California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090

November 29, 2023

Re: Petition to Modify CA Marine Protected Area Network to Enhance Protections for California's Most Resilient Kelp Forests

Dear President Sklar and Honorable Commissioners,

We are writing in support of Environment California Research & Policy Center's petition to increase protections for remaining persistent kelp forests in California state waters through the Marine Life Protection Act (MLPA)'s adaptive management process. As kelp forests contend with increased threats from climate change, predator loss, and invasive species, taking action to preserve the highly persistent kelp forest areas that have so far withstood these threats will be critical to the state's efforts to conserve this essential ecosystem and achieve area-based conservation targets.

California's kelp forests provide numerous and invaluable ecological and environmental benefits. These underwater ecosystems serve as critical nurseries for a wide variety of marine species, providing shelter and food for numerous fish, invertebrates, and marine mammals. They support thriving commercial and recreational fisheries, attract tourists and divers, and can help dampen the impacts of coastal erosion and storm impacts. However, recent decades have seen a decline in kelp forest cover across the Pacific West Coast, including California, due to a combination of natural and human-induced factors such as a major marine heatwave and the loss of predators of kelp grazers by overfishing and disease.

Marine protected areas are a critical tool for increasing the resilience of kelp ecosystems in the face of these stressors. However, the state of California's MPA network has gaps in coverage for the state's most persistent kelp forests. Recent analyses identifying the extent of persistent giant kelp and bull kelp forests in California found only 20.9% of the most highly persistent forests in Central California, 8.4% in Southern California, and less than 1% in Northern California are fully protected.[1,2] Improving the MPA network to better protect our remaining stable kelp forests will aid in increasing the resilience of these ecosystems and prevent further loss of kelp cover.

State officials should utilize all tools at their disposal to address the ongoing threats to kelp forests. Marine protected areas like those created through the California MLPA are a tool that

[1] Arafeh-Dalmau et al. 2021, Southward decrease in the protection of persistent giant kelp forests in the northeast Pacific. *Communications Earth & Environment*. https://doi.org/10.1038/s43247-021-00177-9
[2] Arafeh-Dalmau et al. 2023, Shortfalls in the protection of persistent bull kelp forests in the USA. *Biological Conservation*. https://doi.org/10.1016/j.biocon.2023.110133

has been underutilized in efforts to protect and restore our kelp forests—and one we cannot afford to ignore.

The state has an opportunity to incorporate these new scientific findings into the state network of marine protected areas, ensuring the network better addresses emerging threats to our kelp forests and provides the best possible support for restoration efforts. The petition submitted by Environment California RPC is supported by recent scientific analysis employing 35 years of satellite data to identify persistent kelp forests, and is based on extensive global research demonstrating the benefits of highly to fully protected areas.

As scientists who have spent decades studying our ocean ecosystems, we urge you to take swift action to protect and preserve our coastal and marine resources and natural heritage in the face of increasing climate impacts. Our future depends on it.

Thank you for your ongoing efforts to protect California's ocean heritage, and we look forward to engaging in this important work for years to come.

Sincerely,

Dr. Nur Arafeh-Dalamu
Postdoctoral Scholar, Hopkins Marine Station, Stanford University
Honorary Fellow, University of Queensland

Dr. Fiorenza Micheli
David and Lucile Packard Professor of Marine Science, Stanford University

Dr. Kyle Cavanaugh
Professor, Department of Geography, University of California, Los Angeles

Dr. Dawn Murray
Professor Environmental Studies, Antioch University Santa Barbara

Dr. Carolina Olguin-Jacobson
Postdoctoral Scholar, Hopkins Marine Station, Stanford University

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November 29, 2023

Re: Support for new MPA to protect kelp, seabirds, and sharks of Santa Cruz

Dear President Sklar and Honorable Commissioners,

As a local seabird and marine ecosystem biologist, I am writing in support of a new State Marine Reserve proposed by Environment California and Azul to protect kelp, seabirds, and sharks in coastal waters of Santa Cruz County, CA. As climate change impacts ocean conditions, corresponding shifts in fishing behavior will create new risks for forage fish and place increasing pressure on ocean wildlife. Providing protections now for forage fish within critical nearshore kelp forests and sandy bottom environments is essential for mitigating future threats to migratory seabirds, whales, and sharks.

