

## 4.8 Ecosystem Resources

### 4.8.1 Introduction and Regulatory Requirements

An ecosystem is a system formed by the interaction of a community of organisms with its environment (Webster's College Dictionary, 1991). Ecosystems are composed of living organisms, including humans, and the environment they inhabit. Understanding this relationship is basic to the environmental review process and the assessment of impacts on ecosystems. Sound Transit identified vegetation, wetlands, and aquatic habitat in the study area that would support fish and wildlife.

High-value wildlife habitat generally is made up of moderately to mostly vegetated areas consisting of shrubs, forest, and other habitat known to support sensitive wildlife species. Wetland quality was determined using the Washington State Department of Ecology's (Ecology's) *Washington State Wetland Rating System for Western Washington* (Hruby, 2004). High-quality aquatic habitat was identified based on the quality of the riparian habitat and in-stream habitat.

Components of ecosystems are protected by federal, state, and local regulations. Such regulations govern the planning, land use, and management activities that have the potential to affect and influence fish and wildlife species and their habitats within the project vicinity. Key regulations include the following:

- Sections 404, 402, and 401 of the Clean Water Act (CWA)
- Migratory Bird Treaty Act (MBTA)
- International Migratory Bird Treaty Act
- Endangered Species Act (ESA)
- Magnuson-Stevens Fishery Conservation and Management Act (MSA)
- Bald and Golden Eagle Protection Act (Eagle Act)
- Washington State Hydraulic codes
- Washington State Water Pollution Control Act
- Critical Area Ordinances for the Cities of Bellevue, Mercer Island, Redmond, and Seattle
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Management Recommendations
- Coastal Zone Management Act
- Shoreline Management Act (SMA)/local agency Shoreline Master Programs (SMPs)

Sound Transit has prepared the Ecosystems Technical Report (Appendix H3), which covers federal and state threatened, endangered, and species of concern; wildlife and vegetation; wetlands; and aquatic

resources. Sound Transit has also prepared a Biological Assessment to meet ESA requirements. This section summarizes the findings in Appendix H3 and is based on literature research, communication with regulatory agencies, field assessment of resources (where property access was allowed), and preliminary field reconnaissance of resources (where property access was not allowed). Habitat types were studied within the following boundaries:

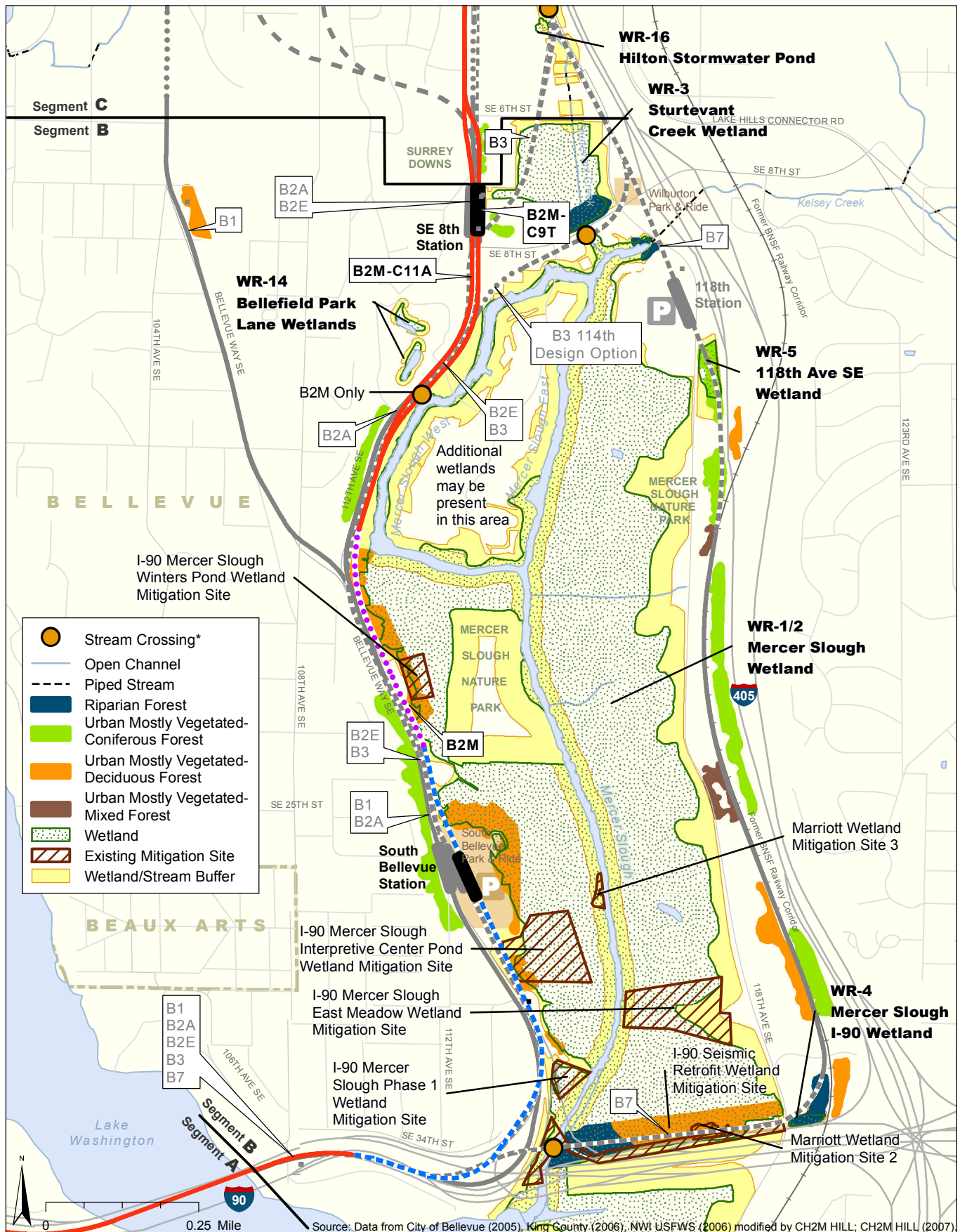
- **Vegetation.** The area within 100 feet of either side of the project alternatives. Vegetation areas were classified and mapped regardless of size or upland/ wetland designation. As a result, the vegetation areas may include upland and/or wetland vegetation, and, therefore, may overlap with wetland areas. This overlap is depicted on Exhibits 4.8-1 through 4.8-4.
- **Wetlands and wetland buffers.** The area within 200 feet of either side of the project alternatives.
- **Aquatic habitat.** A distance extending 100 feet upstream to 300 feet downstream from where project limits cross the stream, and the entire stretch of any stream paralleling the project within 200 feet of the edge of the alternative.

Appendix H3 contains additional detail on methodology, affected environment, impacts, and potential mitigation measures.

### 4.8.2 Affected Environment

The ecosystem evaluation was based on literature reviews; consultation with federal, state, and local agencies and their websites; field work; and aerial mapping. Habitats in the project vicinity have been modified considerably from predevelopment conditions before the arrival of EuroAmerican settlers to the region. Wildlife species present in these modified habitats have adapted to smaller habitat patches and tolerate moderate to high human activity. Areas with lower levels of human activity and larger patches of relatively undisturbed habitat generally support the largest number and highest diversity of wildlife species in the project vicinity.

The areas in the project vicinity that have the largest habitat patches and that support the most wildlife are Lake Washington; Mercer Slough Nature Park; aquatic and terrestrial habitats associated with streams described in Section 4.8.2.3; and larger patches of deciduous, coniferous, and mixed forests that occur along Segments B, D, and E. A number of these forested areas border the study area and extend for several hundred feet parallel and perpendicular to the alternatives.



- Stream Crossing\*
- Open Channel
- Piped Stream
- Riparian Forest
- Urban Mostly Vegetated-Coniferous Forest
- Urban Mostly Vegetated-Deciduous Forest
- Urban Mostly Vegetated-Mixed Forest
- Wetland
- Existing Mitigation Site
- Wetland/Stream Buffer

**Preferred Alternative**

- At-Grade Route
- Elevated Route
- Retained-Cut Route
- Retained-Fill Route
- Tunnel Route

**Other Alternatives**

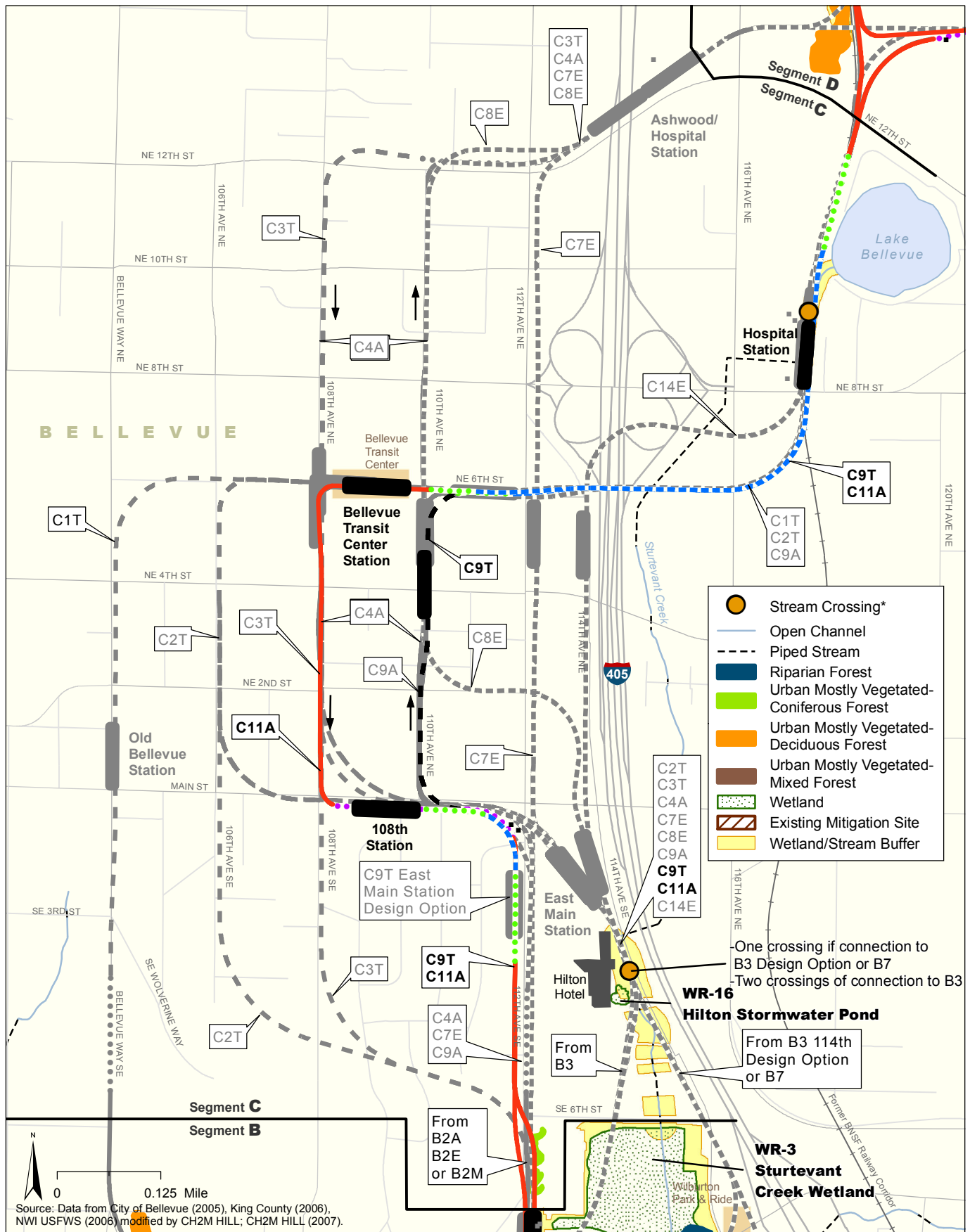
- At-Grade Route
- Elevated Route
- Retained-Cut or Retained-Fill Route
- Tunnel Route

**Legend**

- Traction Power Substation
- Proposed Station
- City Limits

\* See definition of stream crossing in notes to Table 4.8-5

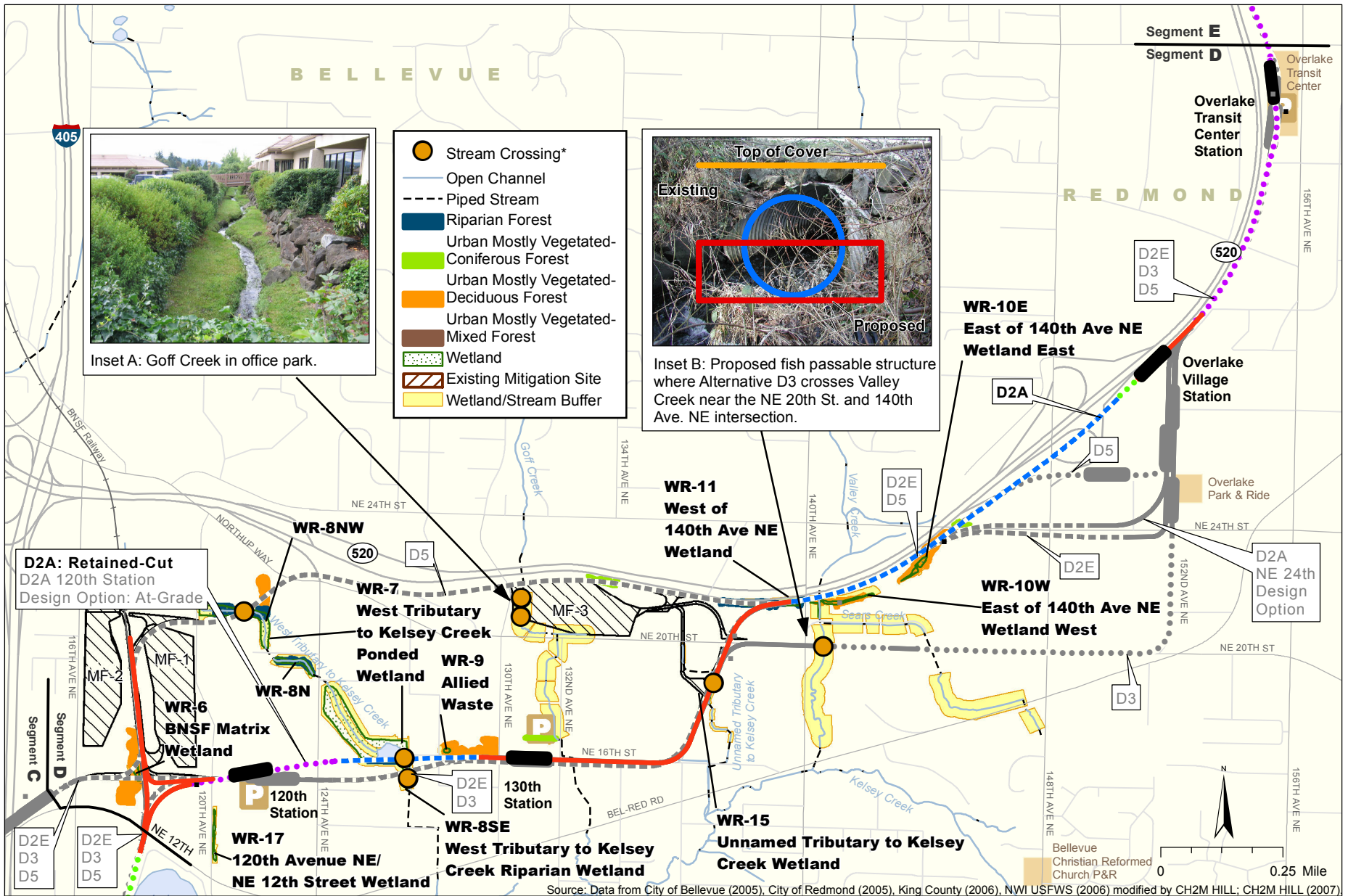
**Exhibit 4.8-1 Vegetation/High-Value Wildlife Habitat, Aquatic Habitat, and Wetlands, Segment B East Link Project**



