



**Staff Recommendation**

December 12, 2023

Item 8b

**Action Item:**

**Consideration and Approval for Disbursement of Funds Related to Kelp Research and Restoration**

Pike Spector, Biodiversity Program Manager

**Recommended Action:** Authorization to disburse up to \$5,941,117 to California Sea Grant (CASG) for projects selected through a competitive solicitation administered by CASG. The following grantees and projects were selected to advance understanding and information management of kelp forest ecosystem recovery, restoration, and resilience, and to build capacity in communities affected by kelp forest ecosystem loss:

8b.1 Up to \$1,229,333 to University of California, Santa Cruz (UCSC) for “Evaluating a novel kelp restoration approach and the conditions conducive for kelp recovery and restoration”

8b.2 Up to \$575,679 to University of California, Santa Barbara (UCSB) for “A proactive approach to kelp restoration in CA: forecasting kelp loss and optimal kelp restoration times”

8b.3 Up to \$832,094 to University of California, San Diego (UCSD) for “Thermal tolerance, population variability and experimental restoration of kelp in Southern CA”

8b.4 Up to \$1,312,848 to the Tolowa Dee-ni' Nation for “Ghvtlh-k'vsh shu'-srnelh-'i~ (Kelp Guardians)”

8b.5 Up to \$1,654,555 to The Nature Conservancy for “Accelerating Bull Kelp Ecosystem Recovery in a Recently Deforested Location in Northern California by Using a Strategic Sequence of Restoration Techniques & Community Participation”

**Location:** Statewide; Del Norte, Mendocino, Sonoma, Santa Cruz, Monterey, Santa Barbara, and San Diego counties

**Strategic Plan Goals and Objectives:** Goal 3: Enhance Coastal and Marine Biodiversity; Objective 3.2: Restore and Protect Kelp Ecosystems

**Equity and Environmental Justice Considerations:** Mentorship to undergraduate and graduate students, with the goal of increasing diversity and retention in science, technology, engineering, and mathematics (STEM) fields; supporting research relationships with minority-serving institutions; supporting meaningful inclusion of tribal and stakeholder communities in research and restoration efforts, including through community science; investment in communities impacted by kelp loss; supporting tribally-led research and restoration efforts; improved access to coastal and marine resources and ecosystem services.

**Exhibits:**

- A. Comment Letters

**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 projects are consistent with the purposes of Division 26.5 of the Public Resources Code, the California Ocean Protection Act;
2. The proposed projects are consistent with the Budget Act of 2022 which included a \$50 million General Fund appropriation for grants or expenditures for resilience projects that conserve, protect, and restore marine wildlife and healthy ocean and coastal ecosystems; and
3. 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 \$5,941,117 to California Sea Grant for projects selected through the Accelerating Kelp Research Program:

- \$1,229,333 to University of California, Santa Cruz
- \$575,679 to University of California, Santa Barbara
- \$832,094 to University of California, San Diego
- \$1,312,848 to the Tolowa Dee-ni' Nation
- \$1,654,555 to The Nature Conservancy

This authorization is subject to the condition that prior to disbursement of funds, that all projects receive necessary permits for all project components and that California Sea Grant 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 disbursement of \$5,941,117 to California Sea Grant (CASG) to fund five projects selected through a competitive solicitation focused on accelerating kelp research and restoration efforts across the state, administered by CASG this year. At its [April 24, 2023 meeting](#), OPC authorized up to \$5,400,000 to California Sea Grant to support this solicitation, pending Council approval of selected projects. An additional \$541,117 is now being requested for authorization and disbursement in order to fund five highly ranked projects. OPC staff therefore seek approval to increase the authorization from \$5,400,000 to \$5,941,117.

Given the ecological, socioeconomic, and cultural importance of kelp, as well as its vulnerability to changing climatic events, OPC and the California Department of Fish and Wildlife (CDFW) are prioritizing the protection and restoration of California’s kelp forests to conserve biodiversity, build climate resilience, and maintain ecosystem services. The solicitation advances these priorities with the overarching goal of accelerating and scaling up kelp forest research and restoration in California, while promoting a “learn by doing” approach to kelp forest conservation. Specifically, the solicitation sought to support solutions-oriented projects that will guide the development of ecosystem-based management strategies for kelp forests in the face of climate change.

