

4.8 Ecosystem Resources

4.8.1 Introduction to Resources and Regulatory Requirements

An ecosystem is the interaction between plants, animals, and microorganisms, and the physical environment in which they live, all of which function together as a unit. Ecosystems are made up 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 high-quality upland vegetation, wetlands, and aquatic habitat in the study area that would support sensitive wildlife and aquatic resources.

High-quality upland habitat generally is made up of moderately to mostly vegetated areas consisting of shrubs, forest, and other habitat known to support sensitive wildlife species. Areas that qualify as high-quality wetland habitat were identified using a variety of accepted tools, including the U.S. Department of Ecology's (Ecology's) Western Washington Rating Form, to determine the categories of each wetland. High-quality aquatic habitat was identified based on the quality of the riparian habitat, in-stream habitat, and water, and changes in habitat caused by humans.

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 *Ecosystem Technical Report* (Appendix H3) covering federal and state threatened, endangered, and species of concern; wildlife and vegetation; wetlands; and aquatic resources. When a preferred alternative is identified and a Final Environmental Impact Statement (EIS) is prepared for the East Link Project, a Biological Assessment will be prepared to meet ESA requirements. This section summarizes the findings in the *Ecosystems Technical Report* (Appendix H3) and is based on literature research, communication with regulatory agencies, and preliminary field reconnaissance of resources. The habitat types studied are defined as follows:

- **Upland vegetation.** The area within 100 feet of either side of the project alternatives.
- **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 (in accordance with Washington Administrative Code (WAC) 173-201A-400 for the length of streams and rivers and as agreed to by the National Marine Fisheries Service [NMFS] and U.S. Fish and Wildlife Service [USFWS] for ESA consultations).

4.8.2 Affected Environment

The ecosystem evaluation was based on literature reviews; consultation with federal, state, and local agencies and their web sites; field surveys; and aerial mapping. Habitats in the project vicinity have been modified considerably from pre-settlement conditions by human activities. Wildlife species present in these modified habitats have adapted to smaller habitat patches and are tolerant of 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.

The following subsections describe the habitat types that are found in the study area in addition to a discussion 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 a local Critical Areas Ordinances. This section describes habitats that are considered to be high-quality habitat types in terms of upland vegetation (areas that are outside of the normal high water line), wetlands, and aquatic habitat.

4.8.2.1 Upland Vegetation

Ecosystems typically are defined by vegetation types.

The study area passes through highly urbanized environments with some key pockets of natural vegetation and water bodies (i.e., ecosystems). Pockets of vegetation/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, medium, and low value as wildlife habitat.

Sound Transit characterized the higher-value vegetation/wildlife habitat types in the upland vegetation study area (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 the only high-value habitat in that segment is Lake Washington. Lower-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 vegetation types with the highest value are found in the study area:

- Wetlands (wetland values are defined below)
- Coniferous forests, typically containing Douglas fir, pines, and red cedar
- Deciduous forests, including big-leaf maple, black cottonwood, red alder, and Pacific madrone

- Urban with patches of coniferous and deciduous forests
- Riparian forest, including big-leaf maple, black cottonwood, red alder, and Pacific madrone, located adjacent to water bodies
- Open waters, including lakes, ponds, and streams

These higher-quality upland 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

Wetlands are defined by soil characteristics, 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 a variety of accepted sources and methods:

- 1987 Corps of Engineers Wetland Delineation Manual (USACE, 1987)
- 1997 Washington State Wetlands Identification and Delineation Manual (Ecology publication #96-94) (Ecology, 1997)
- 2004 Washington State Wetland Rating System for Western Washington Manual (Ecology publication #04-06-025) (Ecology, 2004)
- The hydrogeomorphic classification (HGM) (Brinson, 1993), determined using guidance found in the Washington State Wetland Rating System for Western Washington, Revised (Hruby, 2004)
- The Cowardin system (Cowardin, et al., 1979), used to define and describe the physical attributes of wetlands in the study area

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.

