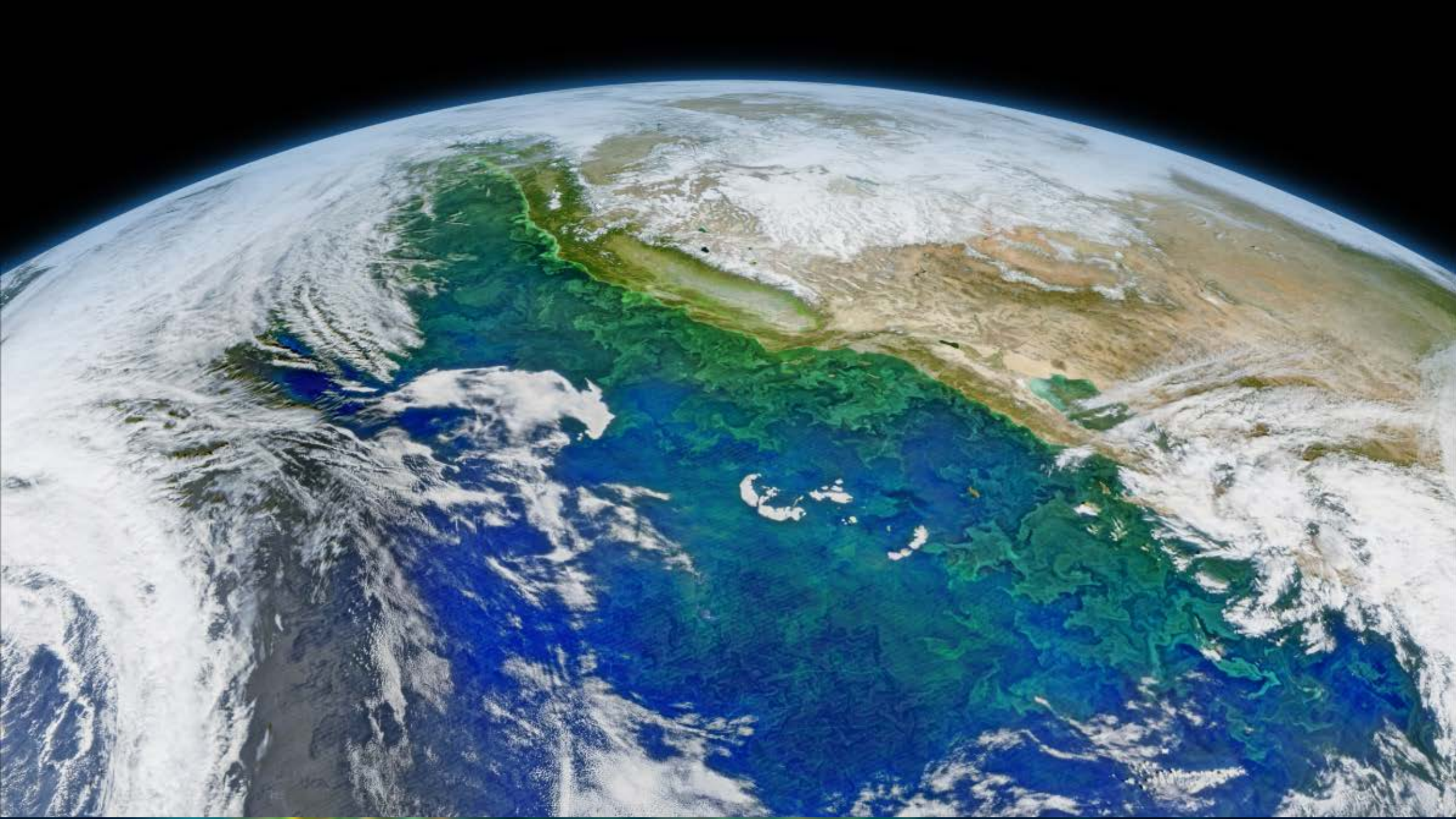
Agenda Item E.1.a
Supplemental EWG PPT 1
September 2019

Ecosystem Workgroup Fishery Ecosystem Plan Update

September 2019
Agenda Item E.1.



Strengthening Scientific Input and Ecosystem-Based Fishery Management
for the Pacific and North Pacific Fishery Management Councils

Suggestions from a panel discussion
July 19-20, 2005
Seattle, Washington

Panel
Richard Marasco (chair)
Daniel Goodman
Churchill Grimes
Peter Lawson
André Punt
Terry Quinn

with assistance from
Dave Hanson
Fran Recht
Jodie Little

Pacific States Marine Fisheries Commission

July 2005

ECOSYSTEM FISHERY MANAGEMENT PLANNING FOR U.S. WEST COAST FISHERIES

August 2010

PREPARED BY:

