

AD HOC ECOSYSTEM WORKGROUP SUPPLEMENTAL INFORMATIONAL REPORT ON FISHERY ECOSYSTEM PLAN INITIATIVE 3: CLIMATE AND COMMUNITIES

During its March 2018 meeting, the Council considered its initial plans for a new Fishery Ecosystem Plan initiative on [Climate and Communities](#). The Council's advisory bodies and the public have between March and August 2018 to develop recommendations for next steps in this ecosystem initiative, in support of further Council discussion at its September 2018 meeting. In May 2018, The Nature Conservancy is sponsoring a two-day workshop, in cooperation with the Fisheries Leadership and Sustainability Forum, to discuss potential directions for the initiative and to spur public comment development on the initiative. The Council's direction from its March 2018 meeting, agenda item F.2., included a request that the Ecosystem Workgroup (EWG) communicate with the May workshop organizers to advise them on organizing concepts and questions for the workshop. We provide this April 2018 Informational Report to share our response to the Council's March 2018 direction with the Council, its advisory bodies, and the public.

Thinking About Climate Change and Fisheries Management

The EWG posed several questions to stimulate thinking about the workshop's content and outcomes.

How do we think about climate change? Or, how do we assess our readiness to adapt to climate change? There are many examples of how others have approached the question using planning and analysis frameworks. The leading work of the Intergovernmental Panel on Climate Change and their focus on impacts, vulnerability, and options for adaptation and mitigation is widely used. Numerous terrestrial based examples are available, such as the climate change planning work of several U.S. national forests. The reports *Climate Change and Our Natural Resources* by Western Washington Treaty Tribes, and *Readying California Fisheries for Climate Change* by the Climate Change and Fisheries Working Group and Ocean Science Trust illustrate our region's commitment to thinking deeply about climate change readiness, adaptation, and mitigation.

We can consider these climate change readiness questions from the perspective of: the nation, states or tribes and regions, individual communities, or individuals and businesses. Within the Council process, we bring together the perspectives of states and tribes, within the larger region, and with influence from the national, community, individual, and business perspectives. Our role is to create a flexible framework and provide information that might help communities, individuals, and businesses adapt to climate change.

Communities and fisheries are always having to evolve to keep up with whatever changes are taking place in the ecosystem, and with changes in local, regional, and national political systems and laws. How do changes to fish stocks and fisheries due to climate shift fit within the realm of all the other changes that the fisheries/communities address or experience? In other words, "*Is climate change just another factor that the fisheries must evolve to address?*"

Looking retrospectively at previous changes for particular fisheries might shed light on how strongly to consider the impacts of climate change. What is the planning horizon for fishing

industries and communities? Twenty years ago, could we have imagined where we are now, having faced major shifts in groundfish and coastal pelagic species (CPS) abundance, permit consolidation in multiple fisheries, rising permit values, etc.?

Looking forward, will we see fishing efficiency increasing through technology and information improvements, or processing efficiency improvements? What other pressures might we see on marine resources – increasing ocean uses (energy, recreation, aquaculture, etc.,) increasing or changing habitat impacts from marine and upland activities, increasingly frequent or larger harmful algal blooms and dead zones? How might the international and national management structures that affect our species change?

The [2016 Union of Concerned Scientists](#) (UCS) report provides another framework and principles for climate change readiness assessment, and is focused particularly on adaptation. The report introduces the concept of a “climate resilience gap”: “the degree to which a community or nation is unprepared for damaging climate effects—and therefore the degree to which people will suffer from climate-related events.” The framework is based on the idea that there are two ways to reduce the gap, adaptation or mitigation, from the principle that we should “manage unavoidable changes and avoid unmanageable ones” ([Bierbaum et al. 2007](#)).

Mitigation refers to reducing emissions, or pulling greenhouse gases out of the atmosphere, which is largely outside of the Council’s authority. Therefore, fisheries management should focus on exploring and adopting adaptation measures. The UCS framework focuses on adaptation to: improve scientific efforts to match the scope of science planning to the magnitude of projected change and to create opportunities for adaptive decision-making; achieve equitable outcomes to policies to share the costs of responding to climate change and the benefits of resilience-building; and apply common sense to using our resources, so that we understand the limits of adaptation while working towards our long-term management and mitigation goals.

