ECOSYSTEM WORKGROUP REPORT ON THE FISHERY ECOSYSTEM PLAN UPDATE

Contents

1 Introduction

At its September 2018 meeting, the Council directed the Ecosystem Workgroup (EWG) to provide a report on updating the 2013 Fishery Ecosystem Plan (FEP), specifically requesting:

- An analysis of the FEP's existing goals and objectives, the progress that has been made on implementing those goals and objectives, and recommendations on improving the goals and objectives so that they are more specific and measurable;
- An outline for modifying the FEP to reflect updates in scientific information since the Council's 2013 adoption of the original FEP, and to reflect Council progress on ecosystem initiatives and other ecosystem-based fisheries management projects.

The EWG discussed updating the FEP at its webinar meetings on October 25 and November 28, and at its meeting in Portland, Oregon, January 15-16. 2019. As we noted under Agenda Item E.2, the partial shutdown of the Federal government came at a critical time in our work. Among other things, our National Marine Fisheries Service (NMFS) members could not attend our January meeting, where we had intended to discuss much of this material. In general, the shutdown interrupted and curtailed our deliberations compared to what they could have been. Nonetheless, we hope we have given the Council enough here to consider how to move forward with the FEP review.

We particularly looked at the FEP's Purpose and Need statement in Section 1.1 and at the FEP's Objectives in Chapter 2. We also reviewed the visions, goals, objectives, and other aspirational prose of the draft Bering Sea FEP, the Western Pacific Fishery Management Council's FEPs, the South Atlantic FEP, the National Fish, Wildlife and Plants Climate Adaptation Strategy, and the planning statements for several national forests and national marine sanctuaries. In addition, we considered the goals, vision statements and other strategic planning elements used among the Councils more broadly, such as the Mid-Atlantic Council's Visioning Project and Strategic Plan and the South Atlantic Council's Vision Blueprint for their Snapper-Grouper fishery.

For this March 2019 meeting, the EWG recommends that the Council provide guidance on: whether it wishes to proceed with an FEP update and, if so, whether it prefers one of the three types of updates suggested in Section 2 of this report, or some other process; whether it will send out the draft Chapter 1 provided in Section 5 of this report for public review, or engage in a more extensive goal-setting process.

2 Options and Process for Revising the FEP

The EWG considered comments received from Council advisory bodies in September 2018 to assess options for revising and updating the FEP. We weighed the need for and value of updates of specific chapters now against the workload and personnel that would be required for those updates. Even simple updates, such as just revisiting the purpose, need, and objectives will require full involvement by the Council family. We note that any work over the next year, by the EWG or other advisory bodies, will siphon resources away from completing the Climate and Communities Initiative. The EWG recommends that the FEP be updated at some point. We just raise the question of whether it would be best to take on this task now or at some time in the near future.

The EWG recommends that the Council consider these progressive options for an update process:

> Appendix Only (Status Quo): Limit the current update to revising the FEP Appendix so that it discusses the initiatives completed to date and considers revisions to the suite of potential future initiatives;
>
> Vision Update: Update the FEP's visionary statements, currently housed in its Purpose, Need, and Objectives, Chapters 1 and 2. Develop a Vision statement for the FEP and rearrange and revise the FEP's Purpose, Need, and Objectives. Also revise and update the FEP appendix. The revised Chapter 2 would focus on the annual ecosystem reporting process, the ecosystem initiatives process, and on the process for future updates to the FEP.
>
> Full Update: In addition to updating the FEP's Appendix and Chapters 1 and 2, also update and possibly restructure Chapters 3-6: California Current Ecosystem (CCE) Overview; Addressing the Effects and Uncertainties of Human Activities and Environmental Shifts on the Marine Environment; PFMC Policy Priorities for Ocean Resource Management; Bringing Cross-FMP and Ecosystem Science into the Council Process.

If the Council wishes to proceed with either the Vision Update or Full Update, Chapter 1 of the FEP could provide a Vision Statement for the Council's work in the CCE, a Purpose Statement for the FEP, and a set of Goals and Objectives for the Council's ecosystem work. Chapter 2 of the revised FEP would focus on the Council process for: receiving and reviewing the ecosystem status report, choosing and developing the ecosystem initiatives, and future updates to the FEP. In Section 4 of this report, we discuss ideas and sources for visionary statements in the FEP. Section 5 provides a draft revised Chapter 1, with draft vision statement, draft revised purpose statement, and draft revised and amended goals and objectives. For reference, the FEP's existing Chapters 1 and 2 are in the Appendix to this report. Should the Council choose a Full Update, the EWG will need additional time to develop a full scoping for how to most effectively address that need in a future document.