- Preferred Alternative**
- At-Grade Route (Red line)
  - Elevated Route (Blue dashed line)
  - Retained-Cut Route (Purple dotted line)
  - Retained-Fill Route (Green dotted line)
  - Tunnel Route (Black dashed line)
- Other Alternatives**
- At-Grade Route (Grey dashed line)
  - Elevated Route (Black dashed line)
  - Retained-Cut or Retained-Fill Route (Black dotted line)
  - Tunnel Route (Black dashed line)

- Traction Power Substation (Black square)
  - Proposed Station (Black rectangle)
  - City Limits (Yellow outline)
- \* See definition of stream crossing in notes to Table 4.8-5

**Exhibit 4.8-2 Vegetation/High-Value Wildlife Habitat, Aquatic Habitat, and Wetlands, Segment C East Link Project**



Source: Data from City of Bellevue (2005), City of Redmond (2005), King County (2006), NWI USFWS (2006) modified by CH2M HILL; CH2M HILL (2007)

**Preferred Alternative**

- At-Grade Route
- Elevated Route
- Retained-Cut Route
- Retained-Fill Route
- Tunnel Route

**Other Alternatives**

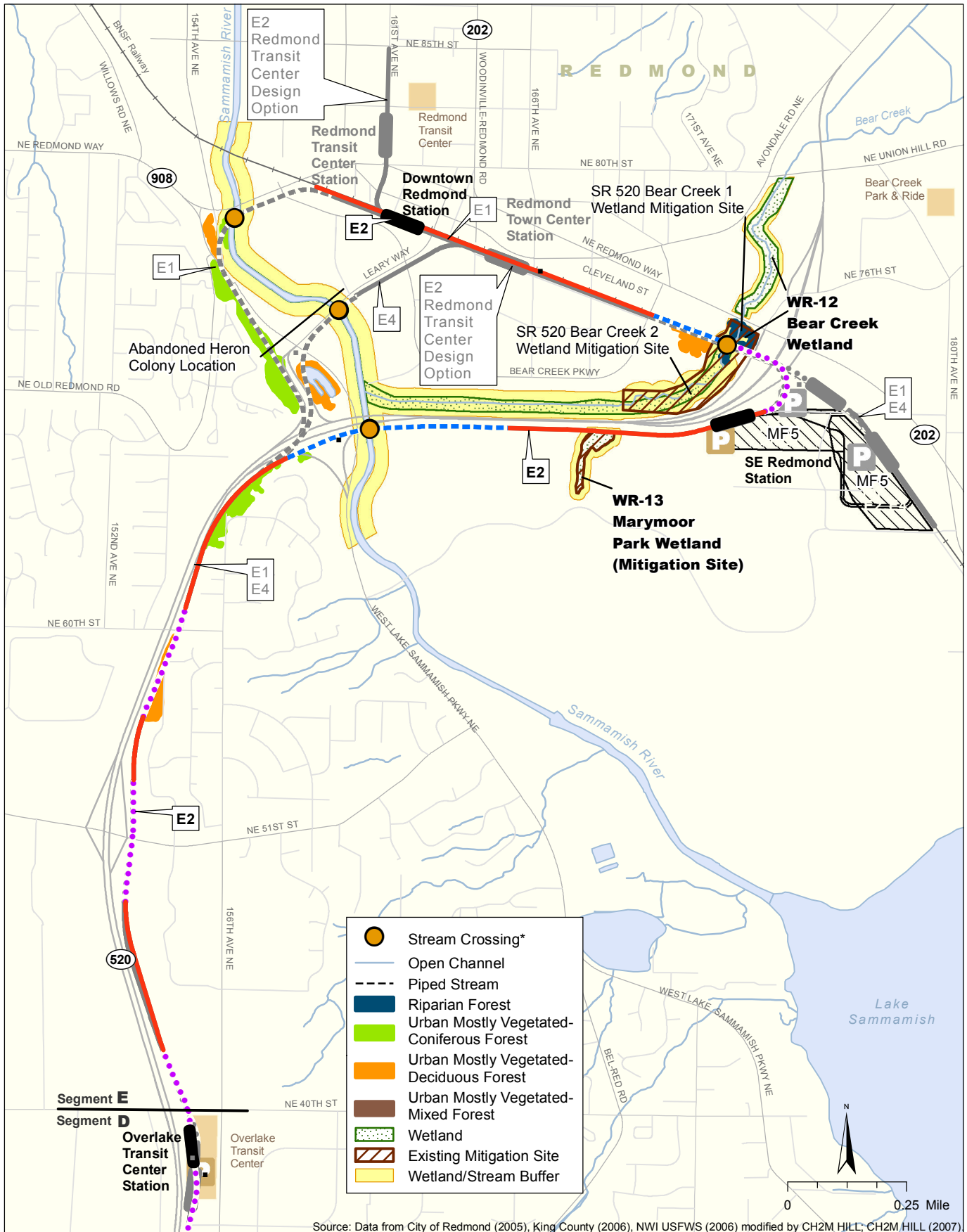
- At-Grade Route
- Elevated Route
- Retained-Cut or Retained-Fill Route
- Tunnel Route

**Legend:**

- Traction Power Substation
- Proposed Station
- Maintenance Facility
- City Limits

\* See definition of stream crossing in notes to Table 4.8-5

**Exhibit 4.8-3 Vegetation/High-Value Wildlife Habitat, Aquatic Habitat, and Wetlands, Segment D East Link Project**



- Preferred Alternative**
- At-Grade Route
  - Elevated Route
  - ... Retained-Cut Route
  - ... Retained-Fill Route
  - Tunnel Route

- Other Alternatives**
- At-Grade Route
  - Elevated Route
  - ... Retained-Cut or Retained-Fill Route
  - Tunnel Route

- Traction Power Substation
- Proposed Station
- ▨ Maintenance Facility
- City Limits

\* See definition of stream crossing in notes to Table 4.8-5

**Exhibit 4.8-4 Vegetation/High-Value Wildlife Habitat, Aquatic Habitat, and Wetlands, Segment E East Link Project**

The following subsections describe the habitat types that are found in the study area and discuss these habitat types by project segment. These habitat types were assessed by applying classification systems specific to the habitat type and as they relate to the likely presence of one or more threatened and/or endangered species or species protected by local critical areas ordinances. This section describes habitats in terms of vegetation types, wetlands, and aquatic resources.

**4.8.2.1 Vegetation/High-Value Habitat**

Non-aquatic ecosystems typically are defined by vegetation types. The study area crosses through highly urbanized environments with some key pockets of natural vegetation and water bodies. Pockets of vegetation and habitat types in the study area were classified following a system that was used for Sound Transit’s Central Link Project. This system was modified from the King County (1987) Wildlife Habitat Profile

(Sound Transit, 1999) and categorizes vegetation in terms of high, moderate, and low value as wildlife habitat.

Vegetation types in the study area were characterized as shown in Exhibits 4.8-1 through 4.8-4. These vegetation types are also designated by WDFW as priority habitats and are known to support federal and state threatened and endangered species. Segment A is not included in the exhibits because Lake Washington is the only high-value habitat in that segment.

Low- and moderate-value habitat types are not shown because the habitats are either too narrow to sustain wildlife species or the vegetation types do not readily support federal or state priority species.

The following urban vegetation types with **high-value habitat** are found in the study area:

- Wetlands (wetlands are defined below)
- Coniferous forests, typically containing Douglas-fir, hemlock, and red cedar

- Deciduous forests, including big-leaf maple, black cottonwood, and red alder
- Mixed coniferous and deciduous forests
- Riparian forest, including big-leaf maple, black cottonwood, red alder, and willow, located adjacent to water bodies

These high-value habitats and/or the species they support are often regulated by local Critical Areas Ordinances and state and federal laws and regulations.

**4.8.2.2 Wetlands and Wetland Buffers**

Seventeen wetlands were identified in the study area. Wetlands are shown in Exhibits 4.8-1 through 4.8-4 and described in Table 4.8-1. There are no wetlands within the defined Segment A study area. In general, wetlands in the study area have been altered and are surrounded by urban and residential environments.

Wetlands are defined by soil characteristics, the presence or absence of hydrology, and dominance of vegetation adapted to wet environments. Many wetlands and aquatic habitats in the study area are considered jurisdictional waters, including wetlands of the United States by the U.S. Army Corps of Engineers (USACE), and are protected under the CWA Section 404. These wetlands require a permit from the USACE for any discharge of dredged or fill material into waters of the United States.

Generally, wetlands provide wildlife habitat, but they can be further classified in terms of the level of wildlife/biological habitat, hydrologic, and water quality function they provide. Sound Transit categorized and classified wetlands using Ecology’s *Washington State Wetland Rating System for Western Washington* (Hruby, 2004). Local jurisdictions in the study area have adopted Ecology’s rating system without modification. Wetland buffers, as defined by the state or specific local jurisdiction regulating the wetland, were also identified.

Various levels of wetland functions have been identified in the study area. The wetland rating system (Hruby, 2004) defines three main wetland functional categories: water quality, hydrologic, and habitat. The degree to which several functions are performed by a wetland (e.g., enhancing water quality, reducing floods, and providing fish and wildlife habitat) result in a higher category assignment, with Category 1 (I) offering the highest function and Category 4 (IV) offering the lowest. The assessments used for these ratings can be found Appendix H3.

Habitat Value
Terrestrial plant communities, wetlands, and aquatic systems such as streams provide a variety of functions in the environment. The value of these functions is determined by the habitat’s ability to support the needs of biological species. High-value habitats are those that support or may support threatened, endangered, and/or sensitive species as determined by the federal, state, and local jurisdictions. For instance, wetlands generally offer high habitat value because they provide many functions, such as water quality improvement, groundwater recharge, nutrient and sediment filtering, habitat for a variety of animals, and education and recreation opportunities for people.

TABLE 4.8-1  
Summary of Wetlands Located in the Study Area

Locator	Wetland	Location	Category <sup>a</sup>	Acreage
WR-1/2	Mercer Slough Wetland (includes numerous existing mitigation sites; see Exhibit 4.8-1)	Mercer Slough	2	301
WR-3	Sturtevant Creek	Mercer Slough	2	12.2
WR-4	Mercer Slough I-90	Mercer Slough	4	0.5
WR-5	118th Avenue SE	Mercer Slough	2	1.5
WR-6	BNSF Matrix	Former BNSF Railway corridor at NE 12th Street	3	0.2
WR-7	West Tributary to Kelsey Creek Poned	West Tributary Kelsey Creek	3	5.8
WR-8 NW	West Tributary to Kelsey Creek Riparian	West Tributary Kelsey Creek	3	2.1
WR-8 N	West Tributary to Kelsey Creek Riparian	West Tributary Kelsey Creek	3	0.5
WR-8 SE	West Tributary to Kelsey Creek Riparian	West Tributary Kelsey Creek	3	0.5
WR-9	Allied Waste	NE 15th Place	3	0.1
WR-10E	East of 140th Ave NE: Eastern	SR 520 east of 140th Avenue NE	4	0.2
WR-10W	East of 140th Ave NE: Western	SR 520 at Valley Creek	2	0.4
WR-11	West of 140th Avenue NE	SR 520 at 140th Avenue NE	3	0.3
WR-12	Bear Creek	Bear Creek	2	25
WR-13	Marymoor Park	Marymoor Park	3	2.0
WR-14	Bellefield Park Lane	Mercer Slough	4	1.0
WR-15	Unnamed Tributary to Kelsey Creek	Kelsey Creek Tributary	4	0.1
WR-16	Hilton Stormwater Pond	Sturtevant Creek	3	0.2
WR-17	120th Avenue NE and NE 12th Street Wetland	120th Avenue NE and NE 12th Street Wetland	3	0.2

<sup>a</sup> Category is based on Ecology's rating system (Hruby, 2004), which the Cities of Bellevue and Redmond adopted without modification.

#### 4.8.2.3 Aquatic Habitat

One lake and 10 streams were identified in the study area. Lake Washington is the second largest natural lake in the state and the largest lake in King County. It is fed by the Sammamish River at its north end and the Cedar River at its south. Lakes are most often classified based on their productivity: the amount of algae and aquatic plants that the lake can support. They also may be classified based on size or hydrology (drainage), plant or animal communities, or the way humans use them (water supply, recreation, amount of development, and navigation). Lake Washington is classified as oligotrophic (low biological productivity) (King County, 2010). Streams in the study area (defined as a body of water with a current, confined within a bed and stream banks) were classified based on existing conditions using King County, Washington Department of Natural Resources (WDNR), City of Bellevue, and City of Redmond classification systems. The classification systems are described in more detail

in Appendix H3. Each of these classification systems are based on channel width, flow rate, flow regime, and presence or absence of salmonids. Each system is very similar to the others but has different category names.

Table 4.8-2 identifies and describes water bodies located in the study area and lists those most likely to support salmonids (salmon and trout). There is no nontribal commercial fishing in the aquatic study area. Sound Transit consulted with the Muckleshoot Tribe about Usual and Accustomed Treaty Rights that provide the tribe with unique fishing, hunting, and gathering rights. The Tribe expressed concern about impacts of the project on their fishery on Lake Washington, the Lake Washington Ship Canal, and outside of the Hiram Chittenden (Ballard) Locks. In the recent past, this fishery has been used for sockeye salmon (*Oncorhynchus nerka*). In the future, however, other fisheries might be opened by the Pacific Fishery Management Council in association with the Western Washington Treaty Tribes.

TABLE 4.8-2  
Water Bodies, Aquatic Habitat Quality, and Aquatic Species in the Study Area

Water Body	Aquatic Habitat Quality	Aquatic Species Present	Comments
<b>Segment A, Interstate 90</b>			
Lake Washington	Good, although there are recorded longer, warmer stratification periods linked to declines of key organisms in the food chain that salmonids depend on. Some areas of spawning habitat for sockeye salmon.	Chinook, steelhead, sockeye, coho, bull trout, rainbow and cutthroat trout, smallmouth bass, yellow perch, peamouth, river lamprey, and western toad.	A regionally important lake and designated as a shoreline of statewide significance. An important migratory corridor for Chinook.
<b>Segment B, South Bellevue</b>			
Mercer Slough	Poor; lack of riffles and gravel and high summer temperature. No spawning habitat for salmonids.	Chinook, sockeye, steelhead, and coho pass through to spawn in Kelsey Creek; smallmouth bass.	Chinook gather in the mouth of Mercer Slough under I-90 crossing. All salmonids destined for Kelsey Creek pass through Mercer Slough.
Kelsey Creek	Poor spawning and rearing habitat. Habitat has been degraded by clearing and urban development.	Chinook, sockeye, coho, steelhead, and sea-run cutthroat; peamouth spawning.	Largest stream in Bellevue. This is an urban stream of regional significance due to high presence of Chinook. Urbanized area results in a rapidly fluctuating flow regime. An important migratory corridor for Chinook.
Sturtevant Creek	Poor spawning and rearing habitat. Habitat has been degraded by logging and urban development. All tributary inflows are through piped systems.	Chinook and sockeye up to the impassable culvert at I-405; peamouth spawning.	Urbanized area results in a rapidly fluctuating flow regime.
<b>Segment C, Downtown Bellevue</b>			
Sturtevant Creek	Fair to good spawning and rearing habitat.	Chinook and sockeye up to impassable culvert at I-405. Peamouth spawning.	Urbanized area results in a rapidly fluctuating flow regime.
<b>Segment D, Bel-Red/Overlake</b>			
West Tributary to Kelsey Creek	Poor spawning but good rearing habitat. Habitat has been degraded by urban development.	Chinook, sockeye, coho, steelhead and cutthroat below Bel-Red Road.	Pacific giant salamander documented. Impassable culvert at Bel-Red Road.
Goff Creek	Fair to poor spawning and rearing habitat depending on reach.	Chinook and sockeye salmon below Bel-Red Road; cutthroat trout.	Urbanized area results in a rapidly fluctuating flow regime. Impassable culvert at Bel-Red Road.
Unnamed tributary to Kelsey Creek	Poor spawning and rearing habitat. Very small	None known to use this tributary.	Very small, ditch-like at crossing. Urbanized area and low intermittent flow regime.
Valley Creek	Poor to good spawning and rearing habitat depending on reach.	Sockeye (historically), Chinook, steelhead, coho, and cutthroat trout.	Urbanized area results in a rapidly fluctuating flow regime.
Sears Creek	Fair spawning and rearing habitat because of some presence of pools and clean gravel riffles.	Known use by Chinook, coho, and cutthroat trout up to the NE 20th Street culvert.	Urbanized area results in a rapidly fluctuating flow regime. Most of drainage is piped.
<b>Segment E, Downtown Redmond</b>			
Sammamish River	Highly degraded with very little spawning and poor rearing habitat, limited riparian vegetation, high summer temperatures.	Migratory corridor use by Chinook, coho, and kokanee (resident sockeye); steelhead; cutthroat trout.	No spawning. On the State 303(d) list for high temperatures. Sammamish River provides a critical migratory corridor for salmon returning to Bear Creek.
Bear Creek	Overall good spawning and rearing habitat quality.	Chinook, coho, sockeye, and kokanee salmon; steelhead; and cutthroat trout. All spawn in Bear Creek.	Identified as one of the top six natural resource basins in King County. There is a major watershed planning effort for this watershed. Classified as a shoreline of statewide significance. An important migratory corridor for Chinook.