The proposed MPA off Soquel Point in Santa Cruz is positioned within the northern Monterey Bay bight, a biologically rich and unique marine region encompassing nearshore kelp forests, sandy beach, and deeper soft-bottom habitats. Physically, these waters are influenced by the Año Nuevo upwelling front and the area is characterized by a broad shallow shelf. These features create a unique ocean circulation pattern where freshly upwelled and nutrient rich cold-water eddies become slower and recirculate within this semi-enclosed bay[1]. These waters are ideal growing conditions for phytoplankton, crustaceans and cephalopods, larval fishes and forage fishes (anchovies, sardines, herring), which create the base of the food web for predatory sharks, seabirds, and whales.

This biologically diverse area is recognized as important to more than 100 species of marine seabirds and shorebirds, mammals and sea turtles (Harvey & Benson 1997[2], Henkel 2006[3], Neuman et al. 2008[4]). In the summer months, enormous flocks of Sooty Shearwater travel 20,000 km from New Zealand 20,000 km to feed on the anchovy schools (Figure 1) within the

[1] Graham and Largier 1997. Upwelling shadows as nearshore retention sites: the example of northern Monterey Bay. Continental Shelf Research, 1997

[2]Harvey and Benson 1997. Marine Bird and Mammal Distribution and Abundance in Monterey Bay, During 1996. Moss Landing Marine Laboratories Technical Publication 97-02, 80pp.

[3] Henkel 2004. Seasonal Abundance of Marine Birds in Monterey Bay, California. Western Birds: 126-146.

[4] Neuman, Henkel, and Page. 2008. Shorebird use of sandy beaches in central California Waterbirds.

northern bight of the Bay (Figure 2) (Adams et al. 2012[5]). This annual natural feeding frenzy phenomenon is described as the "River of Birds" and is fueled by the dense nearshore aggregations of anchovies, which are also host to iconic lunge-feeding humpback whales,[6] pelicans, and gulls.

An "Oasis Effect" has been described for these nearshore areas in California[7] by which whales and other marine animals aggregate in large numbers to feed in nearshore "oases" of forage fish during times of poor food availability offshore. Similarly, Endangered Leatherback Sea Turtles travel from offshore areas to feed within the bight when ocean conditions nearshore favor jellyfish[8]. The connection between nearshore and offshore forage fish dynamics figures importantly in the future conservation of these globally connected migratory species[9].

However, these areas are not protected from extractive uses including fisheries. Despite 30 years of protected designation within the Monterey Bay National Marine Sanctuary, Adelaars et al. 2012[10] found that the relative level of conservation, particularly within the northern bay sandy shelf area of the Sanctuary, is low. The Sanctuary primarily protects the waters from offshore oil and gas exploitation, but does not protect against the impacts of fishing and many other human activities which may compromise thriving marine food webs. Large important areas of nearshore sandy-bottom and kelp forest habitats in Monterey Bay remain unprotected (see Figure 7 in Adelaars et al.).

In addition, over the past 10 years our coastal ecosystems have seen significant shifts in the face of a changing climate. Warming waters – including intense episodic marine heatwaves – have caused mobile species to temporarily shift their geographic ranges to remain within suitable environmental conditions,[11] often increasing the chances for harmful interactions with fisheries and other human activities. In the Monterey Bay, warming waters have led to habitat

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[5] Adams, MacLeod, Suryan, Hyrenbach and Harvey. 2012. Summer-time use of west coast US National Marine Sanctuaries by migrating sooty shearwaters (Puffinus [=Ardennna] griseus). Biological Conservation 156: 105-116.

[6] [video] Sooty Shearwaters on Monterey Bay feeding with Humpback Whales (MB Whale Watch)

[7] Benson, Croll, Marinovic, Chavez, and Harvey. 2002. Changes in the cetacean assemblage of a coastal upwelling ecosystem during El Niño 1997-98 and La Niña 1999. Prog. Oceanogr. 54:279-291.

