



A Comprehensive Strategy to Identify and Conserve Pacific Coast Groundfish EFH – Has Amendment 19 Succeeded?

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Acknowledgements

- NWFSC and SWFSC
- West Coast Region
- Council's EFH Technical and Review Committees, and Project Team
- Pacific Fisheries Management Council and Its Advisory Bodies
- Pacific States Marine Fisheries Commission
- Academic Partners

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National Essential Fish Habitat Summit; May 17-19, 2016; Annapolis, Maryland

Habitat Assessment

Synthesis

Complexity/ Certainty	Integration of habitat data	Frequency of habitat assessment
Low ↓ High	Habitat products in map or GIS format Habitat products with stock data by lifestage Habitat products for growth/survival by lifestage Habitat products that address multiple species, ecological value & trophic interactions	Baseline assessment complete Periodic assessments conducted Standardized monitoring in place

Data

Complexity/ Certainty	Habitat type & area	Ecological value	Status or condition
Low ↓ High	Bathymetric charts Multibeam acoustics Seafloor & water column Abiotic & biotic components	Presence/absence Density Growth/survival Interspecific competition Production	Impact of fishing activities Impact of pollution Impact of climate change Impact of invasive species

Flow of information:

data gathering phase, synthesis phase, leading to policy

(From NMFS Habitat Assessment Improvement Plan, NMFS 2010)

4,000-5,000 eggs

Habitat Quality

2 spawners



??? 1-year-olds
to Lower Granite Dam



?? Migrants return to
spawning grounds



??? Migrants Below
Bonneville Dam

In-river survival

Habitat Quality



??? Adults return to
mouth of Columbia



??? Youngsters To 3rd
Birthday (Estuary &
Ocean)

Habitat Quality

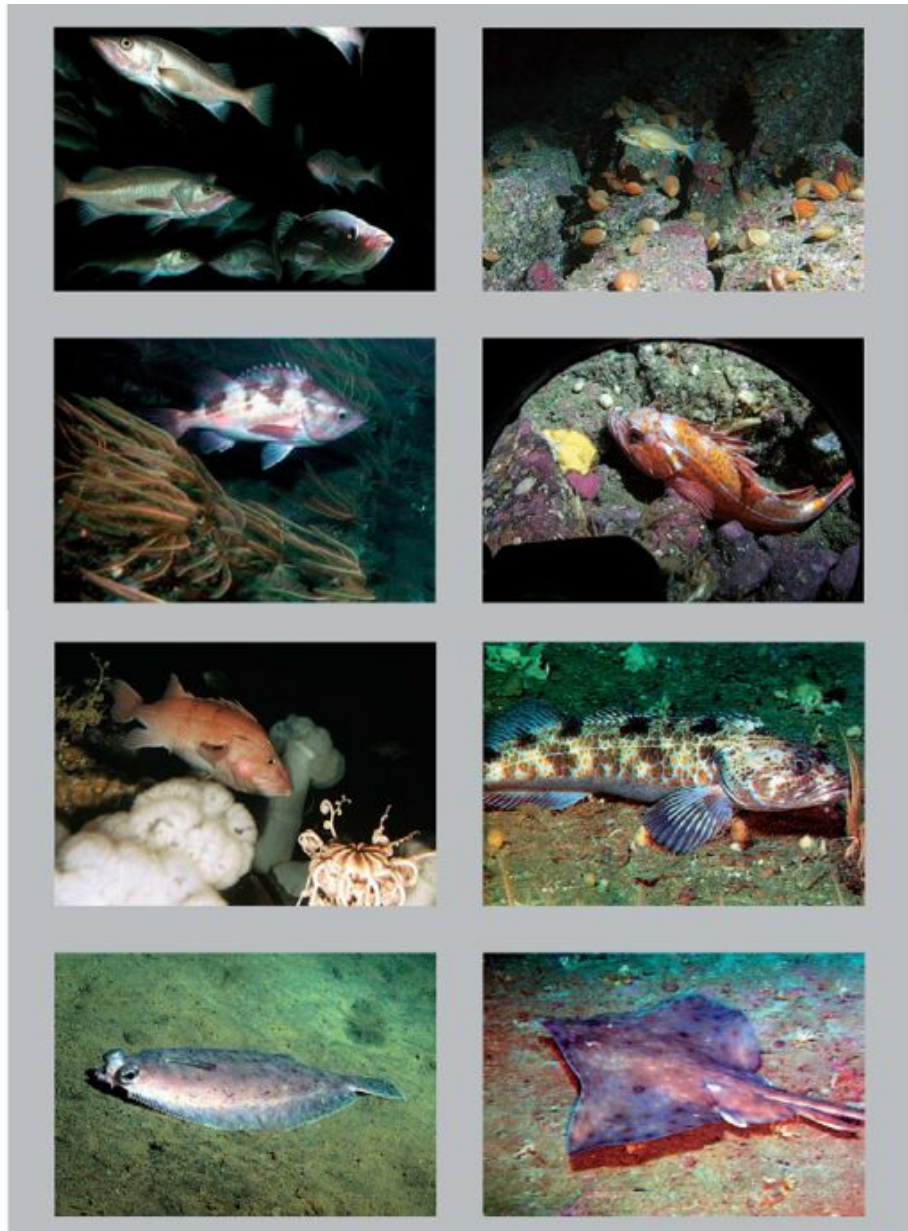


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EFH for 82
Species of
Pacific Coast
Groundfish in
2006 (now 90+)



Habitats for groundfishes off the U.S. Pacific Coast - an FMP with a Diverse Array of Species, Life Histories, and Habitat Associations



