June 2022
Blake Island Marine State Park – Marine Facility Improvement Project

ANCHOR QEA

Final Predesign Report

Prepared for Washington State Office of Financial Management

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ABBREVIATIONS

ADA	Americans with Disabilities Act
AEP	Annual Exceedance Probability
Blake Island	Blake Island Marine State Park
BMP	best management practice
CAMP	Classification and Management Planning
CUP	Conditional Use Permit
cy	cubic yard
CZMA	Coastal Zone Management Act
DAHP	Department of Archaeology and Historic Preservation
DCD	Kitsap County Department of Community Development
DMMP	Dredged Material Management Program
DNR	Washington State Department of Natural Resources
DNS	Determination of Non-Significance
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
GEO	Governor's Executive Order
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resources Permit Application
LID	low impact development
MHHW	mean higher high water
MLLW	mean lower low water
NAVD88	North American Vertical Datum of 1988
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWP	Nationwide Permit
OFM	Washington State Office of Financial Management
OHWM	ordinary high water mark
Project	Blake Island Marine State Park – Marine Facility Improvement Project
RCP	Representative Concentration Pathway
RCW	Revised Code of Washington
ROM	rough order of magnitude
SEPA	State Environmental Policy Act

Services	National Marine Fisheries Service and U.S. Fish and Wildlife Service
sf	square foot
SHPO	State Historic Preservation Officer
SMP	Shoreline Master Program
SSDP	Shoreline Substantial Development Permit
State Parks	Washington State Parks and Recreation Commission
USACE	U.S. Army Corps of Engineers
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

Disclaimer

The Washington State Office of Financial Management (OFM) is required by Revised Code of Washington (RCW) 43.88.110(5) to institute procedures for reviewing capital projects proposed by state agencies. In order to qualify for design consideration and request funding in the capital budget, OFM requires predesign analysis and reports for all proposed capital projects valued over $10 million or valued between $1 million and $10 million selected by the Legislature or OFM because they are particularly time sensitive, have high risk, or are of particular interest to decision-makers.

A predesign study is a beginning step in a comprehensive review and funding process and is intended to explore alternatives for proposed capital projects and assess which alternative best addresses the identified problem, opportunity, or program requirement and at what cost. Decision-makers in the Governor's Office, OFM, and the Legislature use this information to determine whether a project should proceed toward design and construction. The fact that an agency has undertaken a predesign study does not guarantee that a project will be approved to continue to the design or construction phases. The subsequent review and approval by OFM and/or the Legislature is an ongoing process to determine the future of the project. If approval of the predesign study is not granted, the project will not be included in the Governor's proposed budget for consideration by the Legislature. Furthermore, approval of the completed predesign does not guarantee appropriations for design or construction.

While the Predesign Report identifies a Preferred Alternative and conceptual design, it does not impose constraints that cannot be altered during the design process if additional information becomes available. Reasonable flexibility, with legislative intent, during the design and construction process is expected and encouraged. Any future project decisions and actions by State Parks will be dependent on OFM's approval of this plan and will be based on additional site analysis, environmental review, and available funding.

1 Executive Summary

The Washington State Parks and Recreation Commission (State Parks) is requesting funding to support the Blake Island Marine State Park (Blake Island) – Marine Facility Improvement Project (Project). State Parks seeks to make improvements at the Blake Island marina to meet the following goals:

1. Support larger vessels in the marina; keep the marina usable for commercial and public users.
2. Develop a long-term solution to providing an on-grade boat landing for State Parks' marine crews.
3. Continue to connect the public with Blake Island's natural and cultural heritage through recreational and education experiences, consistent with the State Parks mission.

Originally constructed in 1974, the Blake Island marina is deteriorating. If the marina were to remain as is, the docks and floats would likely see accelerated deterioration. A 2021 assessment (Moffat & Nichol 2021) found that there are multiple structural deficiencies rated "severe" that should be addressed as soon as possible, including an undermined abutment and degraded timber piles. It is anticipated that annual maintenance will increase significantly within the next 3 to 5 years to limit safety concerns and keep the marina open. The existing 1974 footprint and configuration of the marina also limit navigation of both commercial and public vessels, as well as the number and types of vessels that can be accommodated. The existing marina does not meet Americans with Disabilities Act (ADA) requirements.

In addition to the marina structures, the marina basin has sedimentation build up. The last dredge event was in 1988. Over the decades, sediment accumulation has impacted vessels entering and exiting the entrance channel and has impacted the commercial moorage areas. If unaddressed, sediment accumulation will continue and further impact vessel use at the marina. Specific to the commercial moorage, this accumulation could impact State Parks from finding a commercial operation partner.

Outside of the marina but within the project limits, there is an existing on-grade boat launch primarily used by State Parks operations staff. The current boat launch is permitted as a temporary use, which inhibits efficient and productive use.

The Project provides State Parks with an opportunity to reconstruct the marina to enhance recreation, increase moorage, and increase flexibility while also reducing future maintenance dredging. Because the marina currently operates at maximum capacity during peak months, a marina reconstruction would expand the amount of public moorage for a wide variety of vessel types and sizes. An improvement of the marina's basin and docks would enhance commercial operations and public use. The Project also provides State Parks the opportunity to increase ADA accessibility, design

for sea level rise, improve habitat, and create a permanent State Parks boat launch to improve operations.

In addition, improvements to Blake Island's marina will provide equitable public access to unique recreational and outdoor experiences for the next 50 years. Until 2021, Argosy Cruises was the commercial vendor that ferried the public from the Seattle waterfront to Blake Island. The Project provides an opportunity for State Parks to improve the marina and attract a new commercial vendor to maintain that service for visitors to access the island. An opinion piece in *The Seattle Times* recently touched on the need for improved access to the island, noting:

> [F]or so many communities, particularly in South King County, open space and a little bit of nature are hard-to-find amenities. Families across the economic spectrum should be able to walk the green trails of Blake Island, wade its secluded beaches, and appreciate its peace and connection to northwest history. (Seattle Times Editorial Board 2021)

In a separate project associated with operations of Blake Island's Tillicum Village, State Parks is considering a new approach to its future operation and is currently developing a planning process to address these opportunities.

This Predesign Report follows a project-specific predesign checklist, approved by the Washington State Office of Financial Management (OFM), in close coordination with State Parks. State Parks identified three alternatives during the study, including a No Action Alternative that assumes no improvements would occur in the marina or upland areas, and the park would remain in its current configuration and existing condition. These alternatives were then assessed using 11 design criteria (see sidebar).

The three alternatives include the following:

- **Alternative 1** is a No Action Alternative and proposes no capital projects within Blake Island. The marina will continue to deteriorate, facing increased maintenance and future closure.
- **Alternative 2** proposes to reconstruct the marina within the existing marina's development footprint along with improvements to the adjacent upland area and State Parks boat launch.
- **Alternative 3** proposes to both reconstruct and expand the marina along with improvements to the adjacent upland area and State Parks boat launch.

The alternatives analysis evaluated each alternative by comparing design criteria scores, rough order-of-magnitude (ROM) construction costs, life-cycle costs, and schedule estimates. The alternatives analysis has identified **Alternative 2 as the Preferred Alternative**.

Design Criteria

1. Recreation and Visitor Experience
2. Sustainable Operations
3. Commercial Operations
4. Flexibility
5. Sediment Management
6. Nearshore and Subtidal Habitat
7. Sea Level Rise
8. Permit Feasibility
9. Value for Cost
10. Implementation Schedule
11. Constructability

The Predesign Report analyzes the Preferred Alternative, considers completed and ongoing studies, Project location and context, stormwater requirements, ownership, easement and setback requirements, potential issues and impacts on surrounding areas, utilities, dock footprint and access, and potential environmental impacts. State and federal requirements for ADA access, archaeological and cultural resources, and environmental planning will drive many design decisions for the Project and are described in detail. Coastal processes and sediment quality are significant aspects of the Project and are also described in detail.

The Predesign Report also provides a preliminary design and construction schedule for the Preferred Alternative and describes how State Parks will manage and implement the Project in one phase. The total Project rough order of magnitude (ROM) costs based on the C-100 estimation tool is $28,316,000.

Total Project costs include consultant services and agency administration. This cost reflects conceptual design and includes a 25% design contingency and 10% construction contingency. If the Project is approved to proceed toward design and construction, State Parks will work to develop the Phase 1 design in the 2023 to 2025 biennium to complete Phase 1 construction in in the 2025 to 2027 biennium.

Three appendices follow the report. Appendix A provides the OFM approved predesign checklist for the Project. Appendix B provides the summary information from the Project's life-cycle cost model. Appendix C provides a letter of acknowledgment from the Washington State Department of Archaeology and Historic Preservation.

2 Introduction

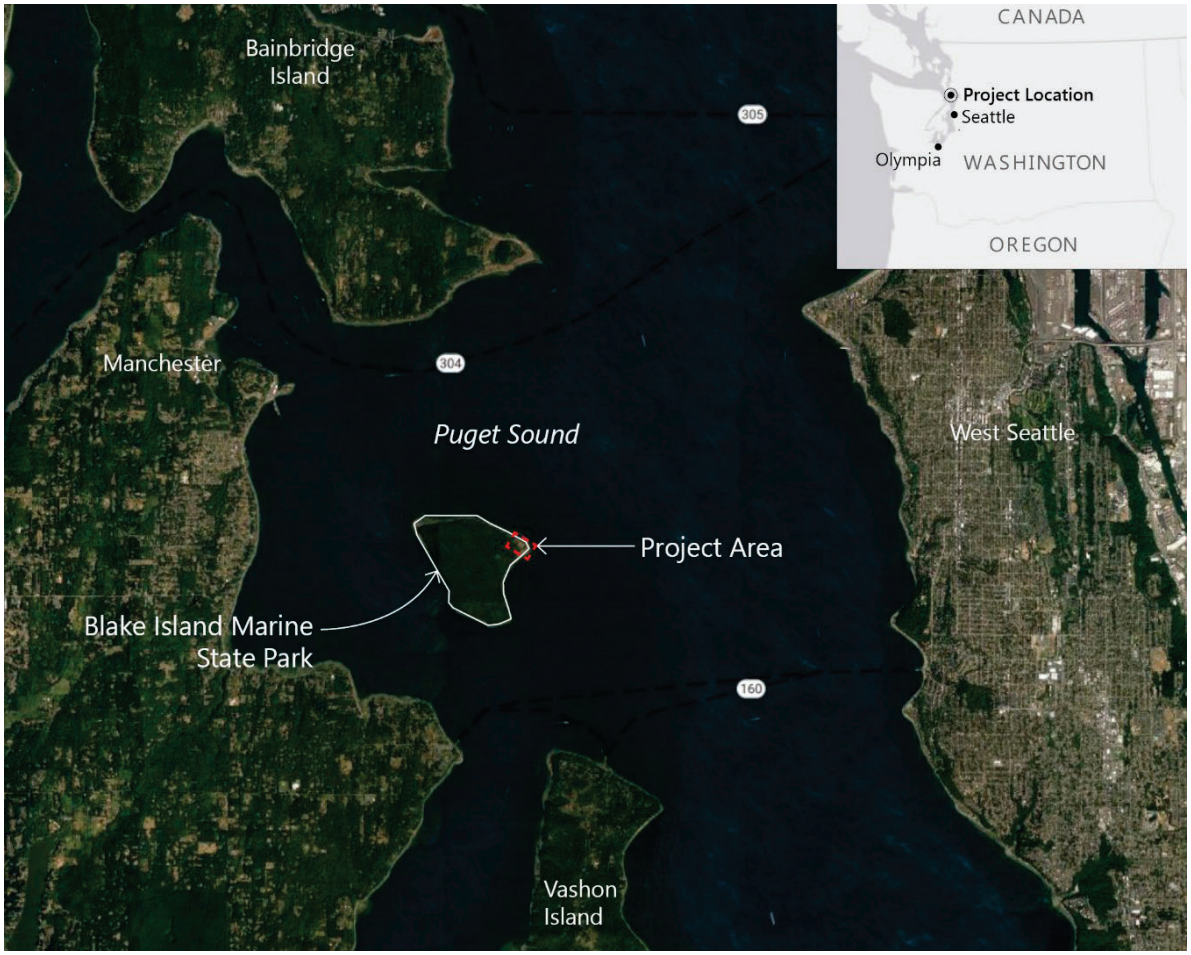
The Predesign Report provides a summary of the proposed Blake Island Marine State Park - Marine Facility Improvement Project (Project) to inform the Washington State Office of Financial Management (OFM) capital project comprehensive review and funding process, as required by Revised Code of Washington (RCW) 43.88.110(5). The Washington State Parks and Recreation Commission (State Parks) acquired Blake Island Marine State Park (Blake Island) in 1959 and within the year designated the entire island as a state park. It includes undeveloped forested areas, beaches and bluffs, hiking and biking trails, areas for water recreational activities such as boating and fishing, and a marina. Figure 1 provides a vicinity map of Blake Island and surrounding areas.

The marina serves public boaters and commercial operators. Most recently, the commercial operator, Argosy Cruises, offered public boat services from downtown Seattle to the island and operated Tillicum Village. Argosy discontinued these services in 2021. State Parks is seeking a new commercial operator vendor to provide boat access to the island. Without a commercial boat service, the vast majority of the public are unable to visit the state park. A recent *Seattle Times* opinion piece explained that public access to Blake Island is an issue of concern:

> However the concessions contract works out, it is imperative that Parks restart some kind of public transportation to the island. It shouldn't just be private boat owners who can experience this public treasure. (Seattle Times Editorial Board 2021)

The purpose of this Predesign Report is to evaluate selected alternatives that will best meet the identified marine facility improvements and best support the current and future visitation at Blake Island. The Predesign Report follows the OFM predesign checklist for the Project (see Appendix A).

Figure 1
Vicinity Map – Blake Island Marine State Park

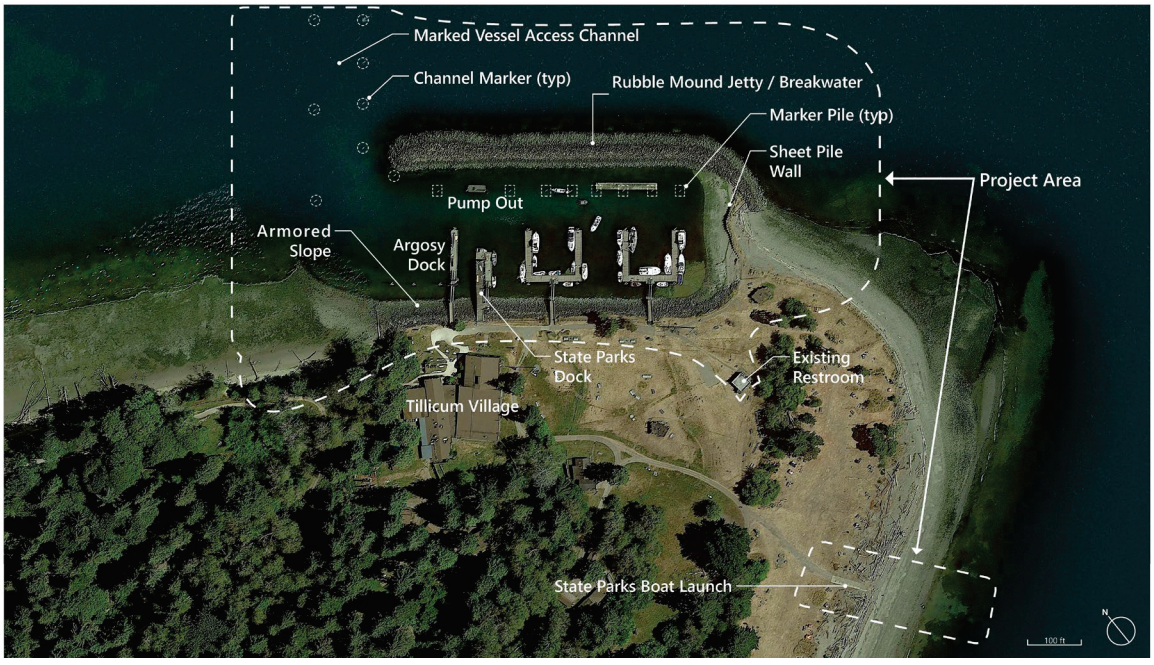


Project Area Limits

The Project area evaluated in this report is located at the northeastern tip of Blake Island (Figures 2 and 3). The Project's predesign scope is limited to the marina, adjacent nearshore and upland areas, and the State Parks boat launch. The Project does not include Tillicum Village. State Parks is starting an effort to consider Tillicum Village's future; this is not within the scope of the Project.

Figure 2
Project Area Map

Figure 3
Project Area Map Detail



2.A Problem Statement and Project Opportunity

2.A.1 The Problem

Originally constructed in 1974, the marina that supports access to Blake Island is deteriorating and has reached the end of its design life. The following summarizes the problems faced at Blake Island including issues associated with:

- Marina
- ADA Access
- Sediment Accumulation
- Environment
- State Parks Boat Launch

Marina

The marina has not seen significant repairs since 2000 (see Section 2.E for a description of construction activities on Blake Island since 1974). The marina includes a commercial floating dock and gangway, State Parks fixed pier dock, and east and west public floating docks and gangway. State Parks conducted a structural assessment in 2021 and identified damage, deterioration, and rot throughout the marina's access floats, piles, and decking as well as damage to marina utilities. Overall, the assessment found that the marina was in a "degraded condition" (Moffat & Nichol 2021). The 2021 assessment noted that if significant renovation or reconstruction does not occur, the marina will be unable to support moorage of private, commercial, and State Parks vessels. The assessment also included a cost estimate for the renovation of the marina based on its findings, estimated at $5,598,000. This cost is on the same order of magnitude as the cost to reconstruct a marina of similar size and location with more durable and environmentally beneficial materials. Additional details on the structural assessment and findings are included in Section 4.B.

Because Blake Island is only accessible by boat, the park would be significantly more challenging to access and operate without renovating the marina's vital combination of public, commercial, and launch facilities. Degraded public moorage will not support public boat access to Blake Island with private vessels. Degraded commercial moorage could preclude State Parks from finding a commercial vendor to bring members of the public who do not have access to a private vessel to the island. Degraded boat launch facilities make regular maintenance impossible to conduct.

The marina operates at maximum capacity for much of the year. A pattern of summer peaks and lower winter use has been consistent for over 20 years. During the summer peak months of July and August, overnight moorage averaged 4,300 overnight moorage visitors and ranged from approximately 3,500 to 5,050 visitors (this is largely visitors mooring vessels in the marina but also includes vessels on mooring buoys throughout Blake Island; State Parks 2021a, 2021b). Overnight moorage operates at capacity during peak months. The data suggest public moorage is limited by

the marina capacity as it has been consistently full during the peak season for over 20 years. The marina currently has a total moorage of 1,063 linear feet. Table 1 summarizes existing moorage and slip sizes.

Table 1
Existing Moorage

Item	Total Slips	Total Moorage (Linear Feet)
Commercial dock	2	170
Commercial dock: seasonal float	1	130
State Parks dock	1	43
Public basin	8	720
	Total Moorage	**1,063**

Americans with Disabilities Act Access

The marina does not meet ADA standards due to the dimensions of the marina's gangways, slip openings, and gaps in timber pier decking. The adjacent upland trail that connects the existing marina's gangway and connecting visitors to an existing restroom also does not meet ADA requirements. The facilities have no clear signage and there are no accessible picnic tables.

Sediment Accumulation

In addition to aging marina structures, sediment accumulation within the marina basin impacts the operation of vessels, especially large boats used by commercial operators. Commercial operators need to carefully navigate at low tide to avoid hitting ground. During the busy summer season, the seasonal commercial dock grounds out during low tides and requires significant annual repairs to remain functional (Schlobohm 2021). In the commercial basin, limited room to turn around results in significant propeller wash adjacent to the commercial moorage, which leads to scouring and a resuspension of sediments that then accumulate near the entrance channel, worsening operational issues. The entrance channel is constrained in size due to the sediment accumulation. Consequently, maintenance dredging is needed to both remove areas of sediment accumulation and account for anticipated future sediment erosion and accumulation throughout the basin. A sedimentation analysis to support the need for maintenance dredging is detailed in Section 4B.

Environment

There are a total of 75 creosote-treated pilings in the entire marina area (Moffatt & Nichol 2021). Creosote-treated wood is toxic to marine life. The marina's existing docks, piers, and gangways are solid concrete or wood decking that prohibit light from reaching the aquatic area below, limiting macroalgae growth and impacting nearshore habitat. Additionally, the nearshore area west of the

marina contains angular rock debris that negatively impacts habitat quality and potentially impedes potential eelgrass beds from establishing.

State Parks Boat Launch

South and east of the Blake Island marina, State Parks operates a boat launch to land its State Parks vessels and transport materials and equipment to and from the island. State Parks has a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW) that allows State Parks to deploy temporary mats waterward to elevation +8 feet mean lower low water (MLLW) and land 75-foot vessels between February 15 and August 15 of each year. Only the front ends of the vessels are allowed to touch the beach and vessels are not allowed to ground out. All temporary mats are required to be removed after loading/unloading is completed. The HPA requirements, specifically limiting access to +8 feet mean higher high water (MHHW) and above, limit the work window when State Parks can use the boat launch; timing the activities is tied to summer high tides and often only one landing per tide is possible.

2.A.2 The Opportunity

State Parks has the opportunity to improve public and commercial access to Blake Island while addressing sedimentation, restoring the nearshore environment, and improving the State Parks boat launch. The following provides a summary of the opportunities provided by the Project.

Improve Marina

As noted in the previous section, the estimated cost to *repair* the marina would be $5,598,000 (Moffat & Nichol 2021). State Parks has estimated the cost to *reconstruct* the marina at $5.5 million, nearly the same amount as repairs. Because the cost to reconstruct the marina with new durable structures is comparable to repairing the marina, the Project offers an opportunity to reconstruct a much more efficient layout and enhance marina amenities for visitors.

Reconstructing the marina gives State Parks the opportunity to improve the marina layout configuration and allow for greater flexibility to adapt to the park's existing and future needs. As noted previously, the marina provides 1,063 linear feet of moorage. If reconstructed and reconfigured, the marina has the potential to provide 2,350 to 3,370 linear feet of moorage. A broader range of slip sizes can support demand for increased capacity, larger public slips, and slips that can accommodate other vessels including 30-, 40-, 50-, and 60-foot motorized and sailing vessels and dinghies. The Project would allow the installation of marina amenities such as a new pumpout and improved lighting.

Improve Americans with Disabilities Act Access

The Project would allow for the construction of ADA-accessible gangways, slips, and upland connection paths. Even, sturdy surfaces would be applied to upland trails and provide an ADA

connection to the existing upland restroom facility. The upland restroom facility is not currently ADA accessible but will undergo a future renovation as a separate project to update the facility to meet ADA requirements. Clear and accessible interpretative signage would be installed throughout the site. A new ADA-accessible picnic area would be constructed.

Address Sedimentation

This Project offers the opportunity to address sedimentation, perform maintenance dredging, and design the dredging work to reduce the frequency of this type of maintenance in the future. Dredging the entrance channel, commercial, and public moorage areas to a depth 2 feet deeper than the last (1988) dredge would reduce future erosion from boat propellors, which would also reduce sediment suspension and accumulation in other marina areas. While dredging there is also an opportunity to steepen the engineered slopes and expand the useable marina space while staying within the overall marina basin footprint.

Improve the Environment

The Project provides several opportunities to improve and restore environmental conditions. Existing creosote-treated piles would be removed and replaced with steel piles. Existing solid docks, floats, and piers that create overwater coverage would be replaced with grated materials that allow light to penetrate. Debris present in the nearshore area westward of the marina would be removed to restore nearshore habitat. Additional beach backshore and riparian plantings would provide stabilization and habitat structure.

Improve State Parks Operations and Provide New Public Water Access

A reconstructed State Parks dock will allow continued access by State Parks vessels to the marina. This Project would also allow for the construction of a permanent, precast concrete boat launch that extends below MHHW, allowing the State Parks *Thunderbird* vessel and State Parks staff to land more frequently at both mid and high tides.

While designing the boat launch, there is also an opportunity to design the launching area as a hand-carried boat launch for the public. Blake Island visitors, in particular campers at the adjacent campground, could utilize the boat launch with small boats such as kayaks.

2.B Project Requirements

This Project must comply with the following State Parks and administrative policies and adopted Classification and Management Planning (CAMP) documents, which drive the Project's operational and programmatic needs.

2.B.1 State Parks Policies

Cultural Resource Management Policy (12-98-1)

The State Parks Cultural Resource Management Policy guides the identification, protection, management, treatment, and use of historic properties and cultural resources on lands owned or operated by State Parks. These resource policies are derived from state and federal laws, Governor executive orders, proclamations, and input from the public. The policies require that resources be evaluated and assessed during the planning process before any decisions are made about the treatment of these resources.

Critical Areas Policy (73-03-1)

The State Parks Critical Areas Policy requires that new park facility developments are not built in critical areas except where the theme, character, quality, or other park planning provides overriding justification for development in such areas, and appropriate mitigation can be provided. When a new park facility development is justified in a critical area, environmental permit considerations shall be prerequisite to the planning, design, and scope of the development, and the development shall be limited such that its assumed lifespan and the cost to abandon the development are an acceptable risk.

Protecting Washington State Parks Natural Resources Policy (73-04-1)

The State Parks Natural Resources Policy provides an overarching policy for the agency that addresses the long-term protection and management of natural resources on State Parks properties. This policy provides guidelines addressing multiple topics including biodiversity protection, abiotic resources, disturbance events, resource use, planning, regulatory compliance, interpretation and education, and research, surveys, and collections.

2.B.2 Central Kitsap Area State Parks Management Plan

The *Central Kitsap Area State Parks Management Plan*, adopted in 2009 (State Parks 2009), describes a management system for state parks within the central Kitsap area. A summary of issues identified for Blake Island is included in Table 2. This table only includes the issues within the Project area limits (as shown in Figure 2) The management plan for Blake Island lists specific issues identified by the public and State Parks staff and suggests management plans to address each issue. The management plan discusses shoreline erosion issues at Blake Island and potential marina and campsite reconfiguration to address this.