3 Progress on Implementing the 2013 FEP Purpose and Need statement and Objectives

The EWG considered the Council's progress made on the FEP purpose, needs, and objectives since the FEP's adoption in 2013. Some progress has occurred through direct actions by the Council or Council subgroups. In other cases, advancement toward FEP goals has been facilitated by NOAA products and activities intended to meet national mandates independent of direct Council requests. Additional actions undertaken by individual states or Tribes have also furthered progress toward advancing FEP objectives. The appendix to this report provides Chapters 1 and 2 of the 2013 FEP, which include the FEP's purpose, needs, and objectives. Here, we summarize progress under three major categories of work: improving information flow, assessing ecosystem information needs, and management policies and administrative structure.

Improving Information Flow into the Council Process (FEP Purpose, Needs, and Objectives): The FEP has met and is continuing to meet its purpose of enhancing the Council's management programs with more ecosystem science, considerations, and policies coordinated across the FMPs and CCE. The Council has seen a significant increase in the flow of physical, biological, economic, and social information into its management processes since 2013. Chapter 3 of the FEP provides an overview of the key oceanographic, physical, biological, social and economic aspects of the CCE, and Chapter 4 discusses the interacting effects of physical, biological, social and economic processes within the CCE. Much of that information is still relevant, although it does not reflect the increased flow of scientific information into the Council process since 2013.

The most notable increase in information flowing into the Council process comes from the annual ecosystem status reports. Each March, NMFS Science Centers present an ecosystem status report with CCE trends for fisheries and species and analyzed under a variety of disciplines, providing the Council and the public with a broad overview of the recent state of the ecosystem. The purpose of the Report is to present CCE information to the Council in a succinct, straightforward format so that the Council may consider ecosystem variability in its fisheries management decisions. The Report also provides progress and new development updates on the California Current Integrated Ecosystem Assessment (CCIEA). The Council's request for these reports grew out of its FEP development process and NMFS began providing reports in November 2012. Each subsequent report has benefited from review and input by the Council to augment and refine the information presented.

A key tool in the CCIEA program is the Atlantis ecosystem model, an end-to-end ecosystem model developed at Australia's Commonwealth Scientific and Industrial Research Organisation, intended to include oceanographic, chemical, ecological, and anthropogenic data and processes. NMFS has been adapting and populating the Atlantis model for use on CCE questions and issues. In June 2014, the Council's SSC-ES led a review of the CCE application of the Atlantis model to assess its potential utility in developing and assessing fisheries management options. The CCE Atlantis model was used in the Council's Groundfish FMP 2015-2016 Harvest Specifications and Management Measures "Tier 1" Final Environmental Impact Statement to evaluate the ecosystem effects of the groundfish harvest policies. This application was a good example of how ecosystem tools to advance cumulative impacts analysis for environmental reviews under the National Environmental Policy Act (NEPA).

In March 2015, the Council undertook its second ecosystem initiative – a directed effort to assess the Report's overall indicator performance and to improve linkages between the Report and fisheries management decision-making. The EWG, CCIEA scientists, and the Scientific and Statistical Committee's Ecosystem Based Management Subcommittee (SSC-ES) collaborated to develop and implement that initiative. CCIEA scientists particularly supported the initiative process by educating Council participants and the public with a series of public webinars explaining: physical oceanography indicators; biological indicators; human dimensions indicators; freshwater, estuarine, and marine habitat indicators; and about risk assessments and applications of indicators to decision-making. The Council completed this initiative in September 2016, providing more focused direction to the CCIEA team on revising indicators and adapting the annual report, and on determining those indicators that should be addressed in subsequent reports. This initiative also benefited CCIEA scientists by providing them with an education in the Council's policy process, allowing them to better tune future work to meet the needs of decision-makers.

Stock assessments include a section titled "Ecosystem Considerations" to provide broader context for the assessment and additional factors to consider (such as a Humboldt squid index used in the 2015 Pacific Whiting assessment,) and the Research and Data Needs section may include ecosystem components. Stock Assessment and Fishery Evaluation (SAFE) documents also include an "Ecosystem Considerations" section.

NMFS scientists and others have been engaging in Management Strategy Evaluation modeling processes to better understand and explore trade-offs pertinent to ecosystem or FMP goals and objectives in resource use and sustainability. These efforts are in various stages of progress or completion; current examples include sablefish, albacore, sardines, and tunas.

Assessing Ecosystem Information Needs (FEP Needs and Objectives):

The EWG's work on the Council's first ecosystem initiative to protect unfished and unmanaged forage fish highlighted the relative dearth of CCE food habits data and analyses. Both the 2013 and 2018 Research and Data Needs documents call for improvements in the collection and processing of CCE food habits data. NMFS's 2018 draft Western Road Map Implementation Plan for EBFM also emphasizes the need for greater attention to and investment in collecting and analyzing food habits and to updating information on the CCE food web. In September 2018, NMFS conducted an internal assessment of CCE food habits data and diet analysis needs through a workshop comparing CCE groundfish diet data needs with existing diet data programs for Alaska and New England groundfish species.

