

ECOSYSTEM WORKGROUP SUPPLEMENTAL REPORT ON
THE FISHERY ECOSYSTEM PLAN UPDATE

The Council last discussed the Fishery Ecosystem Plan (FEP) update in September 2019, making revisions to draft Chapters 1 and 2. Council staff released those revised chapters for public review on October 1, 2019, to allow ample time for public review in advance of this March 2020 meeting (G.2, Attachment 1). In September 2019, the Council also asked the Ecosystem Workgroup (EWG) to draft an annotated outline for the rest of the FEP, Chapters 3-6, for Council review.

The Council received one public comment letter on draft FEP Chapters 1 and 2 for the advance briefing book, a joint letter from The Nature Conservancy, Ocean Conservancy, and Wild Oceans. At this March meeting, the EWG held an extensive and detailed conversation about the suggestions in that letter and we want to express our appreciation for the level of thought that went into those comments. Based on our conversation about the proposed edits, we have made suggestions for revising the October 2019 draft Goals and Objectives, provided in Appendix 1 of this report.

Between October 2019 and February 2020, the EWG reviewed the 2013 FEP's Chapters 3-6, the Council's 2018 Research and Data Needs document, FEPs and planning documents from other fishery management councils, and similar strategic natural resource planning documents from western states and tribes. We also researched available online resources for indices and other analytical information on the state of the ecosystem, including information available from the California Current Integrated Ecosystem Assessment (www.integratedecosystemassessment.noaa.gov/regions/california-current). When the EWG met via webinar on February 25, 2020, we discussed and shared an initial draft outline for FEP Chapters 3-6 with the public. An updated draft outline for those chapters is provided as Appendix 2 of this report.

For this March 2020 meeting, the EWG has the following recommendations for the Council:

1. We support the Council's September 2019 revisions to Chapters 1 and 2, and recommend adopting the EWG's proposed changes to those chapters (Appendix 1 of this report). The EWG may revisit the FEP's draft goals and objectives following the re-drafting of Chapters 3-6, in keeping with the Scientific and Statistical Committee's comments in their report on this agenda item.
2. Supplement the EWG with additional scientific expertise. When the Council re-formed the Ecosystem Plan Development Team as the Ecosystem Workgroup, it removed six seats from the team. The EWG asks that the Council increase EWG membership by adding expertise to the EWG for this FEP revision. In particular, we need additional enthusiastic writers with expertise in economics, biology, and ecology.
3. Provide preliminary guidance on the Chapters 3-6 outline in Appendix 2 to this report, summarized below.

4. Schedule a discussion of draft revisions to Chapter 3 for the Council's September 2020 meeting.

Summary of EWG FEP organizing recommendations in the Appendix 2 draft annotated FEP outline:

- Where possible and appropriate, we recommend removing static charts from the FEP and making that information available in online appendices. For example, information on total coastwide fisheries landings could be linked to and updated from the Pacific Fisheries Information Network. The Highly Migratory Species' Stock Assessment and Fishery Evaluation Report provides examples of this type of automated online appendix (www.pcouncil.org/safe-documents-2/).
- Chapter 3 in Section 3.1 describes the geographic range of the FEP as the U.S. West Coast Exclusive Economic Zone (EEZ). We recommend retaining that geographic range for the FEP, to match the Council's area of authority under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). We do not recommend extending the FEP's geographic range either offshore into high seas waters or inland into river systems.
- Chapter 4 discusses the interacting effects of human activities and shifts in the biophysical environment on each other. We recommend retaining that overall focus, but suggest re-framing Chapter 4 so that it references and discusses those interacting effects in light of the Council's goals and objectives for the ecosystem articulated in Chapter 1 of the FEP.
- Chapter 5 is outward-facing and discusses the Council's priorities for ocean resource management so that other entities operating in or seeking to conduct new activities in the EEZ have a consolidated resource on the Council's expectations for their analyses of the effects of their actions on ocean resources and fisheries.
- Chapter 6 on ecosystem science is linked to the ecosystem section of the Council's Research and Data Needs document (www.pcouncil.org/resources-archives/research-and-data-needs/). When discussing its 200+ page 2018 Research and Data Needs document, the Council expressed an interest in developing a more succinct version of the document in 2023. We expect to draft Chapter 6 after all of the other chapters, so will likely have more questions in the future about the potential length and content of that chapter.