Yoklavich and Wakefield, NMFS OLO Habitat 2015

Goals of Amendment 19

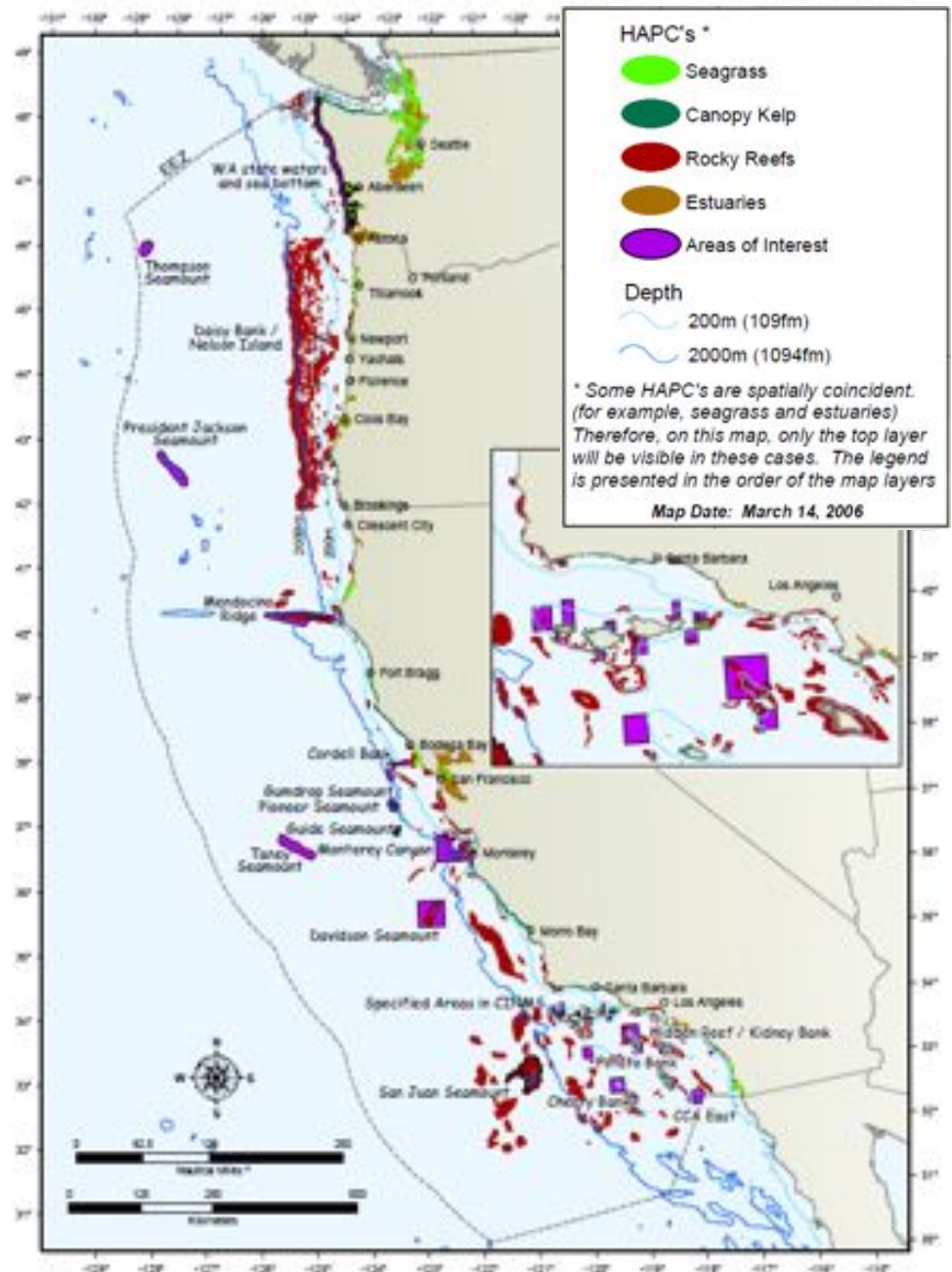
1. Protect a diverse array of habitat types across latitude ranges and within the two known biogeographic zones;
2. Protect the full range of benthic habitat to account for each managed species;
3. Prioritize pristine or sensitive habitats and the gear types most likely to have the highest impact;
4. Distribute socioeconomic costs that would result from implementation of the alternative; and,
5. Implement area closures for different gear types within different habitat types to foster comparative scientific research.

From the Record of Decision for Amendment 19 (NMFS 2006)