#### 4.8.2.4 Threatened and Endangered Fish and Wildlife Species, Species of Concern, and WDFW Priority Species

Sound Transit searched the WDFW's PHS database (2010) for priority species within one-half mile from the outermost routes, which is the widest impact analysis area required for any listed species. No priority plant species were found within the study area. The only federal or state threatened or endangered species known to exist in the study area are Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), coastal-Puget Sound bull trout (*Salvelinus confluentus*), and Puget Sound steelhead (*Oncorhynchus mykiss*). During the nonbreeding season, marbled murrelets (*Brachyramphus marmoratus*) are rare visitors to Lake Washington. They have been observed on the lake in the past but have only been documented once in the past 50 years. Additionally, WDNR requires the submittal of a Bald Eagle Management Plan (WAC 232-12-292) if a bald eagle (*Haliaeetus leucocephalus*) nest is found within one-half mile of the construction limits.

Table 4.8-3 lists all federal endangered, threatened, and candidate species and state endangered, threatened, and sensitive species likely to occur in the study area. This assessment includes research of the existing habitat types that would support these species and investigates known species-sighting locations.

In addition to the listings in Table 4.8-3, a large number of state-monitored species also occur within the project vicinity. WDNR monitors other species for which there is no current protection mandated. Particularly in wetlands and water bodies, many of these species are known to occur within the project vicinity, including the following birds: osprey (*Pandion haliaetus*), red-necked grebe (*Podiceps grisegena*), horned grebe (*Podiceps auritus*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), turkey vulture (*Cathartes aura*), and black tern (*Chlidonias niger*), black swift (*Cypseloides niger*), and Vaux's swift (*Chaetura vauxi*). Also, the Monarch butterfly (*Danaus plexippus*), Dreamy duskywing (*Erynnis icelus*), and Townsend's big-eared bat (*Corynorhinus townsendii*) are state-monitored species that are likely present within the study area.

In addition to federal and state species of concern, the local jurisdictions' Critical Areas Ordinances were considered. The following summarizes applicable ordinances within the study area:

- **Section 198 of the King County Comprehensive Plan** requires the county to protect the active breeding sites of these species, as well as the

immediate area surrounding each site to prevent any disturbance to breeding activities. The species include the bald eagle, great blue heron, osprey, peregrine falcon (*Falco peregrinus*), northern spotted owl (*Strix occidentalis*), marbled murrelet, Townsend's big-eared bat, Vaux's swift, red-tailed hawk (*Buteo jamaicensis*), and goshawk (*Accipiter gentilis*).

- **The City of Mercer Island Comprehensive Land Use Plan** includes Ordinance No. 05C-12, which details its critical areas regulations. To streamline its critical areas regulations, the City of Mercer Island adopted WDFW's Priority Habitat and Species program in its entirety in 1998.
- **Bellevue's Land Use Code 20.25H.025** requires any habitat associated with a species of local importance to be designated a critical area. Furthermore, if a habitat associated with a species of local importance is impacted by a proposed development, the proposal shall implement the WDFW wildlife management recommendations designed for that species. If the habitat does not include a critical area or critical area buffer but is occupied by a locally important species, then only the guidelines in the wildlife management recommendations need to be followed. Species of local importance in Bellevue are numerous and are listed in Table 4.8-3.
- **The City of Redmond's Critical Areas Ordinance** (Ordinance No. 2259) applies species protection to State Species of Concern, Priority Species designated by WDFW, and locally important species. The only locally important species is the great blue heron.

#### 4.8.2.5 High-Value Habitats, Wetlands, and Aquatic Habitats Supporting Species of Concern

This subsection provides a general description of wetland, aquatic, and high-value upland habitats that support the species listed in Table 4.8-3 for each segment. Also, to the extent available, it provides information on species-of-concern sightings that was obtained through data research, interviews with regulatory representatives, and field surveys. The following descriptions do not include ESA protocol surveys and, therefore, do not provide a complete reconnaissance of present species of concern. For the following federally listed species (marbled murrelet, Chinook salmon, steelhead, and bull trout), critical habitat is noted if designated as such in Table 4.8-3.

**TABLE 4.8-3**  
Federal and State Species of Concern, Including Threatened and Endangered, Found in Western Washington; Locally Important Wildlife; and Potential Occurrence in East Link Study Area

Name	Federal/State Status <sup>a</sup>	Bellevue Species of Local Importance	Presence, Preferred Habitat, and Probable Location in Study Area
<b>Birds</b>			
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Federal species of concern and state monitored	Yes	<b>Known in the study area.</b> Closely associated with lakes and large rivers with mature trees. Nest near open water in late successional (i.e., mature) forest and occur in areas with low to relatively high levels of human disturbance. Wintering populations are found throughout the Puget Sound region. Bald eagles are sighted in Segments A, B, C, and E.
Marbled murrelet ( <i>Brachyramphus marmoratus</i> )	Federal and state threatened	No	<b>Extremely rare in the study area.</b> Requires conifer forests with trees more than 28 inches in diameter at breast high with platforms for nesting. Spends the winter in marine waters offshore. Rare and infrequent visitors to Lake Washington during the nonbreeding season. Only observed once in the last 50 years on Lake Washington. Only potentially in Segment A. Critical Habitat: None present in the study area.
Peregrine falcon ( <i>Falco peregrinus</i> )	Federal species of concern and state monitored	Yes	<b>Likely present in the study area.</b> Far-ranging flier that nests and roosts on cliffs and, in cities, on bridges and ledges of tall buildings. In winter, peregrine falcons can be found in the southwestern portion of Puget Sound and lowlands in western Washington. Sightings and potential viable habitat in Segments A, B, C, and E.
Pileated woodpecker ( <i>Dryocopus pileatus</i> )	State candidate	Yes	<b>Known in the study area.</b> Typically found in forests with a component of dead and dying trees and snags for foraging and nesting. Found at Marymoor Park and throughout the study area. One bird observed near I-405 south of SE 8th Street. Likely habitat along BNSF Alternative (B7) and Preferred Marymoor Alternative (E2) due to larger clusters of larger trees and snags.
Purple martin ( <i>Progne subis</i> )	State candidate	Yes	<b>Known in the study area.</b> Nests in structures over water bodies, including natural cavities, pilings, and manmade housing structures. Forages over open water or wet areas for insects while in flight. Nesting observed at Marymoor Park in 2003 (Preferred Alternative E2), but no activity since. Habitat may also be present in Segment B as well.
Western grebe ( <i>Aechmophorus occidentalis</i> )	State candidate	Yes	<b>Known in the study area.</b> Nests in colonies numbering up to several hundred birds east of the Cascade Mountain range and is a winter resident on Lake Washington and Puget Sound. The highest likelihood of occurrence is in Segment A.
Merlin ( <i>Falco columbarius</i> )	State candidate	Yes	<b>Likely present in the study area.</b> Seen during the nesting season at Marymoor Park. Commonly found throughout western Washington, including urban areas, in winter and during migration. May occur in Segments A, B, D, and E.
Olive-sided flycatcher ( <i>Contopus borealis</i> )	Federal species of concern	No	<b>Likely present in the study area.</b> Breeds in coniferous forests in North America. Common in most forest openings throughout Washington and sometimes found in city parks or suburban areas, especially during migration. Potential habitat in Segments B and E.
Willow flycatcher ( <i>Empidonax traillii</i> )	Federal species of concern	No	<b>Known in the study area.</b> Breeds in deciduous thickets, especially in willow thickets. Nest sites are often close to water. Present in Segments B and E.
Great blue heron ( <i>Ardea herodias</i> )	-	Yes	<b>Known in the study area.</b> Nests in small- to medium-sized colonies ranging from 3 to 30 nests. Colonies usually in secluded deciduous forests but can adapt to some levels of disturbance gradually over time. Will use conifer forests occasionally. Colonies often less than 1 mile away from wetland or large water bodies. Listed due to its sensitivity to disturbances and dependence on wetlands, wet meadows, and water bodies.
Red-tailed hawk ( <i>Buteo jamaicensis</i> )	-	Yes	<b>Known in the study area.</b> Found in areas with a mix of forests and open spaces, including agricultural land, grasslands, wetlands, and meadows. Small mammals, especially rodents, are their primary prey.
Osprey ( <i>Pandion haliaeetus</i> )	-	Yes	<b>Known in the study area.</b> Nests in exposed trees or platforms that provide a clear, unobstructed view of surrounding area. Nests close to large bodies of water. Territorial. Several known active nests and territories in Segments B, C, and E.
Common loon ( <i>Gavia immer</i> )	-	Yes	<b>Known in the study area.</b> Population has declined due to acid rain, pollution, industrial contamination of water bodies, and lead poisoning. Artificial floating nesting platforms have reduced the negative impact of fluctuating water levels from human activities to nests.
Green heron ( <i>Butorides virescens</i> )	-	Yes	<b>Known in the study area.</b> Breeds in small wetlands on a platform-built nest that is either in a tree or shrub, close to the water. Feeds on small fish, insects, and amphibians. Nests at Marymoor Park.
Vaux's Swift ( <i>Chaetura vauxi</i> )	-	Yes	<b>Known in the study area.</b> Nests and forages in groups with 30 or more birds. Nest is a cup-shaped nest placed in a dark, confined cavity. Breeds in mountains and foothills, usually more than 700 meters in elevation. Forages over wooded areas and more open habitats, including towns.

TABLE 4.8-3 CONTINUED

Federal and State Species of Concern, Including Threatened and Endangered, Found in Western Washington; Locally Important Wildlife; and Potential Occurrence in East Link Study Area

Name	Federal/State Status <sup>a</sup>	Bellevue Species of Local Importance	Presence, Preferred Habitat, and Probable Location in Study Area
<b>Mammals</b>			
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	-	Yes	<b>May occur in the study area.</b> Areas with a mosaic of woodland/grassland and/or shrub land, especially coniferous mosaics. Found in Pierce County, Fort Lewis.
Keen's myotis ( <i>Myotis keenii</i> )	-	Yes	<b>Unlikely to occur in the study area.</b> Keen's myotis has one of the most limited ranges of any bat species in North America. Habitat use is restricted to dense forests with old growth characteristics. Range is limited to the Olympia Peninsula and low elevation conifer forests in Puget Sound region.
Long-legged myotis ( <i>Myotis volans</i> )	-	Yes	<b>May occur in the study area.</b> Occurs in forested areas statewide. Prefers mountainous, coniferous forests. Often found along forest edges, can occur at high elevations in cool, wet forests.
Long-eared myotis ( <i>Myotis evotis</i> )	-	Yes	<b>May occur in study area.</b> Found in wooded areas statewide; however, it is most common in eastern Washington lodgepole pine forests. Does occur in humid coastal forests with good ground cover. Will occur in any forested habitat except those with no ground cover or in mid-to-high density developments.
<b>Amphibian and Reptile</b>			
Western toad ( <i>Bufo boreas</i> )	Federal species of concern/ state candidate	Yes	<b>Known in the study area.</b> Found in Lake Washington (Segment A) and possibly other water bodies in the study area. May also be present in Segments B, D, and E.
Oregon spotted frog ( <i>Rana pretiosa</i> )	-	Yes	<b>Unlikely to occur in the study area.</b> Highly aquatic amphibian, usually found in or near permanent bodies of still water 9 acres in size or more, including lakes, marshes, and wetlands, and vegetated, slow-flowing perennial streams. Population has experienced heavy declines in the last 20 years. In 1997, only three known populations remained in Washington.
Western pond turtle ( <i>Clemmys marmorata</i> )	-	Yes	<b>Unlikely to occur in the study area.</b> The western pond turtle is a highly aquatic turtle that has been extirpated from almost all of its Washington range. The Washington population consists of a few isolated and scattered populations. The range historically included streams, ponds, lakes, and permanent and ephemeral wetlands throughout the Puget Sound lowlands.
<b>Fish</b>			
Puget Sound Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )	Federal threatened/ state candidate	Yes	<b>Known in the study area.</b> Found in Lake Washington, Sammamish River, and Bear Creek, Mercer Slough, Kelsey Creek, West Tributary to Kelsey Creek, Goff Creek, Valley Creek, and Sears Creek. Found in Segments A, B, D, and E. Critical Habitat: Present in all of the waters listed above.
Puget Sound-Strait of Georgia coho salmon ( <i>Oncorhynchus kisutch</i> )	Federal species of concern	Yes	<b>Known in the study area.</b> Found in Lake Washington, Sammamish River, and Bear Creek, Mercer Slough, Kelsey Creek, West Tributary to Kelsey Creek, Goff Creek, Valley Creek, and Sears Creek. Found in Segments A, B, D, and E.
Puget Sound Steelhead trout ( <i>Oncorhynchus mykiss</i> )	Federal threatened	No	<b>Known in the study area.</b> Found in Lake Washington. Presumed to be present in Mercer Slough, Kelsey Creek and its tributaries, Sammamish River, and Bear Creek. Possibly present in Sturtevant Creek. Found in Segments A, B, D, and E. Critical Habitat: Not designated at this time.
Coastal-Puget Sound bull trout ( <i>Salvelinus confluentus</i> )	Federal threatened/ state candidate	Yes	<b>Known in the study area.</b> Found in Lake Washington, and possibly in Sammamish River and Bear Creek, but rare in all cases. Found in Segment A, and possibly in Segment E. Critical Habitat: Limited to only Lake Washington within the study area.
River lamprey ( <i>Lampetra fluviatilis</i> )	Federal species of concern/ state candidate	Yes	<b>Known in the study area.</b> Found in Mercer Slough, Kelsey Creek, Sammamish River, and Bear Creek. Found in Segments A, B, and E.

<sup>a</sup> Washington species of concern include only native Washington fish and wildlife species that are listed as endangered, threatened, or sensitive, or as candidates for these designations as established in the Washington Administrative Code.

