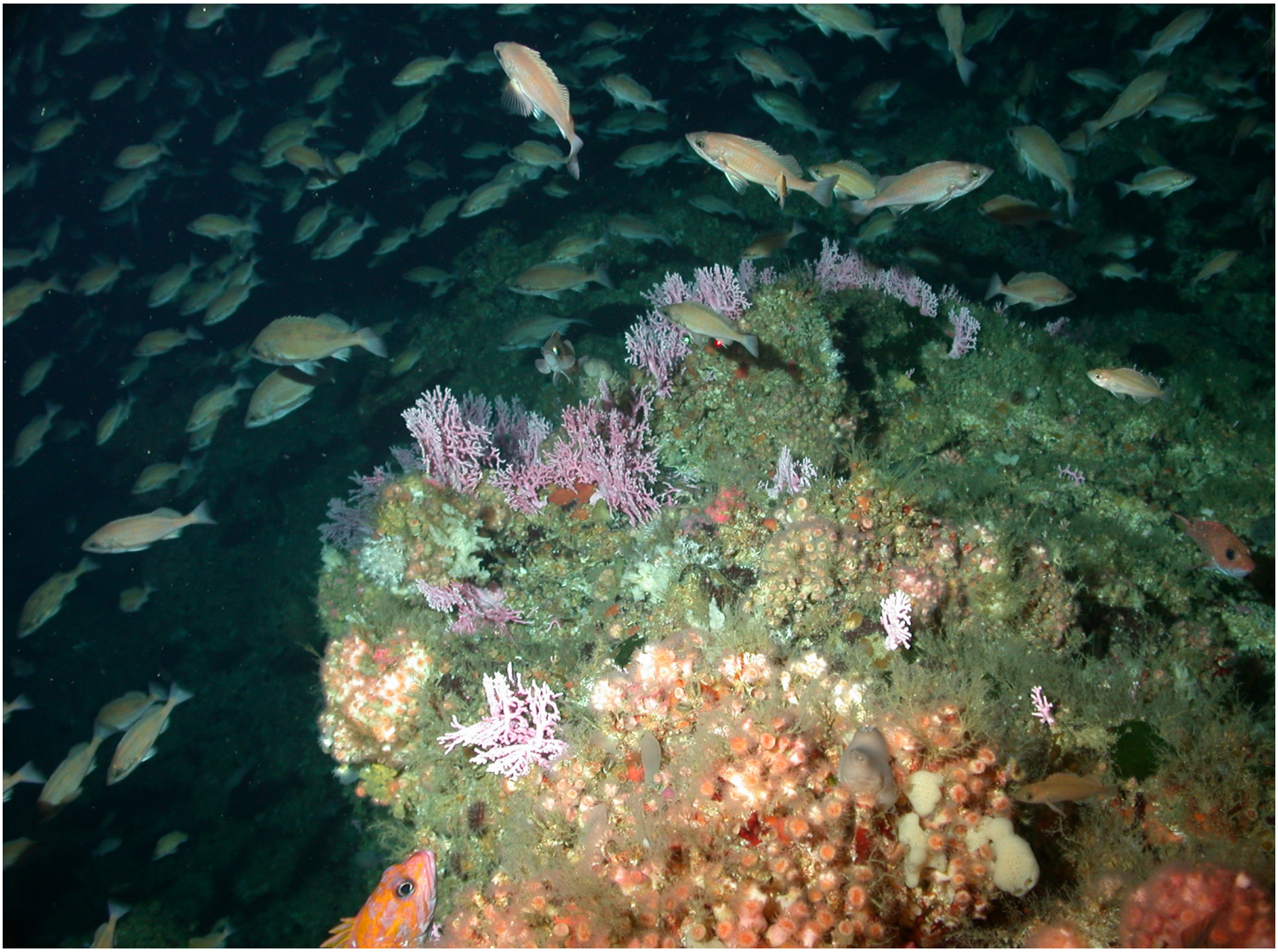

OCEANA Protecting the World's Oceans

PROPOSAL OVERVIEW AND UPDATE

Comprehensive Conservation Alternative to Modify U.S. West Coast Groundfish Essential Fish Habitat Conservation and Management

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June 14, 2016

Second Edition, May 2017

Introduction

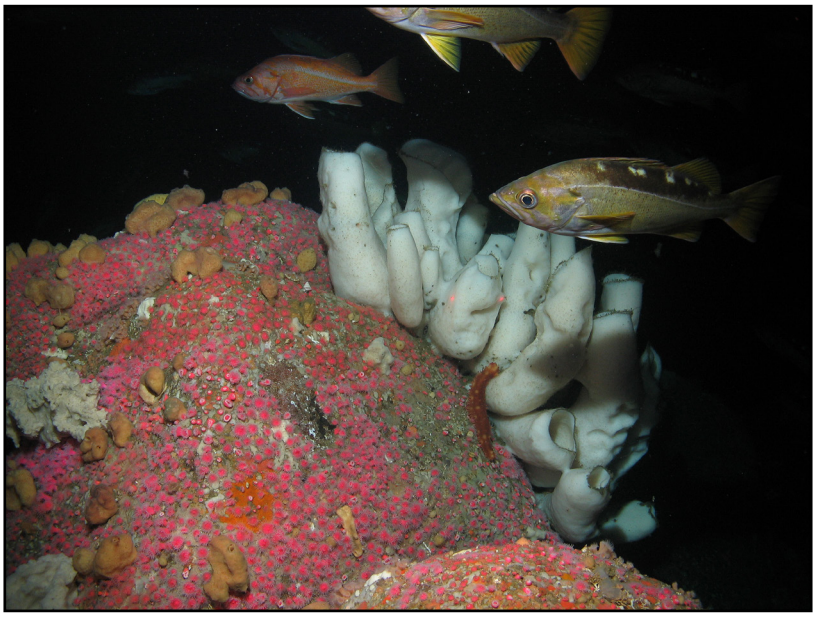
Protecting ocean habitats is a critical and integral part of responsible fishery management. It is necessary for ensuring long-term sustainable and productive fisheries, vibrant coastal communities and healthy marine ecosystems. In response to a call for proposals, in July 2013 Oceana, Natural Resources Defense Council and Ocean Conservancy submitted a Comprehensive Conservation Proposal to modify Pacific Coast Groundfish Essential Fish Habitat (EFH) designation, conservation and enforcement as part of the Pacific Fishery Management Council's (Council) EFH review process. Since that time the Council has made much progress, including the initiation of the Pacific Coast Groundfish Fishery Management Plan (FMP) Amendment 28 process, through which the Council will consider a range of alternatives to modify groundfish EFH Conservation Areas closed to bottom trawling, open parts or all of the coastwide trawl Rockfish Conservation Area (RCA), and consider protecting the deep-water ecosystem off California (>3,500 meters) from all bottom contact gear using discretionary Magnuson-Stevens Act authorities.

At the April 2016 meeting the Council finalized its range of alternatives for Amendment 28, including adopting the proposed EFH Conservation Area modifications (bottom trawl openings and closures) contained in our July 31, 2013 proposal as a distinct alternative, with modifications per our request. Since our original 2013 proposal has now been modified and because there have been significant developments in the EFH process to date, Oceana is submitting this document to the Council to provide updated information, maps and summary analysis.

We recognize that at the April 2016 meeting the Council also voted to exclude further consideration of all proposed EFH Conservation Areas and trawl Rockfish Conservation Area (RCA) modifications inside the Tribal Usual and Accustomed fishing areas (U&As) off Washington State. Here we include information on the three EFH Conservation Areas in our modified proposal that are within Tribal U&A areas for reference and informational purposes. Our modified proposal includes those portions of the Grays Canyon and Quinault Canyon proposal areas that occur outside the Tribal U&As. We provide summary analysis of possible trawl RCA changes and EFH Conservation Area changes in light of the Council motion to exclude changes inside Tribal U&As off Washington.

Also at the April 2016 meeting, the Council voted to adopt the protection of the deep-water ecosystem off California (>3500 meters) as a "preliminary preferred alternative" (PPA). In this report we include additional information on the deep-water habitat area under Council consideration.

We encourage you to view an on-line version of these proposed EFH Conservation Areas with underwater images, video and an interactive map at: at www.oceana.org/PacificSeafloorTour.



Yellowtail rockfish over boot sponges on Rittenburg Bank.
Photo Credit: NOAA GFNMS.
Cover Image: Hydrocoral, cup coral and square spot rockfish at Cortes Bank.
Photo Credit: NOAA Southwest Fisheries Science Center, Advanced Survey Technologies Group.

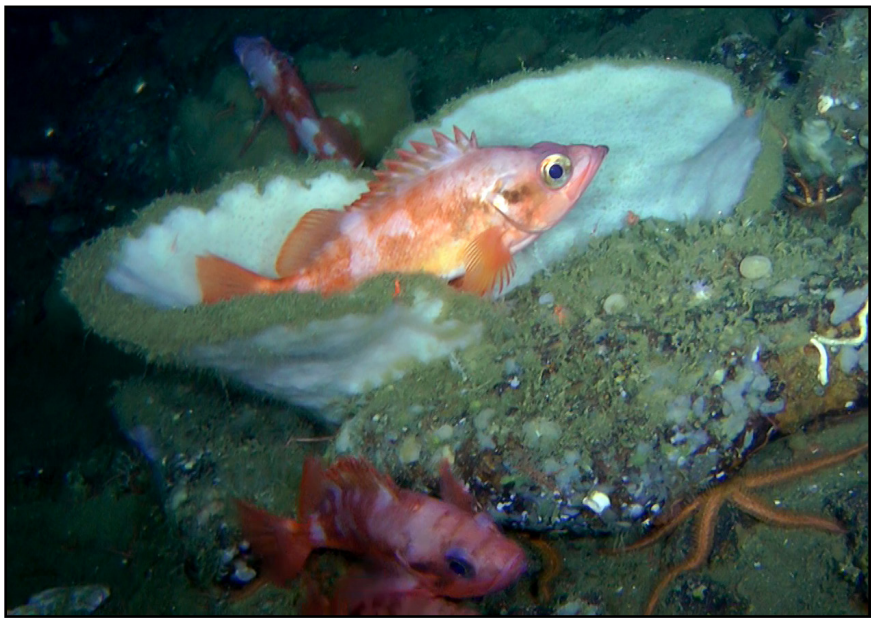
Proposal Approach and Priority Habitats

The overall goal of this proposal is to protect EFH for the full suite of Pacific Coast groundfish species while maintaining vibrant fishing opportunities and coastal communities. The proposed EFH Conservation Areas and deep-water habitat conservation area build off the approach adopted by the Council in 2005 to prohibit the geographic expansion of bottom trawling to protect areas that are potentially pristine and to close known ecologically sensitive and important areas to bottom trawling. Efforts were made to avoid significant bottom trawl effort displacement.

The proposed EFH Conservation Areas focus on priority habitat features, consistent with the Pacific Coast Groundfish FMP Amendment 19 definitions of complex sensitive habitats and Habitat Areas of Particular Concern. We used updated habitat and bottom trawl spatial information provided in this EFH review process, made available on the Pacific Coast Groundfish EFH Data Catalog (http://efh-catalog.coas.oregonstate.edu/overview/). The priority habitat features we focused on include:

- **Hard substrate**: rocky reefs, rocky ridges and rocky slopes (hard, mixed and predicted rock substrate data, with emphasis on areas with new substrate data since 2005)
- **Habitat-forming invertebrates**: particularly corals, sponges, sea pens and sea whips (identified from NOAA trawl surveys, dive surveys (e.g. ROV, AUV), areas of predicted high deep-sea coral suitability, and areas indicating recent high coral and sponge bycatch), and
- **Submarine canyons and gullies**: identified from bathymetric data and maps, where the combination of steep slopes, strong currents and enhanced access to food create places of unique ecological significance for managed fish species, invertebrates, cetaceans and seabirds.

Methane Seeps: Some areas in our proposal include unique and rare deep-sea methane vents and seeps, also known as cold seeps. These are areas where methane and hydrogen sulfide gas leaks through the Earth's crust. While deep-sea seeps alone were not identified as a priority habitat type in Amendment 19, new science suggests these areas provide valuable ecosystem services (Thurber et al. 2014) and they are actually associated with the Council's priority habitat features such as hard substrate and habitat forming invertebrates (Levin et al. 2016). These seeps and vents create distinct chemical environments and substrate conditions including microbial mats, hard carbonates, and support invertebrate aggregations such as cold-water corals, sponges and hydroids. Hard and biogenic substrates produced by these seeps are used by other animals, including flatfish and thornyhead rockfish, for shelter and access to food (Levin et al. 2016). Several Oceana proposed EFH Conservation Areas contain active methane seeps or associated formations including Grays Canyon, Hydrate Ridge, Samoa Deep-water, and the Southern California Bight.



Sharpchin rockfish in sponge at Daisy Bank.
Photo Credit: Oceana.

Proposal Summary (as modified in April 2016)

Oceana's modified proposal (excluding any EFH changes in the U&As) includes 61 EFH Conservation Areas/ modifications, plus seven proposed EFH Conservation Area openings, and protection for the deep-water ecosystem off California. If the Council were to adopt our modified proposal there would be the following habitat conservation area changes:

Total area of additional EFH Conservation Areas:	**19,633 mi^2**
Total area of proposed EFH Conservation Area openings:	**143 mi^2**
Net change in EFH Conservation Areas:	**19,490 mi^2**
Deep-water habitat conservation area:	**123,222 mi^2**
Total increase in area protected:	**142,712 mi^2**

Adoption of the EFH Conservation Area modifications in our proposal (excluding any changes in the U&As), plus the deep-water ecosystem protection, would protect from bottom trawling:

- An additional 1,289 square statute miles of hard rocky reef;
- An additional 208 square miles of mixed (hard/soft) reef;
- 4,729 coral observations as in the NOAA Deep Sea Coral Database plus thousands more documented in habitat surveys since 2013;
- 2,083 sponge observations;
- An additional 2,594 square miles of predicted highly suitable coral habitat.

In order to maintain significant opportunity for the bottom trawl fleet and minimize any economic impacts or displacement, our proposal would:

- Keep open to bottom trawling over 30,000 square miles on the continental shelf and slope off California, Oregon and Washington - with RCA removal south of Pt. Chehalis, WA.
- Displace no more than 2.3% of recent groundfish bottom trawl effort. But, if the Council also removes the entire trawl RCA south of Pt. Chehalis, WA the net change would result in restoration of approximately 1.6% of previous (Jan 1, 2002 - Jun 11, 2006) coastwide trawl effort; this would restore 11.7% of the trawl effort that was previously displaced by the current suite of closures.
- Displace zero bottom contact fishing effort with adoption of the deep-water area (>3,500 meters) off California.

Trawl Rockfish Conservation Area

In the Amendment 28 process, the Council will consider a range of alternatives to open part or the entire coastwide trawl RCA from the California/ Mexico border to the southern extent of the Tribal U&As off Washington (Point Chehalis, WA). The core trawl RCA - a narrow depth-based ribbon from 100 to 150 fathoms and 100 to 200 fathoms in some areas - spans the West Coast EEZ from north to south and is closed year-round to bottom trawling. The first trawl RCA was implemented in 2002 to protect overfished darkblotched rockfish and it was subsequently expanded in 2003 to protect canary rockfish, Pacific ocean perch, lingcod, widow and yelloweye rockfish. Regardless of the original purpose, the core trawl RCA is serving as a de facto habitat protection measure that, in combination with other conservation areas, reduces adverse impacts to EFH.

The trawl RCA overlaps existing EFH Conservation Areas. In some areas off California it overlaps state waters closed to bottom trawling. Those portions of the RCA that overlap with EFH Conservation Areas or state waters would remain closed to trawling if the RCA were lifted. When designing our proposal in 2013, we looked closely at priority habitat features overlapping the trawl RCA. Thirty-one of the proposed 61 EFH Conservation Areas partially overlap the coastwide trawl RCA. Below is a summary of the current RCA and what would remain protected within the trawl RCA with adoption of our proposal versus removal of the coastwide trawl RCA south of Point Chehalis, WA (south of the U&As).

	Protected in the current coastwide trawl RCA	Protected with trawl RCA removal south of Pt. Chehalis, WA	Trawl RCA removal + Oceana Proposed EFH Conservation Areas (excluding changes in U&As)
Total area (mi2)	3,574	881(-75%)	1,785 (-50%)
Rocky reef (mi2)	146	68 (-53%)	140 (-4%)
Mixed reef (mi2)	193	161 (-17%)	181 (-6%)
# Coral observations	18,554	18,214 (-2%)	18,506 (-0.3%)
# Sponge observations	514	263 (-49%)	407 (-21%)

Importantly, to ensure this action continues to minimize the adverse impacts of fishing on EFH, any changes to the trawl RCA and EFH Conservation Areas should result in an overall net increase in habitat protection in terms of total area and priority habitat features across all biogeographic regions (Northern, Central and Southern Biogeographic Regions) and depth strata (shelf and upper slope). While we understand the Council may choose to maintain certain portions of the trawl RCA as a management measure to control bycatch, we have designed and analyzed our modified proposal to ensure adequate habitat protections in the event the trawl RCA is removed.

Biogeographic Regions and Analysis

This report is structured by biogeographic region consistent with the coastwide biogeographic areas and depth zones identified in the National Marine Fisheries Service Groundfish EFH Synthesis Report prepared for the Council EFH review process (PFMC 2013). NMFS identified large biogeographic regions (Northern, Central, Southern and the Salish Sea) and further divided these into three depth zones: a) Continental Shelf (coastline to continental shelf break (approximately 200 m (110 fathoms)), b) Upper Slope (shelf break to 1,280 m/ 700 fathoms, which is the shoreward boundary of the "Bottom Trawl Footprint Closure", and the Lower Slope (1,280 m to the seaward EEZ boundary).

The following figures compare the percentage of the total area and substrate type protected from bottom trawling under status quo management (baseline) with adoption of the Oceana proposed EFH Conservation Area changes (Oceana modified and excluding changes in U&As), combined with removal of the core trawl RCA south of Point Chehalis, WA. The baseline includes current year-round non-tribal bottom trawl closures: EFH Conservation Areas, state water areas closed to bottom trawling, and the trawl RCA. Off Southern California the baseline includes the Western Cowcod Conservation Area, which would also remain closed as an EFH Conservation Area under our proposal. These figures show that if the trawl RCA is removed, our proposal would result in a net gain in total area and priority reef features protected from bottom trawling in the Northern, Central and Southern regions of the continental shelf and slope.

