



**DEPARTMENT OF  
NATURAL RESOURCES**

**OFFICE OF THE  
COMMISSIONER OF PUBLIC LANDS**  
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December 1<sup>st</sup>, 2023

The Honorable Bernard Dean  
Chief Clerk of the House  
338B Legislative Building  
Olympia, WA 98504

The Honorable Sarah Bannister  
Secretary of the Senate  
312 Legislative Building  
Olympia, WA 98504

Dear Chief Clerk Dean and Secretary Bannister:

Please find the attached the **Prioritization Plan** and **Monitoring Plan** for the Kelp and Eelgrass Health and Conservation legislative report, submitted by the Department of Natural Resources (DNR), as required under RCW 79.135.440 and due the Legislature by December 1, 2023. The statute directs DNR to create a statewide Kelp Forest and Eelgrass Meadow Health and Conservation Plan that endeavors to conserve and recover at least 10,000 acres of native kelp forests and eelgrass meadows by the year 2040. The statute also requires DNR to submit a monitoring plan based on the success measures identified within the Health and Conservation Plan.

For 2023, DNR is required to report on the finalized Native Kelp Forest and Eelgrass Meadow Health and Conservation Plan. The Health and Conservation Plan (Prioritization Plan) includes a map of priority areas based on collaborative development criteria, list of potential tools and actions for conservation and restoration, and a monitoring plan based on identified success measures. The Monitoring Plan includes guidance for approaches to tracking implementation of the Prioritization Plan.

For 2024 and going forward, DNR is required to provide ongoing biennial reports that include updates on adaptive management of the plan, monitoring of priority areas and findings, updated maps, distribution and trends, success measures, community engagement, and tribal consultation.

Should you have any questions, please contact me at 360-486-3469 or [Brian.Considine@dnr.wa.gov](mailto:Brian.Considine@dnr.wa.gov).

Sincerely,

Brian Considine  
Legislative Director  
Office of the Commissioner of Public Lands

Enclosure: Legislative Report – Native Kelp Forest and Eelgrass Meadow Health and Conservation  
Monitoring Plan

cc: Members of the Senate Agriculture, Water, Natural Resources, and Parks Committee  
Members of the House Agriculture and Natural Resources Committee  
Members of the Senate Ways and Means Committee  
Members of the House Appropriations Committee  
Office of Financial Management

# Statewide Kelp Forest and Eelgrass Meadow Health and Conservation Monitoring Plan

RCW 79.135.440

Prepared by  
Washington State Department of Natural Resources  
Office of the Commissioner of Public Lands, Hilary Franz  
December 1, 2023



WASHINGTON STATE DEPARTMENT OF  
**NATURAL RESOURCES**

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## **EXECUTIVE SUMMARY**

Kelp forests and eelgrass meadows are vital nearshore habitats that hold significant ecological, economic, and social-cultural value for the people and ecosystems of Washington State. In 2022, the Washington State Legislature passed Senate Bill 5619, signed into law as RCW 79.135.440, recognizing these values. The outcome of the legislation directs the Washington Department of Natural Resources (WA DNR) to identify at least 10,000 acres of additional kelp and eelgrass habitat for conservation and recovery by 2040. To achieve this goal, WA DNR developed the Kelp Forest and Eelgrass Meadow Health and Conservation Prioritization Plan (Prioritization Plan), which provides a framework for collaboratively identifying and prioritizing kelp and eelgrass habitat leading to the 10,000-acre goal.

As a companion document to the Prioritization Plan, the Kelp Forest and Eelgrass Meadow Health and Conservation Monitoring Plan (Monitoring Plan) aims to guide assessment of kelp and eelgrass habitat conservation and recovery efforts, track progress, and adapt strategies over time to achieve the long-term goal of conserving and recovering these vital ecosystems.

The Monitoring Plan has several objectives:

- Identify WA DNR performance metrics to track statewide progress - reported biennially.
- Describe existing statewide monitoring programs to provide context on habitat distribution, trends, stressors, and recovery.
- Support management of monitoring, conservation, and recovery efforts at statewide and local scales.

This plan also lays out WA DNR's current kelp and eelgrass monitoring efforts that inform statewide understanding of these habitats. The Monitoring Plan relies on several ongoing monitoring programs at WA DNR, including its Nearshore Habitat Program, Aquatic Assessment and Monitoring Team, and Aquatic Reserves Program. These programs provide statewide context for the status and trends of kelp and eelgrass habitats and environmental change.

While the focus of this Monitoring Plan is centered on existing WA DNR monitoring programs and collaborations, efforts of partners and other programs are integral to long-term success. Monitoring and implementation partnerships with state, federal, Tribal, and local partners will be necessary to comprehensively monitor and track progress as the Prioritization Plan is applied.

Through continued efforts and engagement, WA DNR is committed to protecting and enhancing these precious coastal ecosystems, promoting biodiversity, supporting fisheries, and providing recreational opportunities for present and future generations. By preserving the health and resilience of kelp forests and eelgrass meadows, the state is ensuring the sustainability of its marine environment and securing the well-being of both natural and human communities for years to come.

## **INTRODUCTION**

Kelp forests and eelgrass meadows are vital nearshore habitats that hold significant ecological, economic, and social-cultural value for the people and ecosystems of Washington State. Recognizing the importance of conserving and restoring these habitats, the Washington State Legislature took decisive action by passing Senate Bill 5619 (RCW 79.135.440) in 2022. This landmark legislation tasked the Washington State Department of Natural Resources (WA DNR) with developing the Kelp Forest and Eelgrass Meadow Health and Conservation Prioritization Plan (referred to hereafter as the "Prioritization Plan") to be submitted to the legislature by December 1<sup>st</sup>, 2023. The Prioritization Plan's primary objective is to provide a framework for collaboratively prioritizing at least 10,000 acres of additional kelp and eelgrass habitat for conservation and recovery by 2040.

The Kelp Forest and Eelgrass Meadow Health and Conservation Monitoring Plan (hereafter referred to as the "Monitoring Plan") is a companion to the Prioritization Plan, describing WA DNR's approach to monitoring progress towards the goals of the legislation and to inform adaptive management. WA DNR will continue to monitor the distribution and trends of native kelp forests and eelgrass meadows to inform the Prioritization Plan and adaptively change actions based on monitoring results. Each Priority Area will have site specific goals, success measures, and associated monitoring that will inform both site-specific and statewide management. A brief summary of the Prioritization Plan is in the call-out box below.