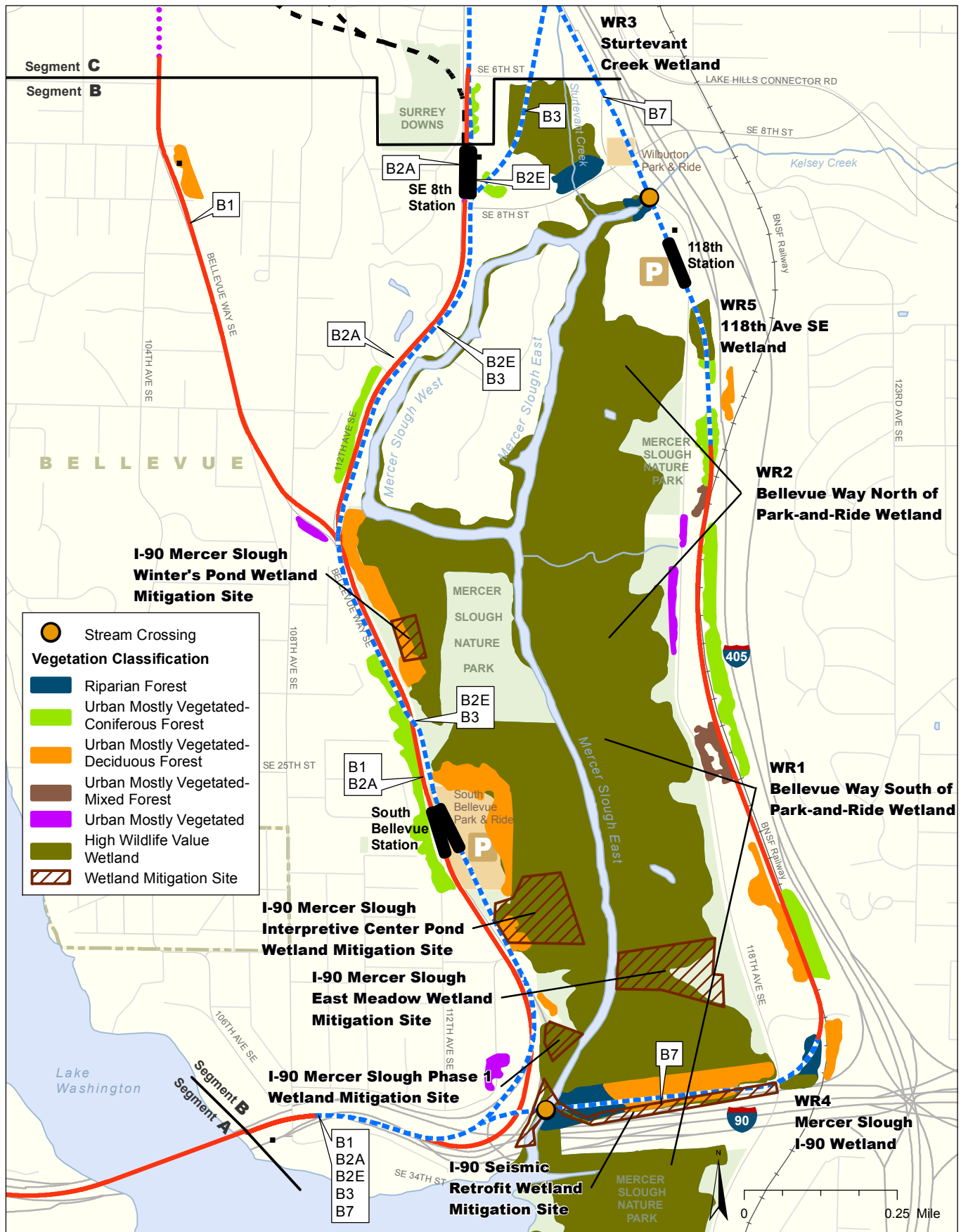
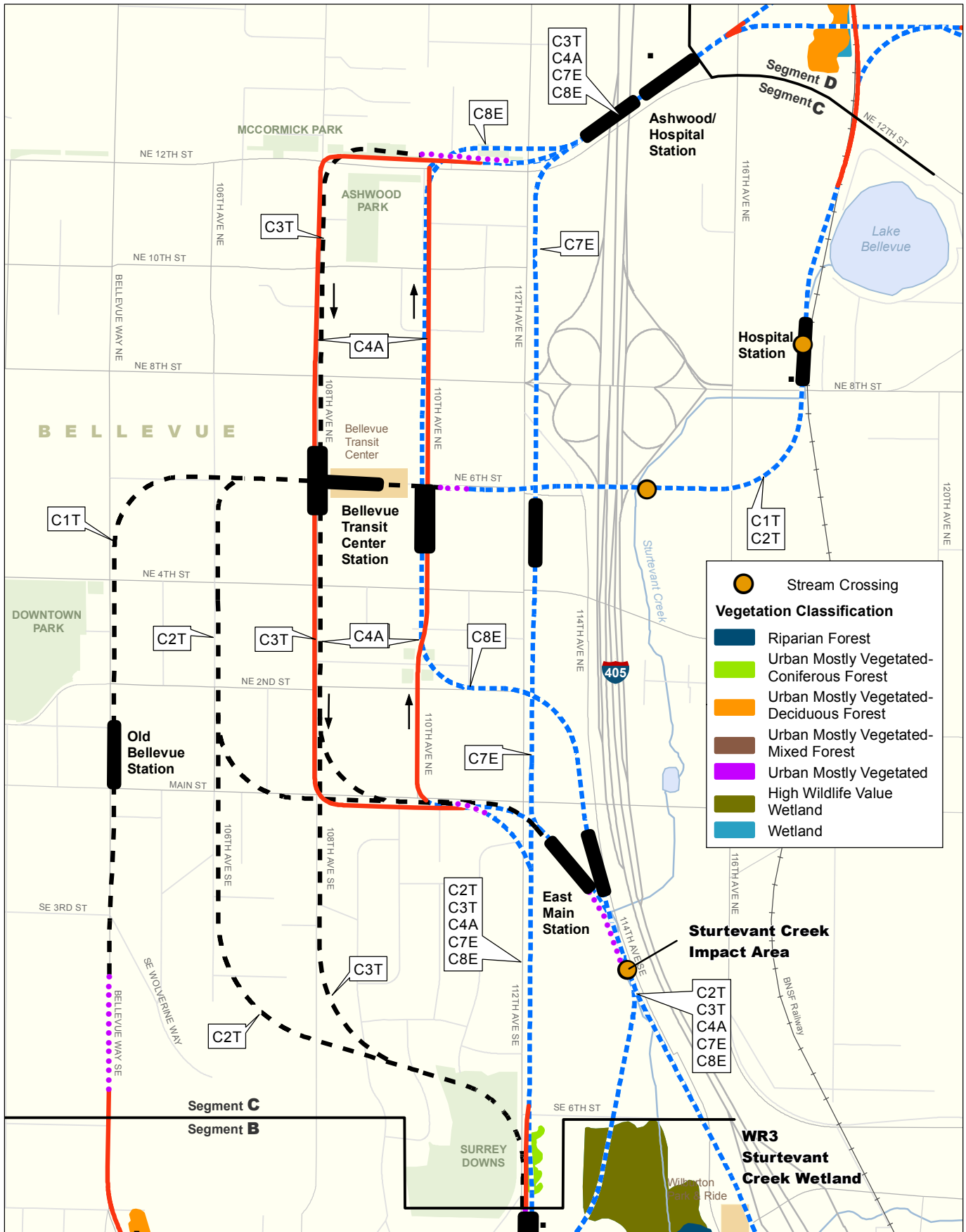
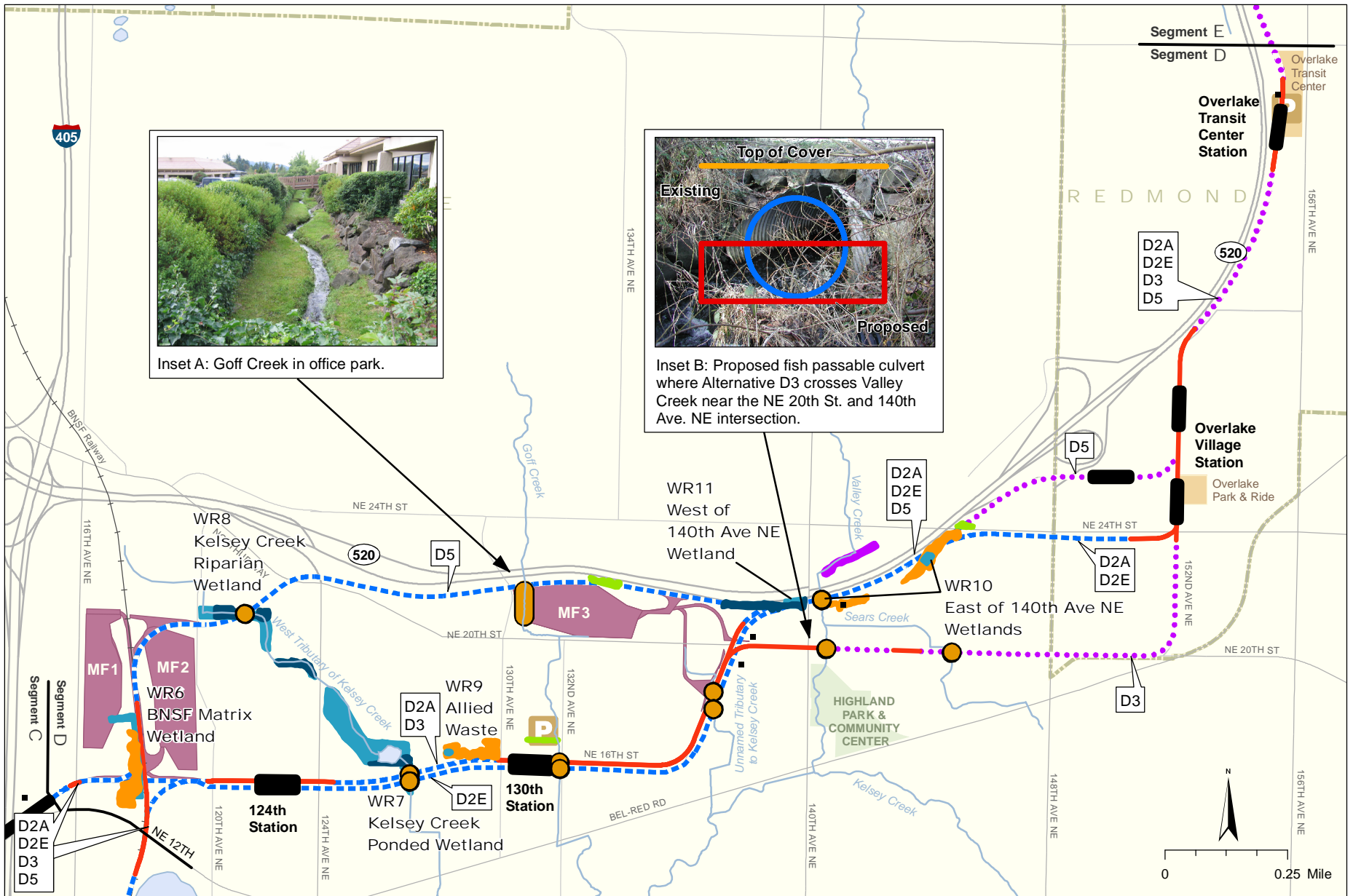