Table 2
Identified Blake Island Issues Within the Project Area

Specific Issue	Potential Projects or Project Direction Identified in the Management Plan
Shoreline erosion	• Examine options to reconfigure marina to reduce erosion impacts. Consider use of new technologies and materials to protect critical facilities while reducing overall impacts to marine and shoreline ecosystems. • Engage Kitsap County in current and future Shoreline Master Program amendment and update programs. Work to ensure existing marina, *Thunderbird* access, and other forms of public and administrative access patterns within the shoreline zone are represented in future shoreline inventories and reach characterizations.
Creosote-treated log removal	• Examine options to programmatically remove/replace creosote-treated logs that make up the pier and moorage support systems. Explore material replacement options that are more environmentally friendly with long-range life expectancies. • Remove remnants of pier used during Trimble land use of the island. The site has been documented by agency Historic Preservation staff and determined to be nonsignificant.
Moorage facilities	• Reconfigure existing marina to maximize moorage space and minimize dredging needs and erosion impacts. • Consider replacement of jetty structure with breakwater or other environmentally appropriate technology. • Explore options to coordinate public or private mass transit parking during peak use periods. • Add permitted mooring buoys (up to 12 more; 36 in total).
ADA access	• Work to provide universal access to marina floats and restrooms. • Consider accessibility needs in all park renovation and construction projects.
Moorage fees and reservation system	• Maintain existing first-come, first-served system for annual moorage passes. • Explore options to develop a mode of mass transit access that could involve a reservation system for passengers.
Administrative facilities	• Renovate State Parks administrative (*Thunderbird*) boat landing to improve access for transportation of supplies, materials, and waste management. • Maintain road system to provide for emergency response and routine patrols and maintenance.

Source: *Central Kitsap Area State Parks Management Plan* (State Parks 2009)

2.C Agency Mission

The Washington State Parks and Recreation Commission cares for Washington's most treasured lands, waters, and historic places. State parks connect all Washingtonians to their diverse natural and cultural heritage and provide memorable recreational and educational experiences that enhance their lives.

The proposed marina improvements fulfill the mission by addressing both recreation and stewardship needs on Blake Island. The proposed improvements seek to improve recreation through expanding moorage and improving facility safety and access. The proposed improvements also seek to responsibly steward state lands through minimizing the development footprint in the nearshore and

improving the nearshore environment through the removal of creosote-treated wood, removal of other anthropogenic debris from the nearshore such as angular rock, and installation of new marina structures that allow light penetration.

2.D Project Approach

State Parks developed a detailed approach, as shown in Figure 4. The approach starts with gathering background information and evaluating the technical components that impact the Project, as follows:

- Marine Biology
- Coastal Processes and Sea Level Rise
- Sediment Quality
- Marine Engineering
- Regulatory Permit Requirements

Figure 4
Step-by-Step Project Approach for the Predesign Phase

The Project's technical evaluations focus on the marina, adjacent upland and nearshore areas, and the boat launch area, as described in Section 4.B.

Following a comprehensive background information review and technical evaluation, State Parks developed a list of design elements for the marina, upland improvements area, and the boat launch. Design criteria and design alternatives were then developed as discussed in Section 3. During the development of alternatives, State Parks engaged with the public, stakeholders, including Argosy Cruises, regulatory agencies, and the Suquamish Tribe, as shown in Figure 4. The following provides a detailed breakdown of design elements proposed for this Project.

2.D.1 Design Element – Marina Improvements

Marina

- Reservable public slips of varying sizes; obtain as much lineal footage as possible.
- First-come first-serve (transient) area public slips, 30-foot length minimum, but long moorage areas would offer flexibility to be used by various boat sizes.
- At least one ADA ramp needed.
- State Parks-only designated dock space with barrier; accommodate four boats of 32-foot maximum length; approximately 120 lineal feet.
- Load/unload area with 30-minute maximum; 40 to 45 linear feet at shoreline.
- All creosote-treated timber removed including gangway piers and park pier.
- Ladders, life rings, fire extinguishers per code.

Lighting

- 24-hour lighting provided at marina (all docks and pumpout):
  - Diffused down light.
  - Lights should not be directed at water (environmental consideration).

Utilities

- Sewer pumpout to accommodate a 50-foot vessel:
  - Located on landward side of marina.
  - On-grade connection.
- Power connection to all docks:
  - Provide electrical services; 30-amp electrical connections for under 50-foot vessels and 50-amp connections for larger vessels. Each utility pedestal shall provide the combination of 30-amp and 50-amp service at a minimum.
- Water connection to State Parks dock space and the pumpout only.

2.D.2 Design Element – Upland Circulation

- 6-foot-wide, ADA-accessible, crushed gravel pathway connection between marina gangways and existing restroom.
- Signage along pathway for wayfinding and park information.
- Stormwater conveyance and drainage along pathway and top of slope.

2.D.3 Design Element – State Boat Parks Launch

- 20-foot-wide, precast concrete boat landing to accommodate State Parks vessels and public use as a hand-carried boat launch.
- 6-foot-wide, crushed gravel pathway connection between concrete boat ramp and adjacent trails and camping areas.

2.E Relevant Project History

Washington State acquired Blake Island in 1959 and within the year designated the entire island as a state park. In 1974, the Department of Natural Resources (DNR) granted the aquatic lands to State Parks. Since that time, State Parks has completed multiple park improvement projects within the Project area as summarized in Table 3. (State Parks 1969, 1973, 1974, 1982, 1988a, 1988b, 1989, 1995, 1997, 2007, 2021c, Worthy and Associates 2000, Moffatt and Nichol 2021)

Table 3
Blake Island Marine State Park Development Timeline

Year	Event
1959	Washington State acquires Blake Island and designates entire island as a state park.
1969	Small boat basin (marina) constructed.
1973	Comfort facilities, picnic area, and sewage lines added to marina facilities.
1974	Rubble mound breakwater and timber pier decks constructed.
1988	Entrance channel dredged; pier ramp and piling replacement project completed
1989	State Parks completed the boat pumpout project at the marina.
1997	Removal and disposal of some of the treated timber piles, installation of new steel piles, removal and replacement of treated timber piles, replacement of utilities and pumpout, riprap repairs.
2000	Blake Island Marine State Park Shoreline Improvements project was completed to address shoreline erosion issues. Sheetpile was installed at the eastern edge of marina basin and adjacent shoreline to south, along existing campground.
2007	State Parks completes the float electrification project at the marina.
2021	State Parks conducts structural assessment of marina.
2021	State Parks begins the Project to meet OFM predesign requirements.

3 Analysis of Alternatives

The alternative analysis identified 11 design criteria to compare the design alternatives and No Action Alternatives to one another. The following provides a summary of the criteria.

Recreation and Visitor Experience

- Keep the marina open and usable during boating season.
- Support current and projected future levels of use.
- Mooring arrangement/experience/difficulty:
  - Minimize turning, backing up, and exposure to obstructions.
  - Provide areas where vessels can raft.
  - Provide cleats that keep mooring rope arrangements safe and efficient.
  - Provide long sight lines.
- Maximize moorage space:
  - Support various sized commercial vessel moorage.
  - Support various sized public vessel moorage.
  - Support State Parks vessel moorage.
- Provide marina amenities for commercial, public, and park users:
  - Provide a new pumpout system to replace the current one.
  - Provide electrical services (30-amp electrical connections for under 50-foot vessels and 50-amp connections for larger vessels). Each utility pedestal shall provide the combination of 30-amp and 50-amp service at a minimum.
  - Provide new communication systems.
- Provide sufficient lighting for user safety. Avoid light pollution and potential impacts to adjacent camping areas.
- Improve accessibility and meet ADA requirements.
- Improve circulation and safety within the marina and to upland amenities (specifically to the existing restroom facility).
- Strengthen connections to existing trails and new trail development.
- Improve safety for vessels entering the marina at the entrance channel.
- Add permitted mooring buoys (up to 12 more; 36 in total).
- Design wave protection to minimize wave height and consider recreational use.

Sustainable Operations

- Renovate State Parks boat launch to improve access for transportation of supplies, materials, and waste management.
- Design durable features using long-lasting materials such as concrete, aluminum, and steel.
- Design marine structures with similar hardware and parts throughout the facility.
- Design basin dredging to prevent floats from grounding out during annual low tides.

- Reduce life-cycle cost (see Cost criteria later in this section).
- Conserve energy.
- Minimize waste in operations.
- Minimize long-term impacts to Blake Island operations
- Provide adequate signing and fencing to limit need for staff to monitor marina and boaters.

Commercial Operations

- Accommodate minimum 90-foot commercial vessels
- Minimize long-term impacts to Tillicum Village operations and visitors.

Flexibility

- Accommodate multiple types of boats and moorage.
- Accommodate type of moorage (reserved, first-come, first-served system for annual moorage passes).
- Consider modular float segments that can be rearranged into different shapes or used at a different site.
- Accommodate changing boating industry and develop a flexible layout for future change.
- Design State Parks boat landing to accommodate public hand-carried boat launch parallel use.

Sediment Management

- Plan and design for scour at commercial dock.
- Plan and design for sediment transport from drift cell.
- Plan and design for sediment transport within marina basin.
- Minimize maintenance dredging frequency to a minimum of 50 years.

Nearshore and Subtidal Habitat

- Minimize intertidal and subtidal overwater shading.
- Maximize grating and materials that allow for light transmittance through overwater structures.
- Remove treated wood from nearshore and subtidal environments (including creosote-treated wood).
- Remove remnants of pier used during Trimble land use of the island (the site has been documented by agency Historic Preservation staff and determined to be nonsignificant; State Parks 2009).
- Protect intact nearshore areas and eelgrass and improve nearshore areas impacted by development.
- Protect, improve, and restore habitat-forming processes like littoral drift.

Sea Level Rise

- Plan for sea level rise and design to a 50-year projection.
- Design for coastal resiliency.
- Address Federal Emergency Management Agency requirements.

Permit Feasibility

- Avoid adverse impacts on threatened and endangered (Endangered Species Act-listed) species.
- Minimize overwater cover; no net gain of overwater cover.
- Minimize in-water fill and in-water impacts and consider potential mitigation strategies for in-water impacts.
- Meet Kitsap County critical area and shoreline management requirements, such as shoreline setbacks, and consider avoidance, minimization, and mitigation strategies.
- Minimize need for maintenance dredging over time.
- Minimize construction impacts:
  - Minimize in-water cut and fill.
  - Minimize impacts to habitat areas and processes.
- Provide a facility that accommodates and promotes operation of low-impact vessels.
- Minimize waste in operations.

Value for Cost

- Provide high value for cost:
  - Cost per linear foot of moorage.
- Minimize life-cycle costs:
  - Limit requirement and/or extent of future maintenance and operational costs.
  - Consider susceptibility of elements to corrosion.

Implementation Schedule

- Phase Project funding requests by state biennium schedule.
- Minimize impacts to Blake Island operations and visitors during construction.
- Minimize impacts to Tillicum Village operations and visitors during construction.

Constructability

- Minimize construction impacts:
  - Minimize in-water cut and fill.
  - Minimize impacts to habitat areas and processes.

The following sections provide details about each of the alternatives considered.

3.A Alternatives Considered

A No Action Alternative and three design alternatives were considered before identifying the Preferred Alternative. The three design alternatives included a renovation of the existing marina, a reconstruction of the marina in the same development footprint and a reconstruction and expansion of the marina to a larger development footprint. While considered early in the alternative analysis, the renovation alternative was removed from consideration as the cost of renovation was similar to the cost for marina reconstruction, and the renovation of the marina did not meet State Parks project goals; the alternative scored low on nearly all design criteria. The option did not increase recreational moorage, did not provide flexibility to State Parks, and did not improve the nearshore environment.

The following provides a summary of the analysis for the following alternatives:

- Alternative 1: No Action
- Alternative 2: Reconstruction
- Alternative 3: Expansion

Each alternative considered the marina area including the basin, breakwater, and sheetpile wall, the adjacent upland circulation, and the State Parks boat launch. For each alternative, this section first provides a summary of Project elements, advantages, and disadvantages, followed by a figure illustrating the alternative's components.

3.A.1 Alternative 1 – No Action

The No Action Alternative assumes that no improvements would occur within the marina basin, upland area, or State Parks boat launch. Figure 5 provides a basemap. Refer to Table 1 in Section 2A for a summary of the marina's existing moorage. If the Project area is left as is, the existing marina structures, including the east and west docks, State Parks dock, and commercial dock, would continue to deteriorate. The following summarizes the potential effects of the No Action Alternative:

- The marina remains difficult for commercial operators, public users, and State Parks staff to navigate safely and effectively due to a narrow entrance channel, limited room to turn, and limited moorage.
- Without maintenance dredging, boats continue to scour the entrance channel, and sediment build up continues.
- The marina currently does not meet ADA standards and remains inaccessible.
- The existing boat landing for State Parks' *Thunderbird* vessel continues to be constrained by a narrow tidal window with a need for its crew to deploy mats along the beach prior to landing.
- The existing creosote-treated pilings and other shoreline debris remain.
- Over time, the marina becomes unusable and potentially need to be closed to commercial and public access. This would severely limit the opportunity for the public to access Blake Island.

Advantages

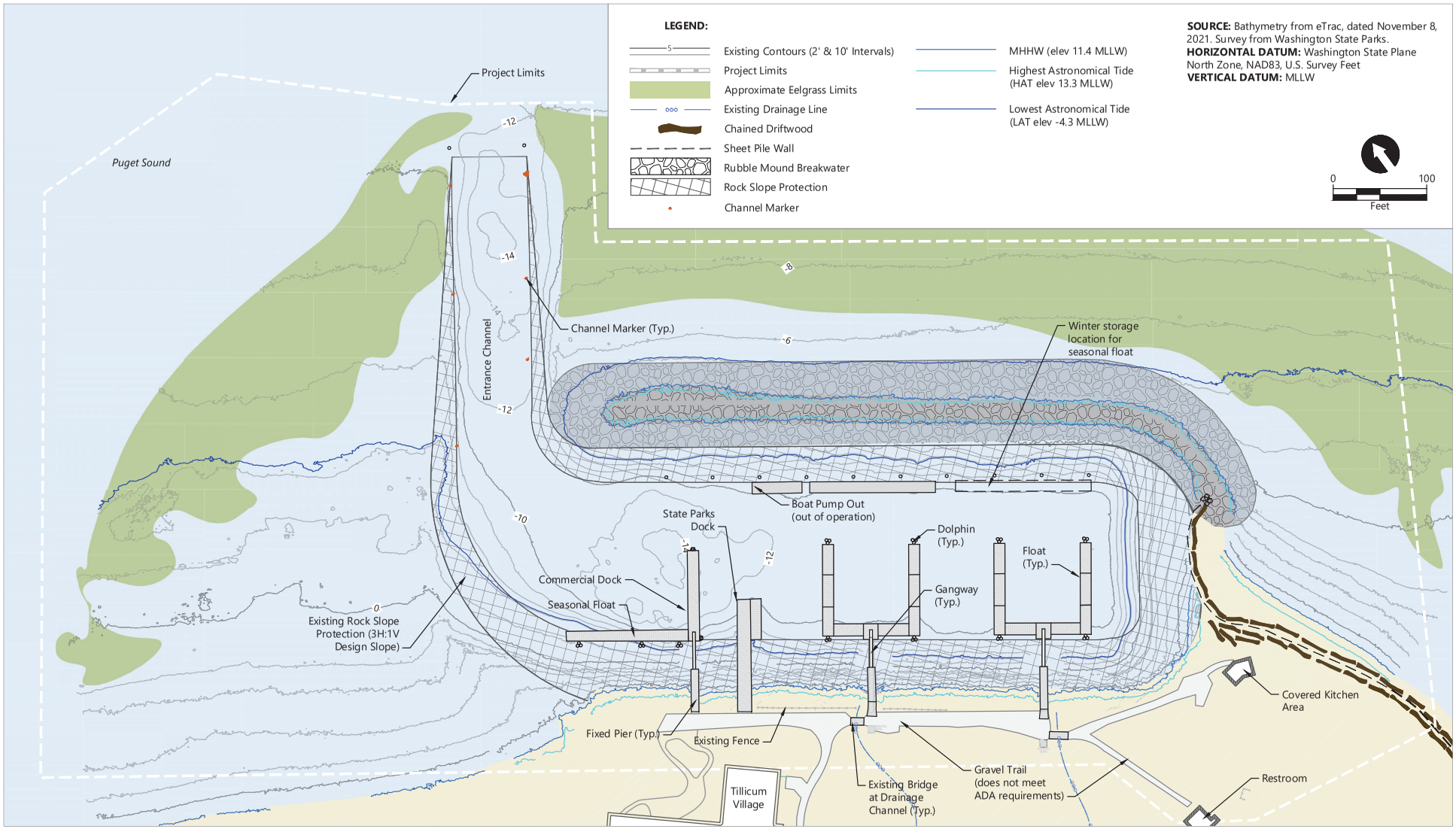
Advantages of the No Action Alternative include the following:

- *Nearshore Habitat and Subtidal Habitat:* No adverse impacts to eelgrass habitat and no existing nearshore ecological processes interrupted.
- *Sea Level Rise:* The existing marina's design, in particular the breakwater and rock slopes, is durable and could withstand rising sea levels and an increase in storm frequency and severity. The top of breakwater and top of rock slope elevations are higher than projected sea level rise scenarios for years 2070 and 2100.
- *Permit Feasibility:* Alternative 1 requires no permitting because no work is proposed.

Disadvantages

Because the No Action Alternative proposes to leave the marina as is, there are multiple disadvantages that would build over time, as the marina falls into further disrepair:

- *Recreation and Visitor Experience*: Commercial and public moorage would remain limited and unable to accommodate a variety of vessel sizes. Navigation of public vessels would remain difficult. Alternative 1 would not meet ADA standards.
- *State Parks Operations and Maintenance:* The existing State Parks dock would continue to deteriorate. For the boat launch, current WDFW authorization would continue to require State Parks to work around a narrow tidal window to avoid impacts to sensitive aquatic habitat. State Parks staff would be required to continue laying out temporary mats prior to boat launch use.
- *Commercial Operations:* The existing commercial dock is in poor condition and would continue to deteriorate. The existing marina width would continue to limit size and navigation of commercial vessels. Sedimentation would be not addressed, resulting in a narrower entrance channel and continued grounding of the commercial seasonal float at low tide.
- *Flexibility*: Over time the condition of the marina would become more deteriorated, resulting in less opportunity for marina use and less flexibility for multiple types of users.
- *Sediment Management*: Sediment accumulation impacts the commercial moorage area, and the seasonal float often grounds out. Necessary maintenance dredging would not occur and sediment accumulation in the marina basin would continue. Increased propeller wash in commercial boat area would continue to scour the basin.
- *Nearshore Habitat and Subtidal Habitat*: Existing creosote-treated structures and piles would remain in the nearshore environment and would continue to release toxins into the environment. Existing shoreline debris would remain in place.
- *Value for Cost*: While Alternative 1 requires no renovation or reconstruction, deterioration over time would require high maintenance and operational costs to keep the marina operational and accessible for as long as possible. Over time, the marina would likely need to close due to safety and access issues. This could result in State Parks incurring demolition costs.



Publish Date: 2022/06/14 9:16 AM | User: rfarnsworth
Filepath: K:\Projects\0363-WA State Parks\Blake Island Marine Facility\0363-RP-008 (Alt1).dwg Figure 5

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Figure 5
Alternative 1 (No Action)

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3.A.2 Alternative 2 – Reconstruction

Alternative 2 proposes to maximize moorage by reconstructing marina features within the existing marina footprint (Figure 6). It proposes to deepen the channel and basin, steepen the marina rock slopes to maximize moorage space and vessel maneuvering, make improvements to marina amenities, provide ADA connections, and improve the State Parks boat launch. Table 4 summarizes the proposed moorage spaces and boat slips. Alternative 2 proposes to keep all improvements and modifications within the current marina footprint to limit impacts to the nearshore environment. Alternative 2 includes the following:

- Marina improvements
  - Maximize moorage
  - Provide ADA connections
  - Provide new boat pumpout on land side
  - Remove all creosote-treated wood
- Breakwater and sheetpile wall
  - Replace steel sheetpile wall with buried rock feature transitioning off the existing breakwater
- Entrance channel and basin
  - Steepen rock slope along basin to maximize basin extent within 1988 footprint
  - To reduce sediment redistribution due to propwash scour and to reduce the need for future maintenance dredging, deepen the entrance channel and commercial basin to -14 feet MLLW and line the commercial basin with rock (cobble or quarry spalls)
  - To reduce sediment redistribution due to propwash scour and reduce the need for future maintenance dredging, deepen the public basin to -12 feet MLLW
- Marine biology/permit feasibility
  - Dredge design would require additional permitting because it is deeper than the 1988 design

Table 4
Alternative 2 Proposed Moorage

Item	Total Slips	Total Moorage (Linear Feet)
Commercial dock (70′ slips)	1	70
Commercial dock (seasonal, 90 slips)	2	180
State Parks dock (30′ slips)	6	180
Public basin (30′ slips)	31	930
Public basin (40′ slips)	9	360
Public basin (60′ slips)	9	540
Public basin (70′ slips)	2	140
Pumpout (60′ slips)	1	60
Total		**2,460**

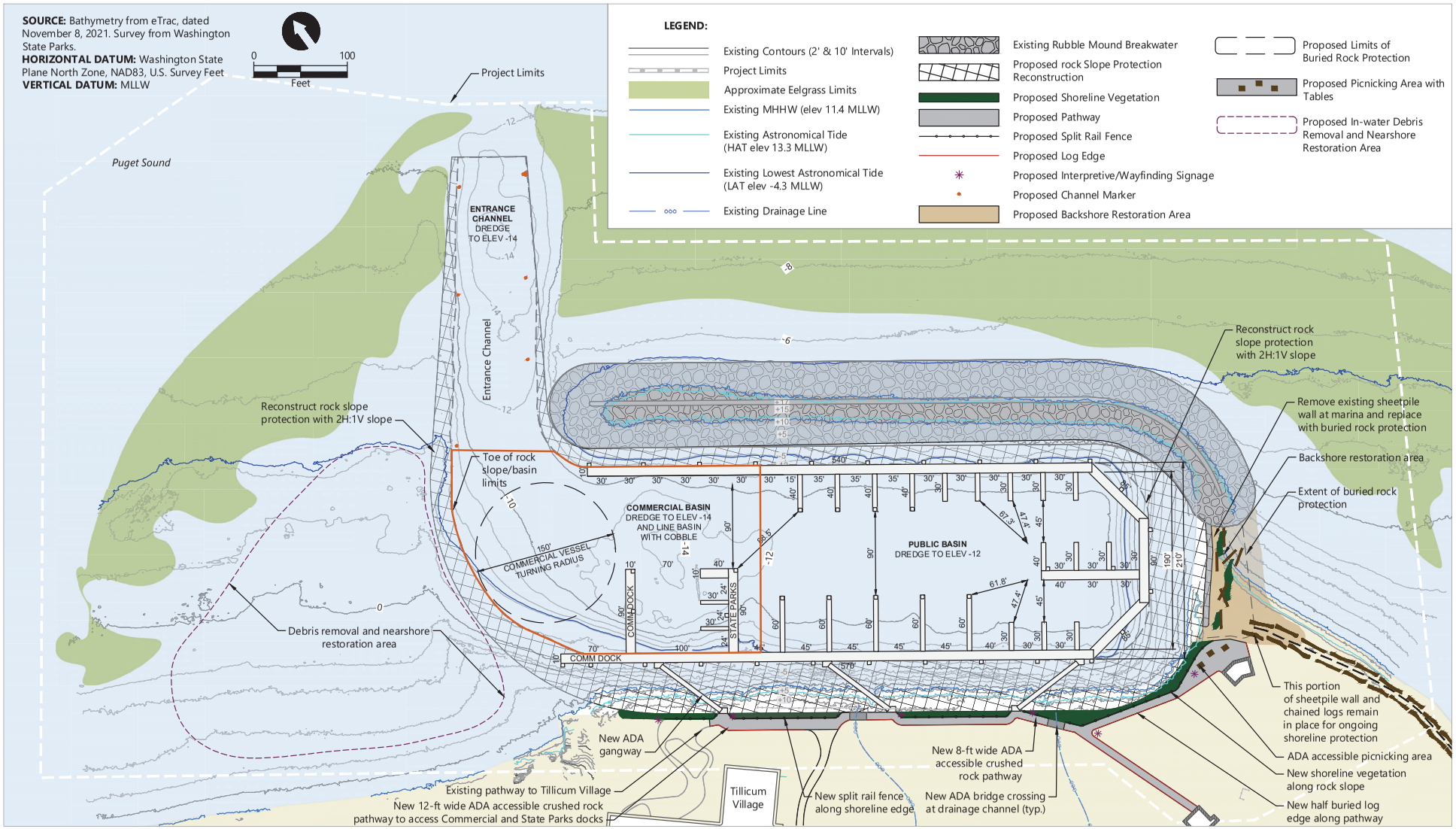
Advantages

- *Recreation and Visitor Experience*: Alternative 2 increases moorage, expanding public access to the marina and accommodating different sizes and types of boats. All gangway access points are ADA accessible. A new upland pathway and picnic area are also fully ADA accessible, strengthening the connection between the marina, restroom, and kitchen shelter. New vegetation areas enhance aesthetics and provide a buffer between the upland pathway and marina rock slope areas. The new boat launch area provides a new hand-carried boat launch for park users.
- *Sustainable Operations*: The reconstructed State Parks pier accommodates State Parks operational use. The new boat launch extends waterward to +4 feet to allow for a longer window of operational use that is less impacted by tide schedules, while still avoiding the eelgrass bed in the subtidal zone. The boat launch would also be a permanent feature and not require State Parks staff to mobilize temporary mats prior to use.
- *Commercial Operations:* Steepening the rock slopes increases the moorage basin and allows for more maneuvering space for commercial vessels. The entrance channel and moorage basins are dredged to a deeper elevation so marina floats would not bottom out at low tides.
- *Flexibility*: The marina design could be programmed for reservable or first-come-first-served slips. There are multiple slip sizes and configurations to accommodate various vessel sizes and types.
- *Sediment Management*: The entrance channel and moorage basins are dredged to a deeper elevation to avoid scour from propwash, commercial and public use.
- *Nearshore Habitat and Subtidal Habitat*: The Project footprint is entirely within the existing marina and would not impact existing eelgrass habitat. The design removes all creosote-treated wood from the marina. New floats and gangway are grated to maximize light penetration.