Amendment 19

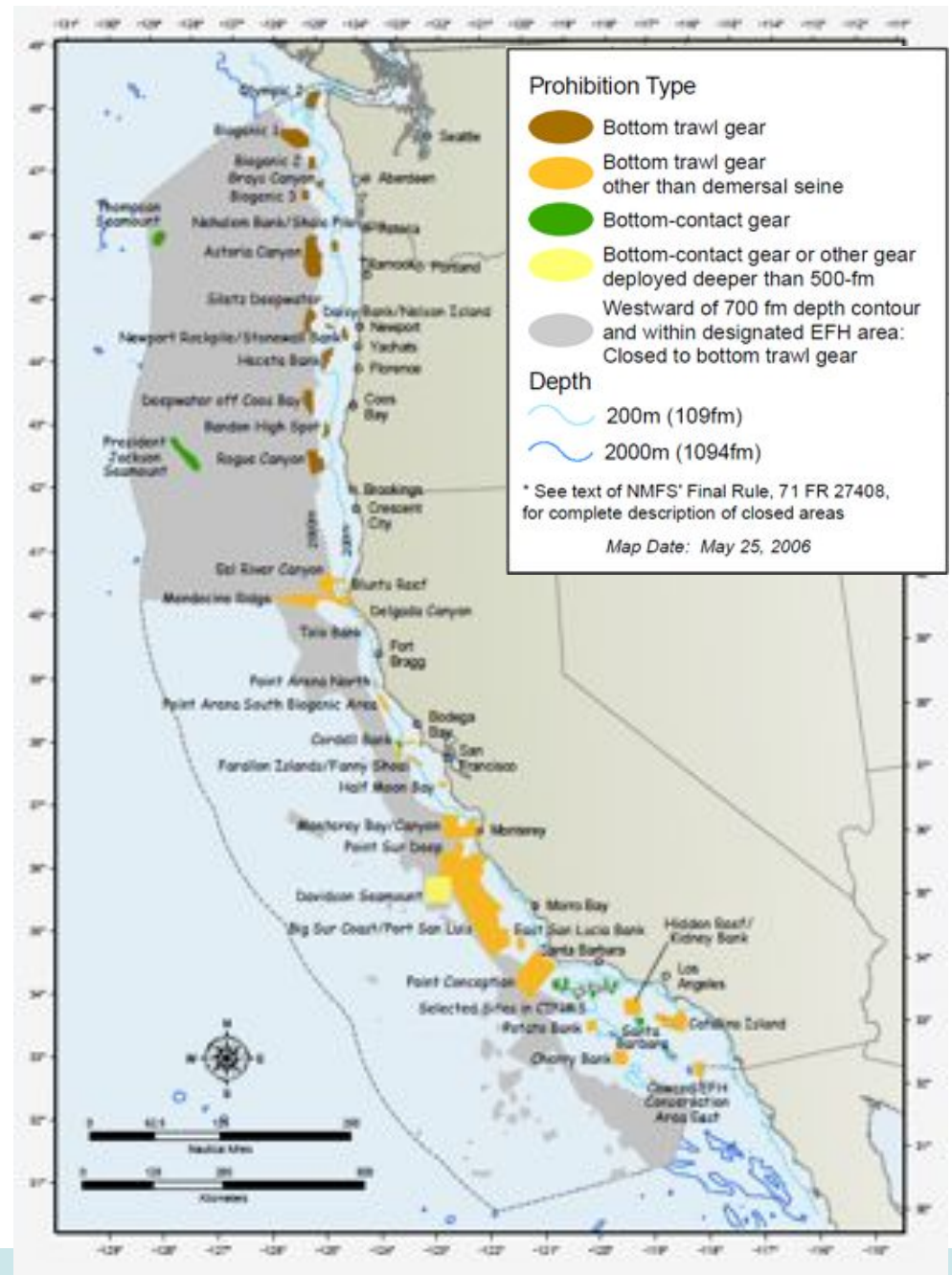
Groundfish HAPCs

- Seagrass
- Canopy Kelp
- Rocky Reefs
- Estuaries
- Areas of Interest



Amendment 19 EFH Closures to Protect Pacific Coast Groundfish Habitat, 2006

- Bottom trawl gear
- BTG other than demersal seine
- Bottom contact gear
- BCG or other gear deployed deeper than 500 fm
- Westward of 700 fm depth contour and within EFH area; Closed to BTG



Flow of information: *data gathering phase, synthesis phase, leading to policy*

PACIFIC COAST GROUND FISH 5-YEAR REVIEW OF ESSENTIAL FISH HABITAT

REPORT TO THE PACIFIC FISHERY
MANAGEMENT COUNCIL
PHASE 1: NEW INFORMATION

SEPTEMBER 2012
(INCLUDING ADDENDUM)

PACIFIC FISHERY MANAGEMENT COUNCIL
7700 NE AMBASSADOR PLACE, SUITE 101
PORTLAND, OR 97220
(503) 820-2280
(866) 806-7204
WWW.PCOUNCIL.ORG

2012

Groundfish Essential Fish Habitat Synthesis: A Report to the Pacific Fishery Management Council

April 2013



2013

Agenda Item B2.2b
EFHRC Report
March 2014

REVIEW OF PACIFIC COAST GROUND FISH ESSENTIAL FISH HABITAT

PHASE 2 REPORT TO THE PACIFIC FISHERY
MANAGEMENT COUNCIL

MARCH 2014

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2014

The groundfish EFH Synthesis provided five types of analyses or summarizations:

- Spatial distribution of physical and biogenic habitats of the West Coast across bioregions, depth zones, and areas with different regulatory protections;
- Association of representative species with habitat characteristics including depth, temperature and substrate;
- Distribution of fishing and non-fishing threats across habitat types;
- Analyses of the overlap of high likelihood of species occurrence and threats to habitat; and
- Summary of the diets of select groundfishes.

Groundfish EFH Online Data Catalog



Overview | Substrate Maps | Biogenic Maps | Effort Maps | MPA Maps | Substrate Data | Imagery Data | Biogenic Data | Effort Data | Synthesis Data | Map Services | Metadata

Introduction: Welcome to the Consolidated GIS Data Catalog and Online Registry for the 5-Year Review of Pacific Coast Groundfish EFH (or EFH Catalog for short). At this site you'll find:

1. Copies of full resolution maps presented in the [Pacific Coast Groundfish 5-Year Review of Essential Fish Habitat Report to the Pacific Fishery Management Council](#) (Phase 1: New Information & Appendix (Sept 2012) and EFH Synthesis Report (April 2013)).
2. ESRI Map Package (zipfiles) downloads for Phase I Report Substrate and Biogenic habitats and Synthesis Report Physical & Biogenic Habitats, Modeled Species Occurrence, and Fishing and Non-Fishing Impacts (including brief metadata records for each). Map packages contain all the supporting GIS layers.
3. Tables of "sources" with links to the original data provider online (where possible) and a brief metadata report for each source:
 - P1 Report - Substrate Data
 - P1 Report - Bathymetry and Imagery Data **(New)**
 - P1 Report - Biogenic Data
 - P1 Report - Effort Data
 - P1 S Report - Synthesis Data **(New)**
4. A collection web map services that present Phase I and Synthesis Report maps & figures as interactive maps.
5. 2005 groundfish HSP model output

[PDF Maps](#)
[Disk 1 - ESRI Shapefiles](#)
[Disk 2 - ESRI Shapefiles](#)
[Disk 3 - ESRI Shapefiles](#)

Disclaimer: We make every attempt to direct users to the primary source for dataset downloads. This means that the source download links typically point to external sites. Where sources are not already available online we do re-distribute if permissible or provide the contact information of the data owner.

Terms of Use: Graphics and Digital Data products originating from the EFHRC Phase I and NMFS Synthesis reports provided here may be freely reproduced, distributed, and used for non-commercial purposes. Digital data accessed through a download link to a source provider is subject to the terms of use of the provider and may differ from our terms.