The solicitation was highly competitive. CASG solicited a request for letters of intent in July 2023, and reviewed the 40 letters received in August 2023. This resulted in 23 full proposals totaling \$19,210,105 for both research and restoration projects. Full proposals were reviewed by a technical review panel composed of academic scientists, subject matter experts, and state, federal agency staff. The technical review panel recommended a ranked list of projects for funding and final project selection recommendations were made collaboratively between OPC, CDFW, and CASG based on management relevance, potential for meaningful restoration, community engagement, and tribal capacity building.

## Project Summary:

### Background:

California’s iconic kelp forests are among the most productive and biodiverse ecosystems on the planet. Giant kelp, which dominates in southern and central California, and bull kelp, which dominates in northern California, are both foundational species that provide a variety of ecological functions and ecosystem services. Kelp provides habitat and serves as an important food source for marine organisms. Kelp can also provide important climate resilience benefits and is critical to the well-being of California’s coastal residents, including California Native American tribes, as well as the state’s \$45 billion ocean economy.

In 2021, OPC released the [Kelp Action Plan](#) that containing strategies and opportunities to address the kelp crisis proactively. OPC has invested more than \$3.5 million to date in monitoring kelp forest health, improving understanding of kelp loss and persistence, and testing potential kelp restoration approaches. This has included partnership with CDFW and California Sea Grant to launch a statewide, solutions-oriented [Kelp Recovery Research Program](#). The Kelp Recovery Research Program has proven invaluable in filling knowledge gaps, but as described in OPC’s Interim Kelp Action Plan, significant scientific, policy, and management questions remain. Further information regarding the status of kelp ecosystem health and implementation of the Kelp Action Plan is provided in Item 8a.

To address remaining research needs, support action while a statewide Kelp Restoration and Management Plan is being developed by CDFW, and promote a “learn by doing” approach to kelp conservation, the recommended projects will build upon the successes of the Kelp Recovery Research Program to accelerate and scale up kelp research and restoration in California.

### Project Descriptions:

The suite of projects recommended for funding will advance our understanding of the efficacy of in-water kelp restoration techniques, including community-led restoration, at key locations in central and northern California, and will reveal key insights into the climate resilience of canopy-forming and understory kelps. In conjunction with this hands-on approach, the selected projects will produce critical and novel kelp restoration forecasting models that will optimize restoration success, and a subset of projects will build capacity for impacted tribal partners across the state.

#### **8b.1 Evaluating a novel kelp restoration approach and the conditions conducive for kelp recovery and restoration, UCSC**

Based out of UCSC, but leveraging partners in Sonoma and Humboldt counties, this project will

evaluate a novel kelp restoration approach and identify environmental and ecological conditions conducive to kelp recovery and restoration for both giant and bull kelp in central and northern California. Experimental manipulations of kelp grazers along the perimeter of remnant forests will be used to understand how kelps may expand and reclaim adjacent urchin barrens. The second study will determine the environmental and ecological conditions that are conducive to natural kelp recovery to guide the timing and location of restoration efforts. The results from these paired studies will direct future investments in kelp forest restoration by filling knowledge gaps in herbivory control and the environmental conditions that facilitate kelp forest recovery.

### **8b.2 A proactive approach to kelp restoration in California: forecasting kelp loss and optimal kelp restoration times, UCSB**

Building on the success of the guide to kelp forest restoration funded under the Kelp Recovery Research Program, this project will produce the first-of-its-kind forecast model for both kelp loss and for optimizing kelp restoration in California. This empirical model will identify persistence and loss of kelp forests under changing climate to determine regions and time frames that may no longer support functional kelp forest in the future. These results, combined with the identification of environmental drivers of short term and long-term gains and losses of kelp forest persistence, will be used to identify areas of high restoration efficacy, thus informing where restoration efforts can be most effective. The deliverables of this project, including automatically updated forecast maps, will facilitate near-real time synthesis of kelp forest persistence and resilience, and aid future restoration actions.