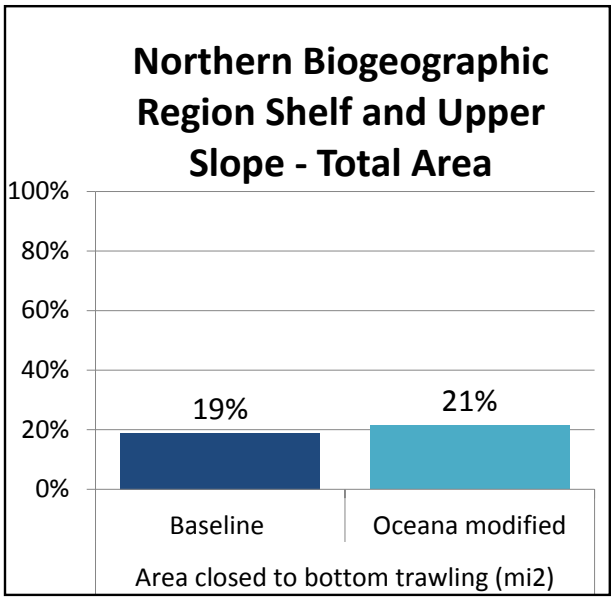


Chart 1. Northern Region (Shelf and Slope), percent of total area closed to bottom trawling.

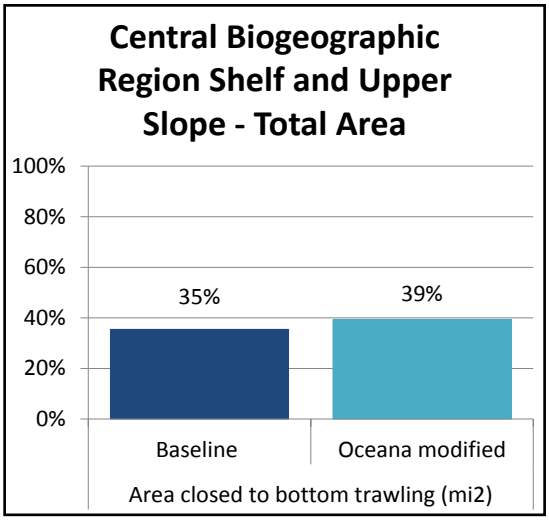


Chart 2. Central Region (shelf and slope), percent of total area closed to bottom trawling.

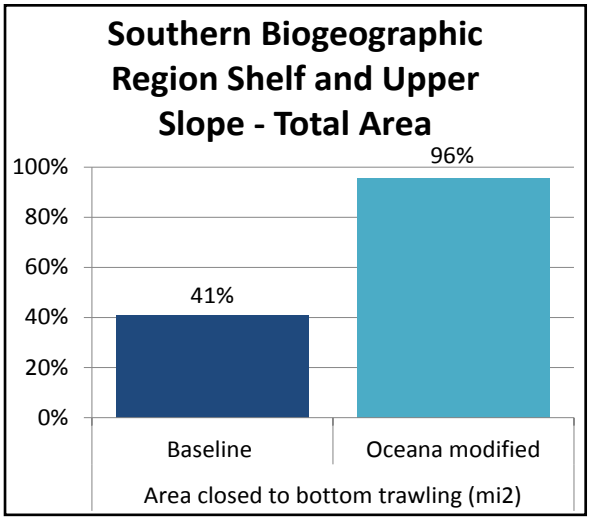


Chart 3. Southern Region (shelf and slope), percent of total area closed to bottom trawling.

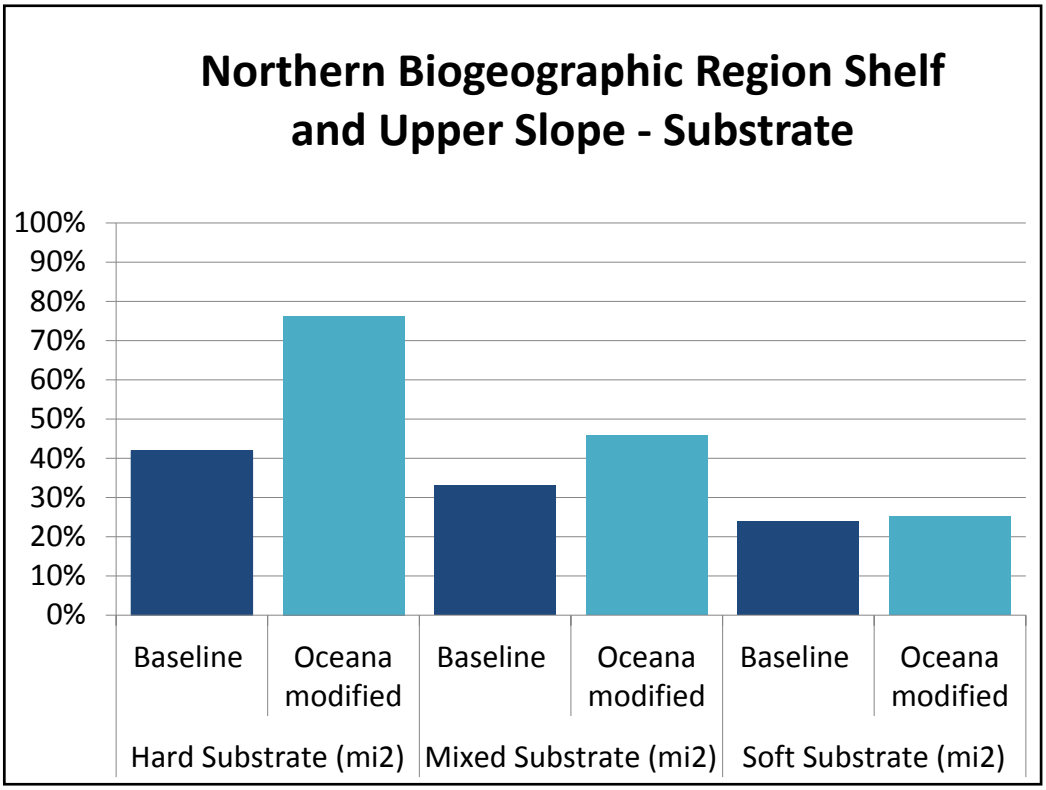


Chart 4. Percent substrate protected in the Northern Biogeographic Region, shelf and upper slope combined, under the baseline (status quo areas closed to bottom trawling) and the Oceana modified proposal, and with trawl RCA removal south of Point Chehalis, WA.

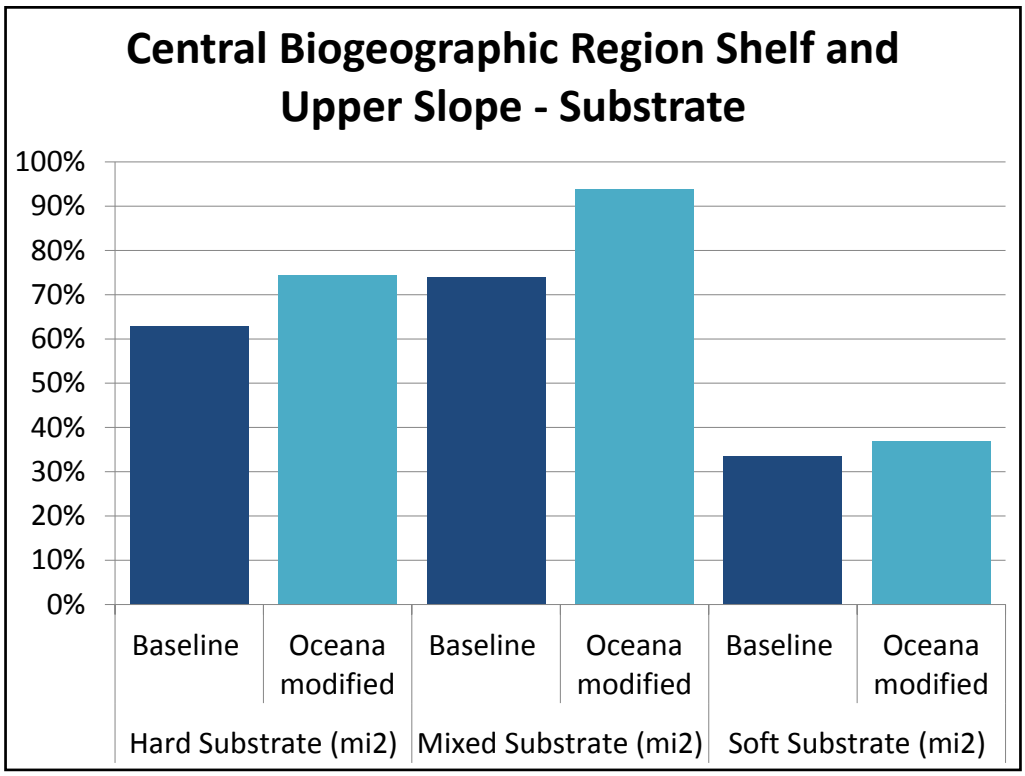


Chart 5. Percent substrate type protected in the Central Biogeographic Region, shelf and upper slope combined, under baseline (status quo areas closed to bottom trawling) and the Oceana modified proposal, with trawl RCA removed.

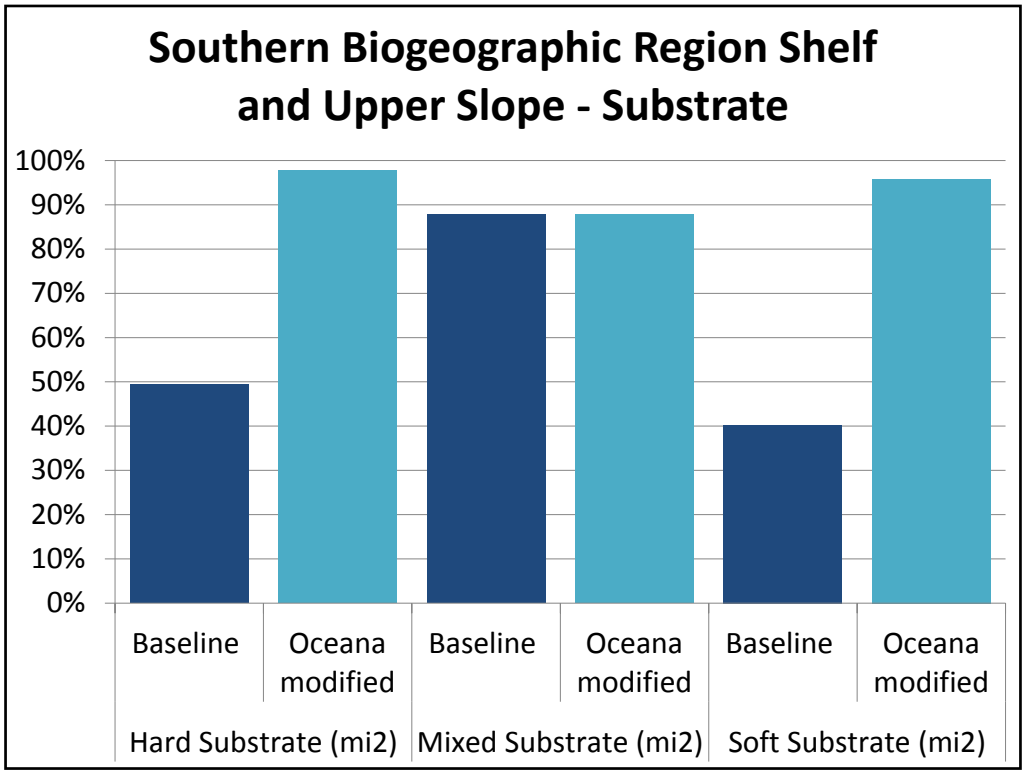
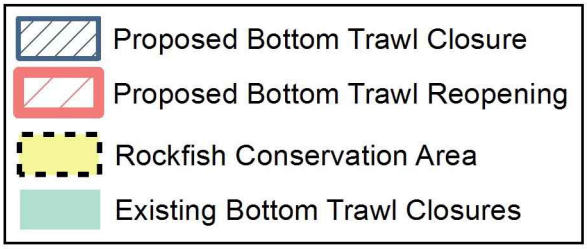


Chart 6. Percent substrate protected in the Southern Biogeographic Region, shelf and upper slope combined, under baseline (status quo areas closed to bottom trawling) and the Oceana modified proposal, with trawl RCA removed. The baseline analysis includes the Western Cowcod Conservation Area, which would remain closed under the Oceana proposal.

Northern Biogeographic Region
(U.S. Canada Border to Cape Mendocino, California)



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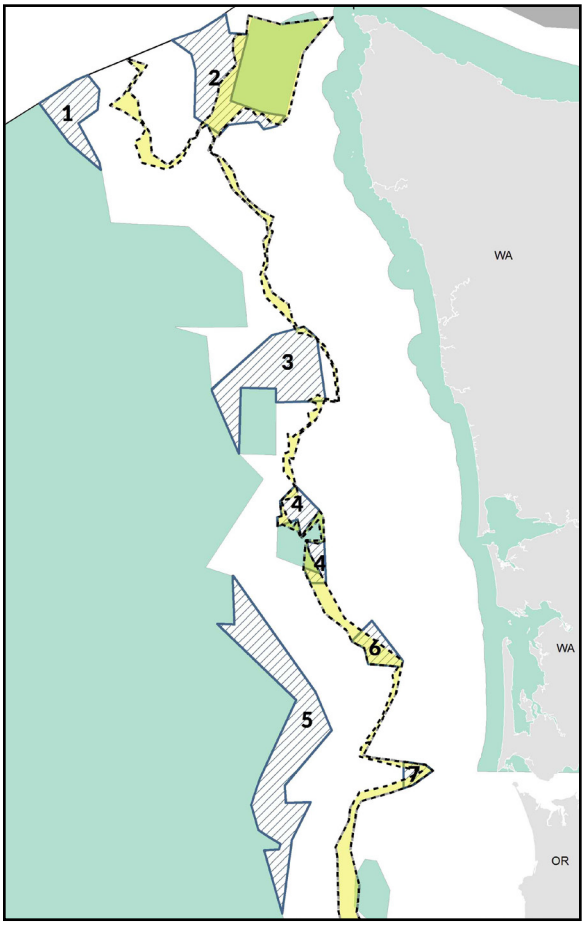
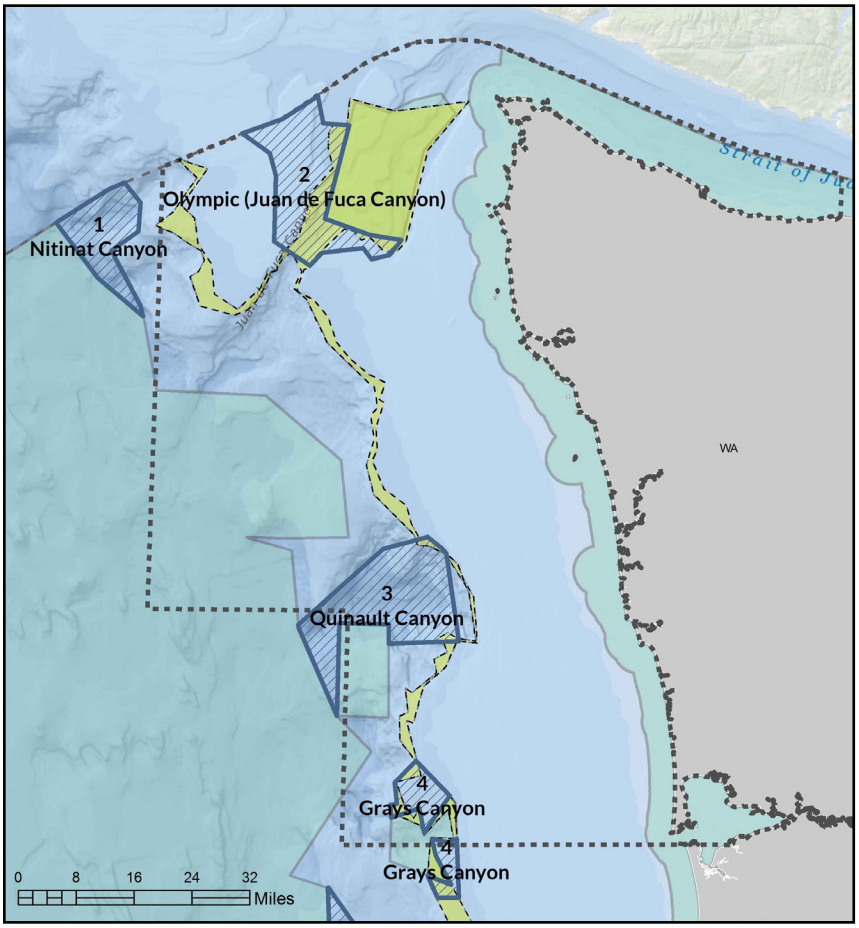
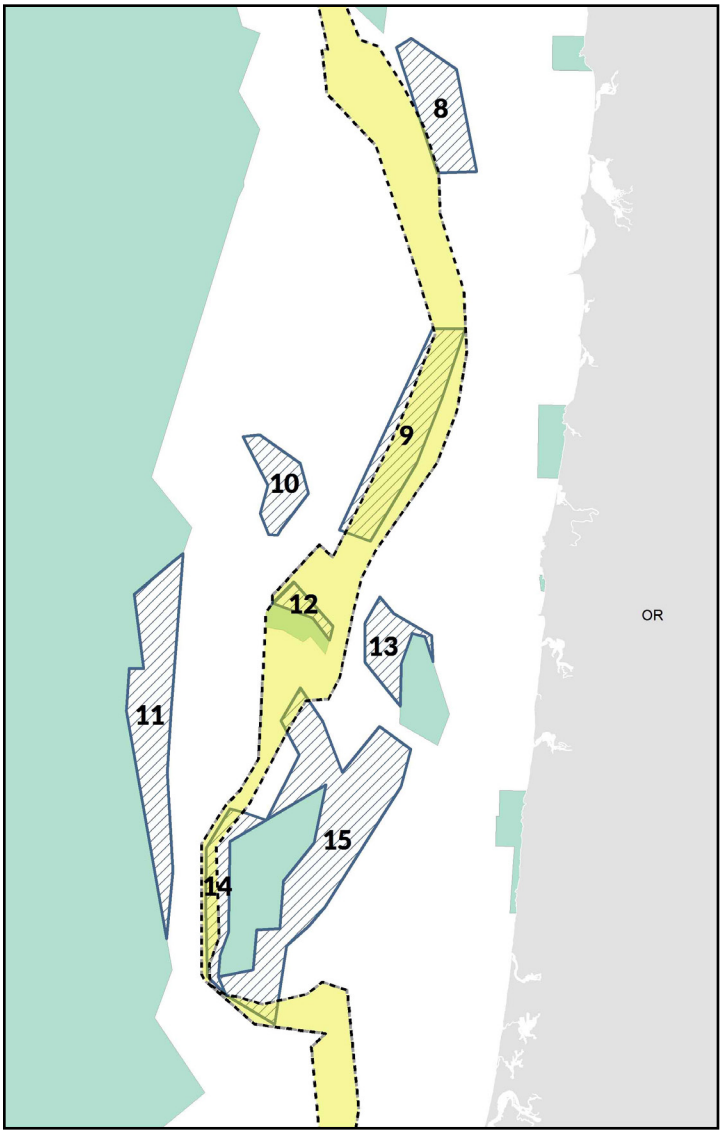