[8] Benson, Forney, Harvey, Carretta, and Dutton. 2007 Abundance, distribution, and habitat of leatherback turtles (*Dermochelys coriacea*) off California, 1990–2003. Fish. Bull. 105:337–347.

[9] International Agreement on the Conservation of Albatrosses and Petrels (Conservation of Migratory Species).

[10] Adelaars, Bassett, Donlou, Marks, Pardieck, and Lindholm. 2012. Examining the Conservation Level of Marine management Areas within the Monterey Bay National Marine Sanctuary: How Protected is the Sanctuary? Marine Sanctuaries Conservation Series ONMS-12-04. U.S. Department of Commerce, NOAA, Silver Spring, MD. 41 pp. [NB: Figure 7 - Soquel Cove area]

[11] Pecl, Araju et al. 2017. Biodiversity redistribution under climate change: Impacts on ecosystems and human well-being. Science

compression for whales and other mobile marine species, causing them to move inshore more frequently to feed and resulting in record-high whale entanglements in fishing gear.[12] Other species such as Common Murre, Rhinoceros Auklets and Brandt's Cormorant engage in prey switching as a strategy to buffer prey availability[13], utilizing species from kelp forests and nearshore ecosystems when offshore species are less abundant. Maintaining healthy nearshore environments with a diversity of prey sources for predators experiencing climatic stressors is critical for the climate resilience of the overall ecosystem. However, the very changes underpinning these shifts in wildlife behavior can also influence fisher behavior,[14] putting pressure on these food webs at the very time that they're needed to maintain ecosystem resilience.

Conservation of healthy forage fish populations in the face of climate change is critical. A recent review highlighted the need for conservation of the prey base with regard to the seabird populations in California, noting that where humans and wild predators coexist, human fishers are far more efficient in their prey harvesting activities[15]. Further, a global review by Cury et al. 2011 suggested a precautionary approach of leaving one third of the fish biomass for the seabirds[16]. Both of these studies point to the need for establishing protections of forage fish for seabirds which are not exploited to full capacity. A new state MPA would strengthen protections for forage fish now, before shifting ocean conditions bring new threats to this area. The proposed MPA area is not currently not currently subject to any significant commercial take, making protecting this area now of minimal economic impact to existing fisheries.

Conservation in this area is aided by the participation of actively engaged citizen scientists. Citizens in Santa Cruz County are very concerned about marine conservation and actively participate in citizen science activities including water quality (Coastal Watershed Council), intertidal and subtidal monitoring (LIMPETS[17], Reef Check California) and beach monitoring (BeachCOMBERS, Nevins et al. 2011[18]). Since 1997, citizen scientists have been monitoring

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[12]Santora, Mantua et al. 2020. Habitat compression and ecosystem shifts as potential links between marine heatwave and record whale entanglements. Nature

[13] Warzybok et al. 2018 Prey switching and consumption by seabirds in the central California Current upwelling ecosystem: Implications for forage fish management. J Marine Systems

[14] Pichegru et al. 2012. Industrial fishing, no-take zones and endangered penguins. Biol. Cons. 156:117-125.

[15]Ainley, Adams, Jahncke (eds). 2014 Towards ecosystem-based fishery management in the California Current system–predators and the preyscape: a workshop.

[16]Cury et al. 2011. Global Seabird Response to Forage Fish Depletion—One-Third for the Birds. Science

[17] Pearse et al. 2015 Long-term monitoring of surfgrass meadows in the Monterey Bay National Marine Sanctuary : recovery followed by stability after the termination of a domestic sewage discharge.

[18]Nevins, Benson, Phillips, de Marignac, DeVogelaere, Ames and Harvey. 2011. Coastal Ocean Mammal and Bird Education and Research Surveys (BeachCOMBERS), 1997-2007: ten years of monitoring beached marine birds and mammals in the Monterey Bay National Marine Sanctuary.

impacts to marine birds and mammals in and around the proposed MPA, contributing significant evidence for understanding human impacts, documenting the recovery of species in the region, and complementing long-term monitoring efforts by the state.

