



August 27, 2018

Mr. Phil Anderson, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, #101
Portland, OR 97220

RE: Agenda Item G.3: Climate and Communities Initiative Update

Dear Chair Anderson and Council Members:

Ocean Conservancy, the Nature Conservancy (TNC), Natural Resources Defense Council, and Wild Oceans thank the Pacific Fishery Management Council (Council) for its work implementing the Fishery Ecosystem Plan (FEP) and preparing West Coast fisheries and communities for climate change. The impacts of climate variability and change are already being felt along our coast, and thinking ahead to address the challenges and opportunities that will arise in the future is critical to ensuring a healthy ecosystem. As the Council considers next steps to implement the Climate and Communities Initiative, we recommend the following:

- 1. Use scenario planning to focus the initiative on increasing management efficiencies and addressing stock range shifts**
- 2. Conduct a Council process “tune-up” to build resiliency today**
- 3. Ask NMFS to develop a species response plan to identify, develop, and use climate related indicators and climate-ready HCRs**

Background

Recent unprecedented oceanographic events and their consequences on fishing-dependent communities have highlighted both the variability inherent in the California Current Large Marine Ecosystem (CCLME) and the impacts that a changing ocean can have on people.^{1,2} The “warm blob” (North Pacific marine heat wave), El Niño conditions, harmful algal blooms, and domoic acid events have all impacted the California Current Large Marine Ecosystem, West Coast fisheries and coastal communities in recent years.³ We witnessed unusual mortality events for sea lions,⁴ bird die-offs,⁵ and

¹ NMFS Climate Science Strategy Western Region Action Plan, Appendix B. *The 2012-2015 “climate change stress test” for the West Coast*. Pg. 63.

² Daniel Mintz, The Humboldt Independent. *Crab Disaster Could Reflect Long-Term Trend*. August 16, 2016.

³ NOAA Fisheries. News and Features. *Commerce Secretary Pritzker declares fisheries disasters for nine West Coast species*. January 19, 2017. <http://www.noaa.gov/news/commerce-secretary-pritzker-declares-fisheries-disasters-for-nine-west-coast-species>.

⁴ 2013–2016 California Sea Lion Unusual Mortality Event in California (NOAA, 2016); <http://www.nmfs.noaa.gov/pr/health/mmume/>

general low ecosystem productivity.⁶ The widespread implications of climate change to fish and fisheries in the California Current is widely documented by multiple scientific and policy sources.^{7,8,9} The Council-sponsored NOAA Fisheries climate webinar series highlighted recent climate-related events and the need to evolve fisheries management to ensure resilient fisheries.¹⁰ Additionally, the TNC-sponsored Climate and Communities Initiative Workshop, held in May, highlighted the public's desire to address climate change and the climate change issues that most concern stakeholders and managers.

With a better understanding of current variability and a better ability to adapt to changing conditions in the future, we can meet ecosystem protection goals and promote longevity for our fishing communities. As recent years have shown, conditions will change, often in surprising ways, and pose challenges for fishermen and managers. Preparing now will help the Council meet those challenges, elevate awareness among stakeholders, and limit adverse consequences for people and the environment. The Council has already embarked on this work, by beginning the development of the Climate and Communities Initiative. We offer the following recommendations as the core of the Initiative to develop climate ready fisheries while protecting the ecological sustainability of the resource.

Recommendations

1. Use scenario planning to focus the initiative on increasing management efficiencies and addressing stock range shifts

a. Streamline management

As shown by advisory body comments and the TNC Climate and Communities Initiative Workshop report, fishery participants want existing management streamlined to increase efficiency in fisheries operations.

As examples, several areas of possible focus have already been identified through the FEP initiative scoping:

1. Increase the ability to diversify: Diversification is an important component of flexible and resilient fisheries, thus doing what we can now to promote diversification, through more fluid permit transfers for example, could be important for maintaining fisheries in an ecologically and economically significant way;

[californiasealions2013.htm](#)

⁵ Opar, A. Lost at sea: starving birds in a warming world. Audubon Magazine (2015);

<https://www.audubon.org/magazine/march-april-2015/lost-seastarving-birds-warming-world>

⁶ Whitney, F. A. Anomalous winter winds decrease 2014 transition zone productivity in the NE Pacific. Geophys. Res. Lett. 42, 428–431 (2015).