Source: (Csuti et al., 2001; Friends of Marymoor Park, 2009; Kaufman and Brock, 2003; Opler and Wright, 1999; Seattle Audubon Society, 2009; Sibley, 2000; Stebbins, 2003; UFWFS, 2009; WDFW, 2009; Wahl et al., 2005)

### Segment A

Lake Washington is an important water body for aquatic and avian species. Bald eagles, osprey, peregrine falcons, and great blue heron use the lake as foraging grounds. WDFW recorded that three peregrine falcon nests are located within one-half mile of the study area. One is located under the I-90 floating bridge across Lake Washington just above the Seattle shoreline, and the second one is located under the East Channel bridge on the Mercer Island side. During a field visit in March 2007, project biologists were unable to locate either of the nests. The Washington State Department of Transportation (WSDOT) indicates there has not been a recorded successful nest under the I-90 floating bridge for the past 2 years. The nest under the East Channel bridge has been successful for the past 3 to 4 years, and is expected to remain successful as long as the adults live. A third nest is located in Downtown Bellevue (WDFW PHS database, 2010). There are no communal bald eagle roosts, winter concentration areas, or buffers for such areas within one-half mile of any of the proposed project components in Segment A. However, five active eagle territories are located within one-half mile of *Preferred Interstate 90 Alternative (A1)*. Of these, three nests were known to be active, with incubating adults roosting outside the study area in April 2007. Chinook, sockeye, and coho salmon (*Oncorhynchus kisutch*), steelhead, cutthroat, and bull trout are known to occur in Lake Washington. Table 4.8-4 shows their residence period in the lake and in the particular streams in the study area where these species are known to spawn.

### Segment B

High-value wildlife habitats (as described in Section 4.8.2.1) are associated with Mercer Slough in Segment B. Mercer Slough serves as a migratory corridor for anadromous salmonids from Lake Washington to reach several streams (Kelsey and Sturtevant Creeks). Mercer Slough Nature Park is the largest freshwater wetland remaining along the shores of Lake Washington. Although not identified during field survey efforts, additional wetlands may be present in the Bellefield Office Park. Several existing wetland mitigation sites are located in the Mercer Slough (see Exhibit 4.8-1). The park encompasses 320 acres and is composed of herbaceous, scrub-shrub, and forested wetland; upland forest; meadows; and a blueberry farm. However, noxious and invasive weeds (such as Japanese knotweed, purple loosestrife, reed canarygrass, and Himalayan blackberry) are invading the wetlands and/or buffers. Red-tailed hawks (*Buteo jamaicensis*) are regularly seen and known to nest in the Mercer Slough Nature Park.

TABLE 4.8-4  
Anadromous Salmonids in Lake Washington

Species	Time Period in Lake Washington	Spawning Streams
Summer and fall Chinook salmon	Adults, June to mid-December; smolts, March to July	Cedar River, North Creek, May Creek, Little Bear Creek, Swamp Creek, Kelsey Creek and tributaries, Bear Creek, Issaquah Creek. All are part of designated critical habitat.
Steelhead trout	Adults, December through April; smolts, April and May	Tributary streams and rivers including Bear Creek. Critical habitat not designated.
Bull trout	A few fish documented in the lake each year	Unknown if bull trout spawn in the Lake Washington system. Designated critical habitat limited to Lake Washington only.
Coho salmon	Adults, August to February; smolts, March through June	Too many to list. Most tributaries except the smallest. Issaquah Hatchery
Sockeye salmon	Adults, April to mid-December; fry, juveniles, and smolts, all year	Cedar River, Kelsey Creek and tributaries, North Creek, Little Bear Creek, Bear Creek, and Issaquah Creek
Sea-run cutthroat trout	Adults, April and May; smolts, March through July	Too many to list. Most tributaries except the smallest

The City of Bellevue indicated that there was a historic heron rookery in Mercer Slough Nature Park, but the rookery is no longer active. However, great blue heron are sighted in the Mercer Slough vicinity (City of Bellevue, 2008).

North of Mercer Slough Nature Park is the Sturtevant Creek Wetland, through which Sturtevant Creek flows. Signs of recent beaver activity have been observed. Habitat is limited by the surrounding roads, office buildings, parking lots, and a new hotel. Noxious and invasive weeds (such as reed canarygrass and Himalayan blackberry) are invading this wetland and its buffers.

### Segment C

There is minimal wildlife habitat available in Segment C; however, an osprey nest is located less than one-half mile west of Downtown Bellevue. Lake Bellevue is located east of the former BNSF Railway corridor just east of Overlake Hospital. This lake offers minimal habitat value because the only fish known to exist in the lake are goldfish, vegetation is sparse, the bottom is silt and organic material, and dense development surrounds the lake. Sturtevant Creek leaves Lake Bellevue as a featureless glide in the ditch

alongside the tracks in the former BNSF Railway corridor. Riparian vegetation is sparse and mostly grasses or blackberries but also includes some cottonwood and willow trees near Lake Bellevue. The channel substrate composition consists of sand and silt, and habitat quality is poor. Sturtevant Creek is in a pipe system for much of the reach between NE 8th Street and the I-405 crossing. The stream is blocked to fish passage at the I-405 culvert next to the Hilton Hotel.

While most of Sturtevant Creek has minimal habitat value, the short reach adjacent to the Hilton Hotel (shown on Exhibits 4.8-1 and 4.8-2 as Hilton Stormwater Pond), north of the SE 6th Street crossing, has good in-stream habitat because there are pools and riffles with moderately clean gravel; this is virtually the only usable spawning habitat in Sturtevant Creek for salmonids.

#### Segment D

There are nine wetlands with varying habitat value in this segment. High-value habitats, including a riparian wetland, are located along the West Tributary to Kelsey Creek, along State Route (SR) 520 (some vegetated strips), and along portions of Valley Creek. Lower reaches of Goff Creek and the West Tributary to Kelsey Creek support salmonid spawning, while culverts in the middle reaches block fish passage. Valley Creek has some good in-stream habitat because there are some riffles with a few pools and mature riparian vegetation. Although Sears Creek is confined and there is a lack of riparian vegetation, it provides fair habitat because there are pools and riffles, and there is considerable use of the creek by salmon up to where it is blocked by the culvert under NE 20th Street.

The City of Bellevue plans to enhance Goff Creek and West Tributary to Kelsey Creek as part of implementation of the Bel-Red Corridor Project in Segment D. Funding for early implementation of the Bel-Red Corridor Project is included in the City's 2007-2013 Capital Improvement Program.

The Unnamed Tributary to Kelsey Creek has a very low base flow and is sometimes intermittent. The entire drainage lies within a commercial district and is piped or in a roadside ditch for much of its length. There are no habitat features such as pools or riffles in the potentially affected reach. Gradient is flat, and substrates consist of grass, silt, and sand. The channel has a category 4 wetland fringe in this reach, but it does not add habitat value because it consists of mowed grasses. The entire creek is above a fish passage block and there is no spawning habitat;

therefore, it is highly unlikely that salmonids are present.

#### Segment E

In Segment E, there is limited high-value habitat along the Sammamish River, which is used by a variety of waterfowl and salmon. The 640-acre Marymoor Park has a variety of habitats, including herbaceous, scrub-shrub, and forested wetlands; a riparian corridor; deciduous upland forest; and grassy fields. There is a constructed wetland mitigation site near the northern boundary of the park. There are several permanent or semi-permanent priority species nests in Marymoor Park. Two bald eagle nests, an osprey nest, and a red-tailed hawk nest are located within the park boundaries. The osprey nest is located on an artificial platform within 0.1 mile of SR 520, while the other nests are over one-half mile from the study area. Several nest boxes are set up for purple martins (*Progne subis*) at the south end of the park, and they have used these nest boxes in the past. However, since 2008, usage of these boxes by purple martins is uncertain (Hobbs, 2011). Also, a reported heron rookery near Leary Way has been abandoned.

The Bear Creek basin drains about 50 square miles of suburban and rural land. Bear Creek basin remains one of the more productive stream systems in the region. The diversity and number of aquatic resources in the Bear Creek basin distinguish it as one of the top six natural resource basins in King County in the Waterways 2000 Program (Kerwin, 2001). Bear Creek offers some high-value riparian and in-stream pool habitat near the east portion of the Town Center Open Space. Farther to the west, nonnative vegetation has been removed and replanted with native shrubs and tree saplings as part of a habitat restoration project. The City of Redmond has plans to rehabilitate the lower 3,000 feet of Bear Creek to improve fish habitat.

#### Maintenance Facility Surroundings

Two small areas of urban, mostly vegetated, deciduous forest are located south of the 116th (MF1) and BNSF (MF2) maintenance facilities. The SR 520 Maintenance Facility (MF3) is surrounded by small office parks and retail stores. The SE Redmond Maintenance Facility (MF5) is surrounded by commercial and light industrial development.

#### 4.8.3 Environmental Impacts

There are two types of impacts discussed in this section: permanent operational impacts within the permanent project right-of-way and temporary construction impacts between the permanent project right-of-way and the construction areas.

For analysis of the East Link Project environmental impacts, it was assumed that Sound Transit would already have implemented a series of avoidance and best management practices (BMPs) during construction. These practices are described in Appendix H3. In short, these include but are not limited to:

- Designating construction zone limits
- Implementing a Temporary Erosion and Sediment Control (TESC) plan
- Implementing the terms and conditions in the Hydraulic Project Approval (HPA) for any work within or below the ordinary high water mark
- Following the requirements of the National Pollution Discharge Elimination System (NPDES) permit program
- Treating and monitoring weeds consistent with the King County Noxious Weed Control Board direction
- Implementing Ecology requirements for permanent stormwater runoff, flow controls, and pest management in accordance with current agreements

For analysis of temporary construction impacts on ecosystem resources, Sound Transit assumed that all uplands and wetlands within the construction and staging areas would be disturbed during construction and that all vegetation would be removed. Short-term temporary turbidity impacts may also occur from sedimentation in streams resulting from vegetation removal. The duration of the temporary construction impacts would vary depending on the recovery time required for the affected habitat type. For example, water quality impacts would be likely to occur over a small spatial and temporal extent because adherence to state water quality standards for turbidity requires implementation of BMPs to minimize the impact. Sound Transit also projected construction noise impacts on wildlife species within the study area described below and in Appendix H3.

Construction activities would also temporarily affect wildlife in the general area. Impacts would occur from losing vegetation and habitat, disrupting travel corridors, creating noise impacts, and displacing wildlife into potentially less suitable habitats where they might not thrive. Wildlife would likely be displaced when construction begins. Species displaced by construction noise would likely return after construction is complete if their habitat was not altered and if post-construction human activity levels

return to pre-construction levels. However, reestablishing native vegetation would require 2 to 4 years for herbaceous upland and wetland types and decades for mature forest types. Species that forage on or near the ground, such as urban-dwelling small mammals or birds such as juncos and song sparrows, would use their preferred habitats first. Species that require mature vegetation, and especially those that use large shrubs and trees, such as wrens, chickadees, and woodpecker, would recolonize their preferred habitats last. Operational impacts could include permanent displacement of high-value habitat areas that can cause displacement of associated wildlife species, shading of vegetation, culvert extension, realignment of streams that support aquatic species, and additional runoff from increases in impervious surface area. Sound Transit also evaluated project operation noise levels above existing conditions and line-of-sight impacts that could lead to displacement or disturbance of wildlife species.

Sound Transit would implement BMPs to avoid and minimize impacts on streams and other aquatic habitats to meet federal, state, and local regulatory requirements. These BMPs are documented in Appendix H3 and are environmental commitments that Sound Transit would implement.

Sound Transit conducted surveys to prepare a Biological Assessment for ESA consultation. The determination of effect for ESA-listed species in Sound Transit's Biological Assessment is a "may affect, not likely to adversely affect" listed species, and there would be no adverse effect on Essential Fish Habitat under MSA.

#### 4.8.3.1 No Build Alternative

The No Build Alternative would cause no temporary construction or permanent operational impacts on ecosystem resources. However, without the East Link Project, land use development might not be concentrated in the planned growth centers, causing additional growth elsewhere, including in or near areas of high-value habitat. Higher vehicle miles traveled also would be expected under the No Build Alternative, resulting in higher traffic, which can be associated with introducing more pollutants that might drain to surface waters and reduce water quality.

Implementing the No Build Alternative would not result in potential beneficial environmental improvements such as:

- Reducing pollutant loading to Lake Washington and streams in the study area by reducing 51.7

acres of pollutant-generating surfaces and an estimated 200,000 vehicle miles traveled each year

- Implementing proposed mitigation for wetlands and streams, which would improve the existing conditions of these resources.

#### 4.8.3.2 Impacts during Operation

##### Impacts Common to All Build Alternatives

Permanent operational impacts common to all alternatives would depend on the ecosystem resource being affected (e.g., aquatic habitat from culvert extension or wildlife displacement from removal of high-value and priority habitat) and are described for each resource below. The following sections and Table 4.8-5 identify permanent operational impacts on high-value wildlife habitat, wetlands, wetland and stream buffers, and aquatic habitat.

##### High-Value Habitat

Several types of permanent impacts on habitat areas and impacts on associated wildlife would be expected:

- Habitat would be removed (particularly high-value habitat) that supports breeding, foraging, and roosting, which might disturb or even displace some wildlife species. Depending on the combination of alternatives selected, the range of impact (not including impacts on wetlands) could vary from 1.7 to 6.0 acres of high-value habitat removed within the study area before compensatory mitigation. Wildlife, including WDFW priority species that use this habitat type, might vacate the area.
- To prevent trees and branches from interfering with operation of the light rail, existing high-quality forest-dominated vegetation and wildlife habitat under and within 20 feet of each side of the elevated guideways would be converted to shrub and short-tree habitat, which may become high-quality habitat for some species.
- Existing low-quality, weed-dominated, and disturbed vegetation and wildlife habitat under and within 20 feet of each side of the elevated guideways would be converted to shrub and short-tree habitat, which would be a substantial environmental improvement.
- Operational noise impacts on wildlife would likely be relatively minor compared with existing traffic noise in most segments of the proposed corridors. Maximum noise levels from light rail operation would actually be lower than existing maximum noise levels related to other transportation noise sources currently in use in most segments, including heavy trucks, dump trucks, and buses.
- Existing maximum noise levels from buses and heavy trucks on busy arterials typically range from 78 to 86 decibels on the A-weighted scale (dBA) at 50 feet at 35 to 40 miles per hour (mph). The Link light rail trains produce 79 dBA at 50 feet at 40 mph, which is similar to the noise produced by most buses and medium trucks, and lower than heavy trucks by 2 to 6 dBA. Noise levels from East Link operations would not likely adversely impact wildlife for any segment because wildlife using habitats next to the alternatives are more or less accustomed to some level of existing human and vehicular activity.
- Linear disruption of habitat integrity. Losing small, interconnected habitats could increase habitat fragmentation in the area and disrupt wildlife movement between habitat types. In the project vicinity, many smaller habitat types were categorized as being low- or moderate-value habitats. These habitats could be used by a variety of wildlife species, including priority species, although their expected occurrence would be lower than for high-value habitats.
- The only ESA-listed wildlife species in the project vicinity, the marbled murrelet, is extremely rare in the study area (only one sighting in the past 50 years on Lake Washington) and is not expected to be adversely impacted from operations because there would not be any habitat alterations in Lake Washington, and the Segment A alternative would be located in the center of the I-90 roadway and not increase noise levels.
- Impacts on wetlands such as permanently removing wetland and stream buffer area and function, converting forest-dominated wetlands to shrub-dominated wetlands, and generating runoff from new untreated non-pollutant-generating impervious surfaces (PGIS) and new PGIS would also affect high value habitat.
- Potentially spilling fuel, oil, or chemical spills at maintenance facilities
- Beneficial environmental improvements listed above

##### Wetlands and Wetland Buffers

The alternatives were designed to avoid and minimize impacts on wetlands to reduce overall impacts. The alternatives would involve placing fill or retained cut/fill for at-grade tracks and columns for elevated guideways that could remove or shade wetlands. Permanent impacts on wetlands that would persist throughout East Link operation include the following:

TABLE 4.8-5

Potential Permanent Operational Direct Impacts on Wetland, Wetland/Stream Buffer, High-Value Wildlife Habitat, and Aquatic Habitat