Work to date on the third ecosystem initiative, the Climate and Communities Initiative, has highlighted our information needs relative to climate shift and change. The initiative began with a series of informational webinars on: what we expect to happen in the CCE under climate change; the state of the art for ecological forecasting at different time scales; potential distributional changes for CCE species, and forecasts of fishery participation under different climate scenarios. In March 2018, the EWG reported to the Council on management questions and issues that could benefit from increased climate and ecosystem science input, consolidating a management assessment of climate information needs.

Concurrent with its 2013 adoption of the FEP, the Council adopted a 2013 Research and Data Needs document that included a significantly expanded section on the Council's ecosystem science needs. That discussion of ecosystem science needs had initially been developed as Chapter 6 of

the FEP, Bringing Cross-FMP and Ecosystem Science into the Council Process, but the Council determined that it had a more home in its overarching Research and Data Needs document. In 2018, the Council again updated its Research and Data Needs document, in keeping with the Magnuson-Stevens Fishery Conservation and Management Act (MSA's) schedule for fishery management council articulation of their multi-year research priorities for fisheries, fisheries interactions, habitats, and other areas of research necessary for management. If the Council foresees another voluminous Research and Data Needs document in 2023, Chapter 6 of the FEP could remain brief. However, if the Council plans for more succinct Research and Data Needs documents going forward, future versions of FEP Chapter 6 might become more expansive.

Management Policies and Administrative Structure (FEP Purpose, Needs, and Objectives): Prior to the Council's consideration of an FEP, there was no clear administrative structure for coordinating conservation and management measures across the FMPs. As discussed above, the 2013 FEP provides an annual process for reporting on the state of the ecosystem. The FEP also provides a biennial process for considering and developing new ecosystem initiatives on issues that may affect species from multiple FMPs. The SSC's work to support expanding and enhancing ecosystem considerations in stock assessments and to more thoroughly articulate ecosystem research and data needs has also improved Council-wide efforts to use more ecosystem information in management processes and decision-making.

The most significant management policies that have come directly out of the FEP process result from the first ecosystem initiative on protecting unfished and unmanaged forage fish. Through that initiative, the Council provided its first update to the list of fisheries and gear authorized for use in Federal waters off the U.S. West Coast since 1999. This list of authorized fisheries and gear provides a precautionary protection of both the environment and the Council's management authority by ensuring that no new fisheries or gear are introduced to the EEZ without prior notification to and consideration by the Council.

The first ecosystem initiative also resulted in Comprehensive Ecosystem-Based Amendment 1, which amended all four of the Council's FMPs to prohibit the future development of fisheries without advance Council consent for a suite of pelagic unfished lower trophic level species and species groups: round herring (*Etrumeus teres*) and thread herring (*Opisthonema libertate* and *O. medirastre*); mesopelagic fishes of the families *Myctophidae, Bathylagidae*, *Paralepididae,* and *Gonostomatidae*; Pacific sand lance (*Ammodytes hexapterus*); Pacific saury (*Cololabis saira*); silversides (family *Atherinopsidae*); smelts of the family *Osmeridae*; and pelagic squids (families: *Cranchiidae, Gonatidae, Histioteuthidae*, *Octopoteuthidae, Ommastrephidae* except Humboldt squid (*Dosidicus gigas*,) *Onychoteuthidae,* and *Thysanoteuthidae*). Beyond the management measures themselves, this initiative created a process for developing and implementing multi-FMP amendment processes, a practice never used for all four of the Council's FMPs simultaneously.

Efforts to incorporate ecosystem information into stock assessments has been attempted for multiple species, although success has been mixed, as have efforts to manage stocks at spatial scales more relevant to stock structure. The sablefish MSE process, intended in part to look at the potential effects of environmental conditions on sablefish stock status, has spurred deeper research into the range and distribution of sablefish within and between U.S. and Canadian waters off northern North America.

4 Goals, Objectives, Visions, and Ideas from Fishery Management Councils and Other Management Processes

In EWG discussions over the winter, we considered the various reasons why people and organizations set goals and objectives. The purpose of goal-setting can simply be to transparently communicate common values, principles, vision, and ideas pertinent to management in the CCE. Or, the purpose may be more action-oriented and intended to motivate and organize activities, guide decisions, and create accountability for progress. Since the FEP's adoption, as discussed in Section 3, our ecosystem initiatives and other Council activities have built on the FEP's Needs and Objectives, guided and supplemented by annual ecosystem reporting and common interests in advancing ecosystem based fisheries management among the fisheries science and policy communities. Through its work on ecosystem issues since 2013, the Council may have new ideas about what aspirational goals might be useful to express for its ecosystem work going forward.

