



# MARINE RESOURCES ADVISORY COUNCIL

April 27, 2023

# Agenda

Time	Topic
12:00 p.m.	Welcome and introductions
12:05 p.m.	Recent OA happenings
12:35 p.m.	2023 MRAC workplan update
12:45 p.m.	Coastal shellfish status
1:00 p.m.	Kelp efforts
1:15 p.m.	Aquaculture and multi-stressors discussion
1:30 p.m.	Tools discussion
2:00 p.m.	Next steps & adjourn

# Budget update

New request for 2023-2025 biennium	Lead agency	Governor's budget
Increase ongoing funding level for WOAC operations, monitoring network, and Forecast model to offset increased costs and expand engagement to better reach the Washington coast.	University of Washington, WOAC	\$300,000
<p>New biological studies:</p> <ul style="list-style-type: none"><li>• Characterize the response of Dungeness crab larvae to existing ocean acidification conditions in Puget Sound.</li><li>• Continue to investigate the relationship between seawater chemistry and harmful algal blooms in Washington waters.</li><li>• Continue to investigate eDNA as a tool to monitor biological response to OA in Washington waters.</li><li>• Analyze existing time-series of paired biological and environmental observations.</li></ul>	University of Washington, WOAC	\$520,000
	<b>TOTAL</b>	<b>\$820,000</b>

# 2023 MRAC workplan

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When	What
January	Ad hoc committee: One Pagers
February	Ad hoc committees: One Pagers
March	Ad hoc committee support: One Pagers
April (we are here)	MRAC Meeting (virtual)
May	Ad hoc committee support: Carbon Dioxide Removal, One Pagers
June	Ad hoc committee support: Carbon Dioxide Removal, One Pagers
July	MRAC Meeting (virtual)
August	Ad hoc committee support
September	Budget request development (if any)
October	MRAC Meeting (in-person, tentative)
November	Ad hoc committee support Potential legislative work session
December	Ad hoc committee support

# Bull KELP

## *Conservation & Recovery*



Betsy Peabody  
Puget Sound Restoration Fund

# Blue Ribbon Panel Report

## Action 6.3.1

- Preserve Washington's Existing native seagrass and kelp populations, and where possible, restore these populations.



Photo: Dorothy Edwards/Crosscut

# Kelp Funding

**\$1.49M** - Legislature 2021-2023 - Kelp Plan Implementation (6 partners)

**\$1.15M** - Legislature 2022 - DNR Kelp & Eelgrass Conservation Plan

**\$2.21M** - Legislature 2023-2025 - Kelp Plan Implementation (11 partners)

**\$1.95M** - Habitat Strategic Initiative Grants (NEP/PSP) 2023-2027 (3 projects)

**\$1.68M** - Paul G. Allen Family Foundation 2021-2024

**\$770K** - King County/Suquamish Tribe Settlement 2022-2027

**\$660K** - NOAA 2017-2023 - Kelp restoration

**\$200K**– Port of Seattle – Kelp enhancements & monitoring

Other Funders:

The Pew Charitable Trusts has also invested substantially in the kelp cause.

# Kelp Partners



BLUE DOT SEA FARMS



CALM COVE  
OYSTER CO.

Pew



BENJAMIN & MARGARET HALL  
FOUNDATION



BUILDERS INITIATIVE



# Kelp Conservation and Recovery Plan 2020



## Puget Sound Kelp Conservation and Recovery Plan

May 2020

Prepared by the Northwest Straits Commission, NOAA's National Marine Fisheries Service, Puget Sound Restoration Fund, Washington State Department of Natural Resources, and Marine Agronomics.



### Our shared vision for thriving kelp forests in Puget Sound

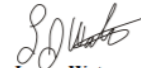
Vibrant kelp forests are vital to the health of Puget Sound and Salish Sea. They provide critical refuge, feeding, and nursery grounds for forage fish, rockfish, and salmon, as well as fueling food webs that support healthy bird and marine mammal populations—including Southern Resident killer whales. Mounting evidence points to significant local declines of kelp forests throughout Puget Sound. In response to these widespread concerns, the Puget Sound Kelp Conservation and Recovery Plan provides a research and management framework for a coordinated and collaborative approach to protecting and restoring kelp forests of Puget Sound. We envision revitalized Puget Sound kelp forests stretching from Olympia to Vancouver, B.C. providing economic, recreational, and ecological benefits to all living things that call these shores and waters home.