Alternative		Wetland <sup>a</sup> (acres)	Wetland/ Stream Buffer <sup>a,b</sup> (acres)	High-Value Wildlife Habitat <sup>a,c</sup> (acres)	Aquatic Habitat/Stream Crossings <sup>d</sup>
<b>Segment A, Interstate 90</b>					
Preferred Interstate 90 Alternative (A1)		No impacts			
<b>Segment B, South Bellevue</b>					
Preferred 112th SE Modified Alternative (B2M)	to C11A	0.1	3.3 (0.2 of mitigation site)	0.6	0 crossings
	to C9T		4.5 (0.2 of mitigation site)	0.7	1 crossing of a narrow alcove in the shoreline of Mercer Slough
Bellevue Way Alternative (B1)		0.2	1.8	1.7	0 crossings
112th SE At-Grade Alternative (B2A)			3.4 (<0.1 of mitigation site)	0.7	
112th SE Elevated Alternative (B2E)			2.8 (<0.1 of mitigation site)	0.4	
112th SE Bypass Alternative (B3)		0.7	3.4 (<0.1 of mitigation site)	0.7	
B3 - 114th Extension Design Option		0.2	3.6 (<0.1 of mitigation site)	0.7	1 elevated crossing of Sturtevant Creek
BNSF Alternative (B7)		1.9 (0.4 of mitigation site)	0.4 (<0.1 of mitigation site)	3.0	1 elevated crossing of Mercer Slough
<b>Segment C, Downtown Bellevue</b>					
Preferred 108th NE At-Grade Alternative (C11A)	from B2M	0	0	0	1 elevated crossing of Sturtevant Creek 1 culvert replacement on Sturtevant Creek
	from B3		0.1		Same as C11A from B2M except there are 3 elevated crossings of Sturtevant Creek
	from B3 - 114th Design Option or B7				Same as C11A from B2M except there are 2 elevated crossings of Sturtevant Creek
Preferred 110th NE Tunnel Alternative (C9T) <sup>e</sup>	from B2M	0	0	0.3	1 elevated crossing of Sturtevant Creek 1 culvert replacement on Sturtevant Creek
	from B3		0.1	0	Same as C9T from B2M except there are 3 elevated crossings of Sturtevant Creek
	from B3 - 114th Design Option or B7				Same as C9T from B2M except there are 2 elevated crossings of Sturtevant Creek
Bellevue Way Tunnel Alternative (C1T)		0	0	0	Same as C11A from B2M
106th NE Tunnel Alternative (C2T)	from B2A	0	0	0.1	Same as C11A from B2M
	From B2E			0.2	
	from B3	0	0.1	0	Same as C11A from B3
	from B7				Same as C11A from B3 - 114th Design Option or B7



TABLE 4.8-5 CONTINUED

Potential Permanent Operational Direct Impacts on Wetland, Wetland/Stream Buffer, High-Value Wildlife Habitat, and Aquatic Habitat

Alternative		Wetland <sup>a</sup> (acres)	Wetland/ Stream Buffer <sup>a,b</sup> (acres)	High-Value Wildlife Habitat <sup>a,c</sup> (acres)	Aquatic Habitat/Stream Crossings <sup>d</sup>
108th NE Tunnel Alternative (C3T)	from B2A	0	0	0.1	0 crossings
	from B2E			0.2	0 crossings
	From B3		0.1	0	2 elevated crossings of Sturtevant Creek
	from B7				1 elevated crossing of Sturtevant Creek
Couplet Alternative (C4A)	from B2A or B2E	0	0	0.2	0 crossings
	from B3		0.1	0	Same as C3T from B3
	from B7				Same as C3T from B7
112th NE Elevated Alternative (C7E)	from B2A or B2E	0	0	0.2	0 crossings
	from B3		0.1	0	Same as C3T from B3
	From B7				Same as C3T from B7
110th NE Elevated Alternative (C8E)	from B3	0	0.1	0	Same as C3T from B3
	from B7				Same as C3T from B7
110th Avenue NE At- Grade Alternative (C9A)	from B2A	0	0	0	Same as C11A from B2M
	from B3	<0.1	0.1		Same as C11A from B3
	from B3 – 114th Design Option or B7	0			Same as C11A from B7
114th NE Elevated Alternative (C14E)	from B3	<0.1	0.1	0	Same as C11A from B3
	from B3 – 114th Design Option or B7	0			Same as C11A from B7
<b>Segment D, Bel-Red/Overlake</b>					
<i>Preferred NE 16th At-Grade Alternative (D2A) from former BNSF Railway corridor<sup>f</sup></i>		0.5	0.6	0.9	1 elevated crossing at the West Tributary to Kelsey Creek; 1 new culvert on a 130-foot segment on the Unnamed Tributary to Kelsey Creek
D2A - NE 24th Design Option		0.5	0.6	0.8	Same as D2A
NE 16th Elevated Alternative (D2E) from NE 12th or former BNSF Railway corridor		0.2 to 0.3	0.5	0.5	Same as D2A except the Unnamed Tributary to Kelsey Creek Crossing is elevated
NE 20th Alternative (D3) from NE 12th or former BNSF Railway corridor		0.2	0.1	<0.1 to 0.1	Same as D2A except for a culvert extension at Valley Creek (loss of 30 feet of channel function/habitat)
SR 520 Alternative (D5) from NE 12th or former BNSF Railway corridor		0.2 to 0.3	0.6 to 0.7	1.3 to 1.4	1 elevated crossing at West Tributary to Kelsey Creek, and Goff, and Valley Creeks culverts
<b>Segment E, Downtown Redmond</b>					
<i>Preferred Marymoor Alternative (E2)</i>		0.1 (0.1 of mitigation site)	0.4 (<0.1 of mitigation site)	1.1	2 elevated stream crossings (Sammamish River and Bear Creek)
E2 - Redmond Transit Center Design Option		0.1 (0.1 of mitigation site)	0.5 (<0.1 of mitigation site)	1.2	Same as E2
Redmond Way Alternative (E1)		0.1	0.2 (0.1 of mitigation site)	2.1	

TABLE 4.8-5 CONTINUED

Potential Permanent Operational Direct Impacts on Wetland, Wetland/Stream Buffer, High-Value Wildlife Habitat, and Aquatic Habitat

Alternative	Wetland <sup>a</sup> (acres)	Wetland/ Stream Buffer <sup>a,b</sup> (acres)	High-Value Wildlife Habitat <sup>a,c</sup> (acres)	Aquatic Habitat/Stream Crossings <sup>d</sup>
Leary Way Alternative (E4)	<0.1	0.2 (0.1 of mitigation site)	1.2	
<b>Maintenance Facilities</b>				
116th Maintenance Facility (MF1) (D2A, D2E, D3)	0.1	0.1	0.1	0 stream crossings
116th Maintenance Facility (MF1) (D5)	0	0	0	0 stream crossings
BNSF Maintenance Facility (MF2) (D2A, D2E, D3)	0.1	0.1	0.1	Same as MF1 (D2A, D2E, D3)
BNSF Maintenance Facility (MF2) (D5)	0.1	0.2	0.2	0 stream crossings
SR 520 Maintenance Facility (MF3) (D2, D3, D5)	<0.1	0	0	2 culvert replacements with a gain of 42 feet of open channel on Goff Creek
SE Redmond Maintenance Facility (MF5)	0	0	0	0 stream crossings

<sup>a</sup> Vegetation areas were classified and mapped regardless of size or upland/wetland designation. As a result, the vegetation areas may include upland and/or wetland vegetation. Vegetation areas may overlap with wetlands and/or buffers, and therefore impact acreage numbers for wetlands, buffers, and high-value wildlife habitat cannot be added together. This overlap is depicted on Exhibits 4.8-1 to 4.8-4.

<sup>b</sup> Some of the impacts on stream buffers overlap with impacts on some wetland buffers.

<sup>c</sup> *High-Value Wildlife Habitat* includes riparian forest and three types of urban mostly vegetated forest (coniferous forest, deciduous forest, and mixed coniferous/deciduous forest).

<sup>d</sup> Stream crossings identified in this table are crossings of open channels. Crossings over existing culverts or piped sections of streams are not included.

<sup>e</sup> The C9T - East Main Station Design Option connecting from *Preferred Alternative B2M* would not result in a change to impacts for either *Preferred Alternative C9T* or *B2M*.

<sup>f</sup> Impacts for D2A - 120th Station Design Option would not vary from those of *Preferred Alternative D2A*.

- Permanently removing wetland area and function, including wetlands beneath elevated structures and portions of several existing mitigation sites. Depending on the combination of alternatives selected, impacts could vary from permanently filling or altering approximately 0.3 to 2.6 wetland acres.
- Permanently removing wetland and stream buffer area and function, including buffers beneath elevated structures. Depending on the combination of alternatives selected, impacts could vary from permanently filling or altering approximately 0.8 to 5.6 acres of wetland/stream buffer.
- Permanently converting forest-dominated wetlands to shrub-dominated wetlands and buffers under and within 20 feet of each side of the elevated guideways to prevent trees and branches from interfering with operation of the light rail.
- Generating runoff from new untreated non-PGIS and new PGIS (i.e., roadway modifications, park-and-ride lots, and maintenance facilities),

potentially increasing pollutant loads to wetlands (see Section 4.9, Water Resources)

- Potentially spilling fuel, oil, or chemical spills at maintenance facilities
- Beneficial environmental improvements listed above

**Aquatic Habitat**

The range of permanent impacts would vary from no impacts on fish habitats, to beneficial impacts, to only minor adverse impacts before mitigation. In urban areas, new projects may result in beneficial impacts on aquatic resources. New projects that alter streams would have to meet current regulatory requirements on stream restoration, including improving instream habitat and improving riparian vegetation. Permanent impacts on aquatic habitat common to all alternatives would include the following:

- Impervious surfaces preclude normal infiltration of precipitation into groundwater aquifers and reduce dry-season base flows by decreasing water inputs to streams from springs and seeps. The amount of new impervious surface that could

result from building the East Link Project between Seattle and Redmond would be between 16 and 35 acres (see Section 4.9, Water Resources).

- Stormwater from all project-related PGIS would be treated to at least basic treatment levels (i.e., removal of at least 80 percent of suspended solids). Stormwater from relocated or widened roadways and those that do not currently receive treatment would also be retrofitted to current standards. Stormwater from maintenance facilities would be treated to enhanced treatment levels to remove heavy metals, including those that are toxic to fish and aquatic invertebrates. Basic and enhanced treatment would reduce heavy metal and hydrocarbon contaminants in stormwater but would not eliminate all of it. In addition, the East Link Project would result in fewer cars on the road and, therefore, less pollutant loading to stream systems. Substantial permanent impacts on water quality, and therefore aquatic species, would not be expected from increased surface runoff.

### Permanent Operational Impacts by Alternative Segment A

With *Preferred Alternative A1*, removing motor vehicles from the center roadway would reduce the pollutant discharge from this roadway, resulting in a net benefit to the water quality of stormwater runoff to Lake Washington. Operation of light rail could discharge stray electrical current into Lake Washington and create electric current fields around the span. An assessment of whether the electric current field would affect aquatic resources estimated that stray current intensity would be one to three orders of magnitude below physiological or behavioral response thresholds for even the most sensitive Lake Washington fish species. Therefore, no operational impacts on high-quality aquatic habitats are anticipated due to this factor.

### Segment B

#### High-Value Habitat

*Preferred 112th SE Modified Alternative (B2M)* connecting to *Preferred 108th NE At-Grade Alternative (C11A)* or *Preferred 110th NE Tunnel Alternative (C9T)* would permanently affect 0.6 and 0.7 acre of high-value habitat, respectively (all deciduous forest), which would be slightly higher than the smallest total impact among the Segment B alternatives. This impact includes removing some mature deciduous trees near the Bellevue Way SE and 112th Avenue SE intersection.

With the other Segment B alternatives, the potential area of high-value habitat that could be permanently impacted varies from approximately 0.4 acre (112th SE

Elevated Alternative [B2E]) to approximately 3.0 acres (BNSF Alternative [B7]). Alternative B7 would affect the most area of riparian forest. Alternatives B1 and B7 would affect the most high-value coniferous forest. Alternative B7 would affect the largest area of high-value deciduous forest (0.8 acre), which exceeds the total amount of high-quality wildlife habitat that would be affected by *Preferred Alternative B2M*. Amphibians are not expected to move from Mercer Slough to uplands west of Bellevue Way SE and are also not expected to be impacted because Bellevue Way is already a barrier.

#### Wetlands and Wetland Buffers

*Preferred Alternative B2M* would be located along the east side of Bellevue Way SE and 112th Avenue SE where Mercer Slough is located, but *B2M* almost entirely avoids permanent impacts on wetlands (approximately 0.1 acre). However, *Preferred Alternative B2M to C9T* would have the largest impact on wetland buffers of all the Segment B alternatives.

Portions of *Preferred Alternative B2M* would be constructed in retained cuts along Bellevue Way SE. Without mitigation, the concrete-lined retained cuts could intercept and re-direct local groundwater flow, with resulting adverse impacts to down-gradient wetlands and surface water features. As described in the Water Resources mitigation section (Section 4.9.4), the pervious fill system installed around the outside of the sealed, concrete-lined retained cut would allow the shallow groundwater to continue to flow to the down-gradient wetlands. Similarly, track foundations in many places along this section would be improved with subsurface stone columns, but these are pervious to groundwater movement. The primary sources of hydrology for the Mercer Slough wetlands are the controlled water fluctuation of Lake Washington; input from Kelsey Creek and other small drainages; groundwater from the hillside slopes to the west and east of Mercer Slough wetlands; culverts that enter from the north, west, and east sides; and precipitation. As a result, no impact on hydrology of the Mercer Slough wetland is expected.

Of the other Segment B alternatives, Alternative B7 could have the greatest permanent impact on wetlands (1.9 acres). Nearly one-quarter of this impact would be on existing mitigation sites. Alternative B7 would have the smallest permanent impact on wetland buffers (0.4 acre).

The other Segment B alternatives along Bellevue Way SE (Bellevue Way Alternative [B1], 112th SE At-Grade Alternative [B2A], and B2E) would all permanently affect approximately 0.2 acre of wetland with the new stormwater pond proposed immediately east of the

South Bellevue Park-and-Ride Lot. All of these Segment B alternatives would avoid permanent wetland impacts on existing mitigation sites within the Mercer Slough Nature Park.

The 112th SE Bypass Alternative (B3) could potentially impact 0.7 acre of wetlands. This alternative would have similar impacts on wetlands along Bellevue Way SE as the other Bellevue Way alternatives. However, constructing the elevated guideway through the Sturtevant Creek Wetland (WR-3) would also disturb 0.5 acre of shrub and emergent Category 2 wetlands dominated by reed canarygrass (a state-listed noxious weed). Implementing Alternative B3 - 114th Extension Design Option with Alternative B3 would reduce the potential permanent operational impacts on wetlands or buffers by avoiding the Sturtevant Creek Wetland (WR-3).

The other Segment B alternatives would have varying degrees of potential permanent impacts on wetland/stream buffers. Among the Segment B alternatives along Bellevue Way SE, Alternative B1 would have the least permanent impacts on wetland/stream buffers (1.8 acres). All Bellevue Way alternatives except Alternative B1, including *Preferred Alternative B2M*, would have relatively similar potential permanent impacts on buffers. All of these Segment B alternatives (except B1) would permanently impact wetland buffers of existing mitigation sites within the Mercer Slough Nature Park.

#### Aquatic Habitat

*Preferred Alternative B2M* to either *C11A* or *C9T* would have a small direct permanent impact on aquatic habitat. *Preferred Alternative B2M* would install a short bridge over a small unnamed stream inlet to Mercer Slough West near SE 15th Street. Impacts on the stream buffer between the west channel of Mercer Slough and 112th Avenue SE are estimated at 0.4 and 1.0 acre for *Preferred Alternative B2M* to *C11A* or *C9T*, respectively. The vegetation in this stream buffer that would be affected is low-quality habitat because it is dominated by Himalayan blackberry (a state-listed noxious weed) and mowed lawn with few native trees or shrubs (Exhibit 4.8-5).