⁷ NMFS Climate Science Strategy Western Region Action Plan. Expected Impacts of Climate Change in the CCLME. Pg. 17.

⁸ Sydeman, W.J., and S.A. Thompson. Potential impacts of climate change on California's fish and fisheries. Farallon Institute. 2013.

⁹ California Ocean Science Trust. *Readying California Fisheries for Climate Change*. June 2017.

¹⁰ Webinar Series on Ecosystem Climate and Communities held in January-February 2018. ;

<https://www.pcouncil.org/2018/01/51541/51541/>

2. Lower the barriers to entry and exit: Identifying existing barriers to fishery entry and exit and addressing these will promote innovation, a better functioning market, and provide opportunities in both directions for participants;
3. Address federal/state permitting “rub” areas: Increasing fluency between state and federal management units will help participants operate more efficiently and better plan their business decisions; and
4. Expedite gear innovation: Fostering innovation will help maximize catch while protecting the natural ecosystem in a changing environment.

Scenario planning is a structured process that engages experts and stakeholders to organize complex information about how the future might look, and then use these future scenarios to think about how to plan.^{11,12,13} Used by practitioners across disciplines, it would be an effective tool to help accomplish this work. Climate scenarios could be developed by a group of experts, ideally climate and fisheries staff from NOAA science centers, and provide information on the expected impacts of climate change to managed stocks and associated fisheries. The scenarios could be tailored to specific fisheries, species/species groups, Fishery Management Plans (FMP), and/or climate impacts, and would provide a platform to develop response decisions and tools. The scenario planning process engages stakeholders and identifies what areas of management should be improved, how they can be improved, prioritize these needs, and identify data and research needs.

b. Develop a policy or suite of policies to address emerging and moving fisheries

Geographically shifting stocks are a likely outcome of climate change.¹⁴ The East Coast serves as a warning of the need to address jurisdictional issues, and examine the efficacy of current management frameworks; we should ensure they are successful under changing conditions in meeting social and economic goals as well as fostering ecological integrity.

As conditions in the marine environment change, it is likely that stock distribution will move out of historic fishing grounds and we will see a permanent shift of many species to new areas.¹⁵ For instance, West Coast rockfish populations are predicted to move to deeper waters, and previously unfished species will enter American waters from Mexico. We saw West Coast squid populations move from Southern and Central California to Oregon in 2017, causing the fleet to travel further from their home ports and illustrating a potential management problem given the difference in management structures between California and Oregon. As fish stocks move in space (both north-south and east-west) existing

¹¹ National Park Service Scenario Planning Handbook

<<https://www.nps.gov/subjects/climatechange/upload/CCScenariosHandbookJuly2013.pdf>>

¹² Sorrels, Tara, "Icelandic Fisheries: Scenario Planning for Climate Change" (2016). *Honors College Capstone Experience/Thesis Projects*. Paper 663.

<https://digitalcommons.wku.edu/cgi/viewcontent.cgi?referer=https://www.bing.com/&httpsredir=1&article=1671&context=s tu_hon_theses>

¹³ The Resilient Fisheries RI project (with support from the Rhode Island Natural History Survey.) 2018. *Rhode Island Commercial Fisheries Blueprint for Resilience*. Available at: [www.resilientfisheriesri.org/wp-content/uploads/2018/04/RI-Commercial-Fisheries-Blueprint-for-Resilience-1.pdf](http://resilientfisheriesri.org/wp-content/uploads/2018/04/RI-Commercial-Fisheries-Blueprint-for-Resilience-1.pdf)

¹⁴ Morley JW, Selden RL, Latour RJ, Frölicher TL, Seagraves RJ, Pinsky ML (2018) Projecting shifts in thermal habitat for 686 species on the North American continental shelf. *PLoS ONE* 13(5): e0196127. <https://doi.org/10.1371/journal.pone.0196127>

¹⁵ NFMS Webinar series, Spring 2018, available at: <https://www.pcouncil.org/ecosystem-based-management/fishery-ecosystem-plan-initiatives/climate-and-communities-initiative/climate-and-communities-initiative-2018-webinar-series/>

management measures may be insufficient to ensure sustainable management goals can be achieved. Beyond target fish stocks, other species and habitats are also expected to change, dynamically adding to the challenge. As noted above, creating a management system that has the ability to address these changes as they arise will be critical to ensuring the integrity of the ecosystem and minimizing impacts on fisherman.

