Fauntleroy Ferry Terminal
Trestle and Transfer Span Replacement Project

Planning and Environmental Linkages

Environmental Analysis

March 2024

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1. Summary

The Fauntleroy ferry terminal in West Seattle serves more than 3 million riders per year, supporting Washington State Ferries' "Triangle" route between Fauntleroy, Southworth and Vashon Island. The terminal faces several challenges, including the following:

- Aging, seismically vulnerable parts of the terminal are overdue for replacement.
- Rising sea levels risk damage to the terminal structures from debris during future high tides.
- Vehicles backing up along Fauntleroy Way SW, with only one lane to serve two destinations.
- Small dock with capacity for about 84 cars serving three Issaquah Class ferries that hold 124 cars each.

The purpose of WSF's SR 160 – Fauntleroy Ferry Terminal – Trestle and Transfer Span Replacement Project is to improve operations on the Triangle ferry route and preserve and upgrade the terminal facilities.

1.1 Environmental context and analysis

WSF is conducting a Planning and Environmental Linkages (PEL) study in partnership with the Federal Highway Administration. The PEL Environmental Analysis describes how the Level 3 alternatives interact with key environmental resources, including potential benefits and impacts to the surrounding environment.

In developing and evaluating each alternative, WSF is considering the following important environmental resources and features near the terminal:

- **Intertidal and nearshore habitats,** including eelgrass and macroalgae near the dock that provide valuable habitat for salmon and other marine wildlife.
- A **scour hole** where the vessel accelerating and decelerating has eroded the seabed and created a raised berm around the end of the trestle, preventing eelgrass and macroalgae growth.
- **Fauntleroy Creek** flows under Fauntleroy Way SW, south of the dock, under the dock to the north, and then into Puget Sound. Fauntleroy Creek provides spawning habitat for coho salmon and coastal cutthroat trout.
- The aging dock is supported by about 430 **creosote-treated timber piles** and contains1,000 tons of toxic creosote-treated timber—a known water pollutant. The density of timber piles also influences the flow of Puget Sound tidal waters and Fauntleroy Creek near the trestle, causing debris and driftwood to snag and collect under the trestle and on the shore.
- **Cove Park** offers public waterfront access and a narrow sandy beach next to the dock.
- **Captain's Park** provides a public green space with bench seating across Fauntleroy Way SW from the terminal entrance.

This analysis focuses on the environmental elements reflected in the Level 3 screening criteria as most crucial to meeting the project purpose and need. After selecting a preferred alternative, WSF will continue evaluating additional environmental factors, like noise, air and visual quality.

To develop the PEL Environmental Analysis, WSF reviewed publicly available data, conducted field work near the terminal facility, and considered input from communities, agencies and tribes. WSF will use this analysis to apply the screening criteria to the Level 3 alternatives and identify a preferred alternative.

Find more information about intertidal and nearshore habitats, the scour hole and Fauntleroy Creek in section 3.1.1. See sections 3.1.2, 3.3 and 3.4 for more discussion on creosote-treated timber piles. See section 2.6 for a discussion of Cove and Captain's Parks.

1.2 Summary of environmental features for all Level 3 alternatives

After Level 2 screening, WSF carefully considered the surrounding environment in refining the Level 3 alternatives. Each alternative includes these features:

- Raise the dock higher than the existing dock to **meet rising sea levels** and allow more space and daylight under the dock.
- Remove about 430 **creosote-treated timber piles** and 1,000 tons of toxic creosote-treated timber piles—a known water pollutant.
- Use fewer steel piles to support the new dock, providing **more space for fish to pass** to and from Fauntleroy Creek and the surrounding eelgrass beds which are important habitat for salmon and other fish.
- **Increase** the square footage of the structure built over the water, known as **overwater structure** to align with updated safety and design standards.

More information about each of these features is included in more detail below.

1.3 Level 3 screening criteria

WSF must consider important environmental resources and features near the terminal. The Level 3 screening includes the following environmental criteria and key factors:

- Accommodating projected sea level rise.
- Permitting and coordination regarding:
    - Effect on and/or opportunities to restore macroalgae and eelgrass habitat.
    - Increase in overwater coverage.
    - Environmental mitigation costs.
    - Cultural resources.
    - Treaty fishing rights.
- Avoiding changes to parks and recreational areas, including nearby Cove Park and Captain's Park.

1.3.1 Accommodating sea level rise

All Level 3 alternatives raise the dock to accommodate rising sea level and associated effects. From an environmental perspective, the higher dock will reduce the risk of damage to the dock from logs and debris, create more space for natural movement and light to filter under the dock, and withstand higher tides and more severe storms in the future.

See section 3.8 for more information about how the project will accommodate rising sea levels.

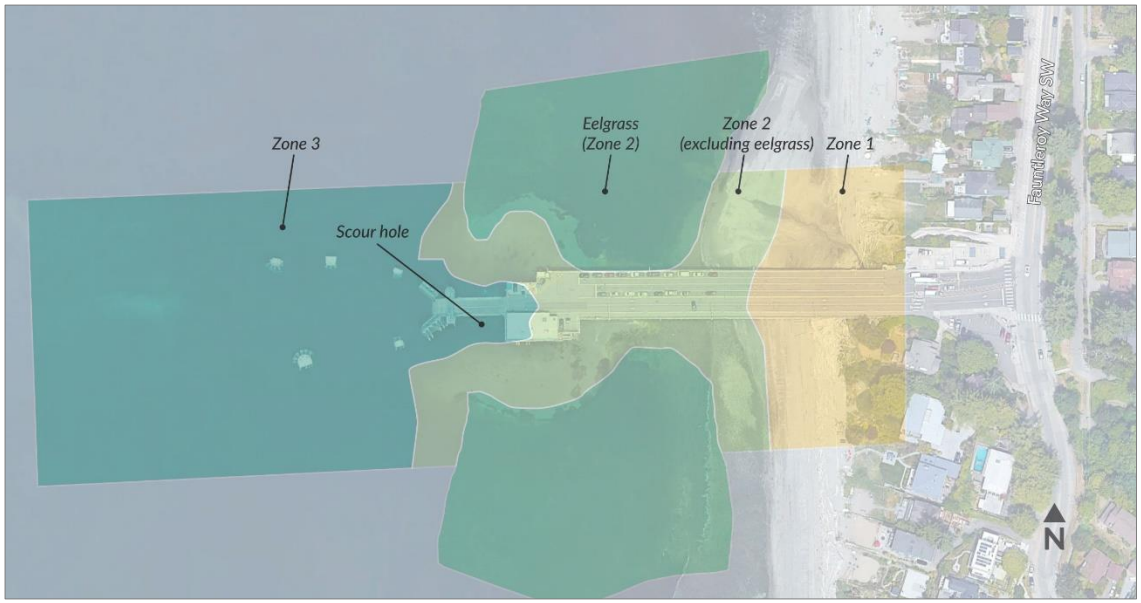
1.3.2 Permitting and coordination

1.3.2.1 Effect on macroalgae and eelgrass habitat

Intertidal and nearshore habitats near the dock provide valuable eelgrass habitat which is important for forage fish, salmon, and other marine wildlife.

WSF characterized three ecological zones around the dock as shown in the map below:

- **Zone 1: Upper shore zone** – The area closest to the shore where Fauntleroy Creek flows into Fauntleroy Cove.
- **Zone 2: Shallow marine zone** – The area in the water around the dock. This is the most ecologically sensitive area, where eelgrass and macroalgae grow.
- **Zone 3: Deeper marine zone** – The area west of the dock, where deeper water and less sunlight makes it difficult for eelgrass and other vegetation to grow.



WSF recently conducted an underwater video survey to identify the presence and distribution of eelgrass and macroalgae near the terminal. The survey confirmed eelgrass beds located north and south of the trestle. There is no eelgrass in the area around the end of the dock where propeller wash from vessels creates a scour hole. The vessel accelerating and decelerating erodes a deeper area and creates a raised berm around the end of the trestle, preventing eelgrass growth. WSF also found kelp west of the ferry slip.

See section 3.1 for more details on fish, wildlife and vegetation resources.

1.3.2.2 Overwater coverage

To avoid and minimize environmental effects caused by overwater shading, WSF developed alternatives that taper and lengthen the dock. This strategy reduces the amount of dock structure over areas where eelgrass grows. It also minimizes the effects of ferry operations in the more ecologically sensitive areas of Zone 2 near the shore.

The table below shows the approximate total overwater coverage (in square feet) of each alternative, including the existing dock.

Alternative	Existing	A	A-1, A-2 and A-3	B	B-1	B-2	B-3	C
Approximate overwater structure footprint (sf)	42,000	54,500	59,000	77,100	84,200	86,100	75,900	92,000
Approximate increase in overwater structure footprint (sf)	NA	12,500	17,000	35,100	42,200	44,100	33,900	50,000
Percent increase in overwater coverage	NA	30%	40%	84%	100%	105%	81%	119%

See the *Level 3 Alternative Summary* for detailed descriptions of each alternative.

Alternatives A and A-1, A-2 and A-3 have the smallest increase in overwater structure, Alternative C has the greatest increase in overwater structure. Alternatives B and B-3 offer the smallest increase in overwater structure in ecologically sensitive Zone 2 and offer more opportunity to restore macroalgae and eelgrass growth by moving propeller wash from the vessel into the deeper waters of Zone 3.

Alternatives B, B-1, B-2, B-3 and C move the ferry berthing structure and propeller wash further offshore. Alternative C has the greatest increase in overwater coverage. Alternatives A, A-1, A-2 and A-3 maintain scour activity in the same ecologically sensitive location.

See section 3.1 for a more detailed discussion of overwater coverage related to fish, wildlife and vegetation.

1.3.2.3 Environmental mitigation costs

WSF will mitigate environmental impacts caused by the project in coordination with regulatory agencies and tribes. WSF anticipates these key factors will influence environmental mitigation costs: total increase in overwater coverage; increase in overwater coverage in ecologically sensitive Zone 2; and opportunity to restore eelgrass and macroalgae within Zone 2.

Alternatives A, A-1, A-2, A-3 have the least overall increase in overwater coverage, including within Zone 2. Alternatives B and B-3 have the least comparative increase in overwater coverage and provide opportunities to restore eelgrass and macroalgae by relocating propeller was offshore. These alternatives have lower mitigation costs than Alternatives B-1, B-2 and C.

Read section 3.1.2.3 for more detail on environmental mitigation costs.

1.3.2.4 Cultural resources

WSF does not expect differences between alternatives related to the probable existence of cultural resources.

See Section 3.5 for details on historic, cultural and archaeological resources near the terminal.

1.3.2.5 Treaty rights

Fauntleroy Cove lies within the usual and accustomed treaty fishing areas of the Suquamish Tribe and the Tulalip Tribes of Washington. The project may affect the tribes' ability to exercise their treaty rights. WSF will continue consulting these treaty tribes throughout the life of the project. This consultation will inform WSF's work to apply Level 3 screening and identify a preferred alternative.

1.3.3 Parks and recreation areas

All Level 3 alternatives raise the dock higher than the existing dock to meet rising sea levels and allow more space and daylight under the dock. This means that all the alternatives change park users' views and experiences at Cove and Captain's parks.

