Item 8

Staff Recommendation
June 19, 2020

Kelp Recovery Research Program

Michael Esgro, OPC Marine Ecosystems Program Manager & Tribal Liaison

RECOMMENDED ACTION: Staff recommends that OPC approve the disbursement of $600,000 to California Sea Grant to create a statewide kelp recovery research program. Together with $1,200,000 in match funding from California Sea Grant, OPC funding will support solutions-oriented research projects aimed at restoring and protecting kelp ecosystems statewide, selected via a competitive call. Individual projects recommended for approval will be provided in an addendum to this staff recommendation prior to June 19.

LOCATION: Statewide

STRATEGIC PLAN OBJECTIVE(S): 3.2: Restore and protect kelp ecosystems

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EXHIBITS:

Exhibit A: Letters of Support

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 Ocean Protection Act; and
> 2) 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 $600,000 to California Sea Grant to create a statewide kelp recovery research program. Together with $1,200,000 in match funding from California Sea Grant, OPC funding will support solutions-oriented research projects aimed at restoring and protecting kelp ecosystems statewide, selected via a competitive call.

This authorization is subject to the condition that prior to disbursement of funds, 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."

PROJECT SUMMARY:

This project will provide $600,000 to California Sea Grant to create a statewide kelp recovery research program. Together with $1,200,000 in match funding from California Sea Grant ($1,800,000 total), OPC funding will support solutions-oriented research projects aimed at restoring and protecting kelp ecosystems statewide, selected via a competitive call. Individual projects recommended for approval will be provided in an addendum to this staff recommendation prior to June 19.

Background

California's coastline has recently been devastated by unprecedented declines in kelp. Aerial surveys conducted by CDFW showed a 93% loss of bull kelp (*Nereocystis luetkeana*) cover on California's north coast from 2013-2014, with an additional 33% loss from 2014-2015. Growth of new bull kelp has been extremely limited since 2015. California's central and south coasts have been similarly affected by severe declines in giant kelp (*Macrocystis pyrifera*), but these declines have been patchier than those on the north coast. For example, certain reefs off the Monterey Peninsula have transitioned to urchin barrens, while others remain kelp forests.

Kelp declines have been attributed to a "perfect storm" of changing ocean conditions. Starting in 2014, water temperatures along the California coast increased dramatically due to an anomalous mass of warm water in the North Pacific known as "The Blob," which was followed by severe El Nino conditions that caused warm waters to persist through mid-2016. Bull kelp is highly sensitive to changes in temperature and can dissolve when water temperatures are more than a few degrees above normal. In addition, warm water holds fewer nutrients than cold water, which severely limits the ability of new kelp to establish and grow. Increased sea surface temperatures have also been implicated in the spread of sea star wasting disease, a mysterious disease that was first reported in 2014 and

subsequently ravaged sea star populations along the U.S. west coast. Sea stars are a major predator of purple sea urchins (*Strongylocentrotus purpuratus*), which in turn eat kelp. With no sea stars to keep them in check, purple sea urchin populations have exploded, grazing kelp forests down to bare rock and turning once-lush reefs into "urchin barrens," which are now persistent statewide.

Kelp is a foundational species for California marine ecosystems. Kelp forms complex biogenic habitat, modifies light levels and sedimentation, attenuates wave energy, sequesters carbon, and serves as a major food source for numerous ecologically and economically important species. The shift from healthy kelp forests to unproductive urchin barrens has caused significant loss of kelp forest ecosystem services. For example, populations of red abalone, California's only remaining abalone fishery ($44 million non-market value), have declined so substantially that the red abalone fishery was closed in 2017 and will remain closed until at least 2021. Without intervention, additional negative ecological and economic impacts are anticipated over time.

As the kelp crisis has unfolded, resource managers have been constrained by a variety of knowledge gaps surrounding kelp forest ecosystem dynamics. As a first step toward addressing these gaps, OPC and CDFW have worked in close partnership to initiate pilot research and restoration work, largely focused on investigating the efficacy of purple urchin removal as a potential kelp restoration tool on the north coast. However, in order to effectively mitigate the kelp crisis at broader spatial and temporal scales, OPC and CDFW urgently require an improved understanding of the drivers of kelp collapse, more robust long-term monitoring of kelp forest health statewide, and a science-based evaluation of the efficacy of various kelp restoration options.

Project Tasks

OPC, CDFW, and California Sea Grant will partner with California's leading kelp forest researchers to create a statewide Kelp Recovery Research Program. This unique partnership will meet the urgency of the kelp crisis by supporting innovative, "solutions-oriented" projects that will directly inform the efforts of resource managers to restore and protect kelp ecosystems statewide.

In particular, the Kelp Recovery Research Program will accomplish the following tasks:

Select projects via a competitive process. In March 2020, OPC and California Sea Grant jointly released a $1,800,000 request for proposals (RFP) for "solutions-oriented" kelp research and restoration projects. California Sea Grant has committed $1,200,000 to this effort and OPC staff has tentatively committed $600,000; the disbursement of this OPC funding to selected projects is contingent upon Council approval.

More than 20 proposals were submitted in response to the RFP, with a total of nearly $10,000,000 requested. Proposals are now being evaluated by a review panel that includes

OPC and CDFW staff as well as technical reviewers from the academic community with expertise in marine ecology, phycology, marine botany, remote sensing, molecular genetics, population dynamics, and aquaculture.

