

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)
Lake Washington Ship Canal Project Master Plan
EAXX-202-00-G3P-1735821983
King County, Washington

The U.S. Army Corps of Engineers, Seattle District (USACE) has conducted an environmental analysis in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The Draft Environmental Assessment (EA) dated **20 February 2025**, for the Lake Washington Ship Canal Project (LWSC) addresses an update to the Project's Master Plan in the City of Seattle, King County, Washington.

The Draft EA, incorporated herein by reference, evaluated various alternatives to provide strategic comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the LWSC Project. There is one major Federal action requiring NEPA compliance and analyzed in the EA summarized below.

a. Proposed Action: The preferred alternative (Alternative 2) seeks to replace the 1994 Master Plan, outlining changes and updates necessary to improve recreation/visitor use while preserving the historic qualities of the LWSC Project and conserving the natural resources (Section 2.4.3 of the draft EA). The proposed action would address important updates in response to changes in regional demographics, recreation use and demand, amenities within the project, current environmental conditions, and pertinent laws and policies. The proposed action would provide strategic comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the project. It would also guide planning for efficient and cost-effective management and development for comprehensive use, responsible stewardship, and sustainability.

Under the proposed action, the updated Master Plan organization is by management area with site-specific resource objectives and recommended development needs. Thirty-eight of the development needs were identified as routine/small scale actions. The project-wide resource objectives for the LWSC Project were revised as follows:

- (1) To establish and maintain close, ongoing coordination with interested federal, state, Tribes, local agencies, and citizen groups and organizations in managing the natural and engineered resources and cultural features associated with the LWSC;
- (2) To protect, preserve, and conserve the LWSC Project's natural and engineered resources to ensure their continued availability for use, enjoyment and recreation by present and future generations;
- (3) To preserve and rehabilitate the Hiram M. Chittenden Locks and LWSC Historic District consistent with the Secretary of the Interior Standards for Rehabilitation; and,
- (4) To preserve, enhance and protect habitat on LWSC Project land that is used by fish and wildlife in the LWSC Project area.

The proposed action recommends verifying boundary surveys and marking of federal property; outlines nine recommendations for improving the Natural Resource Manager’s education and outreach program; and recommends to produce a LWSC partnership guide to describe the roles of partners and how they work together with the USACE. The importance for the USACE to sustain beneficial partnerships and foster others within the local community is highlighted.

The proposed action recommends the development of a Project-wide Vegetation Management Plan to unite all vegetated areas under a single plan. Land Classifications will be revised to reflect changes to the land classification definitions in 2013 (ER 1130-2-550). With the adoption of the updated Master Plan, land classifications at the Carl S. English Jr. Botanical Garden, South Entryway Buffer Zone and Fish Viewing Area will change; however, how the land is used will not change. The Carl S. English Jr. Botanical Garden and the vegetation located at the South Entryway Buffer Zone will be classified as Environmentally Sensitive Areas. This change in land classification will ensure the Garden is managed not just for vegetative cover but also for public display and scientific study. The Loop Road and lawn areas within the botanical garden will be classified as Multiple Resource Management (MRM)-Low Density Recreation while the fish viewing gallery and South Entryway Buffer Zone turf area and sidewalks will be classified as High-Density Recreation.

Alternatives: In addition to a “no action” plan, and the preferred alternative, two other alternatives were identified, but were removed from further consideration. Alternative 3 proposed an updated Master Plan that would maximize natural resource preservation while Alternative 4 proposed an updated Master Plan that would maximize recreation. Alternative 3 would not meet the public demands created by the project itself while sustaining balance with project natural resources, and for this reason was not considered further in the document. Alternative 4 would place more emphasis on developing recreational programs over that of providing for natural resources. Also, Alternative 4 would not consider project-wide resource capability and suitability and would not be consistent with multiple use authorized project purposes, and so was eliminated from further consideration.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the proposed action are listed in Table 1:

Table 1: Summary of Potential Effects of the Proposed Action.

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aquatic resources/wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Invasive species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish and wildlife habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Threatened/Endangered species/critical habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historic properties	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other cultural resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floodplains	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hazardous, toxic & radioactive waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Land use (Land Classification)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Navigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Noise levels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public infrastructure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Socioeconomics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tribal trust resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recreation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Health and Safety	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact Minimization: All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the proposed action. Best management practices (BMPs) as detailed in the EA (Section 5) will be implemented, if appropriate, to minimize impacts. BMPs include methods to reduce dust, to avoid or minimize noise, to reduce soil erosion, and to prevent pollutants from reaching the soil, groundwater, or surface water. Any excavation or construction work near the Ship Canal will be scheduled during times when less fish migration occurs (October 15-February 15) unless otherwise coordinated with resource agencies. Construction, clearing and/or grubbing activities will be scheduled to avoid the migratory bird nesting period (April 15-July 31) unless otherwise coordinated with resource agencies. In addition, the U.S. Environmental Protection Agency (Region 10) Pesticide General Permit BMPs would be implemented when applying pesticides.

Mitigation: No compensatory mitigation is proposed for this action as no loss of wetlands, no jeopardy to ESA-listed species, and no significant impacts to commercially important species are anticipated to occur based on the analyses in the EA. USACE will implement BMPs and conservation measures to ensure impacts are no greater than minimal, short-term effects as described in Section 5 of the draft EA.

Public Review: Public review of the draft EA and FONSI was completed on **24 March 2025**. All comments submitted during the public review period are responded to in the Final EA and FONSI.

Treaty Tribes: The Muckleshoot Indian Tribe and the Suquamish Tribe were contacted during the public scoping period regarding the proposed action. No comments were received. The USACE requested review of the Master Plan on 20 February 2025 and will continue to coordinate throughout the project to meet Tribal Treaty obligations.

Compliance:

a. Endangered Species Act: The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) are responsible for the Endangered Species Act of 1973 (ESA). A Biological Assessment (BA) for the O&M of the LWSC Project was initially transmitted to NMFS and USFWS, collectively known as the Services, in 2001. The USACE consulted with USFWS and NMFS on the LWSC Project that resulted in Biological Opinions (BiOps) from USFWS in 2007, and NMFS in 2008. The BiOps included incidental take permits for a period of five years from the issuance dates of the BiOps. Since the BiOps and take permits have lapsed, the USACE developed a supplemental BA to reinitiate consultation with the Services. The USACE has been operating the LWSC in accordance with the BiOps during this intervening period. On May 1, 2024, USACE submitted a supplemental Biological Assessment to the Services for their review and to request consultation under the ESA and MSA. As of February 2025, USACE continues to work with the Services towards formally reinitiating LWSC O&M consultation.

Regarding the Master Plan, the USACE evaluated the effects of the recommended development needs proposed under Alternative 2 to Federal ESA-listed species (Chinook salmon, Steelhead salmon, bull trout, North American green sturgeon, Pacific eulachon and the Southern Resident killer whale). USACE identified three routine/small-scale actions (use of chemicals to treat pier surfaces, removal of hazard trees along the Montlake Cut, and the use of pesticides and fertilizers) and two major development needs (repairing/replacing revetments along the cuts and replacing the Montlake Cut walkway) that have the potential to affect ESA-listed species and so will require consultation with the NMFS and USFWS prior to implementation. The USACE determined all other recommended development needs will not affect ESA-listed species. The EA will be reevaluated at the time that a future consultation is complete. If necessary, the EA will be supplemented with necessary and applicable corresponding modifications to the scope and/or nature of the proposed actions, the procedures and practices used to implement the actions, and this FONSI will be reassessed.

b. Magnuson-Stevens Fishery Conservation and Management Act (MSA): The USACE determined that no effect to Essential Fish Habitat (EFH) federally

managed fish species in Washington waters will result from the updated Master Plan proposed routine O&M and small-scale actions. The USACE will reevaluate the EA at the time that a future EFH consultation is complete. If necessary, the USACE will supplement the EA with necessary and applicable corresponding modifications to the scope and/or nature of the project, the procedures and practices used to implement the project, and this FONSI will be reassessed.

a. Coastal Zone Management Act (CZMA): The USACE determined that the proposed project is consistent to the maximum extent practicable with the enforceable policies of the approved Washington State Coastal Zone Management Program and the CZMA. The proposed project occurs on land owned by the Federal government and is outside the coastal zone [15 CFR 923.33(a)], and will have no direct or indirect effects on coastal land use, water use, or any other coastal zone resource. Because this action does not affect uses or resources of the coastal zone, and is not a development project, no consistency determination is required. A negative determination is not required.

c. Clean Water Act: The USACE has determined that the proposed action will not require or trigger compliance with the Clean Water Act (CWA). No in-water work is proposed, and all proposed routine O&M and small-scale actions are in upland areas removed from the water. Any future proposed site-specific actions would be reviewed for compliance with the Act.

d. National Historic Preservation Act: USACE contacted the Washington State Historic Preservation Office (SHPO), Muckleshoot Indian Tribe, Suquamish Indian Tribe, City of Seattle Historic Preservation Program, Friends of the Ballard Locks, and the King County Historic Preservation Program during scoping on May 18, 2021. The SHPO provided comments on September 16, 2021. Scoping comments were not received from the Muckleshoot Indian Tribe or Suquamish Indian Tribe. Other scoping comments are summarized in Appendix A to this EA (2025 Draft Master Plan, Attachment F).

The HPMP update is part of mitigation for the replacement of the original large lock center gate. A Memorandum of Agreement (MOA) between USACE and SHPO that describes this mitigation was signed October 2021 for the “Hiram M. Chittenden Locks Large Lock Center Gate Project” (May 2022; available online at <https://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/>). One stipulation is for USACE to update the HPMP with new information on historic buildings and structures found while revising and updating the outdated 1978 National Register of Historic Places Inventory Nomination Form. In addition, USACE was required to offer the SHPO, Department of Archaeology and Historic Preservation, at least one opportunity to review and comment on any HPMP revisions. The USACE incorporated comments provided by the SHPO via email into the HPMP in October 2022, which fulfills the MOA stipulation.

The Master Plan and HPMP are planning and guidance documents, and only undertakings resulting from the Master Plan would undergo Section 106 review and SHPO consultation as appropriate. Therefore, the draft Master Plan and HPMP are in compliance with Section 106 of the NHPA.

Determination:

a. Results of the Environmental Analysis: The probable consequences (impacts and effects) of the proposed action (Alternative 2) on the LWSC Project natural, cultural, and recreational resources were evaluated in the EA. Under Alternative 2, future management changes will improve management programs and process, resulting in beneficial impacts for vegetation, wildlife, water quality, and aesthetics. Beneficial effects of strategic project planning will result in maximization of project funds. Although major work is not proposed in the future, improving some existing facilities, a number of small-scale actions or developments, are proposed under the proposed action. The proposed action will enable more efficient land management and the recreation needs of the public will be better accommodated. Future recommendation will be based on review of existing facilities, resource suitability, carrying capacity, environmental and social effects, trends and forecast of future demands. Beneficial impacts on recreation will come from modernization and upgrading existing facilities while keeping with the appearance and landscapes that are contributing elements to the Historic District. Impacts of the proposed routine O&M and small-scale actions will be minor, short-term, and temporary, and will have minor or no impacts when using BMPs and conservation measures outlined in Section 5 of the EA. All proposed actions occur in upland areas removed from waterways.

b. Summary of Impacts and Compliance: The proposed action will seek to replace the 1994 Master Plan balancing recreation and visitor use with conservation of natural resources. The updated Master Plan will address important updates in response to changes in regional demographics, recreation use and demand, amenities within the project, current environmental conditions, and pertinent laws and policies. The proposed action will provide strategic comprehensive management and development of LWSC Project lands and their associated recreational, natural, and cultural resources. It will also guide planning for efficient and cost-effective management and development for comprehensive use, responsible stewardship, and sustainability. No in-water work or shoreline work is proposed and so the proposed action complies with the CWA and the CZMA. No effects to federally-listed species or to their critical habitats will occur as a result of the proposed action, and so the project is in compliance with ESA and MSA. The project complies with the National Historic Preservation Act and the USACE has coordinated the work with the Washington SHPO and affected Indian Tribes.

Finding: All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on the analysis presented in the EA, which has incorporated or referenced the best information available; the reviews by other Federal, State and local agencies, Tribes; input of the public; and

the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment. Therefore, preparation of an Environmental Impact Statement is not required.

Date

Kathryn P. Sanborn, PhD, PE, PMP
Colonel, Corps of Engineers
District Commander

DRAFT ENVIRONMENTAL ASSESSMENT

LAKE WASHINGTON SHIP CANAL PROJECT MASTER PLAN KING COUNTY, WASHINGTON

EAXX-202-00-G3P-1735821983

February 2025



**US Army Corps
of Engineers®**

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B – Summary of 1994 Master Plan Resource Objectives

C – Tribal Notification Letters to Solicit Comments

D – Draft Finding of No Significant Impact

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ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act of 1990
BMPs	Best Management Practices
BNRR	Burlington Northern Railroad
BiOps	Biological Opinions
CEQ	Council on Environmental Quality
CWA	Clean Water Act
EA	Environmental Assessment
EFH	Essential Fish Habitat
EO	Executive Order
EP	Engineer Pamphlet
EPA	U.S. Environmental Protection Agency
ER	Engineering Regulation
ESA	Endangered Species Act
FDM	Feature Design Memorandums
Garden	Carl S. English Jr. Botanical Garden
HPMP	Historic Properties Management Plan
Locks	Hiram M. Chittenden Locks
LWSC	Lake Washington Ship Canal
MBTA	Migratory Bird Treaty Act
MRM	Multiple Resource Management
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
O&M	Operation and Maintenance
OMP	Operational Management Plan

PA	Programmatic Agreement
RPMs	Reasonable and Prudent Measures
T&C	Terms and Conditions
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VMP	Vegetation Management Plan
UW	University of Washington

1 PROPOSAL FOR FEDERAL ACTION

The U.S. Army Corps of Engineers, Seattle District (USACE), has prepared this Environmental Assessment (EA) in accordance with (1) the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. § 4321 et seq.), (2) regulations of the Council on Environmental Quality for implementing the procedural provisions of NEPA (40 CFR parts 1500-1508), and (3) USACE procedures for implementing NEPA (33 CFR 230). Pursuant to Section 102(C) of NEPA, this assessment evaluates the environmental consequences of the proposed Master Plan for the Lake Washington Ship Canal (LWSC) Project.