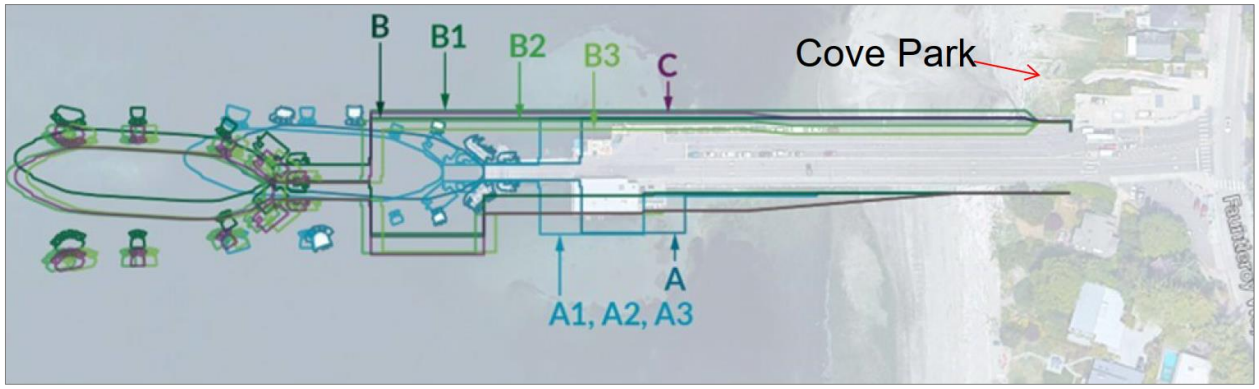
None of the Level 3 alternatives permanently change the path at the end of Barton Street SW, which is the access point for Cove Park. Alternative B-3 has the least impact on Cove Park because it will not widen to the north toward the park. All the other alternatives

widen the dock between five to 22 feet to the north toward Cove Park. The dock is wider over deeper water to minimize effects on Cove Park.

The table below shows the differences among alternatives in dock widening toward Cove Park.

Alternative	Widening north	Additional area north of existing dock
A, A-1, A-2 and A-3	13 feet	2,080 square feet
B	13 feet	2,080 square feet
B-1	22 feet	3,625 square feet
B-2	5 feet	593 square feet
B-3	No widening to north	73 square feet[a]
C	13 feet	2,193 square feet

The image below shows the alternatives in relation to Cove Park.



None of the alternatives have physical effects or changes on Captain's Park. See section 3.6 for park-related details.

1.4 Summary

WSF conducted this planning-level analysis of environmental resources that may be affected by the project. This analysis describes how the Level 3 Alternatives interact with key environmental resources. WSF will use this information to evaluate, or screen, the Level 3 Alternatives and identify a preferred alternative to move to the next phase of environmental review.

Key environmental resources and factors that help differentiate between the Level 3 alternatives include:

- **Effect on and/or ability to restore eelgrass and macroalgae habitat**: While Alternatives A, A-1, A-2 and A-3 offer less overwater coverage than others, they maintain scour activity in an ecologically sensitive location. Alternatives B and B-3 offer the smallest increase in overwater structure in ecologically sensitive Zone 2 and more opportunity to restore macroalgae and eelgrass growth by removing the effects of vessel scour. Alternative C includes the most overwater coverage and moves scour activity away from the ecologically sensitive location.
- **Overwater coverage**: Alternatives A, A-1, A-2 and A-3 offer the least increase in overwater coverage. Alternatives B and B-3 include the second most overwater coverage. Alternatives B-1, B-2 and C provide the most overwater coverage.
- **Environmental mitigation costs**: Alternatives A, A-1, A-2, A-3, B, and B-3 have the least comparative overwater coverage, and likely lower environmental mitigation costs. Alternatives B1 and C have the greatest comparative overwater structure within the ecologically sensitive area near the dock, resulting in higher environmental mitigation costs.
- **Park and recreation areas**: Alternative B-3 has the least effect on Cove Park because it does not widen the dock to the north toward the park. Alternative B-1 has the most effect on Cove Park, widening the dock 22 feet to the north.

WSF does not expect differences between alternatives related to cultural resources and will continue government-to-government tribal consultation to address effects on tribal treaty fishing rights.

1.5 Next steps

WSF will consider the environmental analysis along with the traffic analysis, cost estimates, and additional information to screen the Level 3 alternatives. This process will help WSF identify a preferred alternative to carry forward to the next step in NEPA and SEPA review.

WSF will follow the NEPA and SEPA processes to further evaluate the preferred alternative and environmental effects like noise, air, and visual quality, cultural resources, land use, and navigable waterways.

WSF will consult with affected tribes and other consulting parties following the National Historic Preservation Act and government-to-government consultation requirements.WSF will continue to engage Triangle route communities throughout the project. During NEPA

and SEPA environmental review, WSF will host community meetings and comment periods to gather input on the project and environmental analysis. WSF will continue to share information about community input opportunities as the project progresses.

2. Introduction

2.1 Background

The Fauntleroy ferry terminal is an essential transportation hub for the South Puget Sound that serves more than 3 million riders per year, including people who board ferries by walking, biking, driving and riding transit. The terminal supports the three-destination Fauntleroy, Vashon and Southworth "Triangle" ferry route with daily vehicle and pedestrian service between West Seattle, Vashon Island and the Kitsap Peninsula (Figure 1). Located in West Seattle, the terminal represents the eastern terminus of State Route 160 (SR 160), which extends west to the Sedgwick Road interchange in Kitsap County. Built in the 1950s, the Fauntleroy ferry terminal has one of the oldest docks in the Washington State Ferries (WSF) system. The terminal is in a residential area and is accessed via Fauntleroy Way SW. It is the only terminal in the WSF system not served by a state route or major arterial.

The terminal faces several challenges:

- Aging, seismically vulnerable parts of the terminal that are overdue for replacement.
- Rising sea levels that risk damage to the terminal structures from debris during future high tides.
- Vehicles queueing along the shoulder lane of southbound Fauntleroy Way SW, with only one lane to serve two destinations.
- Small dock with capacity for about 84 vehicles serving three Issaquah Class ferries that hold 124 cars each.

Figure 1 Project vicinity and triangle ferry

2.2 Purpose of the SR 160 – Fauntleroy Ferry Trestle and Transfer Span Replacement Project

The purpose of the SR 160 – Fauntleroy Ferry Terminal – Trestle and Transfer Span Replacement Project (project) is to improve operations on the Triangle ferry route and preserve and upgrade the terminal facilities.

WSF intends to achieve the project purpose by accomplishing the following:

- Replace seismically vulnerable and aging terminal structures to meet current structural, seismic, water quality, storm and tsunami design standards.
- Raise the elevation of the terminal to account for future sea level rise and the increasing frequency and intensity of storms.
- Provide operational efficiencies that support reliable service while meeting service levels projected for the route in *Washington State Ferries 2040 Long Range Plan* (2040 LRP), published by the Washington State Department of Transportation (WSDOT) in January 2019.
- Provide efficient and safe loading and fare processing for people walking, bicycling and driving.
- Improve multimodal connectivity and provide investments in technology that enhance the customer experience and accommodate ridership growth, consistent with the 2040 LRP (WSDOT 2019).

2.3 Planning and Environmental Linkages study

WSF is conducting a Planning and Environmental Linkages (PEL) study in partnership with the Federal Highway Administration (FHWA). The PEL study framework encourages early involvement with the public, tribes and government agencies to help WSF identify transportation issues, environmental concerns, community values and economic goals early and more effectively in project planning. Goals of the PEL study include identifying a preferred alternative for review pursuant to the National Environmental Policy Act (NEPA) and incorporating outreach and analysis conducted in the PEL study into the NEPA and the State Environmental Policy Act (SEPA) reviews (FHWA 2015).

After completing the PEL study, WSF and FHWA will determine the appropriate category of NEPA and SEPA environmental reviews for the project. WSF will continue to engage Triangle route communities throughout the NEPA and SEPA environmental reviews, as well as during final design and construction.

PEL studies are used to develop potential solutions to transportation problems. The goal of this PEL study is to identify a preferred alternative to put forward for NEPA/SEPA environmental review. This PEL environmental analysis is a planning-level assessment

based primarily upon a review of design information for the Level 3 alternatives, publicly available data, targeted field work and engagement with the public, agencies and tribes. The analysis focuses on key environmental resources and the differences between the Level 3 alternatives in terms of their potential environmental effects (both adverse and beneficial). WSF will apply information presented in this PEL environmental analysis to screening criteria to identify a preferred alternative.

2.4 Alternatives development and screening

Early in the PEL study, WSF developed 15 alternatives for Level 1 screening, including two alternatives in Elliott Bay, two alternatives in the Burien/Des Moines area and 11 alternatives in the Fauntleroy area. Based on the Level 1 screening results, WSF advanced all alternatives that keep the terminal in the existing location. WSF conducted further analysis and refinement of those alternatives for Level 2 screening. Based on the Level 2 screening results, WSF identified two general alternatives to carry forward:

- Replace the existing terminal with same size and at the same location as the existing facility.
- Expand the terminal to hold up to 186 vehicles.

WSF refined the alternatives based on the Level 2 screening results, public and advisory group input and engineering, operational and environmental analysis. WSF developed Level 3 alternatives that replace the terminal with a similar size as the existing terminal (Alternatives A, A-1, A-2 and A-3) and concepts that expand the terminal to provide more on-dock vehicle holding capacity (Alternatives B, B-1, B-2, B-3 and C. Attachment 1 presents layouts and key features of the Level 3 alternatives. See the Level 3 Alternatives Summary (WSDOT 2024) for additional detail.

All Level 3 alternatives follow the *WSF Terminal Design Manual* (WSDOT 2016) and include the following elements:

- Replace the dock at the same location as the existing facility.
- Accommodate a total of 186 vehicles (1.5 times the capacity of the Issaquah class ferries that serve the Fauntleroy, Vashon and Southworth route) in a combination of on-dock and southbound Fauntleroy Way SW shoulder holding.
- Meet current seismic design standards to make sure the new terminal can withstand a design-level earthquake and raise the dock to accommodate rising sea levels.
- Provide space for a semitrailer truck to safely navigate through the terminal using designated holding lanes.
- Provide wider lanes for vehicles and dedicated lanes for people walking, rolling, biking and driving motorcycles onto the ferry.

- Create space for terminal operations, including storing materials, mechanical and electrical equipment, trash and recycling containers and parking for terminal supervisors.
- Build a new terminal building.
- Provide at least two dedicated parking spaces to drop-off and pick-up passengers with disabilities.
- Add a larger toll plaza with two toll booths, wider toll lanes, a traffic attendant booth and staff restrooms.
- Minimize dock widening near the shoreline to lessen effects on Cove Park and environmentally sensitive areas.

2.5 Community, agency and tribal engagement

WSF has engaged and continues to engage Triangle route communities, including three advisory groups that represent elected officials (the Executive Advisory Group), agencies with jurisdiction (the Technical Advisory Group) and the three terminal communities (the Community Advisory Group), to help shape the new terminal. Since the start of the PEL study in March 2021, WSF has received public comments and hosted virtual community meetings, advisory group meetings and one online open house. As part of the engagement, WSF has coordinated with tribes and local, state and federal agencies that regulate and manage environmental resources to gather input on data and management/regulatory issues. Comments and engagement input from the community, agencies and tribes inform environmental review during the PEL study.

After completing the PEL study, WSF and FHWA will determine the appropriate category of NEPA and SEPA environmental reviews for the project. WSF will continue to engage Triangle route communities throughout the project. During NEPA and SEPA environmental reviews, this will include public meetings and comment periods to gather input on the project and the PEL environmental analysis. WSF will continue to share information about community input opportunities as the project progresses.

3. Level 3 alternatives existing environmental conditions and potential effects

The following sections present the existing environmental conditions for the proposed project area and an assessment of each alternative's potential effect on environmental resources. For the purposes of identifying a study area for each resource category and assessing potential environmental effects of the Level 3 alternatives as described in section 2.4, WSF used the following sources:

- Proposed permanent dimensions and features of the terminal and trestle for the Level 3 alternatives from the Alternatives Development Basis of Design Summary (Jacobs 2023a).

- Recommendations from the Intersection Configuration Memorandum (Jacobs 2023b).

- Draft Level 3 Alternatives Summary (WSDOT 2024).

The Level 3 alternatives exist at a planning level of development. WSF has not completed a detailed construction analysis for each alternative, including construction footprints, temporary service plans, phasing scenarios and construction duration at this stage. Based on other project experience, WSF estimates construction could take between two to four years. Generally, the construction effects of all Level 3 alternatives would be similar; however, the magnitude and duration of temporary construction effects would be greatest for Alternatives B, B-1, B-2, B-3 and C since the B and C alternatives are the largest facilities and would take longer to construct than Alternatives A, A-1, A-2 and A-3.