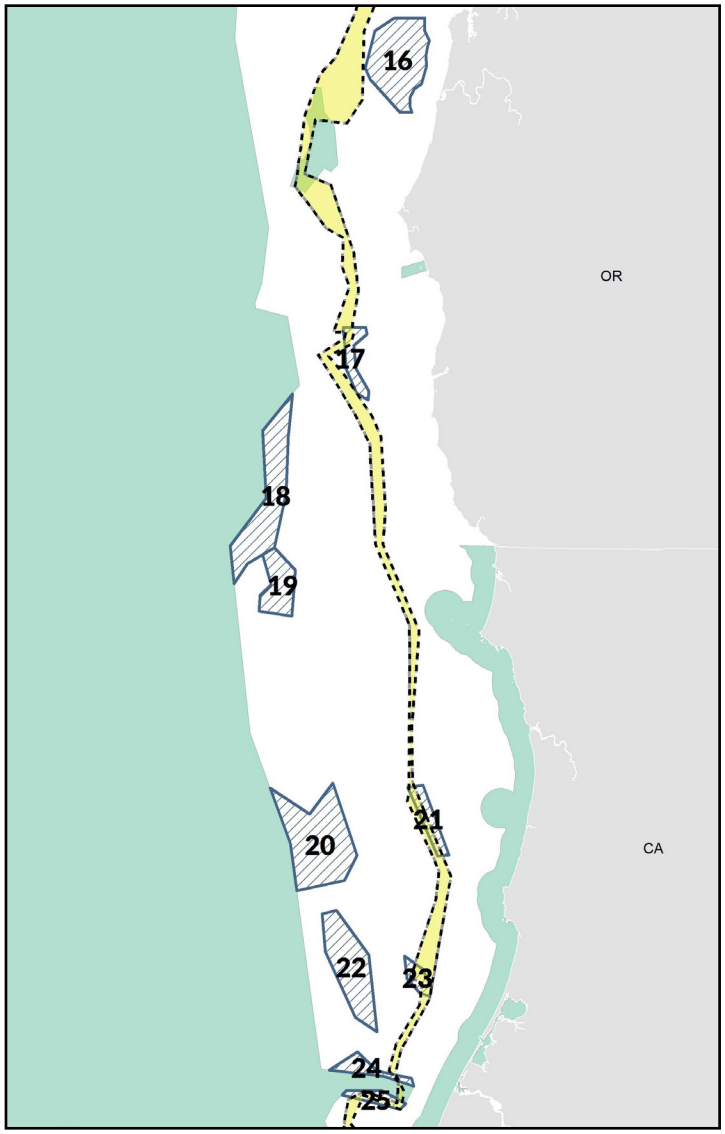
Overview Map 1. Nitinat Canyon (1) to the proposed Astoria Deep EFH Conservation Area (5). The trawl RCA in yellow is overlapping existing areas closed to bottom trawling (light green) and the proposed conservation areas (blue stripes).



Overview Map 2. Nitinat Canyon (1) to Grays Canyon (4) proposal areas, showing the intersection with the outer Tribal U&A boundary off Washington in the dashed line and existing areas closed to non-tribal bottom trawling including Washington State waters, EFH Conservation Areas, and the trawl RCA (yellow, which overlays the Olympic 2 EFH Conservation Area).

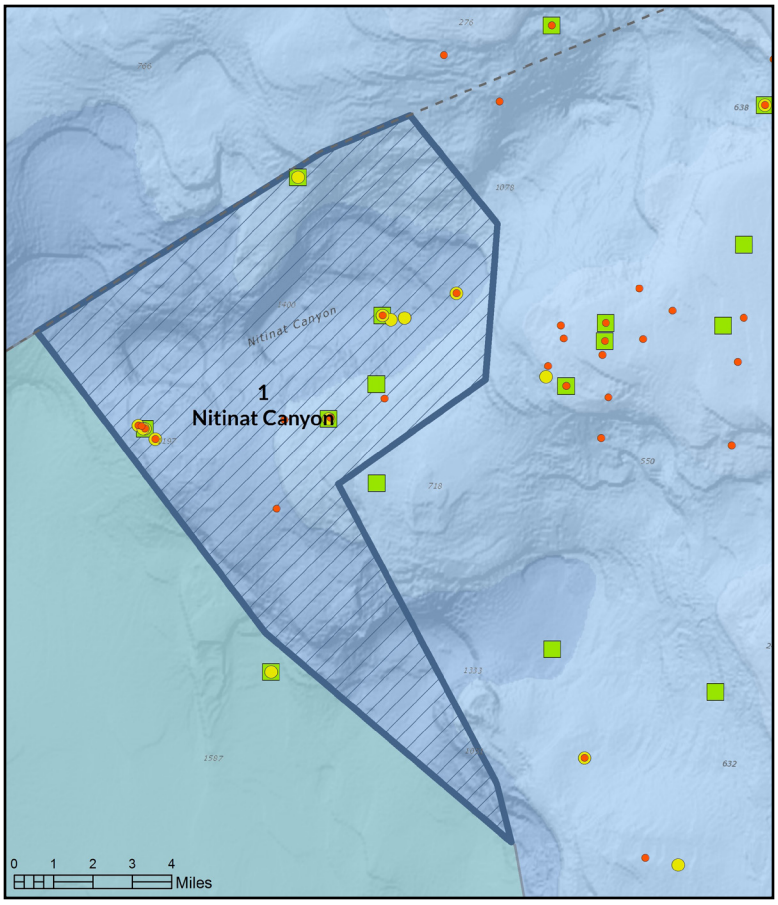


Overview Map 3. South Nehalem (8) to Heceta Bank (14 &15) proposal areas showing existing EFH and Oregon state water areas closed to bottom trawling and the overlapping trawl RCA.



Overview Map 4. Northern Region, Cape Arago Reef, OR (16) to South Eel River Canyon, CA (25).

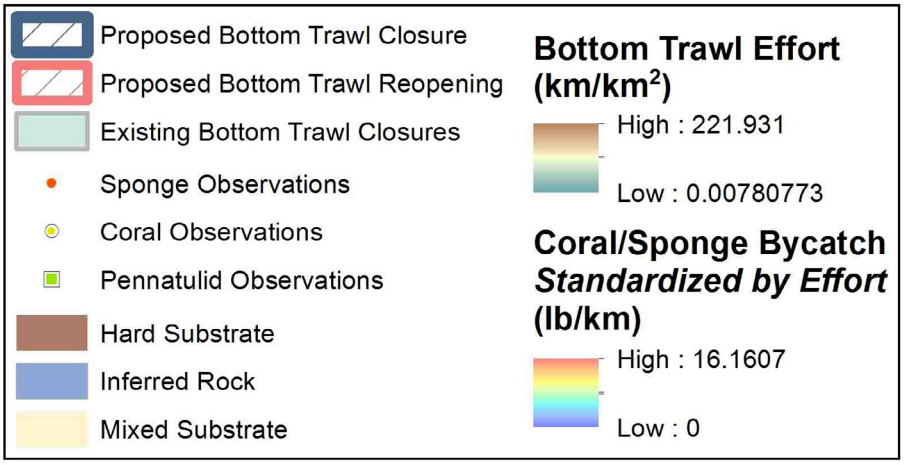
1. Nitinat Canyon



Considered highly suitable for coral growth due to slope, depth, and chemical conditions, this area will protect the canyon features and coral and sponges of Nitinat Canyon west of Washington. Trawl surveys have confirmed the presence of gorgonian corals, black corals, glass sponge, and other important structure-forming species. The area is EFH for groundfish including Dover sole, sablefish, shortspine thornyheads, and longspine thornyheads known to have high levels of occurrence or abundance here based on Northwest Fishery Science Center (NWFSC) models prepared for the PFMC EFH review.

Substrate characteristics are uncertain as this area has yet to be mapped with high resolution sonar. Depths included range from 600 m to 1,500 m, protecting upper slope habitat. Very little to zero bottom trawl effort occurs here according to the trawl data available in the EFH Data Catalog, allowing for minimal interference with fishing activities while protecting priority habitat features. Relatively high coral and sponge bycatch, however, has been observed in the southeast corner of Nitinat Canyon. The shape of this area is designed to encompass the canyon feature, link to the deep-water footprint closure, avoid areas of high bottom trawl effort, incorporate coral and sponge observations and have enforceable lines. The proposed area is outside of Tribal U&As.

2. Olympic (Juan de Fuca Canyon)



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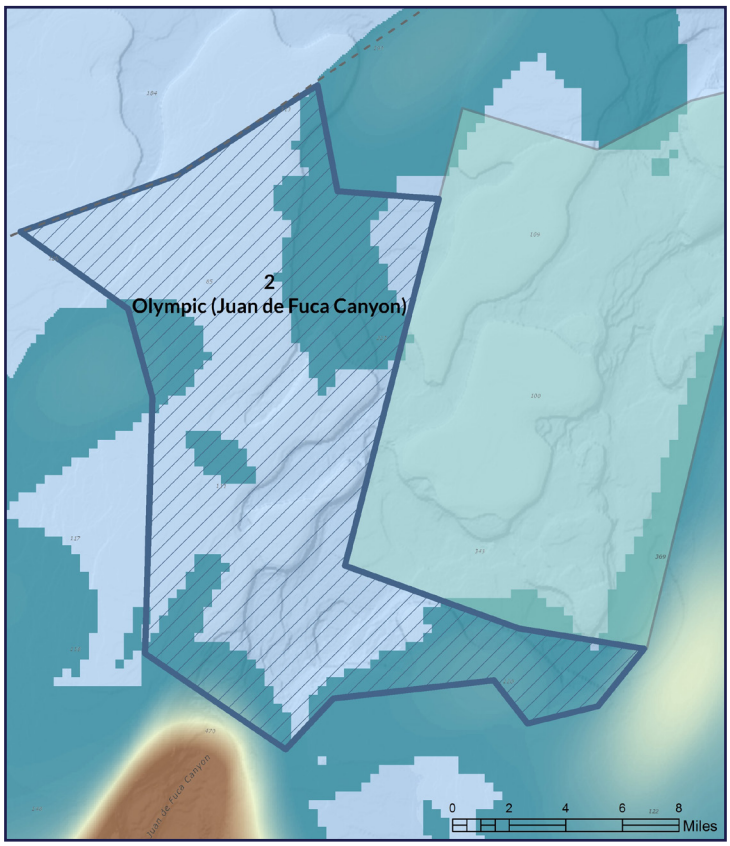
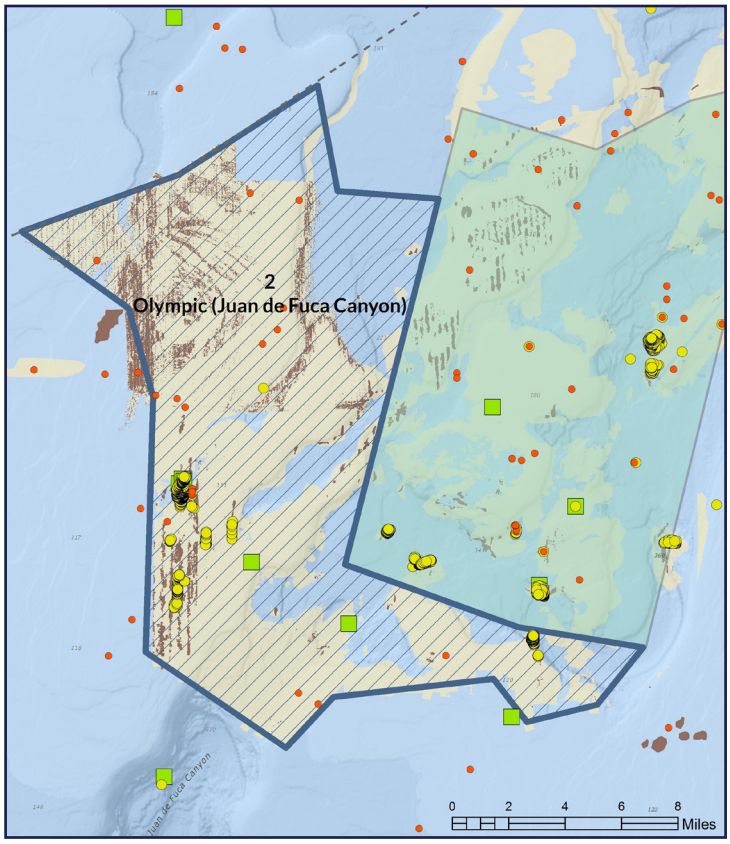
Heavily studied by NOAA and several academic institutions, this area is characterized by significant deep-sea coral and sponge communities. There are over 7,600 coral observations in the proposal area. Average coral density, based on a 2010 NOAA ROV survey, is 33 individual coral structures per 1,000 m^2. These communities consist of black, gorgonian, and stony corals, as well as reef building sponges. These coral and sponge communities host fish species such as rosethorn, yellowtail, yelloweye, canary, tiger, and Puget Sound rockfishes, lingcod, spotted ratfish, Pacific halibut, and kelp greenling. Gravid female rockfish were noted in these communities suggesting their importance for breeding and spawning. Hard and mixed reef substrates are important for many groundfish species and this area covers nearly 150 square miles of these habitat types. The proposal area encompasses the upper portion of the Juan de Fuca Canyon with depths reaching 300 m.

