

## AD HOC CLIMATE AND COMMUNITIES CORE TEAM REPORT ON THE CLIMATE AND COMMUNITIES INITIATIVE

### Introduction

This report reflects Climate and Communities Core Team (CCCT) discussion on the future of the Climate and Communities Initiative (CCI) it wishes the Pacific Fishery Management Council (Council) to consider. The CCCT also makes and recommendations on actions the Council could take to begin preparing West Coast fish stocks and fisheries for the effects of climate change. The discussion and recommendations keep in mind the initiative's goal:

*The goal of a cross-FMP Climate and Communities Initiative is to consider, develop, and implement strategies for improving the flexibility and responsiveness of our management actions to near-term climate shift and long-term climate change, and strategies for increasing the resiliency of our managed stocks and fisheries to those changes. This approach should better support West Coast fishing communities that depend on marine fishery resources.*

After an initial period of developing the initiative – including a series of briefings sponsored by the Ecosystem Workgroup (EWG) and a workshop sponsored by The Nature Conservancy (TNC) – a scenario planning process was identified by the Council as the substantive action and structure for the CCI. The scenario planning process was guided by the CCCT and a contracted scenario planning expert, Jonathan Star. During the scenario planning process, Council members, advisory body members, and stakeholders engaged in multiple in-person and online workshops that identified and considered the potential effects of climate change and other drivers of change on West Coast fish stocks and fisheries, and explored potential management responses to those effects. The timeline of actions the Council and its advisory bodies have taken to develop this initiative is provided in the appendix to this report.

### Accomplishments of the CCI

As requested by the Council in March 2021, the CCCT prepared this report to document what has been achieved during the CCI, and the work that remains to be done. The most important outcome of the Initiative has been to raise awareness of the possible future impact of climate change on West Coast fisheries through creation of scenarios from the scenario planning process. While we cannot know, with precision, what future conditions we may face, scenario planning identified the need to prepare for warmer temperatures, range shifts, ecological surprises, alternative ocean uses and other developments. The [scenarios developed as part of this Council's scenario planning process](#) point toward a future in which species abundance and availability either increase or decrease at the same time climate and ocean conditions change steadily or with high variability and extremes. These axes of uncertainty lead to four possible futures, each of which has distinct implications for West Coast fishing communities. Through scenario planning, the Initiative has provided a structure that encouraged different stakeholders to share their perspectives on how climate change is poised to shape the future, and brainstorm about what that might mean for

Council-managed species and the communities that depend on them. Overall, the CCI has made the topic of climate change a more tangible and central focus of attention for the Council.

However, scenario planning is merely the start of a conversation and, critically, of the actions that need to follow. Scenario planning was not originally intended to be the whole of the CCI, rather it has been a tool to make progress on the Initiative's goal. During the CCI's scenario planning process, participants generated several ideas that could be considered to help prepare for an era of climate change. We fully expect that in the coming months and years, many more ideas will emerge. At this stage, this Final Report outlines a number of recommended actions that the Council could consider integrating into existing processes. By adopting these actions, the Council will build on the momentum generated by the CCI, encourage existing (and possibly new) advisory bodies to implement strategies and actions, and continue to work with a broader set of stakeholders to address climate change issues.

The issues raised through the CCI are ongoing and the CCCT recommends that these issues continue to be a part of the Council process, potentially including new Fishery Ecosystem Plan (FEP) initiatives, advisory body work, as well as other Council actions. In March 2021 the Council requested the CCCT to provide, at this Council meeting, recommendations on future related activities based on the priority actions in the [Report on Regional Workshops](#). CCCT members have variously interpreted this direction either as the conclusion of CCI or its continuation in a new guise. No matter what course the Council takes, we continue to see the CCI goal, reiterated above, as relevant to future Council efforts in responding to the effects of climate change on our fisheries and fishing communities. In this light, the Council should consider whether the CCI as well as the role of the CCCT has concluded or whether there is additional work specific to the CCI and to the CCCT still to be completed. If the Council determines that the CCI should continue, specific new focus areas should be identified by the Council to guide the ongoing process. While scenario planning and the development of the climate change scenarios have been valuable tools to think about how the Council can respond to possible futures, we believe there is more work to be done to accomplish the Initiative's goal.

Whether the Council formally concludes the CCI or not, the CCCT recommends that it be disbanded, given the team was originally established to oversee and guide the scenario planning process, which has concluded. The CCCT was well suited for advising on the structure and content of the scenario planning effort and to oversee the first portion of the CCI goal to "*consider...strategies*" for flexible and responsive management. The CCCT feels that the work to identify and consider future needs and frame the discussion of climate impacts is complete. The CCCT may not, however, be the appropriate venue to "*develop and implement...strategies,*" including fishery management plan (FMP)-specific strategies to address these needs. The CCCT suggests that the next steps be directed to the EWG, likely with new members added with relevant expertise and interests, and the Ecosystem Advisory Subpanel (EAS) as the core advisory bodies for the Council on ecosystem issues, along with the other Council advisory bodies for FMP-specific strategies.

