



Staff Recommendation

June 4, 2024

Item 8c

Action Item:

Consideration and Approval of Disbursement of Funds for Humboldt Bay Eelgrass Distribution Mapping and Spatial Modeling

Sreeja Gopal, Ph.D., Coastal Habitats Program Manager

Recommended Action: Authorization to disburse up to \$500,000 to Merkel and Associates to conduct a baywide eelgrass distribution survey in Humboldt Bay and collect ancillary water column data to facilitate development of an eelgrass habitat suitability model for Humboldt Bay, providing important data to inform offshore wind port development.

Location: Humboldt Bay

Strategic Plan Goals and Objectives: Goal 3: Enhance coastal and marine biodiversity, Objective 3.1: Protect and restore coastal and marine ecosystems. Goal 4: Support ocean health through a sustainable blue economy, Objective 4.4: Guide sustainable renewable energy projects.

Equity and Environmental Justice Considerations: In support of OPC’s Strategic Plan Goal 2 (Advance Equity Across Ocean and Coastal Policies and Actions) and Objectives 2.1 (Enhance Engagement with Tribes), this funding is anticipated to support the Wiyot and Yurok tribes through, but not limited to: capacity building through direct funding for tribes; improved participation of tribes in mapping and modeling; increased tribal workforce development opportunities; and increased opportunity for tribal co-stewardship of ancestral lands and waters.

Findings and Resolution:

Staff recommends that the Ocean Protection Council (OPC) adopt the following findings:

“Based on the accompanying staff report and attached exhibit(s), OPC hereby finds that:

1. The proposed project is consistent with the purposes of Division 26.5 of the Public Resources Code, the California Ocean Protection Act;

2. The proposed project is consistent with the Budget Act of 2022 which included a \$1 million Offshore Wind (OSW) General Fund appropriation for offshore wind research to improve understanding of impacts on ecosystems, fisheries, and cultural resources;
3. The proposed project is consistent with OPC’s Proposition 68 Grant Guidelines, adopted May 2019; and
4. The proposed projects are not ‘legal projects’ that trigger the California Environmental Quality Act (CEQA) pursuant to Public Resources Code section, section 15378.”

Staff further recommends that OPC adopt the following resolution pursuant to Sections 35500 *et seq.* of the Public Resources Code:

“OPC hereby approves the disbursement of up to \$500,000 to Merkel and Associates to conduct a baywide eelgrass distribution survey in Humboldt Bay and collect ancillary water column data to facilitate development of an eelgrass habitat suitability model for Humboldt Bay providing important data to inform offshore wind port development.

This authorization is subject to the condition that prior to disbursement of funds, Merkel and Associates shall submit for the review and approval of the Executive Director of the OPC detailed work plans, schedules, staff requirements, budgets, and the names of any contractors intended to be used to complete the projects, as well as discrete deliverables that can be produced in intervals to ensure the projects are on target for successful completion. All projects will be developed under a shared understanding of process, management, and delivery.”

Executive Summary:

Staff recommends that OPC authorize the disbursement of up to \$500,000 to Merkel and Associates to perform eelgrass distribution mapping and spatial modeling for Humboldt Bay providing important data to inform offshore wind port development.

Seagrasses are one of the most critical and threatened marine habitats in the world. Seagrasses provide a broad range of ecosystems services including providing nursery areas for marine species like the commercially important Dungeness crab, food for birds and other marine species, carbon sequestration, nutrient cycling, sediment stabilization and wave attenuation. Humboldt Bay, traditionally known as Wigi in the Wiyot language, is part of the Wiyot Tribe’s ancestral lands and waters that encompass the Bay and adjacent watersheds. Humboldt Bay is understood to hold approximately 29% of the eelgrass (a type of seagrass) within the State of California based on a 2009 survey. Since 2009, climate change-driven impacts such as floods, droughts and marine heat waves have occurred at frequencies and to degrees unprecedented in recent history in Humboldt Bay, events that have been shown to be stressors for the eelgrass ecosystem. In addition, the substantial size and scope of the Port expansion for Humboldt Bay associated with offshore wind

development is a time-sensitive driver for the need for this work. Therefore, an updated understanding of the current status of the eelgrass population is critical to ensure the long-term sustainability of eelgrass in Humboldt Bay.

The project will leverage local partnerships and collaborate with tribal partners to:

1. Update eelgrass distribution mapping baywide including subtidal bathymetry.
2. Collect temperature and photosynthetically active radiation (PAR) data to refine an existing calibrated/validated hydrodynamic model which informs habitat modeling; and
3. Develop spatial modeling for eelgrass to identify future suitable habitat.

Project Summary:

Background:

Humboldt Bay (the Bay) is traditionally known as Wigi to the Wiyot Tribe whose ancestral lands and waters encompass the Bay and adjacent watersheds. The Bay is believed to hold approximately 29% of the eelgrass within the State of California (Gilkerson and Merkel 2024). However, this estimate is based on eelgrass mapped from a now aging 2009 baywide survey (Schlosser and Eicher 2012) and mapping includes broad cover class categories for eelgrass that are not indicative of the true contribution of eelgrass to the environment of the Bay. Recent surveys conducted within sloughs and tributaries to the Bay, as well as small subsets of the Bay have shown a general net declining trend in eelgrass that ranges from a 5% to 77% reduction in different areas between 2022-23 and the baseline 2009 survey (Merkel & Associates 2022 and 2023).