PACIFIC FISHERY MANAGEMENT COUNCIL
ECOSYSTEM PLAN DEVELOPMENT TEAM
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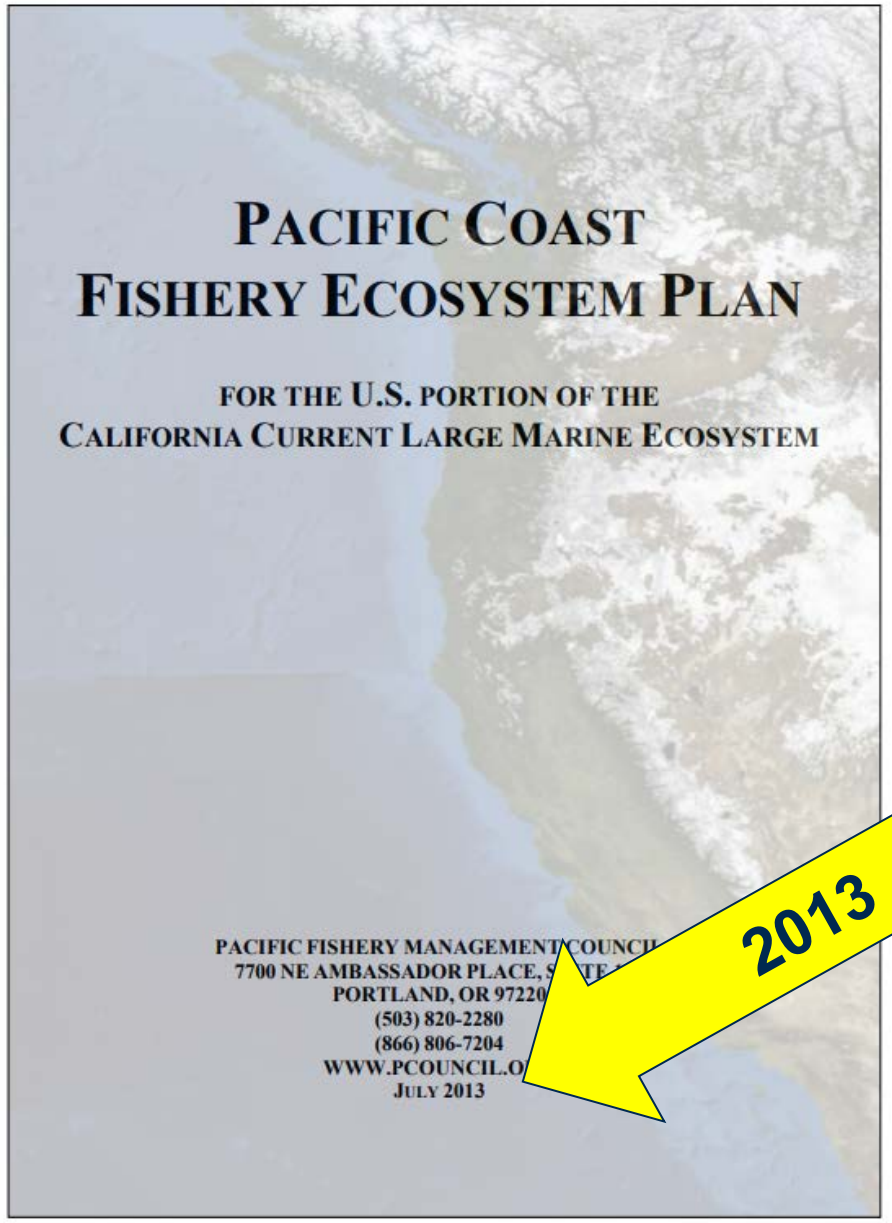
PACIFIC COAST
FISHERY ECOSYSTEM PLAN
FOR THE U.S. PORTION OF THE
CALIFORNIA CURRENT LARGE MARINE ECOSYSTEM
PACIFIC FISHERY MANAGEMENT COUNCIL
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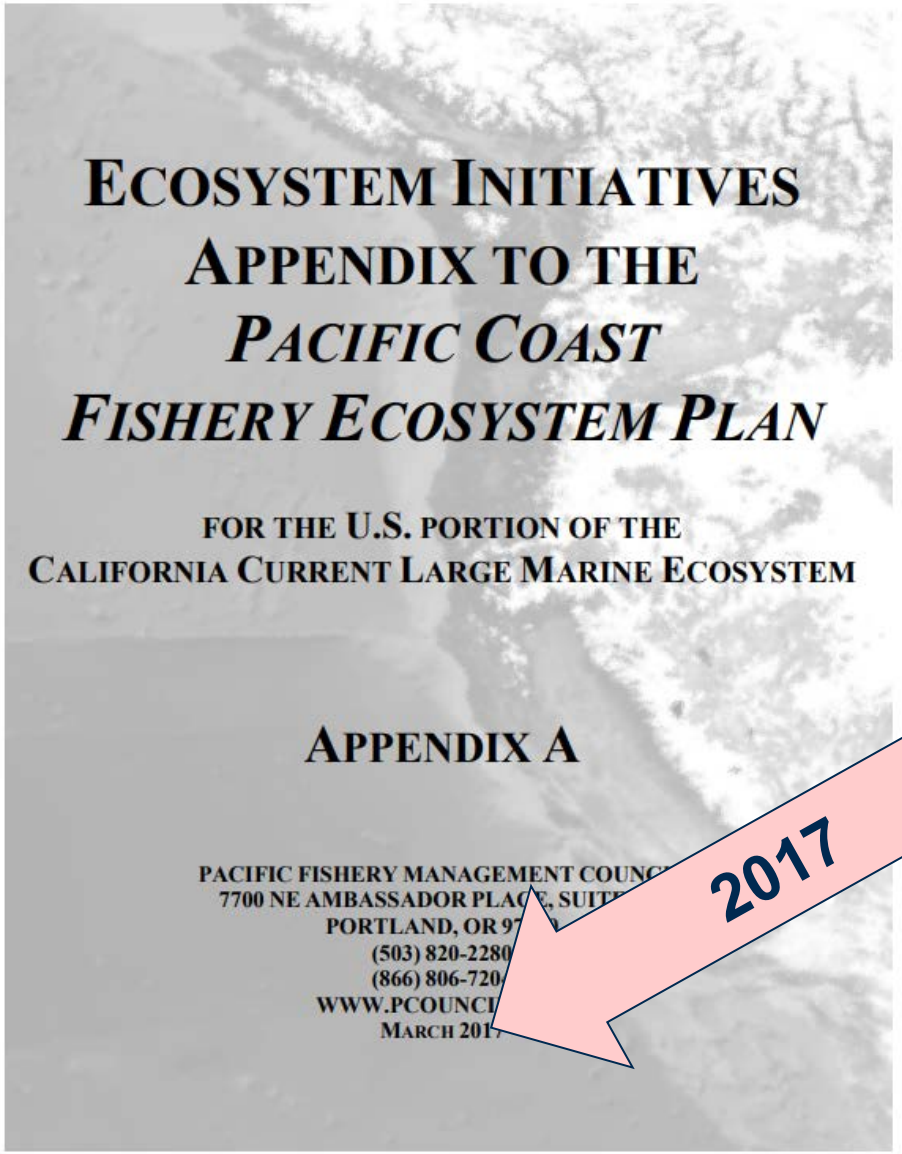
ECOSYSTEM INITIATIVES
APPENDIX TO THE
PACIFIC COAST
FISHERY ECOSYSTEM PLAN
FOR THE U.S. PORTION OF THE
CALIFORNIA CURRENT LARGE MARINE ECOSYSTEM
APPENDIX A
PACIFIC FISHERY MANAGEMENT COUNC
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MARCH 201