We offer two framing questions to consider when looking at whether to revise the FEP's Purpose statement, Need statement, and Objectives. First, should the Council pursue goals that are less process oriented and more focused on characteristics of or aspirations for the ecosystem, or at least provide some combination of the two? Second, as posed by the Council's September 2018 motion, should goals and objectives be made "more specific and measurable"? These two questions also intersect – goals for the Council process and goals addressing the characteristics of the ecosystem can both be made specific and measurable.

As detailed below, visionary statements or goals focusing on characteristics of or aspirations for our marine ecosystems are common among the regional fishery management councils. However, our experience with the second FEP initiative is relevant to the question of identifying specific and measurable goals. That initiative identified no obvious new areas where goals and objectives could be mapped to indicators, reference points, and thresholds based on current science. The only clear place in the Council process where goal-to-process mapping happens now is with the highest tier single species stock assessments.

Goals, objectives, principles, standards, missions, visions, policies, and other terms can all have similar meanings and overlapping purposes. There are many frameworks throughout the strategic planning and project management worlds that could help the Council take visionary statements and tie them to more specific goals and actions. The specific framework itself would be less important than the common understanding and vocabulary a framework would provide. "Goals" could be longer-term aspirational ideas, while "objectives" could be shorter-term descriptions of tasks to be accomplished. For example, the Council may have a goal of improving the use of ecosystem information in setting annual catch limits. An objective under that goal might be to create a process that tracks and reports on the number of stock assessments that incorporate ecosystem data in estimates and forecasts.

In Section 5.0 of this report, we provide a draft example Chapter 1 for an FEP update, drawing from the Purpose and Need statements in Chapter 1 and the Objectives of Chapter 2 of the 2013 FEP, and adding both more aspirational prose and more specific goals. The Council has expressed interest in an FEP that clearly lays out what actions and approaches will best meet the needs of maintaining a healthy ecosystem, but that are also achievable with available management strategies. The Council developed its FEP over the 2010-2013 period, during which time it sent out the FEP's Purpose statement, Need statement, and Objectives out for public review during

several between-meeting periods. If the Council decides to proceed now with either a Vision Update or a Full Update, as described in Section 2 of this report, we recommend that the Council specifically ask its advisory bodies and the public for opinions on the need for more specific and measurable language, and for opinions on more closely tying goals to high priority Council process actions and outcomes.

The EWG reviewed the ecosystem-level visionary statements and documents, as well as the strategic planning processes of other fishery management councils, as summarized here:

North Pacific Fishery Management Council (NPFMC): The 2018 draft Bering Sea FEP includes a description of the NPFMC's "Ecosystem Approach," a Value Statement, a Vision Statement, and an Implementation Strategy, plus six ecosystem goals, each of which has suites of Process, Research, and Ecosystem objectives.[1] These ecosystem objectives are nested under each of these ecosystem goals:

1. Maintain, rebuild, and restore fish stocks at levels sufficient to protect, maintain, and restore food web structure and function;

2. Protect, restore, and maintain the ecological processes, trophic levels, diversity, and overall productive capacity of the system;

3. Conserve habitats for fish and other wildlife;

4. Provide for subsistence, commercial, recreational, and non-consumptive uses of the marine environment;

5. Avoid irreversible or long-term adverse effects on fishery resources and the marine environment;

6. Provide a legacy of healthy ecosystems for future generations.

Western Pacific Fishery Management Council (WPFMC): The WPFMC's FEPs are geography-based FMPs that manage all of the FMP species within each of the WPFMC's geographically dispersed management areas. The WPFMC FEPs include all of the Magnuson-Stevens Act's required FMP elements and actions under those FEPs tend to look similar to what PMFC would consider an FMP action. However, because WPFMC addresses aggregated species and fisheries within defined geographic areas, their FEP actions are considered in an ecosystem context that would be familiar to the PFMC participants. The 2016 FEP for the Hawaiian Archipelago[2] includes goals and objectives that cross FMP and FEP functions:

Goal 1. Conserve and manage target and non-target stocks;

Goal 2. Protect species and habitats of special concern;

Goal 3. Understand and account for important ecosystem parameters and their linkages, and;

Goal 4. Meet the needs of fishermen, their families, and communities in the Hawaiian archipelago.