PFMC
03/06/20

Appendix 1: Suggested revisions to October 2019 draft FEP Goals and Objectives.

Additions shown in bold text. Deletions shown in ~~strikeout text~~.

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Goal 1: ~~The FEP should~~ Provide a framework and public forum to improve and integrate ecosystem information for use in Council decision-making.

Objective 1a: Provide annual and regular opportunities for the Council and its advisory bodies to consider physical, biological, social, and economic information on the CCE with an emphasis on environmental and climate conditions, climate change, habitat conditions, ecosystem interactions, and changing socio-economic drivers;

Objective 1b: Identify research and monitoring priorities to address knowledge gaps, including indicators and reference points to monitor trends and drivers in key ecosystem features;

Objective 1c: Provide a nexus to regional, national, and international ecosystem-based management endeavors;

Goal 2: Conserve and manage species populations **and the ecological relationships among them to realize** ~~to achieve the greatest~~ long-term benefits from marine fisheries **while avoiding irreversible or long-term adverse effects on fishery resources and the marine environment.** ~~and consider the tradeoffs needed to realize those benefits by taking into account the CCE's long-term historical fluctuations in species composition, predator-prey relations, and availability of harvestable surplus of targeted species.~~

Objective 2a: Continue to rebuild individual overfished stocks and minimize overfishing and bycatch in Council-managed species under the authority of the FMPs, taking into account the CCE's known fluctuations in environmental conditions and productivity;

Objective 2b: Map trophic energy flows and other ecological interactions within the CCE to better understand trophic relationships and the potential ecosystem effects of fishing, and to understand the effects of trends in marine mammal, seabird, and other protected species' populations and diets on fish stock abundance;

Objective 2c: Assess and monitor species diversity and trophic levels of catch over appropriate timescales to understand the effects of climate variability and change on fisheries' harvest and variability;

Objective 2d: Assess variability in fisheries income and vessel participation rates for whether CCE fishing rates have affected long-term stability and wellbeing for fishing communities.

Objective 2e: Characterize the cultural, social, and economic benefits that fish and other marine organisms generate through their interactions in the ecosystem.

Goal 3: ~~Promote~~ **Implement** fisheries management that ensures continued ecosystem services for the well-being of West Coast communities and the nation.

Objective 3a: Continue to provide for commercial, recreational, ceremonial, subsistence, and non-consumptive uses of the marine environment;

Objective 3b: Assess whether Council management programs and measures support ecosystem services essential to the ongoing engagement of fishing communities in West Coast fisheries and to providing working harbors for West Coast communities;

Objective 3c: Continue to monitor the effects of non-fishing activities on the ecosystem and, to the extent possible, ensure that conservation benefits derived from **Council-managed closed** ~~closing~~ areas to fishing are not undermined by negative effects of non-fishing activities;

Objective 3d: Support education efforts to promote understanding of: CCE biophysical processes, how the ecosystem affects human well-being, and of the potential risks and benefits to ecosystem services from climate variability and change;

Objective 3e: Promote fair and equitable allocation of resources in a manner such that no particular sector, group or entity acquires an excessive share of the privileges.

Goal 4: Minimize the cumulative adverse effects of human activities on marine habitats to the extent practicable.

Objective 4a: Assess whether changes in ocean chemistry or other environmental factors affect managed species' functional habitat at any life stage, such that species' historical habitat becomes smaller or unusable;

Objective 4b: When developing or modifying habitat protection and other fisheries closed areas within the CCE, consider protections for diverse types of marine habitat, ensuring that closed areas are appropriate in size and location to the needs of managed species and fishing communities;

Objective 4c: Promote awareness of and encourage lost fishing gear recovery projects, the development of fishing gear recovery technology, and fishing gear recycling programs as a means of protecting habitat from derelict fishing gear and ghost fishing.