The other Segment B alternatives (Alternatives B1, B2A, B2E, B3, B3 - 114th Design Option, and B7) would have no direct permanent impacts on fish and aquatic habitats. Of all the Segment B alternatives, the B3 - 114th Design Option and Alternative B7 would have the greatest impact on stream buffer.



EXHIBIT 4.8-5  
Mercer Slough Buffer along 112th Avenue SE

### **Segment C**

#### High-Value Habitat

*Preferred Alternative C11A* would not have permanent impacts on high-value wildlife habitat. *Preferred Tunnel Alternative C9T* would have minor permanent impacts (0.3 acre) on high-value wildlife habitat in Segment C just south of SE 6th Street.

With the 106th NE Tunnel (C2T), 108th NE Tunnel (C3T), Couplet (C4A), 112th NE Elevated (C7E), and 110th NE At-Grade (C9A) Alternatives, there would be a relatively small area of permanent impacts on high-value wildlife habitat (less than 0.1 to 0.2 acre). The other Segment C alternatives would have no impact.

#### Wetlands and Wetland Buffers

No direct or indirect permanent impacts on wetlands or wetland/stream buffers are expected from either *Preferred Alternative C11A* or *C9T* when connected to *Preferred Alternative B2M*. The connection of either *Preferred Alternative C11A* or *C9T* to Alternatives B3, B3-114th Design Option, or B7 would result in a 0.1 acre wetland/stream buffer impact.

Alternatives C9A and C14E would have a less than 0.1 acre direct permanent impact on wetlands when connecting to B3. No other Segment C alternatives would result in direct permanent impacts on wetlands. No direct permanent impacts on wetland buffers are expected from the other Segment C alternatives, except the 0.1 acre impact to wetland buffers at the Hilton Stormwater pond (WR-16) noted above. This same impact would occur for Alternatives C2T, C3T, C4A, C7E, 110th NE Elevated (C8E), C9A, and 114th NE Elevated (C14E) with connections to either Alternatives B3, B3- 114th Design Option, or B7.

### Aquatic Habitat

Identical potential impacts would result with *Preferred Alternatives C11A* and *C9T* (both from *Preferred Alternative B2M*). The Hospital Station would be positioned over the top of the existing Sturtevant Creek channel just north of NE 8th Street (Exhibit 4.8-6). To minimize impacts on the stream and provide for overall improved stream geometry, the channel would be shifted to the west side of the tracks in the former BNSF Railway corridor in a new culvert, thereby realigning the channel to the west approximately 30 feet as an open channel in a landscaped strip next to the station. This reach is approximately 300 feet long. The new channel would be a substantial improvement compared to the existing channel, which is straight, featureless, and lacking any riparian vegetation. The new channel would have landscaped riparian vegetative cover, a gravel streambed, and a curving geometry. However, there is no salmonid presence in this reach because the reach is upstream of several fish-passage blockages.

For connections from *Alternative B3* and *Preferred Alternatives C11A* or *C9T* would run near Sturtevant Creek for 420 feet adjacent to the Hilton Hotel. The existing vegetation along this stream reach would be cleared during construction and replanted with short-growing native species (Exhibit 4.8-7). The elevated guideway would be up to 45 feet above the ground and not effectively shade this riparian area. There would be a temporal loss of riparian function while the new riparian trees reestablish. Even though the riparian trees would be smaller, large woody debris recruitment potential would not be diminished because this area is an intensively managed landscape.

*Preferred Alternatives C11A* or *C9T* connecting from the *B3 - 114th Design Option* or *Alternative B7* would have the same impacts as described above for the *Alternative B3* connector but would add approximately 300 feet of clearing (total of 720 feet), and 130 feet of guideway above the channel, approximately 25 feet off the ground. Potential impacts on riparian function would be the same as described above for this additional reach, except that landscaping in this area is not actively managed to the water's edge as it is on the Hilton Hotel property.

*Alternatives C3T, C4A, and C7E* connecting from *Alternative B2E* would have no impact on aquatic habitat and, thus, have the least impacts of all Segment C alternatives. The *Bellevue Way Tunnel Alternative (C1T)*, *Alternative C2T*, and *Alternative C9A* from *Alternatives B2A* or *B1*, would have the same impacts described for *Preferred Alternatives C11A* and *C9T*.



EXHIBIT 4.8-6  
Sturtevant Creek upstream of NE 8th Street



EXHIBIT 4.8-7  
Sturtevant Creek next to Hilton Hotel at 114th Avenue SE

*Alternatives C2T* and *C9A* from *Alternative B3, B3 - 114th Design Option, or B7* would have the same impacts as *Preferred Alternatives C11A* or *C9T* for both the Hospital Station and the area behind the Hilton Hotel along Sturtevant Creek.

### **Segment D**

#### High-Value Habitat

*Preferred NE 16th At-Grade Alternative (D2A)* and *Alternatives D2A - 120th Station and - NE 24th Design Options* would permanently impact approximately 0.8 to 0.9 acre of high-value habitat, including mostly riparian forest and deciduous forest. There would be no impact on vegetation and wildlife related to the storage track or associated improvements to the former BNSF Railway corridor with *Preferred Alternative D2A*.

The estimated area of high-value habitat that would be directly affected during permanent operation with the other Segment D alternatives varies from a low of approximately <0.1 acre (*NE 20th Alternative [D3]*) to

a high of approximately 1.3 to 1.4 acres (SR 520 Alternative [D5]) depending on connection). Alternative D5 would affect the most area of riparian forest, coniferous forest, and deciduous forest.

#### Wetlands and Wetland Buffers

*Preferred Alternative D2A* would have permanent operational impacts on wetlands WR-11 and WR-15 (resulting from fill for the at-grade trackway), and wetlands WR-7 and WR-8SE where the elevated guideway would cross over. Potential permanent operational impacts on wetlands and wetland buffers would be 0.5 and 0.6 acre, respectively. This is a small permanent operational impact on these Category 3 and 4 wetlands. The primary impact would be on Wetland WR-7, which is a regional stormwater detention pond. Impacts on wetlands and wetland buffers from both D2A design options would essentially be the same as with *Preferred Alternative D2A*.

The storage track along the former BNSF Railway corridor north of the Lake Bellevue would result in impacts of less than one-eighth of an acre of wetland and one-tenth of an acre wetland buffer to accommodate an access path adjacent to the storage tracks.

The other Segment D alternatives and connection options would have approximately one-half the permanent operational impacts on wetlands compared to *Preferred Alternative D2A*, primarily because they would avoid impacts on wetland WR-7. The NE 16th Elevated Alternative (D2E) would permanently affect 0.2 to 0.3 acre of wetland (depending on connection) due to the elevated guideway over Wetlands WR-6, WR-8SE, WR-11, and WR-15. Alternative D3 would permanently affect 0.2 acre of wetland as a result of fill used to widen 136th Place NE for the at-grade trackway at WR-15 and the elevated guideway over Wetlands WR-6 and WR-8SE. Alternative D5 would permanently affect 0.2 to 0.3 acre of wetland (depending on connection) from the elevated guideway over Wetlands WR-6, WR-8NW, and WR-11. Potential permanent impacts on wetland/stream buffers would be lowest (0.1 acre) with Alternative D3 and slightly greater with Alternatives D2E and D5.

#### Aquatic Habitat

*Preferred Alternative D2A* would cross four streams but would have negligible or no direct permanent impact on fish and aquatic species and habitats on these streams.

The elevated crossing at the Kelsey Creek West Tributary would place approximately five support columns along the southern edge (left side of Exhibit 4.8-8) of the regional stormwater detention



EXHIBIT 4.8-8  
West Tributary to Kelsey Creek at Detention Pond

pond (wetland WR-7). The pond does not support salmonids because there are numerous passage blocks downstream and no spawning areas upstream. This area is artificially flooded by the stormwater detention facility; sometimes this area is dry. Large trees would be removed and replaced with understory vegetation. The elevated guideway would be approximately 55 feet in the air.

During operation of *Preferred Alternative D2A*, there would be no permanent impacts on Goff Creek at this at-grade crossing because the creek is in a pipe system at this location.

Direct permanent impacts on the Unnamed Tributary to Kelsey Creek would result from replacing 130 feet of open channel with a culvert for this at-grade crossing. The existing stream channel is essentially a roadside ditch with no riparian vegetation other than mowed grasses. This tributary does not currently support fish. This reach has no habitat function except, perhaps, nutrient uptake. Therefore impacts would be negligible.

Operating *Preferred Alternative D2A* would not result in any permanent impacts on Valley Creek at this elevated crossing because it is in a culvert at this location. Both D2A design options would have potential impacts identical to that of *Preferred Alternative D2A*. The proposed storage track (located between the potential maintenance facilities MF1 and MF2) would not have any impact on aquatic habitats.

The *City of Bellevue Bel-Red Corridor Project Final Report* (September 2007) identifies the West Tributary to Kelsey Creek and Goff Creek as having the greatest opportunity for stream enhancement. The East Link Project would not preclude these enhancements.

Alternative D2E would have no direct permanent impact on the West Tributary to Kelsey Creek.

Alternative D2E is shifted slightly southward to avoid the regional stormwater detention pond and instead spans West Tributary to Kelsey Creek as an elevated guideway 50 to 60 feet off the ground at this location. Impacts at Goff Creek, the Unnamed Tributary to Kelsey Creek, and Valley Creek would be the same as that described for *Preferred Alternative D2A*.

Alternative D3 would have similar impacts as Alternative D2E, except there would be direct permanent impacts where Alternative D3 crosses Valley Creek along NE 20th Street. Aquatic and riparian functions would be lost for the 30 linear feet of channel enclosed in the lengthened culvert at 20th Street. This reach of Valley Creek was rated as good habitat. Sears Creek would be unaffected because it is piped at this location and the proposed retained cut would not cut deep enough to affect the pipe.

Alternative D5 would have impacts at the West Tributary to Kelsey Creek similar to those described for *Preferred Alternative D2A* and Alternative D2E. Impacts at Goff Creek and Valley Creek would be the same as described for *D2A* at Valley Creek. The Unnamed Tributary to Kelsey Creek would be crossed where it is in a pipe system.

## Segment E

### High-Value Habitat

*Preferred Alternative E2* and Alternative E2 - Redmond Transit Center Station Design Option would permanently affect approximately 1.1 and 1.2 acres, respectively, of high-value coniferous and deciduous forest next to SR 520.

The estimated area of high-value habitat that would be directly affected during East Link operation by the other Segment E alternatives is approximately 1.2 acres with Leary Way Alternative (E4) and approximately 2.1 acres for Redmond Way Alternative (E1) (which is nearly twice the impact as from the *Preferred Alternative E2*). Alternative E1 would impact the high-value coniferous forest.

### Wetlands and Wetland Buffers

*Preferred Alternative E2* could permanently impact up to 0.1 acre of wetland and 0.4 acre of wetland/stream buffer. *Preferred Alternative E2* would affect the existing mitigation wetland and buffers at Marymoor Park Wetland (WR-13) and the wetland and stream buffer at the railroad crossing at the Bear Creek Wetland (WR-12). Impacts would be only slightly higher with the E2 - Redmond Transit Center Design Option (see Table 4.8-5).

The other Segment E alternatives (E1 and E4) would have impacts on wetlands and wetland buffers comparable to *Preferred Alternative E2*.

### Aquatic Habitat

*Preferred Alternative E2* would have little direct permanent impacts on aquatic species and habitat. *Preferred Alternative E2* would affect riparian vegetation at the Sammamish River crossing by replacing taller growing tree species with lower understory riparian plants. There would be some shading impacts on approximately 5 feet of streambank and channel on either side of the existing former BNSF Railway Bear Creek railroad bridge. There would be no impact on aquatic habitat from the E2 - Redmond Transit Center Design Option.

Alternative E1 would have the same impacts as *Preferred Alternative E2* at the Sammamish River crossing except that more (0.2 acre) riparian vegetation would be affected. At the Bear Creek crossing, there would be no impacts on riparian vegetation because the guideway would be 48 feet above the top of the stream bank and 53 feet above the water surface. No tall growing tree species are present at this location.

Alternative E4 would have the same impacts as *Preferred Alternative E2* at the Sammamish River crossing. Impacts on the riparian community would be similar to *Preferred Alternative E2* at the Bear Creek crossing except with a higher elevated crossing.

### **Maintenance Facilities**

Table 4.8-5 shows potential permanent operational impacts from maintenance facilities. The three maintenance facilities in Segment D (MF1, MF2, and MF3 maintenance facilities) would require wetlands and/or wetland buffers to be filled. MF3 would result in an increase of 42 linear feet of open stream channel by replacing two culverts with shorter ones on Goff Creek. No permanent operational impacts are expected from the MF5 in Segment E.

#### **4.8.3.3 Construction Impacts**

##### **Impacts Common to All Build Alternatives**

The following summarizes potential temporary impacts that could occur throughout the study area during construction:

- Impacts on vegetation and wildlife habitat:
  - Loss and degradation of breeding, foraging, and roosting habitat
  - Temporary wildlife displacement and disturbance from construction activity noise
  - Movement of mobile species to adjacent areas where they may or may not survive,

depending on the availability of nearby suitable and available habitat

- Loss of less mobile species and species that retreat to burrows
- Impacts on wetlands and buffers:
  - Temporary disturbance of wetland area and function, including wetlands beneath elevated structures. Depending on the combination of alternatives selected, the range of impact could vary from 0.8 to 4.9 acres of wetland.
  - Vegetation clearing, site grading, and filling for construction access to permanent facilities
  - Soil compaction during construction activities that decreases soil permeability, infiltration, water-storage capacity, and vegetation regrowth
  - Reduction of wetland functions
  - Potential accidental spills of fuel oils, chemicals, and/or concrete leachate used during construction
  - Some increase in sediment loading and turbidity from grading and filling activities that could allow sediment-laden runoff into wetlands and degrade water quality
  - Potential introduction and spread of invasive species as a result of disturbance where weeds do not already exist
- Impacts on aquatic habitat:
  - Sedimentation impacts on waters downstream from earthwork activities
- Clearing of riparian vegetation at stream crossings

Removing high-value habitat can affect wildlife resources, and noise from construction activities can also affect wildlife presence, breeding, and foraging habitats. Noise from typical construction activities for light rail construction can range from 80 to 94 dBA Lmax within 50 feet. Typical construction noise is similar from roadway construction and light rail construction. Pile driving could produce 105 to 110 dBA maximum noise level (Lmax). Loud noises from short-term events such as these can startle nearby wildlife and agitate birds. Most wildlife normally return to their usual lifestyle shortly after the event, depending on duration, species, and proximity of the wildlife to the construction activity. The East Link Project would require no in-water work activity that would generate sound pressure levels that would impact threatened and endangered fish species.

Some wetlands and wetland/stream buffers would be temporarily impacted. Protective fencing would be installed to establish construction limits to minimize impacts in this area during construction, and impacted wetland and wetland buffer would be restored after construction.

Any construction activities requiring work below the ordinary high water mark in water bodies supporting fisheries resources would comply with USFWS-, NMFS-, and WDFW-established construction in-water work windows for protection of fish species, including ESA-listed species. Although a detailed construction schedule has not been developed yet, the allowable construction work window should not affect overall project schedule. See Table 4.8-6 for likely in-water work windows for the resources in the study area. Final work windows would be determined during permitting.

TABLE 4.8-6  
In-Water Construction Work Windows for Listed Species<sup>a</sup>

Water Body	Applicable Alternative	ESA Work Window
Lake Washington (western and eastern highrises of I-90 floating bridge)	Preferred Alternative A-1	July 16 through December 31
Lake Washington (East Channel Bridge)	Preferred Alternative A-1	July 16 through July 31; November 16 through December 31
Kelsey Creek Watershed	All Segment D and Segment E Alternatives	July 1 through August 31
Sammamish River and lower Bear Creek	All Segment E Alternatives	July 16 through July 31; November 16 through March 15

<sup>a</sup>Final work windows would be determined during permitting

**Temporary Construction Impacts by Alternative**

Table 4.8-7 shows potential temporary construction impacts on wetlands, wetland/stream buffers, high-value wildlife habitat, and aquatic habitat that would occur as a result of the East Link Project. Specific impacts are described in the following sections.