Navigation: There are 4 core components to this site, each presented as a unique tab or group of tabs along the top (note that the tab color corresponds to component groupings):

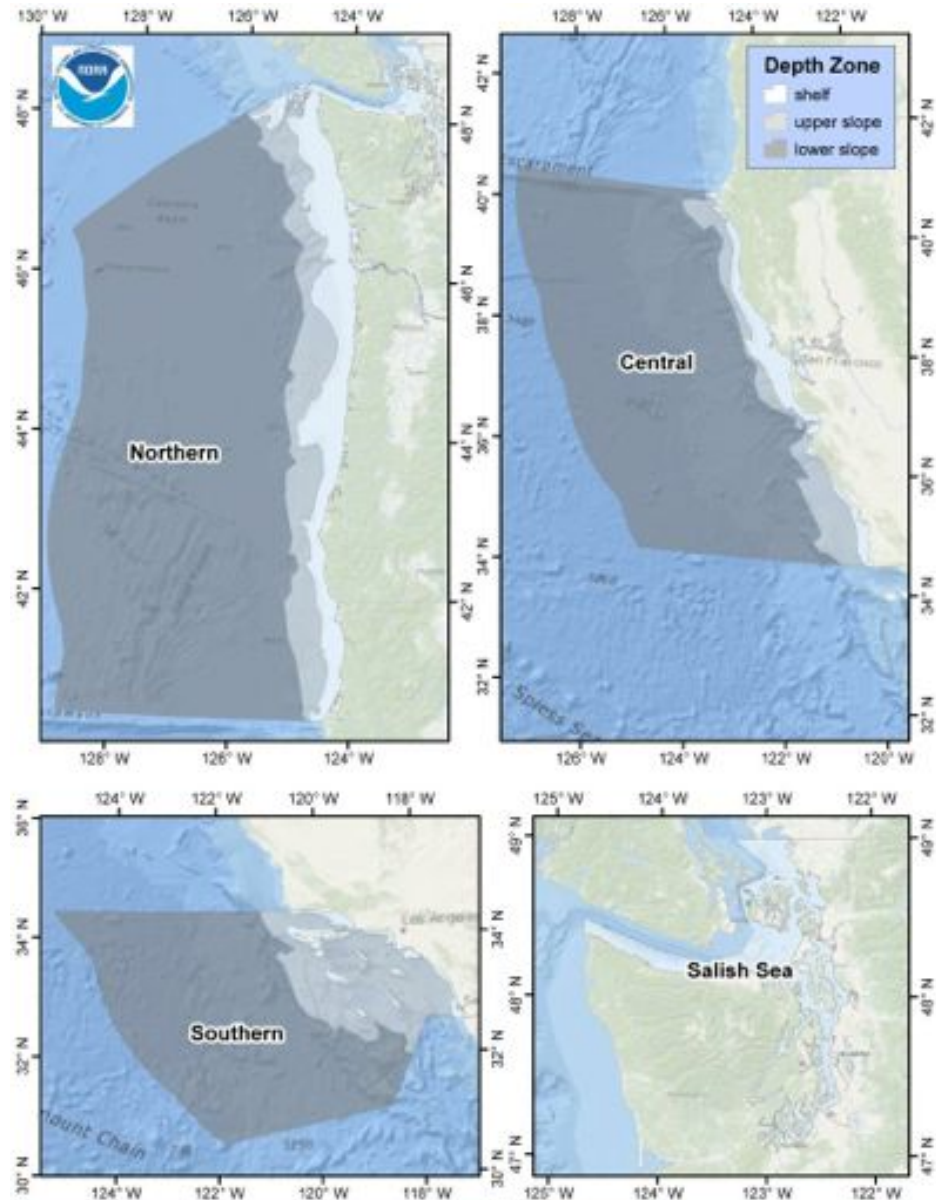
- The **"Substrate Maps," "Biogenic Maps," "Effort Maps,"** and **"MPA Maps"** tabs in blue reveal pages for Appendix plates and figures. Thumbnail images are clickable for full resolution downloads. Go here to find a full resolution digital copy of an appendix figure.
- The **"Substrate Data," "Biogenic Data," "Effort Data,"** and **"Synthesis Data"** tabs in green reveal tables of data available for download under each theme. Go here to locate an original GIS dataset pre-packaged as a zipfile. Note: There is a table column for Plate # to make it easier to locate data geographically from a Phase I Appendix figure.
- The **"Map Services"** tab presents a collection of web map services. At this tab you'll find ArcMap Layer files, Google Earth KMZ files, and links to view data in the new PaCOCS online map application. Your choice will depend upon your platform preference or analysis needs.
- The **"Metadata"** tab by itself (navigating to the tab by clicking on it directly) presents a metadata template with descriptive placeholder information. However, you'll also get a dataset specific metadata report by choosing the "Metadata" button from any dataset record under one of the three download pages.

Revision History: **Last Revision - April 9th, 2015**

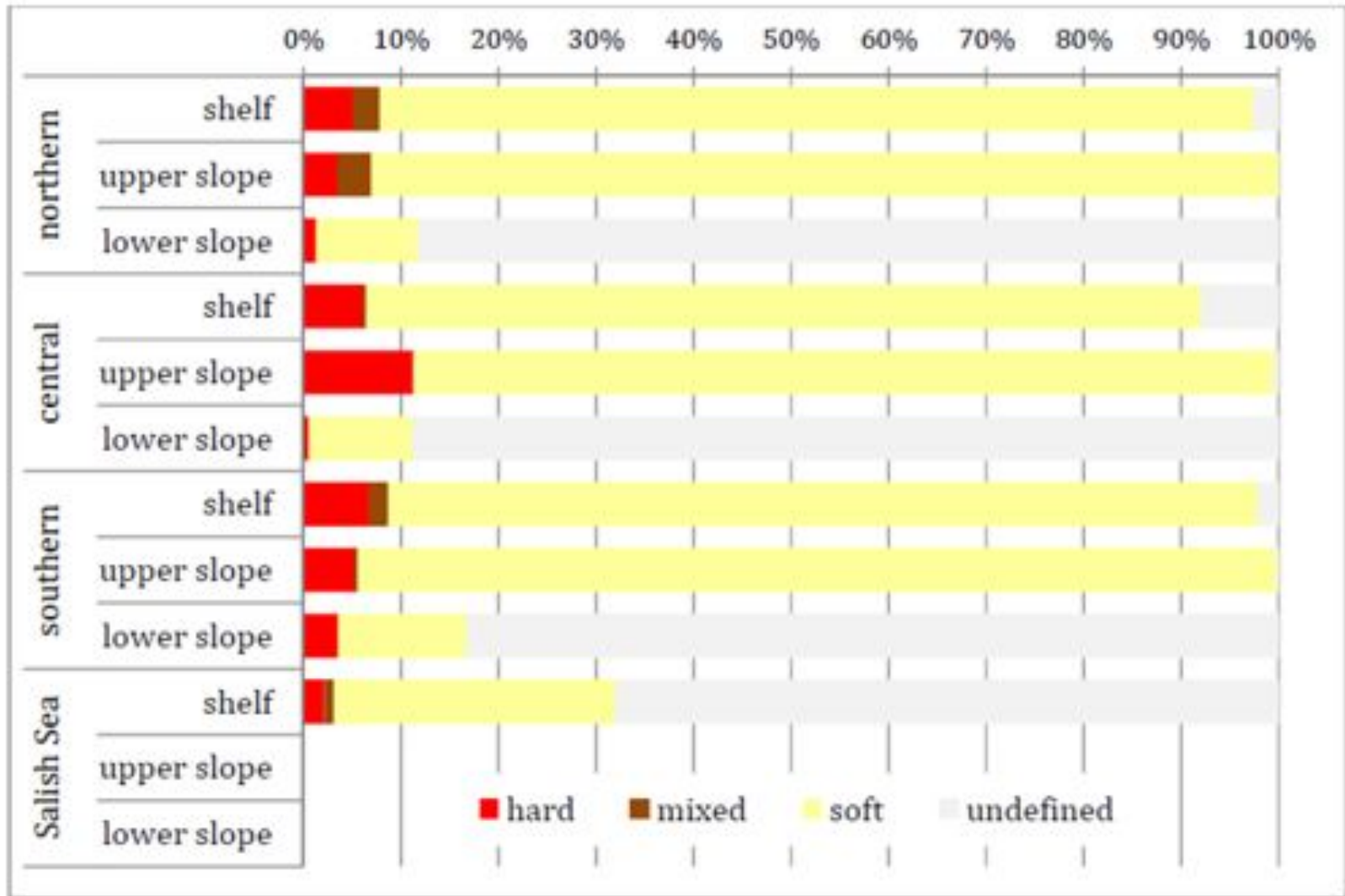
- April 9th, 2015 - Two new map service layers were added to the Map-Viewer and Map Services tab. The new services include: RCA closed area polygons (spring 2015) and Pink Shrimp VMS data developed by Colby Brady on NOAA Fisheries WAFSC.