To the extent that available information permits, this analysis quantifies potential environmental effects and describes differences among the Level 3 alternatives. WSF is conducting multiple concurrent studies to support the PEL study, including traffic operations and *Good To Go!* and advanced ticketing options. WSF will share information from these analyses with stakeholders and will use the information during the Level 3 alternatives and NEPA and SEPA environmental review processes.

3.1 Fish, wildlife and vegetation

3.1.1 Existing conditions

WSF limited the study area for evaluating fish, wildlife and vegetation to within 500 feet of the existing Fauntleroy ferry terminal. All Level 3 alternatives are located within the study area. WSF characterized existing conditions and developed a preliminary, planning-level assessment of potential project effects within this study area.

WSF used existing geographic information system (GIS) and other data from publicly available sources to characterize existing fish, wildlife and vegetation resources within the study area, compiling information on the following topics:

- Federally designated threatened and endangered species and federally designated critical habitat (Information for Planning and Consultation [IPaC], National Oceanic and Atmospheric Administration [NOAA]).

- Essential Fish Habitat (EFH).

- Washington State Priority Habitats and Species (PHS).
- Eelgrass bed presence/absence survey.
- Sand lance and surf smelt spawning areas.
- Marine mammal protection areas.
- Washington state rare plants and high-quality ecosystems.
- Aquatic species (provided by the Fauntleroy Creek Watershed Council).

Attachment 2 contains a mapped representation of existing fish, wildlife and vegetation resources within the study area.

WSF reviewed data from the following agencies and organizations:

- Federal Emergency Management Agency (FEMA n.d.-a, n.d.-b).
- King County (n.d.-a, n.d.-b).
- NOAA (n.d.-a, n.d.-b, n.d.-c).
- U.S. Environmental Protection Agency (USEPA 2010).
- U.S. Fish and Wildlife Service (USFWS n.d.-a, n.d.-b).
- U.S. Geological Survey (USGS n.d.).
- Washington Department of Fish and Wildlife (WDFW n.d.-a, n.d.-b).
- Washington State Department of Ecology (Ecology n.d.-e).
- Washington State Recreation and Conservation Office (n.d.).

- Fauntleroy Creek Watershed Council.

The Fauntleroy ferry terminal is situated in Fauntleroy Cove, south of Lincoln Park, within the Puget Lowland Ecoregion (USEPA 2010). The Puget Lowland Ecoregion is a complex bay and saltwater estuary fed by spring freshwater runoff from the adjacent watersheds, including Fauntleroy Creek. The ecoregion is highly biologically diverse. Beaches, tide flats, salt marshes and other nearshore habitats provide critical habitat for wildlife populations.

Fauntleroy Creek discharges to Fauntleroy Cove south of the ferry terminal. The creek supports anadromous fish use (i.e., hatchery coho salmon). No Endangered Species Act-listed salmonids are present in Fauntleroy Creek. One partial and two total fish passage barriers are mapped on Fauntleroy Creek (WDFW n.d.-a) (Attachment 2). The Washington State Recreation and Conservation Office Fish Barrier Removal Board has funded replacement of these culverts through their fish barrier program. The Fauntleroy Creek Watershed Council sponsors the release and monitoring of coho salmon in Fauntleroy Creek. In 2022, the Council released 1,624 coho fry into Fauntleroy Creek in a partnership with local schools. The released coho smolts migrate to salt water mid-March to May and spawners come into the cove in September in preparation to enter the lower creek mid-October to mid-November.

For this study, WSF separated the area surrounding the Fauntleroy ferry terminal and the Level 3 alternatives into three habitat zones based on NOAA's nearshore habitat descriptions and site-specific conditions (Figure 2) (Ehinger et al. 2023).

WSF used the following habitat zones in the environmental analysis:

- **Zone 1 – Upper shoreline and riparian area.** Zone 1 is comprised of the upper shore and riparian area, which extends up to approximately 300 feet landward from the highest astronomical tide to the extent of residential-associated vegetation and five feet landward of the mean lower low water (MLLW) line.

  Zone 1 includes Fauntleroy Creek—a perennial stream (R3UBH)—and adjacent fringing upland riparian community and landscape community associated with the residential development. One of the primary ecological elements in Zone 1 is Fauntleroy Creek, which discharges into Fauntleroy Cove and connects the freshwater riparian community with the estuarine habitat.

  The riparian area adjacent to Fauntleroy Creek contributes organic inputs that support aquatic species (e.g., salmon smolts) and migration between the estuarine environment and freshwater streams. The upper shoreline is identified as an estuarine marine wetland (E2USN/E2USP) and is the upper limit for spawning areas for forage fish, such as surf smelt and sand lance.

  Zone 1 includes both freshwater and marine resources and provides a moderate level of ecological function compared to Zones 2 and 3, which generally provide higher ecological function than that of Zone 1. Zone 1 is a comparatively small area,

and its geographic position at the upper limit of marine habitat supports ecosystem functions (habitat, erosion control, food web support). It also includes important connection and spawning opportunities for anadromous fish and nutrient transport.

- **Zone 2 – Shallow marine zone.** Zone 2 constitutes the productive shallow water marine environments (E2USP) of Fauntleroy Cove, extending from the terminus of Zone 1 to the -16 foot MLLW bathymetric elevation. It includes two subcomponents:
    - Zone 2 – Eelgrass (areas containing eelgrass vegetative cover, as mapped in a 2023 eelgrass survey) (Confluence 2023).
    - Zone 2 – (Excluding Eelgrass) (Confluence 2023).

Zone 2 includes intertidal and nearshore areas, providing high ecological function associated with the eelgrass and macroalgae community presence. Eelgrass supports survival and growth of various fish and wildlife species, both directly and indirectly by providing habitat structure, spawning, foraging and rearing area. The eelgrass community in Zone 2 offers a food source and protection for forage fish (especially during their early life stages), rockfish and juvenile salmon (including Chinook salmon). This zone also serves as a transitional area for salmon smolts migrating from fresh water to salt water.

Coastal pelagic species (like Pacific herring) use the shallow waters of Zone 2 for rearing and feeding. Zone 2 provides valuable habitat for an abundance of invertebrate and fish species, thus providing a prey base for marine mammals and other species. Overall, the shallow waters in Zone 2 and eelgrass structure are valuable for maintaining the health of the surrounding ecosystem, influencing the availability of food and refuge for numerous species.

- **Zone 3 – Deeper marine zone.** Zone 3 is the deeper marine resource that extends seaward from the boundary of Zone 2.

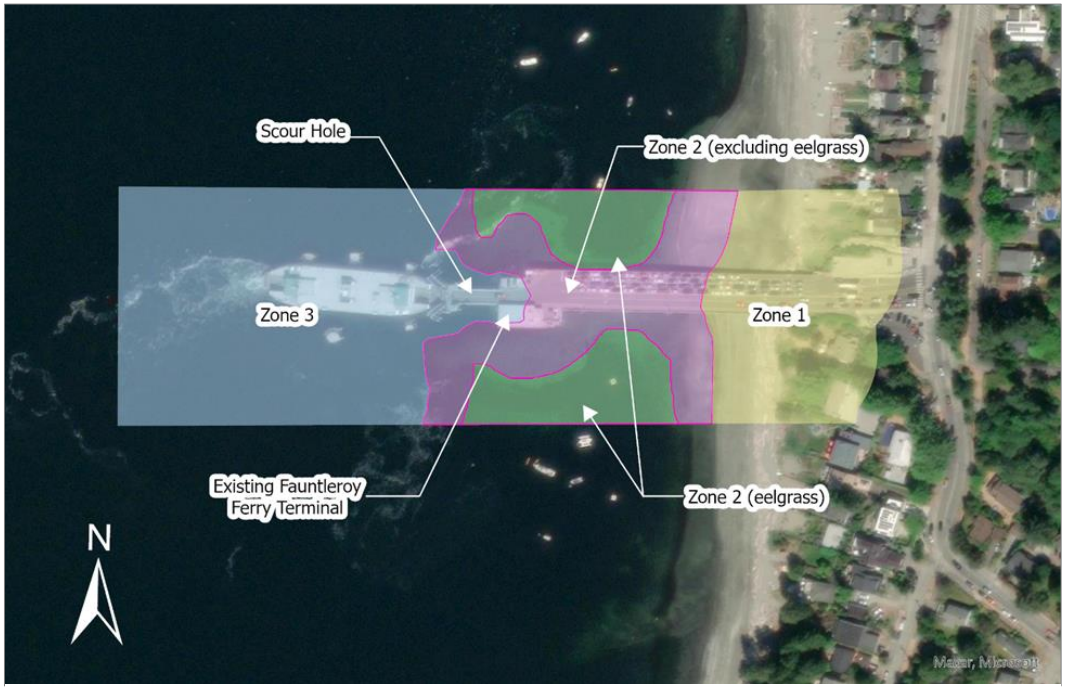


Figure 2 Habitat zones

Zone 3 provides moderate ecological function. The deeper water limits vegetation establishment due to reduced light penetration. Forage fish may rely on stable deepwater sands for habitat, predation avoidance and deepwater feeding opportunities on pelagic invertebrates (including zooplankton and plankton) (USGS 2020; WDNR n.d.-a). Anadromous salmon use deeper waters for feeding during their migration.

At the end of the existing trestle, ferry propulsion activity during docking and exiting the facility has led to long-term substrate erosion and transport, creating a distinct scour hole. The scour hole is an area of deeper water where continued disturbance and deeper water conditions have disturbed and eliminated natural eelgrass and macroalgae communities and prevented their recolonization (Figure 2).

Ferry terminal and ferry operations (historic and ongoing) interact with Fauntleroy Cove's intertidal and nearshore habitats in several ways. One of the primary effects of the existing facility and ferry trestle is the overwater shading of the Zone 2 eelgrass community. The overwater structure shades the nearshore area under and immediately adjacent to the trestle. This inhibits the growth of eelgrass and macroalgae (Zone 2 **–** Excluding Eelgrass), which are an important habitat element and support many key ecologic functions and species.

As discussed above, ferry activity and propeller wash from ferry movement erodes and suspends substrates at the western terminus of the dock and has created a pocket of deep scour and an adjacent area of substrate movement and disturbance. The continued disturbance and erosion have removed historic eelgrass in this area and prevents eelgrass and macroalgae regrowth (Figure 2).

Additionally, the density of the piles supporting the trestle influences the flow path of Fauntleroy Creek into Fauntleroy Cove. The number and placement of piles snag and collect debris and driftwood under and around the trestle on and near the shore. The obstructed flow path may affect the access of anadromous fish to the creek for spawning. In addition, untreated and unconfined surface and stormwater flows from the ferry and vehicle holding area transport contaminants into the cove (see section 3.3). Contaminants in stormwater are associated with roadway materials, oils, tires and other transportation-associated pollutants. These materials are a source of water quality degradation and negative effects on species survival and reproduction.

3.1.1.1 Fish and wildlife

Several federally and state protected species and critical and sensitive habitats have the potential to occur within or next to the study area. Based on the site-specific presence or absence of species-specific suitable habitat, only 11 species may actually use the habitats within the study area. The remainder are expected to be absent due to the lack of suitable habitat in the study area. (Table 1; NOAA n.d.-a; USFWS n.d-a). These sensitive biotic resources include terrestrial mammals, birds, plants, fish, marine mammals and several designated critical habitats, as shown in Tables 1 and 2.