Exhibit 4.8-1 High Value Vegetation/Wildlife & Aquatic Habitat, and Wetlands Segment B
East Link Project



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

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

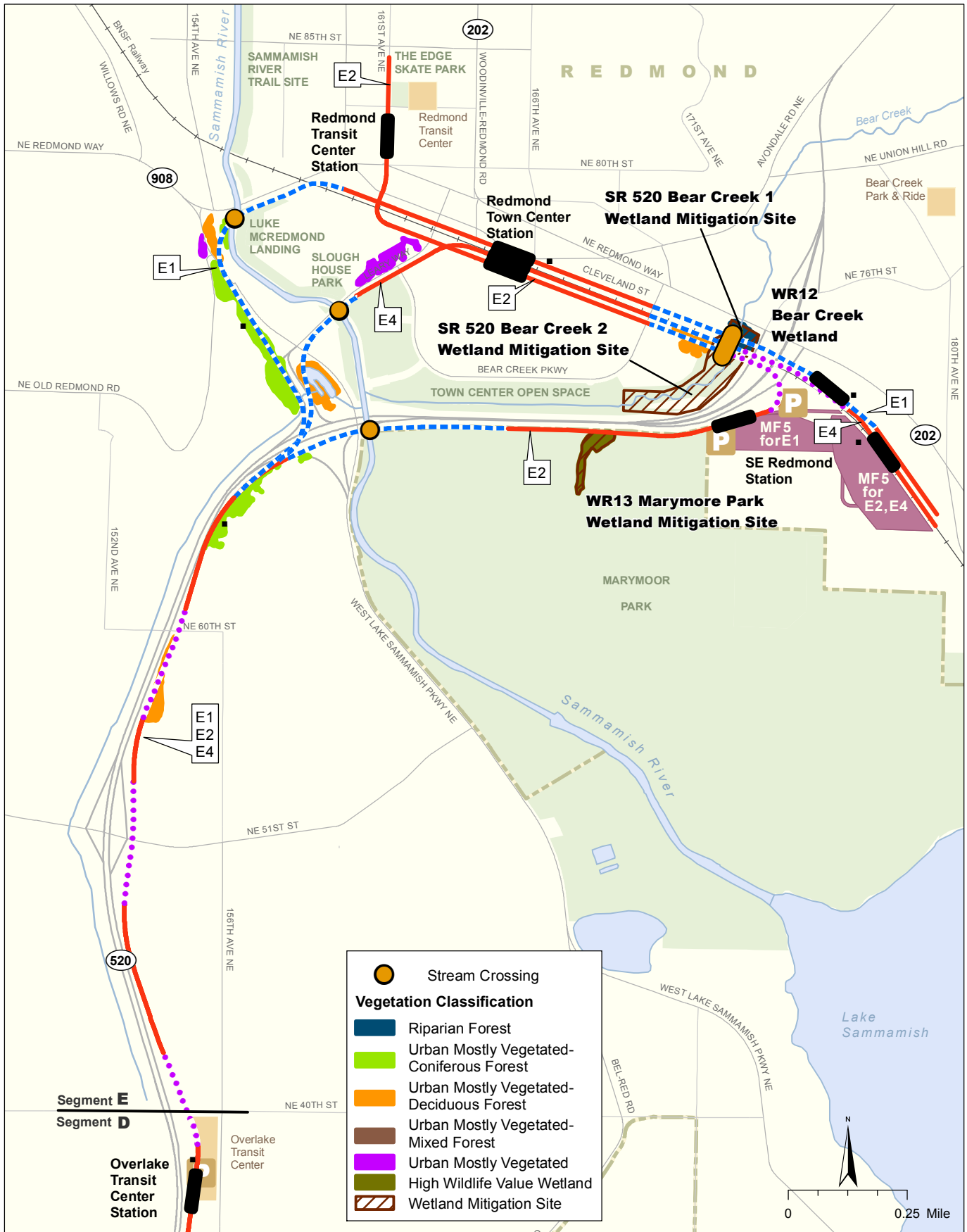


Source: Data from City of Bellevue (2005), City of Redmond (2005), King County (2006), NWI USFWS (2006) modified by CH2M HILL; CH2M HILL (2007).

Vegetation Classification

- | | | | |
|--|-------------------------------------|---------------------------|---------------------------------------|
| Riparian Forest | Urban Mostly Vegetated-Mixed Forest | At-Grade Route | Proposed Station |
| Urban Mostly Vegetated-Coniferous Forest | Urban Mostly Vegetated | Elevated Route | Maintenance Facility and Access Track |
| Urban Mostly Vegetated-Deciduous Forest | Wetland | Retained-Cut Route | New and/or Expanded Park-and-Ride Lot |
| | Stream Crossing | Tunnel Route | |
| | | Traction Power Substation | |

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



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

- At-Grade Route
- - - - - Elevated Route
- ⋯ Retained-Cut Route
- ▬ Tunnel Route
- Traction Power Substation
- ▬ Proposed Station
- ▬ Maintenance Facility and Access Track
- P New and/or Expanded Park-and-Ride Lot

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

Local jurisdictions in the study area also have wetland classification systems that are based on Ecology's rating system. For a comparison of these classification systems, see Table 2-3 in the *Ecosystems Technical Report* (Appendix H3).

Wetland buffers, as defined by the state or specific local jurisdiction regulating the wetland, were also identified. Higher-quality wetlands and the degree to which several functions are performed by a wetland (e.g., water quality, reducing floods, and providing wildlife habitat) result in a higher category assignment, with Category 1 (I) offering the widest range of functions and value, and Category 4 (IV) the lowest. The assessments used for these ratings can be found in the *Ecosystem Technical Report* (Appendix H3). The wetland functional rating system (Hruby, 2004) defines four main wetland functional categories: special criteria, hydrologic, biological, and water quality improvement. All levels of wetland values have been identified in the study area.

Thirteen different 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 in Segments A and C. In general, wetlands in the study area have been altered and are surrounded by urban and residential environments.

4.8.2.3 Aquatic Habitat

Aquatic habitats include ponds, lakes, rivers, and streams. 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 generally has good aquatic productivity.

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 the *Ecosystems Technical Report* (Appendix H3).

Table 4.8-2 identifies and describes water bodies located in the study area and lists those most likely to support salmonids. The Unnamed Tributary of Kelsey Creek, due to its size and very low intermittent flows,

is not known to support fish and therefore not further discussed.

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

There is no 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 effects of the project on their fishing events on Lake Washington; the events typically occur in July. No other fishing concerns were expressed.