[1] https://www.npfmc.org/bsfep/
[2] http://www.wpcouncil.org/wp-content/uploads/2016/01/DRAFT-Hawaii-FEP-011516_and-Appendices.pdf

South Atlantic Fishery Management Council (SAFMC): The South Atlantic Fishery Management Council's FEP II is a dashboard of links to broad categories of ideas, like essential fish habitat or fishing communities, that are represented in existing SAFMC documents like FMPs.[3] SAFMC has added some "policy considerations" documents to traditional Magnuson-Stevens Act analyses and information, such as their December 2016 documents: Policy Considerations for South Atlantic Climate Variability and Fisheries and Essential Fish Habitats, and Policy Considerations for South Atlantic Food Webs and Connectivity and Essential Fish Habitats.[4] These policies seem intended to guide the development of their ecosystem status report, but it is unclear how and whether they compel any particular fisheries management action. The SAFMC FEP II implementation plan provides these EBFM goals:

GOAL 1: Maintaining or improving ecosystem structure and function.

GOAL 2: Maintaining or improving economic, social, and cultural benefits.

GOAL 3: Maintaining or improving biological, economic, and cultural diversity

Mid-Atlantic Fishery Management Council (MAFMC): The MAFMC has an Ecosystem Approaches to Fisheries Management Guidance Document instead of an FEP.[5] That document describes their EAFM goal as, "To manage for ecologically sustainable utilization of living marine resources while maintaining ecosystem productivity, structure, and function." The MAFMC also manages its cross-FMP issues through a strategic planning and yearly Implementation Plan process. Their framework involves a Vision, Mission, Core Values, and Strategic Goals and Objectives. The MAFMC then ties these strategic element to its management activities through annual implementation plans. In terms of measurable and specific goals, the implementation plans map specific "deliverables" and activities and projects to the goals and objectives (http://www.mafmc.org/strategic-plan). Their 2018 Implementation Plan for their strategic planning process identifies four goals for the 2014-2018 period:

- Communication Goal: Engage, Inform, and educate stakeholders to promote public awareness and encourage constructive participation in the Council process.
- Science Goal: Ensure that the Council's management decisions are based on timely and accurate scientific data that are analyzed and modeled in a manner that improves management performance and builds stakeholder confidence.
- Management Goal: Develop fishery management strategies that provide for productive, sustainable fisheries.
- Governance Goal: Ensure that the Council's governance structures and practices fairly represent stakeholder interests, are coordinated with the Council's management partners, and include a clear and well-defined decision-making process.

Other fishery management councils: The New England Fishery Management Council (NEFMC) does not have an FEP. However, the NMFS Northeast Fishery Science Center organizes its annual ecosystem status report around loose categories of ecosystem objectives. NEFMC documents include "A Framework for Providing Catch Advice for a Fishery Ecosystem

[3] https://safmc.net/fishery-ecosystem-plan-ii-introduction/
[4] http://safmc.net/download/SAFMC_HabitatPolicy_ClimateVariabilityFisheries_Final_Dec2016.pdf
http://safmc.net/download/SAFMC_HabitatPolicy_FoodWebConnectivity_Final_Dec2016.pdf
[5] http://www.mafmc.org/eafm/

Plan" that states that "The goal of an FEP is to provide catch advice that produces the optimal yield from fisheries conducted in a specified location, while taking into account all the components of the ecosystem."

The Gulf of Mexico Fishery Management Council has an ecosystem status report, but has neither an FEP nor other similar policy documents. The Caribbean Fishery Management Council does not have an FEP.

5 Draft FEP Vision Statement, Purpose Statement, Goals and Objectives

Based on the review of ideas and concepts discussed in Section 4, the EWG offers a draft revised Chapter 1 that incorporates material from the current FEP's Chapters 1 and 2. We recall that the Council developed the 2013 FEP in a chapter-by-chapter process, building the document over time. The draft Chapter 1 in this discussion is intended both as a start to a Council-wide discussion of the visionary sections of the FEP, and as possible building blocks for future revisions to the FEP.

Chapter 1 Introduction

1.1 Vision for the California Current Ecosystem

The California Current Ecosystem (CCE) is a biodiverse and climatically variable eastern boundary current system with species that connect the broader ecosystem across terrestrial, estuarine, and ocean environments. The Pacific Fishery Management Council (Council) is committed to managing thriving and sustainable CCE fisheries for their inherent value, and the benefit of current and future generations, and to support and preserve the abundance and diversity of the CCE's living marine resources. The Council's vision for the future of the CCE is an ecosystem that: includes adequate habitat protections to support healthy populations of fish and other marine species; allows the dynamic relationships among CCE species to build and maintain resiliency that will help buffer those species' populations against climate change and other potential long-term adverse effects on fishery resources and the marine environment; and, continues to provide ecosystem services to humans such that future generations will have a multiplicity of options available with respect to future uses of these resources.