Table 1. Potentially present federally protected species and critical habitat

Species	ESA listing status	Designated critical habitat in study area	Suitable habitat potentially present within the study area?
North American Wolverine (*Gulo gulo luscus*)	Threatened	Not applicable	No
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	Not applicable	Yes
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Not applicable	No
Streaked horned lark (*Eremophila alpestris strigata*)	Threatened	Not applicable	No
Bull trout (*Salvelinus confluentus*)	Threatened	Yes	Yes
Monarch butterfly (*Danaus plexippus*)	Candidate	No	No
Northwestern Pond Turtle	Threatened	No	Yes
Bocaccio/rockfish (*Sebastes paucispinis*; Puget Sound/Georgia Basin DPS)	Endangered	Yes	Yes
Yelloweye rockfish (*Sebastes ruberrimus*; Puget Sound/Georgia Basin DPS)	Threatened	Yes	Yes
Green sturgeon (*Acipenser medirostris*; Southern DPS)	Threatened	No	No
Salmon, Chinook (*Oncorhynchus tshawytscha*; Puget Sound ESU)	Threatened	Yes	Yes
Steelhead trout (*O. mykiss*; Puget Sound DPS)	Threatened	No	Yes
Killer whale (*Orcinus orca*; Southern Resident DPS)	Endangered	Yes	Yes
Humpback whale (*Megaptera novaeangilae*; Central America DPS, Mexico DPS, Hawaii DPS)	Endangered	No	Yes
Sunflower Sea Star (*Pycnopodia helianthoides*)	Proposed threatened	No	Yes

ESA = Endangered Species Act
ESU = evolutionarily significant unit
DPS = distinct population segment

The NOAA Essential Fish Habitat Mapper identifies the following biologic resources within and adjacent to the study area: Chinook salmon (EFH), coho salmon EFH, pink salmon EFH, groundfish EFH and coastal pelagic EFH (NOAA n.d.-a). The WDFW PHS Program identifies the following PHS within the study area: estuarine and marine wetlands, pacific geoduck, sand lance spawning area, surf smelt spawning area, eelgrass and macroalgae beds and resident coastal cutthroat and coho salmon (within Fauntleroy Creek) (WDFW n.d.-b). Table 2 shows biologic resources (species and habitats) identified above grouped by potential presence within each habitat zone.

Table 2. Fish, wildlife and vegetation resources and habitat zones associations

Fish, wildlife and vegetation resources	Habitat zones		
	Zone 1	Zone 2	Zone 3
Forage fish	X	X	X
Forage fish spawning habitat	X		
Groundfish/rockfish		X	X
Anadromous salmonid (pink, Chinook, coho and chum) and steelhead trout migratory pathway	X	X	X
Coastal pelagic species		X	X
Marine mammals (including killer whales, sea lions and seals)	X	X	X
Bull trout	X	X	X
Marbled murrelet		X	X
Estuarine and marine wetlands	X		
Eelgrass and macroalgae beds		X	

The potential for the fish, wildlife and vegetation resources shown in Table 2 is generalized and based on publicly available information and the 2023 eelgrass survey by Confluence.

3.1.1.2 Vegetation

Vegetation within the study area includes riparian, disturbed shoreline (Zone 1) and eelgrass communities (Zone 2). Terrestrial vegetation near the Fauntleroy ferry terminal (Zone 1) is characterized by fragmented forested and riparian canopy in an urban residential setting. The study area is in a developed urban and suburban environment with patches of native vegetation mostly surviving on road edges, private property and in the narrow riparian area adjacent to Fauntleroy Creek. Existing vegetation includes

residential and commercial landscaping, native trees (deciduous and coniferous), shrubs and grass. In many areas, invasive species and noxious weeds are present. No designated rare plants and high-quality ecosystems are mapped within the study area (WDNR 2022).

The Washington State Coastal Atlas maps patchy eelgrass and kelp communities in Fauntleroy Cove (Zone 2) (Ecology n.d.-b). In June 2023, WSF conducted a video survey to verify the location and extent of eelgrass, other submerged aquatic vegetation and other seabed characteristics around the Fauntleroy ferry terminal (Confluence 2023). Eelgrass and other aquatic vegetation provide cover for larval and juvenile rockfish as well as out-migrating salmonids and supports prey species for listed fish and marine mammals. Native eelgrass beds are present north and south of the terminal and occupy depths of -6 feet and -16 feet MLLW (Figure 2). WSF observed eelgrass beds next to the terminal trestle in survey areas that were close to the shore (Confluence 2023). On the western terminus of the ferry slip, where ferry activity erodes and displaces substrates, a scour hole is present that is not vegetated (Zone 3; Figure 2). WSF did not find eelgrass west of the end of the terminal or at depths greater than -16 feet MLLW or within the deep area associated with the scour hole (Zone 3; Figure 2).

3.1.2 Potential effects of Level 3 alternatives

To evaluate the potential effects of the Level 3 alternatives to fish, wildlife and vegetation in relation to existing conditions, WSF analyzed the following components of the Level 3 alternatives overall and in the three habitat zones:

- Area of over-water structure footprint (square feet), including changes to the overwater structure footprint by alternative, relative to existing conditions.[1]

- Area of in-water structure (i.e., direct impact of piers, dolphins and wing walls; square feet), including change in the in-water structure footprint by alternative, relative to existing conditions.

- Number of proposed piles by alternative, compared to existing conditions.

Indicators of the potential for environmental effects within the habitat zones include changes in overwater and in-water structure footprint, and proposed number of piles.

[1] The existing conditions (existing dock, related infrastructure and maintenance) are representative of a no build alternative for comparison purposes for this and other resources.

3.1.2.1 Construction effects

Construction phasing, methods and impacts will be similar across the Level 3 alternatives. Temporary work platforms and spud anchor work barges will likely support construction activities and create a temporary and variable increase to overwater coverage effects. The key differences between the Level 3 alternatives' construction effects have to do with the number of piles necessary to support the trestle design and the plumes of turbid water associated with pile removal and installation.

Construction will generate noise, notably underwater noise, during activities like pile installation. Alternatives with more piles will likely require more time to construct and lead to greater construction and temporary effects in all zones. Underwater noise mitigation and water quality monitoring during construction will prevent and reduce harm to marine habitat.

3.1.2.2 Permanent effects

WSF analyzed potential permanent effects on biological resources from the Level 3 alternatives, including:

- A comparison of the alternatives' overwater structures compared to existing conditions.
- A comparison of the alternatives' footprints in the habitat zones.
- A comparison of the alternatives' indirect effects to biological resources (e.g., eelgrass establishment, water quality and hydrologic connectivity of Fauntleroy Creek to Fauntleroy Cove).

Comparison of alternatives to existing conditions

Table 3 shows the approximate overwater structure footprint[2] for existing conditions and alternatives. It also shows the approximate increase for each alternative compared to the existing dock in square feet and percent increase. Each alternative results in an increase to the overwater structure footprint. The alternatives from least to greatest increase in the overwater structure footprint are A, A-1 to A-3, B-3, B, B-1, B-2 and C.

[2] For the purposes of this analysis, the overwater footprint is represented by the structure footprint seaward of the bulkhead, which would remain in the same location as the existing structure for all Level 3 Alternatives. Note that habitat Zone 1 extends both seaward and landward of the bulkhead.

Table 3. Existing and alternatives overwater structure footprint

Alternative	Existing	A	A-1, A-2 and A-3	B	B-1	B-2	B-3	C
Approximate overwater structure footprint (square feet)	42,000	54,500	59,000	77,100	84,200	86,100	75,900	92,000
Approximate increase in overwater structure footprint (square feet)	NA	12,500	17,000	35,100	42,200	44,100	33,900	50,000
Percent increase in overwater coverage	NA	30%	40%	84%	100%	105%	81%	119%

Comparison of alternatives within habitat zones

Table 4 summarizes the footprints of the design alternatives compared to the existing dock (i.e., square foot increase in coverage in relation to the existing conditions) for each habitat zone. A comparison of impacts by zone follows:

- Within Zone 1:
    - **Least:** Alternative B-3 results in the smallest increase to the overall and in-water structure footprint at (+2,600 square feet and +110 square feet, respectively). Zone 1 includes an overwater and upland structure footprint.
    - **Greatest:** Alternative B-1 results in the greatest increase in the overwater structure footprint (+7,060 square feet), and Alternative C results in the greatest increase to the in-water structure footprint (+170 square feet).
- Within Zone 2 (Excluding Eelgrass):
    - **Least:** Alternative B results in the smallest increase to the overwater structure footprint (+4,520 square feet), and Alternative B-1 results in the smallest increase to the in-water structure footprint (+190 square feet).
    - **Greatest:** Alternative C results in the greatest increase to the overwater and in-water structure footprint (+12,700 square feet and +350 square feet, respectively).

- Within Zone 2 (Eelgrass):
    - **Least:** Alternative B-3 results in the smallest increase to the overwater and in-water structure footprint (0 square feet and 0 square feet, respectively).
    - **Greatest:** Alternative B-1 results in the greatest increase to the overwater structure footprint (+2,230 square feet), and Alternative C results in the greatest increase to the in-water structure footprint (+40 square feet).
- Within Zone 3:
    - **Least:** Alternative A results in a decrease in the overwater and in-water structure footprint (-2,330 square feet and -280 square feet, respectively).
    - **Greatest:** Alternative C results in the greatest increase to the overwater structure footprint (+33,920 square feet), and Alternative B-2 results in the greatest increase to the in-water structure footprint (720 square feet).

Table 4. Alternatives overwater structure footprint and in-water footprint compared to existing conditions by habitat zone

Design alternative	Zone 1		Zone 2 (excluding eelgrass)		Zone 2 (eelgrass)		Zone 3	
	OWSF (sf) +/-	IWSF (sf) +/-	OWSF (sf) +/-	IWSF (sf) +/-	OWSF (sf) +/-	IWSF (sf) +/-	OWSF (sf) +/-	IWSF (sf) +/-
A	+5,500	+130	+9,060	+240	+910	+20	-2,330	-280
A-1, A-2 and A-3	+3,360	+130	+9,420	+300	+910	+20	+5,080	+290
B	+5,520	+130	+4,520	+130	+910	+20	+28,490	+730
B-1	+7,060	+160	+7,280	+190	+2,230	+40	+29,920	+700
B-2	+4,420	+140	+9,610	+270	+540	+10	+33,810	+720
B-3	+2,600	+110	+6,570	+250	0	0	+28,960	+630
C	+6,050	+170	+12,700	+350	+1,680	+20	+33,920	+710

+/- = Plus or minus square feet as compared to existing condition
IWSF = In-water structure footprint
OWSF = Overwater structure footprint (includes area landward of bulkhead in Zone 1)

Tables 5 and 6 evaluate the Level 3 alternatives and their effects on structure footprint, in-water structure footprint and piles within the habitat zones and the difference between the design alternatives and the existing conditions. Attachment 3 contains figures displaying the Level 3 alternatives and project component effects by habitat zone.

Table 5 summarizes each Level 3 Alternative's structure footprint and number of piles by habitat zone. Table 6 presents the alternatives from least to greatest structure footprint by habitat zone. The alternatives with the smallest structural footprints (in-water and overwater) by zone are:

- Zone 1 (Upper shoreline/riparian): Alternative B-3 has the smallest in-water/overwater footprint of all Level 3 alternatives.
- Zone 2 (Eelgrass): Alternative B-3 has the smallest in-water/overwater footprint of all Level 3 alternatives.
- Zone 2 (Excluding Eelgrass): Alternative B has the smallest in-water/overwater footprint of all Level 3 alternatives.
- Zone 3 (Deep water): Alternative A has the smallest combined in-water/overwater footprint of all Level 3 alternatives.

Alternatives B-1 and C have the largest footprints in square feet across the habitat zones. Table 6 provides more detail on alternative effects on individual habitat zones.