2017

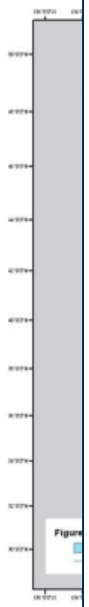
3 California Current Ecosyste

3.1 Geography of the Ecosystem

The geographic range for this FEP is the entire
recognizes that the EEZ does not encompass all
used by many of the Council's more far-rangi
freshwater and estuarine ecosystems to the C
ecoregions in the future. The Council also c
geographic range in any way prevents it from r
other ecosystems beyond the EEZ.

3.1.1 General Description and Ocean

The CCE is comprised of a major eastern boundary current, the California Current, which is dominated by strong coastal upwelling, and is characterized by fluctuations in physical conditions and productivity over multiple time scales (Parrish et al. 1981, Mann and Lazier 1996). Food webs in these types of ecosystems tend to be structured around CPS that exhibit boom-bust cycles over decadal time scales (Bakun 1996, Checkley and Barth 2009, Fréon et al. 2009). By contrast, the top trophic levels of such ecosystems are often dominated by HMS such as salmon, tuna, billfish and marine mammals, whose dynamics may be partially or wholly driven by processes in entirely different ecosystems, even different hemispheres. Ecosystems analogous to the CCE include other shelf and coastal systems, such as the currents off the western coasts of South America and Spain.



The CCE essentially begins where the west w
American continent. The North Pacific Curr
Vancouver Island, although this location varies
the southward-flowing California Current headi
Alaska Current. The "current" in the California
50 to 500 kilometers offshore (Mann and Lazie

4 Addressing the Effects and Uncertaint
Environmental Shifts on the Marine Env

The purpose of this chapter is to consider the potential effects of human activities and environmental processes on the CCE. In Chapter 3, the FEP describes the CCE from a wide variety of disciplines and perspectives. Chapter 4 is intended to broadly 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.

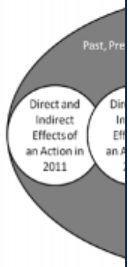


Figure 4.1: C

Chapter 4 discusses five broad categories of effects, whether fr
of changes within the marine environment. Because the Council'
requirements and challenges, this chapter focuses on the type
Council work and which can be linked back to MSA guidan
potential changes in the following areas of Council interest or
CCE (Section 4.1), the abundance of nonfish organisms wi
biophysical habitat within the CCE (Section 4.3), changes in fi
and dependence upon fishery resources (Section 4.4), and asp
living marine resource populations within the CCE (Section 4.5

A suite of laws guide the issues NOAA and the Council must
decisions: MSA, NEPA, ESA, MMPA, the Regulatory Flexibilit
NEPA particularly requires that we assess the cumulative effe
with other "past, present, and reasonably foreseeable future actio
FEP's objectives, detailed in Chapter 2, call for the Counci
ecosystem fishery management planning process to support its
scientific information available on the cumulative ecological effe
species and their fisheries. The scientific questions, processes,
intended to work toward this goal by ultimately improving the
to inform Council decision-making. In Chapter 5, the FEP provi
how other management and private entities considering action
nation's long-term needs for productive CCE fisheries. The
proposes several potential fisheries management initiatives tha
some of the effects of human activities and environmental shifts

5 PFMC Policy Priorities

The purpose of this chapter is to prov
highest priority concerns for non-fishi
may be modified at any time after
management programs and docume
ecological functions of particular cor
resources. Unlike Chapters 2 and 4, t
but to provide external entities with
External entities that may be interest
and in the Council's cumulative man
activities within the CCE, marine use
Governors' Alliance on Ocean Health

The Pacific Council is one of eight r
responsible for the management of fis
the coasts of Washington, Oregon, a
100+ species of fish and their assoc
responsible for reviewing non-fishi
Cumulatively, EFH for Council-mana
of the EEZ to encompass salmon rive
be found within its four FMPs. In ge
projects that have potential adverse e
life, the functional integrity of the mar
communities.

5.1 Species of Particular In

The Council has jurisdiction over fis
other forms of marine animal and plan
administer recovery programs for all
under the ESA, and administer protec
manages protection programs for bi
concerned with the potential effects
any of its managed species at any of
FMPs. There are, however, some spe
effects of non-fishing activities on the

5.1.1 Anadromous Species

Among species within Council FMPs
incubation, juvenile, and a portion of
lives in fresh water. Thus, the surviva
only responsible fisheries managemer
each spawning and rearing tributary, a
and life cycles of salmonid species wi

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

Incorporating ecosystem science into the Council process will be a two-part process. The first part is to identify and act on opportunities to improve the quantity and quality of ecosystem information used in the science that supports Council decision-making, particularly stock assessments. The second part is to bring a new whole-picture assessment of the CCE into the Council process. Throughout the development period for this FEP, the Council and its advisory bodies have discussed the type of scientific information and analyses needed to bring more ecosystem considerations into Council decision-making.