**Segment A**

Several priority species that use Lake Washington in the vicinity of the I-90 bridge may temporarily avoid the bridge area as a result of construction noise. The construction of East Link may have impacts on avian species, such as impacts on the peregrine falcon nests. WSDOT is currently modifying portions of I-90; no impacts on avian species have been reported as result of this activity, and WSDOT has been monitoring the success and failure of the two nests.



TABLE 4.8-7

Potential Temporary Construction Impacts on Wetland, Wetland/Stream Buffer, High-Value Wildlife Habitat, and Aquatic Resources

Alternative		Wetland <sup>a</sup> (acres)	Wetland/ Stream Buffer <sup>a,b</sup> (acres)	High-Value Wildlife Habitat <sup>a,c</sup> (acres)	Aquatic Resources
<b>Segment A, Interstate 90</b>					
Preferred Alternative A1		0	0	0	Over-water and in-water work in Lake Washington
<b>Segment B, South Bellevue</b>					
Preferred Alternative B2M	to C11A	0.5 (<0.1 of mitigation site)	4.0 (0.2 of mitigation site)	1.1	Potential sedimentation from construction of crossing at storm drain channel (near "Y" at Bellevue Way and 112th) and crossing of a narrow alcove off of Mercer Slough (near SE 15th Street)
	to C9T		3.7 (0.2 of mitigation site)	1.0	
Alternative B1		0.9	3.0 (0.3 of mitigation site)	2.1	None
Alternative B2A		0.7	3.7 (0.3 of mitigation site)	1.9	
Alternative B2E		0.6	3.5 (0.3 of mitigation site)	1.3	
Alternative B3		1.2	3.9 (0.3 of mitigation site)	1.9	
B3 – 114th Design Option		0.6	4.8 (0.3 of mitigation site)	2.4	Potential sedimentation from construction of elevated crossing over Sturtevant Creek
Alternative B7		2.9 (0.7 of mitigation site)	0.6 (<0.1 of mitigation site)	4.6	Potential sedimentation from construction of elevated crossing over Mercer Slough
<b>Segment C, Downtown Bellevue</b>					
Preferred Alternative C11A	from B2M	0	0	<0.1	Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing
	from B3, B3 – 114th Design Option, or B7		0.1	0	
Preferred Alternative C9T <sup>d</sup>	from B2M	0	<0.1	0.2	Potential sedimentation from construction in the Sturtevant Creek channel. Vegetation clearing
	from B3 from B3 – 114th Design Option or B7		0.1	0	Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing
Alternative C1T		0	0	0	None
Alternative C2T	from B2A or B2E	0	0	0	Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing
	from B3 or B7		0.1		
Alternative C3T	from B2A or B2E	0	0	0	None
	from B3 or B7		0.1		Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing
Alternative C4A	from B2A or B2E	0	0	0	None
	from B3 or B7		0.1		Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing
Alternative C7E	from B2A or B2E	0	0	0	None
	From B3 or B7		0.1		Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing.
Alternative C8E		0	0.1	0	Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing.
Alternative C9A	from B2A	0	0	0.2	Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing.
	from B3 from B3 – 114th Design Option or B7	0.1 0	0.1	0	
Alternative C14E	from B3	0.1	0.1	0	Potential sedimentation from construction close to and in the Sturtevant Creek channel. Vegetation clearing.
	from B3 – 114th Design Option or B7	0			

TABLE 4.8-7 CONTINUED

Potential Temporary Construction Impacts on Wetland, Wetland/Stream Buffer, High-Value Wildlife Habitat, and Aquatic Resources

Alternative	Wetland <sup>a</sup> (acres)	Wetland/ Stream Buffer <sup>a,b</sup> (acres)	High-Value Wildlife Habitat <sup>a,c</sup> (acres)	Aquatic Resources
<b>Segment D, Bel-Red/Overlake</b>				
<i>Preferred Alternative D2A</i> from former BNSF Railway corridor <sup>e</sup>	0.5	1.7	1.9	Potential sedimentation from in-water construction in the West Tributary to Kelsey Creek and the Unnamed Tributary to Kelsey Creek. Construction near Valley Creek. Vegetation clearing.
D2A – NE 24th Design Option			2.0	
Alternative D2E from NE 12th or former BNSF Railway corridor	0.2 to 0.3	0.6 to 0.7	0.7 to 0.8	Potential sedimentation from construction near West Tributary to Kelsey Creek, the Unnamed Tributary to Kelsey Creek, and Valley Creek. Vegetation clearing
Alternative D3 from NE 12th or former BNSF Railway corridor	0.1	0.1 to 0.2	0.2 to 0.3	Potential sedimentation from construction near West Tributary to Kelsey Creek and in-water construction in Valley Creek and the Unnamed Tributary to Kelsey Creek. Vegetation clearing.
Alternative D5 from NE 12th or former BNSF Railway corridor	0.4	0.8	1.2 to 1.3	Potential sedimentation from construction near West Tributary to Kelsey Creek, Goff Creek, and Valley Creek.
<b>Segment E, Downtown Redmond</b>				
<i>Preferred Alternative E2</i>	0.1 (<0.1 of mitigation site)	0.9 (0.4 of mitigation site)	1.5	Potential for sedimentation from construction near the Sammamish River and Bear Creek. Vegetation clearing
E2 - Redmond Transit Center Design Option	0.2 (<0.1 of mitigation site)	0.9 (0.3 of mitigation site)	1.6	
Alternative E1	0.1	0.3 (0.1 of mitigation site)	2.1	
Alternative E4	<0.1	0.2 (0.1 of mitigation site)	1.1	

<sup>a</sup> Vegetation areas were classified and mapped regardless of size or upland/wetland designation. As a result, the vegetation areas may include upland and/or wetland vegetation. Vegetation areas may overlap with wetlands and/or buffers, and therefore impact acreage numbers for wetlands, buffers, and high-value wildlife habitat cannot be added together. This overlap is depicted on Exhibits 4.8-1 to 4.8-4.

<sup>b</sup> Some of the impacts on stream buffers overlap with impacts to some wetland buffers.

<sup>c</sup> *High-Value Wildlife Habitat* includes riparian forest and three types of urban mostly vegetated forest (coniferous forest, deciduous forest, and mixed coniferous/deciduous forest).

<sup>d</sup> The C9T - East Main Station Design Option connecting from *Preferred Alternative B2M* would not result in a change to impacts for either *Preferred Alternative C9T* or *B2M*.

<sup>e</sup> Impacts for D2A - 120th Station Design Option would not vary from those of *Preferred Alternative D2A*.

Most of the rest of Lake Washington provides comparable suitable habitat for all of the species that may temporarily avoid the project vicinity, and no measureable impacts are expected. Automobiles would be removed from the center lanes of I-90; therefore, no new pollutants would run off from this portion of the bridge.

Sound Transit may to implement special seismic upgrades to the I-90 floating bridge during the construction period. This would include in-water work in Lake Washington to reinforce the structure (see Table 4.8-6 for allowable in-water work windows that Sound Transit would use). The in-water work would consist of bolting or welding the East Channel bridge support column reinforcement jackets together. Impacts from this would be negligible and thus, work isolation BMPs would not be necessary here.

Additionally, construction activities to modify the existing I-90 bridge to accommodate the rail may involve grinding concrete, which could result in concrete dust entering Lake Washington. The lime found in concrete is alkaline, so when concrete comes into contact with water, the water becomes strongly alkaline (pH 11 to 13). High pH can be toxic to fish. Inadvertent spills could affect water quality and aquatic resources. Implementation of BMPs (see Sections 4.9, Water Resources, and 4.12, Hazardous Materials) would avoid and minimize the introduction of concrete dust and accidental spills into the lake. The East Link construction activities in this segment would have a low risk of impacts on ESA-listed fish.

Some work and equipment may be located on a barge in Lake Washington adjacent to the bridge sections. A tribal fishery sometimes occurs in July or August for sockeye, and a tribal fishery may occur at other times for other species in the future. Sound Transit would

contact and coordinate with the Muckleshoot Tribe before construction begins on the I-90 bridge so that support boats and barges would not interfere with tribal fisheries.

### Segment B

#### High-Value Habitat

*Preferred Alternative B2M* would temporarily impact 1.0 to 1.1 acres, depending on the connection to *Preferred Alternative C11A* or *Preferred Alternative C9T*, of high-value deciduous forest habitat, which includes the removal of some mature deciduous trees near the Bellevue Way SE and 112th Avenue SE intersection. Impacts on this area would be minimized to the maximum extent possible, by limiting clearing of mature vegetation to the construction area on each side.

Noise and construction activity in all Segment B alternatives, including *Preferred Alternative B2M*, would have the potential to temporarily displace wildlife in the Mercer Slough Nature Park because construction noise would extend into the parklands. Impacts would be relative to changes in noise levels and the types of human activities. Comparable temporary replacement habitats do not exist in the project vicinity.

WDFW priority species that may use Mercer Slough and forested stands for foraging include the bald eagle, pileated woodpecker (*Dryocopus pileatus*), green heron (*Butorides virescens*), and willow flycatcher (*Empidonax traillii*), which are all relatively sensitive to human disturbance and habitat alteration. Temporary losses of these high-value habitat types would occur. These losses may affect foraging, breeding, and roosting behavior and temporarily displace these species from the project vicinity. Although specific bald eagle foraging locations are not known, construction in Segment B could temporarily displace eagles foraging in the area. Due to the amount of similar available habitat in the Mercer Slough Nature Park, impacts on wildlife would not be substantial. Western toad (*Bufo boreas*) is the only priority species with limited mobility identified as potentially occurring in the study area. If western toads are present close to the construction area during the mating season (spring), construction noise associated with all Segment B alternatives could interfere with the western toad's ability to hear mating and alarm calls and disrupt its reproduction or survival.

With the Segment B alternatives other than *Preferred Alternative B2M*, the estimated area of high-value habitat that would be directly affected during clearing for construction would vary from approximately 1.3 acres (Alternative B2E) to approximately 4.6 acres

(Alternative B7). Alternative B7 would affect more area of each high-value habitat than any other Segment B alternative. All the Bellevue Way alternatives would have a similar total impact on high-value wildlife habitat as Alternative B2E.

#### Wetlands and Wetland Buffers

*Preferred Alternative B2M* to either *C11A* or *C9T* would temporarily impact 0.5 acre of Category 2 wetland that is located next to Bellevue Way SE and 112th Avenue SE (WR-1/2). This is the lowest temporary wetland impact of the Segment B alternatives. The potential temporary impacts on wetlands would be primarily related to the following:

- Construction staging and access within the construction corridor east of the permanent Sound Transit right-of-way along Bellevue Way SE and 112th Avenue SE.
- Construction staging near the South Bellevue Park-and-Ride Lot, which would affect a portion of the Mercer Slough Wetland (WR-1/2), including modifications to the existing stormwater pond.

The potential temporary impacts on wetland buffers would be 4.0 and 3.7 acres for connections to *Preferred Alternatives C11A* or *C9T*, respectively (see Table 4.8-7). general condition of the wetland buffers affected by construction includes unvegetated areas as well as areas of blackberry, lawn, and some deciduous forest (often with an understory of weeds such as Himalayan blackberry and patches of Japanese knotweed). The potential temporary impacts on wetland buffers would be primarily related to the following:

- Construction near the South Bellevue Park-and-Ride Lot
- Construction of the elevated guideway near the intersection of Bellevue Way SE and 112th Avenue SE, which would affect an area of deciduous forest with high-quality habitat
- Construction staging and access within the area east of the project right-of-way

Included are construction impacts on an existing mitigation site located immediately south of the South Bellevue Park-and-Ride Lot. Restoring these affected buffers after construction could improve buffer function by replacing existing areas that are dominated by noxious and invasive weeds or lawn with native species. This could improve the functions of the existing wetland and stream buffers and result in a beneficial environmental impact. Of the other Segment B alternatives, Alternative B7 would have the

greatest temporary construction impacts on wetlands and high-value habitat.

Of all the alternatives evaluated, Alternative B7 has the potential for the largest temporary impact on wetlands (2.9 acres, see Table 4.8-7). The majority of this impact would result from crossing the Mercer Slough wetland (WR-1/2). Alternative B7 would also bisect the WSDOT 118th Avenue SE wetland (WR-5). In order to construct the elevated guideway across Mercer Slough, a temporary work trestle might need to be built. The option of constructing the guideway with an overhead gantry could reduce temporary impacts and would be explored during final design. Alternative B7 would have the lowest potential temporary impact on wetland buffers of all the Segment B alternatives.

Alternatives B1, B2A, and B2E would have relatively similar and low potential impacts on wetlands and similar potential impacts on wetland/stream buffers. These alternatives would also have relatively similar potential buffers impacts that would primarily affect wetland/stream buffers along 112th Avenue SE, which consist of disturbed vegetation dominated by Himalayan blackberry (see Exhibit 4.8-5). Alternatives B1, B2A, B2E, and B3 (with and without the B3 - 114th Design Option) would avoid wetland impacts on existing mitigation sites.

The B3 - 114th Design Option would avoid the temporary impact (approximately 0.6 acre) that Alternative B3 would have on the Sturtevant Creek wetland. This design option would include several small impacts on wetlands near the shoreline of Mercer Slough West, and involve an elevated crossing of Sturtevant Creek along the south side of SE 8th Street that might temporarily affect streamside wetlands and buffers.

#### Aquatic Habitat

*Preferred Alternative B2M to C9T* would have no direct temporary impacts on fish and aquatic species and habitats. It could have some indirect temporary impacts. *Preferred Alternative B2M* would be closer to Mercer Slough West than the other alternatives, and thus would have the highest risk of adding sediment to the slough compared with the other alternatives in Segment B. It also may result in vegetation clearing to the water's edge, causing temporary impacts on riparian zone function. *Preferred Alternative B2M to C11A* is similar to *B2M to C9T* but would be set farther away from Mercer Slough. Except for Alternative B7, the construction impacts of the other Segment B alternatives would have aquatic habitat impacts similar to *Preferred Alternative B2M*. The differences lie in the proximity to Mercer Slough. Other alternatives

that follow Bellevue Way SE are farther from Mercer Slough and thus would have a smaller risk of impacts on aquatic habitat. Construction activities in this segment would have a low risk of impact on salmonids because there is no spawning or primary rearing habitat and there would be no in-water work.

Alternative B7 would cross Mercer Slough with a free-spanning structure, and the support columns would be located outside of the ordinary high water mark, resulting in minimal impacts on aquatic habitat. Construction would, however, be close to the water and could result in riparian vegetation being cleared to the water's edge and would still pose a potential risk of sediment transport and accidental spills into Mercer Slough.

#### **Segment C**

##### High-Value Habitat

With *Preferred Alternatives C11A or C9T*, and Alternative C9A with a connection to B2A there would be a relatively small area of temporary construction impacts on high-value wildlife habitat along Segment C. Segment C is in Downtown Bellevue, a highly developed area. Therefore, no wildlife habitat or wildlife displacement is expected with any of the other Segment C alternatives.

##### Wetlands and Wetland Buffers

*Preferred Alternatives C11A and C9T* would not impact wetlands. However, if connecting from Alternative B3, B3- 114th Design Option, or B7, there would be a potential temporary construction impact on the buffer to the Hilton Stormwater Pond (WR-16). This potential temporary impact would be primarily related to construction of the elevated guideway over Sturtevant Creek. Impacts on the pond buffer overlap with the impacts on the stream buffer.

All of the other Segment C alternatives connecting from Alternatives B3, B3- 114th Design Option, or B7 may have the same potential temporary construction impact on the buffer to the Hilton Stormwater Pond (WR-16) as discussed above for *Preferred Alternatives C11A and C9T*. In addition, Alternatives C9A and C14E may also have a potential temporary construction impact on the Hilton Stormwater Pond (WR-16) itself. The current design for Alternatives C9A and C14E shows a temporary impact on the portion of the pond at its outlet. For purposes of this EIS, it was assumed that the function of the entire 0.1-acre pond would be temporarily disturbed (see Table 4.8-7). Segment C alternatives that connect from Alternatives B2A or B2E would not affect WR-16.