Goal 5: Manage fisheries to support goals for protected species' recovery.

Objective 5a: Assess the status of protected species' populations to understand trophic energy flows and other ecological interactions, including predator-prey interactions, especially as populations reach carrying capacity;

Objective 5b: Identify cross-FMP work that can conserve protected species essential to the flow of trophic energy within the CCE;

Objective 5c: **Manage and minimize bycatch and bycatch mortality of protected species within and across FMPs.** ~~While continuing to manage and minimize bycatch of protected species under the FMPs, ensure that cross FMP bycatch of protected species is sufficiently minimized so that those species' populations may recover to sustainable levels.~~

Goal 6: Plan for the effects of climate variability and change on ecosystem services and consider long-term adaptation strategies.

Objective 6a: Improve monitoring capacity and include climate variability and change considerations into stock assessments and forecasts;

Objective 6b: Assess the effects of climate variability and change on the ecosystem's long-term stability and recommend research needed to understand the effects of potential shifts in species' abundance and distribution;

Objective 6c: Develop management measures to improve fisheries stability and adaptability to the effects of climate variability and change, ocean acidification, marine heatwaves, and hypoxia.

Objective 6d: **Prioritize more frequent assessments and more adaptive and precautionary management for stocks that are highly vulnerable to climate change.**

Appendix 2: March 2020 Annotated Outline of FEP Chapters 3-6

Chapter 3 California Current Ecosystem Overview

3.1 Geography of the Ecosystem

The geographic range for the Pacific Coast FEP is the entire U.S. West Coast EEZ. The West Coast EEZ does not encompass all of the CCE, nor does it include all of the waters and habitat used by many of the Council's more far-ranging species. The Council also recognizes the importance of freshwater and estuarine ecosystems to the CCE and may expand this initial effort to include these ecoregions in the future. The Council does not believe that designating the EEZ as the FEP's geographic range in any way prevents it from receiving or considering information on areas of the CCE or other ecosystems beyond the EEZ.

3.1.1 General Description and Oceanographic Features of the CCE

[Retain and update, possibly to also include shortened information from existing section 3.3.1, Geological Environment, and 3.3.2, Water Column and Temperature Regimes.]

3.1.2 Major Bio-Geographic Sub-Regions of the CCE

[Retain and update.]

3.1.2.1 Northern sub-region: Strait of Juan de Fuca, WA to Cape Blanco, OR

3.1.2.2 Central sub-region: Cape Blanco to Point Conception

3.1.2.3 Southern sub-region: Point Conception to Mexico border

3.1.3 Political Geographic and Large-Scale Human Demographic Features of the CCE

[Retain and update with the intent to shorten.]

3.2 Biological Components of the CCE

This section defines the major biological components of the CCE in terms of trophic levels – a biological component's position within the larger food web. A biological component's trophic level is roughly defined by its position in the food chain. Lower trophic level species consist of, or feed predominantly on, primary producers (phytoplankton, etc). Higher trophic level species are largely top predators such as marine mammals, birds, sharks, and tunas.

[Retain and update 3.2 with the intent to shorten. Move ideas in existing 3.2.2, Species Interactions, to Chapter 4. Move 3.2.4, Lowest Trophic Level, to 3.3 with other photosynthesizing organisms. Refer to California Current Integrated Ecosystem Assessment's Indicator Status and Trends where useful.]

3.2.1 High trophic non-fish species: mammals, birds, and reptiles of the CCE

3.2.2 Mid to High Trophic Level Fishes and Invertebrates [mostly FMP species]

3.2.3 Low Trophic Level [forage fishes down to zooplankton]

3.3 CCE Marine Environment and Habitat

The CCE encompasses over 2 million square kilometers of ocean surface. This large area includes many diverse habitat types that can be described in a variety of ways and at a variety of scales—from individual features like kelp beds, submarine canyons, and seamounts, to broader scale regions, like the continental shelf break, that share certain features coastwide. The Council’s efforts with habitat to date have been largely shaped by the MSA’s EFH provisions. As discussed in section 3.3.4 below, the Council has described EFH in detail for the species managed in all four of the FMPs, and those details are not repeated here.