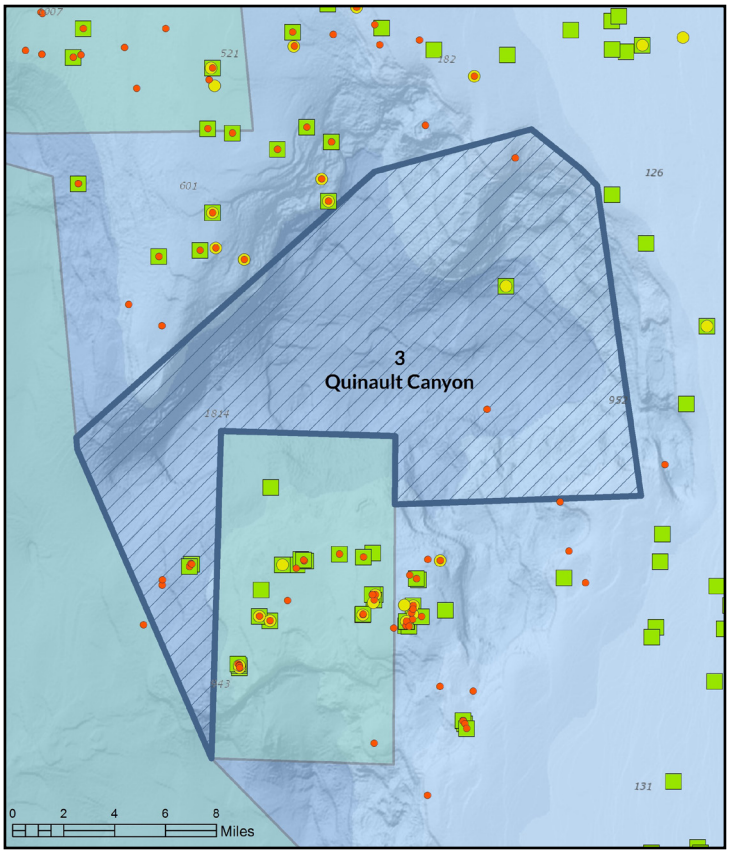


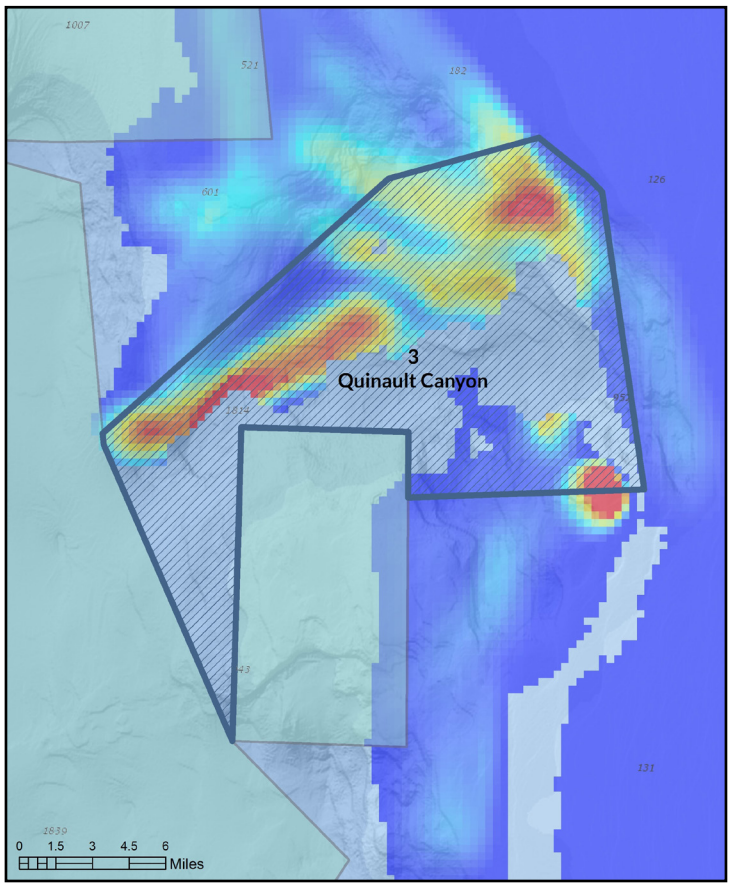


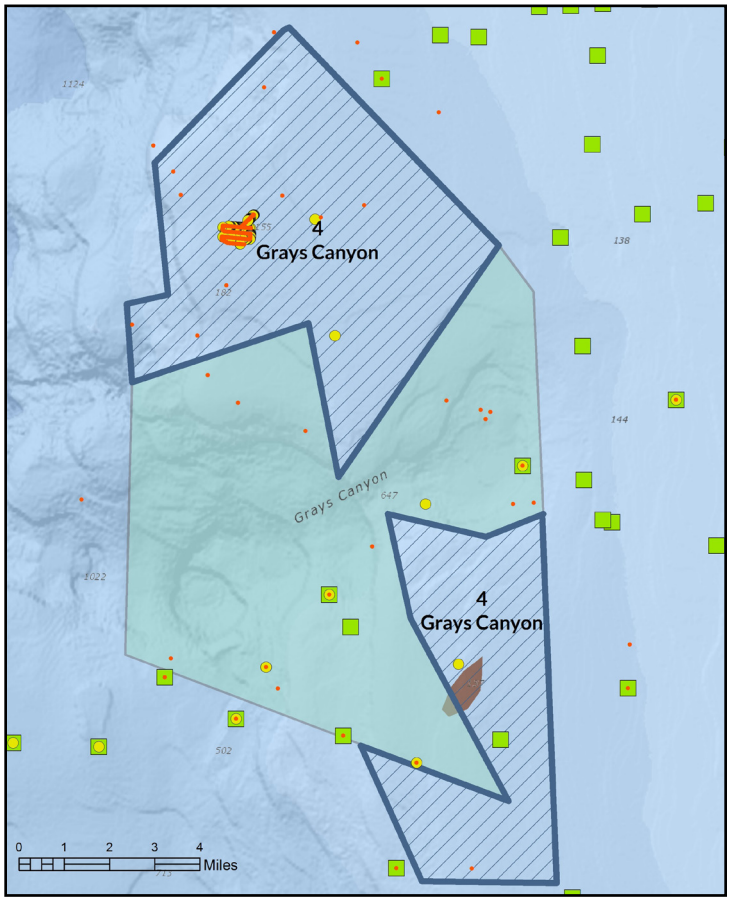
The proposed Olympic area would build off the adjacent Olympic 2 EFH Conservation Area to the east. The shape is designed to encompass the well-documented hard and mixed substrate and observed biogenic habitat while avoiding areas important to the bottom trawl fishery. In addition, the design of this site would incorporate a portion of the RCA that runs up the canyon, maintaining protections for this important habitat area should the trawl RCA be reopened. This area overlaps Makah and Quileute U&As.

3. Quinault Canyon

This large submarine canyon is particularly important for many fish, invertebrate, and cetacean species due to the productive topographically induced upwelling that occurs here. Rockfish have been observed to utilize the high relief offered by boulders, vertical walls, and ridges of the canyon. Despite low sampling efforts, there are 14 records of corals, sponges, and pennatulids including black coral and glass sponge.







The proposed Quinault Canyon area spans depths between 200 m to nearly 1,700 m, encompassing a wide diversity of geologic structure and depth. The design is enforceable and builds on to the existing Biogenic 2 closure to the south. This area includes disproportionately high levels of sponge and coral bycatch that have been observed here; indicating that designating this site as an EFH Conservation Area will protect important coral and sponge biogenic habitat and minimize adverse fishing impacts. This area overlaps Tribal U&As. The proposal area west of the adjacent EFH Conservation Area (Biogenic 2) is outside of the U&A boundary. The proposal area overlaps with the RCA at the canyon rim on the east side.

4. Grays Canyon

This proposed EFH Conservation Area would expand on the existing canyon area and includes known locations of black coral, gorgonian coral, and a large, unique glass sponge reef. There are also methane seeps in the reef area. There are over 2,800 sponge observations at the reef and video analysis found rockfish were nine times more likely to be observed in video frames with sponges than frames without sponges, suggesting the sponge reef is important rockfish refugia. The environmental conditions here are nearly identical to the location of the largest known glass sponge reef located off British Columbia. NOAA surveys and studies by Washington Sea Grant and University of Washington scientists (Bjorklund et al. 2008) documented the sponge reef and found two of three reef-building glass sponge species present there.

This proposal area aims to protect, from non-Tribal bottom trawling, the shelf habitat adjacent to the canyon known to have a high density of sponges. There is hard substrate in this area and a high level of topographical diversity. In shaping the area, one goal was to avoid areas import to groundfish and shrimp bottom trawling, in addition to protecting the essential reef habitat and other physical and biogenic structures. The area overlaps part of the trawl RCA but the sponge reef is outside of the year round trawl RCA. The proposed area to the north overlaps the Quinault Nation U&A and most of the area on the south side is outside of the U&A.

5. *Astoria Footprint Modification*

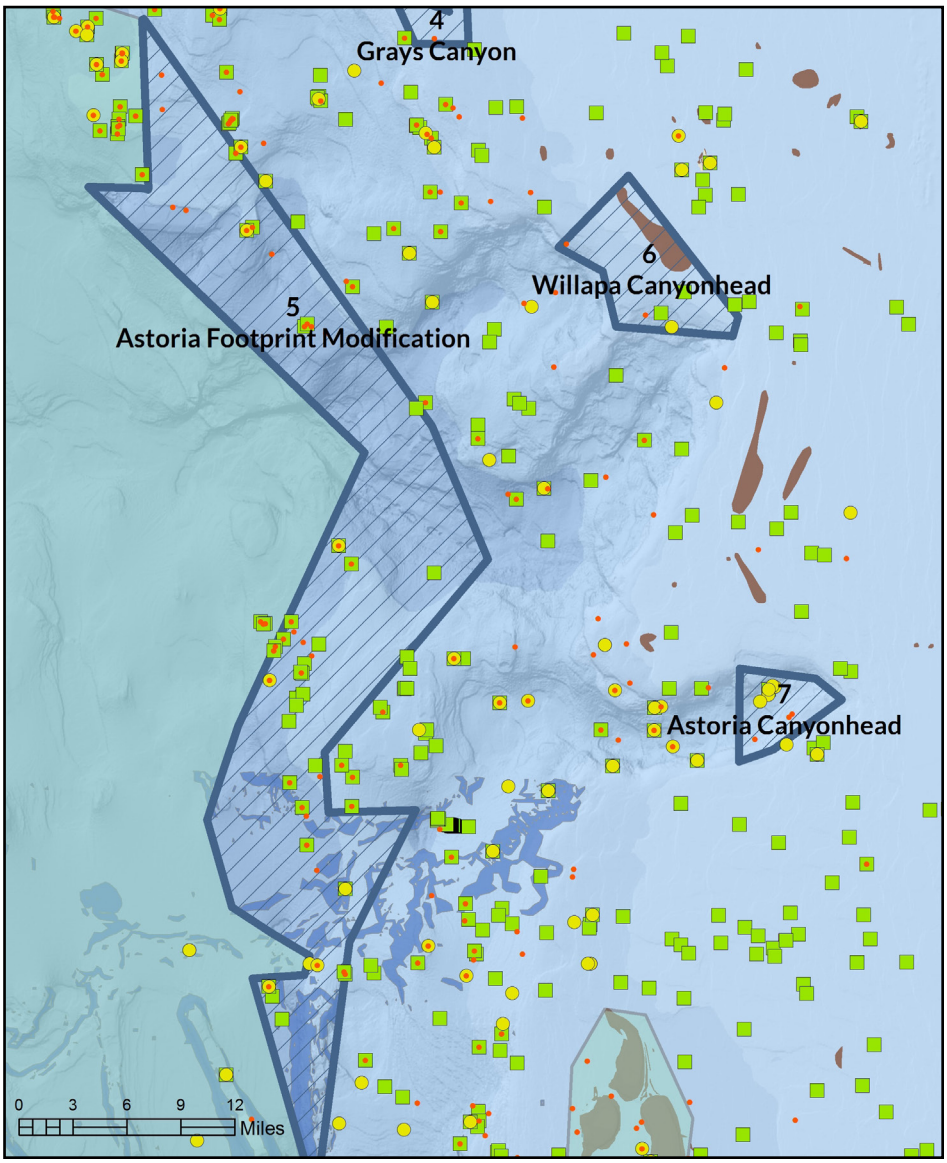
This extension of the Astoria footprint trawl closure covers deep regions of the Astoria and Willapa submarine canyons west of Washington and Oregon. In total, 97 observations of corals, sponges, and pennatulids have been made in this area. Glass sponges, sea pens, black coral and other coral species live here. Terrain, chemical, and biological characteristics of the region suggest high suitability for all coral taxa. NMFS NWFSC describes the area as high value habitat for sablefish and longspine thornyheads, and EFH for several rockfish species and petrale sole.

There is predicted rock substrate in the proposal area (dark blue) and depths spanning 500 m to 1,700 m, suggesting topographical complexity. This proposal location was designed adjacent to the current trawl footprint closure and it includes almost no recent trawl effort. Protecting it would conserve high value habitat with very limited, if any fishery impacts.

6. *Willapa Canyonhead*

West of Willapa Bay, Washington, the Willapa Canyonhead area is high value habitat for several groundfish species. According to the NWFSC species models, the area is important for darkblotched rockfish, greenstriped rockfish, and sablefish with rocky reef areas of likely importance for overfished yelloweye rockfish. Several species of sponges, coral, and sea pens have been found here.

The proposed area accounts for the ecological importance of submarine canyon systems. The site incorporates known mixed and hard substrates, indicating geologic complexity and diversity. It crosses shelf and some upper slope habitat between approximately 130 and 400 meters deep. The design is primarily within the current year-round trawl RCA but extends slightly east to include rocky reef habitat.



7. *Astoria Canyonhead*

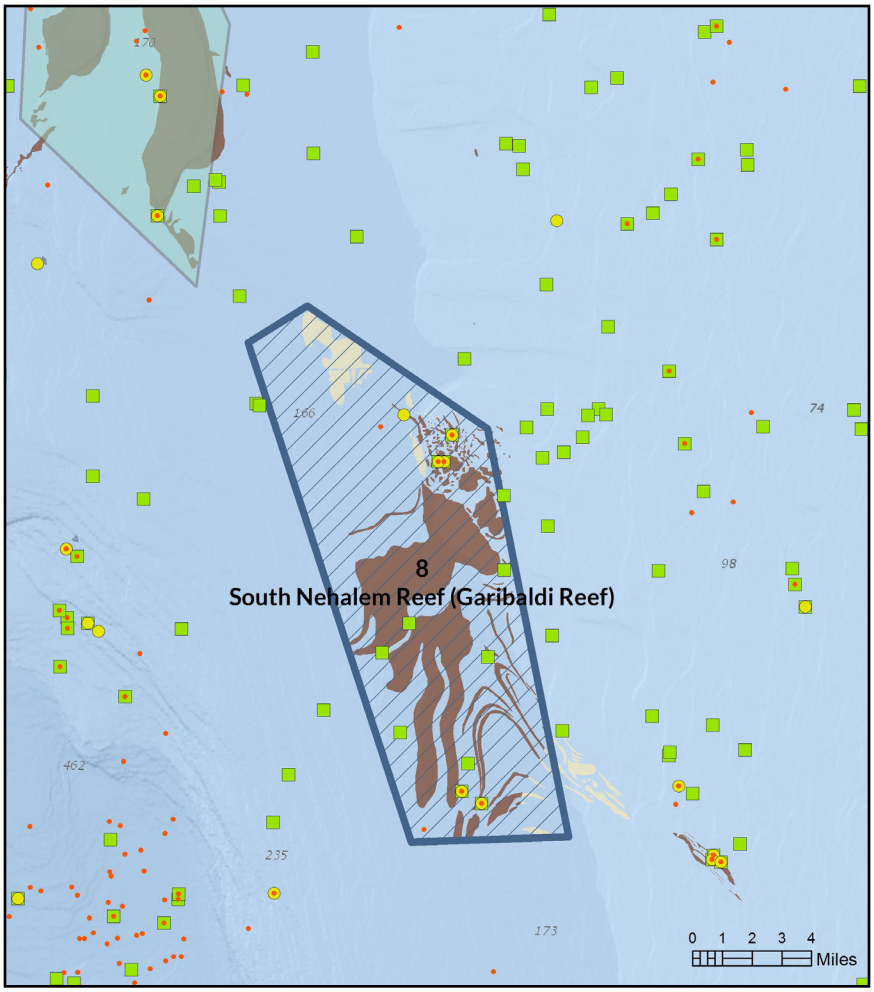
The proposal area at Astoria Canyonhead – roughly 12 miles west of Washington and Oregon off the mouth of the Columbia River - is important for sponge and corals with high predicted habitat suitability for all coral taxa combined due to depth, slope, and other chemical variables. The area is designed to overlap the priority features of the upper canyon where the canyon overlaps the trawl RCA. NOAA trawl surveys yielded six coral records including black and gorgonian corals, plus glass sponge. Fish found here may include darkblotched rockfish and sablefish, according to NWFSC species models. This section of steep and narrow canyon receives key terrestrial carbon inputs from a flux of freshwater coming from the Columbia River, making this an important center of accessible energy along the seafloor.

A study conducted by Bosley et al. (2004) explored the hydrography and trophic relationships of this canyon. Turbulence between the canyon walls directs the transfer of deep nutrients and energy to the nearby shelf habitat (Bosley et al. 2004). Availability of nutrients and prey draws a number of fish species to this canyon. Trawl surveys conducted by Bosley et al. (2004) found nine species of rockfish as well as sablefish, Dover sole, deepsea sole and lanternfish. Prey was identified for each of these fish species with bocaccio at the highest trophic level feeding primarily upon Pacific ocean perch (Bosley et al. 2004). Other prey species such as shrimp, krill, squid, copepods, and myctophids are abundant in this canyon (Bosley et al. 2004). Overall, high densities of pelagic rockfish have been observed here and the canyon appears to be important as rockfish feeding grounds (Bosley et al. 2004). This area, and other canyonheads, may be critical for heavily exploited *Sebastes spp.*

8. South Nehalem Reef (Garibaldi Reef)

This rocky reef habitat to the northwest of Tillamook, OR, represents new data since 2005. The 26 observations of coral, sponge, and pennatulid species include black coral in the northern portion of the site. The southern portion of the area contains sponges and gorgonian corals. Oceana dove on this are in 2013 with an ROV and confirmed the presence of bedrock, gorgonian coral, sponge and pennatulids. In between fingers of reef there are soft, mud seafloor habitats. Species that may be utilizing the habitat in this area, according to NWFSC models are darkblotched, greenstriped, and overfished yelloweye rockfish.

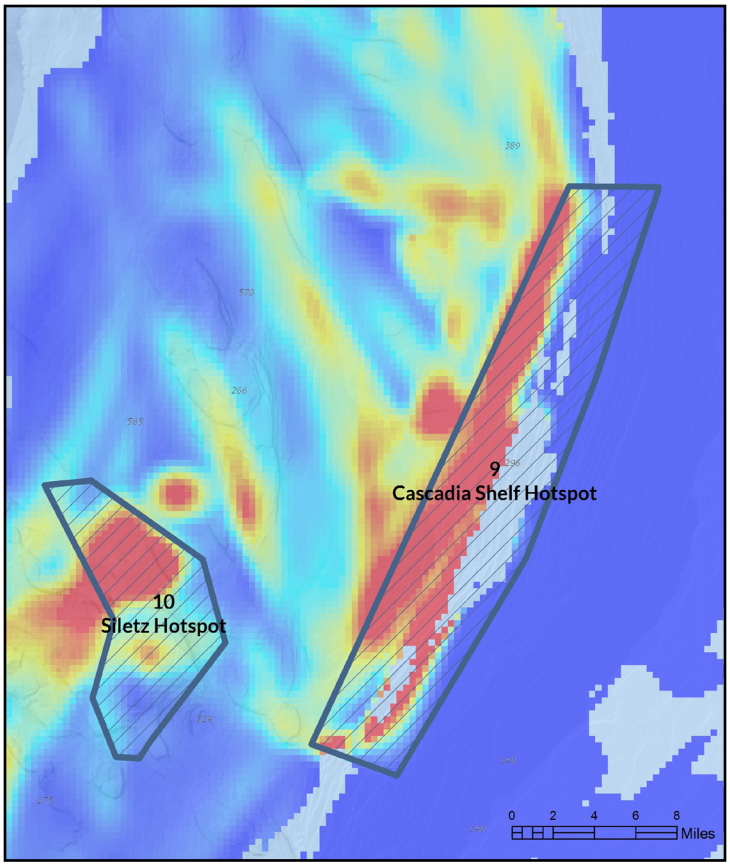
Bottom trawl data shows little to no effort occurs here. Data provided by ODFW to utilize in consideration of shrimp trawling activity, informed the lines of this area to avoid sections important to this industry to the north and east of the proposal area. This site has easily enforceable lines, and according to ODFW data, will affect less than one percent of Oregon pink shrimp trawl effort.