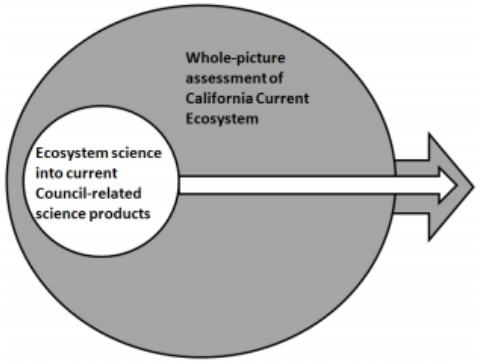


Figure 6.1: Two-part process to bring ecosystem science to the Council

The November 2012 draft version of the FEP included recommendations for ecosystem science that could be conducted to support cross-FMP understanding of the CCE, and to improve ecosystem information available to decision-makers considering issues relevant to particular FMPs. At its November 2012 meeting, the Council moved the ecosystem science recommendations from the draft FEP into its draft 2013 Research and Data Needs document, which the Council finalized in March 2013. To address some of the major trends in scientific needs revealed during the FEP development process, the FEP appendix also includes several potential ecosystem initiatives directed at improving the ecosystem science available to Council decision-making.

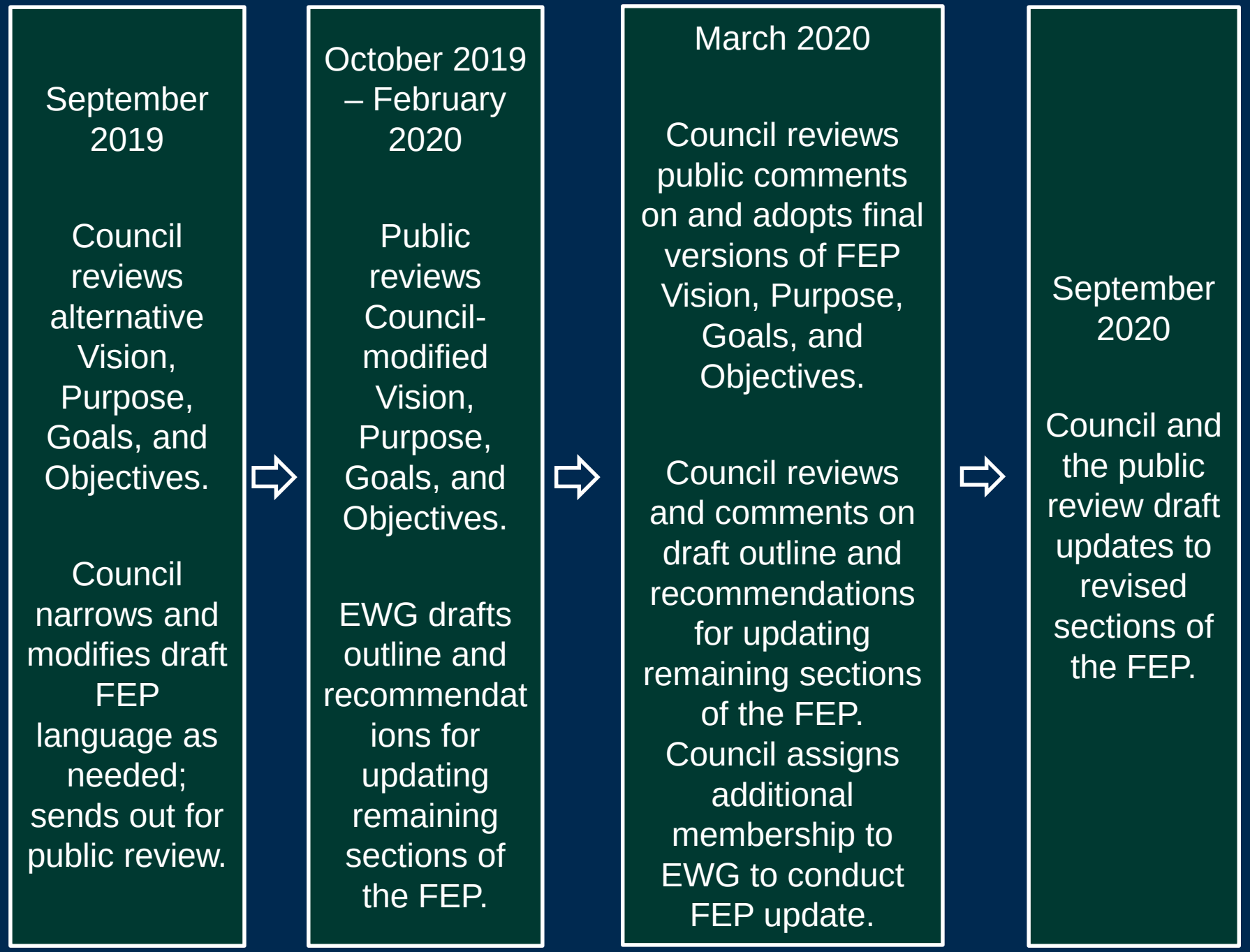
As discussed in Chapter 1, the FEP's Ecosystem Initiatives Appendix proposes an ecosystem-based fishery management process through which the Council and its advisory bodies could analyze a variety of cross-FMP issues to bring a better understanding of the status and functions of the CCE into the Council's policy planning and decision-making processes. Each of the initiatives would require some background scientific work, although some of the initiatives are far more science-focused than policy-focused, including: an initiative on the potential long-term effects of Council harvest policies on age- and size-distribution in managed stocks, a bio-geographic region identification and assessment initiative, a cross-FMP socio-economic effects of fisheries management initiative, and an effects of climate shift initiative. With the exception of an initiative to prevent the future development of fisheries for currently unfished lower trophic level species, the Council has not yet determined whether it wishes to pursue any of the potential ecosystem-based management initiatives.