## **Background to Final Report**

At the Council's March 2021 meeting ([Agenda Item I.2](#)), the Council's advisory bodies filed reports to help guide and inform the Council on completing this initiative, including: the EWG,

the EAS, the Groundfish Advisory Panel, and the Coastal Pelagic Species Advisory Subpanel. Advisory body comments generally supported the scenario planning process, and reviewed and commented on Council capacity for addressing the nine priority areas (see Report on Regional Workshops focusing on the Implications of Climate Change for West Coast Fisheries and Fishing Communities, [Agenda Item I.2, Attachment 1, March 2021](#)) that emerged from the workshops. Of those priority areas, advisory bodies generally saw some key areas for Council work: increasing fisheries management flexibility and responsiveness; Council process efficiency; more efficiency in data collection, analysis, communication, and use; and Council policies that support community resilience and collaboration across geographies and interest groups. Among the public comments, TNC filed an informational report ([Agenda Item 1.2, Public Comment, March 2021](#)) exploring flexibility in fisheries management, a key theme from the CCI. Advisory body comments also identified several key areas that are critical to fisheries, such as marketing and infrastructure; however, the Council does not have direct decision-making authority over these areas.

The Council asked the CCCT to produce a final report for September 2021 to identify priorities and inform the Council's concluding actions for the CCI. The Council requested that CCCT recommendations fall into three categories of action: follow-on initiatives for the FEP (for consideration in March 2022), immediate recommendations to advisory bodies and the Council for ongoing work, and ideas for collaboration with partner agencies and stakeholder groups. CCCT recommendations, below, organize actions from those priority areas identified by the Council and its advisory bodies in March 2021, with a focus on action areas under the Council's purview. The CCCT notes that an in-depth analysis of the scenario planning workshops should be considered and that a report akin to those produced by the [National Park Service](#) and National Oceanic & Atmospheric Administration ([NOAA Fisheries](#)) could be useful.

### **CCCT Recommendations for Potential Council Action**

Below, the CCCT identifies a range of potential actions or activities that flow from the findings of the Climate and Communities Initiative, grouped into three broad categories focused on science, ongoing management, and collaboration with authorities outside the Council process. Some of these items could be further developed as candidate initiatives for consideration in March 2022 while others may be implemented through other Council processes.

This collection is not definitive and the CCCT encourages Council advisory bodies to make recommendations on additional activities consistent with the goal of the CCI.

1. The Council could initiate **science-focused activities** to provision the Council with actionable information:
  - a. The Council could task the EWG and EAS to work with NOAA Fisheries scientists to
    - i. Develop a report for Council consideration that specifies processes to address the following science concerns: Incorporating climate variability and change data and information into our stock assessments, ecosystem assessments, scientific advice, and decision-making such that decision-makers have a sense of any expected shifts in our stocks abundance and distribution, and ecosystem conditions, over the next 5-20 years. The report would also include recommendations to help address the movement of

stocks across jurisdictional boundaries and support stock and ecosystem sustainability. Stocks that may shift across jurisdictions could be targeted for transboundary assessments, and pronounced shifts in ecosystem conditions could be used to update stock and ecosystem reference points, if needed. This activity would best be conducted in conjunction with FMP-specific advisory subpanels and management teams, who could provide input on opportunities and challenges to the use of this information in the Council process, including in long term planning. Finally, the report would identify implementation needs for addressing potential challenges identified in the scenario planning process and larger CCI initiative, including a) Research and data and b) Council process and policies.

- ii. Use NOAA’s climate vulnerability assessments to prioritize stocks for climate management strategy evaluations intended to develop climate-ready harvest control rules and other management measures.
  - iii. Bring FMP-specific ecosystem reporting into the Council process at times when it is most needed and useful. This reporting would be supplemental to the annual ecosystem status report and harvest decisions that are under development.
  - iv. Request that the Integrated Ecosystem Assessment (IEA) team include an appendix in the annual State of the California Current Ecosystem Report that would provide information specific to climate change and take into account the scenarios developed through the scenario planning process as well as develop climate early warning indicators.
- b. The Council could also task advisory bodies to explore the use of “civic science,” including traditional ecological knowledge (TEK), through community-based, and collaborative efforts in the collection of data that could be used to track climate change. In developing any such program, the following questions should be considered: Which climate data might be collected by fishing vessels acting as scientific platforms? Could agencies use basic sea/air temperature data from an array of small platforms? Which fishing vessels are more or less conducive to carrying sensors? Has anything like this been tried elsewhere in the world and, if so, have the data collected been useful and used in ongoing management processes where this could be integrated? What are the cost implications?
2. The Council could implement revisions to **ongoing management processes**, including actions to be undertaken through FMPs:
- a. The Council could task advisory bodies to explore activities to increase flexibility, responsiveness, and adaptability within the Council process:
    - i. The Council could define flexibility and adaptability in the context of shifting West Coast stocks and identify appropriate considerations, based on the results of the scenario planning process and informed by the [informational report](#)<sup>1</sup> provided by TNC. Additionally, the Council could