The 1994 Master Plan for the LWSC Project located in Seattle, Washington needs updating as it is no longer current. This environmental assessment (EA) considers and describes potential environmental effects of the development and adoption of a new Master Plan for management of natural, cultural, and recreational resources at the LWSC Project. The LWSC Project includes the Hiram M. Chittenden Locks (Locks), a navigation channel (often referred to as the LWSC or Ship Canal), and a reservoir (which includes two natural lakes, Lake Washington, and Lake Union). Operated and maintained by the U.S. Army Corps of Engineers (USACE), the LWSC Project formally opened on July 4, 1917, although the first vessel passed through the Locks on August 3, 1916. The LWSC Project was formally registered under the National Register of Historic Places (NRHP) as a Historic District in 1978. The proposed new Master Plan (Appendix A) would be a strategic land-use management document that guides the comprehensive management and development of all project recreation, natural and cultural resources throughout the life of the water resource project. Master Plans address actions related to the management of government-owned lands, but do not extend to the management of the reservoir. Master Plans promote the efficient and cost-effective management, development, and use of project lands. A Master Plan is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

This EA is prepared pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulation (40 CFR 1501.5)¹, and the USACE Engineering Regulation (ER), Policy and Procedure for Implementing NEPA (ER 200-2-2; USACE 1988). The EA covers the action of adopting the proposed updated Master Plan and discusses potential effects. Future site-specific development, operations and

¹ It should be noted that Section 5 of Executive Order 14154 (Unleashing American Energy), signed 20 January 2025, directs the CEQ to “propose rescinding CEQ’s NEPA regulations found at 40 CFR 1500 et seq.” by 19 February 2025.

maintenance actions that may be proposed following adoption of the updated Master Plan, would undergo separate (i.e., tiered) analysis as required by NEPA. The NEPA is a full disclosure law, providing for public involvement in the process. All persons and organizations that have a potential interest in major actions proposed by a Federal agency including, but not limited to, other Federal agencies, State and local agencies, Native American tribes, interested stakeholders, and minority, low-income, or disadvantaged populations are encouraged to participate in the NEPA process.

1.1 PROJECT LOCATION

The eight-mile-long Ship Canal connecting saltwater Puget Sound with the freshwater bodies of Salmon Bay, Lake Union, and Lake Washington, is located entirely within the city limits of Seattle, Washington (Figure 1). The inland waters cover an area of 25,000 acres with a shoreline of about 100 miles. Two small parcels of government-owned submerged lands totaling about 12.7 acres occur along the Ship Canal and Shilshole Bay to the northwest of the Locks site. Freshwater begins at the spillway dam which controls the water level in the lakes upstream. The Ship Canal continues from the Locks to Salmon Bay, Fremont Cut, Lake Union, Portage Bay, Montlake Cut, and Lake Washington's Union Bay, where it ends at Webster Point.

The Fremont Cut is located between Salmon Bay and Lake Union and is approximately 5,800 feet long and 300 feet wide. It is heavily developed and channelized with concrete sills, bolstered by riprap, which line both sides of the channel. The Fremont Cut was initially dredged to a depth of 30 feet. It has not been dredged since the early 1900s. The high banks of most of the cut are lined with a single row of Lombardy poplars. The poplars form a nearly uninterrupted "colonnade" from the Fremont Drawbridge to the east to Seattle Pacific University to the west, although not along the project shoreline.

The Montlake Cut follows a compass-oriented easterly course of 2,500 feet through a narrow neck of land between Lake Union's Portage Bay and Union Bay in Lake Washington. The channel takes its name from the residential district on the south shore. The Montlake District is connected to the University of Washington (UW) campus on the north shore via the Montlake Drawbridge, which crosses the canal at right angles near the center. The channel width is 100 feet, although the right-of-way controlled by USACE is typically 325 feet wide. The channel was dredged to 30 feet in the early 1900s.



Figure 1. Location of the LWSC Project (shown in red) in the city of Seattle.

1.1.1 Early History and Landscape Conditions

Prior to the construction of the Ship Canal and the Locks, and the arrival of Euro-Americans into what is present day Seattle, the area was home to the Duwamish (Dxwdewabs) Tribe. The name Duwamish is said to mean “inside the bay people” and their territory included the Black River, Cedar River, Green River and White River drainage area, extending from Puget Sound to the foothills of the Cascades. The Duwamish also included the Lake Washington people, the Thluwi’thalbsh (at Union Bay), the Sammamish at the mouth of the Sammamish River and the (Colcol-a oc) people of Salmon Bay (Smith 1941; Swanton 1952; Burge 1980; 1985; Suttles and Lane 1990; Ruby and Brown 1992). The subsistence of the Tribes was based upon seasonal harvesting of wildlife, plants, and fishery resources. Saltwater resources included herring, smelt, flounder, lingcod and rockfish. Shellfish resources included butter and horse clams, geoducks, and native oysters. In freshwater rivers and lakes, a variety of fish including salmon, cutthroat, rainbow trout, mountain white fish and suckers were caught (Suttles and Lane 1990). Tribal settlements consisted of permanent villages

made up of cedar plank longhouses. Villages were located along waterways (Suttles and Lane 1990).

The Tribes referred to the narrow estuary at Salmon Bay as “Cllico’l” or “shoving thread through a bead.” This estuary was used as a thoroughfare and canoes would “threaded” their way to and from the freshwater lakes to Puget Sound. This was also a village location on the north shore of Salmon Bay where Ballard now is (Waterman 1922; 2001). Other village sites include five longhouses that were located along the northern margin of the Union Bay and included a longhouse at the University steam plant, Edgewater Park, and the Battelle Institute (Burge 1980; 1984; Larson and Lewarch 1995).

The first official mention of a canal to connect Lake Washington with Puget Sound was by Thomas Mercer at a picnic on the shore of Lake Union on July 4, 1854. The first earth was turned in 1869 when a local citizen, Harvey Pike, began a shallow hand-shoveled canal between Lakes Washington and Union. In 1880, the Lake Washington Canal Association was formed and undertook to finish the canal to a sufficient depth to float logs. In the early 1900s, the channel between Lake Union and Salmon Bay was deepened so that its bottom was below high tide, and a dam was constructed in the channel at the lake outlet to control flows. All of these facilities were for transporting logs and did not provide sufficient depth for vessels.

The original construction of the LWSC included rerouting the Cedar River into Lake Washington along with the creation of the channel to the Locks. The Lake Washington surface elevation was also lowered by about nine feet. The historical outlet for Lake Washington was the Black River that joined with the Duwamish River before emptying into Puget Sound. The Black River was largely eliminated when the Cedar River was directed into Lake Washington (Figure 2). In addition, the original inhabitants of Shilshole Bay were displaced to build the Locks. The village located at Cllico’l was likely destroyed during the construction of the Locks. The description of Figure 3 from the University of Washington American Indians of the Pacific Northwest Images digital collection states: “Salmon Bay Charlie (Hwehlchtid), of the Shilshole people, lived on the southern shore of Salmon Bay, near Ballard. Charlie and his wife Madelline (Chilohleet'sa) remained in their traditional homeland long after others of their Tribe had moved away. This photo[graph], taken around 1905, shows their home at Shilshole.”

The State of Washington and King County cost-shared the upstream excavation and construction with the Federal government. Construction of the canal was started in September 1911, with the small lock opened to traffic on July 30, 1916, and the large lock on August 3, 1916. The Fremont Cut Channel between Salmon Bay and Lake Union was opened October 1916. The Montlake Cut Channel between Lakes Union and Washington was completed May 8, 1917. Official dedication of the project was held July 4, 1917.

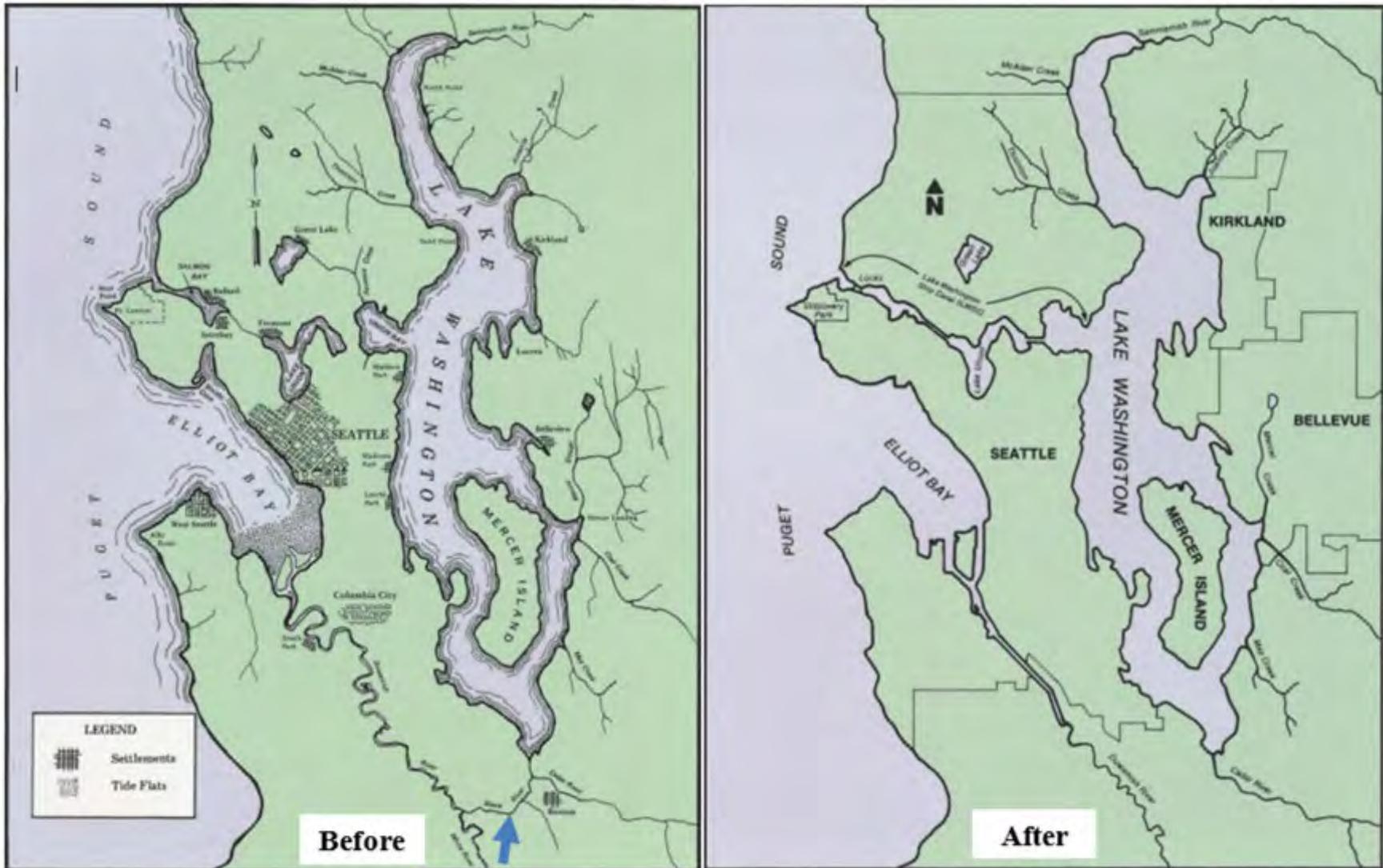


Figure 2. Seattle before the construction of the Locks started in 1911, and after construction the LWSC was completed and built in 1916. Note the Black River (arrow) is no longer present after the construction of the Locks was completed.



Figure 3. Salmon Bay Charlie's house at Shilshole with canoe anchored offshore, ca. 1905 (Photograph and description from the American Indians of the Pacific Northwest Images digital collection; <https://digitalcollections.lib.washington.edu/digital/collection/loc/id/17/>).

1.2 AUTHORITY

USACE cannot perform work without authorization from Congress. There are multiple congressional authorizations for the LWSC Project that are summarized in the updated Master Plan (Appendix A, Section 1.2). House Document 1, 52nd Congress in 1892 authorized the dredging of a ship canal to connect Salmon Bay, Lake Union, and Lake Washington, including any necessary locks and appurtenances. House Document 2, 57th Congress in 1902 authorized the study of locks and dams, and appropriated funds for the construction of a channel between Shilshole Bay and Salmon Bay to the wharves at Ballard, Washington. House Document 3072, 59th Congress in 1906 authorized the canal construction from Puget Sound to Lake Washington. House Document 953, 60th Congress in 1908, provided the funds for construction of the lock and dam and dredging within the new canal between Puget Sound and Lake Washington.

1.3 PURPOSE AND NEED

The purpose of the LWSC Master Plan is to guide USACE to preserve, conserve, restore, maintain, manage, and develop USACE project lands and associated resources in accordance with USACE guidance. Master Plans are to be kept current and be reviewed every five years. The Master Plan prepared in 1994 is over 25 years old and does not reflect current recreation and public use, cultural resource status, invasive and endangered species, wildlife habitat value, and other features like the Carl S. English Jr. Botanical Garden (Garden). The Garden is an important feature of the LWSC National Historic District. An updated Master Plan would incorporate new USACE land use classification standards, include contemporary requirements mandated by Federal environmental laws, and better reflect USACE's Environmental Operating Principals, natural resource management mission, environmental stewardship, and ecosystem management principles. An updated Master Plan would also provide the public an opportunity to provide guidance and feedback on USACE-proposed management of project lands. The updated LWSC Master Plan would provide a comprehensive description of the project, discuss factors influencing resource management and development, identify site-specific problems, a synopsis of public involvement and input, and describe past, present, and proposed development.