4 Sub-Regions X 3 Depth Zones



Distribution of Seafloor Habitat Types By Depth in Latitudinal Biogeographic Subregions



NMFS Groundfish EFH Synthesis Report

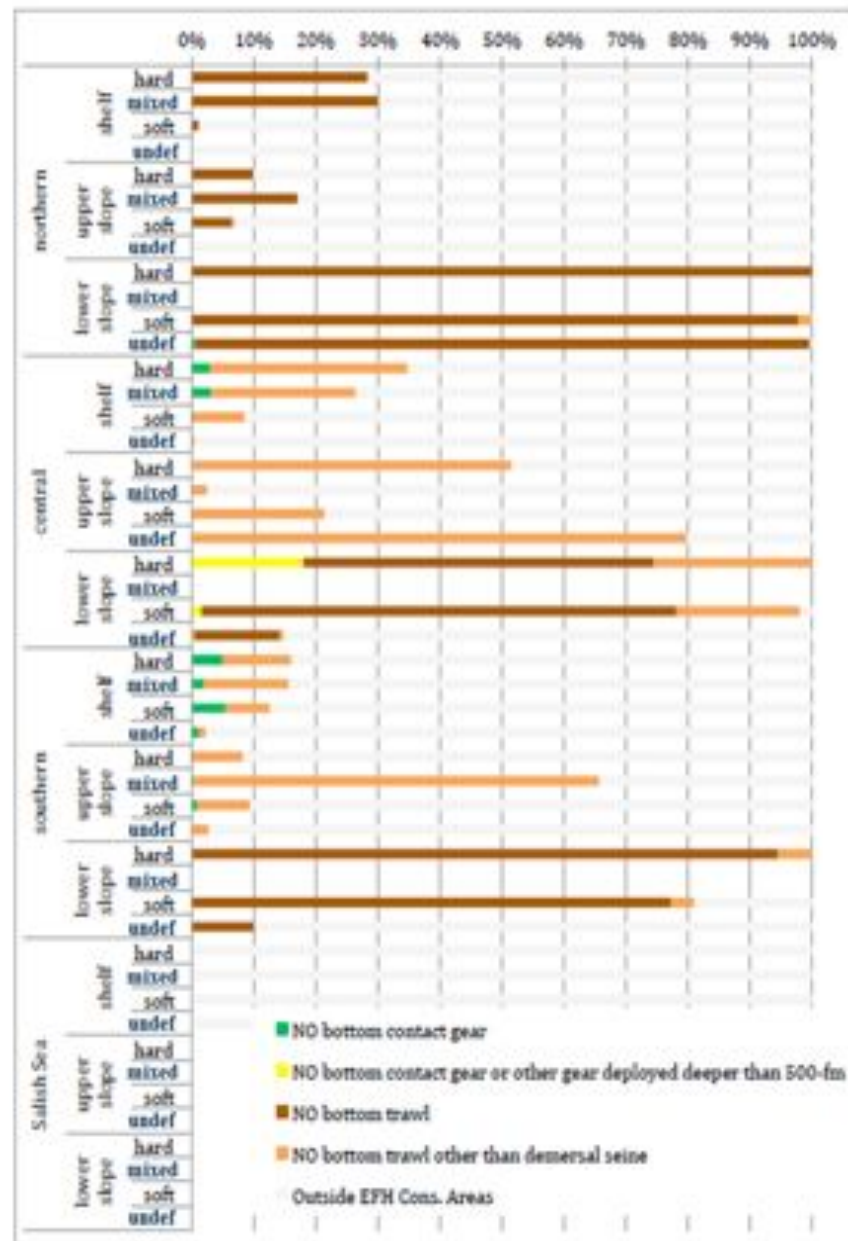
Current Existing Protections for a Diverse Array of Habitats Accounting for each FMP Species

- ~10% of shelf and upper slope habitats have protection
- A greater percentage of hard substratum protected in shelf and upper slope regions
- Lower slope has greater fishing protections due to the >700 fm closure

Also

- Our knowledge of the distribution (and ecological role) of biogenic habitats (e.g., corals and sponges) is limited
- Current EFHCA protect some biogenic habitats; additional areas remain open to some bottom contact gears.

Current Gear Prohibitions



What's Needed in Order to Protect a Diverse Array of Habitats?