- *Sea Level Rise*: The design considers sea level rise. The buried rock slope that would replace the deteriorated sheetpile wall is designed to withstand sea level rise estimates. The marina structures are designed with durable materials to withstand increased storm frequency and severity.
- *Permit Feasibility*: The Project avoids impacts to existing habitat by maintaining the existing footprint. The Project also identifies the mitigation opportunity to remove angular rock and debris from the western nearshore area. The Project is feasible to permit. However, permitting will need to address the dredge depth because the proposed depth is deeper than the previous dredging event (1988).
- *Value for Cost*: Based on a cost analysis, the cost to construct new marina structures is similar to the cost to rehabilitate the existing structures. New structures would have a longer design life and would require less regular maintenance. The value for cost for the marina structures is high. The cost per moorage linear foot is approximately $7,950. The dredging design would also extend the time between maintenance dredging events. The last dredge occurred 32 years ago, and maintenance dredging is now needed to keep the marina useable. The Alternative 2 dredge design extends maintenance dredge requirements to potentially 50 years or more.
- *Implementation Schedule*: The Project design involves defined types of work that could be sequenced to complete in-water work with an efficient approach. The Blake Island in-water work window extends from September 1 to February 15 (for projects that include dredging). The proposed work could be accomplished in a single in-water window, with a potential start following Labor Day to minimize impacts to park users. Upland improvements are defined and could be done following in-water work and with the goal to complete Project work by the busy summer season.
- *Constructability*: The Project is designed to use standard float modules and gangway designs. Precast concrete is identified for construction of the boat launch and upland pathway elements to minimize work on the island. This alternative can be sequenced to maximize constructability. For example, demolition would occur first, allowing for the dredger to have full access to the marina basin to perform the dredging work.

Disadvantages

- *Recreation and Visitor Experience*: While visitor moorage is increased under Alternative 2, their number of slips is less than Alternative 3. The entrance channel is improved through dredging; however, the approach angle of the entrance channel is the same, which can result in poor sight lines for approaching and departing vessels. The existing eastern sandy area within the marina (currently used by nonmotorized boats) is removed to maximize moorage space.
- *Commercial Operations*: This alternative provides a single commercial float and additional space for maneuvering. It does not provide as much commercial moorage as Alternative 3.



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Filepath: K:\Projects\0363-WA State Parks\Blake Island Marine Facility\0363-RP-009 (Alt2-Preferred Alternative).dwg Figure 6

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Figure 6
Alternative 2 (Reconstruction)

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3.A.3 Alternative 3 – Expansion

Alternative 3 proposes to expand the marina to the west, adjusting the dredge and entrance channel to improve sight lines and boating safety (Figure 7). Table 5 summarizes the proposed moorage. Like Alternative 2, this alternative also deepens the channel and basin, makes improvements to marina amenities, expands room for vessels to maneuver, increases moorage by replacing the sheetpile wall with a rock feature, provides ADA connections, and improves the State Parks boat launch.
Alternative 3 includes the following:

- Marina improvements
  - Expand marina to west
  - Expand moorage
  - Provide ADA connections
  - Provide new boat pumpout on land side
  - Remove all creosote-treated wood
- Breakwater and sheetpile wall
  - No change to existing breakwater (except repairs as necessary)
  - New breakwater feature provides protection for marina expansion area
  - Replace steel sheetpile wall with buried rock feature transitioning off the existing breakwater
- Entrance channel and basin
  - Steepen rock slope along basin to maximize basin extent within 1988 footprint
  - Shift entrance channel geometry to reduce sharp angle for boaters entering/exiting marina
  - Expand marina to west with new dredge footprint
  - To reduce sediment redistribution due to propwash scour and to reduce the need for future maintenance dredging, deepen the entrance channel and commercial basin to -14 feet MLLW and line the commercial basin with rock (cobble or quarry spalls)
  - To reduce sediment redistribution due to propwash scour and reduce the need for future maintenance dredging, deepen the public basin to -12 feet MLLW
- Marine biology/permit feasibility
  - This alternative requires mitigation for impact to a new area of nearshore habitat and is challenging to permit
  - Placement of new breakwater feature tries to avoid impacts to eelgrass
  - Overwater footprint increases

Table 5
Alternative 3 Proposed Moorage

Item	Total Slips	Total Moorage (Linear Feet)
Commercial dock (80′ slips)	3	240
Commercial dock (wave attenuator, 90′ slips)	4	360
Commercial dock (150′ slips)	4	600
State Parks dock (30′ slips)	6	180
Public basin (30′ slips)	31	930
Public basin (40′ slips)	9	360
Public basin (60′ slips)	9	540
Public basin (70′ slips)	2	140
Pumpout (60′ slips)	1	60
Total		**3,410**

Advantages

- *Recreation and Visitor Experience*: Alternative 3 has the most significant increase in commercial and public moorage of all the alternatives. Reorientation and widening of the entrance channel would increase visibility for visitors entering and exiting the marina. The design accommodates different sizes and types of boats. A new breakwater feature protects the marina expansion area from large waves, allowing the space to be safe and accessible for many vessel types. All gangway access points are ADA accessible. A new upland pathway and picnic area are also fully ADA accessible, strengthening the connection between the marina, restroom, and kitchen shelter. New vegetation areas enhance aesthetics and provide a buffer between the upland pathway and marina rock slope areas. A new hand-carried boat launch would be provided for park users.
- *Sustainable Operations*: The reconstructed State Parks pier accommodates State Parks operational use. The new boat launch extends waterward to allow for a larger window of operational use that is less impacted by tide schedules. The boat launch would also be a permanent feature and not require State Parks staff to mobilize temporary mats prior to use.
- *Commercial Operations*: This alternative provides more moorage for commercial operations.
- *Flexibility*: This alternative provides the most flexibility for moorage and can accommodate the largest boats.
- *Sediment Management*: The entrance channel and moorage basins are dredged to a deeper elevation to avoid scour from propwash, commercial and public use.
- *Nearshore Habitat and Subtidal Habitat*: The design removes all creosote-treated wood from the marina. New moorage floats (except for the wave attenuation float) and gangway are grated to maximize light penetration.

- *Sea Level Rise*: The design considers sea level rise. The buried rock slope that would replace the deteriorated sheetpile wall and the new breakwater are designed to withstand sea level rise estimates. The marina structures are designed with durable materials to withstand increased storm frequency and severity.

Disadvantages

- *Recreation and Visitor Experience*: The size of the moorage facility is considerably larger than the current marina, creating an opportunity for many more visitors to come to Blake Island. An increase in visitors, however, could lead to more congestion on the island's amenities such as campgrounds, trails, beaches, restrooms, kitchen shelters, and picnicking areas.
- *Recreation and Visitor Experience*: While the realigned entrance channel improves visibility for boaters coming in and out of the marina (see above), the new alignment does not significantly reduce wave heights.
- *Sustainable Operations*: This alternative includes more structures, which would have more operational and maintenance requirements.
- *Nearshore Habitat and Subtidal Habitat*: Alternative 3 would result in impacts to eelgrass and macroalgae habitat in the expansion area and in the footprint of the new breakwater. The new entrance channel location also impacts eelgrass. The proposed wave attenuator float is not grated and would be a solid structure within the nearshore.
- *Sea Level Rise*: This alternative designs for sea level rise. However, the increase in moorage and engineered shoreline results in more future maintenance.
- *Permit Feasibility*: Alternative 3 expands impacts outside the original marina footprint, both for dredging and marina structures. It would require extensive permitting and mitigation to comply with federal, state, and local environmental regulations. Finding appropriate mitigation to offset impacts could be difficult.
- *Value for Cost*: This alternative requires high permitting, design, and construction costs to implement the proposed expansion. The cost per moorage linear foot is approximately $9,250.
- *Implementation Schedule*: The extent of in-water work for proposed dredging and the installation of a new breakwater will likely require construction over two in-water work windows. This could require State Parks to close the park's moorage for a summer season.
- *Constructability*: The Project is constructable; however, the extent of in-water work would be challenging, in particular the new breakwater installation. The contractor will need to identify measures to reduce turbidity and impacts on sensitive habitats and species.

3.A.4 State Parks Boat Launch

Alternatives 2 and 3 present the same proposal for the boat launch. The proposed design (Figure 8) installs a new permanent boat launch in the location of the existing structure. The boat launch is constructed with precast panels and extends to elevation +2 feet MLLW. The boat launch is connected with a 12-foot-wide crushed gravel pathway to the Blake Island roadway network. When not used by State Parks operational staff, the boat launch would be open and accessible to the public as a hand-carried launch. The area adjacent to the boat launch includes proposed beach dune plantings, logs for seating, and picnic tables.

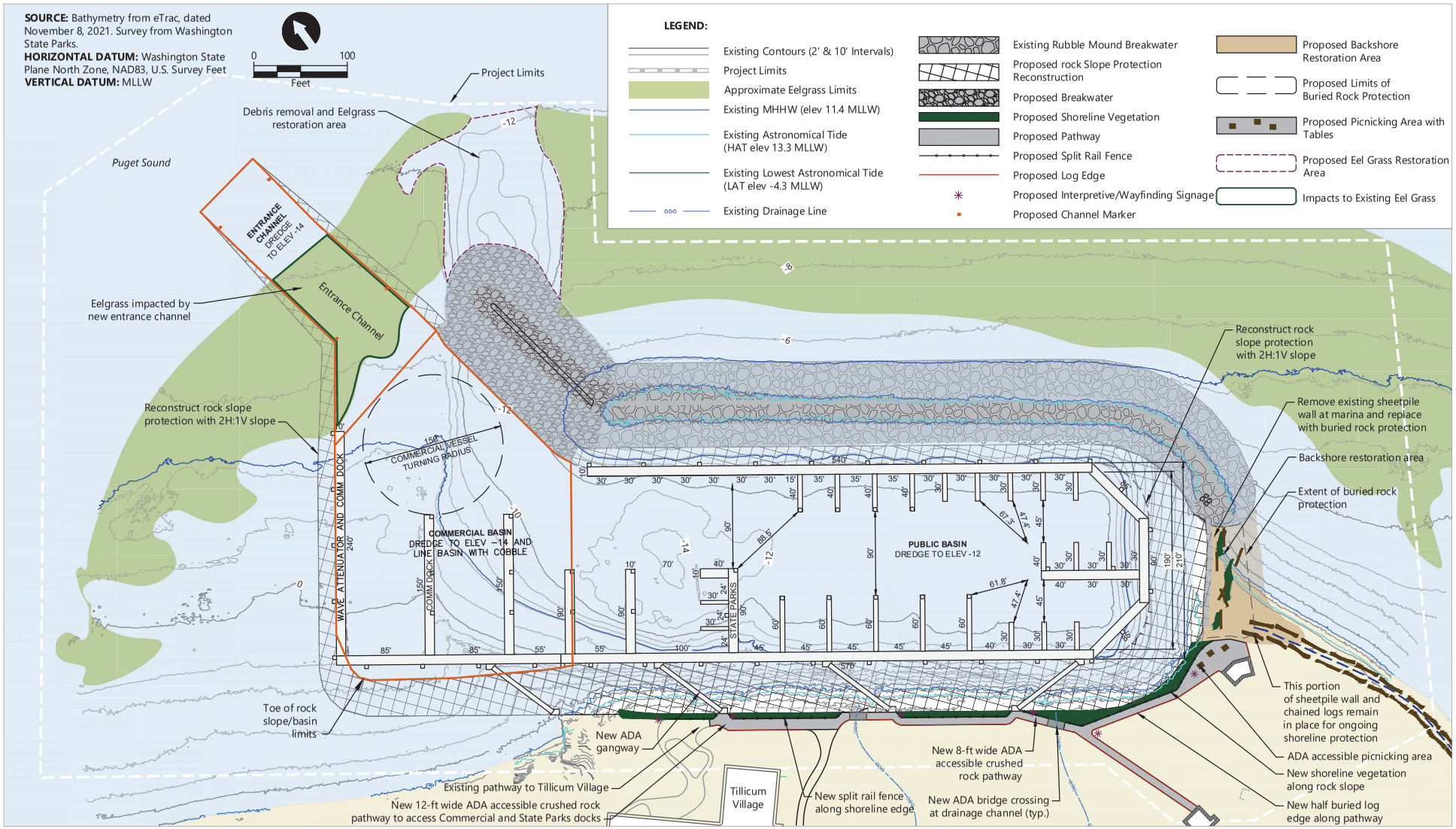

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Figure 7
Alternative 3 (Expansion)

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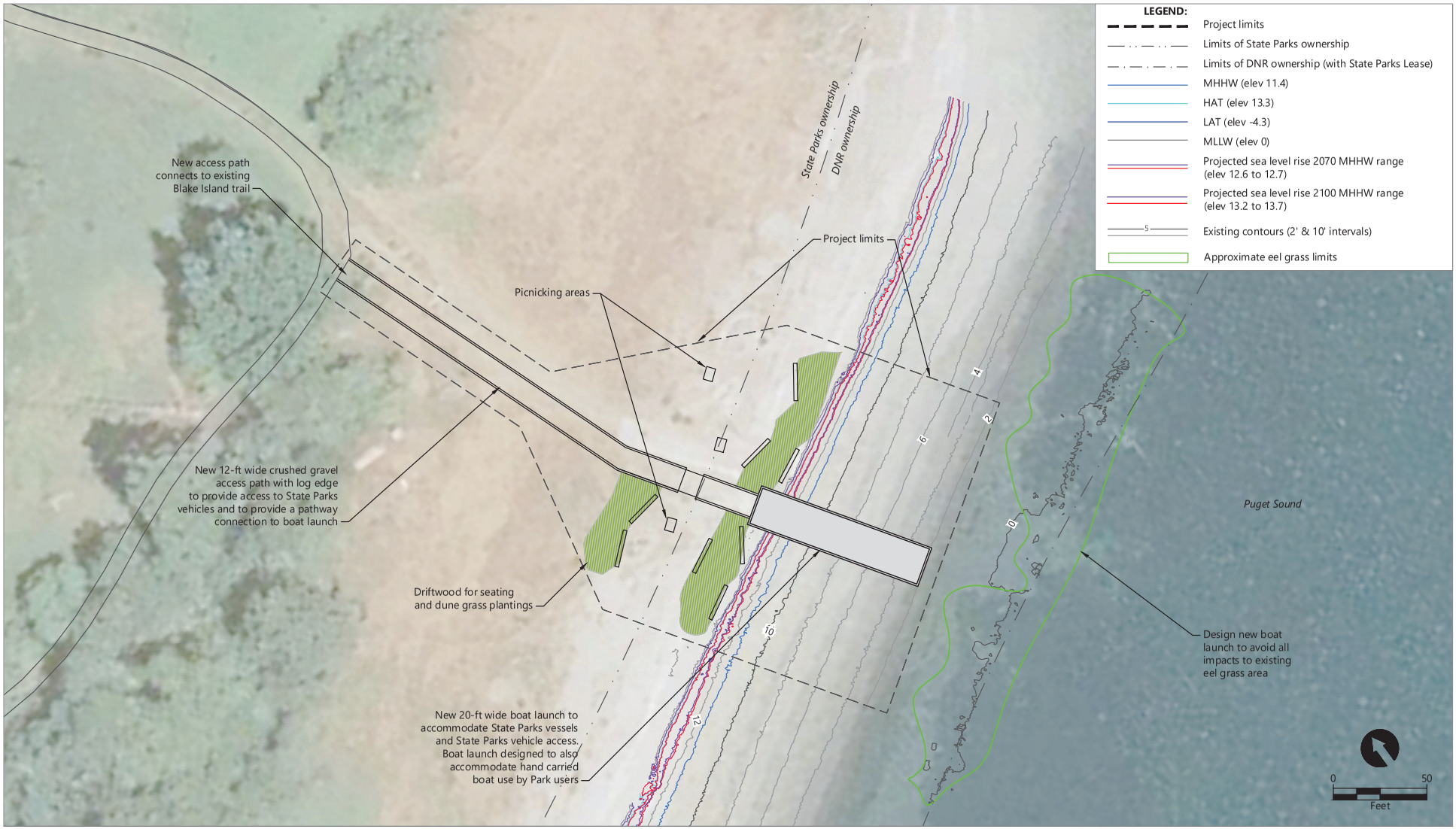

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Figure 8
Proposed State Parks Boat Launch

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Blake Island Marine State Park - Marine Facility Improvement Project

3.A.5 High-Level Alternatives Summary Table

Table 6 provides a summary using the design criteria to compare the alternatives. As the table shows, Alternative 2 ranks highest in terms of meeting the Project's design criteria.

Table 6
Alternatives Analysis Summary

3	Best meets criterion	2	Moderately meets criterion	1	Least meets criterion

Criterion	Alternative 1: No Action	Alternative 2: Reconstruction	Alternative 3: Expansion
Recreation and Visitor Experience	1	2	3
State Parks Operations and Maintenance	1	3	2
Commercial Operations	1	2	3
Flexibility	1	2	3
Sediment Management	1	3	3
Nearshore and Subtidal Habitat	2	3	1
Sea Level Rise	1	3	2
Permit Feasibility	n/a	2	1
Value for Cost	1	3	2
Implementation Schedule	n/a	3	2
Constructability	n/a	3	2
Totals	**9**	**29**	**24**

3.B Cost Estimates for Each Alternative

The following section summarizes ROM and life-cycle cost comparison information.

3.B.1 Rough Order-of-Magnitude Opinion of Probable Construction Costs

Table 7 provides high-level and preliminary ROM opinions of probable costs for each alternative.

Table 7
Rough Order-of-Magnitude Opinion of Probable Costs for Each Alternative

Blake Island Marine Facilities - Predesign
Rough Order of Magnitude - Opinion of Probable Construction Cost - Preliminary
Summary Sheet

	Alternative 1	Alternative 2	Alternative 3
Site preparation	$0	$40,700	$40,700
Demolition	$0	$525,150	$525,150
Dredging and in-water shoreline stabilization	$0	$3,994,660	$8,405,427
Waterside improvements	$0	$6,079,250	$8,393,250
Shoreline restoration	$0	$294,300	$406,800
Upland improvements	$0	$203,600	$309,500
Boat landing and improved circulation	$0	$216,100	$216,100
Subtotal	**$0**	**$11,353,760**	**$18,296,927**
Mobilization (10%)	$0	$1,703,064	$2,744,539
Subtotal	$0	$13,056,824	$21,041,466
Design Contingency (25%)	$0	$3,264,206	$5,260,366
Subtotal	$0	$16,321,030	$26,301,832
Total Rough Order of Magnitude (ROM)	**$0**	**$16,321,030**	**$26,301,832**
Construction Contingency (10%)	$0	$1,632,103	$2,630,183
Subtotal	$0	$17,953,133	$28,932,015
Sales Tax (9%)	$0	$1,615,782	$2,603,881
Subtotal	$0	$19,568,915	$31,535,897
Total ROM Opinion of Probable Construction Cost*	**$0**	**$19,568,915**	**$31,535,897**

3.B.2 Preliminary Cost Estimate Assumptions

Assumptions used for the preliminary cost estimates shown in Table 7 are as follows:

- All costs are in 2022 dollars.
- In providing opinions of probable construction cost, State Parks understands that the Consultant (Anchor QEA, LLC) has no control over the cost or availability of labor, equipment,

or materials, or over market conditions or the Contractor's method of pricing, and the Consultant's opinions of probable construction costs are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, expressed or implied, that the bids or the negotiated cost of the Work will not vary from the Consultant's opinion of probable construction cost.

- Costs do not include Design/Engineering Consultant Services Fees, Project Management, Survey, Planning and Design Review, Bidding, Construction Phase Project Management & Administration, Construction Inspection, Environmental Permitting, Permit Related Monitoring, or Artwork.
- Costs do not include escalation.
- Dredging costs assume that sediment quality testing will occur prior to construction (during design development) and 50% of the dredged materials meet sediment quality standards for an approved open water disposal facility. Costs assume the other 50% of the dredged materials are in exceedance of quality standards for open water disposal, and the material is disposed of at an upland facility. Table 8 provides summary of the cost differences between disposal facilities.

Table 8
Dredged Material Disposal Summary (Preliminary)

Alternative	Material Disposal Assuming Open Water Disposal Cost	Material Disposal Assuming Upland Disposal Cost	Dredging and Upland Disposal Assuming an Averaged Cost*
Alternative 2	$15,935	$4,957,680	$2,486,800
Alternative 3	$28,810	$8,963,080	$4,495,90

Note:
* Averaged cost means 50% of sediment is disposed of at open water facility and 50% is disposed of at upland facility. This is the current cost assumption for preliminary opinion of probable construction costs.

3.B.3 Life-Cycle Cost Model

The OFM life-cycle cost model evaluated the following:

- Existing condition (“Existing Lease”)
- Ownership Options 1, 2, and 3: Alternatives 1, 2 and 3, respectively

The backup of the life-cycle model is provided in Appendix B.

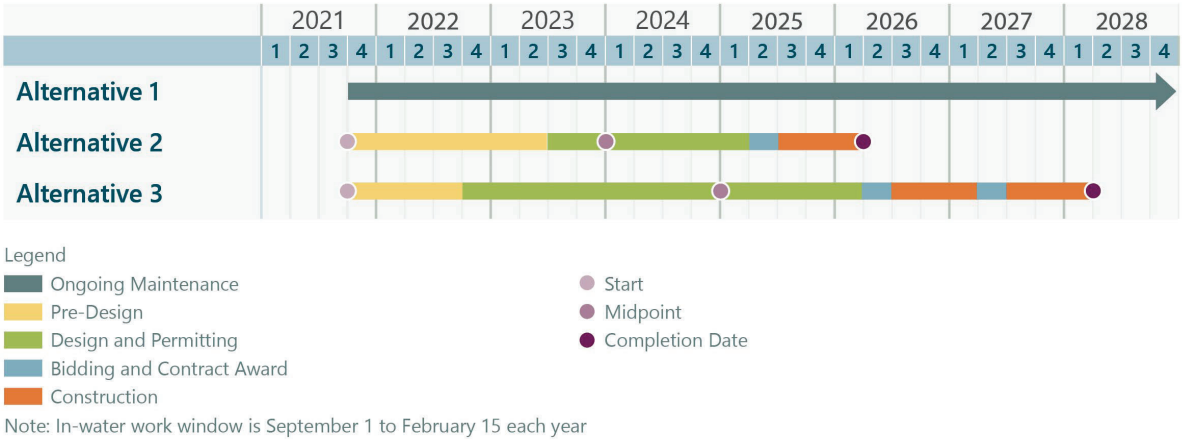
The life-cycle model results indicate that the cost of Alternative 3 will require the highest cumulative cash over time. The initial cost is the highest and the maintenance over time is also higher. Alternative 2 has a lower cumulative cash because there is a lower initial cost and less maintenance

as compared to Alternative 3. Alternatives 2 and 3 have very similar annual cash flow over time. Alternative 1 has the lowest cumulative cash and annual cash flow.

3.C Schedule Estimates

Figure 9 provides estimated start points, midpoints, and completion dates for each alternative.

Figure 9
Schedule Estimates for Each Alternative



Alternative 1 (No Action Alternative) assumes that business as usual can proceed for approximately 3 more years, at which time considerable maintenance will need to occur to keep the marina open and safe. Maintenance will extend the life of the marina, but over time continued structural deterioration would impact operations, useability, and safety, and State Parks may have to consider closure and/or demolition of one or multiple structures. Unforeseen events (such as material failure or large storm events) could reduce the time frame.

Alternative 2 assumes that design and permitting would start at the beginning of the State Parks 2023-2025 biennium (July 1, 2023) and extend over 2 years. This schedule accommodates the environmental permit review period, which could take 18 months in order to secure permits (see Section 4.D for additional details). This approach assumes all the Project elements and required mitigation are permitted together, rather than phasing permitting and design, which could complicate securing permit authorization and completing all work within the environmental permit timing limitations. The Project would then go to bid in 2025 and be constructed in late 2025 and early 2026. The annual in-water work window is a key element to the construction scheduling. For Blake Island, the in-water work window is September 1 to February 15 (for projects that include dredging). Alternative 2 assumes all work can be completed within one in-water work window. Alternative 2 would be fully implemented by early 2026.

Similar to Alternative 2, **Alternative 3** assumes design and permitting of the entire Project would occur concurrently. However, the construction of Alternative 3 is phased over two in-water work windows. The first phase implements the same footprint as Alternative 2 and the second phase expands the marina to the west. Based on these assumptions, design and permitting of Alternative 3 would start at the beginning of the State Parks 2023-2025 biennium (July 1, 2023) and extend over 3 years. The schedule allows time to conduct outreach with the agencies, identify mitigation to offset the impacts of marina expansion, and secure permits. The first phase of construction would then go to bid in 2026 with construction extending from 2026 through early 2027. The second phase of construction would then go to bid in 2027 with construction extending from 2027 through early 2028. Construction will align with the September 1 to February 15 in-water work windows.

4 Detailed Analysis of Preferred Alternative

Alternative 2 scores highest, best meets the Project goals, and is identified as the Preferred Alternative. This chapter provides a detailed description of the Preferred Alternative design. A thorough site analysis summarizes the background information gathering, technical evaluations, and basis of design.

4.A Preferred Alternative Description

The Preferred Alternative proposes to remove the current marina structures and reconstruct new docks, floats, piers, and gangways in a reconfigured horseshoe layout to increase moorage capacity and accommodate a wider variety of vessel types while staying within the existing marina's development footprint (Figure 10). The new layout provides a wide range of slip sizes that will support flexible use of the marina by both public and commercial vessels. The marina basin will be dredged to a depth that accommodates current operations while reducing potential scour, sedimentation, and the frequency of future maintenance dredging (Figure 11). The Preferred Alternative also provides ADA-accessible gangways, slips, and upland trail connections. It proposes to enhance State Parks operations through an improved dock and boat launch. The following provides details of the proposed improvements:

- Dredging will occur to the full horizontal extent conducted in 1988. The designated commercial basin and the entrance channel is dredged to elevation –14 feet, which is 2 feet deeper than the 1988 dredge. The designated public basin is dredged to elevation –12 feet, which is 2 feet deeper than the 1988 dredge.
- The existing armored rock slope is replaced and reconstructed (at a slope of 2 horizontal: 1 vertical) with light riprap. The steeper reconstructed slope will create more room for vessel navigation and moorage within the existing footprint of the marina. Cobble is placed on the bottom of the marina's commercial basin for protection.
- The basin redesign creates a 150-foot turning radius for large commercial vessels. This reduces the long-term need for dredging maintenance because expanded room for maneuvering reduces scouring from propeller wash.
- The marina's existing docks are removed and new marina facilities reconstructed in a horseshoe configuration with "fingers" or slips extending from the horseshoe dock into the basin. The new layout increases moorage by nearly 1,400 linear feet.
- Large slips are placed near the entrance in the commercial basin, providing increased moorage designated for commercial vessels and easy entry and exit to the marina.
- A reconstructed State Parks dock will be designed as a floating structure with gangway access.
- A designated public basin will include 30-, 40-, 60-, and 70-foot slips to accommodate a wide variety of vessel sizes and types.