1.4 MASTER PLANS

Master Plans are required for civil works projects and other government-owned lands for which USACE has administrative responsibility for management of natural and human-made resources. Engineer Pamphlet (EP) 11-30-2-550 (USACE 2013) establishes guidance for the preparation of Master Plans. As stated therein, the primary goals of the Master Plans are to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts, which:

- (1) Provide the best possible combination of responses to regional needs, resources capabilities and suitabilities, and expressed public interests and desires consistent with authorized project purposes;
- (2) Contribute towards providing a high degree of recreation diversity within the region;
- (3) Emphasize the particular qualities, characteristics, and potentials of the project; and
- (4) Exhibit consistence and compatibility with national objectives and other state and regional goals and programs.

The Master Plan provides guidance for future project development and use, and is based on authorized project purposes (navigation, recreation), USACE policies and regulations on the operation of USACE projects (USACE 1985; 1996; 2013), responses to regional and local needs, resource capabilities and suitable uses, and expressed

public interests consistent with authorized project purposes and pertinent legislation. The Master Plan provides policy on use of USACE operating project lands consistent with national objectives and other state and regional goals and programs.

A Master Plan is a dynamic operational document projecting what could and should happen over the life of the project and is flexible based upon changing conditions. The Master Plan deals in concepts, not details, of design or administration. Detailed management and administration functions are addressed in a five-year Operational Management Plan (OMP), which implements the concepts defined in a Master Plan. Tiered analysis of the OMP is the primary way that future detailed, site-specific actions would be addressed fully under NEPA.

An updated Master Plan for the LWSC Project would not address regional water quality, water level management, shoreline management, the operation and maintenance (O&M) of project operations facilities (i.e., dam and/or spillway), or the O&M of the fish ladder; however, the fish ladder plaza and fish viewing room would be addressed in the LWSC Master Plan since they are recreation-oriented features.

1.4.1 Land Allocation and Land Classifications in Master Plans

Land allocation at all USACE Civil Works water resource projects are based on the congressionally authorized purpose for which the project lands were acquired. There are four land allocation categories applicable to USACE projects: (1) Operations, (2) Recreation, (3) Fish and Wildlife, and (4) Mitigation. At LWSC, all of the USACE-administered lands are allocated as Operations because they were acquired for the construction and operations of the project for navigation. The LWSC Project does not have lands that were specifically authorized by Congress for the conservation of fish and wildlife or mitigation.

The lands comprising each individual USACE-administered property have been further classified (“zoned”) to provide for development and resource management consistent with authorized purposes, the provisions of applicable regulations, and the specific features and amenities within each area. Land-use classifications were revised in 2013 (USACE 2013) after the previous Master Plan was approved, and the classifications applicable to the LWSC Project are the following:

- **Project Operations** – This category includes those lands required for the locks, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas that are used solely for the operation of the Project.
- **High Density Recreation** – Lands developed for intensive recreational activities for the visiting public such as day use areas and/or campgrounds. These could include areas for commercial concessions (marinas, comprehensive resorts, etc.), and quasi-public development.

- **Environmentally Sensitive Areas** – Areas where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as Endangered Species Act (ESA), the National Historic Preservation Act (NHPA) or applicable State statutes. These areas must be considered by management to ensure they are not adversely impacted.
- **Multiple Resource Management (MRM)** – This classification allows for the designation of a predominate use as described below, with the understanding that other compatible uses described below may also occur on these lands. Land classification maps must reflect the predominant sub-classification, rather than just Multiple Resource Management. There is one MRM subcategory at the LWSC Project as described in the following bullet:
 - **Recreation-Low Density** – These lands emphasize opportunities for dispersed or low-impact recreation use.
- **Water Surface** – Administration of a surface water zoning program.
 - **Restricted** – Water surface areas restricted for LWSC Project operations, safety and security purposes.

Project Easement Lands – All lands for which USACE holds an easement interest, but that are not government owned. Planned use and management of easement lands would be in strict accordance with the terms and conditions of the easement estate acquired for the LWSC Project. Easements were acquired for specific purposes and do not convey the same rights or ownership to USACE as other lands. For the LWSC Project, USACE retains rights to lands necessary for project operations. There are no flowage or conservation easements associated with the LWSC Project.

1.4.2 Resource Objectives of Master Plans

Resource objectives are realistically attainable outcomes for the use, development, and management of natural and anthropogenic resources. Resource objectives are developed with full consideration of authorized project purposes, applicable Federal laws and directives, resource capabilities, regional needs, plans and goals of regional and local governmental units, and expressed public desires. These objectives enhance project benefits, meet public needs, and foster environmental sustainability. Project-wide resource objectives are statements that are specific to the LWSC Project which specify the selected options for resource use, development, and management as determined through study and analysis of regional needs, resource capabilities and potentials, and public desires.

1.4.3 Maintenance of Facilities and Area Lands in Master Plans

As resource managers, USACE is required to maintain and/or repair existing facilities and infrastructure to continue to provide a safe working and recreational environment. In addition, USACE is required to protect natural areas and natural resources.

1.4.4 Past Master Plans

The first Master Plan of the LWSC Project was completed in April 1977 (USACE 1977). The 1977 Master Plan contained plans for development, operation, and administration of Project lands and water areas for the best use of the land in the interest of the public. The Master Plan acknowledged the LWSC Project's proximity to large population centers, easy access, and unique setting for day-use and visitor facilities. The Master Plan also recommended continued development of such facilities. The 1977 Master Plan established the probable extent of public use over the life of the Project and a plan for development of facilities to meet these needs. Development plans were proposed to provide a wide variety of visitation experiences to the general public as well as to cater to special interest groups like inner-city residents, elderly and handicapped. Policies and procedures for administration and operation were set forth to assure preservation of the scenic, biological, and recreational resources. Coordination with interested Federal, state, and local agencies also occurred. The plan was intended to be flexible and would be revised to meet changing needs and conditions. At the same time the 1977 Plan was being prepared, the fish ladder was being renovated, and an underwater fish-viewing room was being added. The immediate area of the fish ladder was also being landscaped and initial interpretive signage installed. It was anticipated the fish ladder and its new viewing room would be a popular attraction for the LWSC Project.

In 1994, the 1977 LWSC Project Master Plan was updated (USACE 1994). It provided a guide for the use, development, and management of the natural and human-made resources of the LWSC Project that had been in effect for more than 25 years. The 1994 Master Plan made specific recommendations designed to ensure that the resource use objectives, development and management measures, and general design criteria outlined in the 1977 Master Plan were adhered to and reflected in all subsequent planning, development, and management activities at the Project. Land classifications were allocated for LWSC Project lands and specific recommendations for both short- and long-term development and resource management were identified for each classification area. These recommendations included maintenance and operations and cooperative planning with Federal, state, local and citizen interests. The LWSC Project was designated a National Historic District under the NHPA in 1978. A National Historic District is a landmark that includes sites, structures, and objects that have been determined by the Secretary of the Interior to be nationally significant in American history and culture. The 1994 Master Plan therefore included resource objectives and land management measures related to this designation for the purpose of preservation.

An objective of the 1994 Master Plan was to increase resource management effectiveness and provide the basis for preparation of other USACE operational plans.

2 PROPOSED ACTION AND ALTERNATIVES

USACE conducted a preliminary evaluation of the alternatives that would fulfill the purpose and need for the project described in Section 1.3. Four alternatives have been identified, including the No Action Alternative. Alternatives are screened out if they do not conform to policy and do not meet the stated purpose and need. The proposed update of the Master Plan is directed by specific USACE policy which informs consideration of alternatives for strategic project development and management. This section describes the range of alternatives that were evaluated and screened for selection of the preferred alternative and identifies the preferred alternative that was selected. The Preferred Alternative must be the least cost viable alternative while fulfilling all legal, technical, and environmental requirements.

2.1 ALTERNATIVE 1 – NO ACTION/EXISTING MASTER PLAN

2.1.1 Land Allocation and Land Classification

The LWSC Project Master Plan, Design Memorandum 9, was completed in February 1994 (USACE 1994). Project lands were zoned (i.e., classified) in accordance with a land-use plan. A USACE land-use plan ensures management of public access to USACE lands and waters in a manner that protects all project purposes and mission areas. As noted in Section 1.4.1, the USACE land-use classifications were updated in 2013, and so the classifications applied in the 1994 Master Plan are outdated. A summary of land-use classifications from the 1994 Master Plan appears in Appendix B.

2.1.2 Resource Objectives

Six project-wide resource objectives were established by the 1994 Master Plan for the Project and are summarized in Appendix B. The 1994 Master Plan was organized by land-use classifications and a total of 34 site-specific resource objectives were established for individual land-use classified sites and are summarized in Appendix B.

2.1.3 Maintenance of Facilities and Area Lands

The No Action Alternative being evaluated should be viewed as "no change" from current management direction or level of management intensity. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action (under the existing Master Plan) until that action is changed (under a revised Master Plan). Because Master Plans provide the basis for evaluating contemporary recreation or land management proposals, the 1994 document does not account for the

changes that may have occurred over the past 25 years. The existing Master Plan would be capable of providing only minimal support for the development and management of the project. Further, future developments or resource management policies would require approval on a case-by-case basis without the benefit of evaluation in the context of a revised overall plan.

2.2 ALTERNATIVE 2 – UPDATE MASTER PLAN (PREFERRED ALTERNATIVE)

2.2.1 Land Allocation and Land Classification

Under Alternative 2, an updated Master Plan aims to balance the growing public demand for recreation and the need to protect natural resources in a highly urbanized environment. The updated Master Plan organization is by management area which differs from Alternative 1 (No Action) where the 1994 Master Plan organization is by land classification. A summary of the land classifications and acreages under Alternative 2 are given in Table 1. These acreages include both USACE-administered (government-owned acres) and easements.

Table 1. Land acreages and classifications of USACE-administered lands at the LWSC Project under Alternative 2 (Update Master Plan). Total excludes Annotated Revised Code of Washington (ARCW) lands (4.6 acres at the Locks Site).

Land Classification	Total Acres
Project Operations	7.9
High Density Recreation	1.2
Environmentally Sensitive Areas	17.5
MRM – Low Density Recreation	6.1
MRM – Water Surface Restricted	35.8
Easement Lands	20.7
Total	89.2*
*Total excludes Annotated Revised Code of Washington (ARCW) lands (4.6 acres at the Locks Site).	

With the adoption of the updated Master Plan, land classifications at the Garden, South Entryway Buffer Zone and Fish Viewing Area would change (Table 2); however, how the land is used would not change. USACE policy is that land classification should be consistent with use, and the classification as an Environmentally Sensitive Area for the Garden areas and MRM-low density recreation for the Loop Road and lawn areas allows for a holistic approach to land management.

Table 2. Proposed LWSC Project land classification changes between the No Action and Preferred Alternatives.

Site	Existing Master Plan (No Action Alternative)	Update Master Plan (Preferred Alternative)
Fish Viewing Gallery	Recreation	High Density Recreation
South Entryway Buffer Zone	MRM-Vegetative Management	Environmentally Sensitive Area (vegetative areas) and High Density Recreation (turf area, sidewalks)
Garden Beds	MRM-Vegetative Management	Environmentally Sensitive Area
Garden Lawn Areas	MRM-Vegetative Management	MRM-low density recreation
Garden Loop Road	Recreation	MRM-low density recreation

2.2.2 Resource Objectives

The over-arching project-wide resource objective for the LWSC Project is to continue to provide benefits to the public from the congressionally authorized purposes of "Navigation and Recreation." These benefits, as well as the benefit of providing passage of anadromous fish, should be provided in a safe, effective, and efficient manner. Under Alternative 2 (Update Master Plan), project-wide resource objectives for the LWSC Project include:

- (1) To protect, preserve, and conserve the LWSC Project's natural and cultural resources to ensure their continued availability for use, enjoyment and recreation by present and future generations;
- (2) To preserve and rehabilitate the Lake Washington Ship Canal Historic District consistent with the Secretary of the Interior Standards for Rehabilitation;
- (3) To preserve, enhance and protect habitat on LWSC Project land that is used by fish and wildlife; and,
- (4) To establish and maintain close, ongoing coordination with interested Federal, state, Tribes, local agencies, and citizen groups and organizations in managing the natural and engineered resources and cultural features associated with the LWSC.

Alternative 2 (Update Master Plan) project-wide resource objectives are almost identical to the No Action Alternative, with the exception that the 1994 Master Plan (Appendix B, Summary of 1994 Master Plan Resource Objectives) includes two additional objectives.

The additional project-wide resource objectives in the 1994 plan spoke to the LWSC Project cooperating with fish and wildlife agencies in controlling nuisance wildlife and plant species and broadening public understanding of the role of USACE in water resource projects, the purpose and operation of the LWSC Project, and the management of the Project's resources and cultural features using interpretive programs and facilities. These two objectives under the No Action alternative are not carried forward under Alternative 2 (Update Master Plan) as they were considered redundant, or a development need rather than a resource objective.

Alternative 2 (Update Master Plan) has 39 site-specific resource objectives and 70 recommended development needs (Appendix A, 2025 Draft Master Plan, Section 5). Thirty-eight of the development needs were identified as either routine or small-scale actions that likely meet the conditions and standards established under the LWSC Project's Historic Property Management Plan (HPMP) and Programmatic Agreement (PA) and are summarized in a table of proposed small actions for each management area (Appendix A, 2025 Draft Master Plan, Section 8.5). The recommended development needs under Alternative 2 are specific to each management area, whereas the 34 land management measures and 15 development considerations under the No Action Alternative are site-specific by land-use classification (Appendix B, Summary of 1994 Master Plan Resource Objectives).

Alternative 2 (Update Master Plan) recommends verifying boundary surveys and marking of Federal property (Appendix A, 2025 Draft Master Plan, Section 8.2), provides ten recommendations for improving the Natural Resource Manager's education and outreach program (Appendix A, Section 8.4), as well as a recommendation to produce a LWSC partnership guide to describe the roles of partners and how they work together with USACE (Appendix A, Section 6.3).