1.2 Purpose of the Fishery Ecosystem Plan

The purpose of the Fishery Ecosystem Plan (FEP) is to enhance the Council's species-specific management programs with more ecosystem science, broader ecosystem considerations, and management policies that coordinate Council management across its Fishery Management Plans (FMPs) and the California Current Ecosystem (CCE). An FEP should provide a framework for considering policy choices and trade-offs as they affect FMP species and the broader CCE. The FEP should also coordinate information across FMPs for decision-making within the Council process and for consultations with other regional, national, or international entities on actions affecting the CCE or FMP species. Additionally, an FEP should identify and prioritize research needs and provide recommendations to address gaps in ecosystem knowledge and FMP policies, particularly with respect to the cumulative effects of fisheries management on marine ecosystems and fishing communities.

The FEP is meant to be an informational document, and is not meant to be prescriptive relative to Council fisheries management. Information in the FEP, results of the Integrated Ecosystem

Assessment (IEA), and the Annual State of the California Ecosystem Report are available for consideration during the routine management processes for fisheries managed in each FMP. How exactly these items will affect fishery management decisions is at the discretion of the Council.

1.3 Goals and Objectives

The FEP's goals and objectives, below, are intended to address the Council's Vision for the CCE (Section 1.1) and Purpose for the FEP (Section 1.2). This FEP and related activities integrate fisheries management policies across all Council FMPs, while recognizing that the Council's authority is generally limited to managing fisheries and the effects of fisheries on the marine ecosystem, protected species, and to consultations on the effects of non-fishing activities on essential fish habitat (EFH). The Council's work often requires Council members to think about their larger goals for the CCE, including and beyond goals they may have for managing fisheries. Chapter 5 of this FEP, PFMC Policy Priorities for Ocean Resource Management, discusses the Council's CCE policy priorities as they apply to ocean resource management and policy processes external to the Council.

The following FEP goals and objectives build on the FEP's 2013 objectives and on the goals and objectives of the Council's four FMPs.

Goal 1: Improve and integrate information used in Council decision-making across the existing FMPs by:

Objective 1a: Providing opportunities for the Council and its advisory bodies to consider physical, biological, social, and economic information on CCE climate conditions, climate change, habitat conditions, and ecosystem interactions;

Objective 1b: Identifying measures and indicators, and informing reference points to monitor and understand trends and drivers in key ecosystem features;

Objective 1c: Identifying and addressing gaps in ecosystem knowledge, particularly with respect to the cumulative and longer-term effects of fishing on marine ecosystems;

Objective 1d: Examining the potential for a science and management framework that allows for managing fish stocks at spatial scales relevant to the structure of those stocks.

Goal 2: Build toward fuller assessment of the greatest long-term benefits from the conservation and management of marine fisheries, of optimum yield, and of the tradeoffs needed to achieve those benefits while maintaining the integrity of the CCE through:

Objective 2a: Assessing trophic energy flows and other ecological interactions within the CCE;

Objective 2b: Assessing the full range of cultural, social, and economic benefits that fish and other living marine organisms generate through their interactions in the ecosystem;

Objective 2c: Improving assessment of how fisheries affect and are affected by the present and potential future states of the marine ecosystem.

Goal 3: Manage species and habitats to protect ecosystem functions and to provide sustainable commercial, recreational, and cultural and subsistence fisheries to future generations by:

Objective 3a: Providing adequate buffers against the uncertainties of environmental and human-induced impacts to the marine environment by developing safeguards in fisheries management measures;

Objective 3b: Working beyond the Council process to reduce non-fisheries stressors to managed species and habitats;

Objective 3c: Increasing knowledge and information on the potential effects and responses of managed species and habitats to a changing climate.

Goal 4: Provide administrative structure and procedures for coordinating conservation and management measures for the living marine resources of the U.S. West Coast EEZ by:

Objective 4a: Guiding annual and regular reporting of status and trends to the Council;

Objective 4b: Providing a nexus to regional, national, and international ecosystem-based management endeavors, particularly to address the consequences of non-fishing activities on fisheries and fish habitat;

Objective 4c: Identifying ecological relationships within the CCE to provide support for cross-FMP work to conserve non-target species essential to the flow of trophic energy within the CCE.

Appendix – 2013 FEP Chapters 1 and 2

1 Introduction

1.1 Purpose and Need

The purpose of the Fishery Ecosystem Plan (FEP) is to enhance the Pacific Fishery Management Council's (Council) species-specific management programs with more ecosystem science, broader ecosystem considerations, and management policies that coordinate Council management across its Fishery Management Plans (FMPs) and the California Current Ecosystem (CCE). An FEP should provide a framework for considering policy choices and trade-offs as they affect FMP species and the broader CCE.