[Retain and update 3.3 with the intent to shorten. Possibly also move ideas in existing 3.3.1, Geological Environment, and 3.3.2, Water Column Temperature and Chemical Regimes, to 3.1.1.] Ideas from existing 3.3.4, Human Effects on Council-Managed Species’ Habitat, to be moved to Chapter 4.]

3.3.1 Seagrasses, macro-algae, and phytoplankton of the CCE [Retain and revise to consolidate ideas from existing 3.2.1.4, Lowest Trophic Level with existing 3.3.3.3, Microalgal blooms.]

3.3.2 CCE Structure-Forming Invertebrates [Retain and update, using information from West Coast corals cruise if available.]

3.4 Fisheries of the CCE

Fisheries for a broad range of species occur within the CCE, and have since humans first inhabited North America’s western coastal lands. The Council’s four FMPs and analysis documents for actions taken under those FMPs provide details on the fisheries for managed stocks, including: gear used, landings locations, season timing and duration, prohibitions, technical challenges, and communities that dominate landings. This section of the FEP is intended to look at all of the FMP fisheries together, minimizing duplication of descriptions in the Council’s FMPs. This section provides a background on historic fishing in the EEZ and discusses cumulative CCE fisheries harvest, West Coast fisheries capacity levels, and the cumulative socio-economic effects of Council-generated fishery management measures on fishing communities.

[Retain and update 3.4 with the intent to shorten. Possibly move multi-species landings figures to updatable online appendixes. Refer to California Current Integrated Ecosystem Assessment’s Indicator Status and Trends where useful.]

3.4.1 Historical CCE Fisheries [Retain and update.]

3.4.2 Current Fisheries [Retain and update with the intent to shorten. Where possible, move information from figures to updatable online appendixes.]

3.4.2.1 Harvesters

3.4.2.2 Fish Receivers and Processors

3.4.2.3 Recreational Fisheries

3.4.3 Fishing Communities [Retain and update. Where possible, move information from figures and tables to updatable online appendixes.]

3.5 Fisheries and Natural Resource Management in the CCE

Many CCE fisheries are under the Council’s jurisdiction, but the Council also shares jurisdiction over or management responsibilities for the species it manages with other entities or institutions. While the states and tribes participate in the Council process, they also have separate management processes linked to and informing the Council’s work. Beyond the EEZ, management processes for several Council species include multi-national processes with their own priorities and institutions. Figure 3.5.1 [of the 2013 FEP] provides a general overview of the state/tribal/Federal management process: the states, tribal, and Federal government together organize and implement fisheries monitoring, data gathering, and research programs; scientific information is reviewed through the Council’s Scientific and Statistical Committee (SSC); management measures and programs are developed through the Council’s advisory bodies and associated public processes; scientific analyses are again reviewed through the SSC for their utility within the management process; the Council uses the SSC recommendations and advice from its advisory bodies and the public to recommend harvest levels and other management measures; Council recommendations are then reviewed and partially or wholly implemented through Federal, and then tribal and state, regulatory processes.

[Retain and update 3.5 with the intent to shorten.]

3.5.1 Council Fisheries Management [Retain and update.]

3.5.2 Ecosystem-Based Management Measures within FMPs [Retain and update.]

3.5.3 CCE Species Managed Under the ESA or MMPA [Retain and update, moving large tables to online appendix.]

3.5.4 Tribal and State Fisheries Management [Retain and update with the intent to shorten. Include summary for existing 3.5.3, Multi-State, Multi-Tribe and State-Tribal Entities, and move links to listed entities in online appendix.]

3.5.5 International Science and Management Entities [Revise into a short summary and move links to listed entities in online appendix.]