Every biennium, WA DNR will submit a report to the legislature that describes substantial changes to the statewide status and trends for native kelp forests and eelgrass meadows, as well as updates to the status of local and regional success measures. The approaches described in the Monitoring Plan will be updated as needed to reflect current monitoring approaches or goals.

The Monitoring Plan has several objectives. These objectives include:

- Identify WA DNR performance metrics to track statewide progress, which will be reported on a biennial basis.
- Describe WA DNR's current statewide monitoring programs to provide broader context on distributions and trends, stressors, and recovery.
- Support adaptive management of monitoring, conservation, and recovery efforts at statewide and local scales.

## ***Kelp and Eelgrass Health and Conservation Prioritization Plan Overview***

RCW 79.135.440 requires the development of a health and conservation plan to identify habitat by 2040. The Prioritization Plan represents progress towards that 2040 goal. The Prioritization Plan presents a collaboratively developed prioritization framework that provides a roadmap to identify and prioritize native kelp forest and eelgrass meadow areas in greatest need of conservation and recovery. The framework is built around three central questions.

***Why protect kelp and eelgrass?*** Used to identify the shared values that underlie Tribes', agencies, and stakeholders' desires for conservation and recovery to identify broad areas that maximize these values.

***What habitat can best be conserved and recovered?*** Used to identify what opportunities and risks are present that could influence the long-term success and benefit of conservation and recovery actions.

***How can these habitats be conserved and recovered?*** Used to identify tools and actions of conservation and recovery of habitats that are applicable to the habitats identified in questions 1 and 2 or other high value habitats.

Using these questions, DNR developed a two-part framework that first identifies high value habitat statewide, then uses sub-basin scale engagement for local identification of priority areas (**Appendix A**). The prioritization framework represents an iterative, multi-step process with multiple opportunities for Tribal and public input to ensure the outcomes.

Implementation of this framework is outlined within the Prioritization Plan. Alongside experts from DNR, Tribes and stakeholders will provide iterative input and guidance during implementation of the framework to ensure the diverse values and needs surrounding kelp and eelgrass are accurately reflected.

Beginning in 2024, DNR will engage in targeted conversations in three pilot sub-basins (**Appendix A**):

- South Puget Sound
- Grays Harbor
- Eastern Strait of Juan de Fuca

## **VISION OF SUCCESS AND STATEWIDE GOALS**

As previously stated, the long-term outcome of the Kelp and Eelgrass Health and Conservation Prioritization Plan is to conserve and recover at least 10,000 additional acres of native kelp and eelgrass habitat by 2040. This goal is envisioned to be accomplished by inspiring collaborative stewardship and collective action to conserve and recover Washington's kelp forests and eelgrass meadows for the benefit of current and future generations (**Table 1**).

<b>Goal</b>	<b>Actions</b>	<b>Outcomes</b>	<b>Approach</b>
<b>Fulfill the requirements of the legislation</b>	Produce and implement a Statewide Kelp Forest and Eelgrass Meadow Health and Conservation Plan.	Conserve and recover 10,000 acres of native kelp and eelgrass habitat by 2040.	<b>Assess habitat distribution, trends and environmental conditions</b>
	<b>Inspire collaborative stewardship and collective action</b>	Inspire broad public support for and stewardship of kelp and eelgrass habitats	<p>Increase public awareness and support for marine vegetation conservation and recovery.</p> <p>Engage with local community members and decision-makers through outreach to build support.</p> <p>Engage with statewide and local non-profit organizations and stakeholder groups.</p> <p>Engage with Tribal, Black, Indigenous, People of Color, and immigrant communities in planning and implementation of conservation efforts.</p>
Foster collaborative management of kelp and eelgrass habitats		<p>Co-develop and implement management/stewardship plans with local stakeholders and Tribes and fostering co-stewardship with Tribes.</p> <p>Secure sustained statewide long-term funding to support stewardship and monitoring efforts from partners and/or land managers.</p>	<b>Develop stewardship plans and metrics in collaboration with Tribal nations and other partners</b>

Table 1: Goals and associated actions will help successfully achieve the vision of the RCW.

### **How This Monitoring Plan Will Be Used**

This Monitoring Plan represents the WA DNR-led statewide monitoring efforts related to both the long-term monitoring of status and trends of kelp and eelgrass and the near-term next steps of the Prioritization Plan. The Monitoring Plan’s identified metrics are meant to



communicate progress and inform adaptive management of the prioritization and implementation process. WA DNR will provide updates to the overall progress of the performance metrics as outlined in RCW 79.135.440. The first report is due December 1, 2024, with progress updates produced biennially thereafter until 2040.

## **2024-2026 PERFORMANCE METRICS AND ACCOUNTABILITY**

The Monitoring Plan outlines seven metrics that broadly represent the actions identified in the Prioritization Plan. WA DNR will use these metrics to track overall performance and implementation of the Prioritization Plan. These performance metrics encompass statewide monitoring of kelp and eelgrass habitat distribution, trends, and environmental conditions, as well as engagement and partnership, with a particular focus on equity and environmental justice. These near-term performance metrics will be updated as needed.

### ***Statewide Monitoring***

Statewide monitoring efforts described in this Monitoring Plan are focused on WA DNR-led efforts to understand kelp and eelgrass habitat distribution, trends, and environmental conditions, as well as to foster outreach, engagement, and collaboration.

#### ***Assess Kelp and Eelgrass Habitat Distribution, Trends and Environmental Conditions***

Track the number of acres managed and monitored by WA DNR for kelp and eelgrass conservation and recovery identified through the Prioritization Plan process.

**Performance metric:** *Through the Prioritization Plan process, identify at least 2500 acres of new priority kelp or eelgrass habitat by 2026.*

Monitor statewide long-term trends and environmental conditions to continue to build statewide understanding of these habitats and inform management.

**Performance metric:** *Maintain or expand current monitoring efforts in Puget Sound and the Strait of Juan de Fuca through 2040.*

#### ***Develop and monitor engagement and partnership metrics***

Track statewide engagement and partnership metrics.