Table 5. Level 3 alternatives over and in-water structure footprints within habitat Zones 1 through 3

Alternative	Zone 1			Zone 2 (excluding eelgrass)			Zone 2 (eelgrass)			Zone 3			Total piles
	OWSF (sf)	IWSF (sf)	Piles	OWSF (sf)	IWSF (sf)	Piles	OWSF (sf)	IWSF (sf)	Piles	OWSF (sf)	IWSF (sf)	Piles	
Existing	15,020	120	153	24,760	220	268	0	0	0	7,970	380	126	547
A	20,520	250	37	33,820	460	65	910	20	3	5,640	100	14	119
A-1, A-2 and A-3	18,380	250	36	34,180	520	73	910	20	3	13,050	670	97	209
B	20,540	250	36	29,280	350	50	910	20	3	36,460	1,110	157	246
B-1	22,080	280	41	32,040	410	58	2,230	40	5	37,890	1,080	154	258

Alternative	Zone 1			Zone 2 (excluding eelgrass)			Zone 2 (eelgrass)			Zone 3			Total piles
	OWSF (sf)	IWSF (sf)	Piles	OWSF (sf)	IWSF (sf)	Piles	OWSF (sf)	IWSF (sf)	Piles	OWSF (sf)	IWSF (sf)	Piles	
Existing	15,020	120	153	24,760	220	268	0	0	0	7,970	380	126	547
A	20,520	250	37	33,820	460	65	910	20	3	5,640	100	14	119
A-1, A-2 and A-3	18,380	250	36	34,180	520	73	910	20	3	13,050	670	97	209
B-2	19,440	260	37	34,370	490	69	540	10	2	41,780	1,100	81	189
B-3	17,620	230	32	31,330	470	67	0	0	0	36,930	1,010	69	168
C	21,070	290	41	37,460	570	80	1,680	20	3	41,890	1,090	80	204

Table 6. Alternatives ordered from least to greatest structure footprint by habitat zone

Zone 1			Zone 2 (Excluding eelgrass)			Zone 2 (Eelgrass)			Zone 3		
Least to greatest effect	OWSF (sf)	IWSF (sf)	Least to greatest effect	OWSF (sf)	IWSF (sf)	Least to greatest effect	OWSF (sf)	IWSF (sf)	Least to greatest effect	OWSF (sf)	IWSF (sf)
Existing	15,020	120	Existing	24,760	220	Existing	0	0	A	5,640	100
B-3	17,620	230	B	29,280	350	B-3	0	0	Existing	7,970	380
A-1, A-2 and A-3	18,380	250	B-3	31,330	470	B-2	540	10	A-1, A-2 and A-3	13,050	670
B-2	19,440	260	B-1	32,040	410	A	910	20	B	36,460	1,110
A	20,520	250	A	33,820	460	A-1, A-2 and A-3	910	20	B-3	36,930	1,010
B	20,540	250	A-1, A-2 and A-3	34,180	520	B	910	20	B-1	37,890	1,080
C	21,070	290	B-2	34,370	490	C	1,680	20	B-2	41,780	1,100
B-1	22,080	280	C	37,460	570	B-1	2,230	40	C	41,890	1,090

Comparison of alternatives' indirect effects to biological resources

WSF also considered indirect impacts while evaluating the design alternatives. Indirect effects are based on ecologic principals, water quality, hydraulics and alternative project descriptions. Characteristics of Level 3 alternatives contributing to indirect (and generally beneficial) effects include:

- Reorienting dock and berthing structures into deeper waters to remove disturbance to eelgrass communities and promote eelgrass reestablishment (B and C alternatives).
- Removing creosote-treated piles.
- Reducing piles.

The eelgrass community in Zone 2 is critically important to the ecological function of Fauntleroy Cove and the surrounding biological web. As noted above, the existing ferry facility is located within Zone 2 and at the interface of Zone 2 and Zone 3. The disturbance from ferry propeller wash transports and erodes sediments in the docking area (scour hole), preventing eelgrass growth in this area.

Alternatives B, B-1, B-2, B-3 and C move the western extent of the dock and berthing structures into deeper, unvegetated waters (Zone 3). This eliminates propeller wash-associated erosion and transportation of sediments, potentially providing areas for eelgrass recolonization in Zone 2 (where not covered by the dock). In contrast, Alternatives A, A-1, A-2 and A-3 are oriented closer to shore, which would maintain the existing scour hole, sediment transport and effects of shading within Zone 2, inhibiting eelgrass recolonization in this area.

Approximately 550 piles (of which approximately 430 piles are creosote-treated timber) and over 1,000 tons of associated creosote-treated timbers are currently in place at the existing terminal. All Level 3 alternatives would remove these creosote-treated piles and timber and replace them with considerably fewer steel piles (see Table 5). Creosote-treated piles leach toxic chemicals into the water and surrounding sediment, resulting in death and developmental abnormalities to aquatic species (such as herring) (WDNR n.d.-b). Removing the creosote-treated piles would reduce these toxic chemical inputs and associated effects on aquatic species. While all Level 3 alternatives would remove the existing creosote-treated piles, the number of replacement piles varies by design alternative. Fewer proposed piles within Zone 1 would result in less obstruction (i.e., the piles themselves and potential for racked debris) to the natural flow of Fauntleroy Creek into Fauntleroy Cove.

A summary of change in piles by habitat zone follows:

- Within Zone 1, Alternative B-3 results in the fewest replacement piles (32), and Alternatives B-1 and Alternative C result in the most replacement piles (41).

- Within Zone 2 (Eelgrass), Alternative B-3 results in the fewest replaced piles (0), followed by Alternative B-2 (2); Alternatives A, A-1, A-2, A-3 and B (3); and Alternative B-1 (5).

- Within Zone 2 (Excluding Eelgrass), Alternative B results in the fewest replacement piles (50), and Alternative C results in the most replacement piles (80).

- Within Zone 3, Alternative A results in the fewest replacement piles (14), and Alternative B results in the greatest number of replacement piles (157).

3.1.2.3 Next steps

WSF will conduct further detailed analysis of fish, wildlife and vegetation as part of the NEPA and SEPA processes, including preparing a biological assessment in accordance with the federal ESA. WSF will consult with the National Marine Fisheries Service, USFWS, WDFW and tribes about project impacts to fish, wildlife and vegetation. As part of its NEPA and SEPA environmental reviews, WSF will conduct a detailed analysis of wetlands and waterbodies impacts, including a formal delineation of wetlands and waterbodies in the study area (i.e., potential wetlands, Fauntleroy Creek and associated floodplain) and a detailed assessment of impacts to wetlands and marine waters to inform the NEPA and SEPA analyses. In addition, WSF will meet the requirements of Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act and WDFW's Hydraulic Project Approval and other applicable federal, state and local requirements.

WSF considered all aspects of mitigation sequencing (i.e., avoidance, minimization and mitigation) as part of the Level 3 alternatives development and screening. As part of the mitigation development analysis, WSF considered a comparison of alternative mitigation opportunities and costs.

Mitigation cost drivers:

- **Total impacts.** WSF expects alternatives containing the greatest total overwater and in-water footprint (impacts) to have comparatively greater mitigation costs. Minimizing total impacts will help reduce mitigation costs.

- **Implementation costs and level of effort.** WSF expects alternatives having greater Zone 2 (Eelgrass) impacts will result in the highest comparative mitigation costs. Eelgrass restoration, creation and enhancement is the most expensive mitigation option due to specialized techniques, monitoring and adaptive management required for successful eelgrass mitigation.

- **Reducing disturbance to Zone 2.** Alternatives that result in decreased propeller wash effects in Zone 2 by moving the berthing structures into the deeper waters of Zone 3 are likely to significantly reduce the effects of ongoing scour on eelgrass, macroalgae, fish use and benthic habitat in Zone 2 (Eelgrass) and Zone 2 (Excluding Eelgrass). Removal of propeller disturbance in Zone 2 will result in mitigation opportunities to restore eelgrass habitat in Zone 2.

- **Off-site mitigation.** As mitigation obligation increases (e.g., added overwater cover in all zones), more off-site mitigation may be needed, which generally results in increased costs as compared to on-site mitigation.

Based on the criteria named above, total impact overwater/in-water and Zone 2 impact, WSF draws the following general conclusions about comparative mitigation costs between alternatives.

Alternatives with lower comparative mitigation costs:

- Alternative A: With the smallest total overwater structure footprint (Table 3), Alternative A is likely to reduce total mitigation cost, but does not remove ongoing impacts from propeller wash in Zone 2.

- Alternative B: With the smallest overwater structure footprint within Zone 2 (Excluding Eelgrass) (Table 4), Alternative B is likely to require less eelgrass mitigation resulting in a lower cost compared to other alternatives.

- Alternative B-3: With the smallest overwater structure footprint within Zone 2 (Eelgrass) (Table 4), Alternative B-3 is likely to require less eelgrass mitigation compared to other alternatives, resulting in a lower mitigation cost compared to other alternatives.

Alternatives that may increase potential mitigation costs:

- Alternative C: With the greatest total overwater structure footprint (Table 3) and the greatest overwater impacts to Zone 2 (Excluding Eelgrass) (Table 4), Alternative C is likely to increase the required mitigation cost compared to other alternatives.

- Alternatives B-1 and C: These alternatives have the greatest overwater structure footprint/in-water structure footprint within Zone 2 (Eelgrass), which is likely to increase the required mitigation cost compared to other alternatives (Table 4).

3.2 Wetlands and waterbodies

3.2.1 Existing conditions

WSF queried the National Wetlands Inventory (NWI) (USFWS n.d.-b) and the National Hydrography Dataset (USGS n.d.) to identify potential wetlands and other waterbodies within the study area. The study area for wetlands and waterbodies includes areas within 500 feet of the existing Fauntleroy ferry terminal. See Attachment 2 for a map showing existing potential wetlands and other waterbodies.

3.2.1.1 Wetlands

The NWI (USFWS n.d.-b) maps the following wetland types within 500 feet of the existing Fauntleroy ferry terminal (Attachment 2). These wetlands have not been delineated, and their location is based on NWI data. The Cowardin classification of each identified freshwater aquatic resource type is provided below (Cowardin et al. 1979).

- Marine, subtidal (Fauntleroy Cove, navigable waterway).
- Estuarine, intertidal.
- Riverine habitat in Fauntleroy Creek (R3UBH: Riverine, upper perennial, unconsolidated bottom, permanently flooded) aquatic resource type.
- Freshwater forested/shrub, seasonally saturated (PFOB) wetland along Fauntleroy Creek.

Table 7 summarizes the presence of non-delineated wetlands and waterbodies in Zones 1 through 3. Section 3.1 describes marine and estuarine wetland characteristics and functions. This section focuses on freshwater wetlands, found only in Zone 1 of the project area.

Table 7. Presence of non-delineated wetland and waterbodies in Zones 1-3

Non-delineated wetlands and waterbodies	Zone 1	Zone 2	Zone 3
Marine, subtidal (Fauntleroy Cove, navigable waterway)		X	X
Estuarine, intertidal	X	X	

Non-delineated wetlands and waterbodies	Zone 1	Zone 2	Zone 3
Riverine habitat abutting Fauntleroy Creek (R3UBH)	X		
Freshwater forested/shrub (PFOB) wetland	N/A[a]	N/A[a]	N/A[a]
Fauntleroy Creek	X		
Floodplain	X	X	X

The boundaries of the wetlands in Table 7 have not been delineated in the field; their positioning within the habitat zones is based off of mapping from NWI and may change when formally delineated.
[a] The NWI mapped PFOB wetland is located outside of Zones 1 through 3.

3.2.1.2 Fauntleroy Creek

Based on data from the National Hydrography Dataset, Fauntleroy Creek is mapped as a perennial natural stream feature that intersects the project area (Attachment 2) (USGS n.d.). Fauntleroy Creek has not been delineated. The creek flows west through a small riparian corridor south of the ferry terminal and turns north under the terminal and discharges into the cove north of the terminal. According to the resources mentioned above, Fauntleroy Creek is a Type F (fish-bearing) perennial anadromous stream discharging into Fauntleroy Cove near the Fauntleroy ferry terminal.

Fauntleroy Creek drains an approximately 149-acre area (watershed) to the east and south of the Fauntleroy ferry terminal. The creek flows through a culvert under Fauntleroy Way SW that emerges south of the ferry terminal and then flows into Puget Sound. Driftwood and debris that accumulates around the ferry trestle affects the creek channel, and it currently flows under the trestle and empties into Puget Sound north of the trestle.

3.2.1.3 Floodplain

Part of the study area is located within a FEMA Special Flood Hazard Area 100-year flood zone (FEMA n.d.-a) associated with Fauntleroy Cove. No evidence of shoreline armoring is present at the stretch of cove near the ferry.