2.2.3 Maintenance of Facilities and Area Lands

Under Alternative 2 (Update Master Plan), operations, maintenance, and upkeep of existing facilities as well as the protection of natural areas and natural resources would occur, with 38 identified routine O&M and small-scale actions listed in the updated Master Plan (Appendix A, Section 6.6 and 8.5). Thirty-six of these O&M and small-scale actions would have no effect to natural resources or fish and wildlife species listed under ESA. Work involving three routine O&M actions would not occur until consultations with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS; collectively referred to as the Services) were completed; the three recommended actions requiring ESA consultation include:

1. Refurbishing the pier surfaces at the Locks so they are safer to cross in winter weather. This routine O&M action would require the pier surfaces to be replaced with a wood or a composite material and then the surfaces coated with a slip

resistant coating or material to prevent the surfaces from being slippery. The slip resistant coating must be evaluated to determine if the chemical would affect fishery resources.

2. Removing hazard trees at the Montlake Cut. This small-scale action would result in changing the vegetation cover adjacent to the ship canal potentially affecting critical habitat for migrating salmon.
3. Applying fertilizers, herbicides, and other pesticides or chemicals to maintain and/or control vegetation and/or pests in LWSC Project vegetated areas. Fertilizers and pesticides have the potential to enter groundwater and affect migrating salmon.

The No Action alternative listed only ten O&M actions and are provided in Appendix B (Summary of 1994 Master Plan Resource Objectives). Migratory fish species were not listed under ESA at the time of the development of the 1994 Master Plan, and so the O&M actions did not require consultation with the NMFS or USFWS. Further, Alternative 2 provides recommended best management practices (BMPs; Appendix A, Section 6.6 and 8.5.2) for the routine and small-scale activities, while the No Action alternative does not.

Major development needs described under Alternative 2 would be proposed in the future, such as repairing/replacing revetments along the Fremont and Montlake Cuts and replacing the entire walkway along the Montlake Cut. Implementation of the listed development needs would be contingent upon funding.

2.3 ALTERNATIVES REMOVED FROM FURTHER CONSIDERATION

Alternative 3 (update Master Plan Maximizing Natural Resource Preservation) would include development and implementation of a Master Plan to prioritize management and O&M of LWSC Project lands and waters specifically to preserve natural resources. This alternative would not recognize that the LWSC is uniquely located in a highly urban area where the public wants and needs outdoor recreational opportunities. To preserve the natural resources on the LWSC Project lands would mean that some areas would be restricted from public use. This alternative would not meet the public demands created by the project itself while sustaining balance with project natural resources. Alternative 3 (update Master Plan Maximizing Natural Resource Preservation) does not meet the purpose and need (Section 1.3) and therefore is not considered further.

Alternative 4 (update Master Plan Maximizing Recreation) would include development and implementation of Master Plan documentation to prioritize enhancement and expansion of recreation use, programs, and facilities. This alternative would place more emphasis on developing recreational programs over that of providing for natural resources. Although highly modified and developed, the LWSC Project lands still retain areas that are important to the local fish and wildlife resources and need protection and

management. Endangered and threatened salmon migrate past the Locks and are present at certain times of the year in the ship canal. Alternative 4 does not fully respond to the purpose and need identified for a Master Plan revision. Of critical importance is the need to emphasize that an approved USACE Master Plan would be, in part, stewardship driven and must seek to balance recreational development and use with protection and conservation of natural and cultural resources. This alternative does not consider project-wide resource capability and suitability and is not consistent with multiple use authorized project purposes. Alternative 4 is, therefore, eliminated from further consideration.

3 ALTERNATIVES COMPARISON

This section provides information on the existing conditions of resources within the project area and issues relevant to the decision process for selecting the preferred alternative. Existing conditions are the physical, biological, and socioeconomic characteristics of the project area. Factors for selecting the preferred alternative include which of the alternatives meet the purpose and need for the project. The resources evaluated for detailed analysis and a rationale for inclusion or exclusion are presented in Table 3. USACE excluded resources from detailed analysis if they are not potentially affected by the alternatives or have no material bearing on the decision-making process.

Table 3. List of resources considered for detailed effects analysis and rationale for inclusion or exclusion.

Resource	Included in Detailed Analysis (Y/N)	Rationale for inclusion or exclusion
Navigation	N	O&M of the locks, dam, and/or spillway are covered under the LWSC Operations Management Plan, which is separate from LWSC project lands and infrastructure to support management of the project lands.
Hydraulics and Geomorphology	N	No routine O&M or small-scale actions in the proposed updated Master Plan would affect the regional hydraulics or geomorphology.
Sea Level Change	N	Land management activities and land classifications, subject of the updated Master Plan, would not affect sea level change.

Resource	Included in Detailed Analysis (Y/N)	Rationale for inclusion or exclusion
Water Quality	Y	Analysis is required to determine the potential impacts from using chemicals during routine O&M actions like treating walkways (sealants), vegetation (fertilizers and herbicides) and/or pests (pesticides).
Air Quality	Y	Only handheld equipment and small machinery would be working on project lands and are not expected to impact air quality above ambient levels. Emissions are compared to Clean Air Act standards.
Underwater Noise	N	No underwater work is proposed in the updated Master Plan routine O&M actions; however, repairing/replacing the revetment walls, sink hole erosion areas, and storm drain outflows are identified as development needs and when funding is made available in the future, would require environmental analysis prior to the work commencing.
Airborne Noise	N	Mufflers are installed on noise generating equipment; therefore, airborne noise from proposed projects would not be audible above ambient noise of the surrounding urban, industrial and maritime activities. Birds and animals in the project area are assumed to be habituated to noise of the city traffic and vessels navigating the channel and to human activity on the nearby shorelines. Noise from routine O&M due to the proposed action would have no effect.
Hazardous, Toxic, and Radiological Waste	N	No radiological waste is in or near the LWSC; however, the action area is known to have other contaminants. The operating project is surrounded by urban areas and heavy industrialization. The implementation of BMPs during applications of pesticides would reduce the risk of introduction of new contaminants to the environment and are analyzed under Section 3.3.

Resource	Included in Detailed Analysis (Y/N)	Rationale for inclusion or exclusion
Benthic Organisms	N	No proposed actions under the updated Master Plan occur in benthic marine habitats.
Vegetation	Y	The continued operation and maintenance of a botanical garden, and other vegetated areas along the Fremont Cut and Montlake Cut are proposed in the updated Master Plan. All vegetative areas are part of the Historic District, including the Lombardy poplars along the Fremont Cut.
Fish	Y	Salmonids and other fish species migrate through and are present in the locks, fish ladder, and spillway and activities on land can directly affect species in adjacent water bodies.
Wildlife	Y	Terrestrial and marine birds are present on project lands. Skunks, raccoons, foxes, and other small mammals may be also present on project lands. Marine mammals (harbor seals, killer whales, and/or sea lions) may occur in the saltwater (western) side of the locks.
Threatened and Endangered Species	Y	Federally listed fish species are in the ship canal and migrate past the Locks. Section 7(a)(2) of the ESA requires Federal agencies to complete consultation with USFWS and/or NMFS on any Federal action that may affect species listed under the ESA or their designated critical habitat (50 CFR 402).
Invasive Species	Y	Proposed project has some risk for the introduction of invasive species from the movement of soils and plant vegetation. BMPs prior to any minor construction or repair actions would be implemented to reduce the risk of introduction.
Cultural Resources	Y	Analysis is required under the NHPA and other Acts to determine the extent of any potential effects of Federal actions on historic and cultural resources.

Resource	Included in Detailed Analysis (Y/N)	Rationale for inclusion or exclusion
Indian Trust Assets	Y	The Federal government must consider the effects its actions may have on American Indian trust resources, traditions, and cultural practices (Section 7.11).
Social and Economic Resources	Y	The LWSC Project lands are important to the local community and visiting public for recreational purposes.
Recreation and Scenic Values	Y	LWSC provides unique recreational experiences for the visiting public and the proposed action would continue and improve these experiences.
Public Services and Utilities	N	The proposed action would have no substantial effect on electricity, water, wastewater and stormwater collection, sewer and solid waste, natural gas, oil/petroleum, or telecommunications services.
Public Health and Safety	Y	The updated Master Plan proposes to install more signage to better direct the public and improve safety near and around the Locks. The updated Master Plan also proposes to improve public comfort stations with automatic doors, sinks, and toilets.

3.1 WATER QUALITY

The LWSC Project is surrounded by urban and industrialized areas, and therefore, the water resources have been impacted by human activities. The various water bodies comprising the Ship Canal (Lake Union, Lake Washington, Salmon Bay and the interconnecting channels) were historically subjected to industrial, wastewater, and stormwater pollution for many decades. While water quality has improved since the mid-1970s, elevated bacteria levels, contaminated sediment, elevated summer surface temperatures, and low oxygen levels combined with elevated salinity in deeper waters during the summer remain issues for the waterbody. More information on water quality in the Ship Canal can be found in Appendix A (2025 Draft Master Plan, Sections 2.1.2 and 6.1).

3.1.1 Alternative 1 – No Action (Existing Master Plan)

It is anticipated that the selection of Alternative 1 would not impact water quality. Land and water use would remain unchanged and management of the land and activities on

the project would be conducted as it has in the past; however, USACE staff would need to conduct environmental evaluations prior to work being implemented in order to identify any potential impacts to water resources. This would result in longer times prior to implementing any activities on the ground.

3.1.2 Alternative 2 – Update Master Plan (Preferred Alternative)

It is anticipated that the selection of Alternative 2 would not impact water quality. Also, under Alternative 2, all routine O&M and small-scale action work could commence without delay, with the exception of the three actions listed in Section 2.2.3, as they would have been evaluated under this EA. However, major actions such as repairing/replacing revetments along the Fremont and Montlake Cuts and replacing the entire walkway along the Montlake Cut would require further future consideration under Federal and state laws and regulations prior to any work starting.

3.2 AIR QUALITY

The Clean Air Act sets National Ambient Air Quality Standards (NAAQS) to regulate harmful pollutants (42 U.S.C. § 7403). NAAQS are set for six common air pollutants: ozone, carbon monoxide, nitrogen dioxide, particulate matter (solid and liquid particles suspended in the air), sulfur dioxide, and lead. Areas that persistently exceed the standards are designated as nonattainment areas.

The EPA sets *de minimis* thresholds for pollutants in nonattainment and maintenance areas (40 CFR 93.153). Once a nonattainment area has attained and maintained NAAQS, they may be redesignated as “maintenance areas.” According to the Washington State Department of Ecology (Ecology), all areas of Washington, except a small area in Whatcom County, currently meet air quality standards (Ecology 2024) meaning the project is in an attainment area.

Greenhouse gas (GHG) emissions are often reported in carbon dioxide (CO₂) equivalent (CO₂e), which provides a common unit of measure to compare different GHG emissions to account for the ability of various gasses to absorb different amounts of energy. There are currently no Federal GHG emission thresholds. Recent estimates of annual GHG emissions for 2019 in Washington State were 102.1 million metric tons (MMT) CO₂e (Ecology 2022) and King County’s approximately 27.1 MMT CO₂e (Cascadia Consulting Group 2022).

3.2.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action alternative, emissions would continue to be generated for routine maintenance and operations (Section 2.1.3, Maintenance of Facilities and Area Lands). These emissions do not exceed EPA NAAQS *de minimis* standards (Table 4). Annual GHG emissions would continue to account for approximately 0.007 percent of King County’s annual CO₂e emissions (Table 5). Due to the low emissions, the No Action

alternative would not have a substantial effect on total emissions in the Washington State or King County.

Table 4. Summary emissions for particulate matter (PM 2.5 and PM 10), Carbon monoxide (CO), Carbon Dioxide (CO₂), Reactive Organic Gases (ROG), Methane (CH₄), Nitrogen Oxides (NO_x), and Sulfur Dioxide (SO₂). Emissions are reported for the No Action alternative analyzed in the project and are compared to the Environmental Protection Agency's *de minimis* standards. Units are in metric tons (MT).

Alternatives	PM2.5 (MT)	PM10 (MT)	CO (MT)	CO ₂ (MT)	ROG (MT)	CH ₄ (MT)	NO _x (MT)	SO ₂ (MT)
No Action	0.06	0.06	1.72	188.28	0.12	0.01	1.08	0.00
EPA <i>de minimis</i>	100	100	100	N/A	100	N/A	100	100

Table 5. Greenhouse gas emissions represented as carbon dioxide equivalence (CO₂e) in metric tons (MT) for Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O) for the No Action alternative analyzed in the project.

CO ₂ (MT)	CH ₄ (MT CO ₂ e)	N ₂ O (MT CO ₂ e)	Total CO ₂ e (MT)
188.28	0.32	1.90	190.50

3.2.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Under Alternative 2 (Update Master Plan), operations, maintenance, and upkeep of existing facilities as well as the protection of natural areas and natural resources would occur, with 38 identified routine O&M and small-scale actions listed in the updated Master Plan (Appendix A, Section 8.5). Alternative 2 results in slightly greater emissions above the No Action alternative emissions due to the use of machinery and tools to complete additional projects (Table 6). When combined with emissions from the No Action alternative, these emissions still do not exceed EPA *de minimis* standards. Annual GHG emissions would continue to account for approximately 0.007 percent of King County's annual GHG emissions (Table 7). Therefore, Alternative 2 would not result in a meaningful increase in emissions for Washington State or King County.

Table 6. Summary emissions for particulate matter (PM 2.5 and PM 10), Carbon monoxide (CO), Carbon Dioxide (CO₂), Reactive Organic Gases (ROG), Methane (CH₄), Nitrogen Oxides (NO_x), and Sulfur Dioxide (SO₂). Emissions are reported for

both alternatives and are compared to the Environmental Protection Agency's *de minimis* standards. Units are in metric tons (MT).