TABLE 4.8-1
Location and Category for Wetlands Located in the Study Area

Locator	Wetland	Location	Category ^a
WR-1	Bellevue Way South of Park-and-Ride Lot (includes I-90 Mercer Slough interpretative center pond, I-90 Mercer Slough East Meadow, I-90 Mercer slough Phase 1, and I-90 seismic retrofit wetland mitigation sites)	Mercer Slough	1
WR-2	Bellevue Way North of Park-and-Ride Lot (includes I-90 Mercer Slough winter pond wetland mitigation site)	Mercer Slough	1
WR-3	Sturtevant Creek	Mercer Slough	1
WR-4	Mercer Slough I-90	Mercer Slough	1
WR-5	118th Avenue SE	Mercer Slough	1
WR-6	BNSF Matrix	Mercer Slough	3
WR-7	Kelsey Creek Poned	Kelsey Creek	3
WR-8	Kelsey Creek Riparian	Kelsey Creek	3
WR-9	Allied Waste	NE 15th Place Wetland	4
WR-10	East of 140th Ave NE (two parts)	Valley Creek	3
WR-11	West of 140th Avenue NE	Valley Creek	3
WR-12	Bear Creek (SR 520 Bear Creek 1 and 2 wetland mitigation site)	Bear Creek	2
WR-13	Marymoor Park Mitigation Wetland	Marymoor Park	2

^a Category rating is for City of Bellevue or Redmond

TABLE 4.8-2
Water Bodies, Habitat Quality, and Aquatic Species in the Segments B, C, D, and E

Water Body	Aquatic Habitat Quality	Species Present	Comments
Segment A			
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 salmonids.	Chinook, steelhead, sockeye, coho, Coastal-Puget Sound bull trout, river lamprey and western toad.	A regionally important lake and designated as a shoreline of statewide significance.
Segment 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.	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 spawn.	Largest stream in Bellevue. This is an urban stream of regional significance due to high presence of 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 coho occur up to impassable culvert at I-405.	Urbanized area results in some high, but intermittent flow regime.
Segment C			
Sturtevant Creek	Poor spawning and rearing habitat, but better habitat quality than in Segment B.	Coho occur up to impassable culvert at I-405, peemouth chub spawning.	Urbanized area results in some high, but intermittent flow regime.
Segment D			
West Tributary to Kelsey Creek	Poor spawning and rearing habitat. Habitat has been degraded by logging and urban development.	Chinook, sockeye, coho, steelhead, and cutthroat present.	Pacific giant salamander documented.
Goff Creek	Fair to poor spawning and rearing habitat depending on reach.	Chinook and sockeye salmon; cutthroat trout spawn.	Impassable culvert at Bel-Red Road.
Un-named tributary to Kelsey Creek	No suitable habitat for fish. Poor spawning and rearing habitat.	None known to use this tributary	Very small, ditch-like structure. Urbanized area and low intermittent flow regime.
Valley Creek	Poor to good spawning and rearing habitat with good water quality.	Sockeye (historically), Chinook, steelhead, coho, and cutthroat present.	Urbanized area results in some high, but intermittent flow regime.
Sears Creek	Fair spawning and rearing habitat because of some presence of pools and clean gravel riffles.	Considerable use by Chinook, coho, and cutthroat trout occurs up to the Bel-Red Road culvert.	Urbanized area results in some high, but intermittent flow regime. Most of drainage is piped.
Segment E			
Sammamish River	Highly degraded with no spawning and poor rearing habitat, limited riparian vegetation, high summer temperatures.	Seasonal use by Chinook, coho, and kokanee (resident sockeye) salmon; steelhead; cutthroat trout.	No spawning.
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.

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

Sound Transit searched for priority species within a 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 Chinook salmon, coho salmon, coastal-Puget Sound bull trout, and steelhead. During the non-breeding season, marbled murrelets are rare and infrequent 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 and therefore are not expected to be in the project area during construction. Therefore, no impacts are

expected. WDNR requires the submittal of a Bald Eagle Management Plan (WAC 232-12-292) if a bald eagle nest is found within a 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, horned grebe, great blue heron (*Ardea herodias*), great egret (*Ardea alba*), turkey vulture (*Cathartes aura*), and black tern (*Chlidonias niger*), Black Swift (*Cypseloides niger*), and the Vaux swift (*Chaetura vauxi*). Also, the Monarch butterfly (*Danaus plexippus*), and Dreamy duskywing (*Erynnis icelus*) and the 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 King County and local jurisdictions' Critical Areas Ordinances were considered. The following paragraphs summarize 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, 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. In order 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 include great blue heron, red-tailed hawk, bald eagle, peregrine falcon, osprey, pileated woodpecker, purple martin, common loon (*Gavia immer*), western grebe, merlin, great egret, green heron, Vaux's swift, Townsend's big-eared bat, and western toad (*Bufo boreas*).

The **City of Redmond's Critical Areas Ordinance** (Ordinance #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 Wetlands, Aquatic, and High-Value 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.

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 eyries are located within a 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 West Channel Bridge on the Mercer Island side. A field visit in March 2007 was 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 Channel Bridge has been successful for the past 3 to 4 years, and is expected to remain successful until the adults die. A third nest is located in Downtown Bellevue (WDFW PHS database, 2007). There are no communal bald eagle roosts, winter concentration areas, or buffers for such areas within a half mile of any of the proposed project components in Segment A. However, there are five active eagle USFWS territories located within a half mile of the I-90 Alternative (A1). Of

TABLE 4.8-3

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

Name	Federal/State Status ^a	Presence, Preferred Habitat, and Probable Location in Study Area
Bird		
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Federal species of concern and state monitored	Known in the study area. 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, and E.
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Federal and state threatened	Rare in the study area. 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 non-breeding season. Only potentially in Segment A.
Peregrine falcon (<i>Falco peregrinus</i>)	Federal species of concern and state monitored	Likely present in the study area. 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, and E.
Pileated woodpecker (<i>Dryocopus pileatus</i>)	State candidate	Known in the study area. 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 the BNSF (B7) and Marymoor (E2) alternatives due to larger clusters of larger trees and snags.
Purple martin (<i>Progne subis</i>)	State candidate	Known in the study area. Nests in structures over water bodies, including natural cavities, pilings, and man-made housing structures. Forages over open water or wet areas for insects while in flight. Nesting observed at Marymoor Park in 2003 (Alternative E2), but no activity since. Habitat may also be present in Segment B as well.
Western grebe (<i>Aechmophorus occidentalis</i>)	State candidate	Known in the study area. 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	Likely present in the study area. 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	Likely present in the study area. 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	Known in the study area. Breeds in deciduous thickets, especially in willow thickets. Nest sites are often close to water. Present in Segments B and E.
Amphibian and Reptile		
Western toad (<i>Bufo boreas</i>)	Federal species of concern/ state candidate	Known in the study area. 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.
Fish		
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	Federal threatened/ state candidate	Known in the study area. Found in Lake Washington, Sammamish River, and Bear Creek, and possibly present in Mercer Slough, Kelsey Creek, West Tributary to Kelsey Creek, Goff Creek, Valley Creek, and Sears Creek. Found in Segments A, B, D, and E.
Steelhead (<i>Oncorhynchus mykiss</i>)	Federal threatened	Known in the study area. Found in Lake Washington, Mercer Slough, Kelsey Creek, Valley Creek, Sammamish River, and Bear Creek. Found in Segments A, B, D, and E.
Coastal-Puget Sound bull trout (<i>Salvelinus confluentus</i>)	Federal threatened/ state candidate	Known in the study area. 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.
River lamprey (<i>Lampetra fluviatilis</i>)	Federal species of concern/ state candidate	Known in the study area. Found in Mercer Slough, Kelsey Creek, Sammamish River, and Bear Creek. Found in Segments A, B, and E.