### Aquatic Habitat

*Preferred Alternatives C11A and C9T* connection with *Preferred Alternative B2M* would avoid Sturtevant Creek impacts south of Main Street, but relocating the creek for the Hospital Station east of I-405 would require relocating Sturtevant Creek channel just north of NE 8th Street (see Exhibit 4.8-6).

*Preferred Alternatives C11A and C9T* connecting from Alternatives B3, B3 - 114th Design Option, or B7 may result in sediment potentially reaching Sturtevant Creek behind the Hilton Hotel. Construction of support columns in the reach downstream of the I-405 culvert would be close to the channel, and vegetation may be cleared to the water's edge. Temporary construction impacts on riparian zone function would result as well. These construction activities would have a potential to cause sedimentation in Sturtevant Creek. However, careful implementation of BMPs along with the very low flows during the in-water work window would most likely result in a minimal and brief pulse of turbidity when flow is reconnected to the new channel. The route for both *Preferred Alternatives C11A and C9T* also crosses Sturtevant Creek just south of the NE 8th Street/ I-405 interchange, but the creek is in an existing pipe system at this location.

Alternatives C1T, C2T, C9A, and C14E would have the same impacts on Sturtevant Creek at the Hospital Station as described for *Preferred Alternatives C11A and C9T*. All Segment C alternatives, except Alternatives C1T and C7E, would have similar construction impacts on Sturtevant Creek as *C11A and C9T*.

### **Segment D**

#### High-Value Habitat

*Preferred Alternative D2A* would affect approximately 1.9 to 2.1 acres of high-value wildlife habitat that would be directly affected during clearing for construction, depending on the connection option. The estimated area of high-value wildlife habitat that would be directly affected during clearing for construction along the other Segment D alternatives varies from approximately 0.2 to 0.3 acre (Alternative D3) to approximately 1.2 to 1.3 acres (Alternative D5). The proposed storage track with *Preferred Alternative D2A* would not affect high-value wildlife habitat.

#### Wetlands and Wetland Buffers

To construct *Preferred Alternative D2A*, elevated crossings over five wetlands (WR-7, WR-8SE, WR-11, WR-10W, and WR-15) and road construction related to the retained cut across 120th Avenue NE (WR-17) would result in potential temporary impacts on approximately 0.5 acre of wetland and approximately 1.7 acres of wetland/stream buffer. This alternative

would have the largest temporary impact on wetlands and wetland/stream buffers compared to the other Segment D alternatives; however, the total impact would be relatively low. The potential temporary impacts on wetlands and wetland/stream buffers would be primarily related to staging and access necessary to construct the elevated guideway and would affect mostly Category 3 wetlands, a very small amount of one Category 2 forested wetland, and buffers that are currently disturbed by surrounding development, noxious weeds, stormwater from parking lots and buildings, and litter. Direct temporary construction impacts on wetland resources would be the same with either D2A design option, and would be the same as described above for *Preferred Alternative D2A*.

Alternative D3 would result in the smallest temporary impact on wetlands (0.1 acre) and wetland/stream buffers (0.1 to 0.2 acre, depending on the connection from the former BNSF Railway corridor versus NE 12th Street, respectively) compared to all the Segment D alternatives (see Table 4.8-7). This alternative would completely avoid all impacts on the wetlands east and west of 140th Avenue NE (WR-10E, WR-10W, and WR-11) and would have minor temporary impacts on wetlands WR-6, WR-8, and WR-15. In addition, connecting from Segment C via the former BNSF Railway corridor (rather than via NE 12th Street) would further avoid a small impact on the BNSF Matrix Wetland (WR-6).

The amount of temporary impact on wetlands and wetland/stream buffers from Alternatives D2E and D5 would be less than *Preferred Alternative D2A* but more than Alternative D3 (see Table 4.8-7). Alternative D5, which is also completely elevated, would have temporary impacts primarily on the West Tributary to Kelsey Creek Riparian Wetland Northwest (WR-8NW) and the wetland west of 140th Avenue NE (WR-11).

#### Aquatic Habitat

Construction of *Preferred Alternative D2A* would cross four streams (West Tributary to Kelsey Creek, Goff Creek, Unnamed Tributary to Kelsey Creek, and Valley Creek). While there is potential risk of sedimentation, the impacts are likely to be minimal as long as the appropriate BMPs to contain sediment are implemented. In-water work at the West Tributary to Kelsey creek would be isolated with a coffer dam or similar technique. In-water work in the Unnamed Tributary to Kelsey Creek would be isolated by bypass pumping during the connection phase of the culvert/pipe addition in 136th place NE.

All other Segment D alternatives cross streams. This could result in sediment potentially reaching the

streams during construction. However, temporary construction impacts on salmonids are not expected because potential impacts that would occur in the West Tributary to Kelsey Creek, Goff Creek, and Unnamed Tributary to Kelsey Creek would be upstream from fish barriers in the streams and sediments would not likely be transported farther downstream to aquatic habitat that supports fisheries resources. Valley Creek would be crossed by an elevated span next to SR 520 by most alternatives and would have limited potential for sedimentation. Alternative D3 would require a culvert replacement at NE 20th Street. Careful implementation of BMPs should be adequate to minimize sedimentation there. Potential inadvertent spills could affect water quality and aquatic resources. Construction for stream crossings could also disturb western toads due to construction noise, interfering with their ability to hear mating or alarm calls.

### **Segment E**

#### **High-Value Habitat**

*Preferred Alternative E2* and E2 - Redmond Transit Center Design Option would affect approximately 1.5 acres of high-value wildlife habitat that would be directly affected during clearing for construction.

The estimated area of high-value habitat that would be directly affected during clearing for construction with the other Segment E alternatives varies from approximately 1.1 acres (Alternative E4) to approximately 2.1 acres (Alternative E1).

#### **Wetlands and Wetland Buffers**

Construction of *Preferred Alternative E2* would result in potential temporary impacts on 0.1 acre of wetland and on 0.9 acre of wetland/stream buffer. These impacts include a potential minor temporary disturbance (less than 0.1 acre of wetland and 0.4 acre of wetland buffer) to existing mitigation wetlands at SR 520 Bear Creek 1 and 2 mitigation sites at NE 76th Street. Constructing E2 - Redmond Transit Center Design Option would result in potential temporary impacts similar to *Preferred Alternative E2*. Potential temporary impacts on wetlands would be 0.2 acre, and 0.9 acre on wetland/stream buffer. Potential impacts on wetlands and wetland buffers from Alternatives E1 and E4 would be slightly less than those described for *Preferred Alternative E2*, as shown in Table 4.8-7.

#### **Aquatic Habitat**

*Preferred Alternative E2* would cross the Sammamish River and Bear Creek, but no in-water work would be necessary at either crossing; therefore, no direct impacts on salmonid species would occur. Potential sedimentation from clearing and inadvertent spills could affect water quality and aquatic resources.

Implementation of BMPs is expected to avoid sediment input and accidental spills. Construction noise near these streams could disrupt western toad reproduction by interfering with their ability to hear mating and alarm calls. The E2 - Redmond Transit Center Design Option would have potential impacts on aquatic habitat identical to those described for *Preferred Alternative E2*. Potential impacts on aquatic habitat from the other Segment E alternatives would be similar to *Preferred Alternative E2*, which would also cross the Sammamish River and Bear Creek.

Construction noise levels could displace wildlife from coniferous forest patches during construction along the Alternative E1 route. Additional minor displacement or disturbance may occur along *Preferred Alternative E2* where it borders Marymoor Park. Although no impacts are anticipated, all Segment E alternatives cross over Bear Creek, near a created wetland mitigation area (WR-12). If the *Preferred Alternative E2* alignment were shifted to accommodate other improvements in the former BNSF corridor, wetland impacts associated with crossing Bear Creek might change. Protective fencing would be installed to establish construction limits to avoid this area during construction.

All Segment E alternatives might affect wildlife at the Bear Creek Parkway crossing. Although specific bald eagle foraging locations are not known, construction of all Segment E alternatives across Bear Creek would cause temporary losses of forested stands and could temporarily displace any eagle foraging in the area.

#### **Maintenance Facilities**

Increased sediment inputs from construction of maintenance facilities in Segment D (MF1 and MF2) are not expected because the presence of beaver dams would detain and deposit sediment inputs. Construction of MF3 would require two culvert replacements in Goff Creek, which could result in temporary downstream sedimentation. No impacts are expected at the MF5 in Segment E.

### **4.8.4 Potential Mitigation Measures**

Mitigation for ecosystem impacts is based on a hierarchy of avoiding, minimizing, and compensating for unavoidable adverse impacts. The design of the East Link Project incorporates avoidance and minimization techniques. Avoiding impacts on ecosystems is an important component of alternative development and design. Routes were developed based on numerous constructability issues, including the presence of sensitive areas. Where possible, sensitive areas were avoided, and when not possible,

designs were modified to minimize impacts on ecosystems.

Sound Transit would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures, as outlined in Appendix H3, related to BMPs and in adherence with federal, state, and local regulations. The Biological Assessment prepared for ESA consultation also identifies conservation measures and proposed aquatic habitat improvements that would become conditions of federal approvals for the project. Based on this analysis, and the mitigation measures proposed herein, the NMFS and the USFWS concurred on December 7, 2010, and February 23, 2011, respectively, that the determination of effect for ESA-listed species is “may affect, not likely to adversely affect.” The proposed determination of effect on Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act was “No Adverse Effect.”

#### 4.8.4.1 Potential Mitigation for Operational Impacts

The following subsections describe mitigation for specific habitat types. Mitigation measures do not differ between the preferred alternatives and the other East Link alternatives.

##### High-Value Habitat

Project impacts on high-value wildlife habitats regulated by local agencies would be mitigated with habitat replacement or enhancement. The type of habitat to be established would depend on the affected species. The type of habitat to be replaced and mitigation ratios would be determined through discussions with federal, state, and local permitting agencies during final design and project permitting. Sound Transit would adhere to local ordinances regarding tree replacement ratios.

##### Wetlands and Wetland Buffers

The preferred alternatives for the proposed East Link Project would permanently affect approximately 0.7 acre of various wetlands and up to 2.5 acres with a combination of other alternatives. This relatively small amount of impact for an 18-mile-long project (a maximum of 0.14 acre of impact per mile of light rail) reflects Sound Transit’s commitment to avoid and minimize environmental impacts. Sound Transit has committed to achieving no net loss of wetland function and area on a project-wide basis. Sound Transit would apply the interagency wetland mitigation guidance prepared by Ecology, USACE, and USEPA (2006).

Compensatory mitigation sites would be identified within the same drainage basin and compensate for lost functions in-kind. The specific compensatory mitigation sites for unavoidable impacts on wetlands would be determined during final design and project permitting. Compensatory mitigation-to-impact ratios for replacement of wetlands would comply with the requirements of the local critical area ordinances (CAOs) and the interagency wetland mitigation guidance (Ecology et al., 2006). During field work, Sound Transit determined there are several opportunities for wetland mitigation within the study area close to potentially impacted areas that are expected to meet required mitigation ratios. Additional compensatory mitigation may be required for impacts on existing wetland mitigation sites and would be determined during final design and project permitting.

There are no existing approved mitigation banks in the Kelsey Creek subbasin. However, it is possible that a bank could become certified in the project study area in the future and could be used to mitigate project impacts.

##### Aquatic Habitat

On Sturtevant Creek at the Hospital Station where realignment of the stream channel would be required (for *Preferred Alternatives C11A, C9T, and Alternatives C1T, C2T, C9A, or C14E*), Sound Transit would reconstruct the new channel with natural stream habitat features. Riparian habitat functions would be improved with native riparian plantings. This reach is currently lacking shade. The newly shaded reach would help lower stream temperatures in the downstream reaches that support salmonids. Specific requirements and details of these measures would be established during final design and project permitting.

For Alternatives D3 or D5, which have culvert lengthening or shortening (Goff Creek and Valley Creek), habitat improvements might be made in the form of large woody debris placements. For maximum benefit to fisheries, habitat improvements could be done in either Goff Creek, Valley Creek, or West Tributary of Kelsey Creek below the anadromous fish barriers, wherever the best improvements and access exist. Along the West Tributary to Kelsey Creek, enhancement could include creating wider buffers for habitat and open space, environmental education, and stormwater management. Riparian plantings to mitigate impacts in riparian areas from shading by elevated tracks or bridges would be possible in a number of locations, such as in Mercer Slough, West Tributary to Kelsey Creek, Valley Creek, Bear Creek,

and Sammamish River. The Sammamish River would receive the most benefit from this mitigation.

As mitigation for the increased culvert length on the Unnamed Tributary to Kelsey Creek (with *Preferred Alternative D2A* and Alternatives D3 and D2E), Sound Transit proposes to coordinate with the City of Bellevue to find and develop instream habitat improvements on Goff Creek in coordination with the City of Bellevue's larger plans to restore and daylight the creek.

#### 4.8.4.2 Potential Mitigation for Construction Impacts

BMPs have been developed to avoid and minimize impacts during construction. These BMPs, listed in Appendix A of Appendix H3 and Section 4.9, Water Resources, involve implementation of conditions set forth in the HPA, WAC 220-110-070, for installing culverts during construction, Section 401 and Section 404 of the CWA, the NPDES permit, and the development of a Stormwater Pollution Prevention Plan (SWPPP) that prescribes implementation of measures for identifying, reducing, eliminating, or preventing sediment and erosion problems on site. The following subsections describe mitigation for specific habitat types for construction impacts by any of the East Link alternatives.

##### High-Value Habitat

Areas disturbed in the construction staging areas would be revegetated with native vegetation within one year following construction. Sound Transit would update its survey of bird nests during final design. If a bald eagle nest is found within one-half mile of the proposed construction limits, a bald eagle management plan would be prepared. Under the Migratory Bird Treaty Act (MBTA) nesting migratory bird nests cannot be destroyed during the breeding season. Sound Transit would consult with the USFWS on methods to implement during construction to avoid impacts on migratory birds consistent with the MBTA and the Bald and Golden Eagle Protection Act. Such methods would include not clearing vegetation in the Mercer Slough buffer during the nesting season for migratory birds.

##### Wetlands and Wetland Buffers

Wetlands and wetland/stream buffer areas disturbed by construction would be protected by BMPs and revegetated as soon as possible after construction. BMPs would be implemented to avoid construction impacts on wetlands and wetland buffers. Sound Transit would conduct detailed site surveys to establish existing topography and conduct hydrologic monitoring to restore topography. Restoration would include soil amendment and vegetation replacement.

##### Aquatic Habitat

BMPs would be implemented to avoid construction impacts on aquatic resources. Except for the in-water construction in Lake Washington, any in-water work would be isolated from adjacent waters using a coffer dam or other suitable technique. Such isolation is not necessary in Lake Washington due to the type of work done there (welding or bolting metal jackets together).

In-water work would be conducted during approved in-water construction windows. Where ESA-listed species may be present, stream crossings would not require in-water work and the project would not install infrastructure below the ordinary high water mark. Disturbed or temporarily cleared riparian vegetation would be replanted with suitable native species. The proposed channel relocation of Sturtevant Creek adjacent to the Hospital Station would follow guidelines found in the Integrated Streambank Protection Guidelines manual (WDFW, et al. 2002) and other current stream design documents.

If over-water construction takes place over Mercer Slough (with Alternative B7) or the Sammamish River (all Segment E alternatives) during the migratory period of ESA-protected species, nighttime lighting would be shielded from the waters below. Sound Transit would consult with the Tribes to avoid impacting Tribal fisheries from construction work in Lake Washington, from barge/boat transit through the Lake Washington ship canal, or through approaches to the Ballard Locks.