Alternatives	PM2.5 (MT)	PM10 (MT)	CO (MT)	CO2 (MT)	ROG (MT)	CH4 (MT)	NOx (MT)	SO2 (MT)
No Action	0.06	0.06	1.72	188.28	0.12	0.01	1.08	0.00
Alternative 2	0.00	0.00	0.12	4.05	0.00	0.00	0.01	0.00
Total	0.06	0.06	1.84	192.33	0.12	0.01	1.09	0.00
EPA <i>de minimus</i>	100	100	100	N/A	100	N/A	100	100

Table 7. Greenhouse Gas emissions represented as carbon dioxide equivalence (CO2e) in metric tons (MT) for Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O) for both alternatives.

Alternatives	CO2 (MT)	CH4 (MT CO2eq)	N2O (MT CO2eq)	Total CO2eq (MT)
No Action	188.28	0.32	1.90	190.50
Alternative 2	4.05	0.01	0.07	4.13
Total for Alternative 2	192.33	0.33	1.97	194.63

3.3 VEGETATION

Although the LWSC Project footprint is located within an area that is highly urbanized and industrialized, the grounds provide a variety of landscapes that are enhanced by the vegetation that occurs on-site. Park-like habitat exists at the Garden and a colonnade of poplar trees and narrow plantings align both the Fremont and Montlake Cuts. The Garden forms a background and contrast to the mechanical workings of the Locks. The naturalistic plant groupings, large shade trees, and broad unbroken expanses of lawn are typical attributes of the English Landscape Style, in which the Garden was developed. More information regarding the Garden is found in Appendix A (2025 Draft Master Plan, Section 2.3.3), the HPMP. Vegetation on south side of the Locks consists of trees, shrubs, and ground covers which were installed following construction of the fish ladder and adjacent Commodore Park (managed by Seattle Parks and Recreation) between 1976 and 1978.

The Fremont Cut is landscaped with a colonnade of Lombardy poplars lining the straight narrow channel which separates the waterway from the adjacent urban land uses. Beneath the poplars are both native and non-native grasses and shrubs. Vegetation on both sides of the Ship Canal west of the Fremont Bridge consists of a mixture of native and exotic trees, shrubs, ground covers, and grasses. Ornamental tree and shrub plantings, provided by the city of Seattle, on the north shore due to an expansion of the Burke-Gilman Trail took place in the early 1990s.

The Montlake Cut is a narrower channel than the Fremont Cut and is characterized by steep side slopes, planted with a combination of ornamental English ivy, deciduous and evergreen trees, and native shrubs and grasses. Trees primarily consist of native conifers, but a row of approximately 12 Lombardy poplars line the west end of the cut's north shore.

3.3.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative, vegetation management would continue as currently structured. Vegetation would change as growth occurs naturally over time, as vegetation is planted, or as plants establish naturally. Vegetation cover would be controlled by mowing, weeding, fertilizing, and treatments of invasive plant species; however, an environmental analysis on potential impacts to fish and wildlife would need to be completed before these activities could occur. Maintenance of facilities and infrastructure, as well as keeping the visual appearance of the Historic District, would require trimming or removal of vegetation. Land use would remain unchanged and management of the land and activities on the project would be conducted as it has in the past. The management of the Garden and vegetated areas in the South Entryway Buffer Zone would remain as MRM-Vegetative Management. This means that the Garden would not be managed to account for its exceptional scientific, ecological, cultural, or aesthetic features, but instead would be managed for the stewardship of vegetative cover. The lawn areas would be managed for MRM-low density recreation, which does not reflect the use that the area currently experiences. No proposed small-scale undertakings involving vegetated resources, such as replacing irrigation lines, removal of large trees, replacement of turf areas, or the treating of large areas for invasive weeds could occur until after all environmental regulatory requirements had been reviewed and applied, which would require additional time between determination of project need and implementation.

3.3.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Under Alternative 2, the Garden and vegetated areas in the South Entryway Buffer Zone would be managed as Environmentally Sensitive Areas with MRM-Low Density Recreation occurring on turf and sidewalk areas. The Garden is the only USACE managed botanical garden and many plants in the Garden are not native to the Pacific

Northwest and may be rare even in the places where they originated. The lawn areas are specially designed to highlight aspects of the Garden and the views of the Locks. Special public events such as weddings and concerts also occur on the lawn areas. Much of the Garden can be viewed from the Loop Road and it is estimated that over 100,000 visitors tour the Garden each year. Thus, the reclassification of the Garden from MRM-Vegetative Management Area in the No Action Alternative to Environmentally Sensitive Area and the Garden lawn areas as MRM-Low Density Recreation in the updated Master Plan best describes the management area's current use. This change in land classification would ensure the garden beds are managed not just for vegetative cover but also for public display and scientific study. The Garden would be managed to ensure they are not adversely impacted while allowing the public to recreate on the turf areas.

Under Alternative 2 (Update Master Plan), a Project-wide Vegetation Management Plan (VMP) would also be prepared that would incorporate additional analysis to identify changes based on anticipated impacts from increased visitation and influences from outside of the LWSC Project. At present, there is no overarching document providing guidance or direction for the management of the LWSC Project's various vegetative areas. This alternative would be more effective in enhancing vegetation for the benefit of wildlife and aesthetics at the sites as it incorporates long-term balanced planning. Development of a Project-wide VMP would also improve coordination between USACE and Project partners like the city of Seattle (Parks and Recreation) and the UW by identifying management goals and objectives and describing strategies to accomplish the goals. Implementing the guidance and updated analysis would assist in maintaining the appearance of the Historic District while sustaining natural processes for habitats and protecting regional populations of the wildlife species that use and/or require the habitat characteristics associated with LWSC Project lands.

Under Alternative 2 (Update Master Plan), the environmental compliance for five small-scale activities identified for the Garden (Appendix A, 2025 Draft Master Plan, Section 8.5.1, Table 12) would be completed and could proceed without delay. Routine O&M activities such as mowing, weeding, fertilizing, and treatments of invasive plant species would have been evaluated for potential effects to fish and wildlife resources and would be implemented with the recommended BMPs.

3.4 FISH

Surface water and fisheries management are not within the scope of the Master Plan. Although the LWSC Project does not have sites acquired specifically for the congressionally authorized purpose of fish management, some sites provide valuable fish habitat. More information regarding fishery resources can be found in Appendix A (2025 Draft Master Plan, Section 2.3.2). Relevant LWSC Project lands for fish are the Channel Tidelands/Shilshole Bay parcels (intertidal habitat), the vegetated area of the

South Entryway Buffer Zone (highly altered riparian habitat), and the Fremont and Montlake cuts (highly altered riparian habitat) because fish directly or indirectly interact with habitat at these locations. Intertidal habitat is in limited supply in Puget Sound and is important for fish migration, feeding, and growth. Highly altered and developed riparian habitat provides some shade, food for aquatic animals, and stabilizes the soil to protect water quality.

Freshwater, marine, and anadromous fish species are present at the LWSC Project. The Ship Canal connects the freshwater Lake Washington system with the marine Puget Sound, which resulted in a highly modified estuarine system. Some marine and estuarine species migrate through the locks or live in the transition zone immediately below the locks. For example, starry flounder occur in the lower Ship Canal and shiner surfperch are found above the locks through much of the summer, and herring/smelt move above and below the locks during up-lockage. Other species found during sampling in Shilshole Bay (Simenstad et al. 2003) include smelts, tube-snout, pricklebacks, gunnels, Pacific sand lance, English sole, and sculpins.

Sockeye, coho, and Chinook salmon pass through the LWSC Project to reach spawning and rearing areas. Bull trout and steelhead also pass through the LWSC Project but are rarely observed. Sockeye salmon are relatively abundant in Lake Washington but were not prior to the construction of the LWSC Project. The sockeye salmon population increased to be one of the largest fish runs in the U.S. after a series of introductions that occurred between the 1930s and 1960s (Shaklee et al. 1996). Chinook salmon, bull trout, and steelhead are discussed further in Section 3.6 (Threatened and Endangered Species).

3.4.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative, effects to fish from the current management based on strategy and guidelines in the 1994 Master Plan would remain the same. Land use classifications would not change with the No Action Alternative. The Channel Tidelands/Shilshole Bay parcels are classified as an Environmentally Sensitive Area. This land is intertidal habitat, so it experiences submersion under water and exposure twice daily. The intertidal zone is a dynamic area and the specialized aquatic species that live there serve as food for other species. Intertidal habitat also acts as a migration corridor for adult salmon, while juvenile salmon spend time feeding and growing here after exiting the Ship Canal before moving to the ocean. Substantial amounts of intertidal areas throughout Puget Sound have been eliminated by development, thus it is important to preserve this limited and valuable habitat for fish and wildlife use.

The vegetated area of the South Entryway Buffer Zone would remain classified as MRM-Vegetative Management and the resource objectives would not change. Although the MRM-Vegetative Management classification allows for other compatible uses to

occur, further development that would prevent the area from acting as riparian habitat at the fish ladder is unlikely due to a steep slope that makes it neither accessible for, nor conducive to, public use. The vegetation creates some shade and has a small amount of overhang at the fish ladder. The resource objectives are 1) to maintain and protect existing vegetative cover which provides a pleasing visual backdrop to the south entryway and fish ladder area, and 2) to preserve and provide habitat for wildlife species. The area is likely to continue functioning as low-quality riparian habitat according to the Master Plan (1994) land classification; this is supported by the resource objectives.

The north and south shores of the Fremont Cut are classified as MRM-Low Density Recreation in the 1994 Master Plan and maintained to provide access to the recreating public along the shoreline; however, the public is restricted from entering the water to facilitate unimpeded navigation. Lombardy poplars and other vegetation act as highly altered riparian habitat to provide shade, organic input to the waterway, and stabilize the soil. The 1994 Master Plan resource objectives (Appendix B) and the Fremont Cut Vegetative Rehabilitation Plan (USACE 2001) support the maintenance of vegetation that would continue these functions. Fremont Cut is lined with concrete embankments, which would be protected and maintained to the north and south; off-channel habitat part of the Fremont Cut design when it was built over 100 years ago.

The north and south shores of the Montlake Cut are classified as Easement Lands under Alternative 1 (No Action), and each shore is managed by different entities and have different resource objectives (Appendix B, Summary of 1994 Master Plan Resource Objectives). Both shores provide highly altered riparian habitat for fish. Under the No Action Alternative, the indefinite term license granted to the UW for the north shore that allows the University to maintain the in-place structures, landscaping, and public access in its highly developed state would continue. Relevant resource objectives are the maintenance of the license for the north shore because that enables the University to manage the land. The other objective is to retain and preserve the terrain and significant landscape features, as they are part of the Historic District, and preserves the trees that provide most of the riparian habitat benefits. The south shore would continue to be managed by USACE primarily to maintain and preserve the Montlake Cut Waterside Trail, associated features, and landscape plantings. USACE would still implement conservation methods to retain and preserve the terrain and significant landscape features as the University does on the north shore. Montlake Cut is lined with concrete embankments and riprap, which would be protected and maintained to the north and south.

Maintenance of facilities and area lands under the No Action Alternative near or in the water have the potential to disrupt or disturb fish migration, feeding, and resting, water quality, or other sensitive habitats. These proposed undertakings would not occur until

after all environmental regulatory requirements had been reviewed and implemented, which would require additional time between determination of project need and implementation.

3.4.2 Alternative 2 – Update Master Plan (Preferred Alternative)

The updated Master Plan is not expected to impact fish and/or aquatic habitats. Under Alternative 2, a more effective land management could benefit water quality by providing some shading and reducing potential turbidity with implementation of BMPs. Alternative 2 would comply with current USACE policy and provide more opportunities for research and collaboration with Project partners to improve vegetation and facilities management for the betterment of fishery and aquatic resources.

With Alternative 2 (Update Master Plan), vegetated areas located on the Locks Site such as the Garden and South Entryway Buffer Zone would be changed from MRM-Vegetative Management to Environmentally Sensitive Areas, which typically limits or prevents development of lands for public use. This change in land classification would ensure that these areas remain vegetated and undeveloped. The lawn areas in the Garden and the Loop Road would be designated MRM-low density recreation. The turf area and sidewalks at the South Entryway Buffer Zone, and the Fish Viewing Plaza would be designated as High-Density recreation areas. Thus, the public would have the ability to enjoy the vegetated areas in the Garden and South Entryway Buffer Zone without harming the vegetation and so these Environmentally Sensitive Areas would continue to provide marginal riparian habitat.

The land-use classifications for the Channel Tidelands/Shilshole Bay parcels, Montlake Cut, and Fremont Cut remain unchanged from the 1994 Master Plan. The Fremont and Montlake Cuts canal walls are classified as Project Operations while the lands are classified as MRM-Low Density Recreation and maintained to provide access to the recreating public along the shoreline. Management of these areas would not be expected to change under Alternative 2(Update Master Plan) from how they are managed at present, and effects of the proposed action would be similar to those described above for the No Action Alternative.

Proposed small-scale and routine O&M actions are located in upland areas, away from water, and would have no effects on fish when appropriate erosion control is implemented. Noise generated during construction, such as for walkway repair and maintenance, would be masked by the ambient noise of activity at the Locks and spillway dam. BMPs would be implemented to avoid and minimize effects to the aquatic habitat and fish. Concrete wall repair and maintenance in Fremont Cut and Montlake Cut would be near or in-water work but would not substantially affect fish populations due to the use of BMPs.

3.5 WILDLIFE

The LWSC Project supports a diverse array of terrestrial mammals, in as much as the urban and industrialized area can offer. At present, USACE manages the vegetative habitat for the primary benefit of aesthetics, public use, and historical district requirements, and secondarily for the success of multiple wildlife species. Although the current vegetative composition, form, and structure provides habitat for a variety of wildlife species, it may not provide all habitat needs. Areas that can be considered as wildlife habitat are very fragmented throughout the Ship Canal area due to the residential, industrial, and business developments. The proximity of these habitats to water ensures the availability of habitat for waterfowl and other terrestrial species that are also associated with waterways. Although important, the existing wildlife habitat is extremely limited, and in some cases of questionable value.

