<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 p.m.</td>
<td>Welcome and introductions</td>
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<tr>
<td>12:05 p.m.</td>
<td>Recent OA happenings</td>
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<tr>
<td>12:35 p.m.</td>
<td>2023 MRAC workplan update</td>
</tr>
<tr>
<td>12:45 p.m.</td>
<td>Coastal shellfish status</td>
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<tr>
<td>1:00 p.m.</td>
<td>Kelp efforts</td>
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<tr>
<td>1:15 p.m.</td>
<td>Aquaculture and multi-stressors discussion</td>
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<tr>
<td>1:30 p.m.</td>
<td>Tools discussion</td>
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<tr>
<td>2:00 p.m.</td>
<td>Next steps &amp; adjourn</td>
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</table>
## Budget update

### New request for 2023-2025 biennium

<table>
<thead>
<tr>
<th>Description</th>
<th>Lead agency</th>
<th>Governor’s budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase ongoing funding level for WOAC operations, monitoring network, and</td>
<td>University of Washington, WOAC</td>
<td>$300,000</td>
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<tr>
<td>Forecast model to offset increased costs and expand engagement to better</td>
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<tr>
<td>reach the Washington coast.</td>
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<tr>
<td>New biological studies:</td>
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<tr>
<td>• Characterize the response of Dungeness crab larvae to existing ocean</td>
<td>University of Washington, WOAC</td>
<td>$520,000</td>
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<tr>
<td>acidification conditions in Puget Sound.</td>
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<tr>
<td>• Continue to investigate the relationship between seawater chemistry and</td>
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<tr>
<td>harmful algal blooms in Washington waters.</td>
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<tr>
<td>• Continue to investigate eDNA as a tool to monitor biological response to</td>
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<tr>
<td>OA in Washington waters.</td>
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<tr>
<td>• Analyze existing time-series of paired biological and environmental</td>
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<td></td>
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<tr>
<td>observations.</td>
<td></td>
<td></td>
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<tr>
<td>TOTAL</td>
<td></td>
<td>$820,000</td>
</tr>
</tbody>
</table>
## 2023 MRAC workplan

<table>
<thead>
<tr>
<th>When</th>
<th>What</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>Ad hoc committee: One Pagers</td>
</tr>
<tr>
<td>February</td>
<td>Ad hoc committees: One Pagers</td>
</tr>
<tr>
<td>March</td>
<td>Ad hoc committee support: One Pagers</td>
</tr>
<tr>
<td>April (we are here)</td>
<td>MRAC Meeting (virtual)</td>
</tr>
<tr>
<td>May</td>
<td>Ad hoc committee support: Carbon Dioxide Removal, One Pagers</td>
</tr>
<tr>
<td>June</td>
<td>Ad hoc committee support: Carbon Dioxide Removal, One Pagers</td>
</tr>
<tr>
<td>July</td>
<td>MRAC Meeting (virtual)</td>
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<tr>
<td>August</td>
<td>Ad hoc committee support</td>
</tr>
<tr>
<td>September</td>
<td>Budget request development (if any)</td>
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<tr>
<td>October</td>
<td>MRAC Meeting (in-person, tentative)</td>
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<tr>
<td>November</td>
<td>Ad hoc committee support</td>
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<tr>
<td></td>
<td>Potential legislative work session</td>
</tr>
<tr>
<td>December</td>
<td>Ad hoc committee support</td>
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</tbody>
</table>
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.
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 nurseries 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 W. 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

Betty 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)
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

Photo Courtesy: Helen Berry
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 pCO₂
- Future proof kelp forests by developing temperature tolerant strains
Thank you!

Photo Courtesy: /www.eikojonesphotography.com/kelp