^a 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.

these, three were known to be active with incubating adults roosting outside the study area in April 2007.

Chinook and steelhead salmonids, as well as coastal-Puget Sound 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

Mercer Slough Nature Park serves as a pass-through into Lake Washington for many creeks. As a result, the East Link Project's highest wetland categories and

TABLE 4.8-4
Anadromous Salmonids in Lake Washington

Species	Time Period in Lake Washington	Spawning Streams
Summer/fall Chinook	July to October	Issaquah Creek hatchery program
Steelhead	Adults, December through April; smolts, April and May	Tributary streams and rivers including Bear Creek and Issaquah hatchery program
Coastal-Puget Sound Bull trout	A few fish are documented in the lake each year	Unknown whether bull trout spawn in study area streams

highest-value wildlife habitats (as described in Section 4.8.2.1) are located in Segment B. Mercer Slough Nature Park is the largest freshwater wetland remaining along the shores of Lake Washington. Several existing wetland mitigation sites are located in the Mercer Slough (see Table 4.8-1). The park encompasses 320 acres and is composed of herbaceous, scrub-shrub, and forested wetland; upland forest; meadows; a scrub-shrub bog; and a blueberry farm. Red-tailed hawks are regularly seen and known to nest at Mercer Slough. 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). A field visit in April 2007 resulted in no observance of heron in Mercer Slough.

Segment C

There is minimal habitat available in Segment C; however, an osprey nest is located less than a half mile west of Downtown Bellevue. While most of Sturtevant Creek in Segment C has minimal habitat value, the short reach adjacent to the Hilton Hotel, north of the SE 6th Street crossing, has good-quality habitat because there are pools and riffles with moderately clean gravel; this is virtually the only usable habitat in Sturtevant Creek for salmonids. Near I-405, the stream is blocked to fish passage at a culvert.

Also, Lake Bellevue is located east of the BNSF 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.

Segment D

There are five wetlands that are of low habitat value in this segment. High-value habitats including riparian wetland are located along the West Tributary of Kelsey Creek, some strips along State Route 520 (SR 520), and along portions of Valley Creek. Lower

reaches of Goff Creek support salmonid spawning while upstream reaches are blocked to fish passage by culverts. Valley Creek has some good habitat because there are some riffles with a few pools and mature riparian vegetation, while downstream from SR 520 it has no habitat to support salmonids. 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 up to the Bel-Red Road culvert.

The City of Bellevue plans to enhance Goff Creek and West Tributary of 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.

Segment E

There is limited high-value habitat along the Sammamish River in Segment E, although the watercourse is used by a variety of waterfowl and salmon.

Marymoor Park is 640 acres and has a variety of habitats, including herbaceous, scrub-shrub, and forested wetlands, in addition to a constructed wetland mitigation site near the northern boundary of the 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.

The WDFW PHS database indicates that purple martins have been seen in Marymoor Park. However, nest boxes in the park were not used by martins in 2004, 2005, or 2006 (Hobbs, 2007b). 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 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 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.

Maintenance Facility Surroundings

Two small areas of urban, mostly vegetated, deciduous forest located south of the 116th (MF1) and BNSF (MF2) maintenance facilities and along the west

side of the SR 520 Maintenance Facility (MF 3) exist in the study area.

4.8.3 Environmental Impacts

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

The environmental impacts of the East Link Project assume that Sound Transit will already have implemented a series of avoidance and best management practices during construction. These practices are described in the *Ecosystem Technical Report* (separately bound as Appendix H3 of this Draft EIS). In short, these include:

- Designating construction zone limits
- Implementing a Temporary Erosion and Sediment Control (TESC) plan
- Implementing the terms and conditions in the Hydraulic Project Approval for any work within or below the ordinary high water mark and installing new culverts in compliance with Washington Administrative Code (WAC) 220-110-070 regarding fish passage and the guidelines of the WDFW's Integrated Streambank Protection Guidelines
- 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 Department of Ecology requirements for permanent stormwater runoff, flow controls, and as pest management per current agreements

For analysis of short-term ecosystem impacts, Sound Transit assumed that all uplands and wetlands within the construction 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 from vegetation removal. The duration of the short-term 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 best management practices (BMPs)

to minimize the impact. Sound Transit also projected construction noise impacts on wildlife species within the study area.

Long-term 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 has BMPs to avoid and minimize impacts on streams and other aquatic habitats as an implementation approach to meet federal, state and local regulatory requirements. These BMPs are documented in the *Ecosystems Technical Report* (Appendix H3) and are environmental commitments that Sound Transit would implement.

During the Final EIS process, Sound Transit will conduct appropriate surveys to prepare a Biological Assessment for ESA consultation. Sound Transit expects that the Biological Assessment's effects determination for ESA-listed species will be a "may affect and is not likely to adversely affect" listed species and there will be no effects to Essential Fish Habitat under Magnuson-Stevens Fishery Conservation and Management Act (MSA).

4.8.3.1 No Build Alternative

The No Build Alternative would cause no short-term or long-term impacts on ecosystem resources. However, without the East Link Project, land use development may not be concentrated in the planned growth centers, causing additional growth elsewhere, including in or near areas of high-quality 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 may drain to surface waters and reduce water quality.

4.8.3.2 Impacts During Operation

Impacts Common to All Build Alternatives

Long-term impacts common to all alternatives would depend on the ecosystem being affected (e.g., aquatic habitat from culvert extension, wildlife displacement from removal of high-quality and priority habitat) and are described for each resource below.

The following sections and Table 4.8-5 identify long-term impacts to wetlands, upland vegetation and wildlife resources, and aquatic habitat.

Wetlands

Long-term impacts on wetlands that would persist throughout East Link operation include the following:

- Permanent removal of wetland area and function including wetlands beneath elevated structures. Depending on the combination of alternatives selected, the range of impact could vary from permanently filling or altering from 0.005 to 2 acres of wetland prior to compensatory mitigation.
- Shading of wetland areas by shadows cast beyond elevated structures that affect vegetation structure and function
- Runoff from new impervious surface and pollution-generating impervious surface (PGIS) (i.e., roadway modifications, park-and-ride lots, and maintenance facilities) increasing pollutant loads to wetlands
- The potential for accidental fuel, oil, or chemical spills at maintenance facilities

Upland Vegetation and Wildlife Resources

Two types of long-term impacts to upland vegetation and wildlife resources would be expected:

- Removal of high quality habitat that supports breeding, foraging, and roosting, which may cause disturbance or even displacement of some wildlife species. Depending on the combination of alternatives selected, the range of impact (not including to wetlands) could vary from 2.3 to 9.1 acres of high-quality habitat removed within the study area prior to compensatory mitigation. Wildlife, including WDFW priority species, that use this habitat type may vacate the area.
- Effects of operational noise on wildlife would be expected to be relatively minor compared to existing traffic noise during operation, because the loudest portion of light rail only slightly exceeds the highest existing noise level. Existing noise levels from busy arterials in the study area range from 53 to 72 dBA Ldn (see Section 4.7, Noise and Vibration). Operation of an elevated portion of light rail, which allows for top speeds and maximum noise permeation over open areas, would result in a maximum noise level of 70 to 74 dBA at roughly 50 feet from the guideway. Comparably, a typical bus would produce noise levels 3 to 5 dBA louder than the elevated light rail vehicle at the same distance. Noise levels from operation of the East Link Project are not expected to have adverse impacts on wildlife for any

segment because wildlife that use habitats adjacent to the alternatives are more or less accustomed to some level of existing human and vehicular activity.