**Performance metric:** *Develop an equity and environmental justice evaluation guide for each sub-basin (see "Equity and Environmental Justice Metrics" below and **Appendix B.**)*

**Performance metric:** *Update the [Statewide Kelp and Eelgrass Health and Conservation Plan – Engagement Plan](#) to reflect engagement in pilot sub-basins by 2025 in collaboration with community and Tribal partners.*

#### ***Develop stewardship plans and metrics in collaboration with Tribal nations and other partners.***

Track funding for WA DNR and partners to support kelp and eelgrass stewardship and monitoring in priority areas.

**Performance metric:** *Maintain or increase funding for stewardship and monitoring for WA DNR and partners.*

Track partnerships relative to the spectrum of engagement described in the [Statewide Kelp and Eelgrass Health and Conservation Plan - Engagement Plan](#), ensuring the partners represent a diversity of organizations and interests, and collective capacity to contribute to implementation.

**Performance metric:** *Partners represent a diversity of organizations and interests, and collective capacity to contribute to implementation.*

### **Site-specific Monitoring**

Site-specific performance metrics and monitoring efforts will be developed with partners as part of the site-selection and implementation planning process. This process, beginning in 2024, will include engagement, partnership and collaboration with Tribes, local partners, and community members to identify priority sites and develop implementation plans. The implementation plans will identify performance metrics that are relevant to the site and outline a site-specific monitoring plan.

**Performance metric:** *Develop a toolkit of site-specific monitoring tools and approaches for the pilot sub-basins by 2026.*

### **Equity and Environmental Justice Metrics**

Equity and environmental justice are key components of WA DNR's approach to engagement for the Statewide Kelp and Eelgrass Plan. WA DNR's mission to sustain and protect Washington's natural resources, including kelp and eelgrass, requires equitable and just prioritization and involvement of overburdened communities and vulnerable populations in the development of management plans. The Healthy Environment for All (HEAL) Act, passed by the state legislature in 2021, aims to reduce environmental health disparities and improve the health of all Washington state residents by providing recommendations developed by the state Environmental Justice Task Force for prioritizing environmental justice in state government.

A commitment to equity and environmental justice is continuous work. WA DNR strives to ensure that equity and environmental justice, in relation to kelp and eelgrass, is an ongoing process from establishment of the 10,000 acres through 2040 and beyond. In addition, effects of both action and inaction may create overburdened groups who are not apparent today. To that end, WA DNR will evaluate ongoing engagement with Tribes, communities, and stakeholders to ensure that the Kelp and Eelgrass Prioritization Plan and its implementation continue to accurately reflect the values and needs of the diverse groups relevant to this Plan.

WA DNR will work with its Equity and Environmental Justice Program to identify and establish metrics on how we evaluate WA DNR's ongoing engagement. Metrics may be developed to inform statewide equity and environmental justice goals, as well as sub-basin or localized goals.

As part of the sub-basin engagement, and following WA DNR's Provisional Community Engagement Guide, WA DNR will create an evaluation guide with the community and/or partners based on how to measure or define success. An example of this evaluation guide can be found in **Appendix B**.

## **STATEWIDE HABITAT DISTRIBUTION AND TRENDS - WA DNR MONITORING PROGRAMS**

As stewards of more than 2.6 million acres of state-owned aquatic lands, WA DNR is responsible for ensuring protection of habitat and fostering public access and water-dependent activities for future generations. State-owned aquatic lands include the beds and shores of many of the navigable lakes, rivers, streams, and marine waters, such as the Puget Sound, in Washington state. WA DNR's responsibilities include protection of native seagrasses, such as eelgrass and kelp species.

This section summarizes the key WA DNR monitoring programs that will directly inform our progress towards the 10,000+ acre goal by continuing to inform our understanding of the distribution, trends and environmental conditions of kelp forest and eelgrass meadow habitat.

- WA DNR's **Nearshore Habitat Program** annually monitors eelgrass throughout greater Puget Sound and floating kelp throughout Washington State to understand site level and statewide trends in distribution and abundance.
- WA DNR's **Aquatic Assessment and Monitoring Team's Acidification Nearshore Monitoring Network (ANeMoNe)** investigates ocean acidification issues in the nearshore, including monitoring environmental conditions, eelgrass distribution, density, and growth, and bird use. The program additionally conducts research experiments to develop a better understanding of the vulnerability of these nearshore ecosystems to climate change and other interacting stressors.
- WA DNR's **Aquatic Reserves Program** promotes the conservation, restoration, and enhancement of state-owned aquatic lands that have been identified to be of special educational, scientific, or environmental interest. The Aquatic Reserves Program leads a variety of monitoring efforts that inform management of the Aquatic Reserves.

### ***Monitoring Distribution and Trends - Nearshore Habitat Program***

The Nearshore Habitat Program monitors and evaluates the status and trends of marine vegetation for WA DNR. Monitoring results provide feedback on DNR's mandate to ensure environmental protection on aquatic lands, and tracks progress on Puget Sound Recovery through the Puget Sound Vital Sign Indicators for both Eelgrass (Puget Sound) and Floating Kelp (Statewide).

#### **Submerged Vegetation Monitoring Program**

The Submerged Vegetation Monitoring Program (SVMP) at WA DNR is the most widespread monitoring program in greater Puget Sound to assess the long-term distribution and trends of nearshore vegetation, including seagrasses, understory kelp species, and other macroalgae. Updated reports of the status and trends for seagrass species have been published every two years since the beginning of the monitoring program in 2000. The monitoring results are also updated for the long-term tracking of the Eelgrass Vital Sign Indicator for Puget Sound.

#### **Kelp Monitoring**

The Nearshore Habitat Program also surveys and monitors statewide floating kelp in Puget Sound and along the open coast. Floating kelp canopy area has been monitored annually along the Olympic coast and the Strait of Juan de Fuca since 1989 using aerial photography. WA DNR has also expanded the geographic coverage of floating kelp data into Puget Sound with kayaks and power boats, Unmanned Aerial Systems, and fixed-wing aerial imagery.