6.1 Bringing More Ecosystem Information into Stock Assessments

While Council management decisions address a host of issues requiring wide-ranging science support and analysis, stock assessments and other harvest-level support science are the largest category of science products directly used in the Council process. Simultaneous to the FEP development process, the Council's SSC has been considering a process to bring ecosystem considerations into stock assessments. Recognizing

- Update the Vision, Purpose, Goals, and Objectives described in the EWG's March report to the Council, including the addition of ecosystem-level, outcome-oriented goals that focus on the ecosystem within the context of a changing climate.

- Consider public and advisory body comments on the FEP update and present alternative revisions to the Council for review and approval at the Council's September 2019 meeting.


September 2019
Council reviews alternative Vision, Purpose, Goals, and Objectives.
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October 2019 – February 2020
Public reviews Council-modified Vision, Purpose, Goals, and Objectives.
EWG drafts outline and recommendations for updating remaining sections of the FEP.
March 2020
Council reviews public comments on and adopts final versions of FEP Vision, Purpose, Goals, and Objectives.
Council reviews and comments on draft outline and recommendations for updating remaining sections of the FEP.
Council assigns additional membership to EWG to conduct FEP update.
September 2020
Council and the public review draft updates to revised sections of the FEP.

- Update the Vision, Purpose, Goals, and Objectives described in the EWG's March report to the Council, including the addition of ecosystem-level, outcome-oriented goals that focus on the ecosystem within the context of a changing climate.

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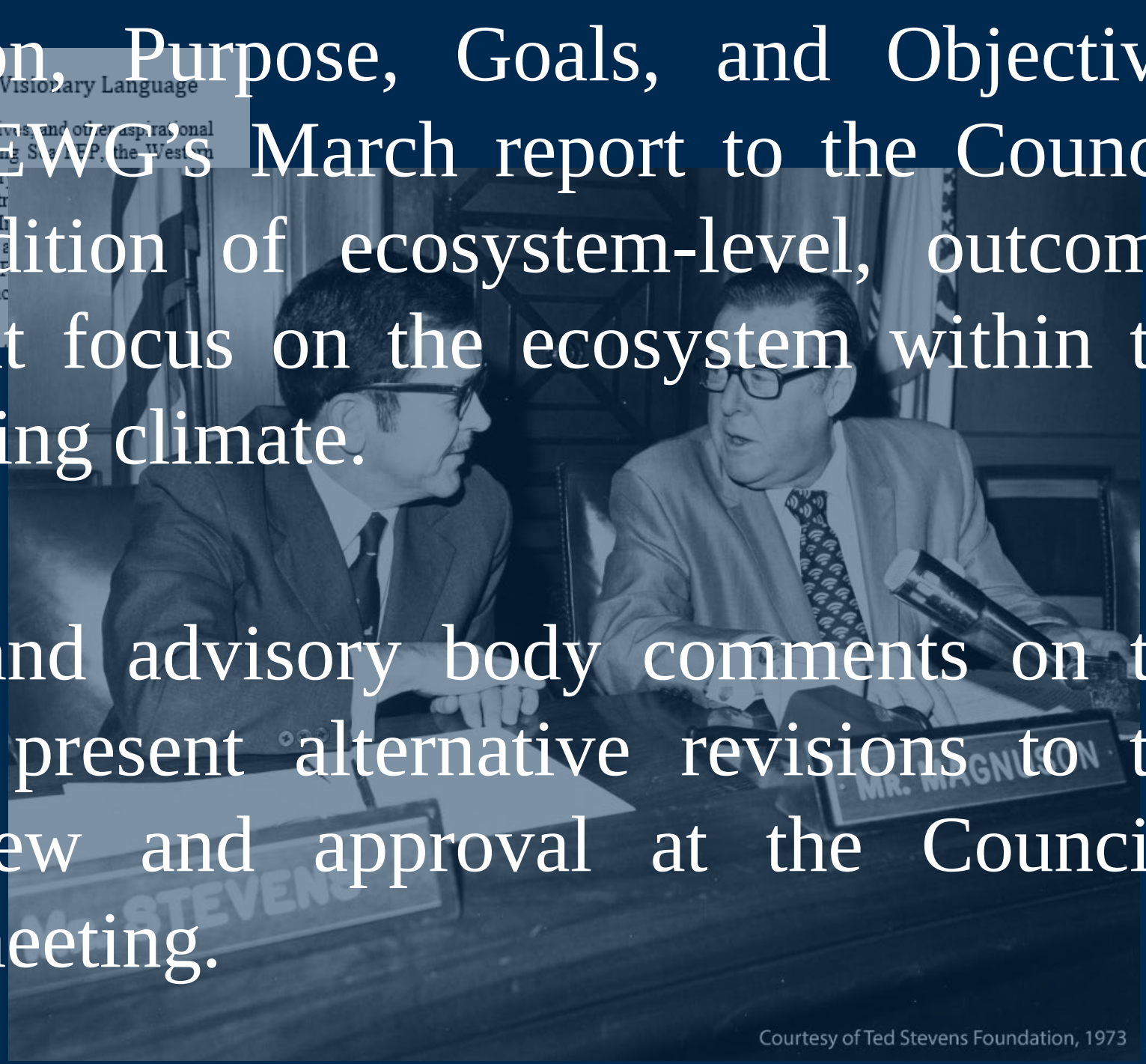
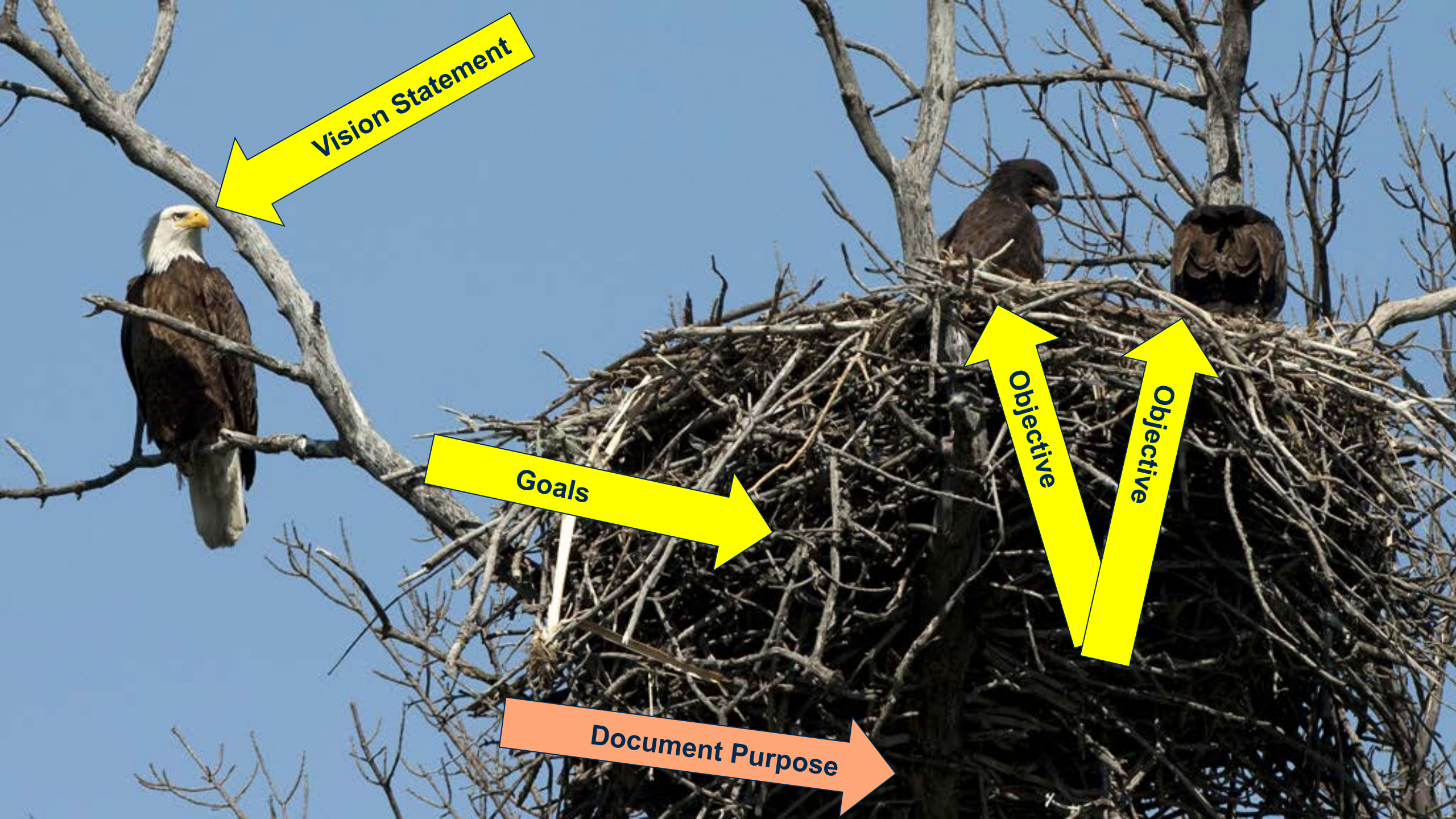