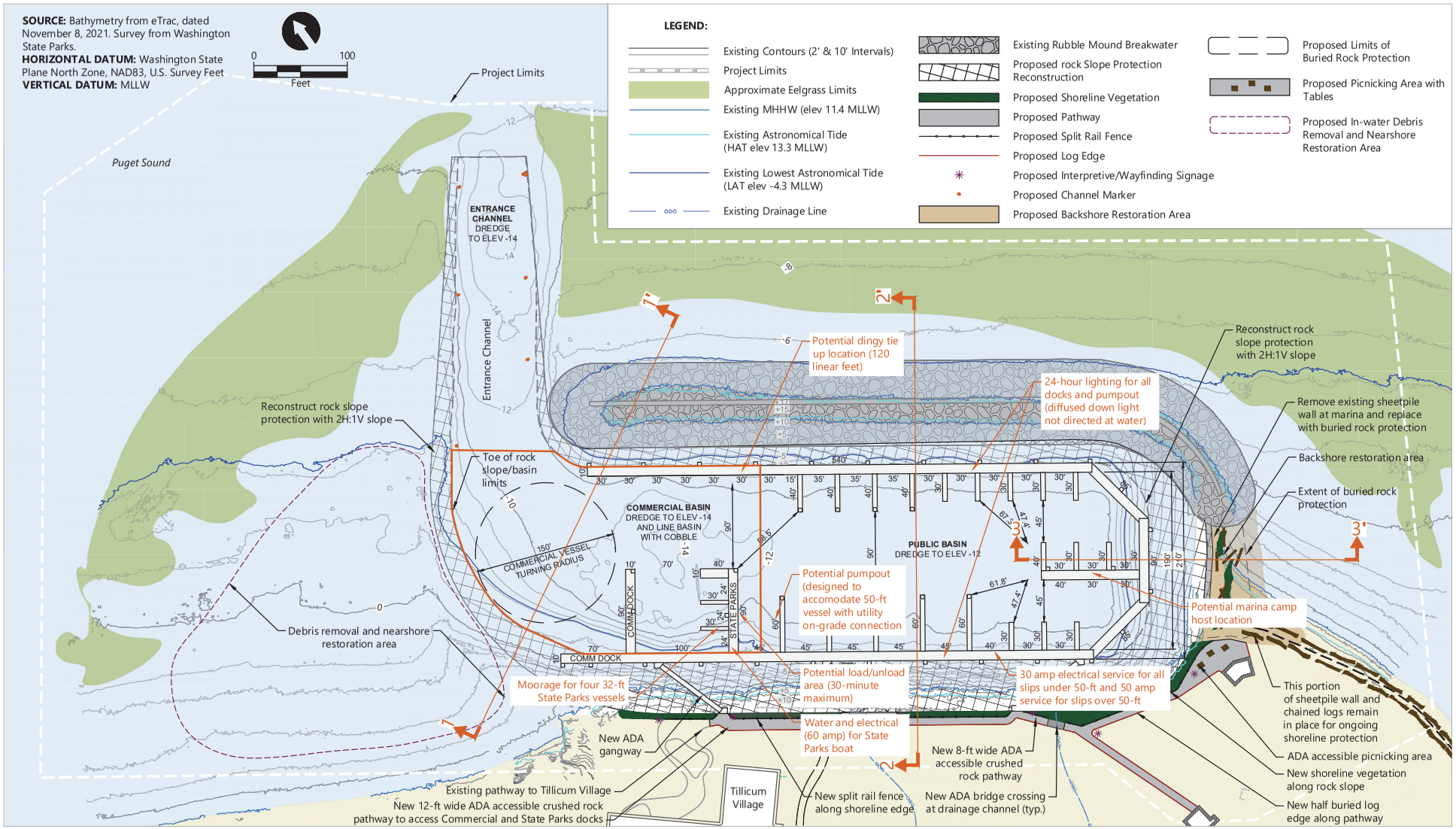
- Three 80-foot ADA gangways are installed along the marina's southern shoreline to create access from the uplands to the commercial and public basins and meet ADA requirements.
- Improvements to marina amenities include new marina floats, guide pilings, sewer force main and pumpout, marina water system, marina electrical system, and marina fire protection system.
- The section of the sheetpile wall on the southeastern side of the marina is replaced with buried rock protection. The buried rock protection is covered by a backshore restoration area that includes driftwood and irrigated dune grass plantings. The sheetpile wall that runs along the shoreline adjacent to the campground (outside of Project limits) is left intact.
- No impacts on existing eelgrass habitat will occur, and the design proposes habitat improvements. Approximately 10,000 square feet of debris is removed in order to restore an equivalent area of nearshore habitat west of the marina.

The Project also proposes the following upland improvements:

- New 12-foot-wide and 8-foot-wide, ADA-accessible crushed rock pathways that connect the upland area to new ADA-accessible gangways; a new ADA concrete bridge crossing at an existing drainage channel; and ADA-accessible picnicking area with three new picnic tables
- New shoreline vegetation
- Split-rail fence along the shoreline edge and new interpretative/wayfinding signage

Features of the State Parks boat launch include the following:

- A 20-foot-wide, precast concrete boat launch for use by the State Parks' *Thunderbird* vessel
- Improved crushed gravel roadway access between the new boat launch and existing Blake Island upland roadways and trails
- Designated area for hand-carried boat landing and launch
- New shoreline vegetation



Publish Date: 2022/06/14 12:15 PM | User: rfarnsworth
Filepath: K:\Projects\0363-WA State Parks\Blake Island Marine Facility\0363-RP-009 (Alt2-Preferred Alternative).dwg Figure 10

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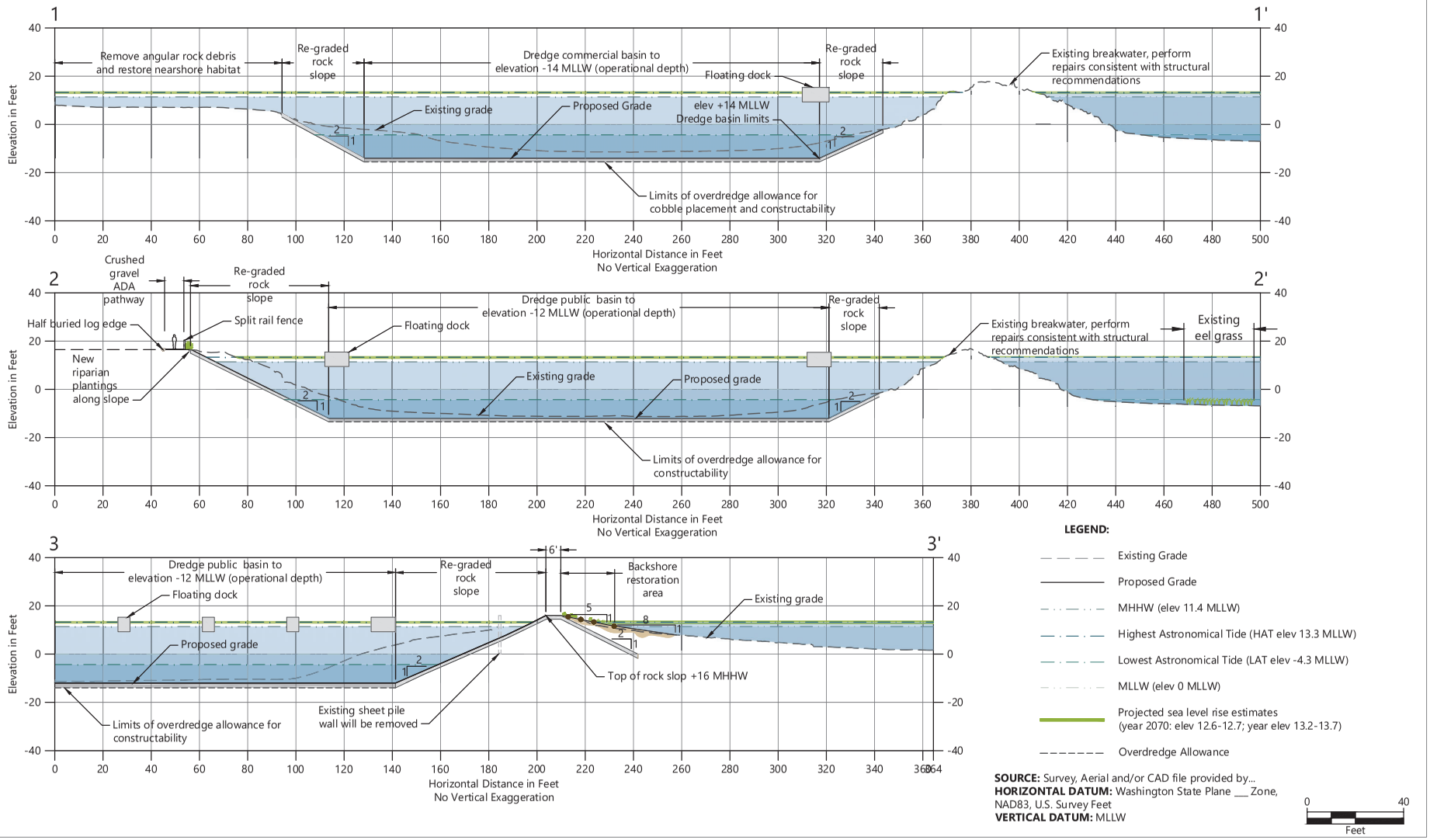
Figure 10
Preferred Alternative Plan

Predesign Report
Blake Island Marine State Park - Marine Facility Improvement Project



Publish Date: 2022/06/14 1:58 PM | User: rfarnsworth
Filepath: K:\Projects\0363-WA State Parks\Blake Island Marine Facility\0363-RP-009 (Alt2-Preferred Alternative).dwg Figure 11

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Figure 11
Preferred Alternative Sections

Blake Island Marina State Park - Marine Facility Improvement Project
Washington State Parks and Recreation Commission

4.B Site Analysis

Following the OFM checklist, this section provides a detailed analysis of the Project area and provides an overview of how the Preferred Alternative addresses each site analysis element.

4.B.1 Completed and Ongoing Studies

Coastal Process Analysis (ongoing)

A preliminary coastal process evaluation (Blue Coast Engineering 2021) was conducted to inform the development and analysis of the alternatives, including the Preferred Alternative. The following summarizes the ongoing work and provides a summary of the following key components:

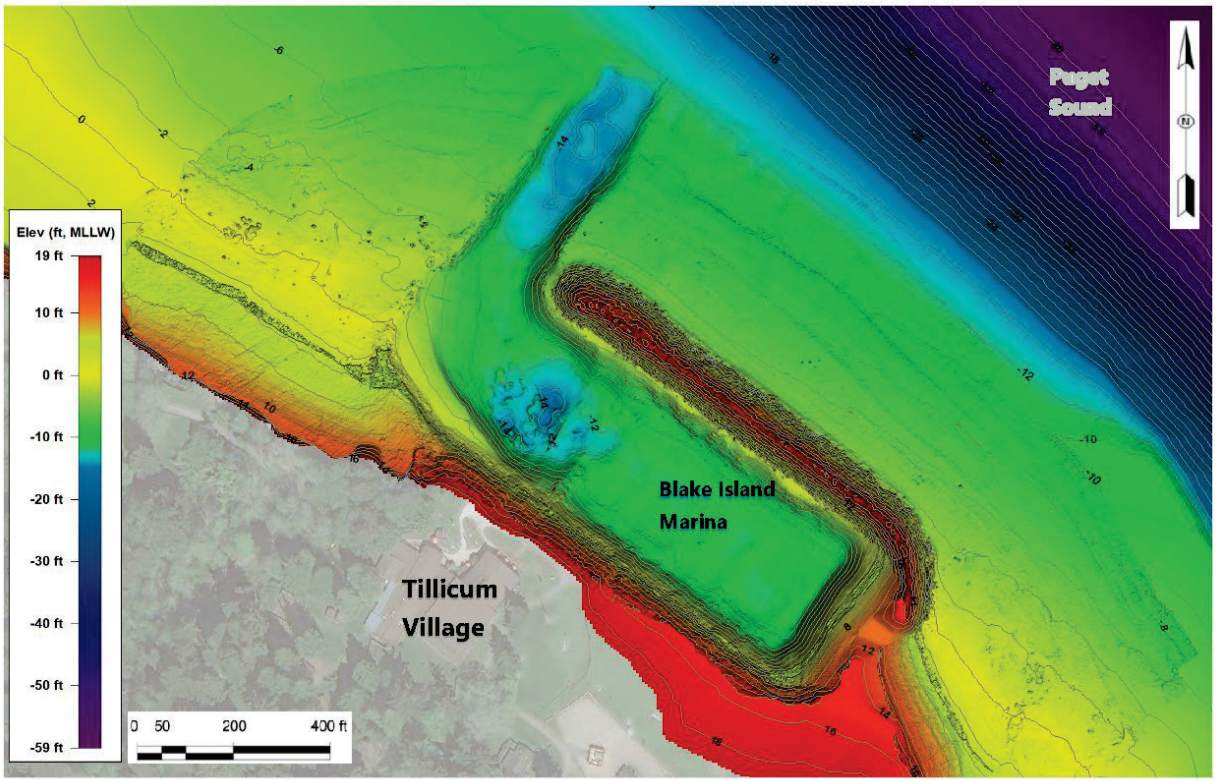
- Existing beach bathymetry and topography data
- Water level and sea level rise
- Wave modeling

The analysis also analyzed sediment accumulation within the marina. This analysis provided data that informed the Preferred Alternative (see Section 4.F).

Bathymetry and Topography Data

Bathymetry and topography data used for the coastal processes analysis included publicly available information and site survey data collected as part of this Project. Regional information was taken from data developed by OCM Partners (2021), which are available from the Coastal National Elevation Database (CoNED 2021). This dataset combined bathymetry information from a 1-meter resolution model developed by the U.S Geological Survey updated with recent multi-source bathymetric data for Puget Sound. Site-specific multi-beam bathymetry data for the Project area were collected on November 8, 2021, by eTrac Inc. Figure 12 provides a map of the nearshore topography and bathymetry data.

Figure 12
Nearshore Topography and Bathymetry in the Project Area



Sources: eTrac Survey 2021, CoNED 2021

Water Levels and Sea Level Rise

Water levels in Puget Sound are influenced by astronomical tides (mixed semi-diurnal); localized, short-term fluctuations due to meteorological conditions (storm surge); and long-term changes in mean sea level resulting from climatic variation and vertical land motion. Reference vertical datums and projections for sea level rise are provided to understand the frequency and level of inundation at the Project area.

Characteristic tidal datum elevations are available from the National Oceanic and Atmospheric Administration (NOAA) National Ocean Service (NOS) water level station 9447130 at Seattle, Washington, which is 8 miles northeast of the Project area, for the 1983 to 2001 tidal epoch (Table 9). Water levels are provided relative to MLLW and North American Vertical Datum of 1988 (NAVD88) using conversions developed by NOAA.

Table 9
Summary of Water Level Elevations at NOAA-NOS Seattle Tide Station (9447130)

Datum / Elevation	Elevation (ft MLLW)	Elevation (ft NAVD88)
100-year water level (1% AEP)[1]	14.7	12.4
10-year water level (10% AEP)[1]	14.3	12.0
Highest Astronomical Tide (HAT)[2]	13.3	10.9
Mean Higher High Water (MHHW)	11.4	9.0
Mean High Water (MHW)	10.5	8.2
Mean Tide Level (MTL)	6.7	4.3
Mean Sea Level (MSL)	6.6	4.3
Mean Low Water (MLW)	2.8	0.5
North American Vertical Datum 1988 (NAVD88)[2]	2.3	0.0
Mean Lower Low Water	0.0	-2.3
Lowest Astronomical Tide (LAT)	-4.3	-6.6

Notes:

1. From NOAA-NOS Seattle station (9497130) 2018 extreme water level trend analysis.
2. NOAA VDatum online tool for Blake Island conversion to NAVD88 differs by 0.1 foot and therefore the NAVD88 conversion from Seattle is presented for planning purposes.

A NOAA-NOS analysis of the water level record at the Seattle tide station 9497130 (the nearest long-term station) provides extreme water levels relative to the 1983 to 2001 epoch with projections to 2018 (NOAA-NOS 2020). The extreme water levels (1-year and 100-year return interval) based on the analysis are provided in Table 9 for the Seattle NOAA gage. The water levels presented in Table 9 are still-water elevations that include fluctuations due to astronomical tide, storm surge, wind, and wave setup but do not include wave run-up. The 100-year still-water elevation of 14.7 feet MLLW is approximately 3 feet below the as-built crest elevation (18 feet MLLW) of the marina breakwater and approximately equal to the riprap revetment as-built crest elevation of 15 feet MLLW.

Long-term mean sea level in Puget Sound is predicted to increase compared to historical rates of sea level rise because of climate change-related impacts. Miller et al. (2018) provide projections of local sea level rise at coastal locations in Puget Sound and Washington for various planning horizons. The projections incorporate the latest assessments of global sea level rise due to low (RCP[1] 4.5) and high (RCP 8.5) greenhouse gas scenarios and local estimates of vertical land motion. The median estimates of sea level rise, in the years 2050, 2070, and 2100 at Blake Island range from 0.8 to 2.3 feet (Table 10). These estimates should be used for planning purposes.

[1] Representative Concentration Pathway (RCP) is a greenhouse gas concentration trajectory adopted by the Intergovernmental Panel on Climate Change (ICPP 2014).

Table 10
Projected Median Sea Level Rise for Different Time Periods and Greenhouse Gas Scenarios for the Coastal Area near Blake Island

Year	Greenhouse Gas Scenario	Sea Level Rise Magnitude (feet) 50% Probability Exceedance[1]
2050	Low (RCP 4.5)	0.8
2050	High (RCP 8.5)	0.8
2070	Low (RCP 4.5)	1.2
2070	High (RCP 8.5)	1.3
2100	Low (RCP 4.5)	1.8
2100	High (RCP 8.5)	2.3

Note:
1. Estimates from Miller et al. (2018).

Wave Modeling

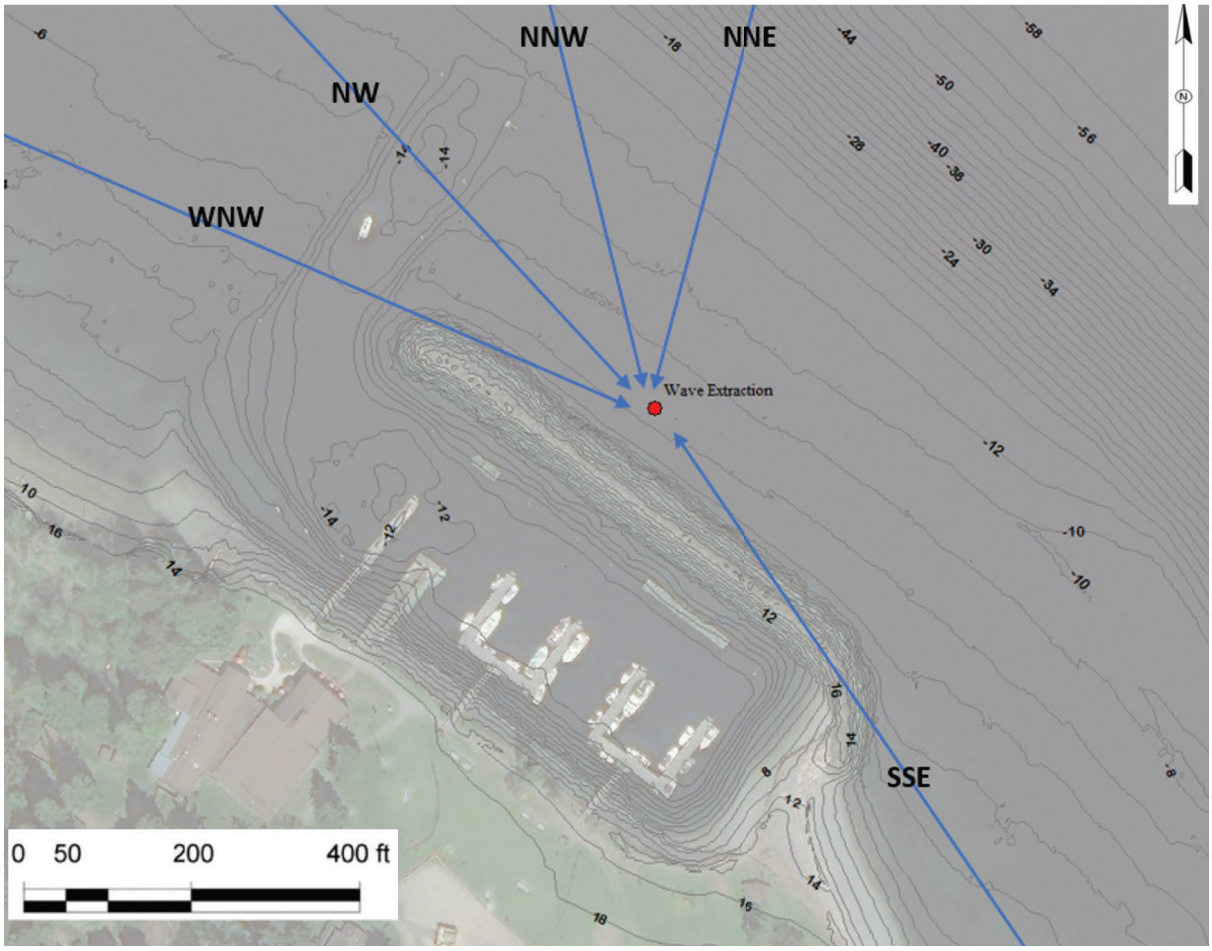
Wave numerical modeling was conducted to provide predictions of wave heights in the vicinity of the Project area. Predicted storm wind conditions were used as input to the wave model considering MHHW water level datum. The model simulations included wind from five directions: NNE, SSE, WNW, NW, and NNW. A list of all model simulations (runs) conducted for this analysis is provided in Table 11.

Table 11
Summary of Wave Model Simulations

Run	Return Period (Based on Wind)	Water Level	Direction	Wind Speed (mph)
1	10-year	MHHW	NNE (13°)	35
2			SSE (150°)	50
3			WNW (292.5°)	15
4			NW (317°)	15
5			NNW (348.75°)	27
6	100-year		NNE (13°)	42
7			SSE (150°)	59
8			WNW (292.5°)	15
9			NW (317°)	18
10			NNW (348.75°)	34

Figure 13 diagrams the modeled wave parameters. The largest waves are approaching the Project area from the SSE. The existing breakwater protects the marina from these waves. The boat launch is impacted by the SSE waves. The largest waves at the marina come from the NNE and NNW.

Figure 13
Modeled Waves



Marine Engineering Evaluation (completed in 2021)

Condition Assessment

A preliminary assessment of the Blake Island marina facilities was completed in June 2021. The *Blake Island State Park Facility Condition Assessment Draft Report* (Moffat & Nichol 2021) includes on-site observations and inspection documentation for the existing four major dock facilities (east dock, west dock, State Parks dock, and commercial dock) along with other marine infrastructure currently on site (sewer pumpout float, breakwater, navigational markers). This assessment reported a total

estimated construction cost for marina repairs to be $5,598,000. Identified data gaps are included in Section 4.E.

During the Predesign Report process, State Parks reviewed the repair cost estimate and, while using different methodology and assumptions that new building codes will be met, arrived at nearly the same cost to repair the marina: $5.5 million. Therefore, the cost to repair[2] the marina is equal to or greater than the cost to replace it.[3] If State Parks does not immediately have funds for the replacement, work should begin immediately on the most critical items and work down the priorities, with any funds available, to keep the facility safe.

The following is a summary of the existing conditions at each dock, including the repairs deemed most critical to the overall safety of the marina. "Poor condition" means there is "advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency" (Moffat & Nichol 2021).

East and West Docks. The east and west docks (Photographs 1 and 2) are each rated to be in poor condition with severely degraded elements. Damage, deterioration, and localized rot are present on the access piers, including the creosote-treated piles and pile caps, the timber cross bracing, decking, and handrail posts. Deck boards on both structures will need to be replaced within 5 years. The east dock's concrete pier abutment is severely deteriorated and in need of immediate repair. The float modules and guide pile hoops on both docks are in critical condition, with severe rot found on key structural members. In order of importance the following repairs should be completed as soon as possible:

1. Replace East Dock Pier Abutment
2. Replace Fractured Pile Hoops on the East and West Dock Floats
3. Replace Severely Deteriorated Floating Docks (East and West)
4. Replace Deteriorated Creosote-Treated Piers (East and West)

[2] "Repair" in this context means to replace some elements of the structure to maintain uses and functionality. Any elements of the structure that are deemed reusable will remain in place.

[3] "Replacement" in this context means to upgrade the existing structures and systems to meet current codes, thereby improving safety and functionality. This is a full replacement of the structure.

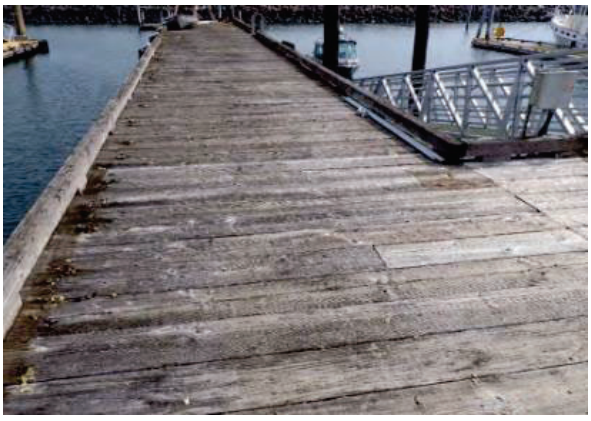
Photograph 1
East dock

Photograph 2
West dock

State Parks Dock. The State Parks dock (Photograph 3) is rated to be in poor condition. Damage, deterioration, and localized rot are present on the access pier, including the creosote-treated piles and pile caps, the timber cross bracing, decking, and handrail posts. Deterioration and rot are also present on the structural framing of the floats. In order of importance the following repairs should be completed as soon as possible:

1. Replace Deteriorated Creosote-Treated Pier
2. Replace Deteriorated State Park Float

Photograph 3
State Parks dock



Commercial Dock. The commercial dock (Photograph 4) is rated to be in poor condition. Damage and deterioration are present on the access pier, including the creosote-treated piles and pile caps, the timber cross bracing, decking, and handrail posts. The concrete floats appear to be in fair condition. However, findings are inconclusive because underwater inspections have not been completed. The following repairs should be completed as soon as possible:

1. Replace Deteriorated Creosote-Treated Pier

Photograph 4
Commercial dock

Other Marine Infrastructure

Sewer Pumpout Float: The sewer pumpout float (Photograph 5) is in fair condition; however, the existing sewer discharge pipe is damaged and out of service.