- Improve mapping and description of benthic habitats
- Evaluate protected vs. non-protected areas, for example:
 - Total area of habitat types protected (i.e. not just Amendment 19)
 - Species-specific protections
- Metrics
 - Relative proportions of habitat types protected
 - Absolute area of habitat types protected

Protecting a Full Range of Habitat for Managed Species

Longspine
Thornyhead

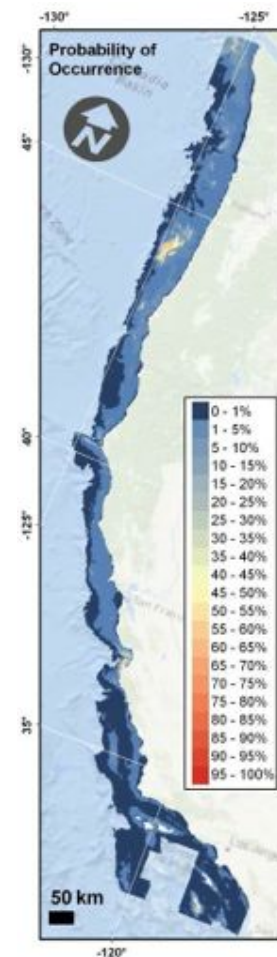
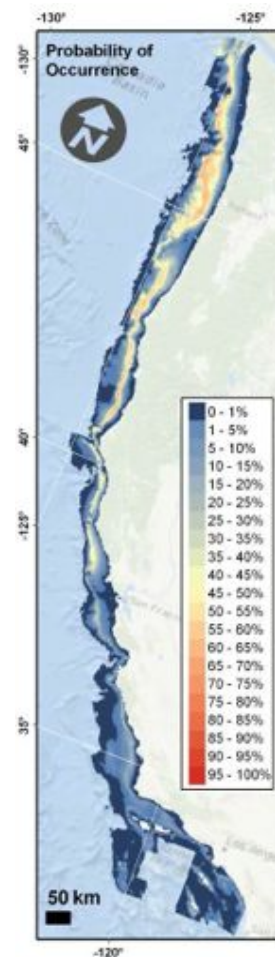
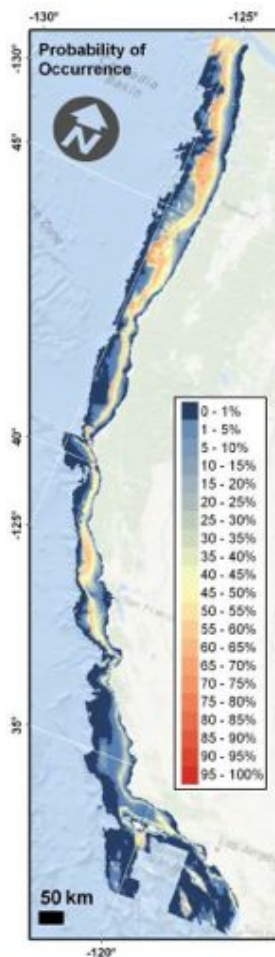
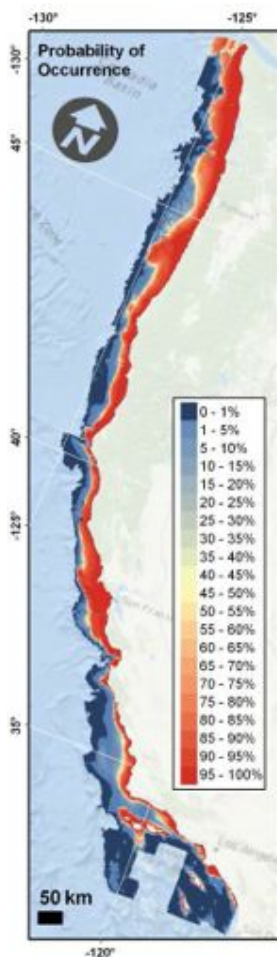
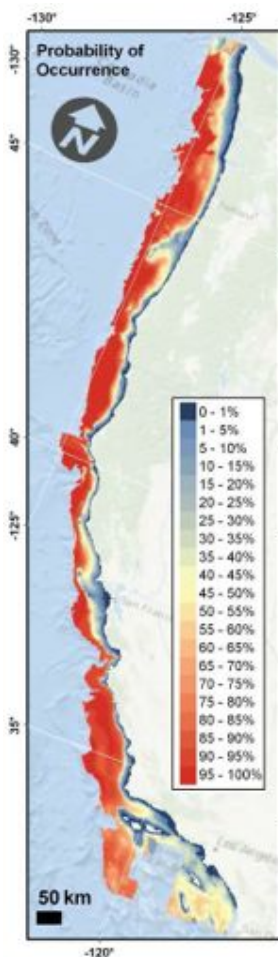
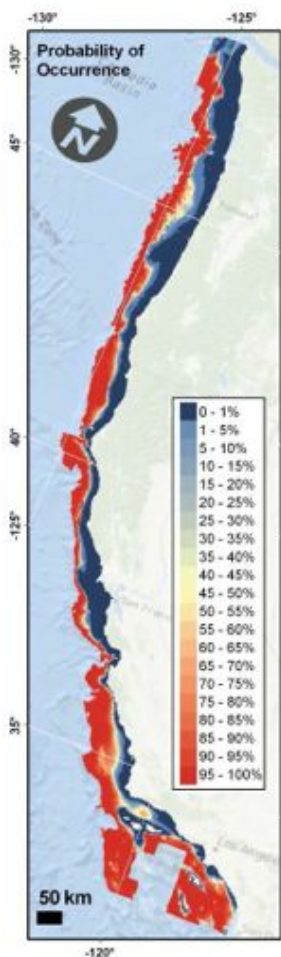
Sablefish