Courtesy of Ted Stevens Foundation, 1973


Vision Statement
Goals
Objective
Objective
Document Purpose

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 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 fl in species composition, predator-prey relati of harvestable surplus of targeted species

Objective 2a: Continue to rebuild ir stocks and minimize overfishing a managed species under the autho into account the CCE's known fluctua conditions and productivity;

Goal 2: Conserve and manage species' po
benefits from marine fisheries and consider
benefits by taking into account the CCE's l
composition, predator-prey relations, and a
targeted species.

Objective 2b: Map trophic ene
interactions within the CCE to
relationships and the potential
and to understand trends in m
other protected species' popu

Objective 2c: Assess and mon
trophic levels of catch over ap
understand the effects of clima
fisheries' harvest and variabili

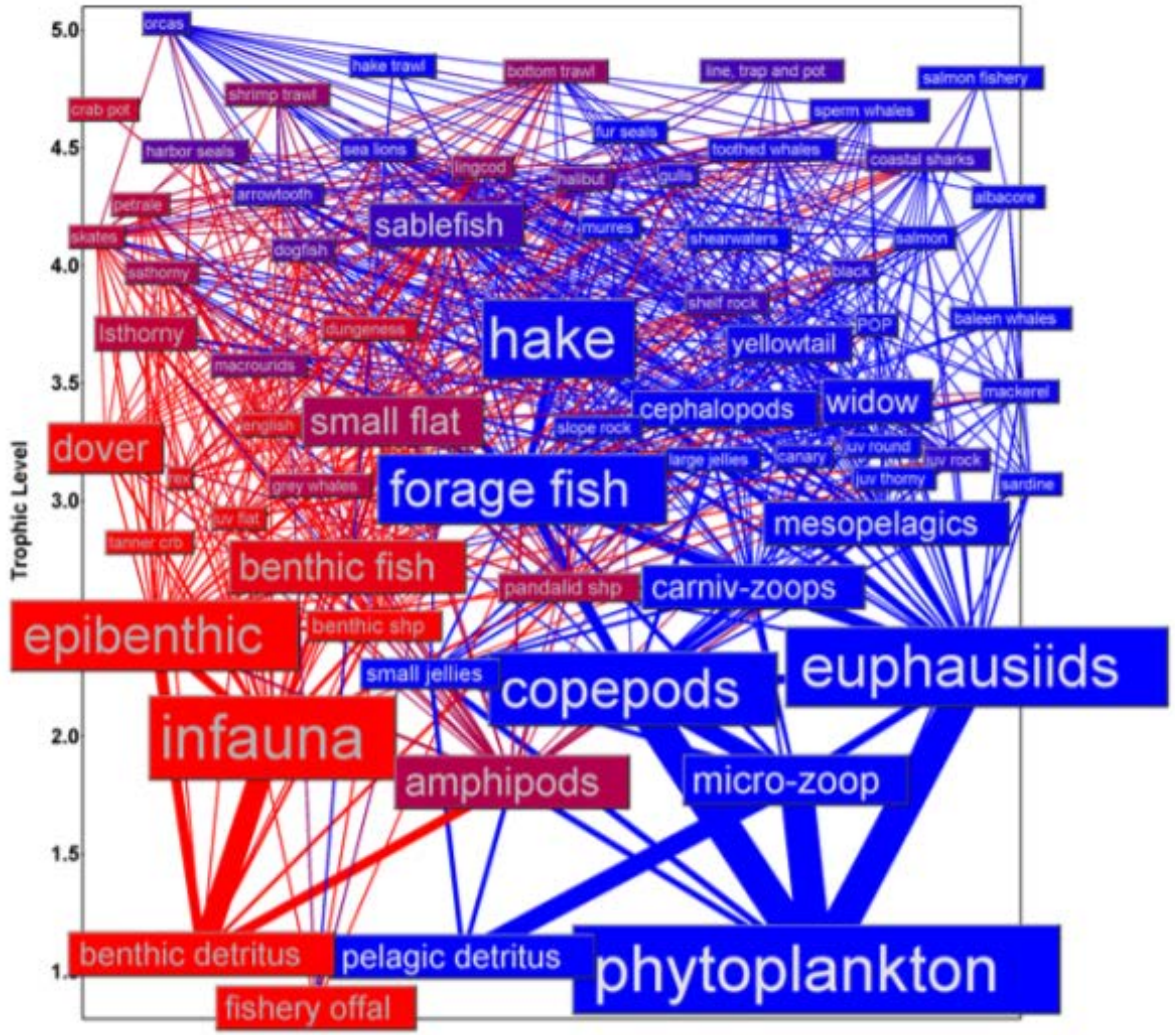