At present, lack of updated baseline data limits the quantitative understanding of eelgrass change over time, and the lack of baywide empirical monitoring or robust ecological modeling tools limits the capacity to evaluate and understand the mechanisms driving eelgrass change in the system. The last spatial model developed for Humboldt Bay eelgrass dates back to 2008 and was completed before the only comprehensive bay survey (Gilkerson 2008).

With Humboldt Bay experiencing the greatest rate of relative sea level rise of anywhere in the state, along with significant observed changes in eelgrass, observed expanded erosion on tidal flats (Merkel & Associates 2023) and likely potential changes within main channels of the Bay along with consideration of opportunities to further expand tidal prism into the surrounding subsided agricultural lands as large-scale restoration projects are contemplated, there is an urgent need to better understand the impacts of multiple natural and anthropogenic environment changes on eelgrass, as well as the potential for eelgrass expansion opportunities. Therefore, it is proposed that a new baywide eelgrass survey be conducted, and ancillary water column data be

collected to enable development of an eelgrass habitat suitability model. This would help advance understanding of the eelgrass ecosystem in the Bay and capacity to effectively manage and predict the effects of natural and anthropogenic changes in the Bay.

Additionally, the Port of Humboldt Bay is the only deep-water port in Northern California and is a vital resource for local business and tourism. To support OSW deployment in California, major port development in California is anticipated. To meet this need, the Humboldt Bay Harbor Recreation and Conservation District (Harbor District) is pursuing the Humboldt Bay Offshore Wind Heavy Lift Multipurpose Marine Terminal (Terminal) to support OSW energy development. Since 2022, the Harbor District has received more than \$445 million to fund design, permitting, and construction of the Terminal, including access roads, onsite utilities, a 40-acre upland staging site, a 1,200 linear foot wharf, and a several acre berth. Of this funding, \$53.3 million is available for environmental restoration and eco-shoreline transition from the bay to the upland site. Conceptual designs for the Terminal are available now, but design is ongoing, and details will be developed concurrent with development of the California Environmental Quality Act Environmental Impact Report over the next few years.

Future potential to support public policy through eelgrass restoration is dependent upon increasing the baseline understanding of the present eelgrass distribution and predictions for the future of eelgrass under climate change scenarios. Subsequent steps outside of the present project scope would be to run various model scenarios to simulate the effects of climate change, evaluate potential for expansion of eelgrass through large scale restoration, and inform eelgrass conservation and mitigation priorities in Humboldt Bay. In particular, survey and model results can be used to inform potential impacts and opportunities related to anticipated OSW port development.

Project Summary:

This project will advance understanding and capacity to effectively manage eelgrass and predict the effects of natural and anthropogenic changes in the Bay to support analysis of effects of changes in the bay, sea level rise, broader climate variability and future development projects, including offshore wind infrastructure. A new eelgrass and bathymetric survey is proposed to be undertaken for Humboldt Bay similar to that completed recently for the 4,215-acre Morro Bay.

An updated understanding of the status of the eelgrass population is critical to ensure the long-term sustainability of eelgrass in Humboldt Bay. The project will leverage local partnerships and collaborate with Tribal partners to accomplish the following objectives:

- Update eelgrass distribution mapping baywide including subtidal bathymetry;

- Collect temperature and photosynthetically active radiation (PAR) data to refine an existing calibrated/validated hydrodynamic model; and
- Develop spatial modeling for eelgrass in Humboldt Bay.

This project will partner with the Wiyot Tribe’s Natural Resources Department on bay water quality data collection, including sensor deployment, maintenance, and data analysis needs for the duration of the one-year monitoring program. Engagement in this effort is anticipated to provide capacity building opportunities for the Wiyot Tribes marine science and monitoring programs. The project will additionally engage with Condor Aviation, a north coast tribal business enterprise and partnership between the Yurok Tribe’s Fisheries Department and Yurok Tribe Construction Corporation that specializes in aerial remote sensing with an emphasis in riverine and estuarine mapping to support bathymetric data collection.

Equity and Environmental Justice Considerations:

Eelgrass resource management and restoration has been identified as a statewide priority under SB 1363 (Monning, Chapter 846, Statutes of 2016) and is an OPC Strategic Plan objective (Objective 3.1, Target 3.1.4). However, there has been a gap in survey and management efforts for the Northern California region, specifically Humboldt Bay, a region that encompasses both Disadvantaged and Severely Disadvantaged Communities ([Community FactFinder](#)). As the state of eelgrass management science has developed, Humboldt Bay faces a higher level of eelgrass mitigation requirements than the rest of the state due to a greater level of historic eelgrass restoration failure and outdated baseline datasets. This increases the economic development costs on this area of the state, thus perpetuating regional economic impacts; however, this burden can be partially alleviated by increasing investment into eelgrass science in the region.

