-term effects to intertidal habitat from the removal of intertidal habitat to accommodate the on-ramp foundation. Removal of the wood wharf and pilings will increase light penetration and habitat productivity. Long-term improvement to water

quality will result from the removal of creosote pilings and the treatment of stormwater runoff that is currently untreated.

## *Mitigation Measures*

See the mitigation measures discussions in the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 51 of this report.

Numerous avoidance, minimization, and conservation measures and best management practices have been included in the project design to mitigate impacts to federally-listed species. The measures are identified in the BA (Anchor 2008), and include:

- Containment booms will be deployed around the work area to contain any floatable debris or spills that may enter the water.
- Timing windows will be followed for in-water work. The in-water work window for Elliott Bay is July 16 through February 14.
- A bubble curtain will be used to reduce underwater sound pressure levels when an impact hammer is used to drive or proof steel piles. The bubble curtain will completely surround the pile and be adequately weighted to keep the bubble ring resting on the sea floor. The pile shall be completely engulfed in bubbles over the full length of the water column at all times when the impact pile driver is in use. A 9 decibel reduction in sound pressure levels is anticipated from use of the bubble curtain.
- Underwater noise during pile driving will be monitored according to accepted methods as described in WSDOT's Underwater Noise Monitoring Plan template.
- Monitoring within of 1.2 miles of the project site will occur for marine mammals during all vibratory and impact pile driving activities. If an orca or Steller sea lion is located, all pile driving activities will stop until the orcas or Steller sea lions have left the area (see Appendix D of the Biological Assessment [Anchor 2008]).
- The last sheet pile to close the cofferdam will be driven at low tide to reduce the potential for fish entrapment. Any fish trapped will be removed following Washington State Department of Transportation Fish Removal Protocol and Standards.
- Heavy equipment will be checked daily for petroleum leaks and repairs made as necessary.

The Admiral's House property is listed in the National Register of Historic Places. A Memorandum of Agreement (FHWA 2011) was prepared with stipulations to account for adverse effect of the Magnolia Bridge project on the historic property. The stipulations include preparation of a "Tree Preservation, Replanting, and Mitigation Planting Plan," based on a pre-construction tree survey, to replace the

limited number of trees and shrubs that must be removed to construct the new bridge and demolish the old bridge. The condition of the new plantings will be monitored during construction. Any plantings that die, are damaged or destroyed within one year after completion of the project will be replaced.

This page is intentionally blank.

# Summary of Findings

---

## Affected Environment

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 55 of this report.

Washington Department of Fish and Wildlife Priority Habitats and Species (PHS) database shows breeding areas for bald eagle, purple martin, peregrine falcon in the study area. PHS-listed marine species and habitats are Dungeness crab, Elliott Bay estuarine habitat, and nearshore estuarine intertidal habitat. The Queen Anne Hill southwest hillside is a PHS-list biodiversity area and corridor.

Federally-listed fish species under the Endangered Species Act (ESA) now include bocaccio (endangered), yelloweye rockfish (threatened), and canary rockfish (threatened). Critical habitat has been designated for Puget Sound steelhead and proposed for bocaccio, yelloweye rockfish, and canary rockfish.

## Impacts

### *Operational Impacts*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 55 of this report.

Operation of the Preferred Alternative will result in a reduction of stormwater pollutants discharging into Elliott Bay. This will provide a water quality benefit to ESA-listed species and fish species with essential fish habitat (EFH) in the project area.

### *Construction Impacts*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on pages 55 and 56 of this report.

Construction of the Preferred Alternative would remove approximately 0.5 acre of forest and approximately 200 square feet of upper intertidal beach habitat. Removal of an existing wood wharf and wall will increase light penetration to about 17,000 square feet of intertidal habitat. This will increase habitat productivity.

The project may have short-term adverse noise and localized turbidity effects on ESA-listed species, but is not likely to adversely affect them. Project effects on PHS-listed habitats will be short-term and localized.

