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Item 8 - Addendum

Staff Recommendation
Addendum
June 19, 2020

Kelp Recovery Research Program – Summary of Selected Projects
Michael Esgro, OPC Marine Ecosystems Program Manager & Tribal Liaison

The Kelp Recovery Research Program will provide $1,800,000 ($600,000 from OPC and $1,200,000 in match funding from California Sea Grant) to support solutions-oriented research projects aimed at restoring and protecting kelp ecosystems statewide. For more details on the Kelp Recovery Research Program, please see the full Staff Recommendation for Item 8.

This addendum provides a summary of the six individual projects recommended for approval as part of the Kelp Recovery Research Program. Projects were selected through a competitive process that included technical review by a panel of scientific experts, as well as review by state agency staff to ensure alignment of project outcomes with management needs.

Jennifer Caselle, Tom Bell (UC Santa Barbara), Mark Carr (UC Santa Cruz): Where, when and how? A guide to kelp restoration in California using spatio-temporal models of kelp dynamics
This project will use cutting-edge modeling techniques to identify key ecological, oceanographic, geographic, and management-related drivers of kelp persistence at local and regional scales. Model results will be used to produce a restoration guide. This guide will enable resource managers to choose optimal locations, times, and methods for kelp restoration activities statewide.

Michael Graham, Scott Hamilton (Moss Landing Marine Laboratories): Assessment of practical methods for re-establishment of northern California bull kelp populations at an ecologically relevant scale
Re-establishing kelp populations via seeding or outplanting is a promising restoration tool that, when paired with urchin removal efforts, can lead to more successful restoration outcomes than urchin removal alone. This project will test the efficacy of various methods for 1) culturing bull kelp in the lab and 2) outplanting cultured kelp to reefs following sea urchin removal in northern California. Investigators will monitor the growth, survival, and reproduction of bull kelp following outplanting.

Joleah Lamb, Matthew Bracken (UC Irvine): Scaling a new cost-effective intervention tool to restore and future-proof coastal kelp forests
This project will complement Graham's project (described above) by testing the efficacy of various methods for culturing and outplanting giant kelp in southern California. In addition, investigators will pursue an "assisted evolution" approach that will acclimatize young kelps to warmer waters, helping to ensure future restoration success in the face of climate change.

Brian Gaylord, Marissa Baskett, Aurora Ricart (UC Davis), Mackenzie Zippay, Brent Hughes, Matt Edwards, Sean Place (Sonoma State University), Jason Hodin (University of Washington): A multi-pronged approach to kelp recovery along California's north coast
This multi-pronged project will accomplish the following: 1) culture heat-tolerant strains of bull kelp and test their outplanting success; 2) model bull kelp spore dispersal to help create a "network" of bull kelp refugia on California's north coast; 3) assess the reproductive viability of malnourished purple sea urchins in urchin barrens, helping to determine whether in-water urchin crushing may inadvertently cause urchins to spawn; 4) quantify the predation rate of juvenile sunflower sea stars on juvenile purple urchin; and 5) develop a dynamic model of the kelp-urchin-sea star system, to help isolate the best policy levers for management action.

Alison Haupt (CSU Monterey Bay), Jan Freiwald (Reef Check California): Informing restoration and recovery of central coast kelp forests – understanding the dynamics of urchin recruitment, reproduction and density
This project will examine the reproductive potential of intertidal and subtidal purple sea urchin populations, helping to determine potential reproductive sources of sea urchins that may play a role in maintaining urchin barrens. Investigators will also assess spatial patterns in kelp and sea urchin recruitment by collecting larvae at a variety of central and north coast sites, including sites where purple urchin removal is currently being conducted. An improved understanding of the kelp and urchin landscape will assist resource managers in restoration site selection.

Felipe Alberto (University of Wisconsin – Milwaukee), Peter Raimondi (UC Santa Cruz), Sergey Nuzhdin (USC): Conservation genomics and gametophyte banking of bull kelp in California
This project will create a bull kelp "seed bank" that will include both spores and living kelps, helping to preserve the species and its genetic diversity for decades into the future. Investigators will also assess genetic variation in bull kelp populations over time and space, enhancing resource managers' understanding of why bull kelp is persisting at certain locations but not others, and helping to optimize restoration site selection on the north coast.