The Garden, and the narrow strips of vegetated habitat along the Fremont and Montlake Cuts provide patches of habitat for small mammals (shrews, moles, squirrels, rats, foxes, skunks, raccoons, and opossums), bats, and birds. Otters and beavers have also been sighted on the project and a USACE survey (Appendix A, 2025 Draft Master Plan, Section 2.3.5.4) detected a total of seven bat species at the LWSC Project (little brown bat, big brown bat, hoary bat, silver-haired bat, California myotis, long-legged myotis, and Yuma myotis).

Green spaces provide habitat for a variety of songbirds (chickadees, warblers, thrushes, and woodpeckers), hummingbirds, and raptors (bald eagles, hawks, owls, and falcons). The proximity of green spaces to water ensures the availability of habitat for waterfowl that are associated with waterways (ducks, geese, cormorants, herons, ospreys, and bald eagles). The interface between saltwater and freshwater creates an area where an array of species may gather and be observed. Great blue herons are found year-round at the LWSC Project, feeding along the shores of both freshwater and saltwater, and some are nesting in the Garden. Bald eagles are observed within the area throughout the year, with higher numbers in the winter months when northern eagles migrate south. No nests have been confirmed in the LWSC Project area. More detailed information about the wildlife resources found at the LWSC Project is found in Appendix A (2025 Draft Master Plan, Sections 2.3.2 and 2.3.5).

3.5.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative, any ongoing impacts to wildlife would occur primarily because of conflicting uses on LWSC Project lands such as recreational and navigational use on sites that may have a secondary benefit to wildlife. Most wildlife, except those acclimated to human presence, avoid high density recreation areas, but could populate and utilize low-density recreation areas. The existing Master Plan does not differentiate between high- and low-density recreation areas. Under the No Action

Alternative, adverse impacts to wildlife could occur with unmanaged human presence in some locations. An increase in visitation would adversely impact wildlife and associated habitat in some locations. Wildlife would likely move to alternative habitat areas.

3.5.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Alternative 2 would comply with current USACE guidance in managing public visitation, and would provide analysis of use, demand, carrying capacity, environmental, and social effects of proposed actions. Utilizing the guidance and updated analysis would assist in sustaining the long-term natural ecosystem process for wildlife habitats and protecting regional populations of wildlife species that use and/or require the habitat characteristics associated with LWSC Project lands. Planning under Alternative 2 would be expected to achieve habitat and animal health by meeting management objectives and would provide long-term benefits to wildlife populations.

3.6 THREATENED AND ENDANGERED SPECIES

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally-listed and proposed threatened or endangered species. The species listed in Table 8 are protected under the ESA and may occur in the project area. The following sections briefly summarize relevant information about the protected species, current knowledge on the presence, and use of the project and action areas by these species. ESA consultation with the Services assesses how the proposed project may affect the species, concluding with a determination of effect. Section 8.6 provides details about project compliance with the ESA.

Table 8. ESA-listed species and designated critical habitat that may be present at or near the LWSC Project.

Species	Distinct Population Segment (DPS)	Federal Listing	Critical Habitat	Potential Occurrence (Likely, Unlikely, or Absent)
Chinook salmon (Oncorhynchus tshawytscha)	Puget Sound Evolutionarily Significant Unit	Threatened (1999)	Designated (2005)	Likely
Steelhead salmon (O. mykiss)	Puget Sound DPS	Threatened (2007)	Designated (2016)	Unlikely

Species	Distinct Population Segment (DPS)	Federal Listing	Critical Habitat	Potential Occurrence (Likely, Unlikely, or Absent)
Bull trout (<i>Salvelinus confluentus</i>)	Coastal-Puget Sound DPS	Threatened (1999)	Designated (2005)	Unlikely
North American green sturgeon (<i>Acipenser medirostris</i>)	Southern DPS	Threatened (2006)	Designation (2009) does not include LWSC Project	Unlikely
Pacific eulachon (<i>Thaleichthys pacificus</i>)	Southern DPS	Threatened (2010)	Designation (2011) does not include LWSC Project	Unlikely
Killer whale (<i>Orcinus orca</i>)	Southern Resident DPS	Endangered (2005)	Designation (2006) includes all waters in Puget Sound deeper than 20 feet	Unlikely

*Likely means the species could be present in the project area. Unlikely means the species could be present in the project area, but due to lack of habitat preference and/or food is not expected to be present. Absent means that the species is not present in the project area.

3.6.1 Alternative 1 – No Action (Existing Master Plan)

The No Action Alternative did not consider the presence or potential presence of threatened or endangered species shown in Table 4, in part because these species became threatened or endangered after the plan's publication. At the time of the publication of the 1994 Master Plan, the only federally listed species potentially present at the LWSC Project was the bald eagle (listed as endangered in 1973 and delisted in 2007). Under the No Action Alternative, all LWSC Project routine O&M activities identified in the 1994 Master Plan that occur away from the navigation channel would continue following the Terms and Conditions (T&C) and Reasonable and Prudent Measures (RPMs) outlined in the Services' Biological Opinions (BiOps). Any routine O&M actions in the 1994 Master Plan near or adjacent to the channel, or any new proposed small-scale actions and/or proposed actions near waterways would require

consultation with the Services prior to any work commencing, requiring additional time (weeks to months).

3.6.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Alternative 2 would enable efficient and improved land management over a long timeline. Implementation of the Alternative 2 would utilize additional analysis to make changes for anticipated impacts for fish and wildlife habitat in all project actions. Further, the allocation of the Garden and South Entryway Buffer Zone from MRM-Vegetative Management Areas to Environmentally Sensitive Areas provides more protection to wildlife habitat from future development. Using long-term balanced planning, this alternative would be more effective in protecting ESA species.

USACE evaluated the effects of Alternative 2 (Update Master Plan) to ESA-listed species and determined 3 of the 70 recommended development needs (refurbishing the Locks pier surfaces, removing hazard trees at Montlake Cut, and applying pesticides and fertilizers) as well as major development needs (repairing/replacing revetments along the cuts and replacing the Montlake Cut walkway) would require consultation with the Services as these actions could potentially affect federally listed species and/or their critical habitat. For all other recommendations under Alternative 2, USACE determined that there would be no effect to ESA-listed species or to their critical habitat. USACE also evaluated the same recommendations under the MSA and determined that the proposed action would not affect EFH for federally managed fisheries in Washington. The reasoning for this determination is that the recommended development needs outlined in Alternative 2 occur in upland areas, do not involve in-water work, and would be implemented using BMPs (Appendix A, 2025 Draft Master Plan, Sections 6.6 and 8.5.2).

3.7 INVASIVE SPECIES

Invasive species are a national concern and represent a significant threat to ecosystems, human and animal health, infrastructure, the economy and cultural resources. Executive Order (EO) 131121 for invasive species was first signed in 1999, and then amended in 2016, with a follow-on EO 13751 “Safeguarding the Nation from the Impacts of Invasive Species.” EO 13751 states that “it is the policy of the United States to prevent the introduction, establishment, and spread of invasive species, as well as to eradicate and control populations of invasive species that are established.” USACE’s invasive species policy is that all Civil Works projects and programs shall meet the spirit of the National Invasive Species Act and will implement measures to prevent or reduce establishment of invasive and non-native species.

Invasive and noxious weeds are found throughout King County and are present on LWSC Project lands. The top three invasive plant species at the LWSC Project are English ivy, Himalayan blackberry, and Canada thistle; however, there are over 20 other

noxious weed species that require control and monitoring (Appendix A, 2025 Draft Master Plan, Section 2.3.6). Invasive and noxious weeds can be introduced in transported soils, equipment, wildlife, and plantings. Visitors to the LWSC can introduce noxious weeds to Project lands unintentionally as they could carry seeds on their clothes or the soles of their shoes.

3.7.1 Alternative 1 – No Action (Existing Master Plan)

The 1994 Master Plan was published prior to EO 131121 and does not speak to invasive species. While the 1994 Master Plan is silent on invasive species, USACE policy and guidance that dictates invasive species management is still applicable and the expectation is the policy and guidance would be followed. Without a revision or supplement, the 1994 Master Plan would not identify policy and guidance that is directly related to invasive species management and so all land management actions would need to be evaluated prior to implementation to ensure compliance with all Federal, State and County regulations and policies. This evaluation would take time (weeks) and BMPs may need to be prescribed.

3.7.2 Alternative 2 – Update Master Plan

Alternative 2 recognizes invasive species issues and follows current USACE policy by recommending BMPs in prevention, providing education to staff and the public, early detection, rapid response, and containment in trying to control and manage invasive species. Alternative 2 recommends the development and implementation of a Project-wide Vegetation Management Plan that would adopt USACE's Integrated Pest Management Plan. Overall, saving time and reducing the prevalence of invasive species is anticipated with implementation of the preferred alternative.

3.8 CULTURAL RESOURCES

Under the NHPA, historic properties are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion into the NRHP. In addition, the term Historic property includes the artifacts, records, and remains related to and located within such properties. Properties of religious and cultural importance to Native American Tribes and Native Hawaiian organizations are also included (36 CFR 800.16(l)(1)). The term "cultural resources" is a term that is not defined under the NHPA but is used as a catch all term when referring to archaeological sites and historic buildings, structures, and objects regardless of if they are eligible to the NRHP. Cultural resources are non-renewable and therefore must be managed with sufficient care to ensure their preservation. The most common potential causes of loss of cultural resources include landscape and building modifications, erosion, vandalism, and artifact collecting. Through requirements of historic preservation policies in public laws, EOs, and USACE regulations, it is the responsibility of USACE to ensure the identification

and protection of archaeological sites, and historic buildings, structures and objects located on project lands controlled and/or administered by USACE. The LWSC Project has a HPMP that has been updated and is a guidance document used to help manage the LWSC Project and the LWSC Historic District. Finally, the LWSC Project has a PA for the O&M of the Lake Washington Ship Canal Project. The PA was signed by the Seattle District, USACE, the Washington State Historic Preservation Office and the Advisory Council of Historic Preservation in 1994 and provides a list of maintenance activities that is exempt from further review under NHPA Section 106. Section 106 of the NHPA requires Federal agencies to consider the effects on historic properties of projects they carry out, assist, fund, permit, license, or approve.

3.8.1 Archaeological Sites

An archaeological site, per the Advisory Council on Historic Preservation, is “a location that contains the physical evidence of past human behavior that allows for its interpretation.” There are no known archaeological sites within the boundaries of the LWSC Project.

3.8.2 Historic District

The LWSC Project was listed on the NRHP in 1978, as a Historic District and is significant under Criteria A, as “a significant major engineering achievement completed under government auspices” that created a navigable waterway joining Puget Sound to Lake Union and Lake Washington. It is also eligible for listing under Criteria B, as it is associated with significant individuals: Major Hiram M. Chittenden, the USACE Seattle District Engineer who developed and promoted the plan for the canal; Colonel James B. Cavanaugh, who supervised the construction of the LWSC Project; and Bebb and Gould, the architectural firm who designed the layout and complex of concrete buildings around the Chittenden Locks. Table 9 lists the buildings, features and landscapes that are contributing elements to the Historic District. There are several differences on contributing elements to the Historic District between the 1978 nomination form and the final 1994 HPMP. These differences are attributed to when the nomination form was completed (1978), and which agency completed the form (Office of Archaeology and Historic Preservation). During the preparation of the 1994 HPMP by the USACE Center of Expertise on Historic Preservation each building was examined carefully to determine if it was a contributing element to the Historic District or not. Since listing on the National Register, there has been changes to the Historic District including the demolition of the guardhouse, boathouse, and removal and replacement of the hoist house crane.

Table 9. List of contributing LWSC elements to the HPMP.

Historic Buildings/Structures/ Landscapes at the LWSC	Listed on the Nomination Form as a Contributing Element	Listed in the 1994 HPMP as a Contributing Element
Hiram M. Chittenden Locks ²	Yes	Yes
Fremont Cut	Yes	Yes
Montlake Cut	Yes	Yes
Lockkeeper's (Cavanaugh) house (1913)	Yes	Yes
Administration Building (1914-1915)	Yes	Yes
Operating Houses Nos. 1, 2 3 and 4 (1914)	Yes	Yes
Mechanic Shop (1914)	Yes	Yes
Transformer House (1914)	Yes	Yes
Office and Shop Building (1916)	Yes	Yes
Machine Shop (1914)	Yes	Yes
Gas and Oil Building (1916)	Yes	Yes
Carpenter and Blacksmith Shops (1921)	Yes	Yes
Emergency Dam Hoist House (1922)	Yes	Yes
Steel Shop (1941)	Yes	Yes
Warehouse No. 2 (1941)	Yes	Yes
District Garage (1941)	Yes	Yes
Public Comfort Station (1947)	Yes	Yes
Boathouse (1949) ³	Yes	Yes
Greenhouse (1949)	Yes	Yes
Gatehouse (1949)	Yes	No

² The Locks include the Locks, Spillway Dam, Guide Piers and Waiting Piers

³ The Boathouse was demolished in 2012

Historic Buildings/Structures/ Landscapes at the LWSC	Listed on the Nomination Form as a Contributing Element	Listed in the 1994 HPMP as a Contributing Element
Open storage Shed (1940s)	Yes	No
Quonset Hut (1949)	Yes	No
Carl S. English Jr., Botanical Gardens	No- but inferred from nomination form	Yes
Fremont Cut (North and South Shores)	Yes	Yes
Montlake Cut (North and South Shores)	Yes	Yes

One of the most unique features of the LWSC Project is the Garden, the only botanical garden managed by USACE and is a contributing element to the Historic District. More information regarding the Historic District is found in Appendix A (2025 Draft Master Plan, Section 2.3.8), the HPMP and Munro et al. 2020 (Attachment D to Appendix A). Landscaping initially occurred after the construction of the Locks, then Carl S. English expanded the existing planning beds and introduced rare, native, exotic, and experiential plants to the Garden.