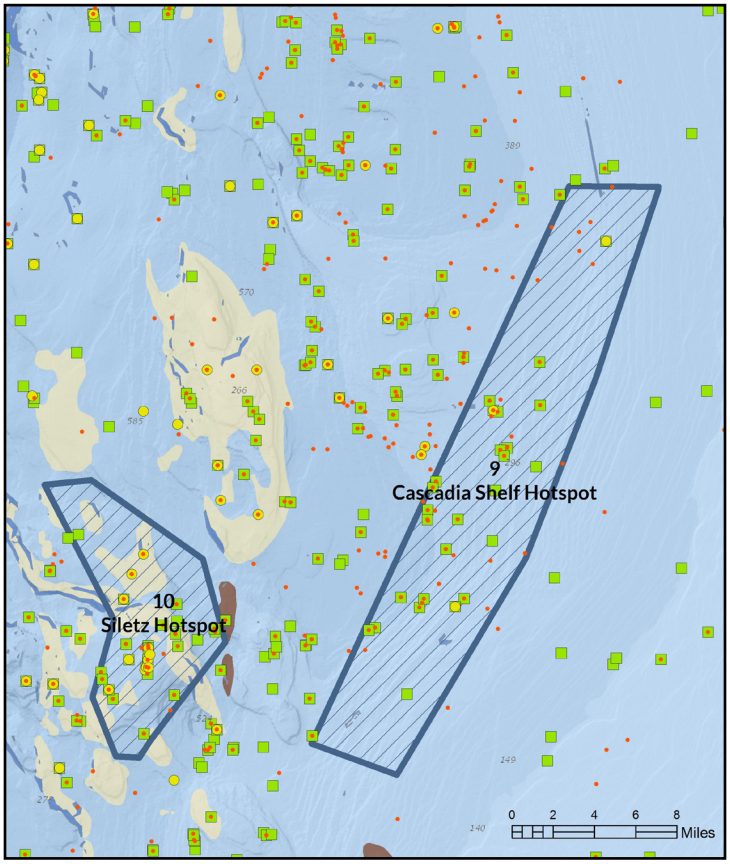
9. Cascadia Hotspot

Located west of Lincoln City, Oregon, this area was identified due to the relatively high sponge bycatch according to the West Coast Groundfish Observer Program and to include portions of the adjacent trawl RCA. The Cascadia Hotspot has the highest bycatch rate score of all the areas proposed for EFH Conservation Area designation. Taxa observed here include, but are not limited to, glass sponges, black corals, and pennatulids, each integral to seafloor habitat complexity.

Much of the upper slope habitat along the West Coast is open to bottom trawling and this at-risk area is a very small portion of this bioregion that would clearly benefit from protection. Closing this hotspot presents the unique opportunity to reduce bycatch at a high rate area while restricting a relatively low amount of seafloor area from bottom trawling. Less than one percent of bottom trawl effort in the state of Oregon has occurred here in recent years. The highest levels of bycatch occur within the western portion of the proposed area. The eastern portion of the area incorporates the trawl RCA.



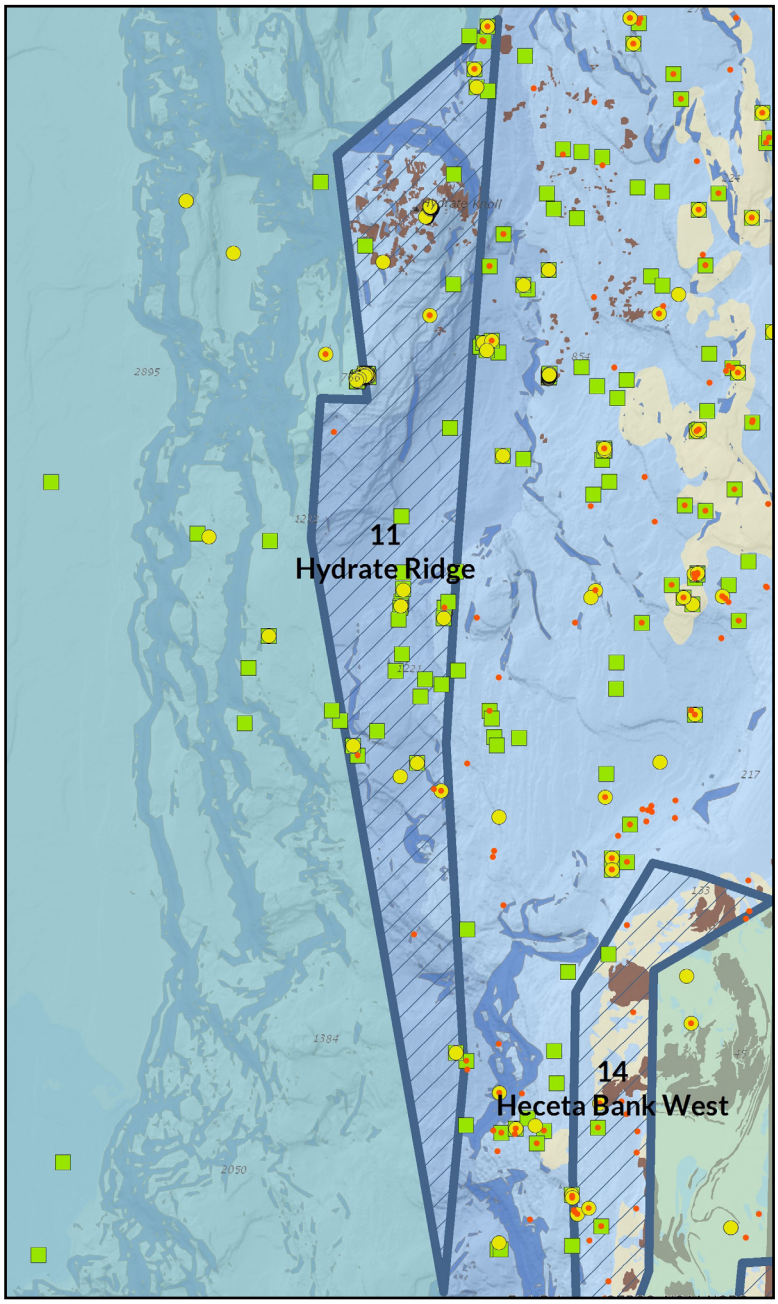
10. Siletz Hotspot



To the west of the Cascadia Hotspot, is another area that is characterized by high coral and sponge bycatch rates. With a total of 69 coral, sponge, and pennatulid observations at this site, designating this area for EFH Conservation would protect black coral, gorgonian coral, glass sponge, and other habitat-building species. According to the NMFS NWFSC species models, this location appears especially important to darkblotched rockfish, longspine thornyhead and sablefish. Oceana dove on this site with an ROV in 2013 and documented and confirmed mixed reef habitat with boulders, cobble and sand, multiple rockfish species, sponge, gorgonian coral and soft coral.

The boundaries of this site were defined primarily in response to the high levels of coral and sponge bycatch in the area while trying to avoid areas of relatively high trawl intensity immediately adjacent to the proposed site. Bathymetric data shows this area includes an offshore bank that rises up to 240 m and then drops to 800 m in the north. Protecting this site would limit impacts to fishing while simultaneously protecting important biological features, as less than one percent of trawl effort in Oregon has occurred here over recent years.

11. Hydrate Ridge/Central Oregon Footprint Modification



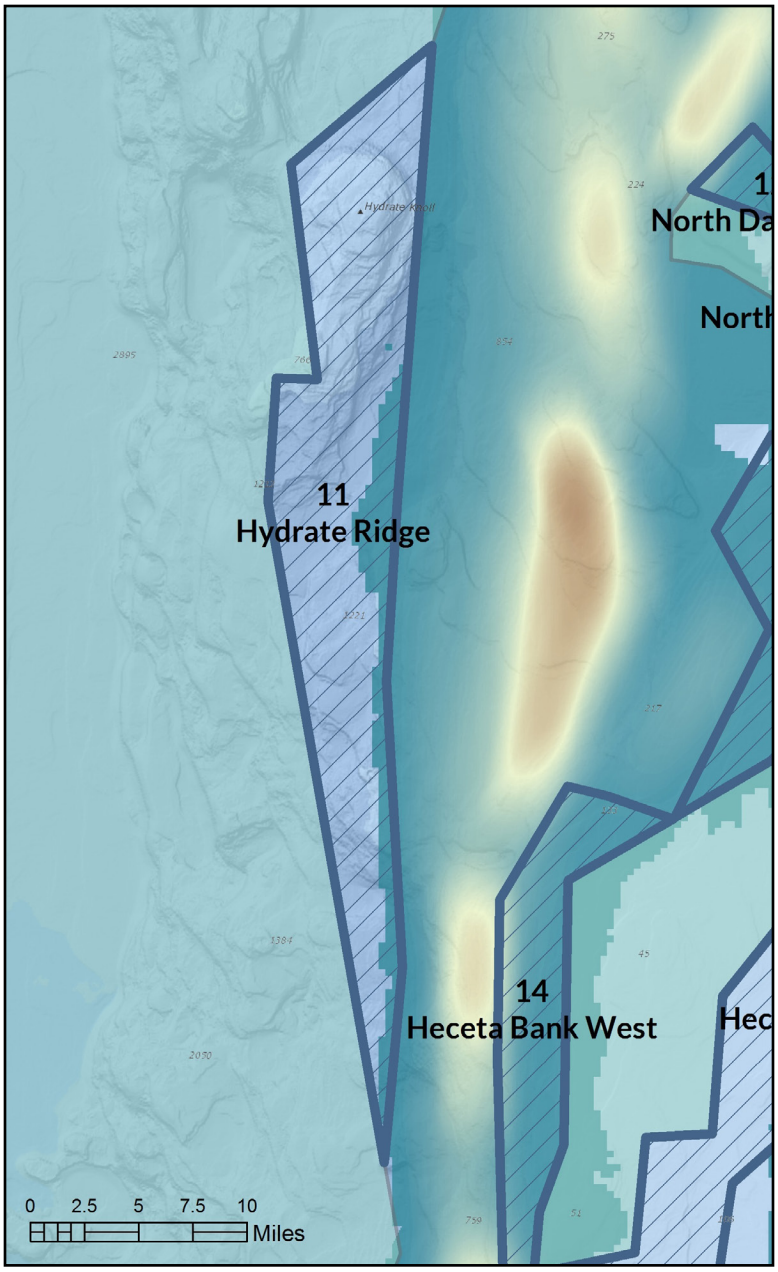
With 343 coral and sponge observations, this site has been relatively well-documented as an important location for biogenic habitat and associated fish species. In addition to gorgonian corals, black corals, and glass sponges, soft corals and Paragorgia (bubblegum coral) have also been observed here. Researchers have found gas hydrate and methane seep carbonates in this region (Johnson et al. 2003, Pasulka et al. 2016). These unique biological and physical characteristics are important for maintaining diverse ecosystems within the oceans and deserve protection. Physical and chemical conditions within this site have been found to be highly conducive for the growth of all coral taxa. Based on species models, this site is ranked high for occurrence and abundance of sablefish and longspine thornyheads.

Hydrate Ridge has high topographic, geochemical, and ecological variability that makes it ideal for conducting research on methane seep communities (Pasulka et al. 2016). The various methane seep assemblages on this ridge include microbial mats, clam beds, and carbonates. Clam bed assemblages, in particular, are important for associated macrofauna as they release higher levels of oxygen (Levin et al. 2010). The southern portion of Hydrate Ridge is in an oxygen minimum zone (OMZ) and has greater microbial diversity than northern Hydrate Ridge (Pasulka et al. 2016). Southern Hydrate Ridge is the proposed site for the OOI Cabled Array to begin continuous study of this seep environment (Interactive Oceans 2016).

The top of Hydrate Ridge (also called Hydrate Knoll) in the north of the proposal area rises up to 574 m and there is a deep ravine to the southwest of the ridge that drops to over 1,200 m. The site's benthos is composed of hard substrate, predicted rock, and soft substrates. Protecting this locale will not significantly displace bottom trawl effort (see map showing very little to no recent bottom trawl effort) and will benefit methane seep communities, groundfish, and several unique structure-forming species.

12. North Daisy Bank

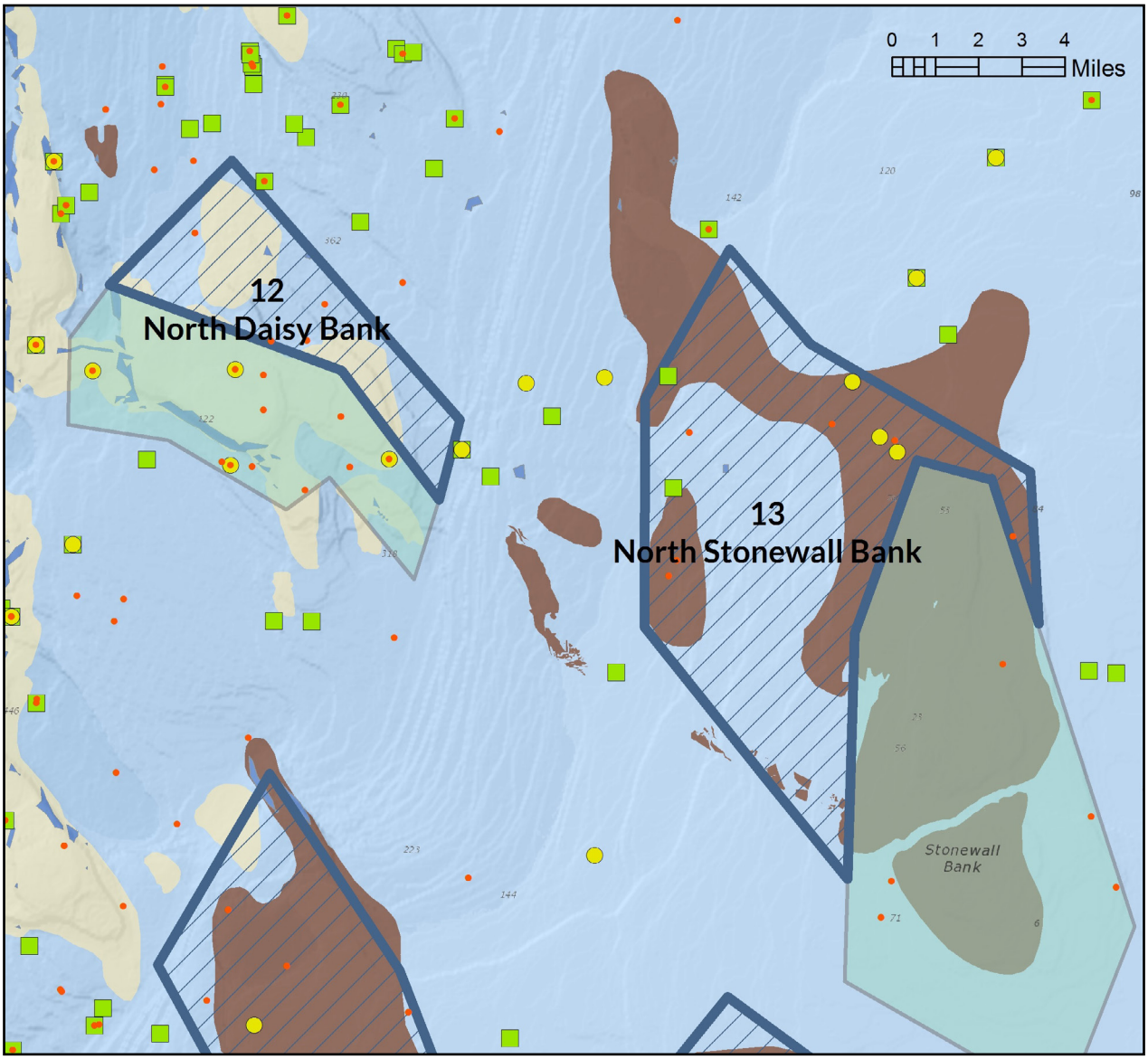
New substrate maps made available as part of the Council's EFH review show the presence of "mixed" reef habitat north of the existing Daisy Bank EFH Conservation Area. This newly identified habitat is incorporated in this proposal area. The boundaries of this area encompass records of sponges, primarily glass sponges, from NOAA trawl surveys. Dive surveys conducted by Oceana confirmed the presence of mixed reef seafloor habitat and showed that other sessile invertebrate species, including gorgonian corals and barrel sponges, are found on this bank. At varying levels of probability, all groundfish species analyzed in NWFSC models occur or are abundant here with sablefish having the highest probability of occurrence and abundance. The proposed area is inside the year round trawl RCA indicating that the conservation area would not displace any recent trawl effort.



13. North Stonewall Bank

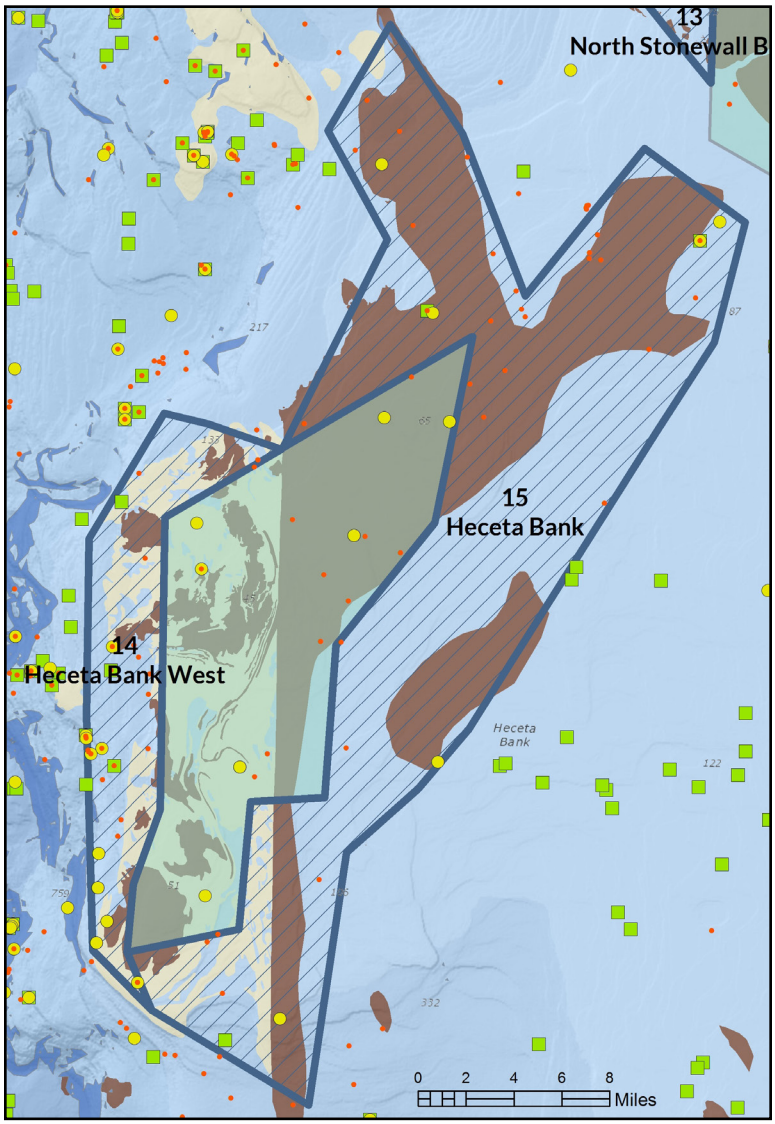
Contained within this proposed site are coral, sponge, and pennatulid observations, according to the EFH Review Catalog. In addition to gorgonian corals and glass sponges, also found here are managed groundfish species. Greenstriped rockfish and petrale sole have the highest probability of abundance according to NWFSC models. This shelf habitat contains hard reef substrate and the data provided for the EFH review represent a new understanding of the extent of the reef. In 2014, Hannah & Blume (2014) observed blue, canary, quillback, rosethorn, silvergray, widow, yelloweye, and yellowtail rockfishes as well as kelp greenling, lingcod, northern ronquil, spotted ratfish, and sculpin within a survey of 160 sites around the whole of Stonewall Bank. Oceana documented sponge, coral, managed groundfish species and hard and mixed reef features during ROV dives in this proposal area.