Petrale Sole

Greenstriped
Rockfish

Darkblotched
Rockfish

Yelloweye
Rockfish

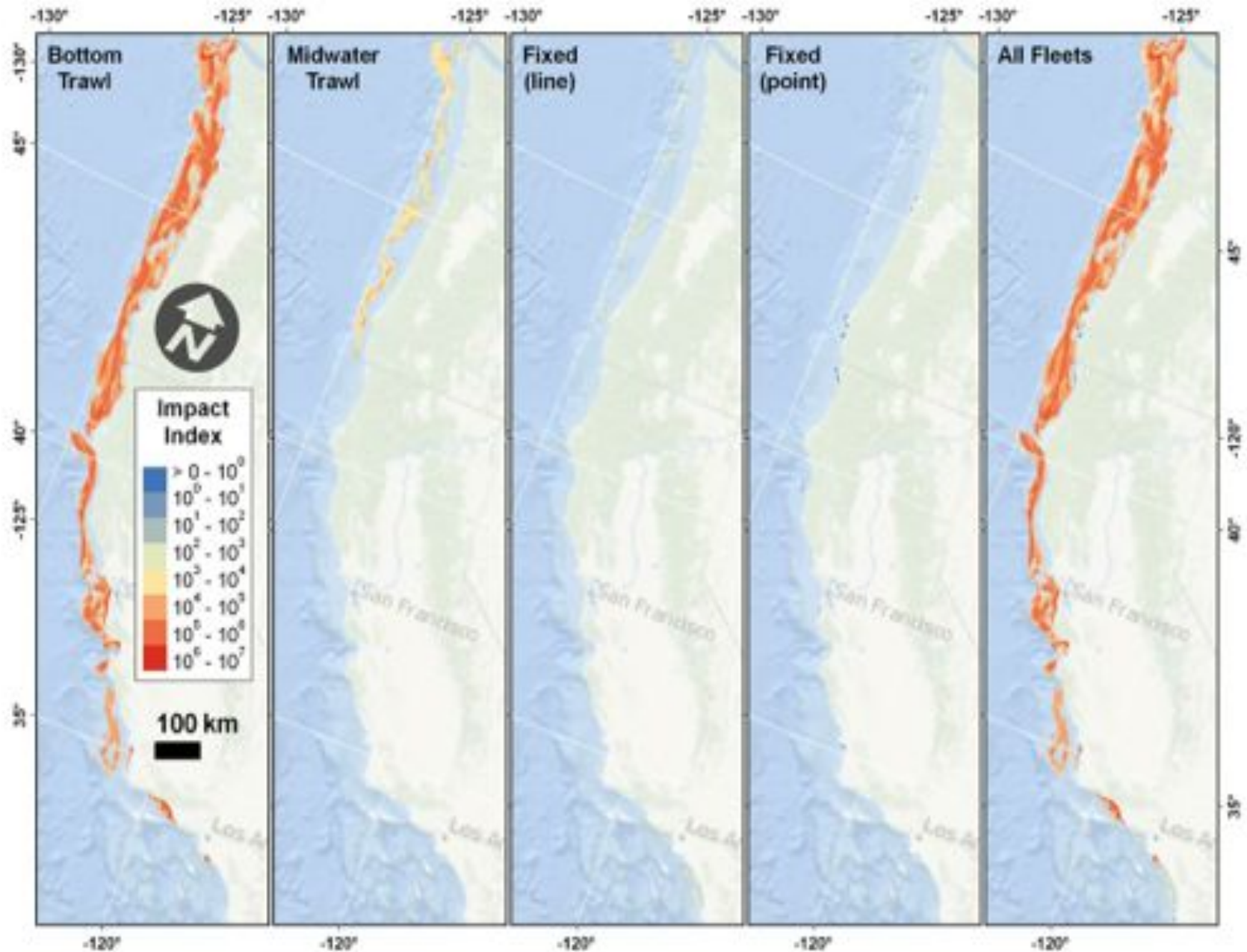


What is Needed to Protect the Full Range of Benthic Habitat to Account for Each Managed Species?

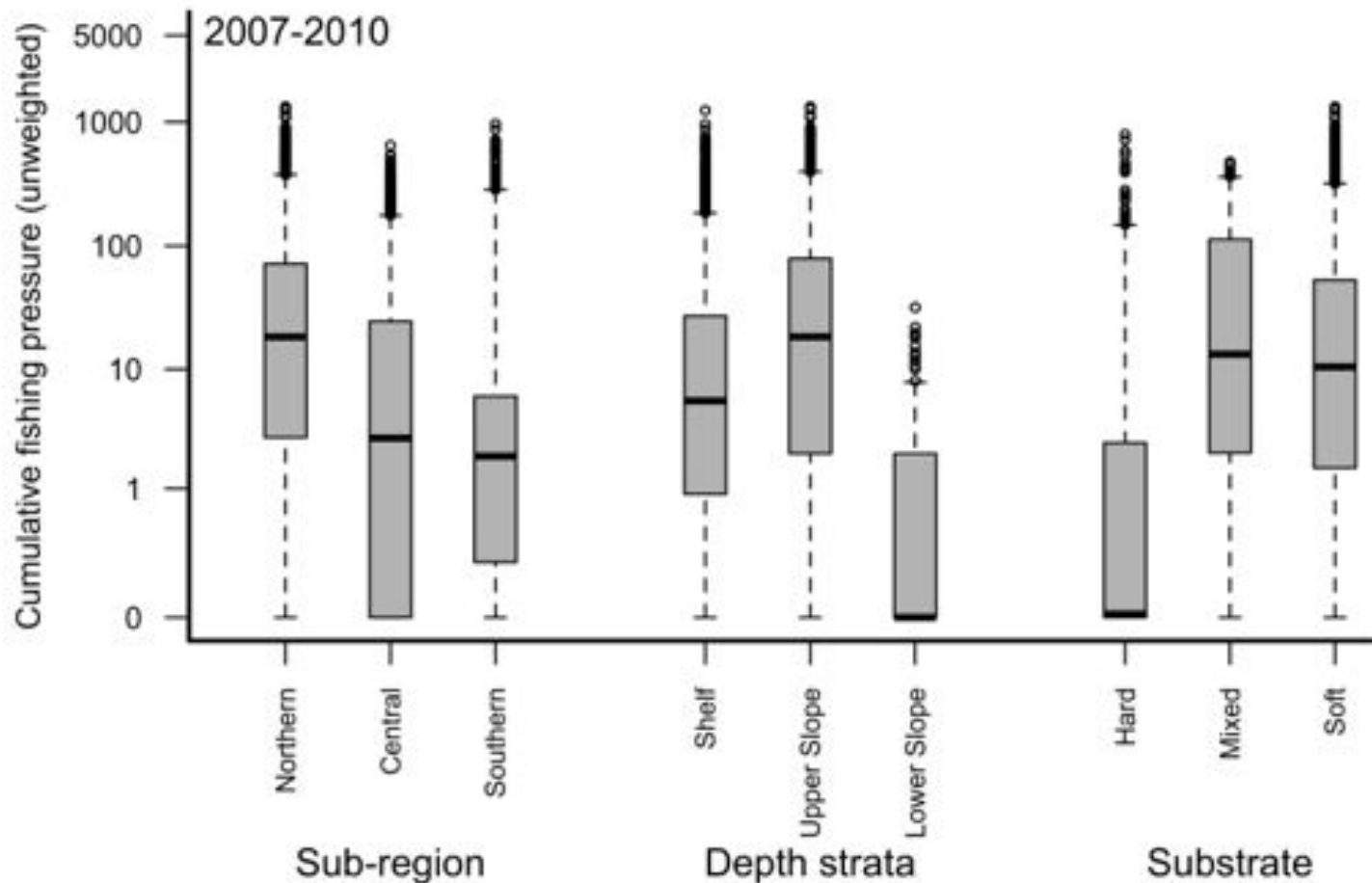
- Life stage and habitat-specific densities, vital rates
- Comprehensive surveys in untrawlable habitats
- Understanding of biogenic habitat use