Rubble Mound Breakwater: The rubble mound breakwater (Photograph 6) is in fair condition. There are minor areas of deterioration where localized areas of rubble have sloughed or settled.

Photograph 5
Sewer pumpout float

Photograph 6
Rubble mound breakwater

Steel Sheetpile Wall: The sheetpile wall (Photograph 7) is severely corroded and has reached the end of its useful life. The purpose of the sheetpile structure and the implications of its failure are not fully understood. Perhaps it is serving to stabilize against deep-seated sliding or to contain finer materials from migrating. Failure of the sheetpile wall would likely increase the possibility of slides

and material loss. If this occurs on the east side of the marina, waves could overtop and remove material completely, exposing the marina on the east side.

Navigational Markers: Data gaps exist within the 2021 condition assessment of the navigational markers (Photograph 8; Moffat & Nichol 2021). The inspection of navigational marker guide piles appears to have been visual only. Below-water inspection would be needed to fully assess their condition.

Photograph 7
Sheetpile wall

Photograph 8
Navigational markers

Americans with Disabilities Act Assessment (completed in 2020)

State Parks contracted with an accessibility consultant, EMG, in 2020 to complete an accessibility assessment for the Blake Island marina area. EMG completed site visits to review exterior and interior accessibility to amenities at the marina. EMG found significant barriers to ADA access. The key barriers identified in the report within the Project area are summarized in Table 12.

Table 12
Significant Accessibility Issues

Facility/Location	Issue
Exterior access route	• Stairs do not have uniform risers. • Accessible routes are not provided to all amenities. • Accessible routes do not meet required clear widths. • Accessible routes do not meet running slope or cross slope compliance. • Entrance to the ranger station is not level. • Accessible routes have gaps in the surface greater than ½" wide. • Handrails at the stairs are not compliant. • Signage does not comply with height requirements and does not have raised lettering.
Boating and fishing	• Boat slip does not have a continuous clear opening with minimum width at pier edge.
Trail	• Trail does not meet required running slope or cross slope. • Portions of the trail are inaccessible. • Inaccessible trail does not have signage.

Source: *Accessibility Assessment for Blake Island* (EMG 2020)

4.B.2 Location

Blake Island is located in Kitsap County, Washington. The 472-acre park is located approximately 1.5 miles east of Manchester, 2 miles south of Bainbridge Island, 4 miles west of West Seattle, and 1.5 miles north of Vashon Island (see Section 2, Figure 1). Blake Island includes over 15,000 feet of Puget Sound shoreline. The state park, which encompasses the whole island, includes undeveloped forested areas, beaches and bluffs, hiking and biking trails, and areas for water recreational activities such as boating and fishing.

Adjacent to the marina is a developed picnic and camping area including restrooms, kitchen shelters, State Parks buildings, and the Tillicum Village buildings. These areas are not included within the Project area (see Section 2, Figures 2 and 3).

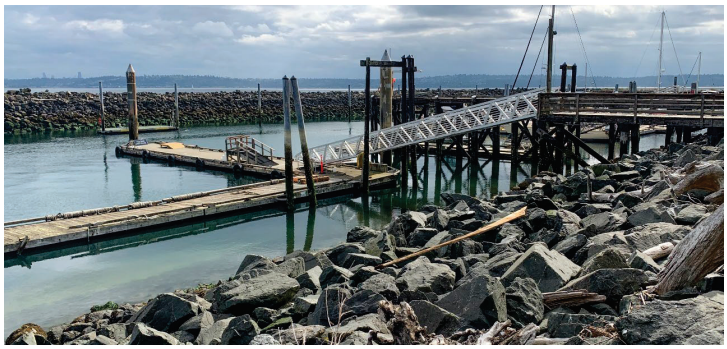
4.B.3 Dock Footprint

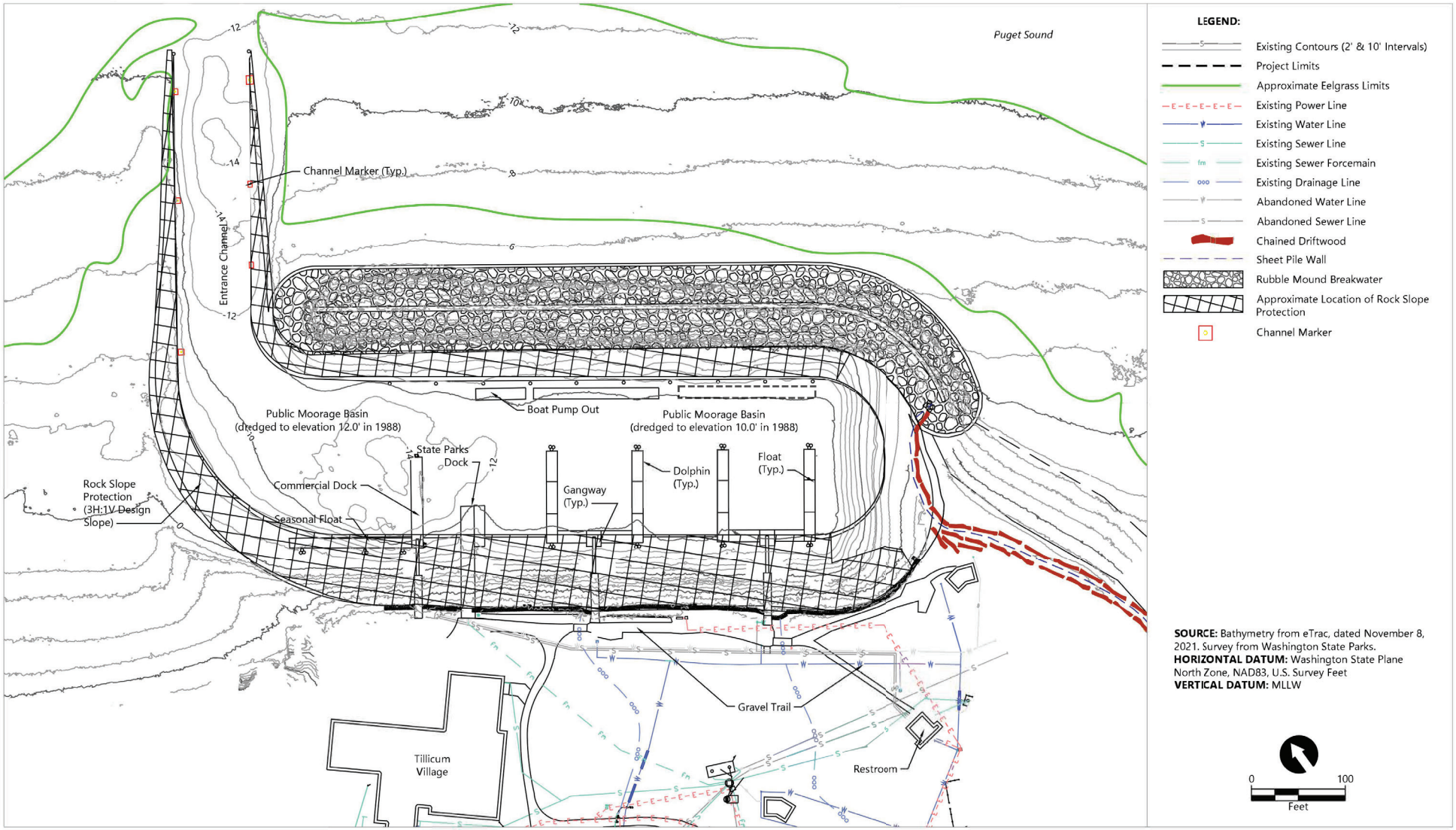
The Blake Island marina is located north of the Tillicum Village building on the northeast shoreline of the island. The marina includes a commercial dock with gangway, a State Parks access only dock with gangway, and four docks for public recreation use arranged in two U-shaped pairs with one gangway each (Photographs 9 and 10).

The marina also includes a seasonal float that is tied adjacent to the commercial dock during the summer season and a pumpout float. The docks are surrounded by a rubble mound breakwater that runs east-west and a section of sheetpile wall. A gravel pathway runs along the upland shoreline for access between the dock ramps, Tillicum Village, and park amenities including a restroom, day use, and camping areas. Figure 14 provides a basemap of the marina.

Photograph 9
View of marina from west with public moorage in the foreground

Photograph 10
View of marina from east along shoreline. Commercial dock with seasonal float in the foreground





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Filepath: K:\Projects\0363-WA State Parks\Blake Island Marine Facility\0363-RP-003 (Basemap_rev).dwg Figure 13

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Figure 14
Marina Base Map

4.B.4 Stormwater Requirements

State Parks will develop improvements in accordance with stormwater requirements of Kitsap County and the Washington State Department of Ecology (Ecology). Kitsap County stormwater design requirements are outlined in the *Kitsap County Stormwater Design Manual, Volumes I and II* (Kitsap County 2021a). The manual summarizes requirements for development in Kitsap County that are consistent with Ecology's *Stormwater Management Manual for Western Washington* (Ecology 2019). These requirements ensure that projects developed in the County meet state regulations, federal regulations, and National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Permit requirements. All projects in Kitsap County that disturb land, or add or replace new impervious surfaces, are required to meet the minimum requirements outlined in the *Kitsap County Stormwater Design Manual*.

Based on the permit review process outlined in the *Kitsap County Stormwater Design Manual*, a site assessment and planning package must be completed for land-disturbing projects to document the assessment of key project components and site design considerations. The planning package includes the following documents:

- **Project Information:** Includes basic project summary information.
- **Existing Site Inventory and Analysis Checklist:** Documents findings from the inventory and analysis of the site required for key project components.
- **Existing Site Composite Map:** Provides an overview of existing site features and proposed improvements to the site.
- **Existing and Proposed Site Land Cover Areas:** Summarizes existing and proposed site land cover areas for the purpose of demonstrating compliance with requirements to minimize impervious surfaces, loss of vegetation, and stormwater runoff.
- **Proposed Site Low Impact Development (LID) Best Management Practices (BMPs) Matrix:** Documents review and feasibility analysis of potential LID BMPs. Provides justification of why individual LID BMPs are included or not included in the design of a project.

The information developed in completing the site assessment and planning package will inform the applicability of minimum stormwater requirements for the Project. The following stormwater thresholds apply to improvements that will be implemented as part of the Project:

- Projects that result in more than 5,000 square feet of new or replaced impervious surface, or convert 0.75 acre or more of vegetation to lawn or landscaping, or convert 2.5 acres or more of native vegetation to pasture, are required to meet all the minimum requirements outlined in the *Kitsap County Stormwater Design Manual*. This includes most large projects.
- Projects that result in more than 2,000 square feet of new or replaced impervious surface or include land-disturbing activities in excess of 7,000 square feet, are required to meet Minimum Requirements 1 through 5. This includes relatively small projects.

- Projects that result in less than 2,000 square feet of new or replaced impervious surface or disturb less than 7,000 square feet are only required to meet Minimum Requirement 2.

The minimum requirements are as follows:

1. Preparation of a Stormwater Site Plan
2. Construction Stormwater Pollution Prevention
3. Source Control of Pollution
4. Preservation of Natural Drainage Systems and Outfalls
5. On-Site Stormwater Management
6. Runoff Treatment
7. Flow Control
8. Wetlands Protection
9. Basin/Watershed Planning Consistency
10. Operation and Maintenance

The Project includes primarily waterfront improvements that will upgrade moorage facilities and are waterward of the ordinary high water mark (OHWM). Additional analysis of existing and proposed land cover and disturbance upland of the OHWM will be needed once the improvements are better defined to understand which minimum stormwater requirements will apply to the Project.

Existing stormwater facilities at the site include two swales and associated culverts that convey surface water from developed areas through the Tillicum Village area to the marina.

The Preferred Alternative will result in minimal increase of hard surfaces within the Project area. The precast concrete boat launch and adjacent crushed gravel trail will increase hard surfaces. The upland trail improvements adjacent to the marina will replace an existing trail and will have a minimal increase in hard surfaces. New concrete abutments at the gangway connections will be an increase in hard surfaces. The Project will need to demonstrate compliance with Minimum Requirements 1 through 9 from the *Stormwater Management Manual for Western Washington*, including treatment of runoff from pollution-generating hard surfaces. A stormwater site plan narrative report will need to be prepared to describe how the design meets Minimum Requirements 1 through 9.

4.B.5 Ownership

State Parks owns the 472-acre Blake Island, which includes 655 acres of saltwater bedlands. The island consists of three parcels; State Parks acquired the first parcel in 1964 and the last parcel in 1974. DNR had leased the aquatic lands adjacent to Blake Island to State Parks but, in 1974, DNR granted the aquatic lands to State Parks (DNR 1974). State Parks ownership extends approximately a quarter mile waterward of the shoreline.

Blake Island was historically used by the Suquamish Indian Tribe. It is believed to have been named by an explorer in honor of George Smith Blake, the commander in charge of U.S. Coast Survey vessels (State Parks 2021d). William Pitt Trimble acquired the land and built an estate, which was later abandoned and destroyed by a fire. State Parks later acquired the land and the island officially became a park in October 1974.

4.B.6 Easements and Setback Requirements

Blake Island's shoreline is under the jurisdiction of the Kitsap County Shoreline Master Program (SMP). The SMP defines six shoreline classification categories: Natural, Rural Conservancy, Urban Conservancy, Shoreline Residential, High Intensity, and Aquatic (Kitsap County 2021b). Blake Island's shoreline is designated as Natural and Rural Conservancy. The northeast corner of the island, where the Project area lies, is designated only as Rural Conservancy. Per SMP Table 22.600.105, permitted activities within the Rural Conservancy shoreline environment include new boating facilities; fill placement upland of the OHWM; ecological restoration; mooring structures, including piers, docks, floats, ramps, and buoys; recreation; soft shoreline; and utilities. New marinas, breakwaters, dredging, dredge disposal, and fill waterward of OHWM may be permitted with a Conditional Use Permit.

The Project is proposed within Kitsap County designated critical areas, including fish and wildlife habitat conservation areas and frequently flooded areas. Therefore, the Project must comply with critical areas regulations per Kitsap County Code Chapters 19.100 and 22.400.115.

Puget Sound Energy has a utility easement at Blake Island near the marina and Tillicum Village for transformers and underground electrical lines associated with a primary electrical service for electrical power supply needs on the island.

4.B.7 Potential Issues with Surrounding Areas

The Blake Island Marine State Park encompasses the whole island, with no direct neighbors. No potential construction or operational issues are anticipated within the immediate surrounding areas.

The Project team will conduct public outreach with Blake Island visitors and any interested parties during the Project. Public outreach will include public postings and specific communications to local boating groups such as local yacht clubs, the Recreation Boating Association of Washington, and the Northwest Marine Trade Association. Ongoing outreach with Argosy will also occur.

As noted in Section 4.B, Blake Island is the ancestral camping groups of the Suquamish Tribe. State Parks will coordinate with the Suquamish Tribe and other interested Tribes during the Project.

4.B.8 Utilities

In addition to storm drainage facilities discussed previously, the following existing utilities serve the Project area:

- **Water:** The island's potable water supply is provided by four groundwater wells. The wells deliver water to two 15,000-gallon, aboveground storage tanks that are located approximately 0.5 mile southwest of the marina near the center of the island. A 3-inch PVC water main conveys water from these facilities to the Tillicum Village area and the marina.
- **Sewer:** The on-site sewer system consists of gravity sewer lines that collect sewage from cabins and buildings in the village and drain to a separation tank located below the picnicking lawn area south of the marina. There is also a pumpout float within the marina with a buried force main connection to the separation tank. The pumpout facilities were constructed in 1988 but have been out of service and closed for years. A vacuum truck empties the separation tank once per year. A sewage lift station, located adjacent to the separation tank, delivers sewage water from the separation tank to a treatment facility located approximately 1,500 feet southwest of the marina through a buried 4-inch force main. The treatment facility includes underground storage tanks, an aerated lagoon, a polishing pond, and drain fields.
- **Power and Communications:** As discussed in Section 4.B, PSE has underground electrical lines within the Project area. A PSE pad-mounted transformer is centrally located adjacent to and upland of the marina. That transformer is connected with approximately 363 linear feet of primary electrical service line to a PSE pad-mounted transformer located just southeast of the restroom building. There is under-dock power to dock pedestals on all docks. Buried secondary power lines connect on-site buildings, the sewage lift station, the sewage treatment facilities, and groundwater well and storage facilities to the PSE transformer near the restroom building. Communication lines are not shown on the current upland survey data provided by State Parks. Additionally, a navigation light near the marina is owned by the U.S. Bureau of Land Management and maintained by the U.S. Coast Guard.

4.B.9 Potential Environmental Impacts

Existing Facilities

As described previously, the Project area is located on the northeast corner of Blake Island, at the marina and approximately 600 feet farther southwest at the State Parks boat launch (Section 2, Figures 2 and 3). The marina area includes a public moorage basin; commercial moorage basin; four creosote-treated, pile-supported piers with floating docks; a steel pile-supported pumpout float; a rubble mound breakwater; a dredged entrance channel with pile channel markers (both creosote-treated wood piles and steel piles); a small beach at the south end of the marina; and rock and steel sheetpile bank protection. The entire marina area includes a total of 75 creosote-treated piles (Moffatt & Nichol 2021).

Adjacent to the marina is a developed picnic and camping area including restrooms, kitchen shelters, State Parks buildings, and the Tillicum Village buildings. The boat launch area is located south of the marina and includes a set of composite-material planking partially buried in gravel above OHWM, and a set of steel planks that can be used as a temporary access ramp for boat landing.

Shoreline Conditions

Photograph 11
View of shoreline southwest of marina

The shoreline includes a sand beach northwest of the marina with a high bluff, and a predominantly gravel beach to the southwest of the marina (Photograph 11). Some of the gravel was installed as part of a bank protection project in 2000 (Worthy and Associates 2000) that included the steel sheetpile wall at the south end of the marina, placement of a backshore with wood, and gravel beach material. This beach and bank work was completed to prevent erosion adjacent to the existing restroom facility.

Vegetation along the developed shoreline is dominated by the native American dunegrass (*Leymus mollis*); the beach backshore and upland areas are maintained as lawn with scattered mature Douglas fir (*Pseudotsuga menziesii*) and madrona (*Arbutus menziesii*), and small patches of salmonberry (*Rubus spectabilis*). Non-native species including Scot's broom (*Cytisus scoparius*) are present in the sandy backshore area. The bluff to the northwest is dominated by mature western red cedar (*Thuja plicata*), Douglas fir, western hemlock (*Tsuga heterophylla*), and Sitka spruce (*Picea sitchensis*) with an understory of swordfern (*Polystichum munitum*), evergreen huckleberry (*Vaccinium ovatum*), trailing blackberry (*Rubus ursinus*), and in more sunny areas close to the shoreline, Pacific crabapple (*Malus fusca*). A plant survey of the entire island was conducted in 2004 (Smith et al. 2005). The vegetation on the island is generally of high quality and dominated by native species, except in the Project area where development is concentrated. One rare plant, giant chain fern (*Woodwardia fimbriata*), is reported to be present on the south shore of the island.

Sediment

A significant habitat-forming feature along the shoreline is the coastal sediment drift cells that extend along the northern and southeast shorelines. These drift cells tend to transport sediment west to east on the northern shoreline, and south to north along the southeast shoreline. Both of these

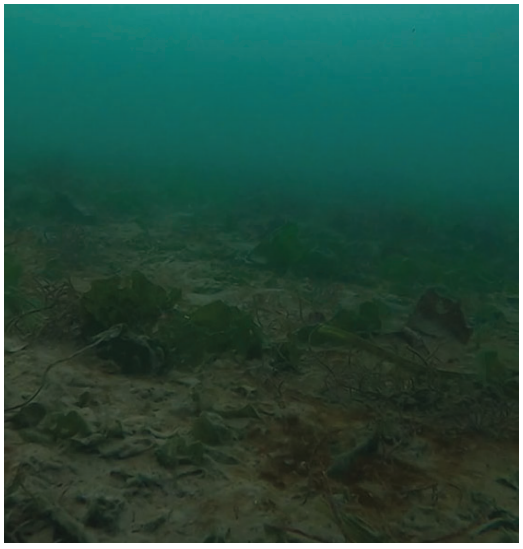
drift cells would naturally bring sediment to the marina location. However, sediment deposition is reduced by the presence of the breakwater, rock, and sheetpile bank protection, and by periodic dredging. These activities reduce the volume of sediment that would otherwise create a shallow shoreline extending somewhat farther east (the historic shoreline).

Marine Vegetation

Marine vegetation mapped at the Project area includes eelgrass (*Zostera* sp.), bull kelp (*Nereocystis luetkeana*), and other macroalgae (DNR 2021). Eelgrass and macroalgae wrack were observed on the beach on the southeast shoreline and within the marina (Photograph 12). The survey of the study area identified eelgrass and other macroalgae present as shown in Figure 14. DNR mapping and surveys in the study area indicate that eelgrass is fairly continuously present along the shoreline outside of the marina (outside of the breakwater) and around the northeast corner and along the southeast shoreline (Christiaen et al. 2018). The eelgrass beds typically extend from near 0 feet MLLW to -17 feet MLLW.

Photograph 12
View of aquatic beds at low tide (marina rubble mound breakwater is in background)

Photograph 13
Bottom of marina at entrance channel



Video taken during the survey of the marina shows clams, crabs, and sparse macroalgae (Photograph 13 shows a still shot from the video footage within the marina).

Special-Status Species

Priority habitats and species (WDFW 2021a) mapped in the Project area include estuarine and marine wetlands and aquatic habitat, and hardshell clam along the southeast shoreline. Farther offshore north of the study area and along the southeast shoreline are mapped areas of Pacific geoduck (*Panopea abrupta*). The south end of the island where giant chain fern is present is also mapped. The northwest corner of the island has been mapped as a Pacific sand lance (*Ammodytes hexapterus*) spawning beach (WDFW 2021b).

Nine species listed or proposed for listing under the Endangered Species Act (ESA) may occur in the Project area and are shown in Table 13 (NOAA 2021; USFWS 2021).

Table 13
ESA-Listed and Proposed Species That May Occur in the Project Area

Species	Listing Status	Critical Habitat
Marbled murrelet *Brachyramphus marmoratus*	Threatened	Designated Does not include Project area
Streaked horned lark *Eremophila alpestris strigata*	Threatened	Designated Does not include Project area
Yellow-billed cuckoo *Coccyzus americanus*	Threatened	Proposed Does not include Project area
Chinook salmon (Puget Sound) *Oncorhynchus tshawytscha*	Threatened	Designated Includes the Project area
Bull trout *Salvelinus confluentus*	Threatened	Designated Includes the Project area
Steelhead trout (Puget Sound) *Oncorhynchus mykiss*	Threatened	Designated Does not include Project area
Bocaccio *Sebastes paucispinus*	Threatened	Designated Includes Project area
Yellow-eye rockfish *Sebastes rubberimus*	Threatened	Designated Includes Project area
Killer whale (Southern Resident) *Orcinus orca*	Endangered	Designated Includes Project area

Water Quality

The marine waters of the Project area are listed on Ecology's 303(d) list of impaired waterbodies for dissolved oxygen (Category 2 – waters of concern) and slightly east of the Project area for sediment (Bis(2-ethylhexyl)phthalate; also Category 2) (Ecology 2022a). Category 2 waterbodies indicate at least one sample exceeded criteria, but there is not enough information to indicate persistent water or sediment quality impairment.

Preferred Alternative Impacts

The Preferred Alternative will result in environmental impacts to the marine and shoreline area. The Project may potentially impact aquatic biological resources, terrestrial biological resources, and water quality through the following activities

- Dredging in marine water
- In-water fill associated with riprap modifications, shoreline stabilization, and installation of a permanent boat launch
- Pile driving
- Increased overwater cover

Table 14 provides a summary of potential project elements. Mitigation efforts include the following:

- Removing all creosote-treated wood within the marina basin and entrance channel
- Replacing creosote-treated wood piles with steel piles
- Replacing solid overwater cover with grated surfacing to allow light transmittance
- Removing debris and restoring nearshore areas
- Installing new native shoreline plantings

Table 14
Preliminary Environmental Impacts Summary

Project Element	Preferred Alternative Quantities	Notes
Overwater cover (solid)	0 sf	
Overwater cover (grated)	23,630 sf	The project uses grated surfacing for new marina floats and gangways to allow for light penetration into the nearshore environment and minimize impacts associated with overwater shading.
Impacts to existing eelgrass	0 sf	The project avoids impacts to marine vegetation.
Nearshore habitat restoration (debris removal) area	10,000 sf	The project proposed debris removal as a potential mitigation measure to offset project impacts in the nearshore area. This effort allows for natural regeneration of marine vegetation.
Removal of creosote-treated pilings	75	The project will remove all creosote-treated wood from the project area to improve water quality.
Number of new steel pilings	55	
New breakwater area	n/a	
New shoreline planting area	2,500 sf	The project will install native backshore and riparian plantings to improve terrestrial habitat.
New boat launch planting area	3,700 sf	
Dredging area	248,052 sf	The dredging area stays within the previous 1988 dredge footprint
Dredging volume	36,960 cy	

4.B.10 Docking and Access

Overview of Docking Vessels

Blake Island is one of few parks in the State Parks system that are accessible only by boat. At Blake Island this means that all visitors arrive via private or commercial vessels.