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<sup>1</sup> Bell R, Strawn A, Kirchner G. 2021. Flexibility in the Pacific Fisheries Management Council’s Fishery Management Plans: What is Flexible Fisheries Management?. Agenda Item 1.2, Public Comment, March 2021 PFMC Briefing Book.

develop priorities for directly addressing climate impacts. This would provide guidance necessary to effectively move forward with 2.a.ii.

- ii. All FMP-specific advisory subpanels and management teams could report back to the Council on:
  1. Administrative, process, and scientific barriers in the management of their fisheries to addressing the effects of ecological or management surprises and shifting stocks through in-season management actions, and on measures the Council could take to increase management nimbleness pre-season and inseason, while supporting long-term stock and ecosystem integrity;
  2. Priorities and processes for review of exempted fishing permit applications and recommendations about how such permits could be deployed to advance climate ready fisheries; and
  3. Opportunities for and challenges to embedding climate variability and change into our assessments, decision tables, and scientific advice for fishery management unit species, with advice and input from the Scientific and Statistical Committee. The Council could then review advisory body recommendations and determine whether revision to FMPs or regulations are needed to implement those recommendations about what kinds of ecosystem information, data, and monitoring are needed.
- b. The Council could plan a future workshop involving members of the Council family that engage with regional fishery management organizations and other international forums that have management responsibility for West Coast fish stocks. Participation should include the Council's non-voting member from the U.S. Department of State and staff from the NOAA Fisheries Office of International Affairs and Seafood Inspection. The workshop would develop recommendations to address adapting to and mitigating for the effects of climate change on fish stocks and fisheries at the international level. A second topic could be the identification of measures to improve current transboundary coordination to prepare for shifts in the distribution of managed fish stocks. Workshop outcomes would be communicated to relevant U.S. delegations as priorities for the development of U.S. positions.
- c. The Council could direct the Ecosystem Workgroup to include a statement in the Council's Guidance Document on Offshore Non-Fishing Activities (draft anticipated March 2022) on the role of greenhouse gas emissions in climate change and related implications for West Coast fisheries.
- d. The Council could direct its staff to provide an update to the Council at each March meeting on actions taken by other fishery management councils throughout the U.S. to better prepare their fisheries for climate change. This information could support development of future ecosystem initiatives.
- e. The Council could direct its staff to create a permanent Council webpage for climate-related work and resources to assist in educating and engaging the public

across platforms. This would help share what the Council has done and is doing, and could facilitate increased stakeholder participation in relevant management forums.

- f. The Council could task the EWG to include a reference to the final Scenario Planning Report(s) in the FEP as an example of potential impacts of climate change.
3. The Council could continue its **collaboration** with partner agencies and stakeholder groups and seek to engage new partners as appropriate:
    - a. The Council could ask that NOAA Fisheries provide a report to the Council on the West Coast fisheries' disaster determinations made in response to events that could be characterized as climate variability or change since 2010 (Magnuson-Stevens Act at 312(a) and 315, Interjurisdictional Fisheries Act 308(b) and 308(d). NOAA Fisheries could note whether there are trends in the causes of fisheries disasters and whether there are changes needed to federal policies that could prevent these disasters from recurring. This analysis could be informed by a recently released paper called [The Rise in Climate Change-Induced Federal Fishery Disasters in the United States](#).<sup>2</sup>
    - b. The Council could ask that NOAA Fisheries provide a report to the Council on how the federal government is coordinating its hatchery, habitat, and hydropower policies to buffer Pacific salmon stocks against the effects of climate change. Are policies aligned with each other towards common goals of supporting a future with sufficient salmon in our streams and ocean to support sustainable fisheries? If the report requested in 3a, above, shows that West Coast fishery disaster determinations are primarily made for salmon fisheries, what changes in hatchery, habitat, and hydropower policies are needed to minimize climate-related disasters?
    - c. The Council could ask that NOAA Fisheries draft a report evaluating the Council's scenario planning process and outcomes.