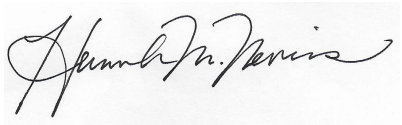
Northern Monterey Bay is host to a multitude of ocean-focused activities and these have created a thriving nature-based economy: surfers treasure the waves of Pleasure Point from Soquel Point to Capitola; beachgoers enjoy tidepooling, birdwatching, fossil hunting, and fishing along the rocky and sandy shores of New Brighton and Seacliff Beaches. Recently, locals have called this area a “Shark Park”, due to the increased use of the area by juvenile white sharks as seen by drones. This natural phenomenon has created a boon for shark-ecotourism businesses based out of Santa Cruz and Capitola (Figure 3). An established MPA in the area would help provide long-term protections for this oft-maligned species which requires nearshore sandy beaches for growth and survival, while supporting local nature-focused businesses.

The proposed MPA would also amplify nearby land-based protected areas, including four California State Parks (New Brighton, Seacliff Beach, Manresa and Sunset State Beaches). Establishing a land-sea connection between terrestrial and coastal protected areas will not only enhance broader ecological ecosystem function, but could connect users within the proposed MPA to interpretive aspects of state parks, which offer extensive access (trails, beach access, RV and tent camping) and interpretive resources (rangers and visitor centers).

In summary, the proposed MPA would provide multiple species and habitats ecological benefits and greater resilience in the face of climate-related impacts and shifting fishing behaviors, as well as leverage local citizen efforts to increase coastal protection and enhancements for marine species. This effort would enable future generations to enjoy firsthand the natural phenomena of the River of Birds by migratory Sooty Shearwaters and the nursery area found to be important for juvenile White Sharks by protecting the basis of the food web in this ecosystem.

Thank you for considering this proposed designation.

Sincerely,



Hannah Nevins, M.S. MSc., Seabird Biologist and Ecologist, Santa Cruz, CA

Figure 1. Shearwaters feed on small schooling fishes including anchovies in nearshore waters of northern Monterey Bay. (Photo: Ingrid Taylor, New Brighton Beach, CA)

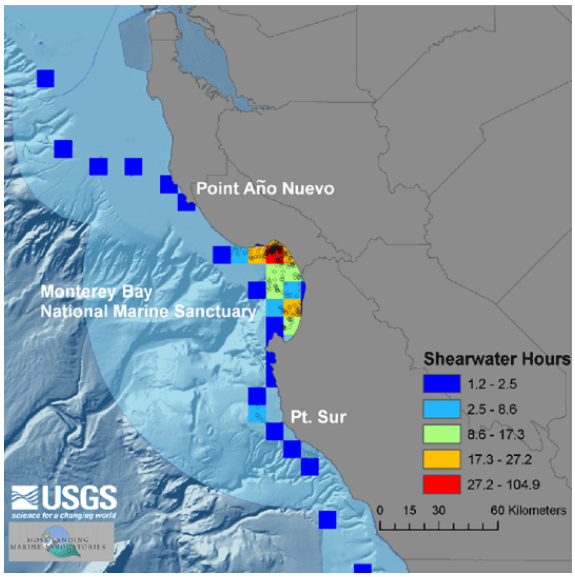


Figure 2. Satellite tracking of migratory Sooty Shearwaters indicate the valuable feeding area in northern Monterey Bay (red area). Northern area is proposed is for greater protection of forage fish important to migratory seabirds and sharks. (Data: USGS/MLML)

Figure 3. Soquel Cove is locally known as the "Shark Park." Passengers on a shark-watching tour based from Santa Cruz check out an approaching great white shark in the sandy bottom habitat off Seacliff Beach in northern Monterey Bay, CA. (Photo Kevin Painchard/Lookout Santa Cruz)

California Fish and Game Commission
P.O. Box 944209
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November 30th, 2023

Re: Petition to Modify CA Marine Protected Area Network to Enhance Protections for California's Most Resilient Kelp Forests; Petition to Increase Level of Protection and Streamline Enforcement for Several California State MPAs

Dear President Sklar and Honorable Commissioners,

As scientists, researchers, and educators who work to understand our changing oceans and inspire the next generation of ocean stewards, we write to express our support for the expansion and strengthening of California's network of Marine Protected Areas (MPAs) to help safeguard the state's diverse marine ecosystems and ensure the long-term resilience of our ocean habitats.