3.2.2 Potential effects of Level 3 alternatives

To evaluate the potential effects on freshwater wetlands and waters, WSF assessed the footprints of the Level 3 alternatives regarding mapped freshwater wetlands and waterbodies.

3.2.2.1 Construction effects

WSF will likely use existing developed areas for any upland construction activities and does not expect to directly affect wetlands or waterbodies.

3.2.2.2 Permanent effects

As noted in section 3.1.2.2, among the Level 3 alternatives, Alternative B-3 would have the smallest permanent increase in-structure footprint in Zone 1 and would have the least potential for indirect effect to freshwater wetlands and waters. Alternatives B-1 and C would have the largest increases in structure footprint in Zone 1 and would be likely to have largest potential indirect effects to wetlands and waters.

The number and positioning of piles proposed for each design alternative within Zone 1 could affect the flow path between Fauntleroy Cove and Fauntleroy Creek, as described in section 3.1.1.

3.2.2.3 Next steps

As part of its NEPA and SEPA environmental reviews, WSF will conduct a detailed analysis of wetlands, Fauntleroy Creek and its associated floodplain. This will include a formal delineation of wetlands and Fauntleroy Creek's ordinary high water mark within the study area and detailed assessment of impacts to wetlands and waters to inform the NEPA and SEPA analyses. In addition, WSF will meet the requirements of Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, WDFW's Hydraulic Project Approval and other applicable federal, state and local requirements.

3.3 Water quality and stormwater

3.3.1 Existing conditions

This water quality and stormwater review provides information about waterbodies that exceed state pollution standards and Total Maximum Daily Load (TMDL). The TMDL is the estimated amount of a pollutant a waterbody can handle without exceeding the state water quality standards. The Clean Water Act requires a TMDL study to specify how much WSF must reduce pollution.

The study area for water quality and stormwater includes the areas within 0.5 miles of the existing Fauntleroy ferry terminal. WSF used Clean Water Act Section 303(d) listings, as well as Ecology's Environmental Information Management System and other data from publicly available resources to characterize existing water quality within the study area.

The study area is part of the Central Puget Sound Basin (Water Resource Inventory Area 9) in the Duwamish and Green Watershed (Hydrologic Unit Code 17110019). There are no wellhead protection zones in the study area.

Ecology identifies Fauntleroy Cove as water quality impaired for one parameter: bacteria (Ecology n.d.-d). Ecology established a TMDL for bacteria in Fauntleroy Creek in an approved water quality improvement project (Ecology 2007, 2008).

Several sources of pollutants may affect Fauntleroy Cove water quality, including:

- Stormwater discharge from existing pollutant-generating impervious surfaces including the existing ferry terminal, Fauntleroy Way SW and other surrounding roadways and developed areas.

- King County Wastewater Treatment Division's combined sewer overflow at Barton Pump Station.

Prior to upgrades in 2015, the combined sewer overflow averaged four overflows per year, discharging 4 million gallons of untreated runoff into Fauntleroy Cove. Approximately 430 creosote-treated timber piles (Figure 3) and more than 1,000 tons of associated creosote-treated timbers support the existing terminal. Creosote pilings can degrade aquatic habitat by leaching toxic chemicals including polycyclic aromatic hydrocarbons (PAHs) into the surrounding water and sediment. Benthic organisms may be exposed to PAHs through their diet and direct contact with contaminated water and sediments. PAHs may bioaccumulate in aquatic invertebrates and other species.

Figure 3 Fauntleroy Ferry Terminal viewed from north of the dock, showing creosote-treated timber piles

3.3.2 Potential effects of Level 3 alternatives

3.3.2.1 Construction effects

All Level 3 alternatives could affect water quality effects during construction. For example, pile removal and installation can generate temporary turbidity in the study area. Removal of a large number of creosote-treated piles could generate turbidity during removal and disturb sediments containing creosote. WSF will implement measures to control sediment mobilization and turbidity during pile removal. Pile installation can also generate turbidity; however, pile installation impacts are highly localized and less disruptive to the substrate than pile removal. WSF will implement best management practices to avoid and minimize water quality impacts during pile installation.

In-water construction would involve operating equipment over water, introducing the risk of water quality impacts from an accidental discharge of fuel, engine fluid or hydraulic fluid. WSF will implement pollution prevention measures, such as containment around overwater work areas, to minimize the possibility of adverse impacts to water quality. Similarly, WSF will use response and clean-up procedures to mitigate any adverse impacts should they occur.

All alternatives will have similar potential construction effects on water quality. Alternatives B, B-1, B-2, B-3 and C having more piles and longer construction durations, potentially posing a slightly higher risk of water quality impacts compared to Alternatives A, A-1, A-2 and A-3.

3.3.2.2 Permanent effects

The long-term effects of all Level 3 alternatives would be beneficial for water quality. All alternatives would remove creosote-treated timber piles and timber, providing a benefit to water and sediment quality in Fauntleroy Cove. WSF will replace creosote-treated timber piles with substantially fewer steel piles. The larger Alternatives B, B-1, B-2 and C would have more pollution-generating impervious surface than the smaller A alternatives, requiring larger stormwater management facilities. Stormwater is currently untreated from the existing trestle. The new trestle will provide updated stormwater treatment facilities following the *WSF Terminal Design Manual* (WSDOT 2016) and regulatory requirements. These updated facilities will provide water quality treatment for stormwater generated on the trestle, reducing pollutant loadings to Fauntleroy Cove from the terminal.

3.3.2.3 Next steps

During NEPA and SEPA environmental reviews, WSF will conduct an analysis of current pollutant loadings to Fauntleroy Cove from the ferry terminal and surrounding area. WSF will also provide designs for pile removal and installation. WSF will provide designs for current and future pollutant loadings from trestle drainage. WSF will develop measures to avoid and minimize water quality impacts

and to mitigate unavoidable impacts that will occur as part of construction and operation of the project. WSF will also develop a comprehensive strategy of measures to implement during construction and operation to reduce or avoid effects on water resources. WSF will consult with resource agencies during stormwater treatment plan development.

3.4 Hazardous materials

3.4.1 Existing conditions

WSF used a study area of 0.5 mile from the Fauntleroy ferry terminal to obtain current information on the presence of sites potentially contaminated with hazardous materials. WSF used Ecology's What's in My Neighborhood: Toxics Clean Up database and mapping tool to find and determine the presence of documented contaminated sites in the study area (Ecology n.d.-f).

WSF found two sites in the study area with hazardous material contamination (Table 8). Both sites are considered to have a low risk of contamination to the project based on their status and distance from the project location.

Table 8. Study area sites contaminated with hazardous materials

Site name (CSID)	Site address	Distance and direction	Potential issues and/or status
45th Ave SW Apartments (10264)	9212 45th Ave SW, Seattle	0.20 miles/southeast	Cleanup started
SCL Fauntleroy Substation (12767)	4520 SW Brace Point Drive, Seattle	0.22 miles/south-southeast	Cleanup complete

CSID = Contaminated Site Identification Number

The study area is within the Tacoma Smelter Plume. Based on Ecology's Dirt Alert database, the expected arsenic concentration in soil is between 20 and 40 parts per million in the study area (Ecology n.d.-c).

As noted in section 3.3, the existing dock includes creosote-treated timber piles and timber. Other hazardous substances, such as asbestos, may be present in the existing terminal facilities.

3.4.2 Potential effects of Level 3 alternatives

3.4.2.1 Construction effects

Construction activities for all Level 3 alternatives involve the use of potentially hazardous materials, such as petroleum, oils, and lubricants. In addition, WSF will generate solid waste during construction, some potentially hazardous. WSF will manage hazardous materials during construction per WSDOT's *Environmental Manual* (2023), Section 447.03(4), and applicable federal, state and local laws, regulations and standards, including best management practices to prevent, control and clean up any hazardous material releases during construction.

WSF will carefully manage removal of creosote-treated piles and timbers and construction debris during construction to minimize the risk of creosote contamination of surrounding water and sediment. WSF will dispose of creosote-treated timber at a certified facility and following applicable requirements.

3.4.2.2 Permanent effects

WSF will construct the project to meet current WSF operational standards with respect to storage, transport and management of hazardous materials.

3.4.2.3 Next steps

WSF will conduct further evaluation of hazardous materials as part of NEPA and SEPA environmental reviews. Based on the outcome of the PEL study, WSF will refine the project design to include instructions for how hazardous materials will be transported, managed and disposed of as part of construction and operations. If WSF proposes temporary or permanent right of way acquisition, it will conduct a Level 1 environmental site assessment following WSDOT guidance.

3.5 Historic, cultural and archaeological resources

3.5.1 Existing conditions

WSF must comply with Section 106 of the National Historic Preservation Act (NHPA) to support federal permits and approvals needed for the project. Section 106 of the NHPA requires that, before beginning any undertaking, a federal agency (in this instance the FHWA) must account for the effects of the undertaking on historic properties. Historic properties include both archaeological and built environment resources that are determined to be eligible for listing on the National Register of Historic Places (NRHP). If FHWA,

in consultation with the State Historic Preservation Officer, decides that the project will adversely affect historic properties, WSF must mitigate those effects.

The study area for cultural resources, including both archaeological and built environment resources, is 0.25 mile area surrounding the Fauntleroy ferry terminal. WSF used the Washington Department of Archaeology and Historic Preservation (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD) database extensively during the records search for this study. WSF identified previously recorded archaeological and built environment resources aged 50 years or older and cultural resources studies within the study area through a search of the WISAARD database. The WISAARD database cultural resources predictive model classifies the study area as "Very High Risk" for cultural resources. This preliminary review will serve as a foundation for future consideration under provisions of Section 106 of the NHPA.

Previously recorded cultural resources within the study area include one recorded archaeological resource and 157 built environmental resources, with two built environment resources that have had determinations of eligibility (Attachment 4). The one archaeological resource, Site 45KI01028 (Resource ID: KI01028), is documented as human skeletal remains representing three individuals discovered during the widening of Fauntleroy Road in 1924. There were no funerary objects reported during the discovery, and the remains were reportedly sent to the Burke Museum in Seattle, Washington (U.S. Department of the Interior 2010). The archaeological site has not been determined eligible for listing on the NRHP. The two built environment resources that have had eligibility determinations are not considered eligible for listing on the NRHP.

A total of eight cultural resources studies have been completed in the study area, according to the WISAARD database records search (Table 9). Of the eight studies, only one identified and documented a cultural resource. The cultural resource is a built environment resource consisting of a single-family residence known as the Leckenby House, which has yet to be considered for listing on the NRHP by the DAHP. There are no ethnographic place names present within the study area.

Table 9. Previous cultural studies within the study area

NADB	Author	Title	Year	Cultural resources
1339804	Hartmann, Glenn D.	A Cultural Resources Survey of the Washington State Department of Transportation's Fauntleroy Ferry Terminal Improvement Project, Seattle	1998	None
1339807	Robbins, Jeffrey R.	Fauntleroy Creek Culvert Replacement Project Seattle, Cultural Resource Assessment	1998	None
1339812	Dugas, Amy E.	Cultural Resource Monitoring of the Fauntleroy Creek Culvert Replacement Project	1998	None

1346977	Luttrell, Charles T.	Cultural Resources Investigations for the Fauntleroy Watershed Council's Lower Fauntleroy Creek Enhancement Project	2006	One built environment structure
1348327	Kiers, Roger	Archaeological Monitoring of Emergency Construction Excavations for the Barton Force Main	2006	None
1684568	Hoyt, Bryan	Archaeological Monitoring of Barton Street Pump Station Geotechnical Borings	2008	None
1687011	Rinck, Brandy	Re: Results of Archaeological Monitoring for the Seattle City Light Pole 154 Replacement	2012	None
1687412	Lockwood, Chris	Archaeological Monitoring of Barton Street Pump Station Upgrade	2015	None

3.5.2 Potential effects of Level 3 alternatives

3.5.2.1 Construction effects

All Level 3 alternatives will involve shoreline and upland construction that could potentially affect cultural resources. Level 3 alternatives will not affect built environment cultural resources (e.g., historic buildings). WSF has not yet determined the extent of the construction footprint for each alternative. Any Level 3 alternative with a substantially larger intertidal and upland construction footprint in comparison to others will be more likely to affect cultural resources. Except for the placement of a traffic signal pole, WSF does not expect any construction on the east side of Fauntleroy Way SW for any alternative. WSF will conduct a cultural resources survey and consult with DAHP and tribes to identify whether cultural resources are present and avoid potential effects as part of the NEPA and SEPA environmental reviews (see section 3.5.2.3).