From 2020 to 2022, a collaborative effort of the Washington Kelp Forest Monitoring Alliance led to the co-development of the Statewide Floating Kelp Vital Sign Indicator. The alliance works to advance understanding and conservation through co-production of knowledge and information sharing. WA DNR will work to integrate partner datasets into the analysis framework adopted for the Statewide Floating Kelp Vital Sign Indicator. These datasets provide an important record of any changes in the distribution and trends for floating kelp habitat statewide and highlight areas of concern as well as critical knowledge gaps.

While understory kelp has been identified by the Puget Sound Partnership as a future indicator, there is currently no statewide monitoring program to track understory kelp distribution and trends. Additional resources may be needed to expand our understanding of distribution and trends of understory kelp (see "Gaps and Needs" on page 14).

### ***Monitoring Climate Change- ANeMoNe Program***

Climate change affects Washington state aquatic resources in many ways. The Aquatic Assessment and Monitoring Team's Acidification Nearshore Monitoring Network (ANeMoNe) was initiated in 2015 to investigate ocean acidification issues in the nearshore by examining the role eelgrass plays in mitigating the negative effects of acidification and climate change.

Through community science and partnerships with local universities, Tribes, WDFW, NOAA, and Puget Sound Restoration Fund, the ANeMoNe program monitors environmental conditions (e.g., water temperature, pH, salinity, dissolved oxygen, and sea level) as well as metrics of habitat quality (eelgrass distribution, density, and growth) and ecosystem health (shellfish spat settlement and bird use).

There are currently 13 monitoring sites distributed statewide - including one in each of the coastal estuaries. These sites can be used to track the impacts of climate change on a sub-basin scale and could be used as reference sites for site-specific monitoring of conservation and recovery actions.

### ***Management-based Monitoring - Aquatic Reserves Program***

The Aquatic Reserves Program leads the monitoring and management of eight Aquatic Reserves, seven of which are marine reserves, constituting approximately 90,000 acres of state-owned aquatic lands, and one freshwater reserve. Each established aquatic reserve has a site-specific management plan that outlines the monitoring and research needs to assess ecological and human use information to support adaptive management decisions. These sites could be used as reference sites for assessment of conservation and recovery actions.

The Aquatic Reserves Program's monitoring efforts include maintaining five SeagrassNet sites, which for over 10 years have paired biological and environmental data on intertidal seagrass beds. The program also supports certain ANeMoNe sites that are established in aquatic reserves.

In the case that a priority area is identified as a potential new aquatic reserve or expansion of existing aquatic reserve, the Aquatic Reserves Program would be the lead program in establishing the reserve and in developing and implementing site-specific monitoring and performance metrics. The addition of new aquatic reserves may require additional resources to expand the program's current management efforts (see "Gaps and Needs" on page 15).

## GUIDANCE FOR LOCALIZED MONITORING

This section outlines the “Toolbox” approach for leveraging WA DNR’s ongoing monitoring programs to track progress towards the goals of the Kelp and Eelgrass Prioritization Plan. It describes potential metrics to be co-developed and assessed with local, state, federal and Tribal partners.

### **Localized, Fine-Scale Monitoring**

Monitoring statewide habitat distribution and trends is important for understanding progress towards the statewide goals of the Prioritization Plan. In addition to this, there is also a need for understanding the status of kelp and eelgrass in specific areas.

The development and implementation of localized monitoring plans will be a critical piece of understanding the status of kelp and eelgrass habitats in a specific area as well as monitoring progress. Localized monitoring plans will be co-developed with partners, Tribes, and other relevant entities and will be customized to fit local priorities and leverage existing efforts. There may be the need for additional resources to implement monitoring plans, see “Gaps and Needs” on page 15.

There are some common elements to consider as localized monitoring plans are developed: the current extent or potential for kelp and eelgrass, performance, environmental conditions, and what stressors might be acting in the area (see **Table 2**). This information will inform and be integrated into the localized plan for each site.

MONITORING THEME	QUESTIONS	EXAMPLE TECHNIQUES, METHODS, AND APPROACHES
<b>Status and Baseline</b>	What do we know about the status and trends of kelp and eelgrass habitats?	Use existing monitoring data (Floating Kelp Indicator and SVMP data) and integrate additional local monitoring – including but not limited to kayak surveys, dive transects, intensive eelgrass sampling, remotely operated vehicles, etc. to assess habitat value.
	Is the habitat persistent and ecologically viable?	Identify potential areas of kelp/eelgrass habitat for sensitive species, for example juvenile chinook salmon.
	Are there kelp and eelgrass habitats that represent an unusual or distinct ecological community?	Assess intertidal and subtidal community types based on substrate, exposure, and ecosystem setting.
	What do we know about the potential or historic habitat for kelp and eelgrass?	Integrate historic maps and knowledge of kelp and eelgrass presence. Identify potential habitat using bathymetry and substrate mapping.
	What data exists that should be integrated with statewide data?	Develop database of local data that can refine the statewide map and support local site selection and monitoring.
<b>Environmental Conditions, Stressors, and</b>	What stressors are influencing the study area (biological, environmental, and physical)?	Identify and monitor stressors in the sites, such as strength of ecological interactions, species/community shifts, invasive species, and community structures.

<b>MONITORING THEME</b>	<b>QUESTIONS</b>	<b>EXAMPLE TECHNIQUES, METHODS, AND APPROACHES</b>
<b>Climate Impacts</b>	<p>What is the cumulative impact and interactions across stressors in the study area?</p> <p>What contribution to stressors is from human activities?</p> <p>What is the projected impact of climate change on the interacting stressors?</p>	<p>Identify and monitor environmental stressors, such as water temperature, sediment shifts, and nutrient inputs.</p> <p>Identify cumulative impacts of multiple stressors on vegetated habitat and the ecosystem.</p> <p>Identify interactions through a combination of monitoring of the site with experiments.</p> <p>Use models, like the Salish Sea Model, to identify human contributions.</p> <p>Monitor metrics that are expected to change due to changing climate, for example temperature, oxygen, pH, sea level rise, along with climate change modeling and research.</p>
<b>Site Specific Values</b>	<p>What are our specific goals regarding ecological, economic, and social-cultural values?</p>	<p>Identify what values exist or are desired in priority areas, identify metrics to track whether actions are successful in protecting/increasing those values.</p>
<b>Local Capacity and Support</b>	<p>What types/scope of monitoring do local communities have interest and capacity for?</p>	<p>Identify existing local interest groups, for example kayakers, beach walkers, drone pilots, that may want to incorporate kelp and eelgrass monitoring into their current activities.</p>

*Table 2: Common questions to consider when developing localized monitoring plans.*

## **GAPS AND NEEDS**

While WA DNR has a strong monitoring program for canopy-forming kelp and seagrass in Puget Sound, additional monitoring will be needed to fully understand and track progress towards our collective kelp and eelgrass conservation and recovery goals. Continuing comprehensive baseline monitoring is necessary to accurately track changes in kelp and eelgrass habitats over time. Regular monitoring is crucial to assess the effectiveness of management efforts, detect early signs of degradation, and inform adaptive management practices.