The only ESA-listed wildlife species in the project vicinity, the marbled murrelet, is 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 alternative would be located in the center of the I-90 roadway and would not increase noise levels.

Aquatic Habitat

The range of long-term impacts would vary from no impacts on fish habitats, to beneficial impacts, to only minor adverse impacts before mitigation. Long-term impacts to 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 31 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 roadways relocated or widened and those that do not currently receive treatment would also be treated 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, East Link would result in fewer cars on the road and therefore fewer pollutants entering stream systems. Substantial long-term effects on water quality, and therefore aquatic species, would not be expected from increased surface runoff.

Operational Impacts by Alternative

Table 4.8-5 shows the acreage of high-quality habitat (wetlands and uplands) that would be lost and the stream crossings that would be required as a result of the East Link Project. Specific impacts are described in the following sections.

TABLE 4.8-5
Operational Impacts on High-Quality Habitat in Segments A, B, C, D, E, and Maintenance Facilities

Alternative	Wetland (acres)	Wetland Buffer (acres)	Other High Quality Habitat ^a (acres)	Aquatic resources
Segment A – Lake Washington				
A1, I-90	0	0	0	None
Segment B – Mercer Slough				
B1, Bellevue Way	0	2	1.7	0 stream crossings
B2A, 112th SE At-Grade	0	3.5	0.7	0 stream crossings
B2E, 112th SE Elevated	0.002/0.005 of mitigation site	3	0.4	0 stream crossings
B3, 112th SE Bypass	0.4/0.005 of mitigation site	3.7	0.7	0 stream crossings
B7, BNSF	1.8/0.3 of mitigation site	0.8	3.0	1 elevated stream crossing
Segment C – Sturtevant Creek				
Segment C Alternatives connecting from B3 and B7	0	0	0.1 to 0.5	1 elevated stream crossing with possibility for support columns in riparian buffer or in stream channel
Bellevue Way Tunnel [C1T] and 106th NE Tunnel [C2T] alternatives	0	0	0.1 to 0.2	Loss of 400 to 700 feet of channel function from culvert lengthening downstream of Lake Bellevue
Segment D – Kelsey, Goff, Valley, and Sears Creeks				
D2A, NE 16th At-Grade, from NE 12TH/BNSF	0.4	0.3	0.6	2 elevated crossings, 1 culvert crossing, 1 new stream enclosure of a 0.2-mile segment on the unnamed tributary to Kelsey Creek
D2E, NE 16th Elevated, from NE 12TH/BNSF	0.3	0.3	0.5	3 elevated crossings, 1 culvert crossing
D3, NE 20th, from NE 12TH/BNSF	0.1	0.1	0.1	1 elevated crossing, 3 culvert crossings (1 replacement); loss of 30 to 60 feet of channel function/habitat
D5, SR 520, from NE 12TH/BNSF	0.5	0.4	1.3	3 elevated crossings with some shading of West Tributary to Kelsey Creek and Goff Creek
Segment E – Bear Creek and Sammamish River				
E1, Redmond Way	0/0.1 of mitigation site	0.01	2.1	2 elevated stream crossings
E2, Marymoor	0.1/0.3 of mitigation site	0.5	1.2	2 elevated stream crossings
E4, Leary Way	0/0.2 of mitigation site	0.1	1.2	2 elevated stream crossings
Maintenance Facilities – Goff Creek (MF 3 only)				
MF1, 116th-D2/D3/D5	0.1	0.4	0.1	0 stream crossings
MF2, BNSF-D5	0.2	0.8	0.4	0 stream crossings
MF 3, SR 520	0	0	0	Loss of 230 feet of channel or increase of fish habitat for 34 feet

^a Includes riparian forest and three types of urban mostly vegetated forest (coniferous forest, deciduous forest, and mixed coniferous/deciduous forest), and urban mostly vegetated. All are classified as priority habitats by WDFW.

Segment A

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 the stormwater runoff to Lake Washington. Operation of light rail could discharge stray electrical current into Lake Washington and create additional electric current fields around the span than already possibly created from the bridge's existing cathodic

corrosion protection system. An assessment of whether the additional electric current field would affect aquatic resources estimates 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, particularly

because the project would remain in the center of the existing I-90 right-of-way.

Segment B

The at-grade Bellevue Way (B1), 112th SE At-Grade (B2A), 112th Bypass (B3) alternatives, and the 112th SE Elevated Alternative (B2E) would result in the loss of high-quality forested areas along Bellevue Way SE. B2E and B3 could potentially impact the I-90 Mercer Slough Interpretive Center Pond and Wetland Mitigation Site (part of WR-1). Movement of amphibians from Mercer Slough to uplands west of Bellevue Way is not expected to be affected because Bellevue Way is already a barrier.

The 112th SE Bypass (B3) and BNSF (B7) alternatives would remove the highest-quality habitat in Segment B. B3 would result in a loss of 3.7 acres of wetland buffer spread over the wetland east of Bellevue Way (WR-1) and the Sturtevant Creek wetland (MR-4). B7 would result in a loss of 1.8 acres of wetland across Mercer Slough (WR-1) and 3.2 acres of other high-quality forested habitat east of Mercer Slough. B7 could also potentially affect the I-90 seismic retrofit wetland mitigation site (part of wetland WR-1), and the elevated structure could shade Mercer Slough.

Segment C

No wetland habitat would be impacted from any alternatives in Segment C. Between 0.1 and 0.2 acre of other high quality habitat would be impacted by the Segment C alternatives.

Impacted habitat would consist of the stream channel of Sturtevant Creek. The 106th NE Tunnel (C2T), 108th NE Tunnel (C3T), Couplet (C4A), 112th NE Elevated (C7E), and 110th NE Elevated (C8E) alternatives connecting from Segment B from 112th SE Bypass [B3] or BNSF [B7] alternatives connectors would require the Sturtevant Creek channel adjacent to the Hilton Hotel to be realigned. The stream reach that would be potentially affected is approximately 925 feet long when connecting to B7 and 1,330 feet long when connecting to the B3. Realignment could provide the opportunity to improve channel morphology (i.e., pool frequency, in-stream structure, riparian vegetation, substrate type) to further enhance physical characteristics supporting salmonids. Habitat would be lost if support columns are placed in the riparian buffer or in the stream channel. Sound Transit would comply with the City of Bellevue Critical Areas Ordinance 20.25H. However, although shading can reduce water temperature, which could benefit fisheries resources, the elevated structure could also shade riparian vegetation, which could affect vegetation growth.