The proposed work provides meaningful opportunities for collaboration between leading eelgrass experts and local tribal communities (the Wiyot and Yurok Tribes) in a manner that supports capacity development along environmental stewardship pathways. Through this work, there is an expectation of development of expanded capabilities and opportunities for tribal engagement in future eelgrass monitoring and restoration in the region. This is especially beneficial since the tribes are culturally engaged in coastal resource management issues and can provide a potential local labor pool that has been historically underserved. Further, the activities outlined here are aligned with OPC’s Strategic Plan Goal 2 (Advance Equity Across Ocean and Coastal Policies and Actions) and Objectives 2.1 (Enhance Engagement with Tribes). This funding would advance benefits to the Wiyot and Yurok tribes which include but are not limited to: capacity building through direct funding for tribes; improved participation of tribes in mapping and modeling; increased tribal workforce development opportunities; and increased opportunity for tribal co-stewardship of ancestral lands and waters.

About the Grantee:

Merkel & Associates is a California-based, woman-owned small business that is well-known for their eelgrass expertise, including mapping, restoration, and modeling of this marine resource. The firm is well versed in eelgrass habitat management issues, has conducted several successful eelgrass restorations (101 eelgrass transplants) on the Pacific coast, and has a proven track record for successfully delivering on large-scale eelgrass mapping, modeling, and restoration projects. Merkel & Associates has pioneered the use of multiple survey platforms for inventorying eelgrass habitat and has set the standard for regional habitat mapping. Merkel & Associates has conducted eelgrass habitat suitability modeling in San Diego Bay and San Francisco Bay. In addition, the firm has been actively engaged in the Humboldt Bay region through their efforts to prepare the Humboldt Bay Eelgrass Comprehensive Management Plan in 2017.

Project Timeline:

The project is expected to be completed within approximately 20 months from the time of execution. The overall schedule, pending suitable weather conditions to complete surveys, is outlined as follows:

- July/August 2024: Project commencement. Eelgrass and bathymetric surveys begin. Water Quality sensor deployment and monitoring begin.
- September 30, 2024: Eelgrass survey season ends.
- November – April 2025: Eelgrass spatial data analysis and mapping.
- May 2025 – July 2025: Contingent/supplemental eelgrass surveying (as needed, pending summer 2024 survey conditions)
- August 2025 – September 2025: Water quality data analysis, supplemental/contingency eelgrass mapping.
- September 2025 – February 2026: Model development and submission of deliverables.

Project Financing:

Staff recommends that the Ocean Protection Council (OPC) authorize encumbrance of up to \$500,000 to Merkel and Associates to perform eelgrass distribution mapping and spatial modeling in Humboldt Bay.

Ocean Protection Council	\$500,000
TOTAL	\$500,000

This project is anticipated to be split-funded between Offshore Wind (OSW) General Fund appropriation (Fiscal Year 2022-2023) and Proposition 68 Chapter 9 Fund appropriation (Fiscal Year 2020-2021). The former included a \$1 million General Fund appropriation for OSW research to improve understanding of impacts on ecosystems, fisheries, and cultural resources. Proposition 68 Chapter 9 Fund provided by The California Drought, Water, Parks, Climate, Coastal Protection and Outdoor Access for All Act of (Section 80120) is intended to be used to support projects that “conserve, protect and restore marine wildlife and healthy ocean and coastal ecosystems with a focus on the state’s system of marine protected areas and sustainable fisheries.”

The proposed project supports the goals of both these funding sources, and provides local assistance consistent with California Ocean Protection Act (COPA). This project will increase understanding of this key coastal ecosystem in Humboldt Bay, support the state in preparing for and minimizing the impacts of climate change, and inform environmental impact assessments of OSW infrastructure development in the Bay. This project will provide resource managers with an environmental baseline to support evaluations of how this ecosystem will continue to provide protections to key species and habitats under shifting climate regimes and evaluate management strategies the state can implement to mitigate climate impacts.

Consistency with California Ocean Protection Act:

The proposed project is consistent with the Ocean Protection Act, Division 26.5 of the Public Resources Code, because it is consistent with trust-fund allowable projects, defined in Public Resources Code Section 35650(b)(2) as projects which:

- Eliminate or reduce threats to coastal and ocean ecosystems, habitats, and species.
- Improve coastal water quality.
- Improve management, conservation, and protection of coastal waters and ocean ecosystems.
- Provide monitoring and scientific data to improve state efforts to protect and conserve ocean resources.
- Protect, conserve, and restore coastal waters and ocean ecosystems.
- Provide funding for adaptive management, planning coordination, monitoring, research, and other necessary activities to minimize the adverse impacts of climate change on California's ocean ecosystem.

Compliance with the California Environmental Quality Act (CEQA):

The proposed project is categorically exempt from review under the California Environmental Quality Act (“CEQA”) pursuant to CEQA guidelines section 15262 because the project involves information collection, data collection, research and resource evaluation activities that will not result in a serious or major disturbance to an environmental resource.