Until 2021, commercial service to Blake Island was provided by Argosy Cruises. Argosy operated two types of vessels to Blake Island: tour boats and fast launches. The Argosy tour boats transported guests from Seattle to Blake Island for a meal and cultural performance at Tillicum Village, which is

located near the marina. This program typically operated from March through September, making two to three trips per day from Seattle, and carrying 200 to 300 guests per trip. Argosy opted to cancel its lease on the Tillicum Village in 2022, and the future of that facility is currently unknown.

The Argosy fast launches were used to provide walk-on ferry service to Blake Island for day excursions or overnight camping. Argosy operated from the commercial dock at the Blake Island marina (Photograph 14), which it leased from State Parks.

Photograph 14
View of Argosy Cruises fast launch at commercial dock

Moorage for private vessels is provided at the docks in the marina, as well as at 23 mooring buoys located along the island shoreline. The marina has four docks for recreational vessels. These are arranged in two pairs running perpendicular to the shoreline, with each pair connected to a main dock that runs parallel to the shoreline. Vessels are able to tie up to any side of any of the docks, and may also raft out (i.e., tie up to the side of a vessel that is tied to the dock).

Private vessels range in size from paddle craft, such as kayaks, up to vessels of 60 feet or more. State Parks does not collect data on the size of boats using these facilities, but anecdotal evidence indicates that 60 feet is approximately the largest vessel that can maneuver in the marina. Most of the buoys are limited to boats of 45 feet or less, while some are limited to 36 feet.

There is no fee to moor between 8:00 a.m. and 1:00 p.m. Boaters who moor at the buoys either stop at the marina first to pay for moorage, or tie up at the buoy and then walk or use a dinghy to go to the marina to pay the moorage fee. State Parks personnel boat around the island at dusk to confirm payment.

Marina Usage Statistics

State Parks has documented Blake Island visitor statistics over the last 5 years. Attendance data (2017 to 2021; State Parks 2021a) provide counts for overnight guests, day use guests, moorage users, and an overall visitation total. Two years of reservation data (2020 to 2021; State Parks 2021b) identify the zip code of guests with camping reservations. The following provides a summary of the visitor statistics based on these two sets of State Parks recorded data. The focus of the section is overnight visits by boaters.

Park Use

Attendance data were analyzed to determine patterns in usage of the park's moorage facilities. These data include the year and month, number of overnight visitors who use moorages, and number of day use visitors.

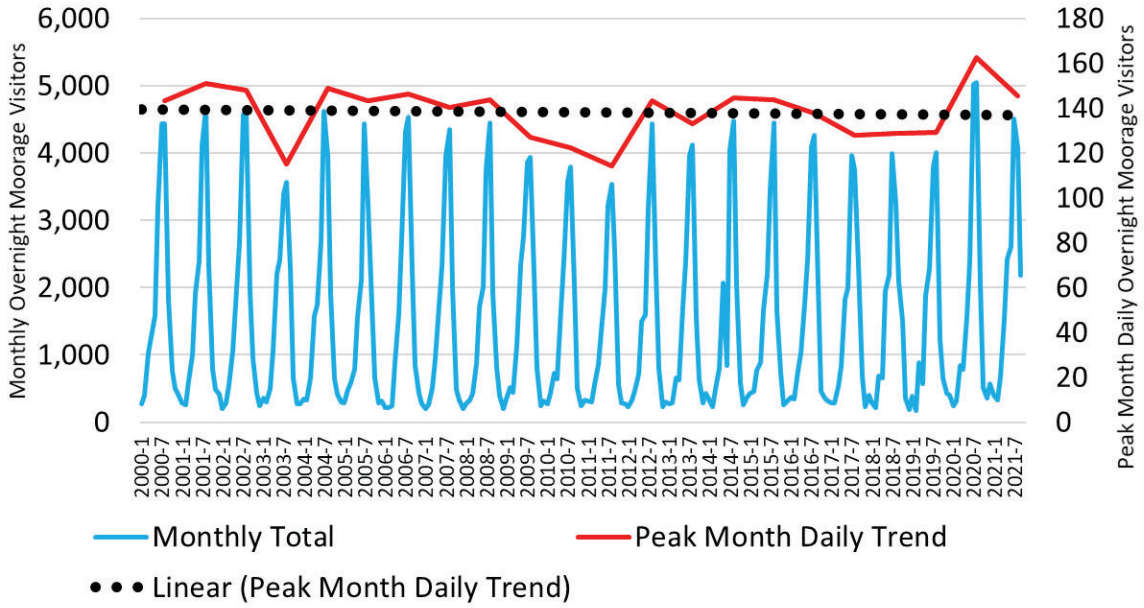
The number of overnight moorage visitors is highly seasonable, and this seasonality has been consistent for more than 20 years. As shown in Figure 15, overnight visitation peaks in the summer and nearly disappears in the winter.

From 2000 through October 2021, the peak month averaged 4,300 overnight moorage visitors and ranged from a low of approximately 3,550 to a high of 5,050. The peak month was either July or August, depending on the year.

The number of daily overnight moorage visitors was estimated by dividing the monthly number of overnight visitors by the number of days in the peak month. From 2000 through October 2021, this averaged 138 overnight moorage visitors per night, with a low of 114 and a high of 163.

The linear trend of peak month overnight guests indicates there has been little change over the past 20 years or more and the overnight moorage operates at capacity during peak periods.

Figure 15
Overnight Moorage Visitors



Blue line indicates the number of overnight moorage visitors for each month (left-hand axis).
Red line illustrates the trend in daily use for the peak month (right-hand axis).
Dotted line illustrates the linear trend of peak month overnight guests.

Market Region for Private Vessels

The primary goal in assessing the market area is to document trends in the recreational vessel fleet in that market region. Data from the State Parks reservation system were analyzed to determine the market area for moorage at Blake Island. The State Parks reservation system does not accept reservations for moorage; however, because all users of the park must arrive by boat, the zip code of the person making camping reservations can be used as a proxy for the zip code of the boat.

The reservation data analyzed span the period of January 2020 through October 2021 and include the following:

- Type of site reserved
- Date in and date out
- Number of people in the party
- Zip code of the person making the reservation

As shown in Table 15, nearly all the demand for reservations at Blake Island is generated by Washington residents. Washington residents account for 96% of campsite reservations and 96% of all facility types.

Table 15
Blake Island Reservations by State (Number of Days Reserved)

Resource Category	State	2020	2021	Total	Share of Total
Campsite	WA	430	849	1,279	96%
	OR	15	10	25	2%
	Other	6	18	24	2%
	Total	451	877	1,328	100%
Group Camp	WA	-	41	41	100%
	Other	-	-	-	0%
	Total	-	41	41	100%
Overflow	WA	1	-	1	50%
	Other	-	1	1	50%
	Total	1	1	2	100%
Day Use Facility	WA	4	11	15	88%
	Other	-	2	2	12%
	Total	4	13	17	100%
All Types	WA	435	901	1,336	96%
	OR	15	10	25	2%
	Other	6	21	27	2%
	Total	456	932	1,388	100%

Source: BST Associates, using data from State Parks

More specifically, most of the demand for reservations at Blake Island is generated in the local area. As shown in Table 16, nearly two-thirds of the demand is generated by residents of King County and 15% by residents of Kitsap County. These two counties, along with Pierce, Snohomish, and Thurston Counties, account for 93% of the reservation days at Blake Island.

Table 16
Blake Island Reservations by County (Number of Days Reserved)

Resource Category	County	State	2020	2021	Total	Share of Total	Cumulative Total
Total	King	WA	291	597	888	64%	64%
	Kitsap	WA	56	146	202	15%	79%
	Pierce	WA	55	58	113	8%	87%
	Snohomish	WA	23	53	76	5%	92%
	Thurston	WA	3	13	16	1%	93%
	Multnomah	OR	10	4	14	1%	94%
	Other		18	61	79	6%	100%
	Total		456	932	1,388	100%	

Source: BST Associates, using data from State Parks

Americans with Disabilities Act Access

See Section 4.B for a summary of the recently completed ADA assessment at the Blake Island marina.

4.B.11 Impacts on Surrounding Areas

Proposed Project improvements will affect the Blake Island facilities and uses during construction. The Project area and specifically the marina will be closed, which will restrict access to campgrounds, day use area, and Tillicum Village. The public could access Blake Island outside of the marina with personal vessels but would not have access to any floats or gangways and would need to either use the existing buoys or land their vessels (such as kayaks) on existing beaches. The closure would last from late summer 2025 through spring 2026.

Photograph 15
View of campsites along western shoreline, south of marina

4.C Consistency with Applicable Long-Term Plans

State Parks has multiple existing documents for Blake Island that are directly and indirectly relevant to the Project. The *Central Kitsap Area State Park Management Plan* was adopted in 2009 and provides a summary of issues at Blake Island. This is described in detail in Section 2B. The following is a list of additional documents reviewed during the predesign phase:

4.C.1 Preparing Washington State Parks for Climate Change

In 2017, State Parks developed *Preparing Washington State Parks for Climate Change* (Whitely Binder et al. 2017), a document to assess climate change concerns within the State Parks system. A summary of information relevant to Blake Island is as follows:

- Sea level rise is estimated at more than 6 inches by 2050 and more than 24 inches by 2100.
- Sea level rise will increase erosion rates and inundate coastal areas of Blake Island, particularly the marine area and the day use area.
- Coastal bluff sloughing events are issues at Blake Island.
- The document Include a sea level rise map for Blake Island. Upland areas within the Project area by the marina are identified as having current +3 feet of storm surge (1% annual probability storm surge value) that will increase considerably in the 2050 sea level rise projection.
- There are concerns about saltwater intrusion into groundwater supplies.

The report notes that Blake Island is a popular and unique park with high day use. Therefore, the threats of climate impacts are a high concern.

4.C.2 Stewardship Plan

State Parks completed a rare plant and vegetation survey of Blake Island in 2005 (Smith et al. 2005). The survey was for the entire island, classifying and delineating unique vegetation communities. A summary of the survey is described in Section 4.B.

4.C.3 Other Identified Planning Documentation

At the time of this report, the following additional planning documentation is known to have been prepared for Blake Island:

1. Blake Island Maintenance Barge Landing Hydraulic Project Approval (HPA) from WDFW
2. *Cultural Resources Survey for the Blake Island State Park Lift Station Replacement Project* (Silverman 2019)
3. *Cultural Resource Monitoring of the Marina Utility Improvements Project at Blake Island State Park* (Kelley 2010)

4.D Consistency with Laws and Regulations

4.D.1 High-Performance Public Buildings

Not applicable.

4.D.2 State Efficiency and Environmental Performance

Not applicable.

4.D.3 Greenhouse Gas Emissions Reduction Policy

Not applicable.

4.D.4 Archeological and Cultural Resources

Federal Requirements

The Project will likely require a permit from the U.S. Army Corps of Engineers (USACE) and therefore must comply with Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the effects of their undertakings on historic properties. A historic property is "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (NRHP; 36 Code of Federal Regulations 800.16(l)(1)). Traditional Cultural Properties may also be historic properties. Under the Section 106 process, USACE must consult with interested and affected Native American Tribes and the State Historic Preservation Officer (SHPO) on potential impacts to historic properties.

To be eligible for inclusion in the NRHP, a property must have significance and retain integrity. "Significant" properties meet one or more of the following criteria:

- They have an association with events that have made a significant contribution to the broad patterns of our history.
- They have an association with the lives of significant persons in our past.
- They embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- They have yielded or may be likely to yield information important in history or prehistory.

"Integrity" is defined as a historic property's ability to convey its historic significance, in other words, its historic appearance and setting.

State Requirements

State laws, regulations, and orders related to cultural resources include RCW 27.53 – Archaeological Sites and Resources, RCW 68.50.645 – Skeletal Human Remains, and RCW 27.44 – Indian Graves and

Records; Washington State Environmental Policy Act (SEPA); and Governor's Executive Order (GEO) 05-05.

GEO 21-02 mandates a review similar to the Section 106 process. GEO 21-02 is required for projects that are funded by capital dollars and are not subject to Section 106 If the Project is reviewed under Section 106, GEO 21-02 would not apply.

SEPA requires consideration of potential short-term, long-term, direct, and indirect impacts to historical, archaeological, and cultural resources, defined as resources that are eligible for listing in the NRHP or a state or local preservation register. State Parks is the SEPA lead agency for the Project.

RCW 27.53 prohibits unpermitted excavation of archaeological materials. The Washington Department of Archaeology and Historic Preservation (DAHP) administers permits, which are required for excavation within archaeological site boundaries. DAHP typically does not require permits for professional testing or excavation of archaeological sites when done at the direction of a lead federal agency during the Section 106 process.

RCW 27.44 and 68.50.645 prohibit disturbance of human remains, except in specific circumstances, and require reporting of discovery of human remains. As the Project proponent, State Parks is responsible for compliance with these laws. The State Parks Archaeologist will consult with DAHP.

4.D.5 Americans with Disabilities Act Implementation

All new facilities proposed in the Preferred Alternative will meet ADA accessibility requirements in compliance with the United States Accessibility Board. This includes pathways, gangway, and marine facilities. The Preferred Alternative provides an ADA-accessible route from the marina to the existing upland restroom.

4.D.6 Compliance with Planning under Chapter RCW 43.88.0301 (1)

(1) The office of financial management must include in its capital budget instructions, beginning with its instructions for the 2003-05 capital budget, a request for "yes" or "no" answers for the following additional informational questions from capital budget applicants for all proposed major capital construction projects valued over 10 million dollars and required to complete a predesign:

(a) For proposed capital projects identified in this subsection that are located in or serving city or county planning under RCW 36.70A.040:

(i) Whether the proposed capital project is identified in the host city or county comprehensive plan, including the capital facility plan, and implementing rules adopted under chapter 36.70A RCW; **No**

(ii) Whether the proposed capital project is located within an adopted urban growth area: **No**

(A) *If at all located within an adopted urban growth area boundary, whether a project facilitates, accommodates, or attracts planned population and employment growth;* **Not applicable**

(B) *If at all located outside an urban growth area boundary, whether the proposed capital project may create pressures for additional development;* **Not applicable**

(b) For proposed capital projects identified in this subsection that are requesting state funding:

(i) Whether there was regional coordination during project development; **Yes**

(ii) Whether local and additional funds were leveraged; **No**

(iii) Whether environmental outcomes and the reduction of adverse environmental impacts were examined. **Yes**

4.D.7 Other Codes or Regulations

State Parks is considering several elements to improve the existing marine facilities, including replacing pier and float configurations and materials, dredging, and replacing the temporary boat launch access ramp with a permanent ramp. It is likely that most of the proposed elements will require individual permits and approvals because they are new features or major changes to existing facilities. Maintenance dredging to previously authorized depths and configurations qualifies for a USACE Nationwide Permit (NWP) and is discussed later under Federal Permits and Approvals. However, new dredging (outside of or deeper than previously authorized dredging) will require an individual permit. The final permit strategy for the proposed improvements will ultimately be determined through continued agency and stakeholder coordination and design refinements.

The following sections provide an overview of anticipated regulatory and permitting requirements for the Project that consider both maintenance (NWP) and individual permitting scenarios. Due to the location of the proposed improvements along the shoreline of Blake Island, it is expected that federal, state, and local permits and approvals will apply. A Joint Aquatic Resources Permit Application (JARPA) form provides a consolidated application that can be submitted to most agencies.

Federal Permits and Approvals

The USACE will likely be the federal lead agency for the Project, due to proposed in-water work occurring in Waters of the United States. If the Project does not qualify as a maintenance activity (NWP), an individual permit from USACE will be required, including Clean Water Act Section 404 and Rivers and Harbors Act Section 10 permits. As the federal lead agency, USACE will initiate consultation with other agencies requiring federal permits and approvals for the Project. Federal laws and regulations requiring federal permits and approvals may include the following:

- National Marine Fisheries Service and U.S. Fish and Wildlife Service (known as "the Services"), for ESA Section 7 compliance

- DAHP, for NHPA Section 106 compliance
- Ecology, for Clean Water Act Section 401 and Coastal Zone Management Act (CZMA) consistency
- Dredged material management review and approval for dredging and disposal of dredged materials in approved sites

The USACE Section 404 permit is required for any discharge of dredge or fill material into Waters of the United States. The USACE Section 10 permit is required for work in navigable waters of the United States and will be required for any in-water work.

ESA-listed aquatic species are present along the shoreline of Blake Island, including ESA-listed Southern Resident killer whales and salmonid species that use the shoreline for migration to and from the Pacific Ocean. To demonstrate ESA Section 7 compliance, a Biological Assessment is typically prepared for projects that require individual permits or are determined to require formal consultation with the Services (formal consultation applies to activities with the potential to result in adverse impacts to ESA-listed species). The formal consultation process is initiated by USACE and includes issuance of a Biological Opinion from the Services that describes ESA compliance and required mitigation measures. The timeframe for ESA review is incorporated within the USACE permit timeframe because USACE permits are not issued until consultation is complete.

For NHPA Section 106 compliance, USACE must inventory and evaluate historic properties in the Area of Potential Effect. A Cultural Resources Assessment describing the results of inventory and evaluation will be prepared by the applicant and submitted to USACE. A USACE archaeologist will review the Cultural Resources Assessment and initiate consultation with DAHP and Native American Tribes. The timeframe for NHPA Section 106 review is incorporated within the USACE permit timeframe because USACE permits are not issued until consultation is complete.

USACE also consults with Ecology for Clean Water Act Section 401 compliance and CZMA consistency as part of the federal review process. Clean Water Act Section 401 compliance is required for projects that propose discharge of dredge or fill material in Waters of the United States and for projects requiring compliance with Washington State Water Quality Surface Water Standards per Washington Administrative Code (WAC) 173-201A. Projects proposing discharge of dredge or fill material are typically issued a Water Quality Certification. The timeframe for Clean Water Act Section 401 review is incorporated within the USACE permit timeframe because USACE permits are not issued until all other federal approvals are complete.

CZMA is triggered by projects within any of Washington's 15 coastal counties. This approval will be processed concurrently with the USACE permits, in coordination with Ecology.

For projects that include dredging, a review and approval through the USACE Dredged Material Management Program (DMMP) is required to determine whether there are any contaminants in the material and where the dredged material may be disposed of (such as at an approved open water disposal site).

Other federal agencies that may be consulted include the U.S. Environmental Protection Agency, if contamination is determined to be present at the site, and the U.S. Coast Guard, if private aids to navigation are proposed (e.g., lights or buoys).

State Permits and Approvals

WDFW regulates work that uses, diverts, obstructs, or changes the natural flow or bed of any of the salt or fresh waters of the state, including projects landward of the OHWM that will directly impact fish life and habitat. Because Project activities include work in and adjacent to waters of the state, a WDFW HPA will be required. HPA review begins once a SEPA determination is issued and takes up to 45 days. No public notice is required.

Work occurring on or over state-owned aquatic lands requires authorization from DNR. In this area, DNR does not own the immediate shoreline or marina area but should be consulted for effects to DNR-owned aquatic lands adjacent to the site.

Local Permits and Approvals

For SEPA compliance, it is assumed that State Parks will issue a Determination of Non-Significance (DNS) or Mitigated DNS for the Project. The SEPA review will require a minimum 14-day public notice period.

Kitsap County is the lead agency for other local permits and approvals, providing review for Shoreline Management Act consistency, critical areas regulations compliance, floodplain permit consistency, and building and construction code compliance. A preapplication meeting with the Kitsap County Department of Community Development (DCD) will be required to review the concept design and determine which permits and associated deliverables are required for the Project.

The Project includes work within the 200-foot shoreline environment, which defines the jurisdiction of the Kitsap County SMP, which was last updated in 2021 (Kitsap County 2021b). The shoreline designations that apply to the Project include the Rural Conservancy shoreline environment 200 feet landward of OHWM. Per SMP Table 22.600.105, in the Rural Conservancy shoreline environment, new or modified marina facilities or boat launches may be permitted in or over water as a conditional use, and expanded dredging may also be permitted as a conditional use. Maintenance dredging to previously authorized depths or dimensions is exempt from a Shoreline Substantial Development Permit (SSDP) or Conditional Use Permit (CUP). A SSDP will be required in addition to the CUP, in which case a public notice will be required. The public notice for shoreline permits is 30 days.

The study area is within Kitsap County designated critical areas, including wetlands, fish and wildlife habitat conservation areas, seismic hazard areas, and the 100-year floodplain; therefore, the Project must comply with critical areas regulations. To demonstrate compliance with critical areas regulations, the applicant must demonstrate consistency with performance criteria, including specific performance standards for proposed development. It is expected that critical areas regulations consistency will be reviewed as part of the shoreline permit package.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, the Project lies within a Zone AE floodplain with a base flood elevation of 14 feet (NAVD88; FEMA 2021). Due to its location within a floodplain, the Project must comply with Kitsap County floodplain requirements. This will include complying with the FEMA development regulations and demonstrating no net loss of floodplain habitat.

For building and construction code compliance, the Project will need a building permit from Kitsap County. These permits are typically applied for at 90% or 100% design. Final plan sets are submitted to the County for approval. A building permit cannot be issued until a SEPA determination is issued for the Project.

Permit Summary

Table 17 summarizes the anticipated environmental permits and approvals for the types of activities that may be included in the Project.

Table 17
Likely Environmental Permits and Approvals

Permit/Approval	Agency	Trigger	Approx. Agency Review Timeframe	Notes
Clean Water Act Section 404/Rivers and Harbors Act Section 10 Individual Permit or Nationwide Permit	USACE	Dredging or placing structures, fill, and/or work within waters of the U.S.	12+ months (individual)	A JARPA form will be submitted
Endangered Species Act Section 7 Compliance	National Marine Fisheries Service and U.S. Fish and Wildlife Service	Section 7 review required for actions that may affect any ESA-listed species or their critical habitat	12-18 months (formal; concurrent with USACE permit review)	A Biological Assessment will be prepared and submitted with the JARPA application

Permit/Approval	Agency	Trigger	Approx. Agency Review Timeframe	Notes
National Historic Preservation Act Section 106 compliance	DAHP and Native American Tribes	Activities that may affect historic properties; if an archaeological site is identified, will need permit to disturb site per RCW 27.53.060	6 months	A Cultural Resources Assessment will be prepared and submitted with the JARPA to USACE
Clean Water Act Section 401 Water Quality Certification	Ecology	Necessary for federal approvals (USACE permit) associated with in-water work	6 to 12 months (concurrent with USACE permit review)	A Water Quality Monitoring Plan may be required for issuance, depending on extent of proposed discharge of dredge or fill material
Coastal Zone Management Act Consistency Determination	USACE in coordination with Ecology	Associated with federal approvals; ensures compliance with Clean Water Act, Shoreline Management Act, etc.	6 to 12 months (concurrent with USACE Permit review)	A CZMA form will be submitted with the JARPA
Dredged Material Management Approval	USACE in coordination with federal and state agencies	Dredging and disposal of dredged materials	6 to 12 months (concurrent with USACE permit review)	An evaluation of the quality of the sediments to be dredged and suitability for disposing in open water or other approved sites. This process should be initiated prior to the JARPA
Hydraulic Project Approval	WDFW	Work that uses, diverts, obstructs, or changes the natural flow or bed of state waters	45 days from SEPA Determination Issuance	Apply online via WDFW's online Aquatic Protection Permitting System
SEPA DNS or Mitigated DNS	State Parks	Work requiring environmental review	4 to 6 months	A SEPA Checklist will be prepared and determination made by State Parks
Shoreline Substantial Development Permit and Conditional Use Permit	Kitsap County DCD	Work occurring within the 200-foot shoreline environment requiring a SSDP or CUP	4 to 6 months	A JARPA and shoreline permit forms will be prepared and submitted to DCD
Critical Areas Regulations Compliance	Kitsap County DCD	Work occurring within designated critical areas	4 to 6 months	A critical areas report will be prepared and submitted demonstrating compliance with performance criteria

Permit/Approval	Agency	Trigger	Approx. Agency Review Timeframe	Notes
Floodplain Consistency	Kitsap County DCD	Activities occurring within a designated floodplain	4 to 6 months	A letter will be prepared by a qualified engineer demonstrating compliance with floodplain regulations
Building Permit	Kitsap County DCD	Activities requiring a building permit	2 to 4 months	A building permit application will be submitted to DCD with 90% or 100% design package

4.E Identified Data Gaps

The background information gathered will inform a unified development scheme for the marina. The information will be used to develop and analyze alternatives and ultimately select a Preferred Alternative as part of the Project's predesign phase. Following predesign, multiple data gaps identified in this report will need to be closed prior to the development of a complete construction-ready and permit-approved design. The following provides a summary of identified data gaps:

- Eelgrass survey to comply with WDFW requirements once a Preferred Alternative has been selected.
- Geotechnical engineering data: Physical sediment characteristics are considered a data gap for maintenance dredging design. Geotechnical data may be a data gap should the preferred design include new dredging and/or structural improvements.
- Environmental data describing the chemical quality of existing sediments within the proposed dredge prism (see additional information in Section 4.F).
- Additional research and topographic survey of visible, exposed utility features will be needed to accurately locate, map, and characterize existing utilities and to identify any utility improvements that will be needed to serve the Project and to ensure that existing utilities that are to remain can be protected and preserved in place.
- Fire protection requirements for new structures, including the floats, will need to be verified with the local fire department during design development and construction documentation. They could include a dry standpipe or sprinklers based on the local fire marshal's requirements.
- Navigation light requirements and additional ownership information on the existing navigational light are needed (it is currently owned by the U.S. Bureau of Land Management and maintained by the U.S. Coast Guard).
- Additional data on the upland electrical infrastructure will need to be gathered and analyzed during design development. Electrical infrastructure upgrades will need to be required. An electrical engineer will be engaged to develop the design.

4.F Significant Components

Dredging is a significant component of the design. The approach to the preferred alternative was informed by a sedimentation accumulation analysis, which explains what is driving sedimentation and recommends how to design dredging to improve the useability at the marina while reducing the need for maintenance dredging in the future.

In addition to the sediment accumulation, the proposed dredging will be heavily influenced by sediment quality within the dredged basin. As described in Section 4.E, sediment quality chemistry is a data gap. State Parks has not yet collected or analyzed sediment samples. State Parks proposes to conduct that work early in the design and permitting phase of the Project when the dredged limits are defined.