The Bellevue Way (C1T) and 106th Tunnel (C2T) alternatives, which cross I-405 at NE 6th Street and travel up the BNSF Railway corridor, may require an additional reach of Sturtevant Creek to be realigned (northeast of I-405). This reach is not currently accessible to salmonids and other fish. The long-term impacts would be positive because the realigned stream channel would be required to meet WDFW hydraulic project approval standards, which would improve stream quality as well as the downstream aquatic habitat. Farther upstream, existing low-quality habitat functions would be lost where these alternatives would pipe about 400 to 700 feet of Sturtevant Creek under the Hospital Station.

Segment D

The elevated portions of the NE 16th At-Grade (D2A), NE 16th Elevated (D2E), and the NE 20th (D3) alternatives would cross the West Tributary to Kelsey Creek. These crossings would shade riparian vegetation; however, no salmonids access this reach. In addition, the NE 20th Alternative (D3) would reduce aquatic and riparian functions along 30 linear feet of Valley Creek (see Table 4.8-5). D2A, D2E, D3, and the SR 520 Alternative (D5) would require removing relatively small groups of coniferous and deciduous forest vegetation, with D5 removing the most forested vegetation. D5 would also shade roughly 75 feet of the West Tributary to Kelsey Creek and riparian area and possibly 10 feet of Goff Creek. Shading could affect vegetation structure and habitat function, which could alter wildlife use of these areas. The NE 20th Alternative (D3) may require replacement and possible lengthening of a culvert at Valley Creek. The culvert would be replaced to provide adequate depth of cover and fish passage and would result in some loss of habitat. There would be no effect to Sears Creek. The effect to Goff Creek is addressed below under Maintenance Facilities.

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. Along the West Tributary to Kelsey Creek, enhancement could include creating wider buffers for habitat and open space, environmental education and stormwater management. Enhancement opportunities along Goff Creek include daylighting a stream segment south of NE 16th Street that is currently in a pipe to provide fish and wildlife habitat and an urban amenity. The East Link Project would not preclude these enhancements.

Segment E

The Redmond Way (E1) and Leary Way (E4) alternatives would shade riparian vegetation over the Sammamish River and Bear Creek but would not change the river or creek channels. Although this would lower the riparian vegetation productivity, which could affect wildlife use of the area, it could also help lower the river temperature, which is beneficial to aquatic species. The Redmond Way Alternative (E1) also removes several patches of coniferous forests, which could alter wildlife use. The Marymoor Alternative (E2) would impact the created wetland mitigation area (WR-13) along the northern property boundary of Marymoor Park due to removal of planted forested and shrub wetland and wetland buffer vegetation; vegetation in this area is still maturing. Table 4.8-5 shows the acreage of high-quality habitat in Segment E that would be lost as a result of the proposed project. All alternatives in Segment E may impact the Bear Creek wetland mitigation site (WR-12) including possibly replacing the culvert that allows Bear Creek overflows into the mitigation site. Finally, all alternatives could result in shading areas of the Sammamish River and Bear Creek.

Maintenance Facilities

Table 4.8-5 shows the acreage of high-value habitat for maintenance facilities. Two of the three maintenance facilities in Segment D (116th [MF1] and BNSF [MF2] maintenance facilities) would require wetlands and wetland buffers to be filled (WR-8). In addition, the SR 520 Maintenance Facility (MF3) would result in the complete loss of aquatic habitat function for 230 linear feet of channel where Goff Creek would be placed in culverts passing under the facility.

4.8.3.3 Construction Impacts

Impacts Common to All Build Alternatives

The following summarize potential impacts that could occur throughout the study area during construction.

- Impacts on upland vegetation:
 - 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 unoccupied habitat
 - Loss of less mobile species and species that retreat to burrows

- Impacts on wetland resources:
 - Vegetation clearing and site grading and filling for construction access and permanent facilities
 - Soil compaction during construction activities that decreases soil permeability, infiltration, water-storage capacity, and vegetation re-growth
 - 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
 - Introduction of invasive species as a result of disturbance
- Impacts on aquatic resources:
 - Sedimentation impacts on waters downstream from earthwork activities
 - Potential accidental spills of fuel oils, chemicals, and/or concrete dust from grinding or leachate used during construction

Removing high-quality habitat can affect wildlife resources, and noise from construction activities can also affect wildlife presence, breeding, and foraging habits. Noise from typical construction activities for light rail construction can range from 80 to 94 dBA within 50 feet, and pile driving could produce 105 dBA. 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 the duration and the 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.

In urban areas, new projects may result in beneficial impacts on aquatic resources because altering streams or changing a culvert requires meeting current regulations. These benefits may include improving culverts to make them fish-passable, improving vegetation, or adjusting water flows in some way.

In-Water Work Windows

Any construction activities requiring work below the ordinary high water line in water bodies supporting

fisheries resources would comply with 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 applicable in-water work windows for the resources in the study area.

TABLE 4.8-6
In-Water Construction Work Windows for Listed Species

Water Body	Applicable Alternative	ESA Work Window
Lake Washington	I-90 (A-1)	July 16 – April 30
Kelsey Creek Watershed and Bear Creek	All Segment D Alternatives and Segment E	July 1 – August 31
Samamish River and lower Bear Creek	All Segment E Alternatives	July 16 – July 31 and November 16 – March 15

Construction Impacts by Alternative

Table 4.8-7 shows short-term construction impacts high-quality 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 effects 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. 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, far fewer pollutants would run off from this portion of the bridge.

Sound Transit may need to implement special seismic upgrades to the I-90 floating bridge during the construction period. This may include in-water work in Lake Washington to reinforce the structure (see table 4.8-6 above for allowable in-water work windows that Sound Transit would use). 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 alkaline concentrations can be toxic to fish. The East Link construction activities in this segment would have a low risk of impacts on ESA-listed fish. Inadvertent spills could affect water quality and aquatic resources. Implementation of BMPs would avoid and minimize the introduction of concrete dust and accidental spills into the lake. Some work and equipment may be located on a barge in Lake Washington adjacent to the bridge sections. A tribal fishery event occurs in July, and if any barging of equipment or materials is required, Sound Transit would consult with the Muckleshoot tribe to avoid conflict with a tribal fishing event.

Segment B

The BNSF Alternative (B7) would have greater impacts to wetlands and high quality habitat than other Segment B alternatives. Noise and construction activity in all Segment B alternatives would have potential to temporarily displace wildlife in Mercer Slough 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, green heron, and willow flycatcher, which are all relatively sensitive to human disturbance and habitat alteration. Short-term 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.

Wetland and wetland buffer would be 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.