**Laura Blackmore,**  
Executive Director, Puget Sound Partnership



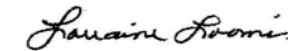
**Hilary S. Franz,**  
Commissioner of Public Lands



**Laura Watson,**  
Director, Washington State Department of Ecology



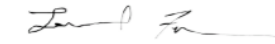
**Kelly Susewind,**  
Director, Washington Department of Fish and Wildlife



**Lorraine Loomis,**  
Chair, Northwest Indian Fisheries Commission



**Barry A. Thom,**  
West Coast Regional Administrator, National Marine Fisheries Service



**Leonard Forsman,**  
Chairman Suquamish Tribe



**Thomas D. Wooten,**  
Chairman Samish Indian Nation



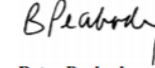
**Jeremy Sullivan,**  
Chairman Port Gamble S'Klallam Tribe



**W. Ron Allen,**  
Tribal Chairman/CEO of the Jamestown S'Klallam Tribe



**David Bean,**  
Chairman Puyallup Tribe



**Betsy Peabody,**  
Executive Director, Puget Sound Restoration Fund

# Kelp Expedition – July 2021

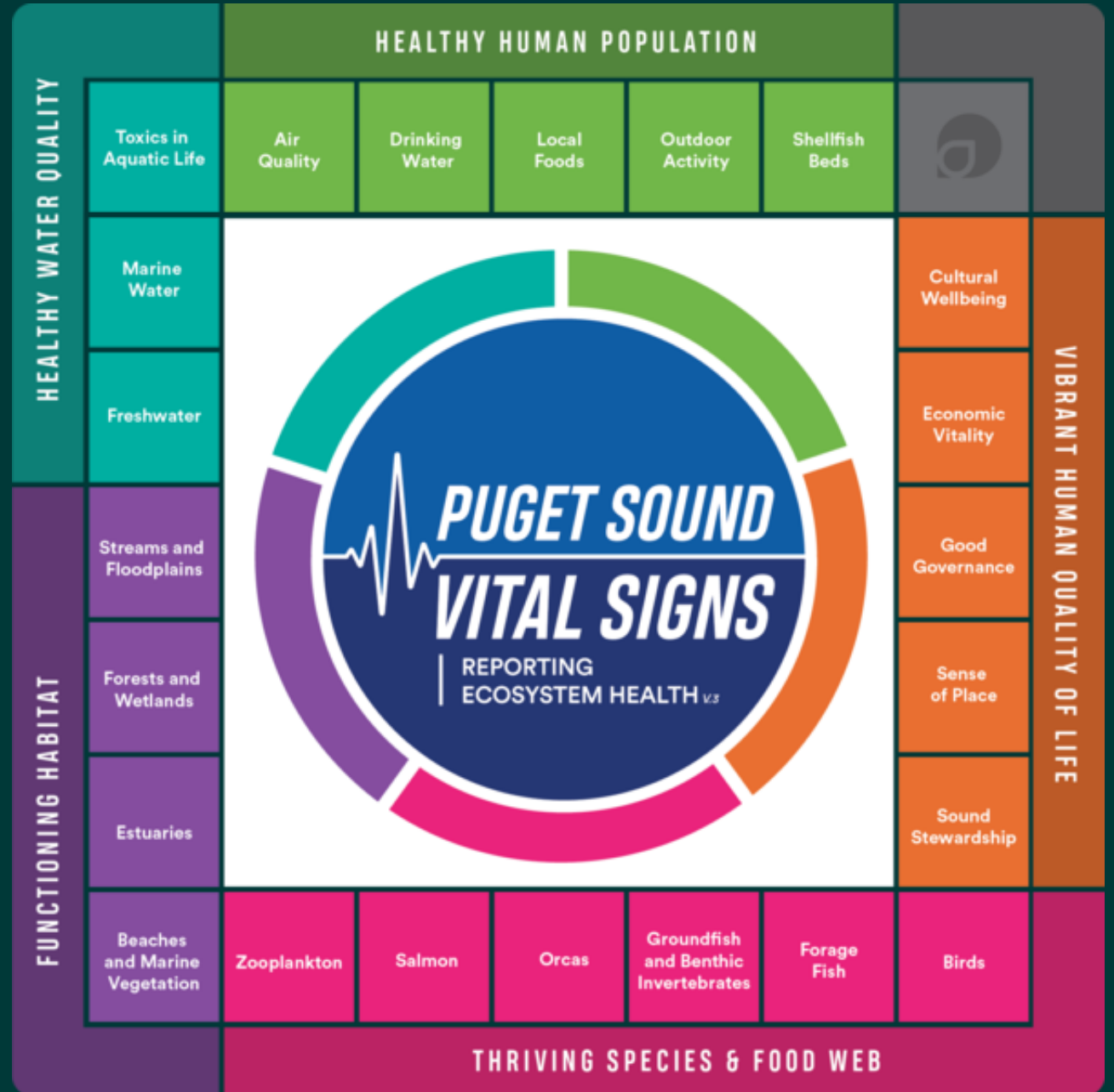