Chapter 4 Interacting Effects of Human Activities and Environmental Shifts within the Marine Environment

This chapter takes a broad look at how human and environmental forces may, singly or combined, have effects on Council-managed resources. For those effects that can be addressed by fishery management measures, the Council can improve and integrate the information that supports decision-making across its FMPs. Ultimately, the Council could use this FEP to inform fishery management measures to help buffer against uncertainties resulting from those effects, and to support greater long-term stability within the CCE and for its fishing communities.

[Retain and reframe Chapter 4 to move away from existing focus on cumulative effects under National Environmental Policy Act. Instead, use revised FEP goals and objectives to frame discussions of ecosystem interactions.]

4.1 Framework and Public Forum for Ecosystem Information used in Council Decision-Making

[Brief discussion of how the process that the Council uses to address Goal 1 improves awareness of the Council and public of ecosystem states: *The FEP should provide a framework and public forum to improve and integrate ecosystem information for use in decision-making.*]

4.2 Effects of Human Activities on Fish Abundance within the Ecosystem

[Retain and update discussion in existing 4.1, Changes in Fish Abundance within the Ecosystem, which is compatible with new draft Goal 2: *Conserve and manage species' populations to achieve the greatest long-term benefits from marine fisheries and consider the tradeoffs needed to realize those benefits by taking into account the CCE's long-term historical fluctuations in species composition, predator-prey relations, and availability of harvestable surplus of targeted species.*]

4.3 Effects of Fisheries Management on Ecosystem Services and the Well-being of West Coast Communities

[Retain and update discussion in existing 4.4, Changes in Fishing Community Involvement in Fisheries and Dependence on Fisheries Resources, which is compatible with new draft Goal 3: *Promote fisheries management that ensures continued ecosystem services for the well-being of West Coast communities and the nation.*]

4.4 Effects of Human Activities on Marine Habitats

[Retain, update, and consolidate text from existing 3.3.4, Human Effects on Council-Managed Species' Habitat, and 4.3, Direct and Indirect Effects of Fishing on Biophysical Habitat, which are compatible with new draft Goal 4: *Minimize the cumulative adverse effects of human activities on marine habitats to the extent practicable.*]

4.5 Effects of Fisheries on Protected Species Recovery

[Retain, reframe and update discussion in existing 4.2, Change in the Abundance of NonFish Organisms within the Ecosystem. Existing 4.2 is intended to address nonfish species broadly, but focuses on nonfish protected species. The new Section 4.5 would

follow the new draft Goal 5 by explicitly focusing on fish and nonfish protected species: *Manage fisheries to support goals for protected species' recovery.*]

4.6 Effects of Climate Variability and Change

[Retain and update discussion in existing 4.1, Changes in Fish Abundance within the Ecosystem, which is compatible with new draft Goal 6: *Plan for the effects of climate variability and change on ecosystem services and consider long-term adaptation strategies.*]

Chapter 5 PFMC Policy Priorities for Ocean Resource Management

The purpose of this chapter is to provide non-Council entities with information on some of the Council's highest priority concerns for non-fishing activities within the West Coast EEZ. It is current as of the adoption of this FEP, may be modified at any time after that, and must be considered within the larger suite of Council management programs and documents. This chapter discusses species, habitat types, fisheries, and ecological functions of particular concern to, or that may strongly drive, the Council's policies for CCE resources. Unlike Chapters 2 and 4, the purpose of Chapter 5 would not be to guide future Council work, but to provide external entities with guidance on Council priorities for the CCE's status and functions. External entities that may be interested in the Council's ecosystem-based management planning process and in the Council's cumulative management priorities may include Federal or state agencies conducting activities within the CCE, regional and national marine use planning bodies, and international fishery and ocean resource management bodies.

[Retain and update Chapter 5. Review priorities with Council for whether they reflect current Council thinking and needs.]

5.1 Species of Particular Interest to the Council

The Council has jurisdiction over fish, which the MSA defines as "finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds." NOAA and the USFWS administer recovery programs for all marine and anadromous species listed as threatened or endangered under the ESA, and administer protection programs for marine mammals under the MMPA. The USFWS manages protection programs for bird species, including seabirds, under the MBTA. The Council is concerned with the potential effects of non-fishing activities that could directly or indirectly harm or kill any of its managed species at any of their life stages, which are identified and discussed in detail in the FMPs. There are, however, some species and species groups that are likely to be more vulnerable to the effects of non-fishing activities on their life cycles and habitats.