### **8b.3 Thermal tolerance, population variability and experimental restoration of kelp in Southern California, UCSD**

While preliminary studies funded by OPC and others have begun to unravel thermal tolerances in bull kelp, this project will be the first study to identify thermal tolerances in giant kelp and five understory/subcanopy kelps in southern California. Using a combination of aquaculture and genomic techniques, this study will examine ecophysiological, microscopic, and cellular responses of kelp taxa to thermal stress and identify population variability and resilience in these key species. Researchers will also work with managers to assess the potential for outplanting heat-tolerant kelp species. These results will inform both species-specific restoration, and ecosystem-scale, science-based achievable targets that will inform state investments and effective restoration efforts.

### **8b.4 Ghvtlh-k'vsh shu'-srnelh-'i~ (Kelp Guardians), Tolowa Dee-ni' Nation**

This project represents a major step forward for tribally led ecosystem-based management and restoration of kelp forest ecosystems in California. This project will build capacity for the Tolowa Dee-ni' Nation to lead kelp forest monitoring and restoration within its ancestral territory by certifying tribal members as scientific divers, and aid in the development of restorative

aquaculture techniques for the tribe, ensuring the security of kelp species important to tribal cultural lifeways. This will result in feasibility studies along the Tolowa coastal area and accelerate the development of a tribal workforce that will lead kelp forest restoration along the several-impacted northern California coast; critically, this project will advance culturally relevant kelp forest monitoring and restoration within ancestral territories and build capacity for the next generation of tribal scientists.

**8b.5 Accelerating Bull Kelp Ecosystem Recovery in a Recently Deforested Location in Northern California by Using a Strategic Sequence of Restoration Techniques & Community Participation, The Nature Conservancy**

Drawing on the success of in-water urchin culling by commercial urchin divers, this project will continue to investigate the effectiveness of deploying a strategic sequence of techniques to optimize restoration success in deforested locations in northern California. This project will utilize commercial urchin hand harvest and urchin trapping in combination with kelp spore bags and seeded lines to limit overgrazing while simultaneously stimulating bull kelp recovery. This project will investigate urchin fishery adaptation to effectively direct kelp restoration efforts and provide opportunities for north coast communities through vocational research, SCUBA training, and community engagement to increase the likelihood of restoration success for these impacted communities.

**Equity and Environmental Justice Considerations:**

OPC is committed to ensuring that all Californians benefit from the work that it supports. OPC and California Sea Grant encouraged all applicants to meaningfully integrate justice, equity, diversity, and inclusion into project design, and prioritized the selection of projects that broaden participation of underrepresented groups in science and conservation.

**8b.1 Evaluating a novel kelp restoration approach and the conditions conducive for kelp recovery and restoration, UCSC**

To facilitate continued public engagement and awareness about kelp forest restoration, project staff from UCSC will ensure that the outcomes of their research will inform the education, guest experience, and broader communication activities of the Monterey Bay Aquarium. This includes informing the development of online and teacher training curriculum, and UC and CSU led PK-12 climate and environmental literacy, justice and action.

**8b.2 A proactive approach to kelp restoration in CA: forecasting kelp loss and optimal kelp restoration times, UCSB**

Project staff from UCSB will train the next generation of researchers by engaging with undergraduates for this project. UCSB is an R1 Hispanic Serving Institution (HSI) and Asian

American and Native American Pacific Islander Serving Institution (AANAPISI). Further, project staff will engage community members, tribes, and other active participants to inform the development of the advanced quantitative model.

### **8b.3 Thermal tolerance, population variability and experimental restoration of kelp in Southern CA, UCSD**

Project staff from UCSD have partnered with Coastal Defenders, a San Diego-based environmental, social, and restorative justice organization, to co-develop an immersive internship program to engage college-level tribal members local to the San Diego area in their research. Through collaborations with Kumeyaay and Nanticoke tribes, the project staff will support community goals to revitalize traditional coastal stewardship practices focused on seaweed harvest in the area.

### **8b.4 Ghvtlh-k'vsh shu'-srnelh-'i~ (Kelp Guardians), Tolowa Dee-ni' Nation**

To further support environmental justice and tribal capacity, the Ghvtlh-k'vsh shu'-srnelh-'i~ (Kelp Guardians) project will certify Tolowa Dee-ni' Nation tribal members as scientific SCUBA divers and provide training in kelp forest monitoring protocols. The project team will provide Tolowa students with tuition to support this training and provide internship opportunities with the Cal Poly Food Sovereignty Lab, thus building capacity for students and tribal members in northern California.