This Monitoring Plan was built upon the monitoring and research needs outlined in the [Puget Sound Kelp Conservation and Recovery Plan](#) and the [Puget Sound Eelgrass Recovery Strategy](#) (Calloway et al., 2020; WA DNR, 2015). Addressing these gaps and needs will affect our ability to monitor progress and adapt management. Additional funding and support for WA DNR and local partners for implementation and monitoring will be necessary to fully realize our collective goals.

### **Statewide Monitoring Gaps**

**Better understanding of eelgrass on the Washington coastline and coastal estuaries:** Additional capacity to leverage existing monitoring or establish and maintain monitoring sites along Washington’s outer coastline is needed to understand the current distribution of

eelgrass and understory kelp. This includes the coastal estuaries and along the Olympic Coast National Marine Sanctuary.

**Better understanding of ecological and human values:** The Prioritization Plan is built upon the collaboratively developed values of kelp and eelgrass habitats. Continuing to refine and understand where these values exist in Washington State can help monitor whether we are achieving our goals of conserving and recovering areas of highest value.

**Floating kelp:** The Kelp Forest Alliance of WA State, including WA DNR, has made great strides in statewide monitoring and reporting of floating kelp status and trends. However, there are still large areas of the state (approximately 50% of Washington's coastline with floating kelp) which have insufficient data for definitive assessment. Maintaining and expanding current floating kelp monitoring efforts at a statewide scale will fill critical gaps in our prioritization and management framework.

**Restoration Techniques and Effectiveness:** Restoration of kelp and eelgrass is a primary tool to grow the areal extent of submerged marine vegetation. For kelp restoration, in particular, much about the practice and long-term efficacy of these practices remains experimental. Identifying suitable restoration sites, optimizing planting, and seeding methods, and evaluating the success of restoration projects are essential for increasing the chances of successful recovery.

**Understory Kelp:** The current state of knowledge about understory kelp is greatly limited compared to eelgrass and canopy forming kelp, largely due to challenges in sampling and monitoring these species. Expanding our knowledge of the distribution and trends of understory kelp is needed to appropriately manage this critical habitat.

### ***Localized Monitoring Gaps***

**Support for fine-scale monitoring of environmental conditions:** Effective conservation and recovery of kelp and eelgrass habitats will require actions and monitoring by a broad spectrum of groups. Tribal nations, local governments, and community partners, some of which already have established monitoring programs, will be a critical piece of localized implementation of the Monitoring Plan. This work will require support directly for those organizations to collect monitoring data, and for WA DNR to expand its current monitoring efforts and roll-up the localized data to inform statewide distribution and trends.

**Support for localized monitoring of social and economic values:** Each priority area will have identified stewardship goals and performance metrics based on the ecological, economic, and social values desired. To understand how our efforts are achieving the economic and social values, additional monitoring of performance metrics may need to be established and tracked by WA DNR, Tribal partners, and/or local partners.

## **ADAPTIVE MANAGEMENT**

Adaptive management – the process of continuous improvement based on new data, analysis, and learning – forms the basis for planning, implementing, and improving kelp and eelgrass conservation and recovery.

As part of biennial reporting to the legislature, WA DNR will report on distribution and trends of kelp and eelgrass to inform adaptive management of the Prioritization Plan and coordinated partner actions. WA DNR will also be evaluating on a biennial basis plan implementation, starting with the 2024-2026 Performance Metrics. The biennial reporting will also include

barriers to plan implementation and legislative or administrative recommendations to address those barriers.

### **Learning from Monitoring and Research**

There are many facets of kelp and eelgrass conservation and recovery challenges, as new issues will emerge or be understood as we make progress over time. As the recovery and conservation strategies are implemented, it is important to test any underlying assumptions that may affect the approaches. WA DNR anticipates working with partners and existing forums to ensure the work leverages multiple opportunities for knowledge exchange.

### **Updating the Monitoring Plan**

The performance metrics outlined in this Monitoring Plan are set for 2026 targets. New performance metrics will be identified and tracked in future phases of the Prioritization Plan implementation and delivered to the legislature during biennial reporting. Additionally, as the Prioritization Plan is implemented, evaluated, and new information is available on kelp and eelgrass health and recovery, WA DNR will update the framework and priority areas through 2040, which may trigger an update to the Monitoring Plan.

## **CONCLUSION**

Kelp forests and eelgrass meadows are vital nearshore habitats that hold significant ecological, economic, and social-cultural value for the people and ecosystems of Washington state. This Monitoring Plan describes WA DNR's approach to assessing progress towards the goals of the legislation and lays the foundation for site-specific monitoring as the Prioritization Plan is implemented.

The 2024-26 performance metrics outlined in this Monitoring Plan are meant to track and communicate WA DNR's commitment to leveraging existing collaborations, developing new partnerships, and seeking co-stewardship opportunities, in addition to monitoring environmental conditions. WA DNR will continue to monitor the distribution and trends of native kelp forests and eelgrass meadows to inform adaptive management of the plan and coordinated partner actions.

This Monitoring Plan also highlights gaps and needs in statewide and localized monitoring efforts, such as the limited understanding of understory kelp, restoration techniques, and the values associated with these habitats. These gaps may limit our ability to identify and describe progress towards the performance metrics and overall goals of the program.

Through continued efforts and engagement, WA DNR is committed to protecting and enhancing these precious coastal ecosystems, promoting biodiversity, supporting fisheries, and providing recreational opportunities for present and future generations. By preserving the health and resilience of kelp forests and eelgrass meadows, the state is ensuring the sustainability of its marine environment and securing the well-being of both natural and human communities for years to come.



