

Establishing a Statewide Baseline and Long-Term MPA Monitoring Program for Commercial and Commercial Passenger Fishing Vessel Fisheries in the State of California

Executive Summary

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Acknowledgments

The MPA Human Uses Project Team would like to express our sincere thanks and gratitude to the 103 fishermen, together with researchers and resource managers, who invested their time and energy in making this project possible. We are deeply appreciative of your guidance and direction at each step of this study's design and implementation. It is our hope that the findings of this study will be used to promote and perpetuate the long-term well-being of California's fishing communities. Thank you to California Sea Grant, in partnership with the California Department of Fish and Wildlife and the California Ocean Protection Council, for funding this project.

How to cite this report:

Bonkoski, J., C. Chen, L. Richmond, K. Sayce, S. Cook, J., Enevoldsen, R. Fisher, D. Chin, J. Chang, M. Kia, and R. Grmela. 2021. *Establishing a Statewide Baseline and Long-Term MPA Monitoring Program for Commercial and Commercial Passenger Fishing Vessel Fisheries in the State of California*. www.mpahumanuses.com.

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People and Place: Fishing Community Well-being in Relation to MPAs

California's coastal and marine resources support a variety of human uses for various social, economic, recreational, and cultural purposes. To understand human-environment interactions in the context of Marine Protected areas (MPAs), a comprehensive understanding of the historical and current use of marine resources in relation to MPA formation, perceptions of MPAs by resource users, and MPA linkages to the socioeconomic health and well-being of people and communities is required. This project was designed to inform the 10-year management review of California's MPA network, focusing on two specific forms of consumptive use: commercial fishing and Commercial Passenger Fishing Vessels (CPFV). This project set out to design, implement, and evaluate a scalable and replicable consumptive human use long-term monitoring program that could be applied statewide and in the long term.

Project methods were designed to address three core components:

- 1. Engagement with fishermen across 18 major California port groups, managers, researchers and other invested parties;**
- 2. Design and implementation of port-based and/or regional focus groups with members of California's commercial and CPFV fishing communities related to community well-being and outcomes from the MPA network; and**
- 3. Spatial data modeling to explore spatial use of the ocean by commercial fisheries in relation to the MPA network.**

To ensure the final research products would be useful, intended end-users—fishermen, managers, and researchers—were engaged at the onset of the project's initiation and at key stages throughout the project's duration to provide input on the design of project methods and final product deliverables. These 'Key Communicators' were invited to share their perspectives and feedback through informal interviews, small group meetings/webinars, 1-on-1 discussions, and written reviews. Following each conversation, the input shared was considered and integrated into the overall project design.

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A core method of this research project involved conducting focus groups with members of commercial and CPFV fishing communities in order to assess their knowledge, attitudes, and perceptions of the MPA network and the overall health and well-being of their fishing communities. Managers and scholars have increasingly recognized the importance of information about perceptions in informing environmental decision-making and adaptive management. In effect, gathering quantitative and qualitative perceptions data can play an important role in monitoring and evaluation of conservation projects such as marine protected areas.

When thinking about the human dimensions of MPAs, there has also been an increased focus by researchers on the well-being outcomes of communities and groups connected to and potentially affected by MPA networks. The concept of well-being encompasses the social, cultural, economic, and ecological conditions within fishing communities. A focus on well-being allows for a more holistic understanding of the conditions and context under which management decisions, such as the implementation and on-going management of MPAs, are experienced.

During focus group conversations, fishing community members were asked to answer questions related to their community well-being and outcomes from the MPA network (see Appendix A.9 for the question list).

The focus group approach and questions list were developed through an assessment of experience with previous socioeconomic monitoring studies; an extensive review of the literature related to community well-being and human dimensions of MPAs; and outreach and engagement with key communicators including fishermen, agency staff, and academics. The focus group approach was designed to be cost effective for collecting social data at a statewide scale and to capture both quantitative and qualitative information through first-hand accounts from fishermen themselves. The arrival of the COVID-19 pandemic at the beginning of our study effort made face-to-face interactions with fishermen untenable, causing the Project Team to pivot to a virtual interview approach.

From July 2020 - May 2021, the Project Team held virtual focus group conversations in 18 of 19 major port groups for the commercial fishing sector and five of seven larger regions for the CPFV sector. During the focus groups, participants were led through a deliberative process to rate and discuss questions related to their perceptions of MPA outcomes and their fishing community's overall well-being. A total of 85 individuals participated in the commercial fishing focus groups and 20 participated in the CPFV focus groups.