3.8.3 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative each proposed project or activity at LWSC Project would be evaluated prior to implementation to determine if it meets the stipulation of the PA and is exempt from further review or if the proposed project or activity would have an effect on the listed LWSC Historic District and if Section 106 consultation would need to occur. This evaluation could potentially delay (weeks to months) project activities.

3.8.4 Alternative 2 – Update Master Plan (Preferred Alternative)

Under Alternative 2, each proposed project or activity at LWSC Project would be evaluated to determine if it meets the stipulation of the PA and is exempt from further review or if the proposed project or activity would have an effect on the listed LWSC Historic District and if additional Section 106 consultation would need to occur. Adopting Alternative 2 would facilitate efficient implementation of project activities while preserving the elements within the Historic District.

3.9 SOCIAL AND ECONOMIC RESOURCES

A summary of social and economic resources is found at Appendix A (2025 Draft Master Plan, Section 2.3.10). The LWSC Project contributes jobs and revenue through sales and income in the local economy due to visitation and commerce through the properties. Hundreds of thousands of people visit the Locks annually and spend millions in sales within 30 miles of the LWSC Project (USACE 2019). The freshwater, tide-free harbor created by the LWSC Project reduces maintenance costs and prolongs vessel life for hundreds of marine commercial vessels and thousands of recreational vessels. The operation of the Locks generates about \$120 million in payroll, not including the commercial-fishing industry, equating to about 3,000 jobs (McDowell Group 2017). Total gross sales among businesses dependent on the Locks was estimated at \$1.19 billion in 2015 (McDowell Group 2017).

3.9.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative there would be minor or no impacts to socioeconomics in the area surrounding the LWSC Project. Any changes in the socioeconomic conditions of the area would likely be the result of outside influences and not those created by the No Action Alternative. Impacts to socioeconomics within the Seattle area from operation of the LWSC Project as they relate to Master Plan management plan concepts are related to utilization of the Project for recreational purposes. Composition of social groups at the LWSC Project appears to mimic the demographics of the region. This conclusion is based on three observations: 1) The LWSC Project is located with an urban population that accounts for much of the Project visitation; 2) there are no fees for use; and 3) there are no requirements for high-cost recreation equipment for many of the recreational opportunities provided by the LWSC Project. Visitors can utilize the LWSC Project facilities without disparity for economic considerations. With the No Action Alternative there would be minor or no adverse impacts to socioeconomics in the Seattle area or the surrounding counties from routine operation and maintenance of facilities, visitor use, or management of natural and cultural resources.

3.9.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Alternative 2 would use contemporary analysis to consider if the LWSC Project is impacting socioeconomics or influencing socioeconomic factors in the use of the recreation facilities. Land values would not be affected if updating the Master Plan was not implemented and operations continued as described in the 1994 Master Plan. Any changes in the socioeconomic conditions of the area would likely be the result of outside influences and not those created by adopting Alternative 2.

3.10 RECREATION AND SCENIC VALUES

The LWSC Project provides a variety of all-season recreational pursuits due to its proximity within the city of Seattle. The Locks site features a visitor center and Garden area where visitors can picnic, enjoy the vegetation, watch ships and boats locking in and out, and partake of special events such as weddings and musical groups. The visitor center is open year-round and offers free tours of the Locks and surrounding Garden. Across the Locks from the Visitor Center and Garden is the fish ladder and Fish Viewing Gallery where visitors can watch fish swimming up the ladder from Puget Sound on their first leg in their journey to inland waters. Visitors can also recreate at the Fremont and Montlake Cuts by walking on trails, viewing wildlife, and watching vessels navigate the Ship Canal. Other events include plant sales, car shows, rowing events, and the boat parade on the opening day of boating season. More information is provided in Appendix A (2025 Draft Master Plan, Section 2.3.11). The method of counting visitors to the LWSC Project, however, does need updating. The current method of counting visitation relies on inaccurate beam traffic counters at Locks site entryways. This method is problematic as it fails to gather information on commuter traffic or visitation to other areas of the project such as at the Fremont and Montlake Cuts.

3.10.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative current recreation use would continue with predicted increasing visitation as local and regional populations grow. However, managers would not be able to accurately assess if there have been increases in public use as the current method to estimate use tends to underestimate visitations and fails to consider visitation to the Fremont and Montlake Cuts. The anticipated increase in public use would potentially deteriorate natural and humanmade resources unless management actions are taken to mitigate the use, and maintenance requirements could increase to sustain current resources. Management areas currently experiencing a high density of visitation, such as the Fish Viewing Gallery, South Entryway Buffer Zone and Garden turf areas would remain as MRM-low density recreation areas. This means that these areas would not receive the support needed to manage high density visitation.

Under the No Action Alternative, visual resources on Project lands would evolve through natural process as vegetation matures, by changes occurring on adjacent lands or from routine O&M activities performed by LWSC Project staff such as mowing, vegetation trimming, facility cleaning, or facility repair. These O&M activities would have minor or no adverse impacts to aesthetics and would be performed to keep-up the appearances of the Historic District.

3.10.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Alternative 2 would comply with current USACE guidance, and recommends analysis of use, demand, carrying capacity, and social effects of proposed actions from the predicted increased visitation. Using a long-term balanced planning approach, Alternative 2 would be more effective in accommodating increased number of visitors and preserving natural resources. Recreation use and experience quality would be beneficially impacted by adoption of Alternative 2 over the long-term.

Implementation of Alternative 2 (Update Master Plan) would utilize additional analysis to make improvements for O&M of natural, cultural, and recreational resources and to maintain the appearance of the Historic District. Alternative 2 recommends improving methods to count visitors at the Locks Site as well as at the cuts. With long-term balanced planning, this alternative would be more effective in creating beneficial impacts for quality aesthetics by using enhanced vegetation management, facility development and visitor management. Visual quality from outside of LWSC Project lands would not be impacted by adoption of Alternative 2.

3.11 PUBLIC HEALTH AND SAFETY

USACE operations at the LWSC Project are guided by a variety of documents and training that serve to promote and enhance the health and safety of the staff and the visiting public. The guidance includes documents issued by the U.S. Army such as Engineering Manual-385-1-1: Corps of Engineers Safety and Health Requirements Manual, documents and requirements issued by the Federal government such as those generated by the Occupational Safety and Health Administration, engineering regulations, and orders related to the management of locks, dams and recreation facilities, and local policies that serve to identify and address needs and issues specific to the location. For all actions undertaken, whether it be for the administration of a local policy, the implementation of a contract, or for management decisions that impact the public, health and safety are integrated into the thought and decision process and are implemented based on the relevant guidance. For Master Plan purposes, while specific health and safety requirements may not be called out and the mitigation for those requirements not specifically identified, all actions are continually vetted to ensure appropriate requirements are being met. Since the Master Plan guides project recreational, natural, and cultural resources, public health and safety considerations are related to those concepts versus project operations such as fish passage management or Locks operations.

3.11.1 Alternative 1 – No Action (Existing Master Plan)

Under the No Action Alternative, relevant current guidance would be reviewed per USACE mandates prior to actions being undertaken to ensure the appropriate health and safety requirements are being met. Despite the age of the existing Master Plan, the

expectation is that health and safety remain a priority for all actions and that current standards are met. For future actions that require but do not yet have an environmental review, safety, and health considerations, if any, would be noted during the review process and appropriate mitigation planned for. Research would be required to indicate if BMPs are available to be incorporated into the action. This would result in an expenditure of time (days to weeks) before an action could be implemented.

3.11.2 Alternative 2 – Update Master Plan (Preferred Alternative)

Alternative 2 would be similar to the No Action Alternative, in that prior to implementation of the proposed actions listed within the document, potential impacts (both positive and negative) to health and safety would be considered. Some specific identified actions, such as improved signage and restroom renovations, are viewed as positive impacts, but may have temporary negative impacts such as a public learning curve as they adapt to access restrictions or to temporary closures of facilities. Relevant guidance would be reviewed and applied, and BMPs (Appendix A, 2025 Draft Master Plan, Section 6.6 and 8.5.2) would be identified for actions and applied as needed.

4 MITIGATION

As outlined in 40 CFR 1508.1(s)(1-5) under NEPA, mitigation means measures that avoid, minimize, or compensate for effects caused by a proposed action or alternatives as described in an environmental document or record of decision and that have a nexus to those effects. While NEPA requires consideration of mitigation, it does not mandate the form or adoption of any mitigation. Mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Under the preferred alternative there is no compensatory mitigation required for this project. BMPs to minimize impacts to resources such as fish and wildlife are described in Appendix A (2025 Draft Master Plan, Section 6.6 and 8.5.2).

5 UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects associated with the preferred alternative would be: (1) temporary, localized, and/or minor increases in noise, activity, and emissions which may temporarily affect visitors and wildlife in the area; (2) irretrievable commitment of fuels and other materials for maintenance, operations, and projects.

6 CUMULATIVE IMPACTS

The NEPA and the CEQ regulations require Federal agencies to consider the cumulative impacts of their actions. Cumulative effects are defined as, “the impact on the environment which results from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These actions include on- or off-site projects conducted by government agencies, businesses, or individuals that are within the spatial and temporal boundaries of the actions considered.

Numerous cumulative effects to the environment have occurred in the project areas from construction of LWSC Project and from the changes in the water behind it. The hydrology of Salmon Bay, Lakes Washington and Union, and the Cedar and Black Rivers were altered, the dam and reservoirs displaced natural vegetation, and human presence and construction impacted resident and migratory species (Appendix A, 2025 Draft Master Plan, Section 1.4). Cultural resources were disturbed, and members of the Duwamish Tribe displaced during the construction as well. These anthropogenic changes have caused cumulative adverse effects to fish, wildlife, and vegetative communities.

Continued recreation and project upkeep at the LWSC facilities would have an on-going minor adverse impact on fish and wildlife in the immediate area. Construction and maintenance activities would temporarily create noise and dust in the area and could temporarily displace wildlife. Continued upkeep of the area, especially in the High-Density Recreation Areas, would provide ongoing benefits to recreationalists. USACE would evaluate the construction of any new project under NEPA to see if they are categorically excluded from further analysis or if they require an EA to determine their impact on the environment. Site-specific proposals for construction would be approved only if it is determined that potential impacts are less than significant. USACE would manage recreation areas in accordance with pertinent environmental laws, which would be expected to reduce some of the wildlife and vegetation impacts to the area from human disturbance.

Continued operation of the LWSC Project would provide on-going benefits to local businesses and commercial fishing and shipping industries by maintaining a freshwater harbor and opportunities for the public to recreate. The LWSC Project is in a highly developed area and future development would have a negative effect on the habitat for fish and wildlife species but would be considered a positive effect for the local economy. The function of the Locks as a regulator of lake water level is also critical to the functioning of the Washington Route 520 and I-90 bridges across Lake Washington and the water and sewer utilities serving Mercer Island.

7 COORDINATION

Preparation of this EA was coordinated with appropriate Tribal, Federal, State, and local interests, as well as environmental groups and the regulated public. USACE invited participation of agencies, Indian Tribes, non-governmental organizations, and the public to identify significant issues related to the proposed project during a public scoping period that occurred between June 5 and July 31, 2020. Letters were sent to the Muckleshoot Indian Tribe, Suquamish Indian Tribe, State Historic Preservation Office, King County Historic Preservation Program, and the city of Seattle's Historic Preservation Program on May 18, 2021. Coordination with these entities was conducted during scoping and public review to ensure compliance with NEPA regulations:

- U.S. Fish and Wildlife Service
- Muckleshoot Indian Tribe
- Suquamish Indian Tribe
- Washington State Department of Archaeology and History Preservation
- Washington Department of Fish and Wildlife
- Washington State Department of Ecology
- Washington State Department of Transportation
- University of Washington
- City of Seattle Parks and Recreation
- Friends of Ballard Locks
- Seattle Audubon Society

8 ENVIRONMENTAL COMPLIANCE

This Environmental Assessment (EA) is being prepared pursuant to Sec. 102(C) of the National Environmental Policy Act (NEPA), and includes compliance with other laws, regulations and Executive Orders as discussed below.

8.1 AMERICAN INDIAN RELIGIOUS FREEDOM ACT

The American Indian Religious Freedom Act (42 U.S.C. § 1996) protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. Implementing the proposed updated Master Plan would not adversely affect the protections offered by this Act.

8.2 BALD EAGLE PROTECTION ACT

The Bald Eagle Protection Act (16 U.S.C. § 668, et seq.) contains requirements on USACE projects concerning bald eagles. Approval and implementation of the proposed updated Master Plan would not adversely affect bald eagles or their habitat because the nearest known bald eagle nest is approximately 1.1 miles away, which is farther than activity-dependent disturbance thresholds of 330 or 660 feet (USFWS 2007).

8.3 CLEAN AIR ACT

The Clean Air Act, as amended, (42 U.S.C. § 7401, et seq.) prohibits Federal agencies from approving any action that does not conform to an approved State or Federal implementation plan to reach (i.e., attain) air quality standards. The project area is not located within a non-attainment area (EPA 2024). Operation of heavy equipment and vehicles during actions to maintain or improve facilities would result in increased fugitive dust and engine emissions; however, these emissions would be short-term and small-scale.

8.4 CLEAN WATER ACT (FEDERAL WATER POLLUTION CONTROL ACT)

The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) is more commonly referred to as the Clean Water Act (CWA). This act is the primary legislative vehicle for Federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the U.S. The CWA was established to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The CWA sets goals to eliminate discharges of pollutants into navigable waters, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment.

This EA evaluates possible impacts to water quality, primarily with respect to suspended solids, turbidity, and temperature. Three sections of the CWA are pertinent to the proposed actions: Section 401 covers water quality standards and evaluation of the effects discharges would have on those standards; Section 402 addresses non-point discharges including, but not limited to, stormwater runoff from construction sites; and Section 404 addresses discharge of fill into Waters of the U.S. Requirements of those three CWA sections are briefly discussed below.