These recommendations represent a number of actions that could be taken in the short term that would move West Coast fisheries forward in climate preparedness, and longer-term initiatives that could be launched early next year that would bolster fishery science, harvest specifications, and climate tracking reporting. The CCCT recommends the Council prioritize these issues, and others brought forward by Council members and advisory bodies, at the September 2021 meeting and begin work immediately thereafter.

## **Summary of CCCT Considerations for Council Discussion**

The CCCT offers the following questions to stimulate Council discussion and guidance on future activities related to the CCI.

1. Should the CCI be continued?

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<sup>2</sup> Bellquist L, Saccomanno V, Semmens BX, Gleason M, Wilson J. 2021. The rise in climate change-induced federal fishery disasters in the United States. *PeerJ* 9:e11186 <https://doi.org/10.7717/peerj.11186>

- a. If so, what specific focus areas should be addressed?
  - b. If so, should the CCCT continue in its role, or should primary oversight and input be coordinated (as the CCCT recommends) through the EWG with input from the EAS and/or through some other mechanism?
2. Should specific FEP Initiatives be added to the FEP appendix?
  - a. Are there potential Initiatives that have been identified through the CCI that can be added to the list of candidate Initiatives in the FEP appendix to be considered in March 2022?
3. Are there specific tasks or guidance that the Council wants to provide to the various advisory bodies and teams at this time?

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## **Appendix -- Timeline of Initiative Activities**

*September 2017:* The Council began a new initiative under its Fishery Ecosystem Plan (FEP), combining multiple ideas from the suite of draft initiatives available in the FEP appendix.

*January-February 2018:* The Council's Ecosystem Workgroup (EWG), working with scientists at National Marine Fisheries Service Northwest and Southwest Fisheries Science Centers, organized a series of webinars to educate the Council, advisory bodies, and the interested public about current research and forecasts related to the effects of climate variability/change on the California Current Ecosystem. [Recordings of these webinars are available](#) online.

*March 2018:* The Council adopted initiative goal to “*to consider, develop, and implement strategies for improving the flexibility and responsiveness of our management actions to near-term climate shift and long-term climate change, and strategies for increasing the resiliency of our managed stocks and fisheries to those changes. This approach should better support West Coast fishing communities that depend on marine fishery resources.*” The Council intended the initiative to assess potential tools, products, and processes necessary to react to potential future ecosystem states resulting from climate variability and change between 2020 and 2040 across multiple species and management plans.

*May 2018:* The Nature Conservancy (TNC) hosted a Climate and Communities workshop to provide managers, scientists, and stakeholders an opportunity to discuss the potential effects of climate change on West Coast fish stocks and fishing communities. TNC provided [the workshop report](#) to the Council in *September 2018*.

*September 2018:* The Council appointed a tri-state (WA/OR/CA) Climate Scenario Investigations sub-committee to look into scenario planning as a potential process for more broad brainstorming discussions of the effects of climate change on our fish stocks and fisheries.

*March 2019:* The Council contracted with Jonathan Star of Scenario Insight to administer the scenario planning process and expanded the Climate Scenario Investigations sub-committee to form the ad hoc Climate and Communities Core Team (CCCT) to oversee that process and to coordinate with advisory bodies and the public.

*May - August 2019:* CCCT, Council staff, and Jonathan Star began background research, interviews, and workshops to focus on shifting fish stock availability (including shifting distribution) across species, fishery management plans, and communities across the West Coast as the topic for the climate change scenario planning exercise.



*January 2020:* The Council and TNC sponsored a [workshop to develop four future scenarios](#) of climate change in the California Current Ecosystem, reporting out to the Council in *March 2020*.

*April - June 2020:* [CCCT](#) held a series of five workshops focusing on different areas of Council responsibility (coastal pelagic species, groundfish, highly migratory species, salmon, and habitat) to flesh out the scenarios, and to better understand the potential implications of the scenarios for key Council-managed species.

*July 2020 - November 2020:* CCCT, Council staff, and Jonathan Star refined the scenarios based on advice from Council advisory bodies and other experts, updated the Council in *September 2020*, and refined [background materials for final scenario planning workshops](#).

*December 2020 - February 2021:* The Council held four regionally-focused workshops (Southern California, Northern California, Oregon, Washington) to talk through the implications of the four different scenarios. In the workshops an array of stakeholders explored the implications of the alternative futures and identified adaptation strategies across a range of possible outcomes.

*March 2021:* Jonathan Star presented a [report summarizing the outcomes of the workshops](#). The Council directed the CCCT to review and consider the priority actions from the four regional workshops and to make recommendations on future activities under the initiative for September 2021.