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Table 0.1 California Commercial Fishing Ports and Regional CPFV Fishing Groups Invited to Participate in Focus Group Discussions

California commercial fishing ports:

Crescent City	San Francisco Area Ports	Ventura / Channel Islands Area Ports
Trinidad	Princeton - Half Moon Bay	Los Angeles / Long Beach Area Ports
Eureka	Santa Cruz	Orange County Area Ports
Shelter Cove	Moss Landing	Oceanside
Fort Bragg Area Ports	Monterey Bay*	San Diego Ports
Point Arena	Morro Bay - Avila / Port San Luis	
Bodega Bay Area Ports	Santa Barbara	

CPFV regions include:

North Coast: Crescent City, Trinidad, Eureka, Shelter Cove, Fort Bragg, Albion, Point Arena
Bodega Bay: Bodega Bay / Bolinas
San Francisco Area Ports: Princeton - Half Moon Bay
Santa Cruz, Moss Landing, Monterey*
Santa Barbara, Ventura, Port Hueneme - Oxnard
Los Angeles / Long Beach*
Orange County Area Ports, Dana Point, Oceanside, San Diego Area Ports

**Fishermen from these ports/port groups chose not to participate in a focus group conversation*

The Project Team also developed a modeled spatial dataset to better understand fishing patterns in and around California state MPAs in the years 2005-2020. This modeling effort set the pre-MPA years as 2005-2009 and the post-MPA years as 2010-2020. This was done in an effort to simplify the model and set a MPA implementation point that tracked with the real world implementation. This methodology can be applied to other years but since this effort was focused on methods development and Ecotrust's spatial data were collected within this timeframe, we determined these years were the most appropriate for modeling.

This modeling utilized both CDFW landings data and Ecotrust spatial fishing data gathered through in-person interviews to support the MPA network design and monitoring process. In combining the strengths of both of these data sets, the Project Team conducted a refactor analysis and a resulting dataset that provides year-over-year spatial fishing effort data at a 1 nm² scale. In addition, spatial data sets were developed for nearshore finfish, urchin, and spiny lobster fisheries and analyzed to conduct a baseline-and-change assessment between pre/post MPA periods and for changes in fishing effort inside/outside of MPAs.

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Our key project findings are listed below. A full presentation of our key project findings and the data products/deliverables can be found on the [project website](#):

1. Commercial fishing perceptions of MPA outcomes: Focus group responses indicated commercial fishermen across California were both dissatisfied with and had experienced negative effects from the MPA network (Figure 0.1). Overall perceptions of MPAs were low across the state, though the magnitude of views varied slightly between ports (Figure 0.2). A majority of participants' perceptions about MPA effects on marine resource

health fell below positive, and across the board, focus group participants from California commercial fishing communities reported experiencing negative livelihood effects. Reported impacts tended to be more acute for ports in Central and Southern California compared to Northern California, where participants indicated that MPAs are located further from ports. Overall, participants expressed dissatisfaction with MPA management (including the MPA planning process), MPA monitoring, and MPA enforcement with many emphasizing this dissatisfaction related to a lack of communication from the state.