8 days; 40 partners; 184 participants



# Kelp Vital Sign

## WA Floating Kelp Indicator:

- A new Vital Sign Indicator for tracking the health of Puget Sound.
- Recognizing that kelp forests provide a foundation for marine ecosystems.



# Kayak-based Kelp Monitoring

Northwest Straits Commission – surveys by citizen scientists since 2017



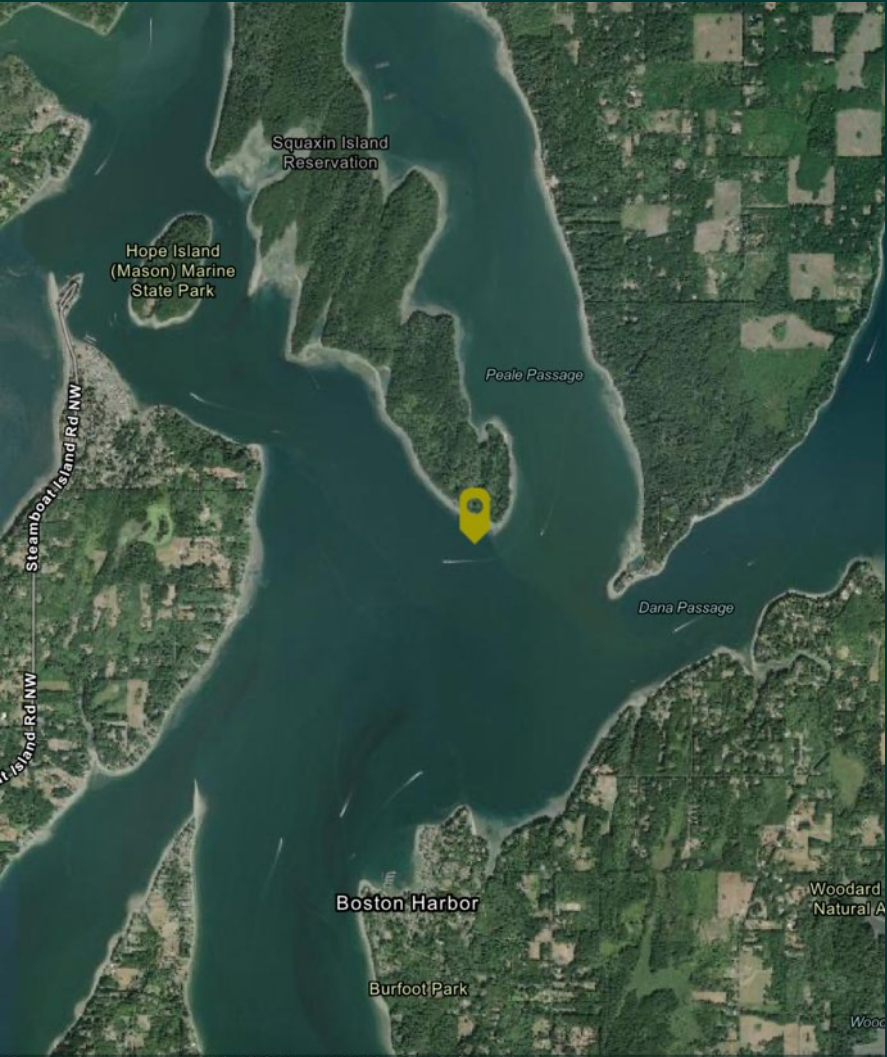
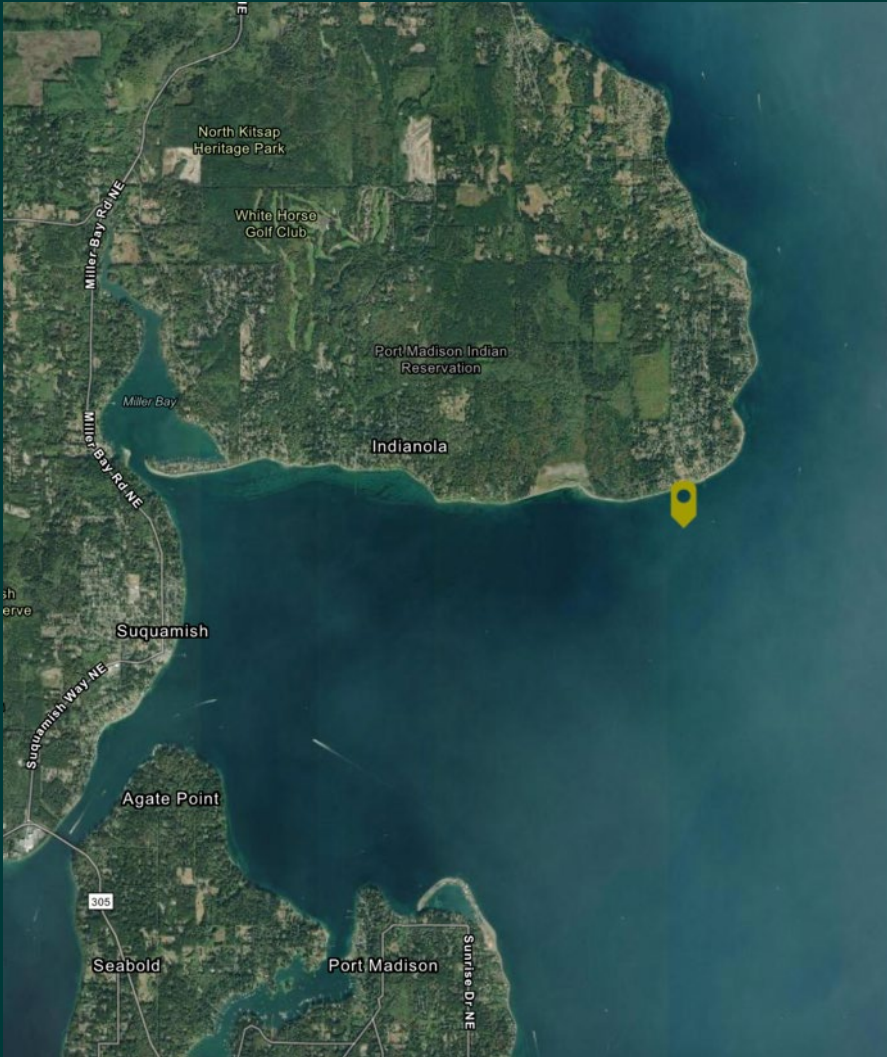
# Kelp Restoration