Globally, the ocean is at a critical juncture, with escalating global temperatures, declining biodiversity, and a growing number of endangered marine species. California's coastal ecosystems have not been spared these global trends: Northern California has lost more than 95% of its kelp forests since 2014, and kelp forests statewide have experienced declines over the past decade.[1] Only an average of 55 Pacific leatherback turtles are now found foraging off California's coast every year, a notable decrease from the yearly average of 128 Pacific leatherbacks observed in the region from 1990 to 2003.[2] Marine heatwaves have doubled over the last 30 years and have become more intense and longer in duration, putting stress on California's marine species and ecosystems.[3]

Now, California has a unique opportunity to take bold, effective and science-based action to conserve its marine biodiversity by expanding its groundbreaking network of state MPAs. MPAs, like state parks on land, protect unique and important ocean habitats from destructive human activities that can damage the integrity of marine ecosystems. Globally and in California, strongly protected and well-enforced MPAs have been shown to be highly effective in conserving biodiversity, enhancing ecosystem resilience, and mitigating the impacts of climate

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[1] Meredith McPherson et. al, Large-scale shift in the structure of a kelp forest ecosystem co-occurs with an epizootic and marine heatwave, Communications Biology, March 5, 2021
[2] Benson, Scott R., Karin A. Forney, Jeffrey E. Moore, Erin L. LaCasella, James T. Harvey, and James V. Carretta. "A Long-Term Decline in the Abundance of Endangered Leatherback Turtles, Dermochelys Coriacea, at a Foraging Ground in the California Current Ecosystem." *Global Ecology and Conservation* 24 November 2020.
[3] IPCC (2021). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte VP, Zhai A, Pirani SL, Connors C, Péan S, et al. (Eds.)].;

change on our oceans.[4] Well-designed and well-implemented reserves better preserve natural interactions within ecosystems, allowing for greater resiliency in the face of rising global temperatures and changing environmental conditions.[5]

California's network of MPAs, established through the 1999 Marine Life Protection Act, celebrated its tenth anniversary last year. The state's recent Decadal Management Review (DMR) analyzed a decade of monitoring data and showed that the MPA network has generally been effective at protecting ocean habitats and increasing fisheries-targeted species' biomass.[6] Now, in the face of increasing threats, we need to build on this system and maintain California's role as a national and global leader in the effort to protect our ocean habitats.

That's why we, as scientists, researchers, and educators, urge you to expand and strengthen our state's network of MPAs via the adaptive management process of the DMR.

Specifically, we support the expansion of the MPA network to include additional protections for California's most resilient kelp forests. While these vital and iconic ecosystems have faced declines statewide in recent years, kelp forests in some areas have persisted or bounced back quickly in the face of marine heatwaves and other disturbances.[7] By expanding protections for these resilient forests under the MLPA, the state can minimize direct human impacts in these relatively healthy areas, helping to ensure their continued persistence and enhancing the effectiveness of restoration efforts for declining kelp ecosystems nearby. Globally, kelp restoration has been most successful in places adjacent to/contiguous with healthy kelp forest ecosystems. [8]

It is also vital that existing California MPAs are able to achieve their stated goals of conserving biodiversity and ecosystem health. We encourage the state to consider increasing protections for MPAs that are currently only lightly or minimally protected, especially in places where weaker or more complicated regulations lead to poor compliance and enforcement. Research has shown that highly and fully protected areas, where few if any destructive or extractive activities are allowed, provide greater ecological benefits than lightly or minimally protected areas.[9] The