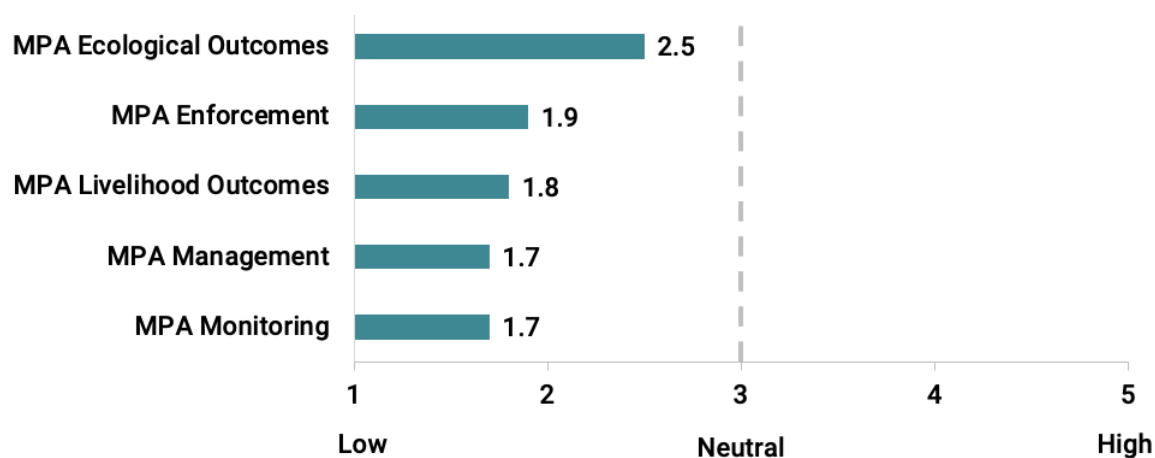


Figure 0.1 Bar chart showing statewide averages of commercial fishing focus group participants' perspectives about MPA outcomes, ordered from highest to lowest.

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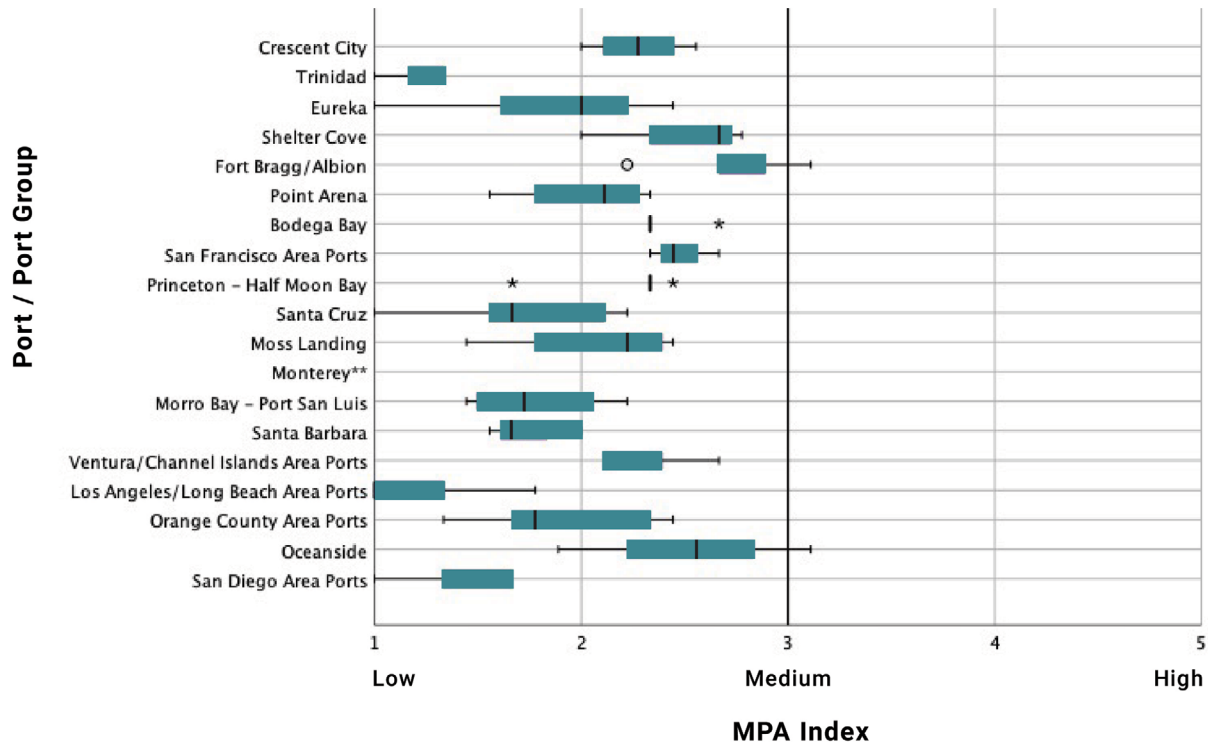


Figure 0.2 Boxplot of the MPA index score for each commercial fishing focus group, ordered geographically from north to south. An MPA index was developed for each port group by combining quantitative responses to 5 MPA questions and bundling them into three broad categories: MPA ecological outcomes, MPA livelihood outcomes, and MPA management.



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2. Commercial fishing perceptions of fishing community well-being:

Focus group responses indicated ports across California are experiencing many challenges related to their well-being (Figure 0.3); however, there were some bright spots. Perceived well-being varied fairly extensively across the state, indicating that not all ports may be experiencing the same type or extent of challenges (Figure 0.4). Participants described the present health of marine resources as strong but also expressed concerns about the potential future health of the resources.