# Maps of Jefferson Head and Squaxin Island

Jefferson Head

Squaxin Island

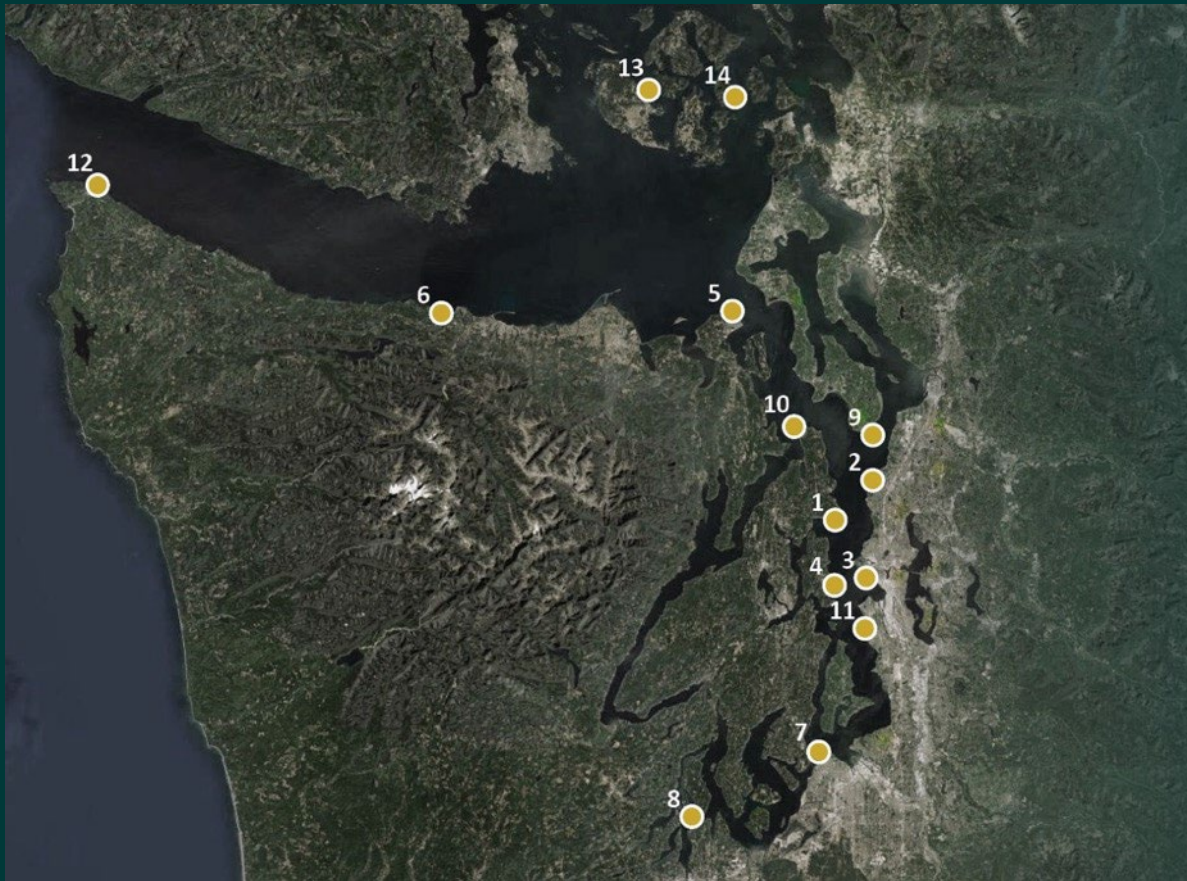


# Kelp Lab & Seed Bank



# Eyes on Kelp Initiative

- Underwater ecological surveys & environmental monitoring at 15 sites
- New monitoring robotic technology at pilot site to enable near real-time monitoring





# Global Kelp Forest Challenge

- Launched Feb 19, 2023, in Hobart, Tasmania
- Pledges from 200 entities worldwide
- PSRF Pledge: Enhance 5 bull kelp forests with Tribes, Agencies, and others by 2028
- DNR Pledge: Protect and restore 5,000 acres of kelp forests by 2040



# Global Restoration Strategies

Five strategies identified to protect and restore kelp forests by Kelp Forest Alliance (KFA):

- Natural regeneration (stressor reduction)
- Assisted regeneration (seeding & supplementation of natural habitat)
- Protection (marine protected areas)
- Problematic species control (urchin destruction, kelp crab removal)
- Competitor removal (sargassum)



# Challenges – Locally and Globally

## Multiple stressors

- Major culprit: Warming seawater (high temps have a strong neg impact)
- Grazers
- Impacts of overfishing on food web
- Pollution/excess nutrients

## 2012 vs 2023:

- "Sweetening" vs warming seawater
- 18°C reproductive failure; 20°C cell degradation



# Future Needs (and Opportunities)

- Turn the headlights on
- Keep them on
- Work closely with rights holders & knowledge holders
- Connect the dots between marine & terrestrial
- Reduce stressors
- Integrate kelp into Blue Carbon framework
  - *Cathy Pfister 2019: 27-136 MT of C/day in PS*
  - *Kindall Murie (now at FHL): even small canopy areas increase pH & aragonite saturation & decrease pCO<sub>2</sub>*
- Future proof kelp forests by developing temperature tolerant strains



An underwater photograph showing a dense kelp forest. The water is a deep teal color. Several large, brown kelp stalks with long, narrow blades are visible. Three small, silver fish with yellowish-orange bellies are swimming in the middle ground. The text "Thank you!" is overlaid in the center in a white, serif font.

Thank you!

Photo Courtesy: [/www.eikojonesphotography.com/kelp](http://www.eikojonesphotography.com/kelp)