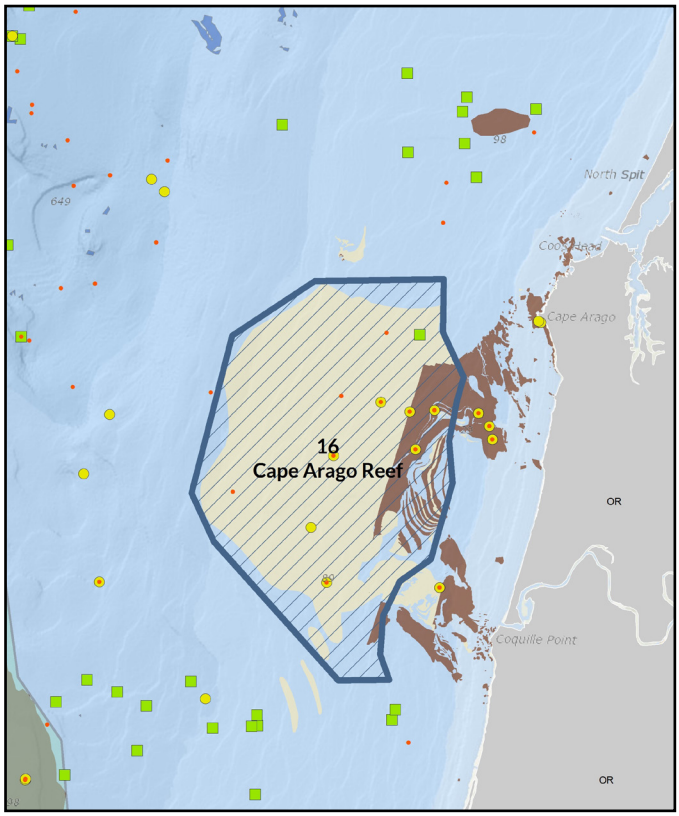
This proposal area is an extension of the north and west boundaries of the current Stonewall Bank EFH Conservation Area, with the goal of protecting a greater amount of the reef habitat there. However, we do not propose the entire reef be protected as it appears from the trawl data there is fishing effort in close proximity to the northern stretch of the reef. Thus, in order to limit impacts to groundfish bottom trawl and Oregon pink shrimp trawl fisheries, this extension is smaller than originally planned and remains distinct from nearby protected areas at Heceta Bank and Daisy Bank. Very little to no trawl effort occurs in this proposed area expansion, and designating this site as an EFH Conservation Area would yield the benefit of protecting priority habitat features.



14. & 15. Heceta Bank & Heceta Bank West

Heceta Bank is the largest contiguous rocky reef complex in the U.S. EEZ north of Cape Mendocino, California. This area is essential to groundfish for feeding and breeding, and is also a hotspot for pelagic birds and marine mammals. The modifications here included two sites – Heceta Bank West (#14) and Heceta Bank (#15) to the east. Both sites are predominately located on the continental shelf at depths less than 200 m, however, the western area drops to roughly 500 m in one spot and both partially overlap sections of the trawl RCA. Heceta Bank West includes newly identified reef habitat mapped with high resolution sonar and the two sites combined include over 200 square miles of hard and mixed rocky reef. The area also includes 40 records of coral, sponge, and pennatulid observations including gorgonian corals, black coral, and glass sponge. In 2013 Oceana completed five ROV dives in the northern section of the Heceta Bank proposal area and confirmed the presence of large contiguous reef habitat, boulders, coral, sponge and other invertebrates, plus managed groundfish.
According to the NWFSC species models, all modeled groundfish are found in this proposed area at varying probability levels of abundance and occurrence; greenstriped rockfish, petrale sole, and sablefish have the highest probability of abundance and occurrence. For areas within the Northern Biogeographic Region, this site has the highest probability of occurrence for overfished yelloweye rockfish.





16. Cape Arago Reef

Significant new information on this reef complex southwest of Coos Bay and west of Bandon, Oregon has been made available since 2005, including new seafloor substrate maps and ROV habitat surveys. In 2011 Oceana conducted eight dives to survey this reef habitat and found hundreds of widow rockfish, greenstriped rockfish, quillback rockfish, blue rockfish, tiger rockfish, rosy rockfish, olive/yellowtail rockfish, rex sole, kelp greenling, and lingcod (Enticknap et al. 2013). In addition, this area appears to be important for canary rockfish and overfished yelloweye. Corals and sponges were present at seven of eight dive sites including gorgonian corals, soft corals, and stony corals. Several sponge types were also observed.

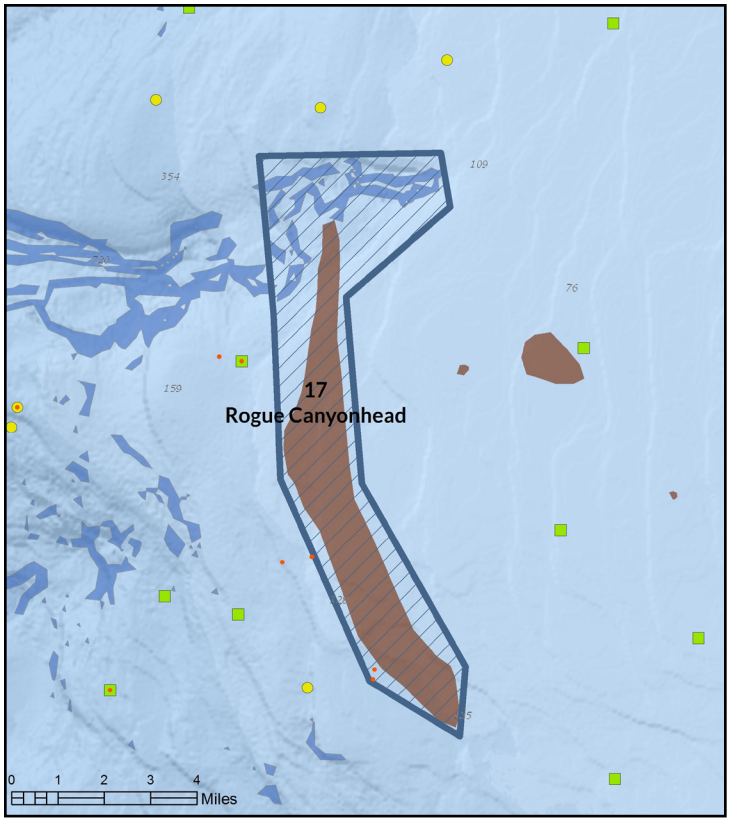
A significant amount of hard and mixed substrate is incorporated in this area. The geologic structure observed here is diverse, as mixed substrate consists of large boulders, cobble, and gravel mixed with mud. According to trawl effort data off southern Oregon, no trawling occurs here making this site easily enforceable with no impacts to bottom trawl fishing.

This proposal area includes the reef in federal waters, immediately adjacent to Oregon state waters.

17. Rogue Canyonhead

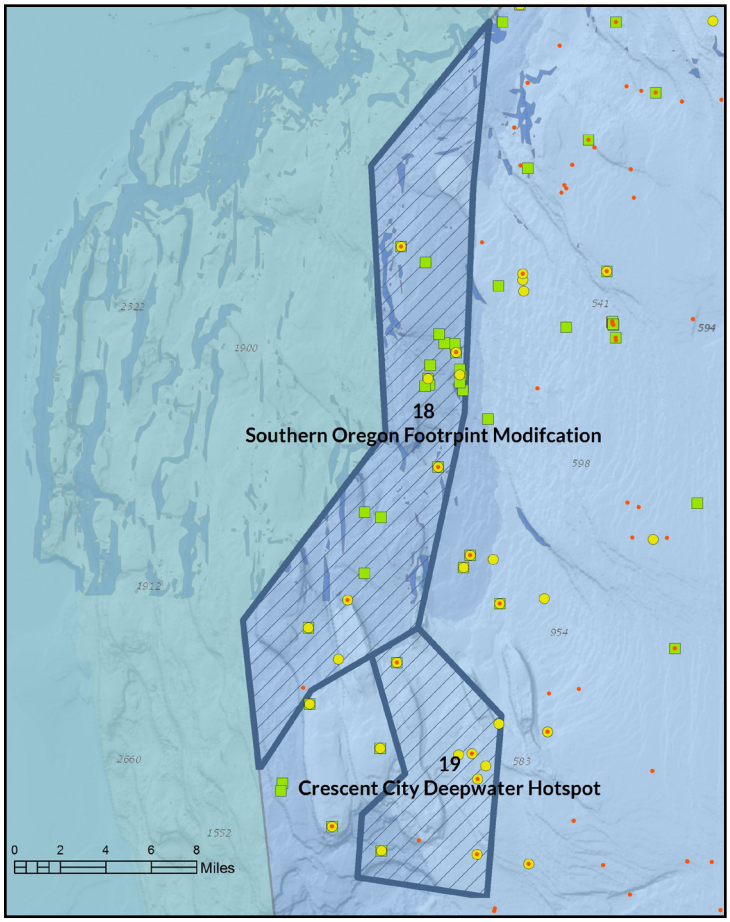
This proposal area includes a long, narrow reef and it is rated as highly suitability habitat for all coral taxa combined (Guinotte & Davies 2012). All NWFSC modeled groundfish are found here with varying probability levels. Sablefish and greenstriped rockfish have the highest probability of abundance.

Hard and inferred rock substrates are covered by this proposed site. The design of this proposed conservation area aims to incorporate the ecologically important canyonhead and reef habitat, while avoiding those areas important to the groundfish bottom trawl and shrimp trawl fisheries. This area also overlaps with the groundfish trawl RCA closure at the canyonhead. Virtually no trawl effort of either fishery occurs here, indicating minimal to no economic impacts from giving this site EFH Conservation Area status.



18. Southern Oregon Footprint Modification

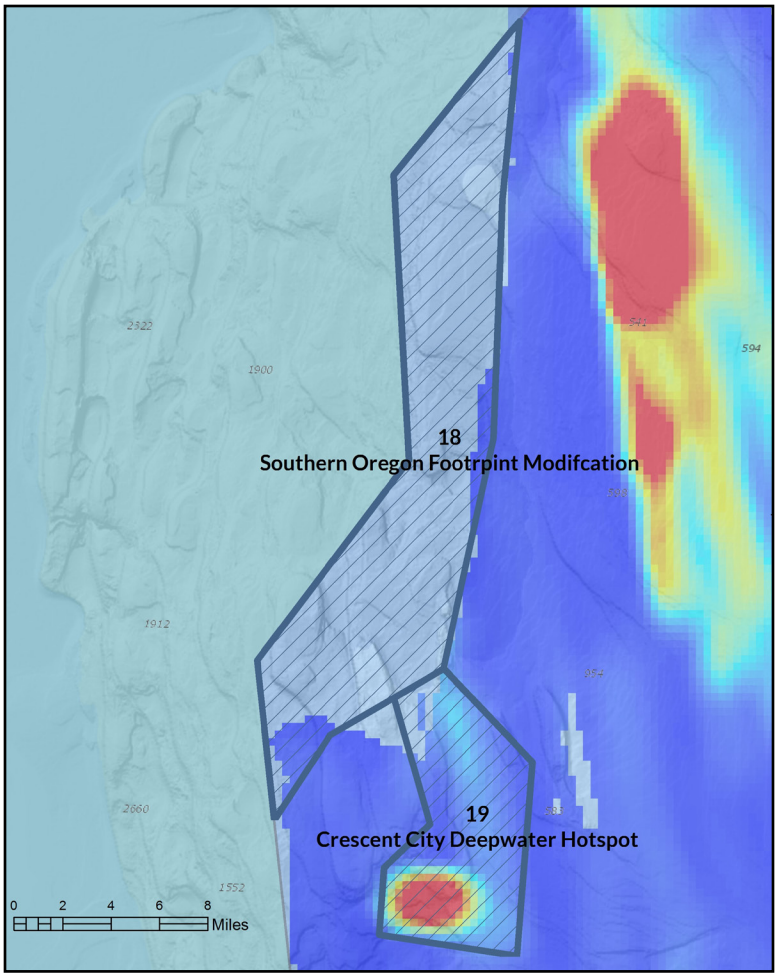
This eastward addition to the 700 fathom deep-water trawl footprint closure encompasses 37 observations of gorgonian corals, black corals, glass sponge, and pennatulids. Also included is an area of high predicted suitability for all coral taxa combined (Guinnotte & Davies 2012). Both NWFSC and NCCOS species models indicate that longspine thornyhead and sablefish have a high probability of abundance and occurrence here. This area of the upper slope spans a depth here range from 820 m at the shallowest point to 1,410 m, and includes areas of predicted rock habitat. No trawl effort occurs here according to 2006-2010 data. The design of this area is enforceable and incorporates essential upper slope habitat with a known diversity of structure-forming invertebrates.



19. Crescent City Deep-water Hotspot

NOAA's Deep Sea Coral Research and Technology Program confirmed that this site contains significant coral habitat (NOAA 2014) and that there has been high bycatch of sponges and corals in this area documented in both NMFS trawl surveys and in the groundfish trawl fishery. This region accounts for nearly a quarter of the coral bycatch coastwide, and protecting this area provides the distinct opportunity to mitigate and prevent adverse impacts to corals. Protection would result in a disproportionately greater reduction in adverse impacts compared with the size of the area and displaced trawl effort.

The proposed area ranges from 780 to 1,200 m. Research dives less than four miles east of this site were conducted by NMFS and academic partners in 2014. During that expedition areas of hard and mixed substrates were identified. What is more, the four research dives combined documented a total of 12,831 corals comprising at least 13 different taxa (including two species of black coral and "peppermint" coral) plus 629 sponges (Yoklavich et al. 2016).



20. Eureka Footprint Modification (Trinidad Canyon)

This important submarine canyon and basin represents the deeper portion of the convergence of a system of offshore submarine canyons. Glass sponges, black corals, and pennatulids have been documented at this site. There is high modeled occurrence and abundance of longspine thornyheads in this area. Very low to no recent trawl effort has occurred here and very few trawl tracks are evident from the 2000-2005 logbook data.

No definitive substrate data is available; however, the canyon structure and range of depths show topographical complexity. Almost no displacement of bottom trawl effort would occur with this proposed area, and no shrimping occurs over the basin. This area represents an excellent opportunity for deep-water protections (1,100 m to 1,600 m) off Northern California with minimal disruption to bottom trawl effort.

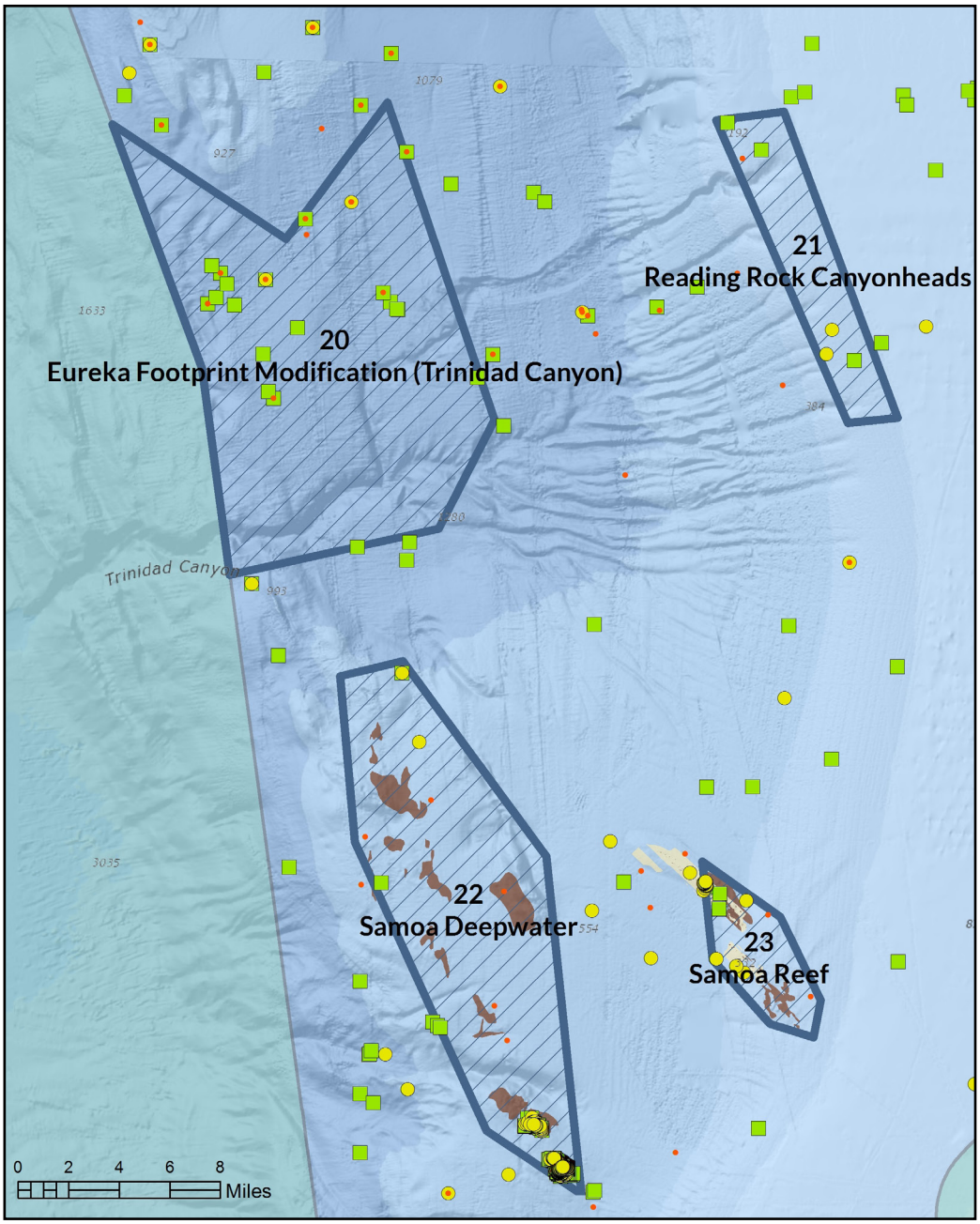
21. Reading Rock Canyonheads

This proposed area would complement the deep-water proposal area at Trinidad Canyon with the conservation of a series of canyonheads that bisect the convergence of the continental shelf and upper slope. It includes areas of high predicted suitability for coral species (Guinnotte & Davies 2012). Gorgonian and other corals, sponges, and pennatulids have been observed here. The proposal area is located west of California's Reading Rocks State Marine Reserve and spans a depth range of 150 to 370 meters. It also overlaps the trawl RCA. Designating this area as an EFH Conservation Area would protect the canyonhead habitat for groundfish species even if the trawl RCA is lifted. Despite the presence of some trawl effort outside the RCA, very little overall displacement would occur in designating this site as an EFH Conservation Area.