Focus group participants highlighted challenges related to their economic well-being with infrastructure, access to harvestable resources, income from fishing, and markets. In addition, participants reported strong internal relationships and high levels of job satisfaction. Still, they reported weaker relationships with external entities (e.g., government agencies, non-fishing nonprofit organizations) and challenges related to recruiting new captains and crew participants into the commercial fishing industry.

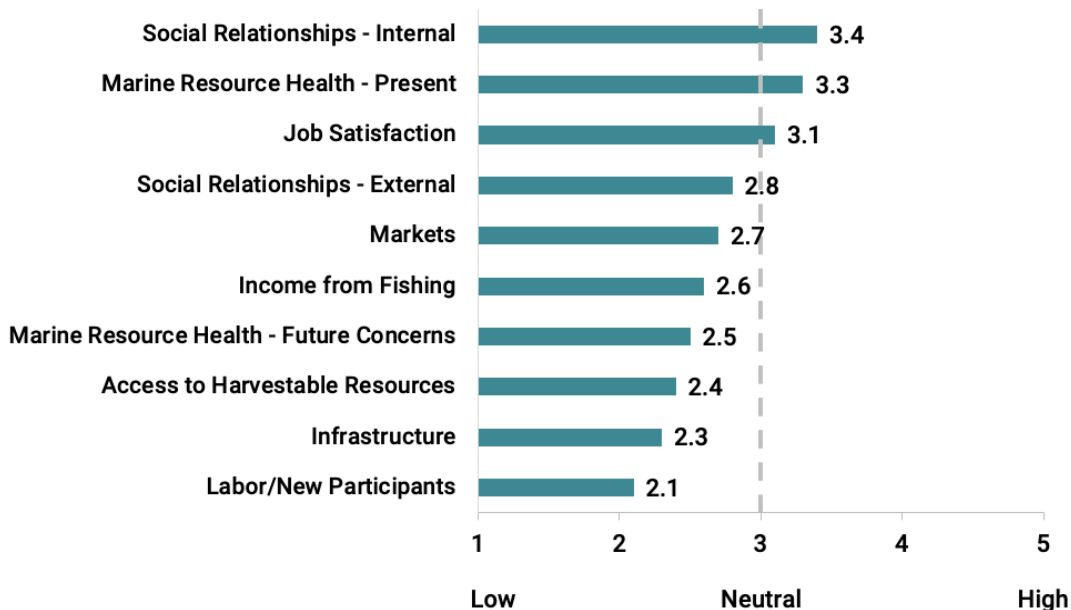


Figure 0.3 Bar chart showing statewide averages of commercial fishing focus group participants' perspectives about well-being outcomes, ordered from highest to lowest.