### *Secondary and Cumulative Impacts*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on page 56 of this report.

The Preferred Alternative mainline and eastbound on-ramp will be constructed over an intertidal area of Smith Cove. Nearshore shading will be offset by the removal of

the low-level wood wharf and wall. Light penetration will increase compared to existing conditions and habitat productivity will increase.

## Mitigation Measures

### *Operational Mitigation*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on pages 56 and 57 of this report.

- The Preferred Alternative will daylight a portion of the Smith Cove beach by removing the existing wood wharf between Pier 91 and the West Yard property.
- Stormwater conveyance and treatment facilities will be maintained to achieve basic stormwater treatment parameters for pollutant and TSS removal.

### *Construction Mitigation*

See the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) on pages 57 and 58 of this report.

- Containment booms will be deployed around the work area to contain any floatable debris or spills that may enter the water.
- Timing windows will be followed for in-water work. The in-water work window for Elliott Bay is July 16 through February 14.
- A bubble curtain will be used to reduce underwater sound pressure levels when an impact hammer is used to drive or proof steel piles. The bubble curtain will completely surround the pile and be adequately weighted to keep the bubble ring resting on the sea floor. The pile shall be completely engulfed in bubbles over the full length of the water column at all times when the impact pile driver is in use. A 9 decibel reduction in sound pressure levels is anticipated from use of the bubble curtain.
- Underwater noise during pile driving will be monitored according to accepted methods as described in WSDOT's Underwater Noise Monitoring Plan template.
- Monitoring within of 1.2 miles of the project site will occur for marine mammals during all vibratory and impact pile driving activities. If an orca or Steller sea lion is located, all pile driving activities will stop until the orcas or Steller sea lions have left the area (see Appendix D of the Biological Assessment [Anchor 2008]).
- The last sheet pile to close the cofferdam will be driven at low tide to reduce the potential for fish entrapment. Any fish trapped will be removed following Washington State Department of Transportation Fish Removal Protocol and Standards.

- Heavy equipment will be checked daily for petroleum leaks and repairs made as necessary.
- A “Tree Preservation, Replanting, and Mitigation Planting Plan,” will be prepared to replace the limited number of trees and shrubs that must be removed to construct the new bridge and demolish the old bridge.
- The condition of the new plantings will be monitored during construction.
- Plantings that die, are damaged or destroyed within one year after completion of the project will be replaced.

This page is intentionally blank.

## References

---

The following references are supplemental to the references listed in the draft Wildlife, Fisheries, and Vegetation Discipline Report (2004) included in this report on page 59.

Anchor Environmental, LLC (Anchor). 2008. Biological Assessment. Magnolia Bridge Replacement Project. October 2008.

Anchor QEA, LLC (Anchor). 2009. Magnolia Bridge Replacement Stormwater Effects on Salmonids. Memorandum amending the Biological Assessment (October 2008). May8, 2009.

Anchor QEA, LLC (Anchor). 2012. Elliott Bay Fish Survey Study. Final, April 2012. Submitted to: City of Seattle Department of Transportation. Submitted by: Tetra Tech, Inc.

Anchor QEA, LLC (Anchor). 2014. Biological Assessment Addendum. Magnolia Bridge Replacement Project. Prepared for City of Seattle Department of Transportation. Draft May 2014.

City of Seattle. 2012. Seattle Biological Evaluation. Updated October 2012.

FHWA et al. (FHWA). 2011. Memorandum of Agreement among the Federal Highway Administration, the Department of Navy, the Washington State Historic Preservation Officer, the Washington State Department of Transportation, Pacific Northwest Communities, LLC, and the City of Seattle executed pursuant to 36 CFR 800.6(b)(iv) regarding the Magnolia Bridge Project, City of Seattle, King County, Washington. November 28, 2011.

U.S. Department of Commerce, National Marine Fisheries Service and U.S. Department of the Interior, Fish and Wildlife Service (Services). 2009. Endangered Species Act Informal Consultation and Essential Fish Habitat Consultation letter concluding consultation. October 19, 2009.

This page is intentionally blank.