

**WRITTEN TESTIMONY OF
DEB SELF**

**EXECUTIVE DIRECTOR OF
GREATER FARALLONES ASSOCIATION**

**BEFORE A LEGISLATIVE HEARING OF
THE U.S. HOUSE OF REPRESENTATIVES**

**COMMITTEE ON NATURAL RESOURCES
SUBCOMMITTEE ON WATER, WILDLIFE AND FISHERIES**

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Chairman Bentz, Ranking Member Huffman, and Members of the Subcommittee, thank you for the honor of testifying before you today on behalf of Greater Farallones Association. My name is Deb Self, and I am the Executive Director of GFA, a nonprofit organization dedicated to working in close public-private partnership with NOAA's Greater Farallones and Cordell Bank National Marine Sanctuary, and the Northern Management Area of the Monterey Bay National Marine Sanctuary.

Our kelp ecosystems are in dire need of rapid restoration to maintain the fisheries and communities that are dependent on kelp. It is my pleasure to voice strong support for H.R. 5487, the Help Our Kelp Act, which would create additional restoration funds for kelp, including an emphasis on ensuring Tribes receive resources for restoration and co-management.

This is important to Greater Farallones Association, because our mission is to ensure a thriving ocean ecosystem through science, restoration, and education. From deep-sea research to community-based coastal monitoring, Greater Farallones Association provides critical longitudinal data to support good decisions about protection of species. In working to inspire and train the next generation of ocean scientists and stewards, we educate around 14,000 California primary and secondary students per year, and provide paid fellowships to college students. Increasingly, we are called on to restore balance and function to sanctuary ecosystems – none more important than kelp forests.

Together, the national marine sanctuaries we partner with encompass approximately 5,000 square miles of federally protected ocean along the coast of California – representing one of the most biologically productive upwelling zones in North America. In this unusual geologic setting, cold water rises from the depths of the ocean, bringing nutrients and plankton to the surface, supporting 36 marine mammal species, more than a quarter million seabirds, and more than 500 species of fish, crabs, shrimp, deep-sea corals, sponges, squid and octopuses. It provides a necessary feeding ground for a globally significant population of white sharks.¹

This abundance is the foundation of Pacific commercial and recreational fisheries, supporting countless communities and federal and state tribes, and also providing vital cultural and recreational value not only to California's inland communities but to all of the American public.

¹ [NOAA Greater Farallones and Cordell Bank National Marine Sanctuaries](#)

The Value of Healthy Kelp

Along the coasts of Northern California and Oregon bull kelp is a foundation species, creating ecological resilience by forming favorable habitat for hundreds of species. Kelp forests provide habitat for numerous state and federally managed fish species, including the federally listed black abalone, lingcod, cabezon and rockfishes.

Healthy kelp forest habitats provide intrinsic biodiversity value through the tourism they support; opportunities for recreation in and around them including SCUBA diving, freediving, swimming, kayaking, and wildlife viewing; kelp harvesting, commercial and recreational fishing; and cultural significance to Tribes and other communities. The [Oregon Kelp Alliance](#) (ORKA), estimates the value of ecosystem services of marine kelp forests in Oregon at \$23-52 million (a preliminary estimate derived from the pre-publication 2024 Oregon Kelp Forest Status Report authored by the Oregon Kelp Alliance). Kelp's ecosystem value for California fisheries, meanwhile, has been estimated to be worth upwards of hundreds of millions of dollars.²

However, this vital resource is teetering. Climate change has brought unusually warm ocean waters to the West Coast over the past decade, and the warmer waters have lowered reproduction rates of kelp and allowed diseases to remove important predators of purple urchin, which graze on kelp. The combination of successive marine heat waves and the introduction of Sea Star Wasting Syndrome to Northern California waters resulted in a widespread die-off of numerous species of sea stars, including the iconic sunflower sea star (*Pycnopodia helianthoides*). A population explosion of purple urchin ensued, and the kelp stood no chance against urchin with voracious appetites and no predators. As a result, kelp forests and their associated species have all but disappeared, including the less competitive red urchin, whose commercial fisheries in California have also collapsed; without kelp restoration, increasingly dire effects on nearshore groundfish fisheries are expected.