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[4] James Horrox, Kelsey Lamp and Steve Blackledge. New Life for the Ocean: How Marine Protections Keep Our Waters Wild. Environment America Research & Policy Center & Frontier Group, February 3, 2021

[5] Kirsten Grorud-Colvert *et al.*, The MPA Guide: A framework to achieve global goals for the ocean. *Science* **373** ,eabf0861(2021). DOI:10.1126/science.abf0861

[6] California Department of Fish and Wildlife. (2022). California's Marine Protected Area Network Decadal Management Review.;

[7] Arafeh-Dalmau et al., Integrating climate adaptation and transboundary management: Guidelines for designing climate smart marine protected areas, One Earth 6, 1–19 November 17, 2023 ª 2023 Published by Elsevier Inc.

[8] Eger, A.M., Marzinelli, E.M., Christie, H., Fagerli, C.W., Fujita, D., Gonzalez, A.P., Hong, S.W., Kim, J.H., Lee, L.C., McHugh, T.A., Nishihara, G.N., Tatsumi, M., Steinberg, P.D. and Vergés, A. (2022), Global kelp forest restoration: past lessons, present status, and future directions. Biol Rev, 97: 1449-1475.

[9] Kirsten Grorud-Colvert *et al.*, The MPA Guide: A framework to achieve global goals for the ocean. *Science* **373** ,eabf0861(2021). DOI:10.1126/science.abf0861

state's network currently protects 12% of state waters in highly- or fully-protected MPAs, as defined by Grorud-Colvert et al. (2021), which leaves 4% of the network lacking the most effective conservation protections.[10] By expanding the level of protection to areas already identified as ecologically important, we can ensure that the area's vulnerable marine resources have the chance to recover and flourish.

Our ocean is not just a source of clean air, wildlife, and natural beauty but also a mystery that beckons exploration and discovery. It is our moral imperative to lead the nation and the world in taking bold actions to preserve the sea, ensuring its future and the well-being of the communities that rely on it for their survival and prosperity.

President Sklar and Honorable Commissioners, you have a chance to take up this imperative and champion the expansion and strengthening of California's network of Marine Protected Areas. By doing so, you will leave a lasting legacy of marine stewardship that will keep California at the forefront of ocean conservation, nationally and globally.

Thank you for your unwavering commitment to the welfare of our ocean and for considering this urgent matter. Together, we can ensure a healthier, more abundant future for the unique marine ecosystems that define California.

Sincerely,

Michael Akresh
Faculty
Antioch University

Alice Alldredge
Professor Emeritus
University of California, Santa Barbara

Steven Allison
Professor
University of California, Irvine

Anupa Asokan
Ocean advocate

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PhD Candidate
University of California Santa Cruz

Leocadio Blanco Bercial
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Bailey Drechsler
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Cuesta College

[10] Kirsten Grorud-Colvert *et al.*, The MPA Guide: A framework to achieve global goals for the ocean. *Science* **373** ,0861(2021). DOI:10.1126/science.abf0861

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November 29, 2023

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State officials should utilize all tools at their disposal to address the ongoing threats to kelp forests. Marine protected areas like those created through the California MLPA are a tool that has been underutilized in efforts to protect and restore our kelp forests—and one we cannot afford to ignore.

The state has an opportunity to incorporate these new scientific findings into the state network of marine protected areas, ensuring the network better addresses emerging threats to our kelp forests and provides the best possible support for restoration efforts. The petition submitted by Environment California RPC is supported by recent scientific analysis employing 35 years of satellite data to identify persistent kelp forests, and is based on extensive global research demonstrating the benefits of highly to fully protected areas.

As scientists who have spent decades studying our ocean ecosystems, we urge you to take swift action to protect and preserve our coastal and marine resources and natural heritage in the face of increasing climate impacts. Our future depends on it.

Thank you for your ongoing efforts to protect California's ocean heritage, and I look forward to engaging in this important work for years to come.

Sincerely,

Dr. Tom Bell
Scientist, Department of Applied Ocean Physics and Engineering, Woods Hole Oceanographic Institution