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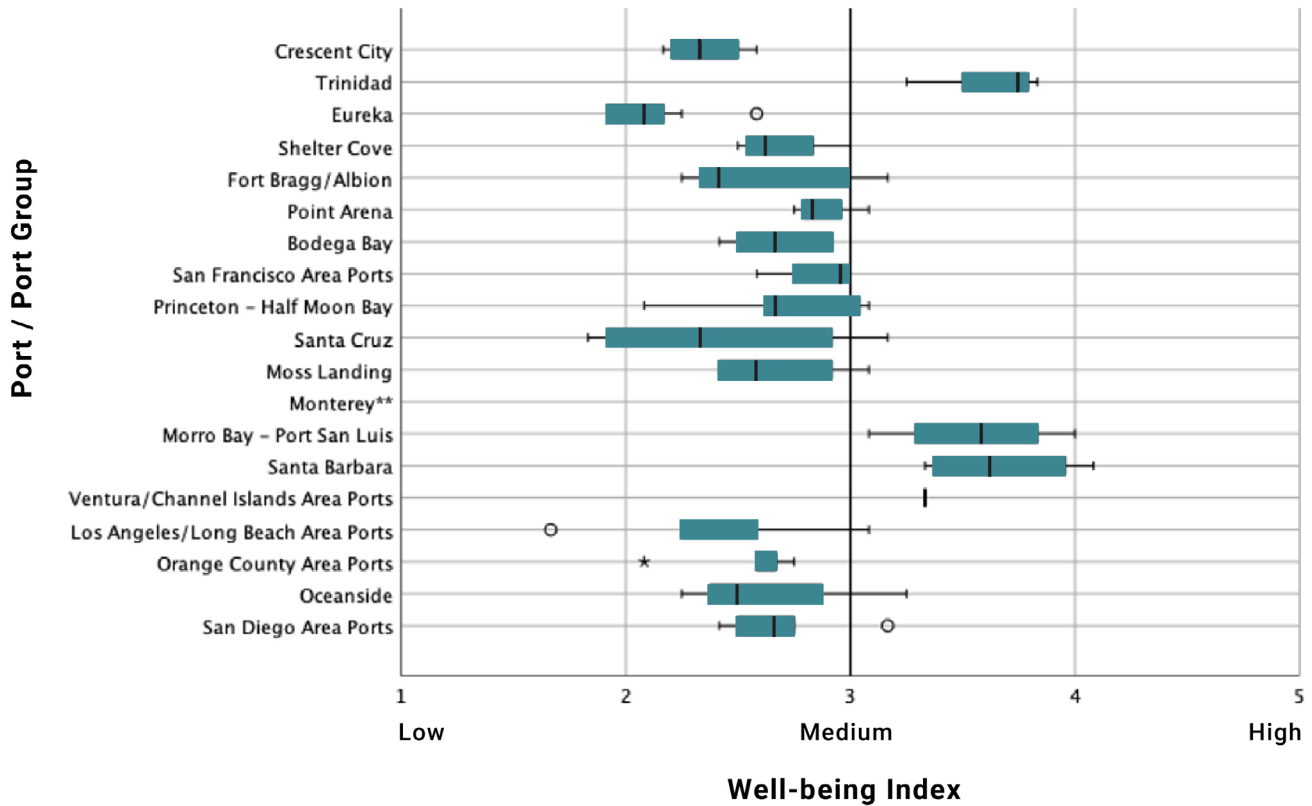
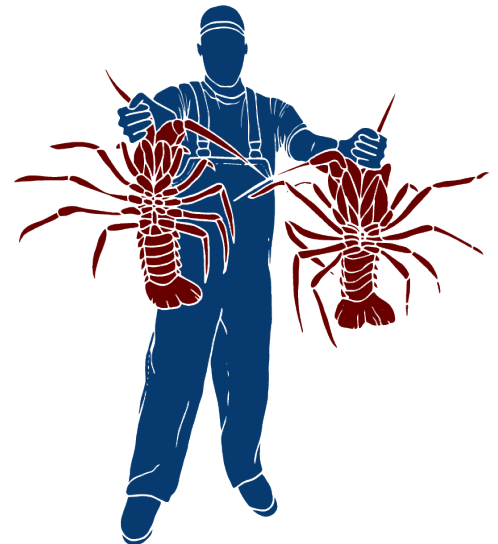


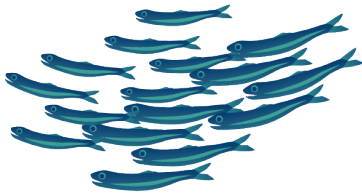
Figure 0.4 Boxplot of the well-being index score for each commercial fishing focus group, ordered geographically from north to south. A well-being index was developed for each port group by combining quantitative responses to 10 well-being questions and bundling them into three broad categories: environmental, economic, and social.



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3. Commercial fishing views on engagement and participation in fishery management:

Focus group participants expressed fear that information gathered by researchers from fishing communities would be used to restrict access to fisheries. Many participants were disillusioned with how decision-makers consider and value fishermen's knowledge and believed there was a lack of support politically for a thriving commercial fishing industry in California. Participants highlighted the disparity of available funding for researchers, managers, and planners relative to how fishermen are compensated for their time and expertise. Most participants were either satisfied or very satisfied with their experience participating in the virtual focus group. Over three-quarters of participants said they would be open to participating in a virtual meeting like the focus group in the future.



4. Commercial fishing perceptions of COVID-19 impacts on fishing communities:

Focus group participants recounted experiencing negative impacts and disruptions in their fishing activities due to COVID-19, including challenges

accessing the waterfront, temporary beach/waterfront closures, and disruptions selling their catch through traditional markets. Health concerns and crew challenges were reported in various ports across the state. Participants reported creative adaptation strategies to keep their businesses afloat through the challenging time.