Figure 3.2.1: The significant food web of the Northern CCE. Height of boxes is scaled to standing biomass of species or groups names, width of lines between groups represents biomass flux of prey to predators. Benthic energy pathways are shown in red, while pelagic energy pathways are shown in blue. This "snapshot" represents the model values for the 1960 time period, as reported in Field et al. (2006).

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.

Objective 2d: Assess variability in fisheries income and vessel participation rates for whether CCE fishing rates have affected long-term stability and well-being 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 fisheries management that ensures continued ecosystem services for the wellbeing 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;

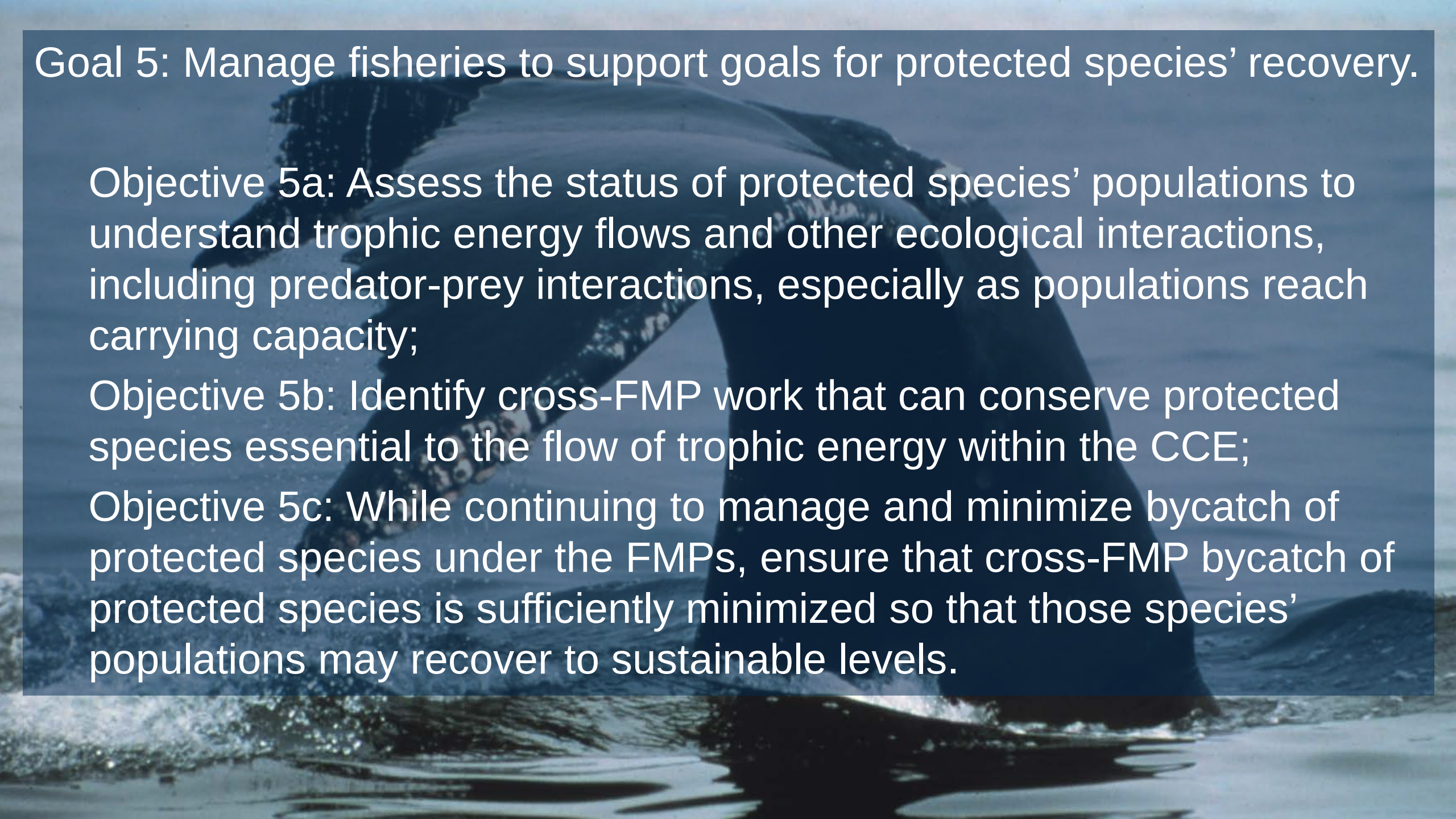
Objective 3c: Continue to monitor the effects of non-fishing activities on the ecosystem and, to the extent possible, ensure that conservation benefits derived from closing areas to fishing are not undermined by negative effects of non-fishing activities;