3.5.2.2 Permanent effects

WSF does not anticipate long-term operations of the Level 3 alternatives to affect cultural resources.

3.5.2.3 Next steps

WSF will identify the area of potential effects to cultural resources for the project and conduct a cultural resources survey of both archaeology and built environment resources. WSF will do this work as part of the NEPA and SEPA environmental reviews, in consultation with DAHP, affected tribes and other consulting parties, and per the requirements of NEPA and SEPA and Section 106 of the NHPA. If WSF identifies historic properties, and those properties are adversely affected by the undertaking, WSF will consult

with the parties listed above to resolve adverse effects, likely through the development of an agreement document, such as a programmatic agreement or memorandum of agreement.

3.6 Parks and recreation

3.6.1 Existing conditions

The study area for parks and recreational resources is 0.5 mile from the Fauntleroy ferry terminal. There are four parks within the study area: Fauntleroy Creek Ravine, Fauntleroy Park, Kilbourne Park and Lincoln Park (SPR n.d.). Two "shoreline street ends," a Seattle Department of Transportation (SDOT) designation, are in the study area for public use and enjoyment: Cove Park (immediately north of the ferry terminal) and Southwest Brace Point Drive. In addition, the area directly across Fauntleroy Way SW from the ferry terminal entrance is a small, informal open space known as Captain's Park. Attachment 5 illustrates the location of parks in the study area.

3.6.1.1 Captain's Park

Captain's Park is a small, open space at the top of the embankment across from the ferry terminal between Fauntleroy Way SW and 47th Avenue SW, between Southwest Henderson and Southwest Director Streets. It is located within the City of Seattle right of way and Seattle Parks and Recreation (SPR) has not designated it as a park. According to the Southwest Seattle Historical Society, Morey Skaret established the area that overlooks Fauntleroy Cove and the ferry terminal "to honor all who have plied the waters including Native Americans who at one time camped at the site." (Southwest Seattle Historical Society n.d.). The area is elevated above Fauntleroy Way SW, which provides a view over Fauntleroy Cove and toward Vashon Island and the Olympic Mountains.

Figure 4 Cove Park entrance

3.6.1.2 Cove Park

Cove Park is an approximately 0.3-acre community resource located north of the Fauntleroy ferry terminal adjacent to the Barton Pump Station. The property is zoned Neighborhood Residential and is not formally designated for recreational use in Seattle's *2017 Parks and Open Space Plan*. SDOT considers Cove Park to be one of its "shoreline street ends" for public use and enjoyment, improved

to provide visual and physical access to the waterfront. SPR manages the park. In 2015, the King County Wastewater Treatment Division revitalized Cove Park as part of its upgrade to the Barton Pump Station.

The park offers passive recreational opportunities, such as walking and scenic enjoyment. The park has waterfront access via a paved path and views of the Puget Sound, Olympic Mountains and Vashon Island from atop the adjacent Barton Pump Station. Artwork at the park includes a statue, engraved stones, pavement designs and a gate honoring the community. Figure 4 shows the paved path and public art at the entrance to Cove Park just north of the Barton Pump Station.

3.6.1.3 Fauntleroy Creek Ravine

SPR owns and maintains Fauntleroy Creek Ravine, a 0.2 acre natural area located southeast of the Barton Street SW intersection and the Fauntleroy ferry terminal. Amenities include art and a walking path, with views of the ferry dock.

3.6.1.4 Fauntleroy Park

SPR owns and manages Fauntleroy Park, an approximately 33 acre park located approximately 0.25 mile east of the ferry terminal. The park is a densely wooded patch of forest with steep slopes and a 1.5 mile network of trails and paths for walking, hiking and dog walking.

3.6.1.5 Kilbourne Park

Kilbourne Park is a 0.6-acre green space beside Fauntleroy Elementary School, about 0.2 mile from the ferry terminal, which connects the larger Fauntleroy Park with the Fauntleroy Creek Ravine.

3.6.1.6 Lincoln Park

SPR owns and manages Lincoln Park, located approximately 0.25 mile north of the ferry terminal. The park is an approximately 135 acre facility located along Fauntleroy Way SW, between Southwest Fontanelle Street to the north and Southwest Trenton Street to the south. Fauntleroy Way SW provides vehicular access to Lincoln Park. Facilities and amenities include 4.6 miles of walking paths, 3.9 miles of bike trails, five picnic shelters, playfields, an outdoor heated saltwater pool and bathhouse and approximately 300 feet of shoreline access. Presently, ferry traffic queueing on Fauntleroy Way SW can back up to Lincoln Park, preventing vehicular access to and from the park.

3.6.1.7 Southwest Brace Point Drive

Southwest Brace Point Drive is an improved narrow road that leads to a sandy beach and views of Fauntleroy Cove. It is 0.2 mile south of the Fauntleroy ferry terminal. SDOT considers the property to be one of its "shoreline street ends" (SPR 2017). Water access is only available during high tide as the public area only extends 75 feet past the concrete curb at the street end.

3.6.2 Potential effects of Level 3 alternatives

3.6.2.1 Construction effects

The construction of all Level 3 alternatives will affect surrounding parks. Nearby construction activities will affect the closest parks (Cove Park, Captain's Park, Fauntleroy Creek Ravine, Southwest Brace Point Drive) when WSF builds a new terminal. During construction, WSF will transport and operate large construction equipment, affecting the recreational experience of park users. WSF will perform most of the construction activity over water, and it is unlikely that construction activities will physically occupy Cove Park, Captain's Park or other parks in the study area. Construction activities may occur on the north side of the trestle next to Cove Park.

WSF does not expect that any of the alternatives will have construction that encroaches on Captain's Park. WSF anticipates that access to the beach and points north of the trestle via Cove Park will be maintained throughout construction, with intermittent closures when necessary for public safety.

3.6.2.2 Permanent effects

WSF will build all Level 3 alternatives higher than the existing trestle and have fewer piles and bents. This will change users' views and experiences of Cove Park and Captain's Park. The new piles will be larger in diameter than the existing piles. While higher, the structure depth of all Level 3 alternatives will be deeper than the existing dock. The higher dock will be more visually prominent, particularly from a nearby vantage point like Cove Park or Captain's Park. However, by building fewer piles and a higher trestle, Level 3 alternatives will potentially allow more daylight under the dock than the existing configuration, physically and visually opening the area under the dock.

None of the Level 3 alternatives will change access to Cove Park via the path at the end of Barton Street SW. All Level 3 alternatives will be wider than the existing dock. However, wider portions of all alternatives will not begin until the beach tide zone to minimize potential effects on Cove Park. Based on community input, WSF designed Level 3 alternatives to avoid affecting Cove Park to the extent practicable. WSF's design puts wider areas of the dock farther offshore and to the south to minimize effects on Cove Park.

Alternatives A, A-1, A-2, A-3, B, B-1, B-2 and C would widen the trestle to the north toward Cove Park, seaward of the beach tide zone. Alternative B-3 would not widen to the north in relation to the existing dock. Table 10 summarizes the relative widening to the north for each Level 3 alternative. It also shows estimated additional area in the upper shore/riparian zone north of the dock representing potential encroachment on Cove Park. Figure 5 illustrates the permanent footprint of each Level 3 alternative relative to Cove Park. Widening of the dock to the north will not permanently change the use of Cove Park.

Table 10. Northern widening of Level 3 alternatives compared to existing dock

Alternative	Widening to north seaward of tide zone	Additional area north of existing dock in upper shoreline/riparian zone
A, A-1, A-2 and A-3	13 feet	2,080 square feet
B	13 feet	2,080 square feet
B-1	22 feet	3,625 square feet
B-2	5 feet	593 square feet
B-3	No widening to north	73 square feet[a]
C	13 feet	2,193 square feet

[a] Alternative B-3's trestle configuration immediately in front of the bulkhead structure is wider than the existing trestle.

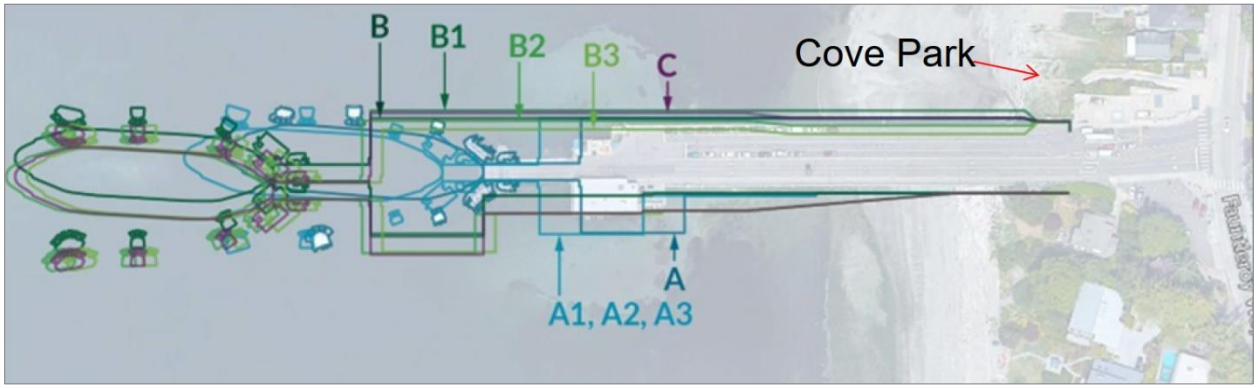


Figure 5 Level 3 alternative locations relative to Cove Park

WSF recommends an intersection configuration for all alternatives that includes installing a proposed traffic signal on the east side of Fauntleroy Way SW. The proposed traffic signal will not physically affect Captain's Park but may affect views from Captain's Park (Jacobs 2023b). Alternatives that reduce queuing on Fauntleroy Way SW, in comparison to the existing dock, may help reduce access conflicts at Lincoln Park.

3.6.2.3 Next steps

As part of NEPA and SEPA environmental reviews, WSF will analyze the temporary footprint of facilities and activities and the duration of construction. WSF will use this information to estimate construction-related effects on Cove Park and Captain's Park. WSF will continue to engage with the public regarding the development and evaluation of construction plans. Section 4(f) of the Department of Transportation Act of 1966 stipulates that FHWA and other Department of Transportation agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges or public and private historic sites unless there is no feasible and prudent alternative to the use of the land and the action includes all possible planning to minimize harm to the property resulting from use. WSF will also evaluate the potential impact of park property protected under Section 4(f) of the Transportation Act as part of NEPA and SEPA environmental reviews.

3.7 Environmental justice

Presidential Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their action on minority and low-income populations, to the greatest extent practicable and permitted by law. This order

ensures that agency actions do not have disproportionately high and adverse effects on these populations or otherwise have the effect of:

- Excluding persons (including populations) from participation.
- Denying people (including populations) benefits.
- Subjecting persons (including populations) to discrimination because of their race, color or national origin.

Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency,” is intended to improve access to federal programs and activities for persons who, because of national origin, are limited in their English proficiency.

3.7.1 Existing conditions

WSF based the study area for environmental justice on the origin and destination for the majority travelers between Fauntleroy, Vashon Island and Southworth, including 129 census tracts in King and Kitsap counties (WSDOT 2014) (Attachment 6). WSF used data from the Washington Environmental Health Disparities Map (Washington State Department of Health n.d.) to identify minority or low-income populations present within the study area.

The map uses 19 indicators that include socioeconomic factors, including low income and minority factors, at the census tract level to rank tracts with respect to risk to vulnerable populations. At a planning level, the map illustrates the location of low income and minority populations in relation to the project.