### **8b.5 Accelerating Bull Kelp Ecosystem Recovery in a Recently Deforested Location in Northern California by Using a Strategic Sequence of Restoration Techniques & Community Participation, The Nature Conservancy**

To build capacity in the underrepresented communities on the north coast, this project will support four students from marginalized groups through the completion of the scientific diving program at affiliated academic institutions, and support initiatives for education and vocational training in a rural community. Community members are often underrepresented in the monitoring and evaluation of marine restoration projects; this project will build capacity and facilitate direct community involvement and engagement for place-based restoration.

### **About the Grantee:**

California Sea Grant is a unique partnership that unites the resources of the federal government, state government, and universities across California to create knowledge, products, and services that benefit the economy, the environment, and the citizens of California. California Sea Grant has an established, highly respected process for evaluating, prioritizing, and administering research grants related to coastal and ocean resources, and has a proven track record of supporting state research efforts. California Sea Grant is experienced at managing large contracts and grants, is

familiar with the state’s scientific community, and has successfully managed many other solicitation and award efforts on behalf of OPC.

**Project Timeline:**

- December 2023: OPC concurrence on individual projects recommended for funding
- February 2024: Work begins on individual projects
- January 2026: Anticipated completion of individual projects
- March 2026: Anticipated receipt of final reports

**Project Financing:**

Staff recommends that the Ocean Protection Council (OPC) authorize encumbrance of up to \$5,941,117 to California Sea Grant (CASG) to support the Accelerating Kelp Research Program.

Funding Source	OPC	CASG
8b.1 University of California, Santa Cruz	\$1,229,333	\$40,000
8b.2 University of California, Santa Barbara	\$575,679	\$33,896
8b.3 University of California, San Diego	\$832,094	\$37,032
8b.4 Tolowa Dee-ni' Nation	\$1,312,848	\$54,500
8b.5 The Nature Conservancy	\$1,654,555	\$54,500
California Sea Grant Administrative Costs	\$336,608	
<b>Total</b>	<b>\$5,941,117</b>	<b>\$219,928</b>

The anticipated source of funds will be from the Budget Act of 2022, which included a \$50 million General Fund appropriation to OPC for grants or expenditures for resilience projects that conserve, protect, and restore marine wildlife and healthy ocean and coastal ecosystems, as well as OPC’s Fiscal Year 2018/2019 appropriation of California Environmental License Plate Funds. The proposed disbursement and anticipated projects are an appropriate use of these funding sources



because the projects will directly support efforts to restore and protect marine ecosystems in the face of changing conditions.

OPC authorized the use of these funds at its April 24, 2023 meeting for up to \$5,400,000 to California Sea Grant to support this solicitation, pending Council approval of selected projects. An additional \$541,117 is being requested for authorization and disbursement in order to fund all five highly ranked projects. OPC staff therefore seeks approval to increase the original authorization from \$5,400,000 to \$5,941,117. Up to \$336,608 of this grant amount is supporting California Sea Grant’s administration of this elected two-year projects. CASG will contribute NOAA Sea Grant funds totaling up to \$219,928 to support undergraduate research associated with each project.

### **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 the management of fisheries and/or foster sustainable fisheries.
- Allow for increased public access to, and enjoyment of, ocean and coastal resources, consistent with sustainable, long-term protection and conservation of those resources.
- 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<sup>8</sup>, 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 projects are not ‘legal projects’ that trigger the California Environmental Quality Act (CEQA) pursuant to Public Resources Code section 21068 and Title 14 of the California Code of Regulations, section 15378. If a project were determined to be a ‘legal project’ under CEQA, the proposed projects are categorically exempt from review under CEQA pursuant to 14 Cal. Code of Regulations Section 15306 because the projects involve information collection, consisting of data collection, research, and resource evaluation activities that will not result in a serious or major disturbance to an environmental resource.

Proposed projects 8b.1, 8b.3, 8b.4, and 8b.5 are additionally categorically exempt from review under CEQA pursuant 14 Cal. Code of Regulations Section 15333 because the projects qualify as small habitat restoration projects not exceeding five acres in size to assure the maintenance, restoration, enhancement, or protection of habitat for fish, plants, or wildlife.