

## ECOSYSTEM WORKGROUP REPORT ON THE CLIMATE AND COMMUNITIES INITIATIVE

The Ecosystem Workgroup (EWG) met with Mr. Jonathan Star to hear a briefing from him on the scenario planning process under development in support of the Climate and Communities Initiative. We focused our discussion on reviewing and supplementing the list of the scenario planning exercise's "Preliminary Driving Forces," and on reviewing and responding to the six scenario planning questions identified in the Climate and Communities Core Team (CCCT) Report 1 for this agenda item. We encourage Mr. Star and the CCCT to refer to the EWG March 2019 reports ([E.2.a Report 1](#) and [E.2.a Report 2](#)) for additional EWG comment on developing scenarios in support of this initiative. We also request that the full EWG membership be invited to the anticipated January 2020 workshop.

The EWG also notes that an effort parallel to the Climate and Communities Initiative is underway in California. In July 2019, a workshop was convened, titled "Launching an Exploration of Policy & Management Options in California to Address Climate Change Impacts on Fishing Communities." Members of the EWG and the Ecosystem Advisory Subpanel were in attendance, and the workshop focused on how state management tools can potentially help address the impacts that fishing communities will face under climate change. The EWG looks forward to seeing how California's efforts may inform and be informed by this Council initiative.

The EWG recommends adding or amending the following items to the list of Preliminary Driving Forces:

- Hypoxia
- Harmful Algal Blooms (HABs)
- Increased climate variability and unpredictability
- Changing hydrology -- snowmelt, winter rain intensity, increased intensity of droughts
- Terrestrial effects of droughts and wildfires (deforestation, new scrubland)
- Nature of range shifts for both managed and protected species
- Patterns and timing of managed and protected species' migrations
- Changing demographics of coastal communities
- Losing infrastructure within fishing communities and losing support for industrial infrastructure
- Aging of fishing fleet and expertise coupled with increased cost of entry to fisheries
- Shifting of fisheries landings volumes to more or fewer ports and/or processing plants
- Changes in technology -- smarter fishing technologies to allow more precise targeting of specific species, or improved ability to preserve flesh/meat quality
- Changing consumer attitudes towards desirability of wild-caught fish, and concerns about contaminants such as microplastics or mercury
- Shifting budgets and resources for scientific monitoring, increasing need for monitoring to track climate variability
- Increasing Council attention needed for allocation issues related to shifting stock availability

- Heterogeneity of effects of climate change may require more regional management planning

The EWG responded to the questions listed in the CCCT's report for this agenda item as follows:

*1. LOOKING BACK: Over the past decade, what have been the most notable developments in West Coast fishing communities? What about in West Coast stock availability? Which trends surprised you most?*

Environmental variability, which has affected our ability to predict patterns in fish availability. Things we used to be able to predict, and the extent to which our predictions have been wrong has been disconcerting for scientists, managers, and the public. Climate variability trends, including HABs and hypoxia, and marine heatwaves. Ecological shifts in the nearshore, such as destruction of kelp forest communities and increased purple urchin populations. Rockfish recruitment improvement, whether in response to rebuilding or to climate variability. Fishing communities seem to have struggled more this past decade than in earlier decades, partially because there haven't been species available to serve as backfill fishing targets when the main targets become unavailable. Major die-offs of some species of birds and mammals.

*2. ORACLE: If I could answer any question for you that would help you better understand the future of West Coast fishing communities (in 2040), what would you want to know? You can ask about the world, the industry, the environment...*

Will we have fishing communities or will we just have fishing? In other words, will fleet consolidation become so strong that fish are only landed in a few large ports along the coast? How diverse will fishing portfolios be in the future? What will it look like compared to today? What is their ability to adapt, barriers to entry? Will we be able to predict or estimate the fish available for harvest? Unpredictability in forecasting seems to be on the rise.

*3. PRE-DETERMINED: What are the most important unstoppable or inevitable trends that you think will affect West Coast fishing communities? (What inevitable factors will affect stock availability?)*

Our ability to predict how many fish are out there is going to get harder. More difficult for industry to make longer term plans because we will have difficulties predicting how much fish are where and when, which will mean that management may need to be more conservative. What if spatial scales change -- will we need to change our monitoring locations? Will declining trends in recreational fishing continue?

*4. WILDCARD: What low probability events could happen to completely reshape the landscape for West Coast fishing communities?*

Tsunami readiness. New generations of people less interested in fishing (may not be low probability). Trade policy -- what if American export markets decline so much that we can't export as much fish? Aquaculture could take off so much that demand for wild capture fisheries could

decrease. West Coast recreational fishing skyrockets in association with adventure tourism and if calm, warm weather moves northward of the Southern California Bight.

*5. GOOD & BAD SCENARIO: Describe how a bad scenario might evolve for West Coast fishing communities in the next 20 years? Can you describe a good scenario – what might that involve?*

**BAD SCENARIO:** All of the kelp forest dying due to extreme temperatures and collapse in nearshore food web. Uncertainty in environment and society undermines faith in management structure and willingness to comply with regulations, ultimately resulting in a free-for-all. Communities losing their sense of being a fishing community -- desire to maintain that is lost due to other economic opportunities.

**GOOD SCENARIO:** The system proves to be more resilient than anticipated. Someone invents a technology to pull carbon out of the atmosphere. Warming temperatures bring more bluefin tuna and other warm waters species to the CCE.

PFMC  
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