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- Washington Department of Natural Resources. 2015. Puget Sound Eelgrass (*Zostera marina*) Recovery Strategy.

# APPENDIX A: SUB-BASIN MAPS

## Sub-Basins Used in Analysis

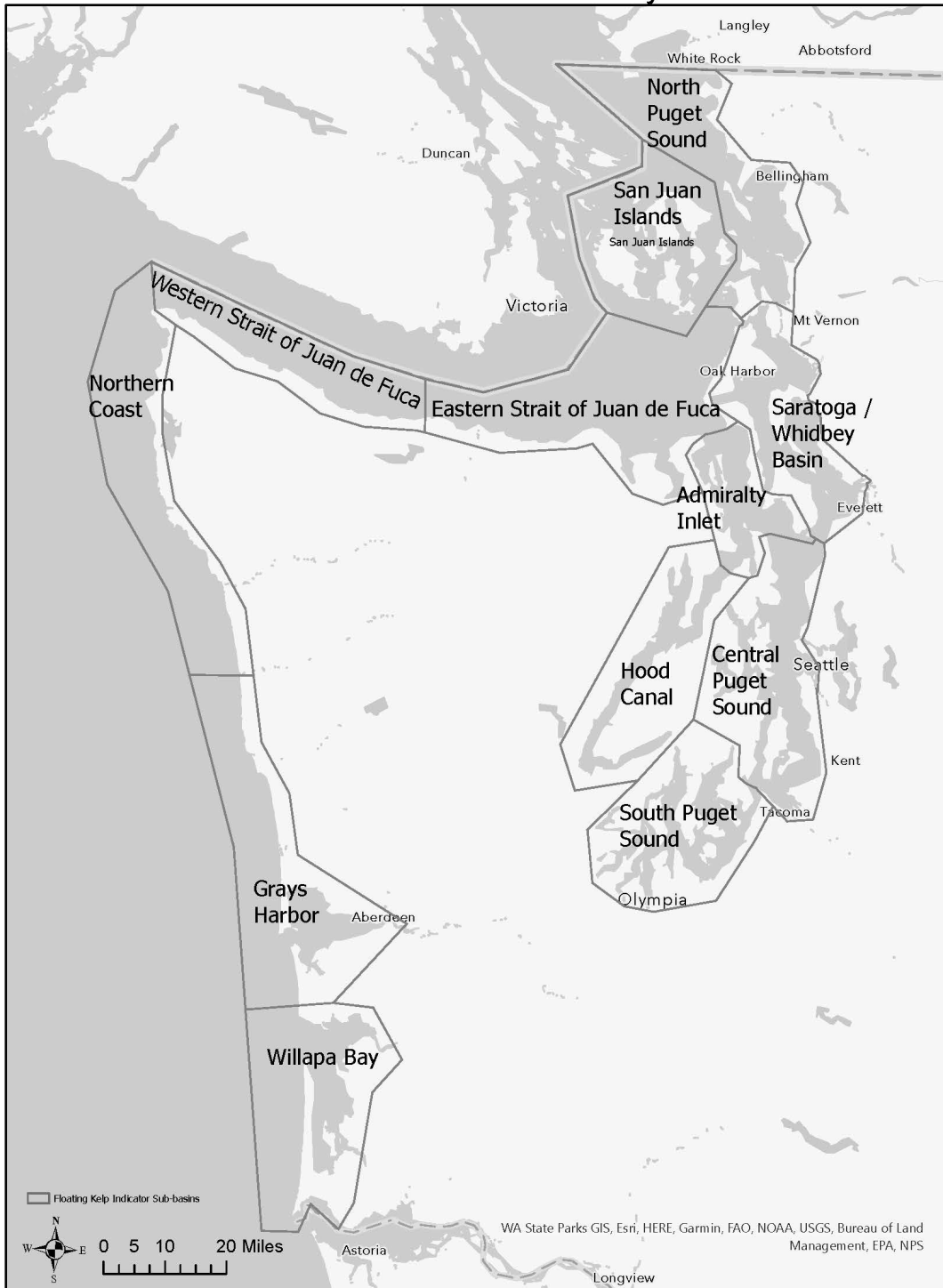


Figure A1: Sub-basins that were used in the Prioritization Plan. These sub-basins are adapted from the Statewide Floating Kelp Indicator (Berry et al., 2023).