The greatest proportionate loss of kelp forests on the West Coast has occurred in Northern California, with some of the most devastating loss in Greater Farallones National Marine Sanctuary, where more than 90% of historic kelp cover was lost between 2014 - 2016. Now, along the Northern California coast, there are only remnant kelp beds – so valuable now, because they may serve as vital sources of kelp spores and also provide information about resilience.

Economic Impact from the Kelp Forest Collapse

The extensive and prolonged loss of kelp forests along the Sonoma and Mendocino County coastlines has resulted in devastating economic impacts for adjacent communities. The recreational red abalone fishery was closed in 2017, causing an estimated \$44 million non-market loss annually (Reid et al 2019). Due to the loss of revenue from red abalone divers, the sole dive shop on the Sonoma-Mendocino coast closed indefinitely. The commercial red sea urchin fishery, with an estimated \$3 million value, subsequently collapsed, leaving commercial fishermen out of work. Loss of kelp forest habitat leads to the loss of additional ecosystem services, including valuable recreational opportunities such as SCUBA diving and kayaking, and supporting cultural resources such as fishing, hunting and traditional subsistence knowledge.

The kelp forests of the California, Oregon, and Alaska coast also have deeply held cultural value for numerous Tribes with customary uses and historic management of these coastal ecosystems. For example, several of Oregon's coastal Tribes use abalone shell extensively in traditional regalia and crafts. Members of the Coquille Indian Tribe have expressed to the Oregon Kelp Alliance that they are concerned about how abalone will persist in the face of the loss of so much of their habitat.

² [Eger, A.M., Marzinelli, E.M., Beas-Luna, R. et al. The value of ecosystem services in global marine kelp forests. *Nat Commun* 14, 1894 \(2023\). <https://doi.org/10.1038/s41467-023-37385-0>](#)

Tipping the Balance From Urchin-Dominated Back to Kelp-Dominated

There *is* a window of time – right now – to reduce purple urchin density, culture and plant baby kelp, and defend emergent kelp beds from urchin encroachment.

Bull kelp, which grows mostly north of Monterey Bay and all the way up the West Coast, is an annual species that grows up to an astonishing 10 inches per day. This fast annual growth makes bull kelp forests among the most resilient and productive ecosystems in the world that thousands of marine species depend on for nursery grounds, food, and shelter. Kelp forest loss on the North Coast has persisted for a decade, but with the focused removal of urchin grazing pressure and replenishment of bull kelp spore availability within strategic locations, the large-scale recovery potential of kelp forests is incredibly high due to the natural resilience and dynamics of kelp.

The benefits of restoring this habitat will also extend to coastal businesses and other jobs related to recreational abalone divers and nearshore recreational and commercial fisheries – and will provide renewed opportunities for recreation for the benefit of local residents, businesses, and tourists.

Kelp restoration on the West Coast is a federal, state, and Tribal priority. Working with multiple partners, Greater Farallones Association's goal is to transition urchin barrens formed in 2014-2016 to kelp forests by removing red and purple urchins to less than two urchins per square meter; culture and plant baby kelp, support the introduction of sunflower sea stars (an major urchin predator) and defend the growth of kelp from encroachment until it is reestablished.

In 2019, Greater Farallones Association published the Sonoma-Mendocino Bull Kelp Restoration Plan,³ outlining strategies in kelp restoration, monitoring, research, and community engagement. In developing those strategies, GFA has met with representatives from the Kashia Band of Pomo Indians, Sherwood Valley Band of Pomo, Noyo Tribal Community, North Coast Resource Partnership Tribal Representatives, Round Valley Tribes, Coyote Valley Band of Pomo, Manchester/Point Arena Tribe, Potter Valley Tribe, and InterTribal Sinkyone Council. Since publication of the Restoration Plan, GFA and NOAA have actively worked to identify areas of kelp resilience and persistence in the Greater Farallones National Marine Sanctuary. Using drones and historical imagery from crewed fixed-wing surveys, we identified persistent kelp beds that historically have shown high resilience to stressors.