5. CPFV perspectives on MPAs, well-being, engagement, and impacts from COVID-19:

Focus group responses indicated CPFV owner/operators share similar perspectives to commercial fishermen. While some participants felt MPAs were positively affecting ecological outcomes, the majority of participants expressed negative or neutral views on the impacts of MPAs on their fishing livelihoods, ecological outcomes, and businesses and fishing practices. Across the state, CPFV participants were dissatisfied with MPA management, monitoring, and enforcement, specifically highlighting their perceptions that managers did a poor job communicating about the MPA Program (Figure 0.5). Statewide, on average CPFV participants rated job satisfaction

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and social relationships among fishing community members and current marine resource health as positive. Statewide average ratings below neutral were reported for factors including income from fishing, relationships with external groups, allocation of resources, and future marine resource health (Figure 0.6).

Many participants expressed frustration that their perspectives and expertise were not heard or accepted as valid sources of information by decision-makers to help inform fisheries management in California. Eight-five percent of participants reported COVID-19 highly or very highly disrupted and changed the way CPFV businesses operate.

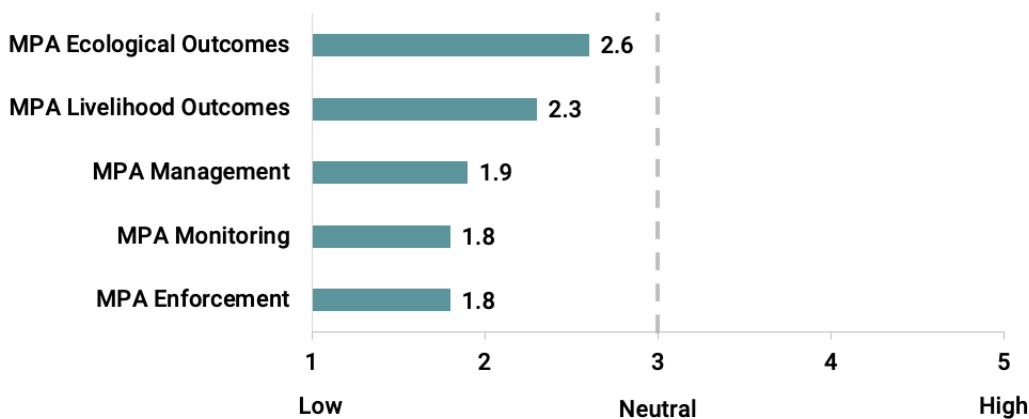


Figure 0.5 Bar chart showing statewide averages of CPFV focus group participants' perspectives about MPA outcomes, ordered from highest to lowest.



Figure 0.6 Bar chart showing statewide averages of CPFV focus group participants' perspectives about well-being outcomes, ordered from highest to lowest.

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6. Spatial and fisheries data analyses:

In assessing the outputs of our spatial modeling approach, the spatial modeling methodology was found to have successfully redistributed the CDFW landings data. While Ecotrust data is not entirely coincident with CDFW data, results show a high level of fidelity between the total per year summarized to the 10nm² blocks and the output of the analysis. Additionally, the model shows changes in commercial fishing activity in micro-blocks immediately adjacent to the State Marine Reserves (SMR). For lobster, these micro-blocks averaged 10% of the catch in pre-MPA (2005-2009) years and increased to 13% in the post-implementation years

(2010 - 2020). The same level of increase can be seen for sea urchin, averaging 19% in pre-MPA years (2005-2009) increasing to 22% in post-MPA years (2010 - 2020). For nearshore finfish (all species) the increase is greater: in pre-MPA years (2005-2009), the average catch in the adjacent areas was 7% but increased to 15% in the post-MPA years (2010 - 2020).



Project Recommendations

Our project directly informs Decadal Evaluation Working Group's (DEWG) Scientific Guidelines to Evaluate MPA Performance, specifically recommendations 3, 5, 10, 11, 13, and 14. Key recommendations for future ongoing MPA monitoring efforts include:

1. Explicitly identify and provide sustained funding for a full spectrum of human dimensions research

2. Establish methods and programs to gather fine-scale spatial and temporal scale human use data.

3. Initiate and integrate collaboration across the human and ecological dimensions

4. Build communication channels that reflect the needs of the target audience

5. Plan meeting experiences to maximize inclusivity, with a focus on participant convenience and comfort

6. Be accountable and transparent about opportunities for adaptive management and potential expansion of MPAs

7. Invest in California fishing community well-being