We recommend using scenario planning to identify priority impact areas and develop solutions. As demonstrated by a successful Groundfish Essential Fish Habitat collaborative process and the TNC Climate and Communities Initiative Workshop, giving stakeholders the space and time to share information, develop solutions, and consider alternatives together outside of the official Council processes can be useful. Issues such as climate change – widespread, complex, multi-dimensional, and with a long-time horizon – are ripe for “win-win” collaboration and creative solution finding.

2. Conduct a Council process “tune-up” to build resiliency today

In addition to the policy actions described above, the Council could use this opportunity to make several smaller-scale adjustments within existing processes. We recommend:

- a. *Make the Ecosystem Working Group (EWG) a permanent standing management team with the following membership:*
 1. One representative from each state;
 2. One tribal representative;
 3. Two members from NOAA Fisheries West Coast Region;
 4. Two members from the West Coast Fishery Science Centers, including an ecosystem expert;
 5. A representative of the United States Fish and Wildlife Service; and
 6. Two rotating issue expert representatives, to provide technical knowledge and guidance on the issue before the team;
- b. *Include ecosystem scientists and/or climate scientists on NOAA Fisheries Stock Assessment Teams (STATs), Stock Assessment Review (STAR) panels, and Council management teams (i.e., GMT, STT, HMSMT, CPSMT, and HC) where possible; and*
- c. *Task the Scientific and Statistical Committee (SSC) with developing guidelines for how and when climate-related ecosystem information can be included in stock assessments.¹⁶*

3. Ask NOAA Fisheries to develop a species response plan to identify, develop, and use climate related indicators and climate-ready Harvest Control Rules (HCRs)

- a. *Develop climate-related indicators for species and species groups that track how climate is impacting them.*

The NOAA Integrated Ecosystem Assessment (IEA) program continues to develop climate-related indicators for single species, species groups, and ecosystem health. Some are contained in the Annual

¹⁶ PFMC, Supplemental SSC Report Agenda item H.1.c, September 2010. The SSC recommended that the SSC ecosystem subcommittee develop guidelines for how ecosystem considerations can be included in stock assessments.

State of the Ecosystem Report, while others are part of the IEA's larger indicator database. As this work grows and continues to mature both in the science as well as potential management applications, NOAA Fisheries can help educate and inform the Council of this work and continue to integrate it into Council management action. Complementing recommendations made in the EBFM Roadmap, we recommend that **the Council ask NOAA Fisheries to develop and plan that describes (1) their current and upcoming climate indicator research priorities, (2) how they will share this new information with the Council, and (3) how NOAA Fisheries recommends it be used in management.**

b. Develop climate-ready HCRs

NOAA Fisheries finished a climate vulnerability assessment (CVA) in 2018 to identify economically important West Coast stocks that are most vulnerable to climate change. We support the EWG concept that the Council use the results of this investigation and conduct Management Strategy Evaluations (MSE) to identify fishery management approaches that are robust to the long-term effects of climate change. These management approaches can be implemented via updated HCRs and FMP amendments, as appropriate.

MSE is the evaluation of different management options using simulation. It is largely considered a powerful method to examine trade-offs, and identify plausible management option/s when evaluated against the goals and objectives for a given fishery or ecosystem. MSEs vary widely in scope, focus, and cost; some require extensive large-scale modeling such as Atlantis, while others require simpler model simulations. We recommend **(1) that the Council develop a process for prioritizing and executing MSEs, informed by the NOAA Fisheries stock assessment prioritization process, and (2) that based on results of the CVA, the Council select priority stocks with which to begin.**

Conclusion

We greatly appreciate the efforts of the Council, especially the EWG, to further develop and refine this initiative. Preparing for climate change is essential and it should be done so strategically, with a targeted set of actions, an adaptive approach, and with a commitment to climate-ready fisheries management that maintains ecosystem integrity. We offer these recommendations to provide an example of a full initiative that moves climate preparedness forward and provides benefits for today's fisheries and management processes and policies. We will be before you at the Council meeting and are happy to answer any questions you may have.

Sincerely,



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