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 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.

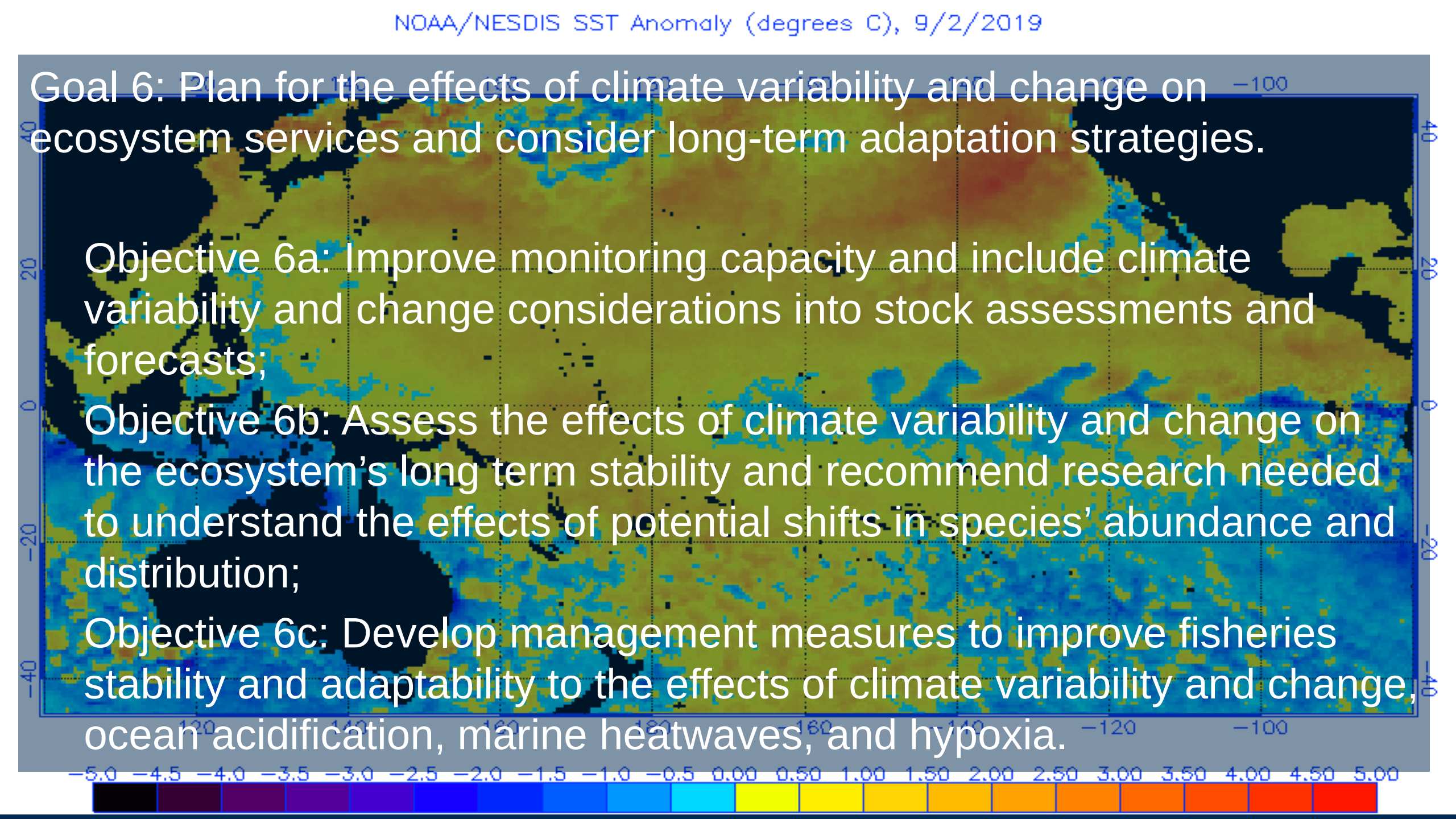


Goal 5: Manage fisheries to support goals for protected species' recovery.

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: 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.

Chapter 2 Ecosystem Issues in the Council Process

This draft Chapter 2 provides the Council's long-term schedule for reviewing and updating the FEP, and its annual schedule for reviewing and considering ecosystem initiatives and the California Current Ecosystem Status Report. These schedules and processes ensure that the Council has regular opportunities to consider ecosystem issues, and allow the Council and its advisory bodies to better integrate ecosystem science into management processes and measures developed under the Council's four FMPs.

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

2.2 Ecosystem Initiatives, 2013-2019

2.3 Ecosystem Status Reports

September 2019

Council reviews alternative Vision, Purpose, Goals, and Objectives.

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