# Pilot Sub-Basins

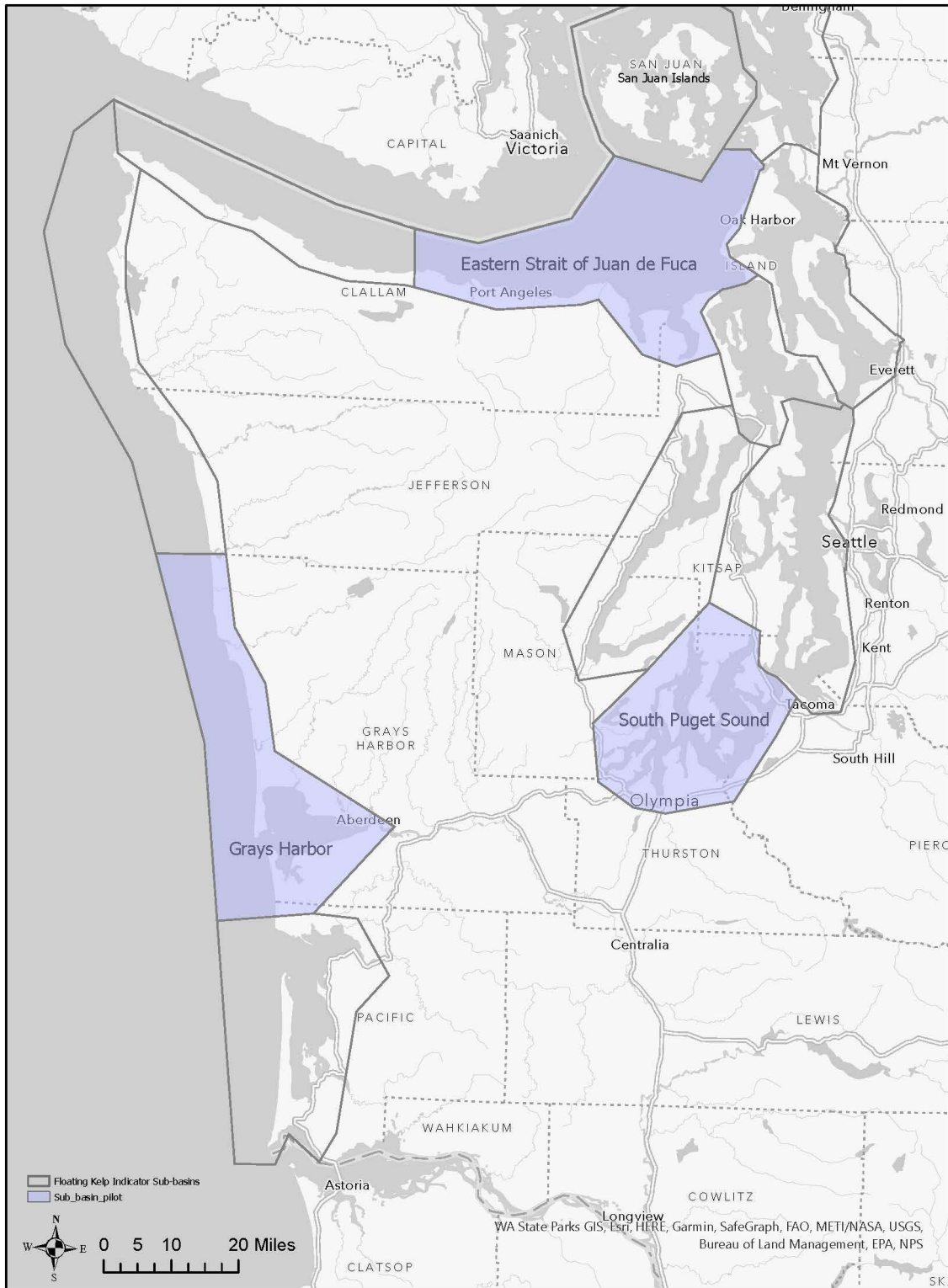


Figure A2: Pilot sub-basins that were selected to be the pilot for additional investigation and

site selection in the Prioritization Plan.

## Statewide Kelp and Eelgrass High Value Areas

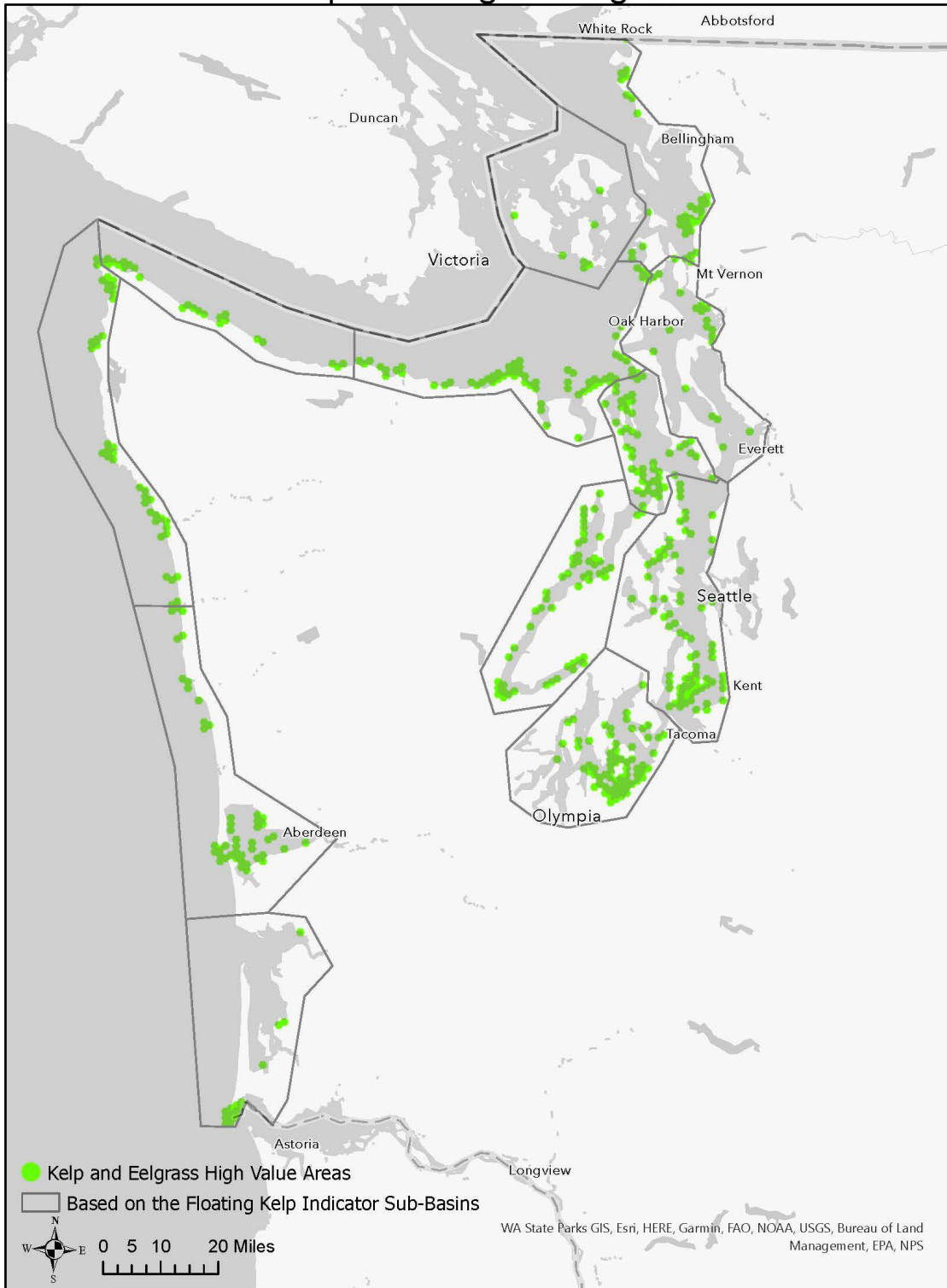


Figure A3: Preliminary High Value Areas, each of which holds significant ecological, economic, and social-cultural values, identified in the Prioritization Plan.