Workshop Structure Suggestions

- Advance workshop homework for participants should at least include reviewing the January 25, 2018 webinar on [what we expect for the California Current Ecosystem under climate change](#), although we believe the full four-webinar series provides a more complete look at potential changes to our ecosystem over time.
- Begin workshop with a presentation of historic West Coast fisheries management, so that participants get a perspective of how fisheries change through time, and so that participants understand what the Council can and can’t do to affect natural resource management.
- Create scenarios for climate change issues and pose possible responses, providing or determining possible tools and approaches.
- Use [preliminary Climate Vulnerability Assessment results](#) for examples of species most like to be negatively affected by climate shift and change, and brainstorm management scenarios particular to those species. We could look at the industry responses to these hypothetical scenarios and look at percentage of industry that stays in the fishery, leaves or switches or something else. Group responses regionally.
- Brainstorm management scenarios for commercially or recreationally viable species with intermittent invasions into the California Current Ecosystem (e.g. Humboldt/jumbo squid), or for new species that may move into the system.

- How did fishing and processing industries and fishing communities react to the 2014-2016 “climate change stress test” of the combined Blob and Super El Niño? How can we learn from history and help industries and communities adapt to climate stress events?
- Discuss how we might approach improved forecasts over time and the monitoring of the physical environment – maintain existing monitoring? Future needs?

Adaptation Strategies and Questions

COMMERCIAL FISHING INDUSTRY

- Stable species/fisheries: modest adjustments; emphasize targeting species that are more adaptable to climate change (e.g., many species in Groundfish fishery management plan (FMP)).
- Mobile species/fisheries: accommodate volatility and risk tolerant, adaptive, experimental, developmental (e.g., CPS and HMS FMP species).
- Pop-up or intermittent species/fisheries: take advantage of new opportunities and get out when benefits drop.
- Will we see greater industry consolidation to form larger businesses to buffer against risks?
- How can fisheries respond to changing distributions of FMP species?
- Do open access fisheries provide a buffer for climate-related issues that may affect participation flexibility in limited entry fisheries?

RECREATIONAL FISHERIES

- Stable species/fisheries: modest adjustments, such as a season-setting processes that may provide more predictability for fishing seasons, allowing advance charter booking and vacation planning.
- Mobile species/fisheries: is there flexibility within and between the states for developing recreational fisheries on new species? If so, can Council management support that flexibility?
- Pop-up or intermittent species/fisheries: take advantage of new opportunities and get out when benefits drop.
- What non-fishing seasonal work intersects with recreational fisheries? For example, charter fishing boats that may also be used for whale or bird tours during migration seasons.
- How can fisheries respond to changing distributions of FMP species?

FISHING COMMUNITIES – CRITICAL SHORESIDE NEEDS & FUNCTIONS

- Port Infrastructure: moorage; offloading, loading ice, fuel, supplies, gear; repairs; public marina availability
- Vocational training availability: are West Coast fishing communities able to train up the next generation of fishing crews, fish processing plant staff, boat captains, and boat owners?
- Processing and transport: how accessible are landings ports to markets?

FISHERIES MANAGEMENT

- Fishery Management Plans: Would we see addition/removal of species/gears from current FMP structure?
 - Would we see FMPs organized to address different fishery strategies and suites of species (stable, vs. mobile, pop-up, etc.)?
 - Cross-FMP issues likely increase.
- Exempted Fishing Permits: May be more demand for experimentation and fishery development.
- Catch Shares: How is their utility and applicability affected with climate change?
- Reference Points, Overfished Definition & Rebuilding Plans: How to determine if reference points need to be revised? Analyses and adjustments for new target reference points.
- Harvest Control Rules: modify to adjust to new conditions, accounting for effects of climate change.
- Adaptation: Are there management changes we can make to reduce frequency of need for disaster declarations and funding?
- Indirect influence on other entities to take action beneficial to resources, users and communities: What are the opportunities and how can this best be achieved?

NON-FISHING ACTIVITIES WITH FISHERIES EFFECTS

- Are there activities affecting freshwater habitat quality that we should know about, so that the Council family can be aware of other policymaking areas that need attention?
- What non-fishing activities might we expect to see more or less of in the marine environment that may affect managed stocks' life cycles and where and how fishing vessels operate?