Manage research projects. OPC and CDFW will coordinate with California Sea Grant and individual project teams to collaboratively manage selected projects and ensure that data collection, analysis, and reporting efforts are contributing to management priorities. Selected projects will, through a combination of field and lab studies, address priorities that include but are not limited to:

- Investigating the efficacy of kelp seeding and outplanting techniques, especially in combination with urchin removal.
- Developing techniques and best practices for the culturing of bull kelp and giant kelp.
- Developing a science-based framework for restoration site selection.
- Using molecular genetics approaches to 1) assess genetic variation of kelp populations and 2) investigate the degree to which genetic variation may confer higher tolerance to changing ocean conditions, such as persistent marine heat waves.
- Mapping historical, current, and projected extent of kelp beds on the California coast.
- Using modeling approaches to examine drivers of kelp persistence and predict responses of kelp populations to environmental and ecological shifts.

Projects that propose to directly engage California's Tribes and Tribal Governments, as well as coastal stakeholder communities (e.g. fishermen, recreational divers) will also be prioritized.

The results of research projects funded through the Kelp Recovery Research Program will help to fill critical knowledge gaps, directly informing state efforts to protect and restore California's iconic kelp forests in the face of changing ocean conditions.

Site Description

This project will occur at a statewide scale. Individual projects will be selected to ensure that scientific efforts are conducted across the state (i.e. North Coast, Central Coast, and South Coast) in both bull kelp and giant kelp systems.

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. 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

- June 2020: grant awarded
- June 2020 – September 2020: projects begin
- September 2020 – March 2022: data collection and analysis under way, interim reports submitted at regular intervals to OPC, CDFW, and California Sea Grant
- March 2022: final reports due to OPC, CDFW, and California Sea Grant

PROJECT FINANCING:

Staff recommends that OPC authorize encumbrance of up to $600,000 to California Sea Grant to conduct the project summarized above.

Ocean Protection Council	$600,000
California Sea Grant	$1,200,000
TOTAL	**$1,800,000**

The anticipated source of funds will be OPC's FY 2018/2019 appropriation of Proposition 68 funds (Chapter 9 – Ocean, Bay, and Coastal Protection). Per OPC's Proposition 68 Grant Guidelines, this funding source prioritizes projects intended to conserve, protect, and restore marine wildlife and healthy ocean and coastal ecosystems.

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:

(A) Eliminate or reduce threats to coastal and ocean ecosystems, habitats, and species: *Results from this project will help inform management approaches aimed at reducing threats to kelp forests statewide.*

(B) Improve the management of fisheries: *This project will improve our understanding of various kelp restoration approaches, directly informing sustainable management of fisheries associated with kelp forest ecosystems (e.g. abalone, rockfishes).*

(C) Foster sustainable fisheries: *The restoration of degraded kelp forest ecosystems has the potential to promote the recovery of economically important fisheries statewide, including the recreational red abalone fishery and the commercial red sea urchin fishery.*

(D) Improve coastal water quality: *Improved understanding of the drivers of kelp forest loss will assist managers in strengthening the nexus between kelp forest health and water quality.*

(E) Allow for increased public access to, and enjoyment of, ocean and coastal resources, of those resources: *The restoration of degraded kelp forest ecosystems has the potential to increase both consumptive and nonconsumptive recreational activities, including fishing and diving, which have been severely negatively impacted by kelp collapse statewide.*

(F) Improve management, conservation, and protection of coastal waters and ocean ecosystems: *Information from this project will directly inform the adaptive management of kelp forest ecosystems statewide, especially in the face of changing ocean conditions and other climate-driven threats.*

(G) Provide monitoring and scientific data to improve state efforts to protect and conserve ocean resources: *This project will include monitoring of various metrics of kelp forest ecosystem health (e.g. kelp canopy extent) and will also provide a robust scientific basis for evaluating the efficacy of various restoration approaches, directly informing future management actions.*

(H) Protect, conserve, and restore coastal waters and ocean ecosystems: *This project will investigate the efficacy of various kelp restoration approaches, potentially including active restoration of kelp forests on an experimental basis.*

(I) Address coastal water contamination from biological pathogens: *Improved understanding of the drivers of kelp forest loss will assist managers in strengthening the nexus between kelp forest health and water quality.*

(J) 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: *Information from this project will directly inform the adaptive management of California's kelp forests statewide.*

By directly engaging OPC and CDFW, this project will promote the coordination of state programs and activities that protect ocean resources.

CONSISTENCY WITH OPC'S STRATEGIC PLAN:

This project supports Objective 3.2: Restore and Protect Kelp Ecosystems. Specifically, this project contributes to two key action items under that Objective:

- Fund research and monitoring to investigate critical knowledge gaps regarding kelp forest ecosystem protection and recovery
- Support and coordinate research projects and volunteer restoration efforts, including local research, in a manner that expands kelp spatial distribution, enhances ecosystem health, and does so in a manner that increases statewide and regional utility of data sets and restoration effectiveness.

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 14 Cal. Code of Regulations Section 15306 because the project involves only data collection, research and resource evaluation activities that will not result in a serious or major disturbance to an environmental resource. Staff will file a Notice of Exemption upon approval by the OPC.