For this PEL environmental analysis, WSF used a disparity ranking of eight to indicate high low-income or high minority populations. High minority, low-income and Limited English Proficiency (LEP) populations are present within the study area (Attachment 6). The King County portion of the study area in Seattle, Burien, SeaTac and Des Moines includes people of color with a disparity ranking of eight or above.

The largest minority population groups are Black, Asian or Hispanic, at more than 10 percent each within the study area census tracts. Similarly, most of the King County part of the study area contains populations that have LEP. No readily identifiable minority populations or populations with LEP are present on Vashon Island or the Kitsap Peninsula. Much of the King County portion of the study in Seattle, SeaTac and Renton include populations living in poverty with a disparity ranking of eight or above. While there are no readily identifiable low-income populations on Vashon Island, some people in the Port Orchard area of the Kitsap Peninsula live in poverty (Attachment 6).

3.7.2 Potential effects of Level 3 alternatives

3.7.2.1 Construction effects

WSF expects all Level 3 alternatives to have environmental effects during construction. WSF will assess whether and how those effects may disproportionately affect low income or minority populations in detail during NEPA and SEPA environmental reviews.

3.7.2.2 Permanent effects

WSF expects all Level 3 alternatives to improve operational efficiency at the Fauntleroy ferry terminal for all users of the system. WSF will assess the effects of the project on environmental justice populations in detail during NEPA and SEPA environmental reviews.

3.7.2.3 Next steps

As part of the NEPA and SEPA environmental review process, WSF will evaluate the population composition of the analysis area to:

- Provide a basis for future outreach activities.
- Assess the effects on the local community.
- Evaluate potential alternatives with respect to environmental justice requirements.

Minority, low-income and LEP populations are present within the study area based upon this cursory-level review. During NEPA and SEPA environmental reviews, WSF recommends the following:

- Perform a detailed environmental justice evaluation, taking into consideration minority, low-income and LEP populations that the project could directly or indirectly affect.
- Collect the most recent demographic information available for the updated study area from the U.S. Census Bureau's American Community Survey. Consider secondary data sources to confirm the presence of environmental justice populations, such as the City of Seattle's Racial and Social Equity Index, report cards for study area schools from the Washington Office of Superintendent of Public Instruction, the Washington Environmental Health Disparities Map and other relevant sources.

- Consider specialized outreach methods to environmental justice populations within the updated study area, including an assessment of LEP.

- Consider and incorporate, as practical, elements that would lessen impact to and/or provide benefit to environmental justice populations affected by the project.

3.8 Air quality, greenhouse gases and climate change

3.8.1 Existing conditions

The project is within the USEPA thresholds set for the six common air pollutants in National Ambient Air Quality Standards: carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution and sulfur dioxide.

Vehicle traffic on Fauntleroy Way SW and ferry operations are local sources of air emissions. Comments received in public engagement have shown concerns about air pollution caused by vehicle idling while traffic is queued on Fauntleroy Way SW, waiting to board the ferry.

Increasing concentrations of greenhouse gases (GHG) in the atmosphere affect global climate. GHG emissions result from human-generated sources, including the combustion of fossil fuels. Some types of GHGs are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Carbon dioxide is the most important anthropogenic GHG because it is a long-lived gas that stays in the atmosphere for up to 100 years.

Climate change is a global phenomenon that has local impacts, including warmer air temperatures, increased sea level rise, increased storm activity and an increased intensity in precipitation events. Research has shown there is a direct correlation between fuel combustion and GHG emissions. Rising sea levels and the increasing frequency and intensity of storms increases the risk of damage and inundation of the terminal.

3.8.2 Potential effects of Level 3 alternatives

3.8.2.1 Construction effects

Construction equipment use will cause a temporary adverse effect on air quality from an increase in dust and air emissions during construction. Construction equipment and vehicles powered by gasoline and diesel engines generate exhaust emissions, including

GHGs. Earthwork and demolition activities are the most typical cause of dust. Level 3 alternatives with longer construction durations would generate more air emissions over the course of construction.

3.8.2.2 Permanent effects

WSF is currently evaluating how the alternatives will improve efficiency of terminal operations in a separate traffic analysis memorandum. WSF expects alternatives that improve the efficiency of loading and unloading to reduce queueing and idling on Fauntleroy Way SW. That, in turn, may contribute to a localized reduction in air emissions compared to the existing condition. The design of all Level 3 alternatives is consistent with existing WSF guidance about sea level rise to provide resiliency against anticipated rising sea level and tidal and storm effects.[3]

3.8.2.3 Next steps

WSF will conduct a detailed assessment of air quality and GHG as part of the NEPA and SEPA environmental reviews.

3.9 Noise

3.9.1 Existing conditions

The noise study area is 0.5 mile from the ferry terminal. Potential noise-sensitive receptors, or locations where occupants are more susceptible to the adverse effects of noise pollution, in the vicinity of the existing terminal include residential areas, parks, schools, a library, restaurants and other businesses. Existing noise sources in the vicinity of the Fauntleroy ferry terminal include transportation, such as vehicles on Fauntleroy Way SW, ferries and terminal operations.

[3] Appendix X of the *WSF Terminal Design Manual* (WSDOT 2016) provides a design tidal range for Fauntleroy Cove that includes a maximum tidal elevation with sea level rise. A 13-inch medium estimate that is not site specific and was used in the development of the Level 3 Alternatives.

3.9.2 Potential effects of Level 3 alternatives

3.9.2.1 Construction effects

WSF will use construction vehicles and engine-powered equipment for all Level 3 alternatives and this equipment will produce noise. Some noise will come from stationary equipment that may run constantly for extended periods of time (e.g., pumps, generators and compressors), and other construction noise will occur intermittently during active construction activities such as from trucks, cranes or backhoes. WSF will use vibratory extraction to remove piles and use a combination of vibratory and impact driving to install piles, depending on substrate conditions and structural requirements. Generally, pile installation will generate more noise due to pile-driving activity than pile removal.

3.9.2.2 Permanent effects

Following construction, activities at the ferry terminal will likely generate noise similar to the existing condition for all Level 3 alternatives. Alternatives that improve efficiency and decrease queueing on Fauntleroy Way SW may have localized noise reduction due to a decrease in idling vehicles.

3.9.2.3 Next steps

WSF will conduct a detailed noise analysis during NEPA and SEPA environmental reviews to determine noise impacts on specific receptors and land uses consistent with WSF and FHWA requirements, including analyzing and recommending mitigation measures.

3.10 Land use

3.10.1 Existing conditions

Existing land use in the vicinity of the ferry terminal includes residential areas, parks and pockets of commercial/mixed-use areas. The terminal is in the Fauntleroy neighborhood of West Seattle, bordered by Lincoln Park to the north, the Roxhill and White Center neighborhoods to the east and the Arbor Heights neighborhood to the south. According to the West Seattle Chamber of Commerce, Fauntleroy is one of seven business districts in West Seattle providing professional services and restaurants. The Seattle 2035 Comprehensive Plan future land use map (City of Seattle n.d.) identifies similar land uses in the future with the following:

- City-owned open space land use around Lincoln Park, Fauntleroy Creek Ravine, Fauntleroy Park and Kilbourne Park.

- Neighborhood residential areas, which provide opportunities for detached single-family and other compatible housing options that are low in height, bulk and scale.
- Pockets of commercial/mixed-use areas and multifamily residential areas.

The 2040 LRP (WSDOT 2019) recognizes the need for critical preservation work to upgrade the Fauntleroy ferry terminal. The Washington State Legislature programmed funding for the Fauntleroy terminal in the 2025–2027 biennium. Other major planned developments in the vicinity of the terminal include the following:

- The West Seattle Bridge Program led by SDOT will make improvements to transportation infrastructure, including repairing the West Seattle Bridge, rehabilitating the Spokane Street Swing Bridge, improving access to the low bridge for different users and implementing more than 195 traffic mitigation projects to help make it easier and safer to get in and around West Seattle.

- The West Seattle Link Light Rail extension led by Sound Transit will provide fast and reliable light rail connection between West Seattle and Downtown Seattle. The rail extension adds 4.7 miles of light rail service as well as four new stations between SODO and Alaska Junction. The proposed Alaska Junction link light rail station is located approximately 3 miles north of the Fauntleroy ferry terminal.

3.10.2 Potential effects of Level 3 alternatives

3.10.2.1 Construction effects

All Level 3 alternatives will temporarily affect existing land uses in the immediate vicinity of the ferry terminal. Construction involves construction worker, vehicle and equipment movement to and from the site, and the presence and operation of large construction equipment and construction activities. The parking area next to the dock (south of the dock and west of Fauntleroy Way SW) may be used for contractor staging or storage during construction. Construction activities my require rerouting traffic, and result in traffic delays and restricted mobility during the transport of equipment and materials to and from the construction site. This may temporarily affect land use in the areas surrounding the ferry terminal.

Construction activities will not displace adjacent land uses, but activities will cause increased traffic and noise and introduce noticeable changes to the terminal area during construction. As noted in section 3.6, construction activities will affect the recreational experiences of park users and similarly affect surrounding areas, including residential areas, during active construction.

3.10.2.2 Permanent effects

All Level 3 alternatives will replace the existing Fauntleroy ferry terminal with an updated, modernized facility. WSF does not anticipate any changes to existing zoning or land use.

WSF anticipates some permanent right of way acquisition for all Level 3 alternatives. Table 11 presents preliminary estimated right of way effects for the alternatives.

Table 11. Estimated permanent right of way for Level 3 alternatives

Alternative	Estimated right of way – tidelands (private parcel) (square feet)	Estimated right of way – between inner and outer harbor lines (square feet)
A	300	2,400
A-1, A-2 and A-3	0	2,900
B	0	3,000
B-1	0	3,000
B-2	300	5,900
B-3	300	5,900
C	300	5,900

3.10.2.3 Next steps

As part of NEPA and SEPA environmental reviews, WSF will determine the project's consistency with applicable land use goals and policies and consult with the City of Seattle's Department of Planning and Development regarding consistency with the Seattle Shoreline Master Program.

3.11 Visual quality and aesthetics

3.11.1 Existing conditions

The visual study area is 0.5 mile from the Fauntleroy ferry terminal. Viewpoints from within the study area include Lincoln Park, Cove Park, Captain's Park, Brace Point Street End and nearby residential areas. Viewers include area residents, users of park facilities,

pedestrians, transit users and motorists passing through the area. Key components of the visual environment include Fauntleroy Cove and views across Puget Sound of Vashon Island and the Olympic mountains, as well as the existing ferry terminal and other development around the shoreline.

3.11.2 Potential effects of Level 3 alternatives

3.11.2.1 Construction effects

Construction of all Level 3 alternatives will create temporary visual impacts during construction. Large construction equipment and construction activities such as increased truck traffic will be visible from viewpoints and by the viewers mentioned in section 3.11.1.

3.11.2.2 Permanent effects

All Level 3 alternatives will increase the footprint of the terminal facility. Alternatives A and A-1, A-2 and A-3 would be larger than the existing facility but would generally be of the same scale and length. Alternatives B, B-1, B-2, B-3 and C would be between 226 and 250 feet longer than the existing dock and Alternatives A, A-1, A-2 and A-3, and therefore likely to be more visually prominent from nearby viewpoints.

3.11.2.3 Next steps

WSF is preparing visual simulations of the dock alternatives to further support community engagement and Level 3 alternatives screening. WSF will use visual simulations of the dock alternatives during the NEPA and SEPA environmental reviews to determine visual impacts on specific views and viewers for various key observation points.

4. References

City of Seattle. n.d. Seattle 2035 Comprehensive Plan future land use map. seattlecitygis.maps.arcgis.com/apps/Minimalist/index.html?appid=47cd50ddafaa4726a6b7340fdf073d37. Accessed August 11, 2022.

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Attachment 1

Level 3 alternative layouts

Attachment 2

Fish, wildlife, vegetation, wetlands and aquatics existing conditions

Attachment 3

Alternatives Zones 1 through 3 effects

Attachment 4

Built environment resources

Attachment 5

Park locations in study area

Attachment 6

Study area census tracts