2002 - 2010

Effort Across Gear Types

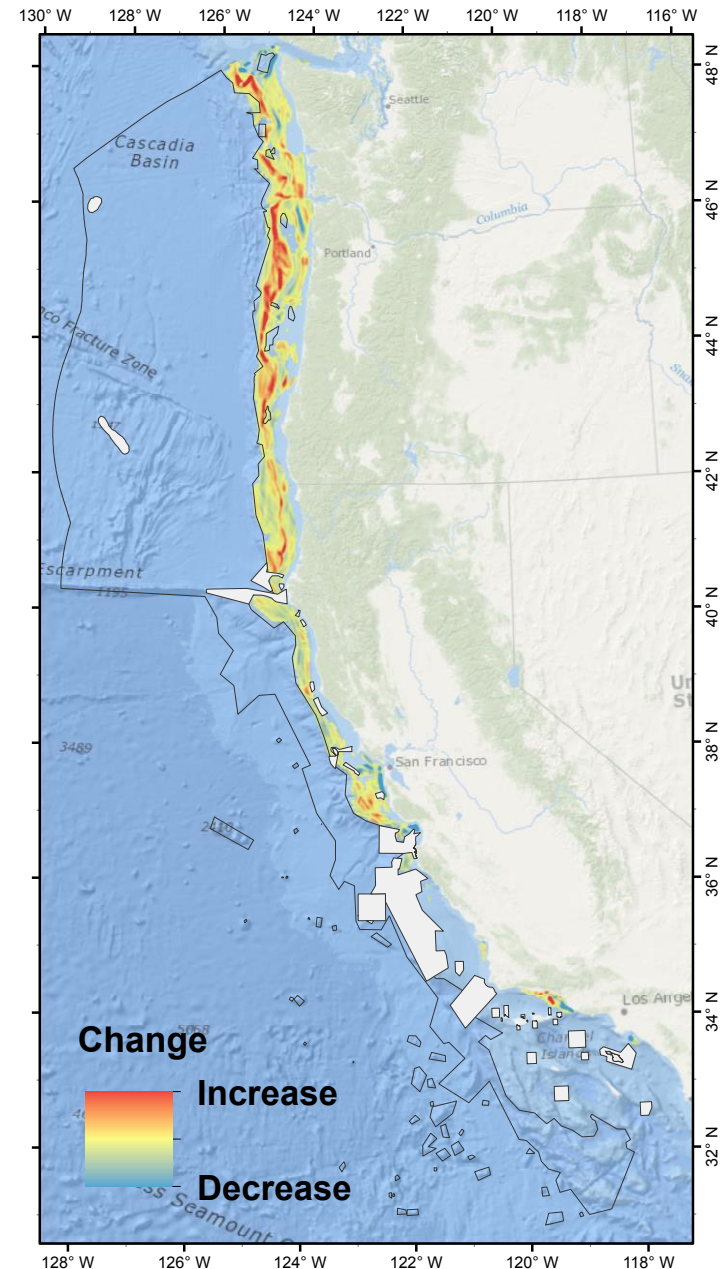


Cumulative Fishing Pressures by Sub-region



Bottom Trawl Effort Change Before and After Amendment 19

- Some displacement seaward (>150 fm), associated with Rockfish Conservation Areas (RCAs)
- Little to no change with Amendment 19 Conservation Areas, but changes with footrope regulations



Fishing Effort

- Fishing effort disproportionate geographically
 - North
 - Soft habitats on the shelf and upper slope
- Over the last decade, areas of high fishing pressure have remained relatively stable
 - Over longer time frames, this is not the case (footrope regulations in bottom trawl fishery)
 - Some movement associated with Rockfish Conservation Areas (RCAs)

Prioritize Pristine or Sensitive Habitats and the Gear Types Most Likely to Have the Highest Impact

- Fishes associate with various types of structure in either physical and/or biogenic habitats
- Bottom tending fishing gears have the potential to reduce habitat complexity by altering physical structure, and removal of taxa that produce structure
- Certain types of biogenic habitats are known to be particularly sensitive to the disturbances inflicted by fishing
- Our understanding of the location of these biogenic habitats has improved over the past decade but information is still severely lacking

What is needed to prioritize pristine or sensitive habitats?

- Improved habitat mapping
- Greater understanding of the distribution and abundance of biogenic habitats on a lower taxonomic level than presently available
- Observational and experimental studies to evaluate the impact and recovery from different gear types on all habitat types

Distribute Socio-economic Costs of EFH-Based Regulations

- Currently, the greatest attention has been directed toward changes in trawl fishing effort
- Potential metrics
 - Landings or ex-vessel revenue
 - By port, species, gear, or vessel type
 - Or, evaluating areas fished, catch rates, landed species
 - Regional economic output or employment

Research as a priority --The Council continues to ask: “How much habitat protection is enough?”

- Comparative analyses of abundance and diversity of species could be conducted between EFH Conservation Areas and areas with no prohibitions in order to evaluate performance of an Amendment closure.
- Considerations:
 - Maintain closures for periods of time long enough to support research on the impacts of the closure
 - Establish closures in a full range of habitats and across relevant gear types in the context of a planned experiment