The needs for ecosystem-based fishery management within the Council process are:

1. Improve management decisions and the administrative process by providing biophysical and socio-economic information on CCE climate conditions, climate change, habitat conditions and ecosystem interactions.
2. Provide adequate buffers against the uncertainties of environmental and human-induced impacts to the marine environment by developing safeguards in fisheries management measures.
3. Develop new and inform existing fishery management measures that take into account the ecosystem effects of those measures on CCE species and habitat, and that take into account the effects of the CCE on fishery management.
4. Coordinate information across FMPs for decision-making within the Council process and for consultations with other regional, national, or international entities on actions affecting the CCE or FMP species.
5. Identify and prioritize research needs and provide recommendations to address gaps in ecosystem knowledge and FMP policies, particularly with respect to the cumulative effects of fisheries management on marine ecosystems and fishing communities.

The FEP is meant to be an informational document. It is not meant to be prescriptive relative to Council fisheries management. Information in the FEP, results of the Integrated Ecosystem Assessment (IEA), and the Annual State of the California Ecosystem Report may be available for consideration during the routine management processes for fisheries managed in each FMP. How exactly these items will affect fishery management decisions is at the discretion of the Council.

1.2 How this Document is Organized

This FEP takes its organization from the Council's Purpose and Need statement, in Section 1.1. Chapter 2 provides the FEP's Objectives, a more detailed exploration of what the FEP would do to meet its Purpose and Need. Chapter 3 provides an overview of the CCE from a variety of physical, biological, and socio-economic perspectives and disciplines. Chapter 4 discusses the cumulative effects and uncertainties of environmental shifts and human activities on the marine

environment. Chapter 5 discusses Council CCE policy priorities across its FMPs, so that ocean resource management and policy processes external to the Council (e.g. West Coast Governors' Alliance on Ocean Health, National Ocean Council, international fishery and ocean resource management bodies) may be made aware of and may better take into account those priorities. Chapter 6 broadly discusses processes for bringing ecosystem science into the Council process. In addition to this main FEP, there is an FEP Appendix A that provides an ecosystem-based fishery management initiative process for the FEP's use into the future.

1.3 Schedule and Process for Developing and Amending the FEP and the Ecosystem Initiatives

In November 2009, the Council appointed two new ad hoc advisory bodies, the Ecosystem Plan Development Team (EPDT) and the Ecosystem Advisory Subpanel (EAS). From 2010 through early 2013, these advisory bodies, with direction from the Council and in cooperation with its permanent committees, developed a draft FEP for public review, released in February 2013. At its April 2013 meeting in Portland, Oregon, the Council adopted a final FEP, providing instructions for the document's last revisions and for the Council's future discussions of ecosystem science and cross-FMP policy issues.

This document, the main body of the FEP, will not be amended until the Council determines that an FEP review and revision process is necessary. At that time, the Council may consider appointing new ad hoc advisory bodies to review and recommend revisions to the FEP. The Council does not anticipate initiating an FEP review process until at least 2018. In addition to the main body of the FEP, which consists of Chapters 1-6, the Council may choose to add one or more appendices to the FEP without opening the main body of the FEP to revision.

Appendix A to the FEP is an Ecosystem Initiatives appendix that: 1) provides the Council with a process by which it may consider ecosystem-based management initiatives to address issues of interest to the Council that may cross authorities of two or more of its FMPs; 2) provides a fleshed-out example FEP Initiative 1 that the Council has decided to consider in 2013 and beyond, to protect unfished lower trophic level (forage) fish species within the U.S. West Coast Exclusive Economic Zone (EEZ); and 3) provides additional potential cross-FMP initiatives for review and consideration by the Council and the public.

Each year at the Council's March meeting, the Council and its advisory bodies will:

- review progress to date on any ecosystem initiatives the Council already has underway;
- review the list of potential ecosystem initiatives provided in Appendix A to the FEP and determine whether any of those initiatives merit Council attention in the coming year;
- if initiatives are chosen for Council efforts, request background materials from the appropriate entities;
- in March 2015 and in each subsequent odd-numbered year, assess whether there are new ecosystem initiative proposals that could be added to the appendix; and
- in March 2018, assess whether to initiate a review and update of the FEP.

Each initiative in Appendix A includes suggestions for background information needed to support consideration of the initiative and suggestions for the expertise needed on an ad hoc team to develop the initiative. If the Council determines that it wishes to address a new ecosystem initiative, it would begin by requesting relevant background information from the appropriate agencies and other entities, which would then be made available to the Council and its advisory bodies at a subsequent Council meeting, scheduled at the Council's discretion. Upon review of the background informational materials, the Council will decide whether to further pursue that initiative, and may then request nominations for appointments to an ad hoc team to be tasked with developing the initiative. Any materials developed through the ad hoc team process would, as usual with Council advisory body materials, be made available for review and comment by all of the Council's advisory bodies and the public during the Council's policy assessment and development process.