We continue to collaborate with the Kashia Band of Pomo Indians to establish a kelp forest canopy mapping site at Kashia Coastal Reserve and this year we look forward to further information sharing as the Tribe begins work to start their own restoration project. I'll say again that GFA is very supportive of the set aside in H.R. 5487 to fund Tribal restoration efforts.

We Have Begun Restoring Kelp in Greater Farallones National Marine Sanctuary

With the support of a previous appropriation of funds for kelp restoration, Greater Farallones Association has begun restoration work within the marine sanctuary. We have done so by standing up a trained team of scientific divers to conduct biological assessments and to monitor the success of our restoration strategies. Secondly, GFA entered the commercial fishing industry with a California commercial fish buyers license that allows us to leverage the efforts of commercial fishermen who are really struggling to make ends meet. In our first short season of 2023, commercial urchin divers used rakes to collect more than 24,000 pounds of urchin by hand, making substantial headway in several key restoration areas. These boat-based urchin removals occur primarily out of Bodega Bay and secondarily out of Point Arena. For each restoration site, commercial urchin divers are removing urchins to densities of 1-2 urchins per sq meter at transects we established to demarcate the restoration sites, which are in depths 10 to 60 feet. The commercial fishermen return to the sites to collect urchins every 2-3 weeks after the initial pass for at least 12 months after initial urchin removal. The fishermen bring proficiency with hand rakes and baskets,

³ [Hohman, R., Hutto, S., Catton, C. and F. Koe. 2019. Sonoma-Mendocino Bull Kelp Restoration Plan. Plan for the Greater Farallones National Marine Sanctuary and the California Department of Fish and Wildlife. San Francisco, CA. 166 pp.](#)

offering a fast-paced, high-quantity removal effort; their long-time experience diving in these coves brings safety and important observations about the substrate and urchin barriers (like sand bars) as hone our approach to securing long-term sustainability of cleared areas.



Commercial urchin dive boat (left) and a commercial urchin diver, harvesting urchins (right). Photo: Stephen Page.



Left, an urchin barren in Greater Farallones National Marine Sanctuary. Right, long-time commercial urchin diver Erik Owen, celebrating a haul of purple urchin with a GFA Staff member and NOAA Scientific Diver. (Photos: CDFW, GFA)

Kelp Enhancement (Outplanting)

In a complementary strategy, Greater Farallones Association is also planting baby kelp and giving it a shot at quickly growing and reaching its reproductive stage within a given season – all with the hopes of seeding a connected “necklace” of resilient kelp beds along the coast. We have partnered with Moss Landing Marine Lab (MLML) and Sonoma State University to develop practical and cost-effective techniques for enhancing recruitment of bull kelp in kelp restoration areas following urchin removals.

First, we culture bull kelp recruits at MLML and Bodega Marine Lab (BML) for planting in the restoration

zones. Then, we transport them to the North Coast where our collaborative team of scientific divers runs mesh bags with concentrated spores and twine inoculated with juvenile kelp along the restoration plots. By pairing kelp enhancement with urchin removal efforts, we aim to grow kelp and seed the next generation of kelp plants in the restoration area.



Kelp culturing set-up managed by SSU at the UC Davis Bodega Marine lab (left). Kelp are grown on gravel under conditions and temperatures similar to that of the field (center). Photos: Brent Hughes, SSU. At right, growing kelp with restoration staff.

Finally, because the recovery of the understory algal community and settlement of bull kelp will be heavily influenced by ocean conditions (primarily temperature), we are working with several academic partners to deploy moorings at each site equipped with sensors to continuously collect environmental data during the growth season for bull kelp.

Conclusion

To plan, conduct, monitor, and maintain kelp restoration projects is critical to not just ecosystem health, but our states' economic health. From commercial fishing to recreational dive shops, from community well-being to Tribal autonomy, restoring kelp can reverse devastating economic and cultural trends.

H.R. 5487 will help our kelp and help our communities. Greater Farallones Association strongly supports the Help Our Kelp Act and its emphasis on science-based restoration and Tribal engagement. We look forward with hope to extending nascent restoration programs to ensure there is adequate time to bring back the kelp.



Photo credit: NOAA