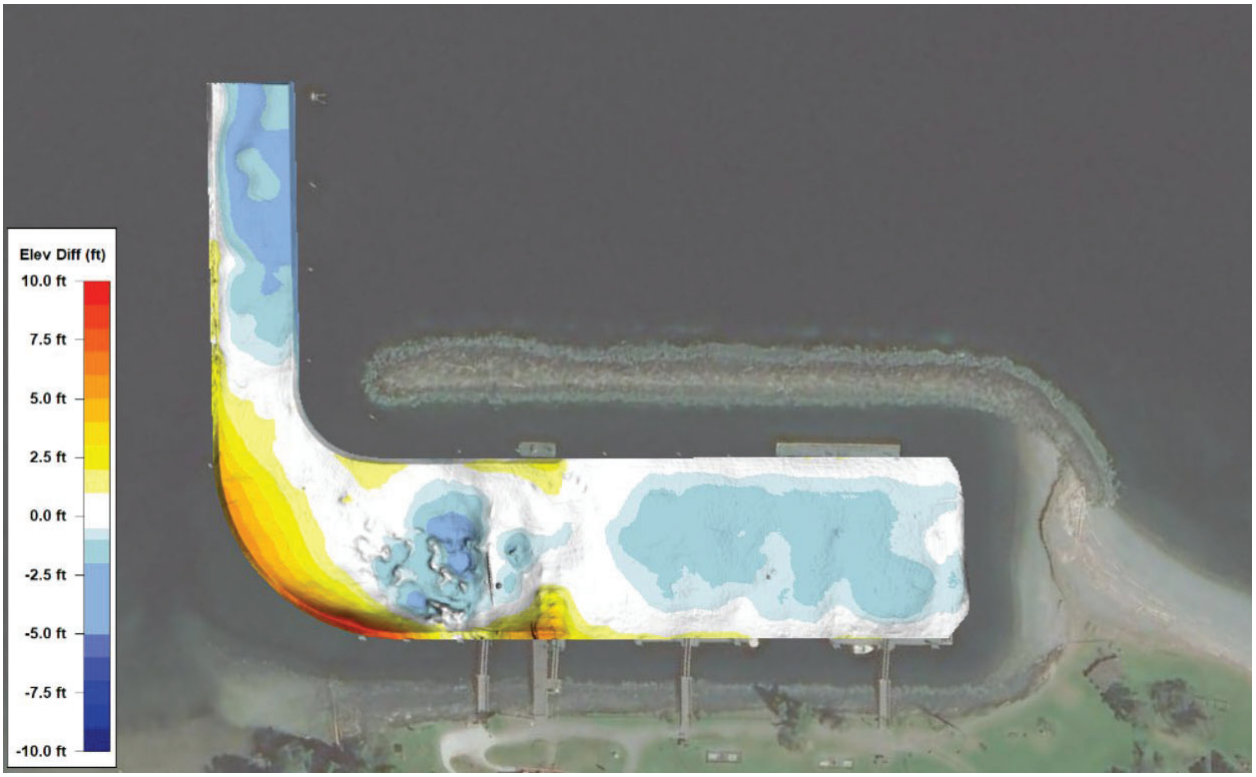
The following provides additional details on the sedimentation accumulation analysis and sediment quality approach.

4.F.1 Sediment Accumulation

The sedimentation inside the marina was quantified using the bathymetric survey completed by eTrac (2021). A map of elevation differences for the interval from 1988 (as-built dredge condition) and 2021 bathymetric survey (Figure 16) shows the bed of the marina primarily increased in elevation (red colors) along the western edge of the entrance channel and at the head of the marina (below the sheetpile wall). Other small areas of increased elevation exist along the inside of the breakwater (near the boat pumpout) and near the commercial dock. The remainder of marina did not change by more than 0.5 foot (white). Some areas decreased in elevation (blue colors). The area of decrease near the commercial dock appears to be the result of propeller wash scour from vessels maneuvering in the marina. Rough estimates of volume loss/gain within the marina entrance channel and interior of marina (area shown in Figure 16) over this time period show that approximately 3,200 cy of sediment have accreted in the marina relative to 1988, and 3,540 cy have eroded, for a net decrease of 340 cy[4].

[4] This volume gain/loss and change in elevations shown in Figure 16 were for evaluation of sedimentation (volume and source) within the marina entrance channel only and do not represent estimates of potential dredge volumes for the marina.

Figure 16
Elevation Change Between eTrac Survey of November 2021 and Digitized 1988 As-Built Plan



Accretion appears to be an issue primarily within the marina along the western edge of the entrance channel. This is consistent with anecdotal reports from Argosy Cruises. In recent outreach, Argosy stated that their boats needed to stay far east in the channel at low tide to avoid hitting ground (Schlobohm 2021). Argosy also noted that during summer low tides, their seasonal dock (located west of the commercial dock) often grounded out, requiring significant repairs to keep it in operation. During the October 2021 site reconnaissance, State Parks also stated that a 2017 winter storm resulted in a bluff failure just west of the Blake Island marina, and they observed increased sedimentation in the entrance channel (State Parks 2021c). State Parks also noted that the bluff failure was at least partially caused by stormwater runoff from the adjacent Blake Island Perimeter Road trail that had developed a small incised channel flowing to the bluff failure area. State Parks has since re-routed stormwater to a natural ravine feature through a new ditch and culvert.

Accretion in the western portion of the entrance channel appears to be primarily the result of littoral drift into the entrance channel and settlement along the steep dredge slope on the channel. A substantial amount of sediment does not appear to be transported beyond this portion of the channel. Propeller wash also appears to be an important mechanism for transport and scour of

sediment within the marina. Accretion at the eastern head of the marina, below the sheetpile wall, is primarily sand (based on the site visit observations at mid-tide) and is likely the result of overwash processes from the east that occurred prior to the sheetpile wall being constructed in 2000 (State Parks 2000).

4.F.2 Sediment Quality

As described previously, the current Blake Island marina was built in 1974 and dredged to an elevation of -10 feet MLLW. A maintenance dredging event occurred in 1988 to restore the design depth of the marina basin to -10 feet MLLW and to deepen the entrance channel to -12 feet MLLW. Before the 1988 maintenance dredging event, a single composite sediment sample was collected consistent with the Puget Sound Dredged Disposal Analysis process (which preceded the current DMMP process) to evaluate suitability to place the sediment in an unconfined open water disposal site. The sediment was determined to be suitable for unconfined open water disposal, and 7,000 cy of material was placed at the Commencement Bay open water disposal site (USACE 1989).

No other sediment sampling events are documented within or near the marina in the Ecology Environmental Information and Management database. Additionally, no documentation has been found to suggest there have been events or uses that would have impacted the environmental quality of the marina sediments, beyond its general use as a marina. Typical environmental risks associated with marinas include fuel docks, paint wear, and debris. The environmental quality of sediments within the marina basin is currently unknown and is considered a data gap that will be addressed during the design phase of the Project.

Elements in Excess of ADA Requirements

All proposed marina improvements will meet ADA code requirements. ADA requires that at least one gangway be provided. All three proposed gangways in the Preferred Alternative will meet ADA requirements.

4.G Planned Technology Infrastructure

Not applicable.

4.H Planned Commissioning

Not applicable.

4.I Future Phases or Other Facilities

The Project will occur in a single phase and is not part of a larger multiple phase project. Within Blake Island Marine State Park (outside of the Project area), State Parks is starting an effort to

consider Tillicum Village's future. Until 2021, Tillicum Village was operated by Argosy Cruises. It is currently vacant.

4.J Project Management and Delivery Methods

4.J.1 Delivery Method Alternatives

The Project will be a design-bid-build project. State Parks will contract with a consultant to provide engineering and design services and to develop a biddable set of construction documents. State Parks will then put the Project out for public competitive bid and select the low bidder. State Parks will then contract with the selected contractor to construct the Project design.

1. The preferred delivery method for Project completion is design-bid-build. The complexity of dredging and marina design requires clear, accurate plans and specifications to ensure competitive bidding and verifiable contractor compliance. State Parks has the experienced staff and skill set to clearly identify Project needs and layout for the design consultant to deliver adequate plans and specifications for bidding and construction. State Parks has extensive history awarding contracts. State Parks has adequate and experienced staff for ensuring construction compliance.
2. A phased construction method would be considered only if the Project was severely underfunded.
3. A design-build method is not considered viable due to the complexity and uniqueness of shoreline and coastal environment and marine facilities. While most design-build contractors are competent at traditional business and office projects, few contractors are capable of delivering a marine facilities design in the shoreline environment found at Blake Island. This reduces competition and increases the risk of an unsatisfactory product.
4. A construction manager-general contractor method of project delivery is not preferred on this Project. This method does not promote competition for the construction phase of the Project, which is the major cost of the Project. Again, few contractors are capable of delivering both the design and construction skill sets. This usually ends up with a construction subcontractor and less protection for the agency.

4.J.2 Describe How the Project Will Be Managed Within the Agency

It is anticipated that State Parks Southwest Region Capital Program staff will provide direct management of the Project procurement to complete design documentation, and later for Project procurement and management with the contractor during the construction phases of work. State

Parks will be represented primarily by the Southwest Region Construction Project Coordinator, and other staff will be involved as needed. Anticipated roles and responsibilities include the following:

- Southwest Region Construction Project Coordinator and Contracts Professionals
  - Directs consultant selection
  - Manages consultant selection
  - Assists agency in review and approval of programming and budgets
  - Issues advertisements for bid
- Design Consultant
  - Provides programming services per contract
- Contractor
  - Provides demolition of existing marina, dredging, and construction of the new marina and upland improvements per contract
- Southwest Region Capital Team
  - Participate in periodic design meetings and construction observation

4.K Schedule

Figure 17 provides a high-level milestone schedule for the Project, from predesign through design development, environmental permitting, construction documentation, and bidding and construction. The schedule proposes a constructability review and value engineering, as required by RCW 43.88.110(5)(c), to occur following 90% design and prior to the completion of the final construction documents bid set. The schedule identifies public outreach points and when the agencies, including environmental agencies and Tribes, will be notified and asked for input. The schedule also differentiates consultant-provided services and services led by State Parks.

The schedule assumes that, once under contract, the Contractor selected to construct the Project will procure all materials within 4 to 6 months. If there are procurement issues due to supply and/or shipping concerns, the schedule allows for a 1-year delay. In this scenario, the in-water construction would begin in the third quarter of 2026 rather than the third quarter of 2025. Construction will still be completed within the 2025-2027 biennium and would only require the marina to be closed for one season.

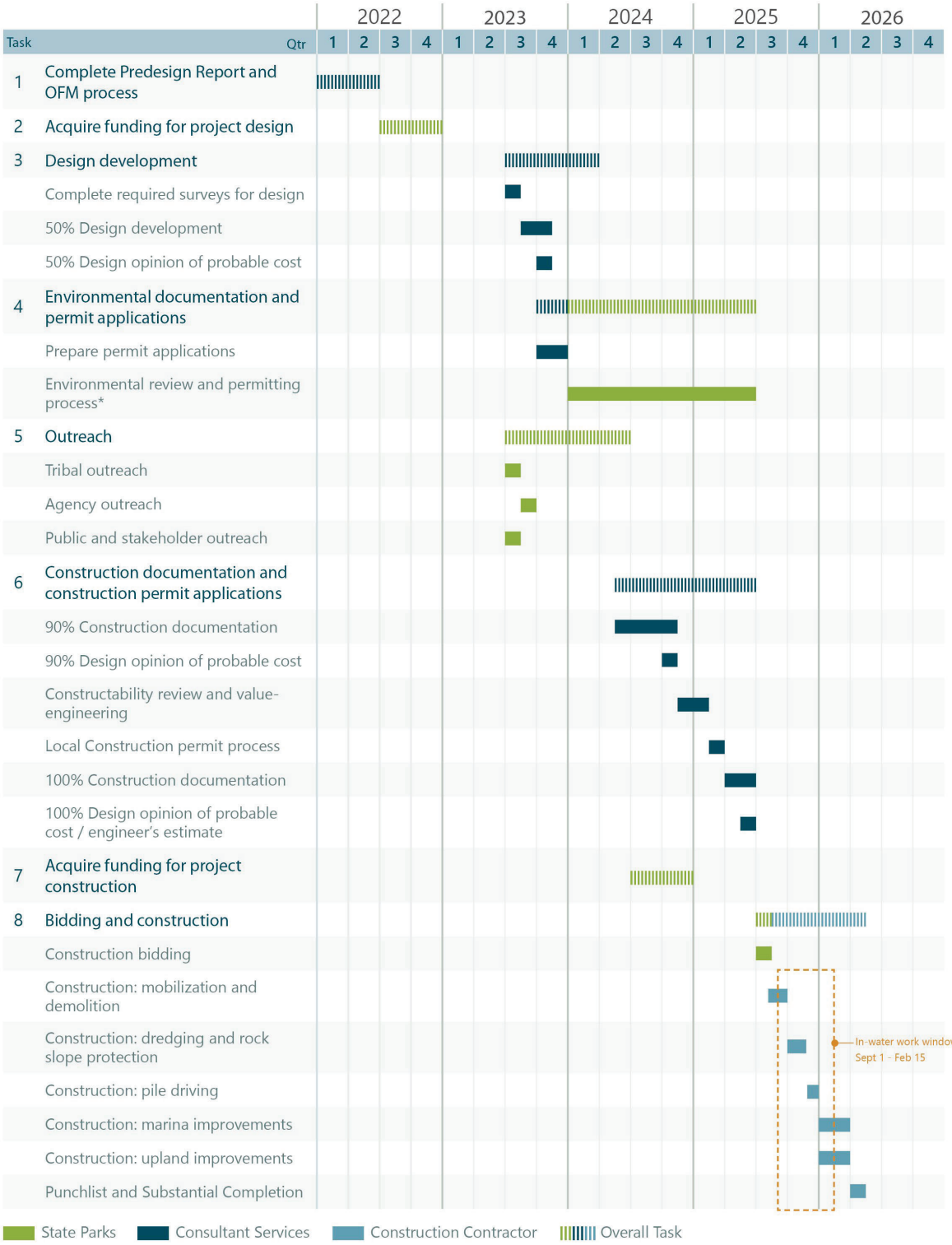
Several factors could extend the length of the Project, as follows:

- **Agency review:** Environmental permitting agency review times, in particular, USACE and the Services, could extend beyond the 18 months provided in the schedule.
- **Impacts to listed species:** Direct and indirect impacts to listed species and listed species habitat, in particular eelgrass, could extend the environmental permitting timeframe.
- **Section 106 compliance:** As described in Section 4.D, USACE will initiate Section 106 consultation with interested and affected Native American Tribes and SHPO on potential

impacts to historic properties. This step could potentially extend the permitting review. The current 18-month review window takes this into account; however, the Section 106 process could extend the review period beyond 18 months.

- **SEPA process:** Public appeals during the SEPA process are possible and could extend the Project schedule.
- **Discovery of archaeological resources:** It is possible that archaeological resources, such as middens, could be uncovered during construction, delaying the Project.

Figure 17
High-Level Project Milestone Schedule



* Acquisition of environment permits requires agreement from governing agencies not subject to project schedule.

5 Preferred Alternative Budget Analysis

5.A Cost Estimate

5.A.1 Major Assumptions

The opinion of probable construction cost was developed using the design information developed for the Preferred Alternative. Due to data gaps (described in Section 4.E) and limited design detail (conceptual or 10% level of design), a 25% design contingency and 10% construction contingency are recommended. Table 18 provides the opinion of probable construction cost in a Uniformat II Level 2 summary table; which reflects the following major assumptions:

- All unit price costs are in 2022 dollars.
- A 25% design contingency is included because the design is at conceptual stage.
- Contractor overhead and profit markups are provided to account for items such as mobilization.
- Predesign Report reviewers understand that State Parks and their predesign consultant have no control over the cost or availability of labor, equipment, or materials, or over market condition or the selected contractor's method of pricing. The opinion of probable construction costs is made on the basis of State Parks and its predesign consultant's professional judgment and experience.
- State Parks and its predesign consultant make no warranty, expressed or implied, that the bids or the negotiated cost to construct the Project will not vary from the opinion of probable construction cost.
- The opinion of probable construction cost provides information on the maximum allowable construction costs only. Design/engineering consultant services fees, project management, survey, planning and design review, bidding, construction phase project management and administration, construction inspection, environmental permitting, permit-related monitoring, and artwork and/or interpretive elements are not included. The Project costs are captured in the C-100 forms.

Table 18
Opinion of Probable Construction Cost

Rough Order of Magnitude - Opinion of Probable Construction Cost Rough Order of Magnitude Costs for Alternative 2 - June 2022						
Item	**Qty.**	**Unit**		**Unit Cost**		**Subtotal**
1. Site Preparation						
a. Install temporary construction fencing for site security and tree	600	LF	$	10.00	$	6,000
b. Install temporary erosion and sediment control	1	LS	$	12,650.00	$	12,700
c. Install temporary access and staging	1	LS	$	5,000.00	$	5,000
d. Provide temporary traffic control	1	LS	$	5,000.00	$	5,000
e. Clear and grub site vegetation	1	LS	$	2,000.00	$	2,000
f. Remove miscellaneous items	1	EST	$	10,000.00	$	10,000
Subtotal Site Preparation					**$**	**40,700**
2. Demolition						
a. Marina demolition	10,503	SF	$	50.00	$	525,150
Subtotal Demolition					**$**	**525,150**
3. Dredging and In-water Shoreline Stabilization						
a. Surveying	1	LS	$	34,500.00	$	34,500
b. Dredging and in-water transportation	35,412	CY	$	30.00	$	1,062,360
c. Material disposal (50% open water disposal)	17,706	CY	$	0.45	$	8,000
d. Material disposal (50% upland disposal)	17,706	CY	$	140.00	$	2,478,800
e. Purchase and place coarse material (cobble)	1,500	CY	$	50.00	$	75,000
f. Armored slope reconstruction (purchase and place light riprap)	5,600	CY	$	60.00	$	336,000
Subtotal Dredging and In-water Shoreline Stabilization					**$**	**3,994,660**
4. Waterside Improvements						
a. Marina floats	21,230	SF	$	175.0	$	3,715,250
b. Marina 24" guide pilings	55	EA	$	19,000.0	$	1,045,000
c. Marina gangways	1,200	SF	$	175.0	$	210,000
d Marina sewer force main & pump out	1	LS	$	20,000.0	$	20,000
e. Marina water system	1	LS	$	20,000.0	$	20,000
f. New sheet pile wall	120	LF	$	4,000.00	$	480,000
g. Marina electrical system	1	LS	$	589,000.0	$	589,000
h. Marina fire protection system	1	LS	$	-	$	-
Subtotal Waterside Improvements					**$**	**6,079,250**
5. Shoreline Restoration						
a. Procure and place rock protection at backshore restoration area	260	CY	$	100.00	$	26,000
b. In-water debris removal	500	TON	$	175.00	$	87,500
c. Eelgrass restoration mitigation allowance	1	ALLOW	$	100,000.00	$	100,000
d. Furnish and place beach sand	944	TON	$	58.00	$	54,800
e. Furnish and place unanchored driftwood	5	EA	$	690.00	$	3,500
f. Dunegrass planting	2500	SF	$	7.00	$	17,500
g. Install new irrigation in new planting areas	2,500	SF	$	2.00	$	5,000
Subtotal Shoreline Restoration					**$**	**294,300**

6. Upland Improvements						
a. Concrete bridge crossing at drainage channel	2	EA	$	5,000.00	$	10,000
b. Fine grading	200	CY	$	12.00	$	2,400
c. Furnish and place crushed rock path surfacing (6-in depth)	141	CY	$	53.00	$	7,500
d. Furnish and place raised log edge along pathway	790	LF	$	74.00	$	58,500
e. Furnish and place split rail fence along shoreline	548	LF	$	44.00	$	24,100
f. Furnish and install picnic tables	3	EA	$	4,410.00	$	13,200
g. Furnish and install interpretive/wayfinding signage	5	EA	$	10,000.00	$	50,000
h. Furnish and install shoreline vegetation	4,000	SF	$	7.00	$	28,000
i. Install new irrigation in new planting areas	4,000	SF	$	2.00	$	8,000
J. Furnish and install 3" mulch in planting areas	37	CY	$	51.00	$	1,900
Subtotal Upland Improvements					**$**	**203,600**
7. Boat Landing and improved circulation						
a. Furnish and place crushed rock path surfacing (6-in depth) for 12-ft wide a	56	CY	$	53.00	$	3,000
b. Furnish and place raised log edge along pathway	430	LF	$	74.00	$	31,800
c. Furnish and install picnic tables	3	EA	$	4,410.00	$	13,200
d. New 20-ft wide precast concrete boat launch	1	LS		$130,000.00	$	130,000
e. Furnish and place unanchored driftwood	7	EA	$	690.00	$	4,800
f. Dunegrass planting	3700	SF	$	7.00	$	25,900
g. Install new irrigation in new planting areas	3,700	SF	$	2.00	$	7,400
Subtotal Boat Landing and improved circulation					**$**	**216,100**

Subtotal Construction	**$**	**11,353,760**
Mobilization (15%)	$	1,703,064
Subtotal	$	13,056,824
Design Contingency (25%)	$	3,264,206
Subtotal	$	16,321,030
Total Rough Order of Magnitude (ROM)	**$**	**16,321,030**
Construction Contingency (10%)	$	1,632,103
Subtotal	$	17,953,133
Sales Tax (9.0%)	$	1,615,782
Subtotal	$	19,568,915
Total ROM Opinion of Probable Construction Cost*	**$**	**19,568,915**

All costs are in 2022 dollars.
In providing opinions of probable construction cost, the Client (Washington State Parks and Recreation Commission) understands that the Consultant (Anchor QEA, LLC) has no control over the cost or availability of labor, equipment or materials, or over market condition or the Contractor's method of pricing, and the consultant's opinions of probable construction costs are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, expressed or implied, that the bids or the negotiated cost of the Work will not vary from the Consultant's opinion of probable construction cost.
*Not Included: Design/Engineering Consultant Services Fees, Project Management, Survey, Planning & Design Review, Bidding, Construction Phase Project Management & Administration, Construction Inspection, Environmental Permitting, Permit Related Monitoring, Artwork.

5.A.2 C-100 Forms

Table 19 provides a summary of the C-100 form for the Project. The form provides consultant services, construction, and other costs such as archaeological contingency.

Table 19
C-100 Form Summary

19-1 – Summary Tab

Acquisition			
Acquisition Subtotal	**$0**	**Acquisition Subtotal Escalated**	**$0**

Consultant Services			
Predesign Services	$0		
Design Phase Services	$1,310,411		
Extra Services	$510,000		
Other Services	$1,008,736		
Design Services Contingency	$282,915		
Consultant Services Subtotal	**$3,112,062**	**Consultant Services Subtotal Escalated**	**$3,532,977**

Construction			
Maximum Allowable Construction Cost (MACC)	$16,665,030	Maximum Allowable Construction Cost (MACC) Escalated	$19,736,784
DBB Risk Contingencies	$0		
DBB Management	$0		
Owner Construction Contingency	$1,666,503		$1,980,806
Non-Taxable Items	$0		$0
Sales Tax	$1,649,838	Sales Tax Escalated	$1,954,583
Construction Subtotal	**$19,981,371**	**Construction Subtotal Escalated**	**$23,672,173**

Equipment			
Equipment	$0		
Sales Tax	$0		
Non-Taxable Items	$0		
Equipment Subtotal	**$0**	**Equipment Subtotal Escalated**	**$0**

Artwork			
Artwork Subtotal	**$0**	**Artwork Subtotal Escalated**	**$0**

Agency Project Administration			
Agency Project Administration Subtotal	$934,941		
DES Additional Services Subtotal	$0		
Other Project Admin Costs	$0		
Project Administration Subtotal	**$934,941**	**Project Administration Subtotal Escalated**	**$1,111,271**

Other Costs			
Other Costs Subtotal	**$0**	**Other Costs Subtotal Escalated**	**$0**

Project Cost Estimate			
Total Project	**$24,028,373**	Total Project Escalated	**$28,316,421**
		Rounded Escalated Total	**$28,316,000**

19-2 – Funding Summary Tab

	Project Cost (Escalated)	Funded in Prior Biennia	New Approp Request 2023-2025	2025-2027	Out Years
Acquisition					
Acquisition Subtotal	$0				$0
Consultant Services					
Consultant Services Subtotal	$3,532,977		$1,997,720	$1,535,257	$0
Construction					
Construction Subtotal	$23,672,173			$23,672,173	$0
Equipment					
Equipment Subtotal	$0				$0
Artwork					
Artwork Subtotal	$0				$0
Agency Project Administration					
Project Administration Subtotal	$1,111,271		$500,000	$611,271	$0
Other Costs					
Other Costs Subtotal	$0				$0
Project Cost Estimate					
Total Project	**$28,316,421**	**$0**	**$2,497,720**	**$25,818,701**	**$0**
	$28,316,000	**$0**	**$2,498,000**	**$25,819,000**	**$0**
	Percentage requested as a new appropriation		**9%**		

What is planned for the requested new appropriation? (*Ex. Acquisition and design, phase 1 construction, etc.*)
2023-25: design and permitting
Insert Row Here

What has been completed or is underway with a previous appropriation?
2021-23: predesign
Insert Row Here

What is planned with a future appropriation?
2025-27: construction
Insert Row Here

5.B Proposed Funding

This Project's construction will be funded through State General Funds as a capital project.

5.C Facility Operations and Maintenance Requirements

Blake Island currently employs three permanent staff and three seasonal staff to operate and maintain the facility. The Preferred Alternative will not require additional staff to support operations and maintenance of the facility. The updated facilities will require less maintenance than the current facilities following Project completion; over time, maintenance will increase but will not be more than State Parks currently supports.

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Appendix A
OFM Predesign Checklist

Project Predesign Applicable Elements

Project: Blake Island Marine Facilities Improvements

CBS#: 92000017 - 40000017

Appropriation: C11 2021-23 State Parks Capital Preservation Pool

A predesign should include the content detailed here. OFM will approve limited scope pre-designs on a case-by-case basis.