1.4 State-of-the-Ecosystem Reporting

In support of its ecosystem-based management processes, the Council has requested that NMFS, in coordination with other interested agencies, provide it with an annual state-of-the-ecosystem report at each of its March meetings, beginning in March 2014. The Council asked that the report:

- be bounded in terms of its size and page range to about 20 pages in length, and
- not wait for the "perfect" science to become available, should there be scientific information that does not come with definitive answers and numbers, but which may be useful for the Council to consider.

At its November 2012 meeting, the Council received a draft Annual State of the California Current Ecosystem Report. That report briefly synthesized those results of the California Current IEA that might be most useful to the Council's major decisions on potential harvest levels for its managed species groups. The Council and its advisory bodies reviewed the draft report, provided suggestions for future reports by commenting on the information in the report that appeared to be most useful to the Council process, and asked if National Oceanic and Atmospheric Administration (NOAA) Fisheries Northwest and Southwest Fisheries Science Centers might collaborate on developing the report annually into the future. The Council re-iterated its guidance that the report not exceed 20 pages in length, and be tailored to providing information on indicators directly relevant to Council decision-making. Information in the report is intended to improve the Council and public's general understanding of the status and functions of the CCE and is not tied to any specific management measures or targets for Council-managed species. When the Council receives future annual ecosystem reports, it anticipates continuing to review the reports' contents so that they may be tailored to best meet management needs.

2. Objectives

The FEP objectives, listed below, are intended to address the purpose and need statement in Section 1.1. This FEP and related activities are together expected to further integrate management across all Council FMPs, while recognizing that the Council's authority is generally limited to managing fisheries and the effects of fisheries on the marine ecosystem, protected species, and to consultations on the effects of non-fishing activities on essential fish habitat (EFH). The Council's

work often requires Council members to think about their larger goals for the CCE, including and beyond goals they may have for managing fisheries. Chapter 5 of this FEP, *PFMC Policy Priorities for Ocean Resource Management*, discusses the Council's CCE policy priorities as they apply to ocean resource management and policy processes external to the Council. Thus, Chapter 2 provides Council objectives for Council work, while Chapter 5 provides the Council's aspirations for the work of others within the CCE, given Council priorities for the fish stocks and fisheries it manages.

The Council's four existing FMPs each have suites of goals and objectives that differ in their precise language, but have five common themes consistent with an ecosystem approach to fishery management: avoid overfishing, minimize bycatch, maintain stability in landings, minimize impacts to habitat, and accommodate existing fisheries sectors. The Coastal Pelagic Species (CPS) FMP has an additional goal of providing adequate forage for dependent species. The following FEP objectives are intended to build upon the Council's four FMPs by recognizing that, through the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the United States (U.S.) supports the ongoing participation of its citizens in commercial and recreational fisheries off its coasts, while also requiring that fish stocks be conserved and managed for optimum yield.

1. Improve and integrate information used in Council decision-making across the existing FMPs by:

a. Describing the key oceanographic, physical, biological, and socioeconomic features of the CCE and dependent fishing communities;
b. Identifying measures and indicators, and informing reference points to monitor and understand trends and drivers in key ecosystem features;
c. Identifying and addressing gaps in ecosystem knowledge, particularly with respect to the cumulative and longer-term effects of fishing on marine ecosystems;
d. Examining the potential for a science and management framework that allows for managing fish stocks at spatial scales relevant to the structure of those stocks.

2. Build toward fuller assessment of the greatest long-term benefits from the conservation and management of marine fisheries, of optimum yield, and of the tradeoffs needed to achieve those benefits while maintaining the integrity of the CCE through:

a. Assessing trophic energy flows and other ecological interactions within the CCE;
b. Assessing the full range of cultural, social, and economic benefits that fish and other living marine organisms generate through their interactions in the ecosystem;
c. Improving assessment of how fisheries affect and are affected by the present and potential future states of the marine ecosystem.

3. Provide administrative structure and procedures for coordinating conservation and management measures for the living marine resources of the U.S. West Coast EEZ:

a. Guiding annual and regular reporting of status and trends to the Council;

b. Providing a nexus to regional, national, and international ecosystem-based management endeavors, particularly to address the consequences of non-fishing activities on fisheries and fish habitat;
c. Identifying ecological relationships within the CCE to provide support for cross-FMP work to conserve non-target species essential to the flow of trophic energy within the CCE.

PFMC
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