22. *Samoa Deep-water*

This proposal area includes several of the very few deep rocky reefs between Cape Mendocino, California and Cape Blanco, Oregon. This area contains gorgonian corals and glass sponges among other valuable and sensitive invertebrate taxa. Two rocky reef sites in the southwest corner of the proposal area were surveyed by the Monterey Bay Aquarium Research Institute. In total, these surveys yielded 2,071 individual coral observations according to data contained in the NOAA Deep Sea Coral Research Technology Program deep sea coral and sponge database.

Levin et al. (2003) conducted dives to assess methane seep sediments and associated macrofaunal communities at the southern tip of this area. Dives explored unique and diverse seafloor habitats including clam beds, microbial mats, and nearby non-seep sediments (Levin et al. 2003). This habitat encourages scientific interest and may be an important setting for enhancing knowledge of seafloor ecosystems, in addition to being an essential site for slow-growing corals and sponges. Although limited trawl effort has occurred in the proposal area, it is limited to only approximately one percent of the trawl effort off California.



23. Samoa Reef

This area contains rocky reef habitat and numerous observations of biogenic habitats, including black corals, gorgonians, and sponges. The area is offshore the Samoa State Marine Conservation Area, and it includes rocky and mixed habitat overlapping the trawl RCA. The design of this shape aims to account for the reef habitat and observations of important corals, sponges, and pennatulids while avoiding areas important to the bottom trawl fishery. This area encompasses very little of total recent trawl effort off California. The full extent of the reef extends deeper beyond the boundaries of this proposed area, but we do not propose designation for the full reef due to overlap with a core trawl area.

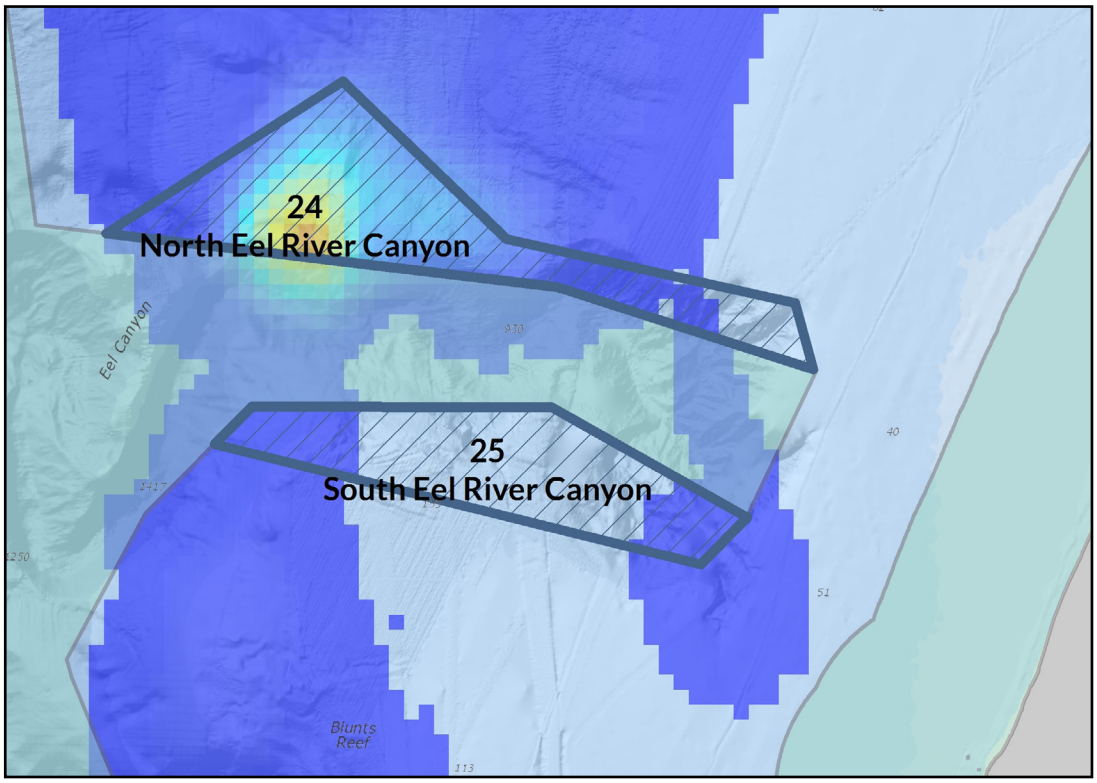
24. North Eel River Canyon

North Eel River Canyon is a proposed expansion of the existing Eel River Canyon EFH Conservation Area. Included here are records of gorgonian corals and glass sponges. This area was identified primarily to encompass a major sponge bycatch hotspot. In total, this one hotspot represents nearly 8% of the sponge bycatch off California. It appears to be located on a series of sequential banks and ridges on the northern edge of Eel River Canyon where there are also multiple records of glass sponges and other sponge types from trawl surveys.

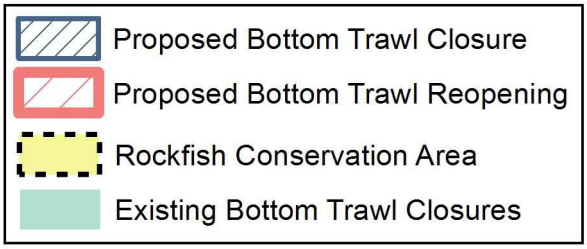
The proposal area would also add a portion of the trawl RCA into an EFH Conservation Area, maintaining protection should surrounding RCAs be re-opened. NOAA's Deep Sea Coral Research and Technology Program has confirmed this proposed site as having significant coral and sponge bycatch (NOAA 2014). We believe this closure is warranted despite the limited trawl effort that would be displaced.

25. South Eel River Canyon

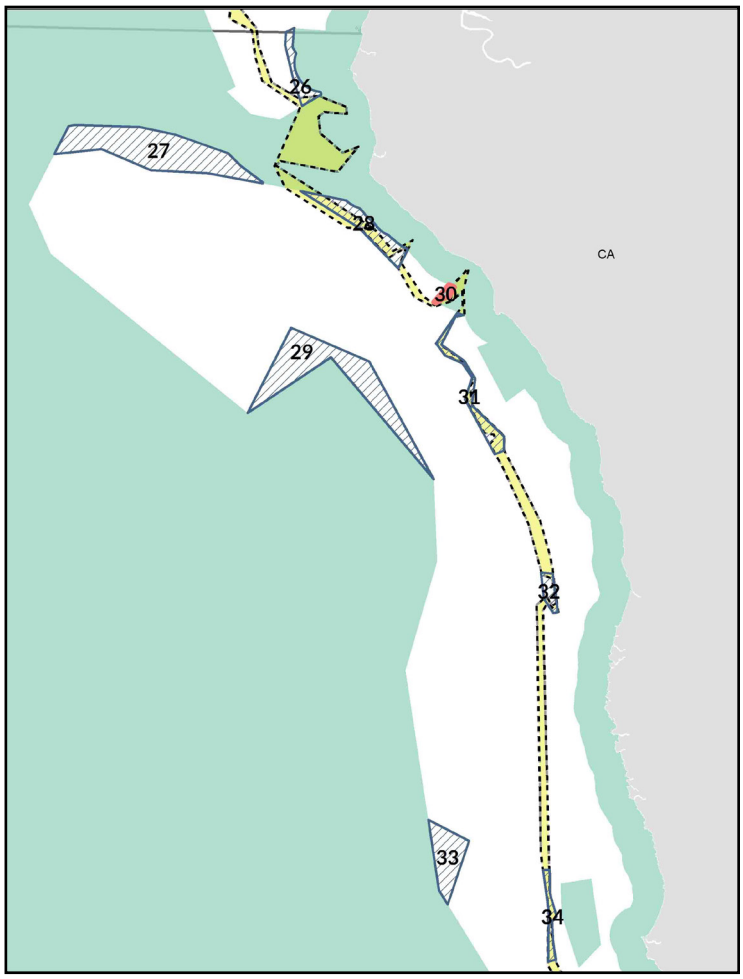
This area is a proposed expansion of the existing Eel River Canyon EFH Conservation Area. It contains observations of sponges, including glass sponges and it also contains high modeled occurrence and abundance of longspine thornyhead. The area is topographically diverse with steep canyon walls and canyon edges. It is primarily in an area with very low to no trawling, and its designation would add the southern canyon edge, much of which is part of the current trawl RCA.



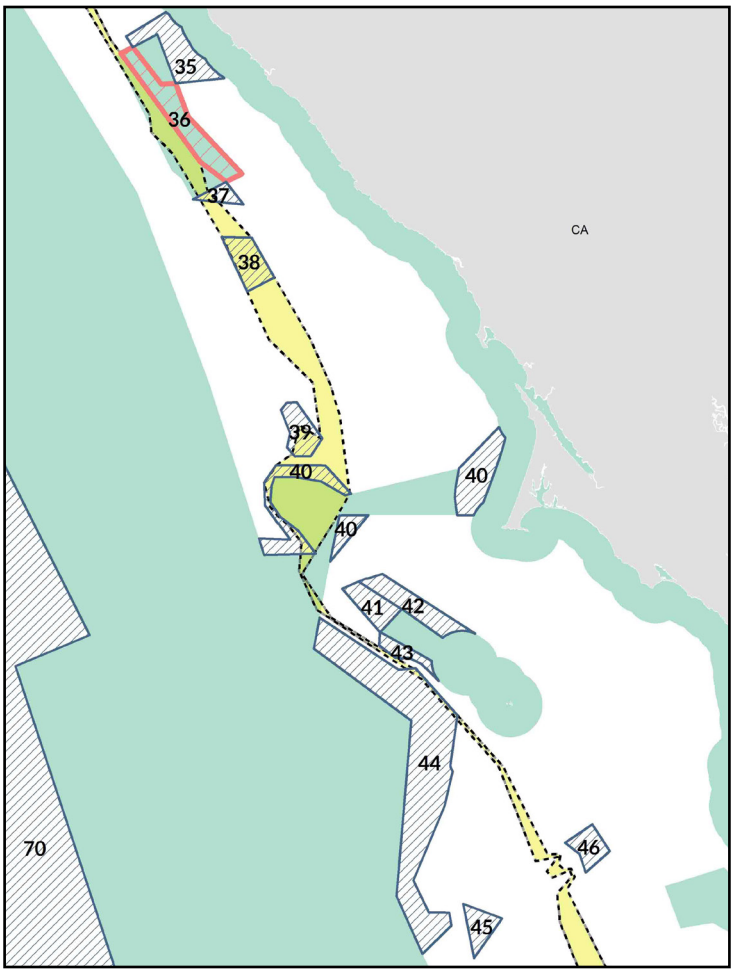
Central Biogeographic Region
(Cape Mendocino, California to Point Conception, California)



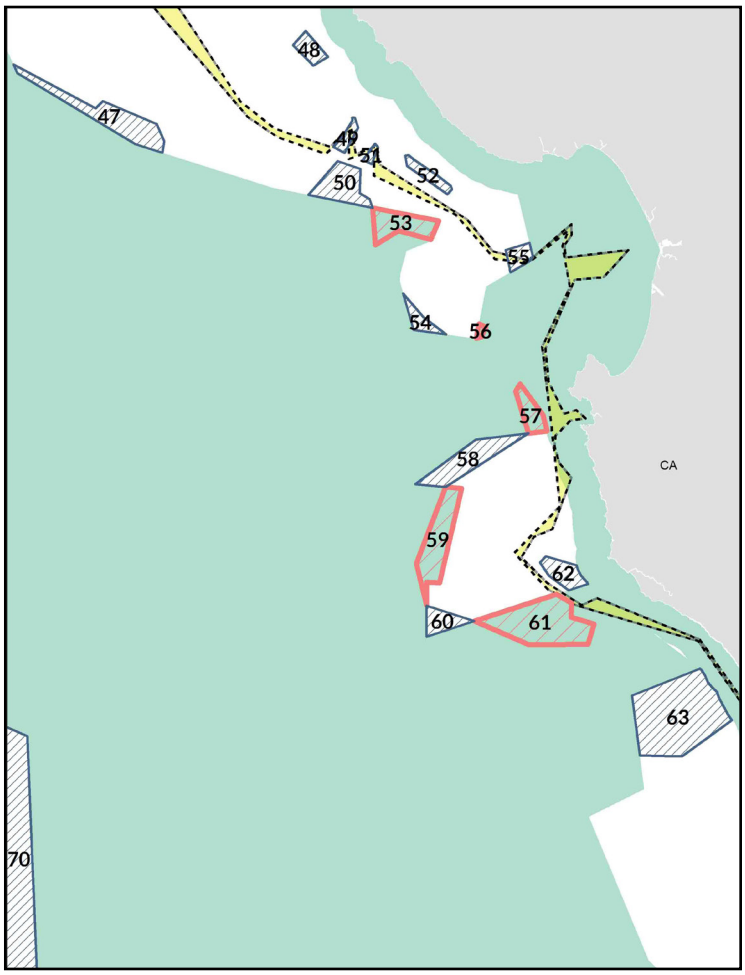
Master Legend for Overview Maps



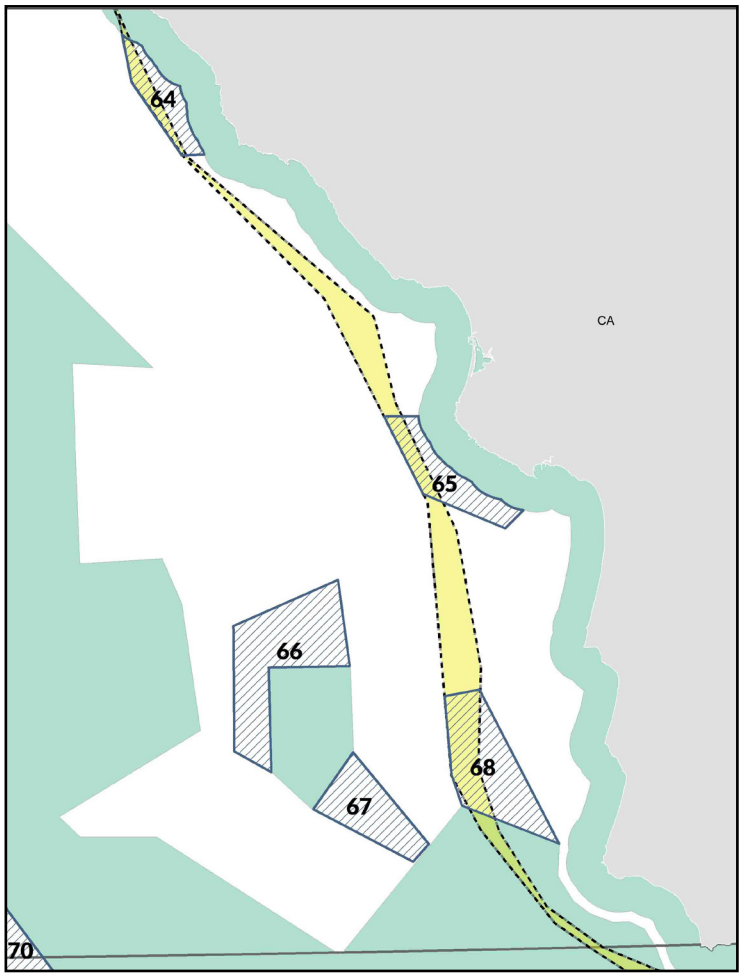
Overview Map 5. Blunts Reef (26) to Point Arena Canyonheads (34). The trawl RCA in yellow is overlapping existing EFH and state areas closed to bottom trawling (light green) and proposed conservation areas (blue stripes) and proposed openings (light red).



Overview Map 6. Saunders Reef (25) to Pioneer Canyonhead (46).

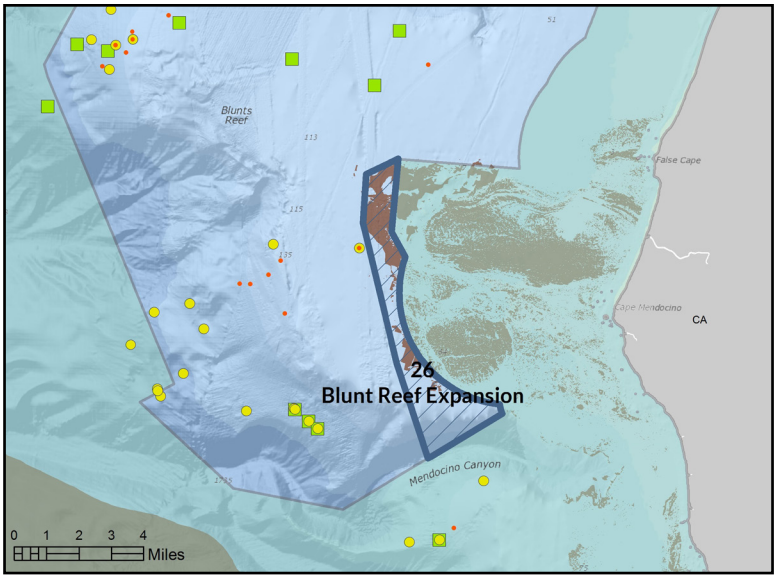


Overview Map 7. Cabrillo Canyon (47) to Between Partington Point and Lopez Point (63).