Construction activities in this segment would have a low risk of impact on ESA-listed fish because there is no spawning or primary rearing habitat and because there would be no in-water work. The BNSF Alternative (B7) would cross Mercer Slough with a free-spanning structure, and the support columns would be located outside of the ordinary high water line, resulting in minimal impacts on aquatic ecosystems. Construction would, however, be close to the water and would damage riparian vegetation and would still pose a risk of sediment transport and accidental spills into Mercer Slough. A temporary work trestle would likely be constructed along the

TABLE 4.8-7
Short-Term Construction Impacts on High Quality Habitat

Alternative	Wetland (acres)	Wetland Buffer (acres)	Other High Value Habitat ^a (acres)	Aquatic Resources
Segment A	0	0	0	Over-water work above Lake Washington
Segment B				
B1, Bellevue Way	0.1	1.8	0.3	None
B2A, 112th SE At-Grade	0.3	1.7	0.7	None
B2E, 112th SE Elevated	0.1	1.1	0.1	None
B3, 112th SE Bypass	0.2	1.7	0.7	Sedimentation
B7, BNSF	2.7	0.7	2.4	Sedimentation
Segment C				
C1T, Bellevue Way (From B1)	None	None	None	300 feet new culvert, 400 to 700 feet of reconstruction, sedimentation
C2T, 106th Tunnel (From B3 & B7)	None	None	None	300 feet new culvert and possible 1500 to 2030 feet of reconstruction, sedimentation
C3T, 108th Tunnel; C4A, Couplet; C7E, 112th NE Elevated; C8E, 110th NE Elevated (from B3 & B7)	None	None	None	Possible 900 to 1330 feet of reconstruction, sedimentation
Segment D	None	None	None	Sedimentation
Segment E				
E1, Redmond Way	0	0.1	0	Sedimentation
E2, Marymoor	0.3	0.4	0	Sedimentation
E4, Leary Way	0	0.1	0	Sedimentation

^a Includes riparian forest and three types of urban mostly vegetated forest: coniferous forest, deciduous forest, and mixed coniferous/deciduous forest, and urban mostly vegetated. All are classified as priority habitats by WDFW.

BNSF Alternative (B7) in Mercer Slough Park to accommodate construction, and a 100-foot-wide corridor would be cleared of vegetation.

Construction noise associated with all Segment B alternatives could interfere with the western toad's ability to hear mating and alarm calls, disrupting its reproduction or survival.

Segment C

Segment C is in a highly developed area, and no wildlife displacement is expected. However, during construction of the elevated portions of the connectors from B3 and B7 to all segment C alternatives except C1T may result sediment reaching Sturtevant Creek. Construction of support columns in this same area may require realigning 925 to 1,330 feet of stream habitat. Alternatives C1T and C2T may require a new culvert for 300 feet of Sturtevant Creek under the proposed Hospital station and reconstruction of the Creek for another 400 to 700 for the trackway in this area. This would result in a short-term loss of habitat and habitat function. Inadvertent spills could affect water quality and aquatic resources.

Segment D

The SR 520 Alternative (D5) may affect some areas of coniferous and deciduous forest during construction,

but the areas potentially affected are reported in Table 4.8-5, Operational Impacts. All Segment D alternatives cross streams. This could result in sediment reaching the streams during construction; however, short term impacts on salmonids are not expected because potential impacts that would occur in the West Tributary to Kelsey Creek, Goff Creek, and Kelsey Creek would be upstream from fish barriers in the streams and sediments would not be likely to be transported farther downstream to aquatic habitat that supports fisheries resources. 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

Construction noise levels could displace wildlife from coniferous forest patches during construction along the Redmond Way Alternative (E1). Additional minor displacement or disturbance may occur along the Marymoor 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). Protective fencing would be installed to establish construction limits to avoid this area during construction.

All Segment E alternatives may 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 short-term losses of the creek and forested stands and could temporarily displace any eagle foraging in the area.

All Segment E alternatives 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. Inadvertent spills could affect water quality and aquatic resources. Implementation of BMPs is expected to avoid accidental spills. Construction noise near these streams could disrupt western toad reproduction by interfering with the ability to hear mating and alarm calls.

Maintenance Facilities

Increased sediment inputs from construction of maintenance facilities in Segment D (116th [MF1] and BNSF [MF2]) are not expected because the presence of beaver dams would detain and deposit sediment inputs. Construction of the SR 520 Maintenance Facility [MF3] would require reconstruction or relocation of Goff Creek, which could result in temporary channel erosion and downstream sedimentation. No impacts are expected at the SE Redmond Maintenance Facility (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. At the beginning of the project, 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 the *Ecosystems Technical Report* (Appendix H3), related to BMPs and adherence to federal, state, and local regulations. The Biological Assessment prepared for ESA consultation may also outline 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, Sound Transit expects that the

determination for ESA-listed species would be “may affect and is not likely to adversely effect” listed species and there would not be effects on Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act.

4.8.4.1 Potential Mitigation for Operational Impacts

The following subsections describe mitigation for specific habitat types.

Upland Vegetation

High-value habitats regulated by local agencies that are affected by the project 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 local permitting agencies during final design and project permitting.

Sound Transit would adhere to local ordinances regarding tree replacement ratios.

Wetlands

Sound Transit has committed to achieving no net loss of wetland function and area on a project-wide basis. Compensatory mitigation sites would be identified close to impacts and compensate for lost functions in-kind. The specific compensatory mitigation sites for unavoidable impacts to wetlands would be determined during final design and project permitting. Compensatory mitigation-to-impact ratios for replacement of wetlands by jurisdiction and category are shown in Table 4.8-8.

TABLE 4.8-8
Wetland Categories and Mitigation Ratios for Wetlands

Classification System	Mitigation Ratios ^a
City of Bellevue ^b	Category 1: 6:1 Category 2: 3:1 Category 3: 2:1 Category 4: 1.5:1
City of Redmond	Category 1: 6:1 to 24:1 Category 2: 1:1 to 12:1 Category 3: 1:1 to 8:1 Category 4: 1:1 to 6:1

^a Variations in mitigation ratios are based upon the type of mitigation offered (e.g., creation, restoration, re-establishment) and the Cowardin (1979) class affected.

^b All Category 1, 2, and 3 wetlands in Bellevue have a 20-foot setback that prohibits placement of any structure within 20 feet of the wetland boundary.

During field work, Sound Transit determined there are several opportunities for wetland mitigation to occur 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 to existing wetland mitigation sites and would be determined during final design and project permitting.

Aquatic Habitat

Where realignment of streams is required, Sound Transit would reconstruct new channels with improved habitat features to improve salmonid spawning and rearing functions, adding large woody debris and replacing or improving streamside riparian habitat functions. Specific requirements and details of these measures would be established during final design and project permitting.

For alternatives with culvert lengthening (i.e., Goff Creek and Valley Creek), habitat improvements may be made in the form of large woody debris placements. For maximum benefit to fisheries, habitat improvements could be done in either Valley Creek or Kelsey Creek. Also, the extension of a culvert on Goff Creek for MF3 may be avoided by realigning the stream or reducing the length of culvert.

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.

Habitat function in Sturtevant Creek affected by the 400 to 700-foot-long culvert under the Hospital Station would be compensated for by improving equivalent habitat along another segment of Sturtevant Creek that currently does support salmonids or elsewhere in the Kelsey Creek basin.

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 the *Ecosystems Technical Report* (Appendix H3), involve implementation of conditions set forth in the Hydraulic Project Approval (HPA), WAC 220-110-070, for installing culverts during construction, Section 401 and Section 404, the National Pollutant Discharge Elimination System (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.

Upland Vegetation and Wetland Areas

Areas disturbed in the construction staging areas would be revegetated within 1 year following construction.

Sound Transit would update its survey of bird nests during final design. If a bald eagle nest is found within a 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. If nests are found, at minimum Sound Transit would relocate sensitive nests prior to beginning construction and 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.

Aquatics Habitat

BMPs would be implemented to avoid construction impacts on aquatic resources. Sound Transit would consult with the tribes to avoid impacting tribal fishing events for construction work in Lake Washington.