Section 404 and 401: USACE does not issue Section 404 permits to itself for its own civil works activities, but USACE accepts responsibility for the compliance of its civil works projects with Sections 401 and 404 under the CWA.

Section 402: Section 402 of the CWA is triggered when a construction site would have greater than 1 acre of ground disturbance.

Adoption of the proposed updated Master Plan does not require analysis or coordination under the CWA because it does not guide water management decisions. A Master Plan guides management of government-owned lands and does not extend guidance to the management of a reservoir. However, any future site-specific actions such as the recommended major develop needs to repair/replace the revetments along the Freemont and Montlake Cuts and replacing the Montlake Cut walkway would be individually reviewed for compliance with the Act prior to work commencing.

8.5 COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act, (CZMA) as amended, (16 U.S.C. §1451-1464) requires Federal agencies to conduct activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved State Coastal Zone Management Program. The USACE determined that the proposed project is consistent to the maximum extent practicable with the enforceable policies of the approved Washington State Coastal Zone Management Program and the CZMA. The proposed project occurs on land owned by the Federal government and is therefore outside the coastal zone [15 CFR 923.33(a)]; in addition, implementation of Alternative 2 (Update Master Plan) will have no direct or indirect effects on coastal land use, water use, or any other coastal zone resource. Because this action does not affect uses or resources of the coastal zone, and is not a development project, no consistency determination is required. A negative determination is not required.

8.6 ENDANGERED SPECIES ACT

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA), as amended, (16 U.S.C. § 1531-1544), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species and their critical habitats.

The No Action Alternative did not consider the presence or potential presence of threatened or endangered species shown in Table 8 (Section 3.6) because these species became threatened or endangered after the 1994 Master Plan's publication. At the time of publication, the only federally listed species potentially present at the LWSC Project was the bald eagle (listed as endangered in 1973 and delisted in 2007).

The USACE consulted with the Services on the LWSC Project Operations and Maintenance (O&M) that resulted in BiOps from USFWS in 2007 and NMFS in 2008.

The BiOps included incidental take permits for a period of five years from the dates of the BiOps. USACE has been operating the LWSC Project in accordance with the BiOps during this intervening period. On May 1, 2024, USACE submitted a supplemental Biological Assessment to the Services for their review and to request consultation under the ESA and MSA. As of February 2025, USACE continues to work with the Services towards formally reinitiating LWSC O&M consultation.

USACE evaluated effects of recommended development needs under Alternative 2 (Update Master Plan) and identified actions with the potential to affect ESA-listed species and require consultation with the Services prior to implementation. This includes three routine or small-scale actions: use of chemicals to treat pier surfaces, removal of hazard trees along the Montlake Cut, and the use of pesticides and fertilizers, and two major development needs: repairing and replacing revetments along the Cuts and replacing the Montlake Cut walkway. These five actions are included in the LWSC O&M consultation. USACE determined all other recommended development needs would not affect ESA-listed species. Based on this analysis and pending consultation, Alternative 2 (Update Master Plan) would be in compliance with ESA.

8.7 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act, (16 U.S.C. § 1801 et. seq.), as amended by the Sustainable Fisheries Act of 1996 (PL 104-267) requires Federal agencies to consult with the NMFS regarding actions that may adversely affect EFH for Pacific coast groundfish, coastal pelagic species, and Pacific salmon. The Act defined EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH is the habitat (waters and substrate) required to support a sustainable fishery and a managed species’ contribution to a healthy ecosystem. Waters include aquatic areas and their associated physical, chemical, and biological properties used by fish. Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities.

The No Action Alternative did not consider effects to EFH. Under Alternative 2 (Update Master Plan), the proposed routine O&M and small-scale actions would not affect EFH for groundfish, coastal pelagic or Pacific salmon species. BMPs outlined in Appendix A (2025 Draft Master Plan, Section 8.5.2) would reduce potential impacts to the EFH.

Three routine or small-scale actions (use of chemicals to treat pier surfaces, removal of hazard trees along the Montlake Cut, and the use of pesticides and fertilizers) and two major development needs (repairing/replacing revetments along the Cuts and replacing the Montlake Cut walkway) would occur near the waterways and require further environmental evaluation prior to implementation. USACE evaluated potential effects to EFH if Alternative 2 (Update Master Plan) were to be adopted and is in consultation with NMFS for potential adverse effects to EFH as of January 2025. USACE determined the

Alternative would not adversely affect EFH, and so is in compliance with the Act, pending completion of EFH consultation.

8.8 MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1361-1407) restricts harassment of marine mammals and requires interagency consultation in conjunction with the ESA consultation for Federal activities. All marine mammals are protected under the MMPA regardless of whether they are endangered, threatened, or depleted.

USACE did not propose actions such as pile driving that could harass marine mammals under either alternative. Alternative 2 (Update Master Plan) includes BMPs to reduce or avoid effects to aquatic animals, including marine mammals, for projects near water. Therefore, implementing Alternative 2 (Update Master Plan) is in compliance with the MMPA.

8.9 MIGRATORY BIRD TREATY ACT AND EO 13186 MIGRATORY BIRD HABITAT PROTECTION

The Migratory Bird Treaty Act (MBTA), as amended, (16 U.S.C. § 703-712) protects over 800 bird species and their habitat and commits that the U.S. will take measures to protect identified ecosystems of special importance to migratory birds against pollution, detrimental alterations, and other environmental degradations. EO 13186 directs Federal agencies to evaluate the effects of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative effects to migratory birds.

A wide variety of species listed under the MBTA occur on USACE managed lands within the LWSC Project. Under Alternative 2 (Update Master Plan), USACE would use BMPs to avoid vegetation clearing and grubbing during the bird nesting period (April 15-July 31) and to avoid impacts to fish and wildlife while applying pesticides. With these BMPs there would be no take of migratory birds and this action would not conflict with the purpose of MBTA or EO 13186. Therefore, the adoption of Alternative 2 (Update Master Plan) would be in compliance with the MBTA and EO 13186.

8.10 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA (42 U.S.C. § 4321 et seq.) commits Federal agencies to considering, documenting, and publicly disclosing the environmental effects of their actions. It requires that an EIS be included when a recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. Major Federal actions determined not likely to have significant adverse effects on the quality of the human environment may be evaluated through an EA.

This draft EA evaluates the environmental effects requiring NEPA compliance with the proposed Lake Washington Ship Canal Project Master Plan (Appendix A). This draft EA and draft FONSI (Appendix D) are made available for public review and comment. USACE invites submission of comments on the environmental impact of the proposed action. USACE will consider all submissions received during the comment period. The nature or scope of the proposal may be changed upon consideration of the comments received and this EA updated. If significant effects on the quality of the human environment are identified and cannot be mitigated for, USACE would initiate an EIS and afford all the appropriate public participation opportunities attendant to an EIS.

8.11 NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the NHPA (54 U.S.C. § 300101-307108) requires that Federal agencies evaluate the effects of Federal undertakings on historical, archeological, and cultural resources and afford the Advisory Council on Historic Preservation opportunities to comment on the proposed undertaking if there is an adverse effect to an eligible Historic Property. The lead agency must examine whether feasible alternatives exist that would avoid eligible cultural resources. If an effect cannot reasonably be avoided, measures must be taken to minimize or mitigate potential adverse effects.

USACE contacted the Washington State Historic Preservation Office (SHPO), Muckleshoot Indian Tribe, Suquamish Indian Tribe, City of Seattle Historic Preservation Program, Friends of the Ballard Locks, and the King County Historic Preservation Program during scoping on May 18, 2021. The SHPO provided comments on September 16, 2021. Scoping comments were not received from the Muckleshoot Indian Tribe or Suquamish Indian Tribe. Other scoping comments are summarized in Appendix A to this EA (2025 Draft Master Plan, Attachment F).

The HPMP update is part of mitigation for the replacement of the original large lock center gate. A Memorandum of Agreement (MOA) between USACE and SHPO that describes this mitigation was signed October 2021 for the “Hiram M. Chittenden Locks Large Lock Center Gate Project” (May 2022; available online at <https://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/>). One stipulation is for USACE to update the HPMP with new information on historic buildings and structures found while revising and updating the outdated 1978 National Register of Historic Places Inventory Nomination Form. In addition, USACE was required to offer the SHPO, Department of Archaeology and Historic Preservation, at least one opportunity to review and comment on any HPMP revisions. The USACE incorporated comments provided by the SHPO via email into the HPMP in October 2022, which fulfills the MOA stipulation.

The Master Plan and HPMP are planning and guidance documents, so only undertakings (i.e., projects) resulting from the Master Plan would undergo Section 106 review and SHPO consultation as appropriate. Therefore, the draft Master Plan and HPMP are in compliance with Section 106 of the NHPA. The draft HPMP is in Appendix A to this EA (2025 Draft Master Plan, Attachment D).

8.12 NATIVE AMERICAN TRUST ASSETS

In the mid-1850s, the U.S. entered into treaties with nearly all of the Native American tribes in the territory that would become Washington State. These treaties guaranteed the signatory tribes the right to "*take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory*" [*U.S. v. Washington*, 384 F. Supp. 312 at 332 (WDWA 1974)]. In *U.S. v. Washington*, 384 F. Supp. 312 at 343 - 344, the court resolved that the Treaty tribes had the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than de minimis effects to access to usual and accustomed fishing area may violate this treaty right [*Northwest Sea Farms v. Wynn*, F. Supp. 931 F. Supp. 1515 at 1522 (WDWA1996)]. In *U.S. v. Washington*, 759 F.2d 1353 (9th Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined on a case-by-case basis. The Ninth Circuit has held that this right encompasses the right to take shellfish [*U.S. v. Washington*, 135 F.3d 618 (9th Cir 1998)].

The Federal government must consider the effects its actions may have on American Indian trust resources, traditions, and cultural practices. The Federal basis of a tribe's legal status rests within the context of U.S. Constitutional provisions for Federal government's powers for treaty making with other sovereign nations, and American Indian tribes' inherent sovereignty. Numerous tribes in the Puget Sound area are parties to treaties with the U.S., which reserve lands and rights to the tribes. One of the treaty-reserved rights is the ability to take fish at all places where the tribe fished at treaty time, commonly referred to as "Usual and Accustomed" locations. Tribal fisheries are central to the cultural and economic existence of tribes and their members. Treaty terms and the rights arising from them cannot be rescinded or canceled without explicit Congressional consent. Federal agencies, including USACE, have a legal obligation to abide by treaty terms and to avoid interference with treaty-reserved fishing rights. The following tribes have Usual and Accustomed fishing rights in the project area:

- Muckleshoot Indian Tribe
- Suquamish Tribe

USACE notified the Muckleshoot Indian Tribe and Suquamish Tribe in writing of the proposed action to update the LWSC Master Plan and solicited comments and concerns by emailing coordination letters (Appendix C, Tribal Notification Letters to Solicit Comments) on June 25, 2020, and the Notice of Availability on February 20, 2025, to solicit any comments and identify potential conflicts with fishing practices. USACE briefed Muckleshoot and Suquamish Indian Tribal biologists on the proposed project at the annual co-manager meeting webinar conference call on May 27, 2021, with no comments received. While the Master Plan was being developed, general progress updates were provided during subsequent annual co-manager meeting webinar conference calls in May 13, 2022, May 30, 2023, and June 10, 2024.

8.13 NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT

The Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001-13I; 104 Stat. 3042) provides for the protection of Native American and Native Hawaiian cultural items. It establishes a process for the authorized removal of human remains, funerary, sacred, and other objects of cultural patrimony from sites located on land owned or controlled by the Federal government. The Act requires Federal agencies and federally assisted museums to return specified Native American cultural items to the federally recognized Indian tribes or Native Hawaiian groups to which they are associated. In the event of inadvertent discoveries of human remains, artifacts, and funerary objects, USACE would follow the terms of the Act's regulations, 43 CFR 10 et seq.

8.14 NOISE CONTROL ACT

The Noise Control Act (42 U.S.C. § 4901 to 4918) establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. Federal agencies are required to limit noise emissions to within compliance levels. Noise emission levels at the LWSC Project site would increase above current levels temporarily due to construction of improvements or features identified as development needs under Alternative 2 (Update Master Plan). Appropriate measures would be taken to keep the noise level within the compliance levels such that all equipment and vehicles would have properly working mufflers and would be kept in a proper state of tune to reduce backfires. Contractors obtain city of Seattle noise variances as needed. Based on these preventative measures, USACE is in compliance with this Act.

8.15 EO 11988 FLOODPLAIN MANAGEMENT

EO 11988 requires each agency to provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains in

carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land-use, including but not limited to water and related land resources planning, regulating, and licensing activities. The recommended actions identified in Alternative 2 would not affect the flood holding capacity or flood surface profiles of the Ship Canal, Lake Washington or, Lake Union, nor would the actions facilitate floodplain development. Therefore, Alternative 2 (Update Master Plan) is in compliance with this EO.

8.16 EO 11990 PROTECTION OF WETLANDS

Federal agencies shall take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in fulfilling the agency's responsibilities. Each agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands, which may result from such use. There are no wetlands on the LWSC Project, so no wetlands would be impacted by adopting Alternative 2 (Update Master Plan). Alternative 2 does not conflict with the requirements of the EO.

9 SUMMARY OF ASSESSMENT

The No Action Alternative does not meet the project's purpose and need. The Preferred Alternative (Alternative 2 – Update Master Plan) fulfills the project's purpose and need because it provides recommended guidelines for future LWSC Project development and use. Alternative 2 – Update Master Plan is derived from authorized Project purposes, USACE policies and regulations on the operation of USACE projects, responses to regional and local needs, resource capabilities and suitable uses, and expressed public interests consistent with authorized Project purposes and pertinent legislation. Based on the analysis above, USACE does not expect the proposed Master Plan update (Alternative 2) to constitute a major Federal action significantly affecting the quality of the human environment, and therefore would not require preparation of an EIS. Public comments are invited on this draft EA and will be considered prior to the finalization of this EA and FONSI.

10 REFERENCES

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