Yes	**1 Executive summary**
Yes	**2 Problem statement, opportunity or program requirement**
Yes	A Identify the problem, opportunity or program requirement that the project addresses and how it will be accomplished.
Yes	B Identify and explain the statutory or other requirements that drive the project's operational programs and how these affect the need for space, location or physical accommodations. Include anticipated caseload projections (growth or decline) and assumptions, if applicable.
Yes	C Explain the connection between the agency's mission, goals and objectives; statutory requirements; and the problem, opportunity or program requirements.
Yes	D Describe in general terms what is needed to solve the problem.
Yes	E Include any relevant history of the project, including previous predesigns or budget funding requests that did not go forward to design or construction.
	3 Analysis of alternatives (including the preferred alternative)
Yes	A Describe all alternatives that were considered, including the preferred alternative. Include:
Yes	i A no action alternative.
Yes	ii Advantages and disadvantages of each alternative. Please include a high-level summary table with your analysis that compares the alternatives, including the anticipated cost for each alternative.
Yes	iii Cost estimates for each alternative:
Yes	a) Provide enough information so decision makers have a general understanding of the costs.
Yes	b) Complete OFM's Life Cycle Cost Model (RCW 39.35B.050).
Yes	iv Schedule estimates for each alternative. Estimate the start, midpoint and completion dates.
	4 Detailed analysis of preferred alternative
Yes	A Describe the preferred project alternative in detail, including the following:
Yes	i Nature of space – how much of the proposed space will be used for what purpose (i.e., office, lab, conference, classroom, etc.)
Yes	ii Occupancy numbers **Dock**.
Yes	iii Basic configuration of the **dock**, including square footage and the number of floors.
Yes	iv Space needs assessment. Identify the guidelines used. (See Predesign Manual)
	B Site analysis:
Yes	i Identify site studies that are completed or under way.
	ii Provide the following:
Yes	a) Location.
Yes	b) **Dock** footprint and its relationship to adjacent facilities and site features. Provide aerial view, sketches of the building site and basic floorplans.
Yes	c) Stormwater requirements.
Yes	d) Ownership of the site and any acquisition issues.
Yes	e) Easements and setback requirements.
Yes	f) Potential issues with the surrounding neighborhood, during construction and ongoing.
Yes	g) Utility extension or relocation issues.

Project Predesign Applicable Elements

Project: Blake Island Marine Facilities Improvements

Yes	h) Potential environmental impacts.
Yes	i) **Docking** and access issues, including improvements required by local ordinances, local road impacts and parking demand.
Yes	j) Impact on surroundings and existing development with construction lay-down areas and construction phasing.
Yes	C Consistency with applicable long-term plans (such as the Thurston County and Capitol campus master plans and agency or area master plans) as required by RCW
Yes	D Consistency with other laws and regulations:
N/A	i High-performance public buildings (Chapter 39.35D RCW).
N/A	ii State efficiency and environmental performance, if applicable (Executive Order 18-01).
N/A	iii Greenhouse gas emissions reduction policy (RCW 70.235.070).
Yes	iv Archeological and cultural resources (Executive Order 05-05 and Section 106 of the National Historic Preservation Act of 1966).
Yes	v Americans with Disabilities Act (ADA) implementation (Executive Order 96-04).
Yes	vi Compliance with planning under Chapter 36.70A RCW, as required by RCW 43.88.0301.
Yes	vii Information required by RCW 43.88.0301(1).
Yes	viii Other codes or regulations.
Yes	E Identify problems that require further study. Evaluate identified problems to establish probable costs and risk.
Yes	F Identify significant or distinguishable components, including major equipment and ADA requirements in excess of existing code.
Yes	G Identify planned technology infrastructure and other related IT investments that affect the **dock** plans.
Yes	H Describe planned commissioning to ensure systems function as designed.
Yes	I Describe any future phases or other facilities that will affect this project.
Yes	J Project management and delivery method alternatives considered
Yes	i Identify and justify the proposed project delivery method, such as design-build, phased construction, general contractor/construction manager (GC/CM) or conventional design/bid/build. Justify the proposed method of project delivery.
Yes	(a) For design-build, link the justification to RCW 39.10.300 for uses, RCW 39.10.320 requirements and RCW 39.10.330 for process.
Yes	(b) For GC/CM, link the justification to the requirements in RCW 39.10.340 for uses, RCW 39.10.320 requirements and RCW 39.10.360 for process.
Yes	ii Describe how the project will be managed within the agency.
Yes	a) Identify roles and responsibilities for the project.
Yes	b) Identify in-house staffing requirements for the proposed project.
Yes	c) Identify consultant services, DES resources or additional staff needed to manage the project.
	K Schedule
Yes	i Provide a high-level milestone schedule for the project, including key dates for budget approval, design, bid, acquisition, construction, equipment installation, testing, occupancy and full operation.
Yes	ii Incorporate value-engineering analysis and constructability review into the project schedule, as required by RCW 43.88.110(5)(c).
Yes	iii Describe factors that may delay the project schedule, such as an environmentally sensitive
Yes	iv Describe the permitting or local government ordinances or neighborhood issues (such as location or parking compatibility) that could affect the schedule.
Yes	v Identify when the local jurisdiction will be contacted and whether community stakeholder meetings are a part of the process.
	5 Project budget analysis for the preferred alternative
Yes	A Cost estimate.
Yes	i Major assumptions used in preparing the cost estimate.
Yes	ii Summary table of Uniformat Level II cost estimates.
Yes	iii The C-100.
Yes	B Proposed funding.

Project Predesign Applicable Elements

Project: Blake Island Marine Facilities Improvements

Yes	i	Identify the fund sources and expected receipt of the funds.
N/A	ii	If alternatively financed, such as through a COP, provide the projected debt service and fund source. Include the assumptions used for calculating finance terms and interest rates.
Yes	C	Facility operations and maintenance requirements.
Yes	i	Define the anticipated impact of the proposed project on the operating budget for the agency or institution. Include maintenance and operating assumptions (including FTEs).
Yes	ii	Show five biennia of capital and operating costs from the time of occupancy, including an estimate of building repair, replacement and maintenance.
Yes	D	Clarify whether furniture, fixtures and equipment are included in the project budget. If not included, explain why.
	• **Predesign appendices**	
Yes	A	Completed Life Cycle Cost Model.
Yes	B	A letter from DAHP.

Appendix B
Life-Cycle Costs Model

Life Cycle Cost Analysis - Project Summary

Agency	Washington State Parks and Recreation Commission
Project Title	Blake Island Marine Facilities Improvement

Existing Description	Fort Worden's historic pier is deteriorating and nearing the end of its life. It is negatively impacting the area's marine environment. If left as is, the pier could become a safety concern.

Lease Option 1 Description	

Lease Option 2 Description	

Ownership Option 1 Description	Alternative 1. No action.

Ownership Option 2 Description	Alternative 2. Reconstruct the marina and maximize moorage within the existing marina footprint.

Ownership Option 3 Description	Alternative 3. Reconstruct the marina, expand the marina to the west, and adjust the dredge and entrance channel to improve sight lines and boating safety.

Lease Options Information	Existing Lease	Lease Option 1	Lease Option 2
Total Rentable Square Feet	10,503	-	-
Annual Lease Cost (Initial Term of Lease)	$ -	$ -	$ -
Full Service Cost/SF (Initial Term of Lease)	$ -	$ -	$ -
Occupancy Date	n/a		
Project Initial Costs	n/a	$ -	$ -
Persons Relocating	-	-	-
RSF/Person Calculated			

Ownership Information	Ownership 1	Ownership 2	Ownership 3
Total Gross Square Feet	10,503	22,485	31,670
Total Rentable Square Feet	10,503	22,480	31,660
Occupancy Date	6/30/2022	6/30/2022	6/30/2022
Initial Project Costs	$ -	$ -	$ -
Est Construction TPC ($/GSF)	$ 364	$ 966	$ 1,081
RSF/Person Calculated	-	-	-

Financial Analysis of Options

	Display Option?	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
	Financial Comparisons	**Existing Lease**	**Lease 1**	**Lease 2**	**Ownership 1**				**Ownership 2**				**Ownership 3**			
Years	**Financing Means**	**Current**	**Current**	**Current**	**GO Bond**	**COP**	**COP Deferred ***	**63-20**	**GO Bond**	**COP**	**COP Deferred**	**63-20**	**GO Bond**	**COP**	**COP Deferred**	**63-20**
50	50 Year Cumulative Cash	$1,575,060,400	$ -	$ -			$ 44,117,623				$ 117,699,080				$ 148,730,980	
	50 Year Net Present Value	$1,337,729,436	$ -	$ -			$ 42,049,633				$ 106,787,799				$ 134,762,760	
	Lowest Cost Option (Analysis Period)	**4**					**1**				**2**				**3**	

*The best NPV result for the 50 year analysis period is the Ownership 1 option using COP Deferred * financing. This option becomes the best financial alternative in 2023.*

	Financial Comparisons	**Existing Lease**	**Lease 1**	**Lease 2**	**Ownership 1**				**Ownership 2**				**Ownership 3**			
Years	**Financing Means**	**Current**	**Current**	**Current**	**GO Bond**	**COP**	**COP Deferred ***	**63-20**	**GO Bond**	**COP**	**COP Deferred**	**63-20**	**GO Bond**	**COP**	**COP Deferred**	**63-20**
30	30 Year Cumulative Cash	$ 649,764,073	$ -	$ -			$ 38,358,487				$ 85,392,642				$ 110,059,424	
	30 Year Net Present Value	$ 593,363,327	$ -	$ -			$ 37,416,302				$ 80,796,671				$ 103,650,776	
	Lowest Cost Option (30 Years)	**4**					**1**				**2**				**3**	

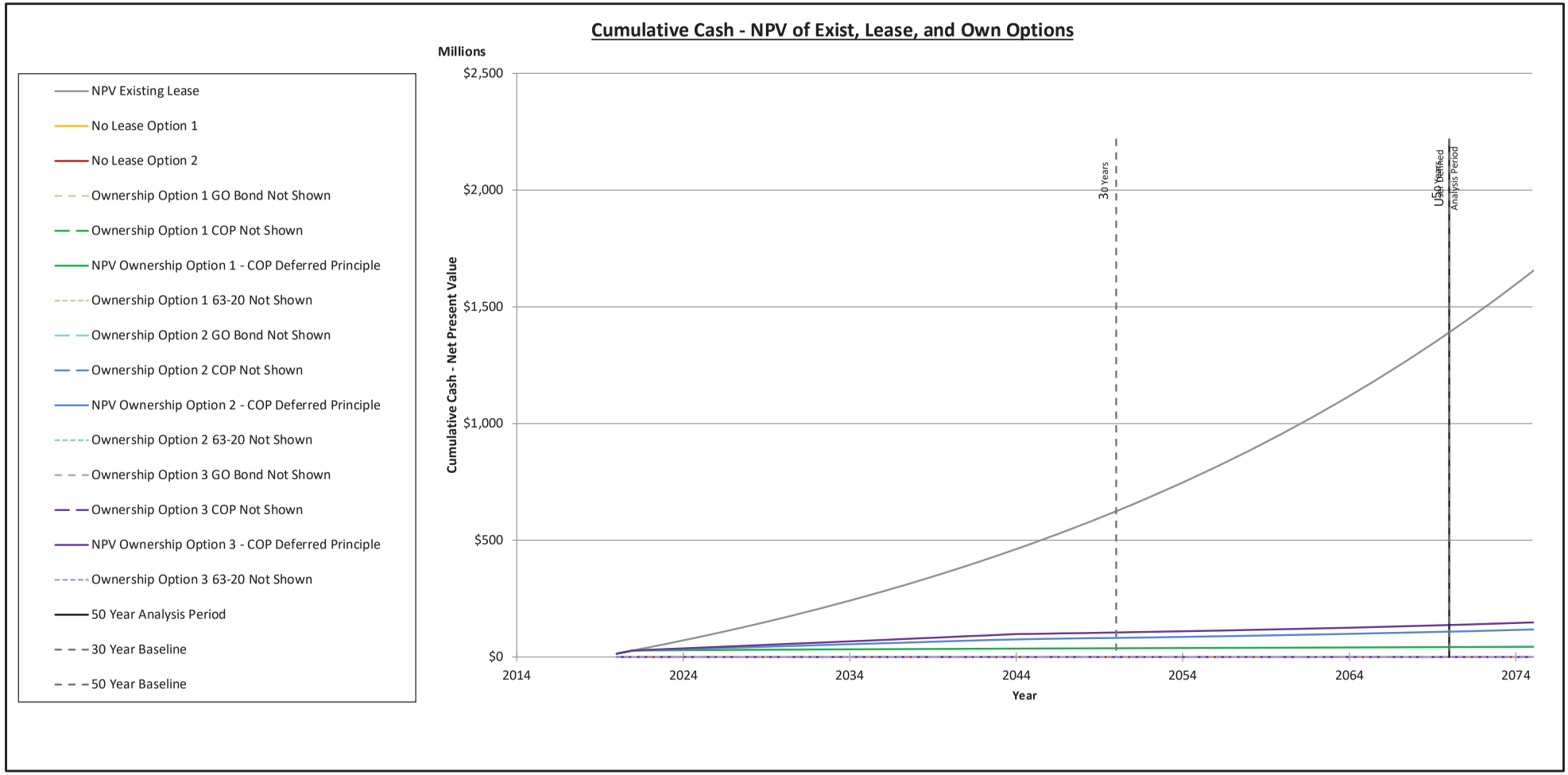
*The best NPV result for the 30 year analysis period is the Ownership 1 option using COP Deferred * financing. This option becomes the best financial alternative in 2023.*

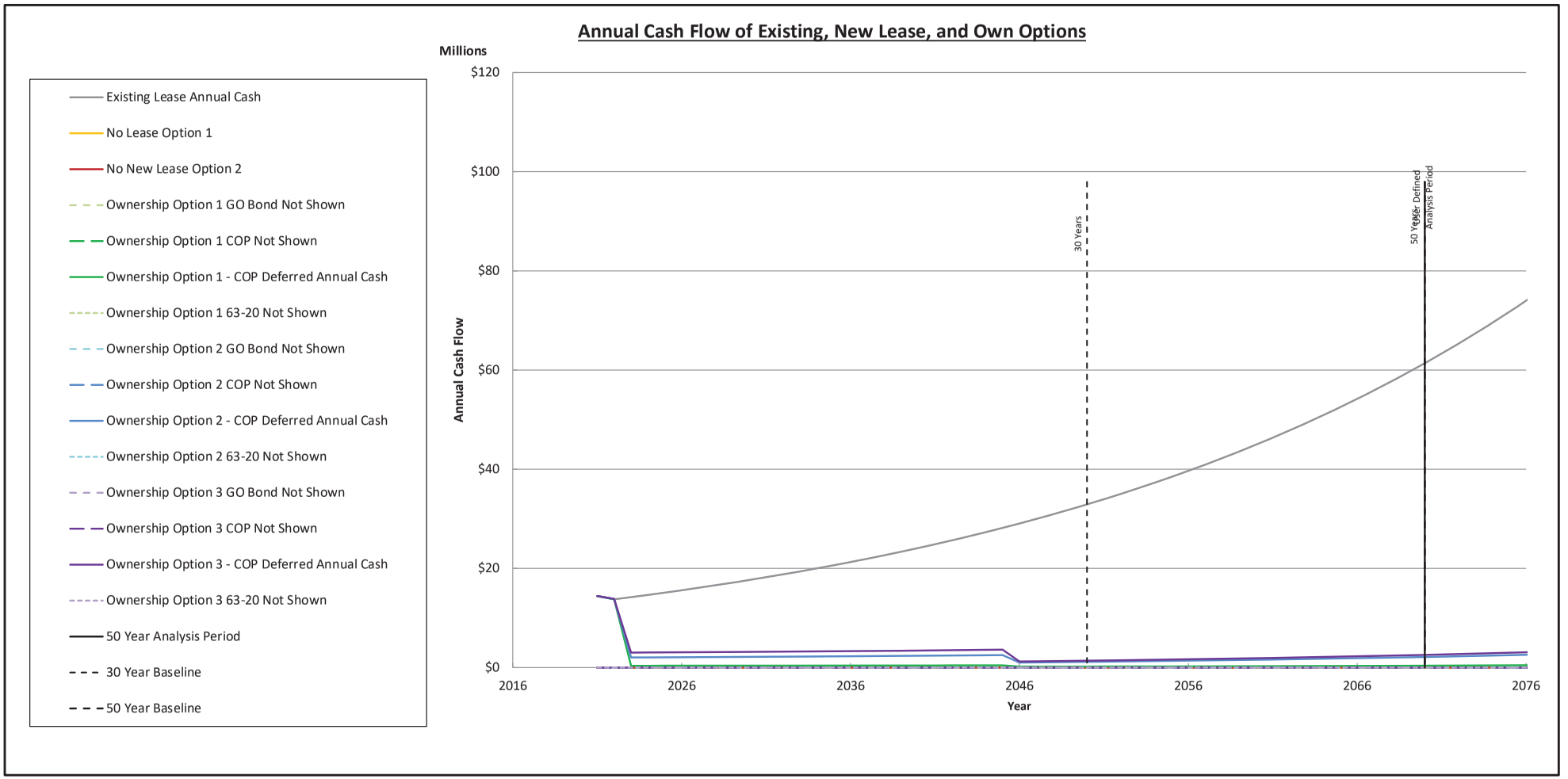
	Financial Comparisons	**Existing Lease**	**Lease 1**	**Lease 2**	**Ownership 1**				**Ownership 2**				**Ownership 3**			
Years	**Financing Means**	**Current**	**Current**	**Current**	**GO Bond**	**COP**	**COP Deferred ***	**63-20**	**GO Bond**	**COP**	**COP Deferred**	**63-20**	**GO Bond**	**COP**	**COP Deferred**	**63-20**
50	50 Year Cumulative Cash	$1,575,060,400	$ -	$ -			$ 44,117,623				$ 117,699,080				$ 148,730,980	
	50 Year Net Present Value	$1,337,729,436	$ -	$ -			$ 42,049,633				$ 106,787,799				$ 134,762,760	
	Lowest Cost Option (50 Years)	**4**					**1**				**2**				**3**	

*The best NPV result for the 50 year analysis period is the Ownership 1 option using COP Deferred * financing. This option becomes the best financial alternative in 2023.*

** - Defers payment on principle for 2 years while the building is being constructed. See instructions on Capitalized Interest.*

Cumulative Cash - NPV of Exist, Lease, and Own Options




Annual Cash Flow of Existing, New Lease, and Own Options
Millions
$120
$100
$80
$60
$40
$20
$0
Annual Cash Flow
2016
2026
2036
2046
2056
2066
2076
Year
30 Years
50 Year Defined Analysis Period
Existing Lease Annual Cash
No Lease Option 1
No New Lease Option 2
Ownership Option 1 GO Bond Not Shown
Ownership Option 1 COP Not Shown
Ownership Option 1 - COP Deferred Annual Cash
Ownership Option 1 63-20 Not Shown
Ownership Option 2 GO Bond Not Shown
Ownership Option 2 COP Not Shown
Ownership Option 2 - COP Deferred Annual Cash
Ownership Option 2 63-20 Not Shown
Ownership Option 3 GO Bond Not Shown
Ownership Option 3 COP Not Shown
Ownership Option 3 - COP Deferred Annual Cash
Ownership Option 3 63-20 Not Shown
50 Year Analysis Period
30 Year Baseline
50 Year Baseline

Financial Assumptions

Date of Life Cycle Cost Analysis:	6/6/2022
Analysis Period Start Date	6/30/2020
User Input Years of Analysis	50

All assumptions subject to change to reflect updated costs and conditions.

	Lease Options			Ownership Option 1			Ownership Option 2			Ownership Option 3		
	Existing Lease	**Lease Option 1**	**Lease Option 2**	**GO Bond**	**COP**	**63-20**	**GO Bond**	**COP**	**63-20**	**GO Bond**	**COP**	**63-20**
Inflation / Interest Rate	3.120%	3.120%	3.120%	3.540%	3.720%	3.720%	3.540%	3.670%	3.670%	3.540%	3.670%	3.670%
Discount Rate	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%
Length of Financing	N/A	N/A	N/A	25	25	25	25	25	25	25	25	25

See Financial Assumptions tab for more detailed information

COP Deferred and 63-20 Financing defer the payment on principle until construction completion.

New Lease Assumptions

Real Estate Transaction fees are 2.5% of the lease for the first 5 years and 1.25% for each year thereafter in the initial term of the lease.

Tenant Improvements are typically estimated at $15 per rentable square foot.

IT infrastructure is typically estimated at $350 per person.

Furniture costs are typically estimated at $500 per person and do not include new workstations.

Moving Vendor and Supplies are typically estimated at $205 per person.

Default Ownership Options Assumptions

Assumes a 2 month lease to move-in overlap period for outfitting building and relocation.

Assumes surface parking.

The floor plate of the construction option office building is 25,000 gross square feet.

The estimated total project cost for construction is $420.00 per square foot.

See the Capital Construction Defaults tab for more construction assumptions.

Appendix C
DAHP Letter

Don Hoch
Acting Director

STATE OF WASHINGTON
WASHINGTON STATE PARKS AND RECREATION COMMISSION
1111 Israel Road S.W. • P.O. Box 42650 • Olympia, WA 98504-2650 • (360) 902-8500
TDD Telecommunications Device for the Deaf: 800-833-6388
www.parks.state.wa.us

March 11, 2022

Nicholas Vann, Deputy State Historic Preservation Officer
Department of Archeology and Historic Preservation
1110 S. Capitol Way
Suite 30
Olympia, Washington 98501

RE: Letter of Acknowledgment Request for Blake Island Marine Facilities Improvements

Dear Mr. Vann:

The Washington State Parks and Recreation Commission is seeking a letter of acknowledgement for a proposed development project at Blake Island State Park, Kitsap County, Washington. I'm requesting this letter of acknowledgement so we can include it in our predesign report submittal to the Office of Financial Management (OFM).

The Blake Island Marine Facilities Improvements project will consist of either dredging sand and sediment from the entrance channel and south end of the Blake Island marina or constructing an alternative to dredging which meets park needs: upgrades moorage, gangway, and access routes to comply with federal accessibility requirements (ADA); removes creosote from the pier and entrance sign; and constructs a permanent ramp for the State Parks marine crew vessel. The tentative schedule for this project is as follows: predesign would occur in 2021-23; design and permitting in 2023-25, with dredging and/or other solutions in 2025-27, and construction of remaining project elements in 2027-29.

Cultural resource investigations, including consultation with DAHP and affected Tribes, will be conducted as needed throughout all phases of the project for compliance with Section 106 of the National Historic Preservation Act, as amended.

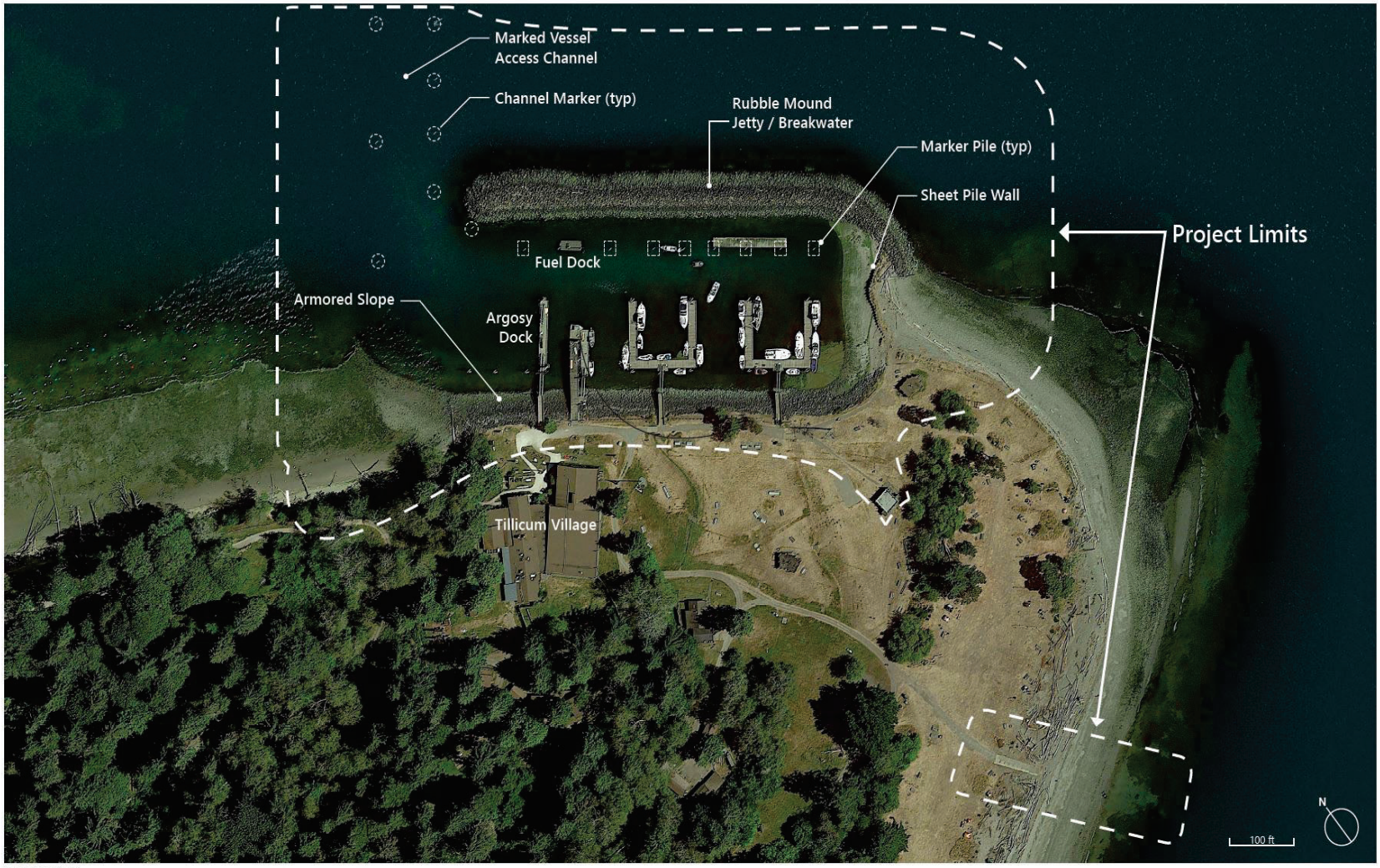
Please find an attached copy of our predesign conceptual plan for your consideration. If you need additional information or have questions, please contact me at (360) 787-6511. Thank you for your attention to this request.

Sincerely,

Jennifer Wilson
Archaeology Program Manager

Enclosures (n=1) Predesign Project Plan

Cc: Azeem Hoosein, Capital Program Manager, WSPRC
Brian Yearout, Capital Program Coordinator, SW Region, WSPRC
Sanh, Ho, Project Manager, WSPRC
Dennis Tate, Capital Budget Manager, WSPRC



Aerial imagery showing the predesign plans for the Blake Island Marine Facilities Improvements project.