[Retain and update 5.1.]

5.1.1 Anadromous Species [Retain and update.]

5.1.2 Species protected through an overfished species rebuilding plan [Retain and update.]

5.1.3 Species dependent upon a fixed habitat type [Retain and update.]

5.1.4 Species and locations with tribal treaty rights to fishing [Retain and update.]

5.1.5 Internationally-managed species [Retain and update.]

5.2 Fish Habitat

Under the MSA, fishery management councils must describe and identify EFH for managed species. With regard to non-fishing activities that may affect EFH, the Council may comment on activities that may affect fishery resources under its authority, and shall comment on activities that may affect EFH of anadromous species, such as salmon. The MSA defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” 16 U.S.C. §1802. That definition, in combination with the diverse life histories of the 100+ species under Council management, has necessarily resulted in a large geographic area defined as EFH for the cumulative group of Council-managed species. The Council is concerned with non-fishing activities that may affect species with strong linkages to and dependency upon fixed or particular habitat. Similarly, the Council would be concerned with non-fishing activities that have the potential to affect managed species, habitat that is itself vulnerable to long-term alteration. Each of the Council’s FMPs, their EFH appendices, and applicable NEPA analyses should be consulted for assessments of the types of human activities expected to have a potential negative effect on EFH for Council-managed species.

[Retain and update 5.2.]

5.3 Fisheries

The Council manages West Coast fisheries for species within its four FMPs: CPS, groundfish, HMS, and salmon. However, participants in the Council process also participate in state, tribal, and international management processes for West Coast species outside of the FMPs. Therefore, while the Council is particularly interested in non-fishing activities that may disturb or prevent fishing activities of Council-managed fisheries, Council process participants are also concerned with non-fishing activities that may affect all fishing opportunities for West Coast fishing communities. Some fishing communities and fishing types may be more vulnerable to disturbance by non-fishing activities than others, as detailed below.

[Retain and update 5.3.]

5.3.1 Communities with a Dependency on Fishery Resources [Retain and update.]

5.3.2 Tribal Fishing Communities [Retain and update.]

5.3.3 Brief Duration Fisheries [Retain and update.]

5.3.4 Location-Constrained Fisheries [Retain and update.]

5.4.5 Internationally-managed species [Retain and update.]

5.4 Ecosystem Structure and Function

Ecosystems are in a constant state of change, and an ecosystem's structure and function will change over time regardless of the level of human intervention with that ecosystem. However, there will be some human activities that have immediate and obvious effects on an ecosystem's structure and function, such as a large-scale oil spill. And, there will be some human activities that have had, and may continue to have, increasing effects on an ecosystem's structure and function over time, such as anthropogenic sound in the oceans.

[Retain and update 5.4.]

Chapter 6 Bringing Cross-FMP and Ecosystem Science into the Council Process

The intent and contents of Chapter 6 on ecosystem science were revised several times during the development of the current FEP. In early 2013, the Council adopted both the new FEP and a new Research and Data Needs document. The Council moved the discussion of ecosystem science needs that had comprised drafts of Chapter 6 into the 2013 Research and Data Needs document, leaving a brief Chapter 6 in the FEP to address processes for: 1) bringing more ecosystem information into stock assessments, and 2) annual reports on ecosystem indicators.

When the Council again updated its Research and Data Needs Document in 2018, that document had ballooned to 230 pages, and there was some discussion among Council members about wanting a more concise Research and Data Needs Document for the anticipated 2023 update.

In March 2020, it would be helpful to hear some Council discussion of whether it would like to see Chapter 6 revised to bring ecosystem science needs back into the FEP, or if prefers to keep those in the Research and Data Needs Document. The EWG plans to draft new FEP chapters in numerical order, which means that the Council will probably have future opportunities to weigh in on this question before the EWG begins drafting Chapter 6.