## APPENDIX B: EXAMPLE ENVIRONMENTAL JUSTICE EVALUATION GUIDE

WA DNR will create an evaluation guide with Tribal and/or community partners based on how we collectively intend to measure or define success. Below are several evaluation questions to consider before, during, and after community engagement. The table below was sourced from the [Washington Department of Natural Resources Provisional Community Engagement Guide 2022-2025](#) (Table B1).

When	Evaluation Questions
<i>Before Community Engagement</i>	How was the need for this project identified?
	Are the right community members involved?
	Does the structure and process allow for all voices to be heard, especially those impacted by historically and contemporary injustices?
	How will you support your partners or community members? What training, information, or resources will they need?
	How will you intentionally provide space for those impacted by injustices to have their issues heard and addressed?
	How does the community measure/define success?
<i>During Community Engagement</i>	How well does the group work together?
	Who has a voice and who doesn't?
	How will the group make decisions?
	How are conflicts or disagreements handled?
	Who leads the engagement efforts, meetings, or events?
	How are community members involved in developing the project?
	If you did a stakeholder analysis, did your results have the desired effect? Were they helpful?
	How did you ensure your community engagement effort was culturally and linguistically appropriate?
	Did stakeholder involvement improve the work, increase effectiveness, or increase political and community support of the effort?

<i>After Community Engagement</i>	Who came up with the project goals and plan?
	What could you have done better to identify and involve community partners and representatives?
	What strategies did you use to ensure all voices were heard?
	When partners who have been impacted by injustices or represent groups who are under-represented or historically marginalized brought forward issues, how were those addressed?
	Did your partners feel supported? What could be improved?
	How did you loop back to the community to thank them and let them know next steps and impact of their involvement?

*Table B1: Sample environmental justice evaluation template.*

## APPENDIX C: STATEWIDE VALUES

The first step in the prioritization framework described in the Statewide Kelp and Eelgrass Health and Conservation Prioritization Plan was to identify broadly what habitat provides ecological, social-cultural, and economic values. We have defined “values of kelp and eelgrass” as the values that Washingtonians identify for kelp and eelgrass habitats. These values underpin almost every aspect of human well-being, including food and water quality, health, and economy. The table below lays out some initial values that WA DNR used to identify preliminary High Value Areas and will be used as a starting place when discussing site selection (**Table B1**). Some of these values may be tracked as performance metrics at the localized level.

Value	Description	Value Category		
		Ecological	Economic	Social-Cultural
Artistic value and spiritual connections	Identified by public workshop participants, kelp and eelgrass possess intrinsic spiritual and artistic values.			X
Blue carbon potential	Kelp and eelgrass contribute to carbon sequestration by taking up organic carbon and storing it. In the future, there might be opportunities to integrate blue carbon into future climate market mechanisms (Ulman et al., 2013).	X	X	
Commercial fishing and shellfish aquaculture	Kelp and eelgrass provide habitat for commercially important species of fish and shellfish at various life stages.		X	
Habitat for ESA fish species	Kelp and eelgrass provide habitat for ESA species at various life stages, including listed salmon and rockfish species.	X	X	X
Important salmon habitat	Kelp and eelgrass provide habitat for salmonid species at various life stages, regardless of ESA listing.	X	X	X
Food web connectivity	Kelp and eelgrass provide habitat for forage fish species. Forage fish species are critical in other nearshore food webs.	X	X	X
Food web support	Kelp and eelgrass fuel nearshore food webs as a primary producer and important food source for many species.	X		
Important invert habitat	Kelp and eelgrass are key habitats for native invertebrate species, including some that are threatened and endangered.	X		
Important migratory bird habitat	Kelp and eelgrass are important habitats for birds as they migrate, not only as a food source but as resting areas.	X		
Functional Estuaries	Eelgrass can be found in these major estuaries on the coast and Puget Sound, which provide	X	X	X



Value	Description	Value Category		
		Ecological	Economic	Social-Cultural
	important habitat for many different species of fish, birds, and other wildlife.			
Existing Marine Managed Areas	These areas were identified and prioritized by their respective agencies and have unique ecological and social value in Washington.	X		X
Nutrient cycling	Kelp and eelgrass take up excess nutrients in the water column.	X	X	
Ocean Acidification Buffering	Eelgrass can buffer against ocean acidification. More research is needed to better understand kelp's ability to buffer against ocean acidification.	X	X	
Recreation and subsistence fishing	Kelp and eelgrass provide habitat for subsistence and recreational fisheries at various life stages.			X
Recreational diving	Kelp and eelgrass habitats support rich marine life that is of high value to divers.		X	X
Recreational kelp harvest	Kelp is a traditional food of many people who reside in Washington.	X		X
Sediment and shoreline stabilization	Eelgrass can provide stabilization to sediments and shoreline habitats during high energy events. However, sedimentation is also a stressor to kelp and eelgrass. We need to identify where eelgrass is beneficial but also identify where there are anthropogenic causes for increased sedimentation for stressor reduction.	X	X	X
Supports iconic NW species	Not only an iconic species in the NW, but orcas are also known to frequent kelp beds and these habitats support their prey/food webs.	X	X	X
Supports NW tourism	People come to the NW to enjoy the scenic vistas and the flora/fauna that exist in those vistas. Parks, refuges, and preserves are areas of high use for Washingtonians and visitors to enjoy.		X	X
Tribal Treaty Rights and Indigenous uses	A multi-faceted value that intersects with many of the values listed in this table, Tribes and Indigenous people residing in Washington have many uses and values around kelp and eelgrass.	X	X	X
Unique Ecological Areas	Previous prioritization processes have identified unique ecological areas on state-owned aquatic lands, particularly the process to identify new WA DNR Aquatic Reserves. The outcome and effort of that process should be leveraged for future prioritization efforts.	X		
Water quality improvement	Kelp and eelgrass can improve water quality by absorption of carbon dioxide and sequestration of nutrients and known pollutants. This can greatly benefit both local human populations and the	X	X	X

Value	Description	Value Category		
		Ecological	Economic	Social-Cultural
	ecosystems. However, extremely poor water quality is also a known stressor and should be identified in potential actions.			

*Table C1: Description of values around kelp and eelgrass and how they relate to ecological, economic, and social-cultural benefits.*