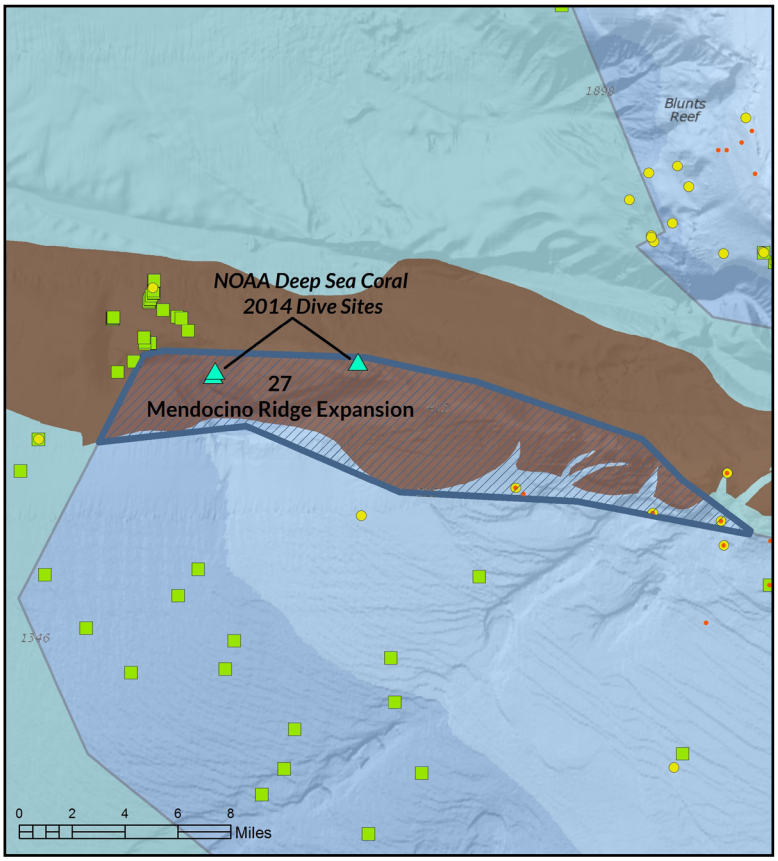
Overview Map 8. La Cruz Canyon/ Piedras Blancas (64) to Point Arguello (68).

26. Blunts Reef Expansion



This rocky reef habitat west of Cape Mendocino, California is strongly important for groundfish species as indicated by the high occurrence and abundance of all six NWFSC modeled species. Additionally, a significant portion of this area has been identified as high predicted coral habitat for all taxa. This is a proposed expansion of the current Blunts Reef EFH Conservation Area that adds the remaining hard substrate mapped at this reef. This proposed area and the Mendocino Ridge Expansion (#27) contain the highest predicted habitat for yelloweye rockfish in the Northern California region. Virtually no trawling is indicated throughout the entire proposed closure area. This area would protect the northern portion of the Mendocino submarine canyon where it drops off to a depth of 800 m, as well as part of the trawl RCA. This closure is designed to connect to the existing EFH Conservation Area at Blunts Reef, the Mendocino Ridge EFH Conservation Area and California state waters to act as a single, enforceable conservation area connecting nearshore and offshore environments.

27. Mendocino Ridge Expansion



The current Mendocino Ridge EFH Conservation Area protects important hard substrate and incorporates a significant amount of coral and sponge observations. This proposal area, however, expands on that to protect a large section of hard substrate extending to the south of the ridge. Towed cameras deployed by NOAA scientists in 2014 documented that the survey area inside our proposal area was 97% hard substrate of relatively high relief at depths between 631 and 798 meters (Yoklavich et al. 2016). They also documented over 10,000 coral colonies during their 2014 research there (see dive locations on map). Soft corals were found at shallower depths as well as gorgonians including bubblegum corals and sea fans (Yoklavich et al. 2016). At deeper slope areas more dominated by soft sediments, researchers documented gorgonian corals including 230 bamboo corals, 10 *Paragorgia* corals (peppermint coral) and 615 sea fans (*Swiftia* spp.) (Yoklavich et al. 2016). Estimated density of corals at one dive site is this area is the highest of any areas surveyed during this Northern California cruise at over 3,300 corals per 1,000 m^2 (Yoklavich et al. 2016).

Mendocino Ridge is characterized by topographic complexity and geologic and biological diversity. The boundaries of this area encompass depths from about 300 m to over 1,400 m. According to trawl effort data in the EFH Data Catalog, little to no trawl effort occurs here. This area is a clear choice for designation as an EFH Conservation Area due to the extensive presence of coral, hard substrate, and the likely high impact to EFH should bottom trawls be used there.

28. Spanish Canyon

This proposed site includes the entire canyonhead of Spanish Canyon currently in the trawl RCA and it extends to the state water boundary, adjacent to Big Flat State Marine Conservation Area. This area has predicted high occurrence and abundance of greenstriped rockfish, darkblotched rockfish, petrale sole, and sablefish according to NWFSC models. Most of the site contains high predicted coral habitat for all taxa (Guinnotte & Davies 2012), and depths range from 100 m to 530 m. This proposal area allows for increased connectivity between the Mendocino Canyon feature and the major submarine canyon complex to the south (Spanish Canyon and Delgada Canyon complex) as well inshore/ offshore connectivity between areas in state and federal waters. This area is in the current trawl RCA and reopening of this area to bottom trawling would subject sensitive habitats to adverse impacts.

29. Delgada Canyon Deep

Delgada Canyon Deep encompasses deep-water habitat from 1,000 m (600 fathoms) to nearly 1,500 m (820 fathoms). There are records of biogenic habitat from NOAA trawl surveys including pennatulids, sponges, and the black coral *Chrysopathes speciosa*. This location includes substantial and biologically important canyon habitat that is part of the Delgada Canyon complex. These canyons all have high predicted coral habitat suitability and high NWFSC modeled occurrence and abundance for longspine thornyhead and sablefish. We previously discussed this area extensively with the fishing industry, and the northern waypoints are based on specific feedback from the industry. The original shape was reduced in size to avoid important trawl grounds shallower than 1,000 m (600 fm). This area is designed to encompass important deep-water habitat and extends from the current closure while avoiding recent trawl effort off California.

30. Delgada Canyon Reopening

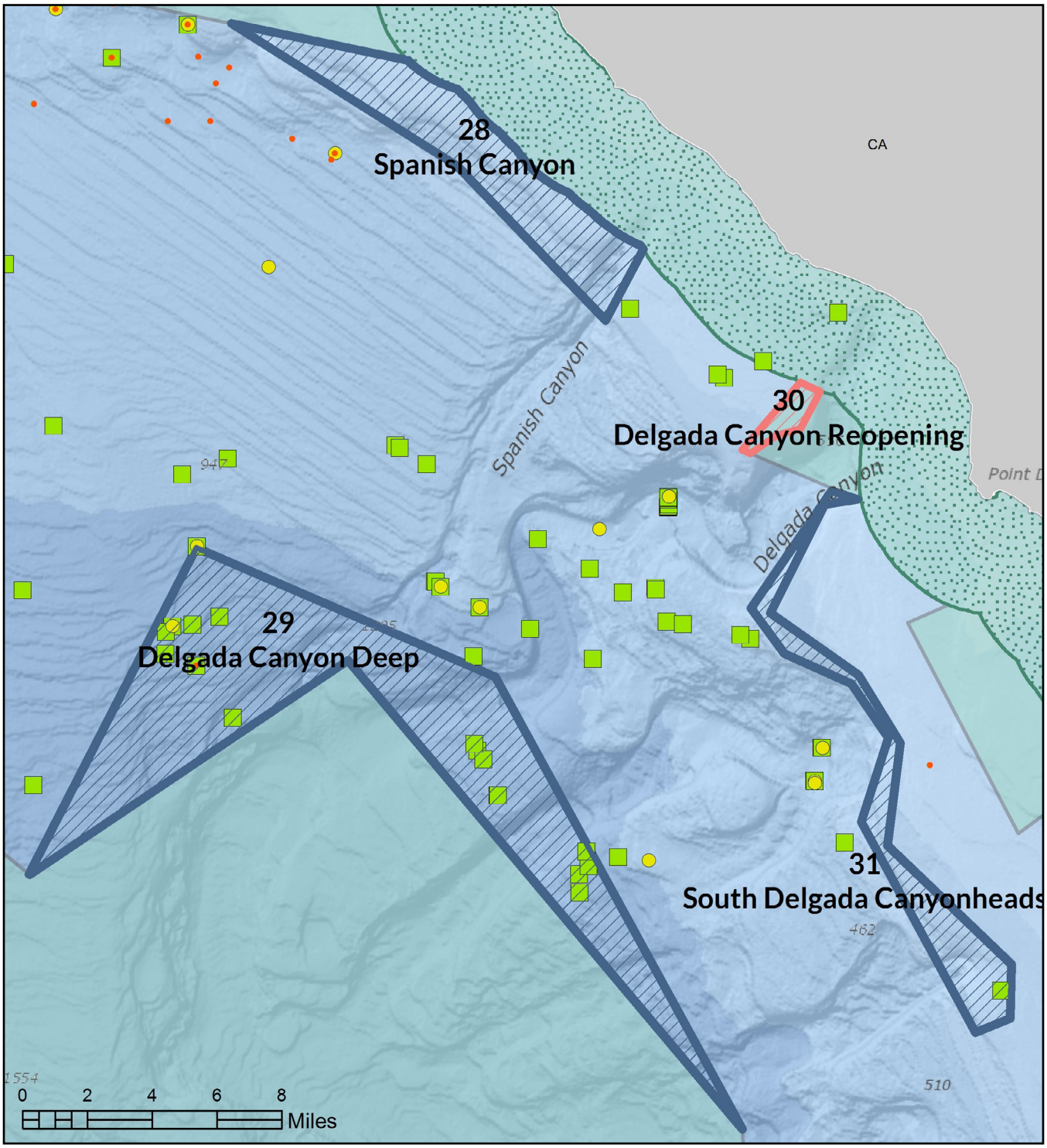
The original designation of the Delgada Canyon EFH Conservation Area was a critical component of the Amendment 19 action to protect known priority habitats in this region off Northern California. This was the result of thorough and deliberate consideration by the Council and the State of California. Fishery managers recognized this action was necessary to prevent adverse impacts to EFH even in light of the known importance of this area as a fishing ground and to promote recovery of this area. The fishing industry requested the entire EFH Conservation Area and RCA be reopened to bottom trawling. However, doing so would cause adverse impacts to sensitive habitats that have been protected from trawling since 2006. In the interest of being responsive to the industry request, and after careful consideration, we proposed reopening as much of the area on the shelf as possible while maintaining the most sensitive areas closed. The area that would be reopened is very important and productive habitat for groundfish and includes some high predicted coral habitat, isolated patches of hard substrate, and the northern canyon edge. In contrast to the opening in the collaborative proposal, the trawl RCA and deeper depths of the existing Delgada Canyon EFH Conservation Area would not be affected by this reopening. As with all other proposed reopening areas, our support for this reopening is contingent on the adoption of the closure components of this proposal as a regional package.

31. South Delgada Canyonheads

Coextensive with the trawl RCA boundaries, this area encompasses the major canyonheads in the Delgada Canyon complex. According to NWFSC models, the area includes high abundance and occurrence of greenstriped and darkblotched rockfish; it also includes high abundance and occurrence of chilipepper rockfish, Dover sole, and lingcod according to NCCOS models. Since the area is entirely within the current trawl RCA, it will not result in any displacement of current trawl effort. While much of the RCA in Northern California may be reopened to trawling under in the Amendment 28 process, this area is one of the key areas within the RCA containing priority habitats that should remain closed as EFH so as to prevent adverse impacts.

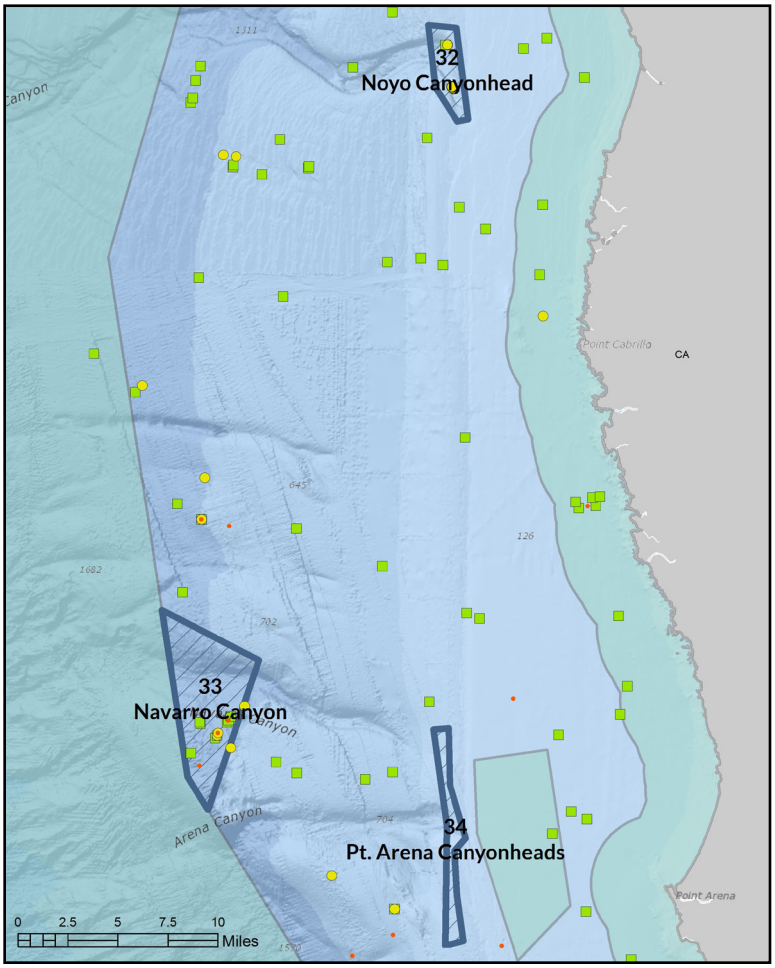
32. *Noyo Canyonhead*

Encompassing the trawl RCA portion of Noyo Canyon and its canyonhead, this site contains multiple coral and sponge records documented by the Monterey Bay Aquarium Research Institute, including the bubble gum coral *Paragorgia spp*., and it is high predicted coral habitat (Guinnotte & Davies 2012). While this general area is an important fishing ground close to Ft. Bragg, most of is the proposal area is currently part of the trawl RCA and the area includes virtually no recent trawl effort. Due to the targeted nature of this closure, there will still be opportunities for continuous trawl tows along the canyon edges.



33. Navarro Canyon

Navarro Canyon is a new proposed EFH Conservation area encompassing deep-water canyon habitat adjacent to the 700 fathom EFH trawl closure. This area contains multiple records of biogenic habitat, including the gorgonian coral *Euplexaura marki*, the glass sponge *Aphrocallistes vastus*, and numerous other sponges and pennatulids. The boundaries of this area have been revised based on fishing industry input to avoid areas of high importance to the trawl fleet. Early versions of this area included the canyon to the south and much more of the shallower depths of the canyon, but those were removed based on feedback we received. Our proposal for this area was designed carefully to include a known aggregation of corals and sponges to the south of the canyon. That coral and sponge area is not included in the collaborative proposal. According to the EFH data, there is little to no trawl intensity in this area.

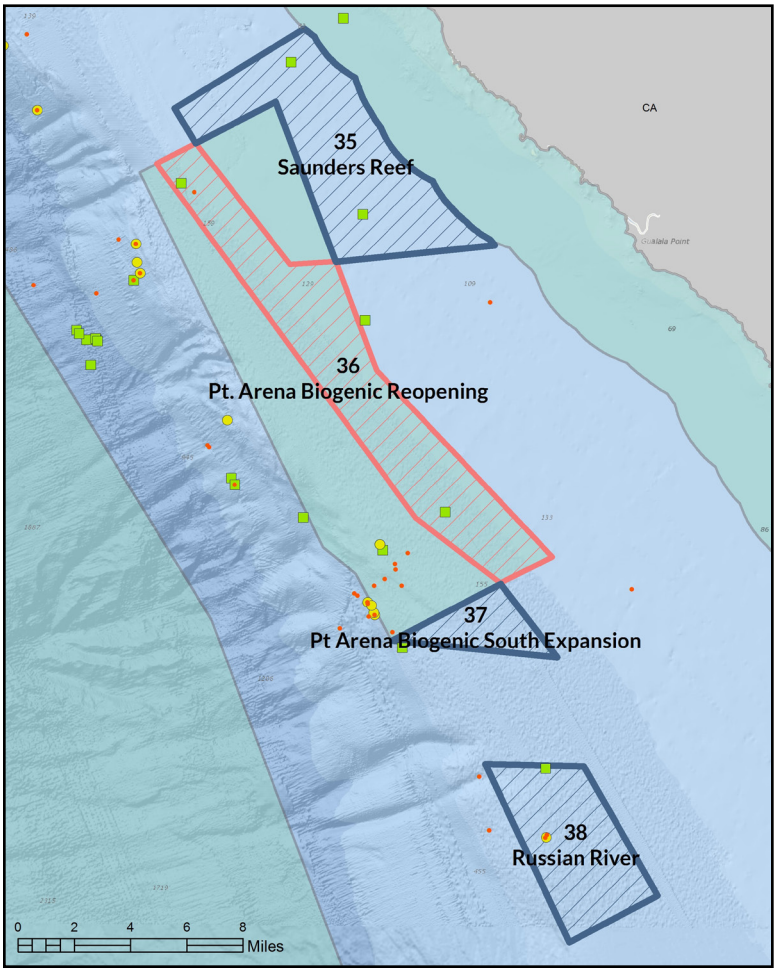


34. Pt. Arena Canyonheads

Exclusively within the trawl RCA, this area is in a high coral habitat suitability region and spans three major canyonheads. This area is located directly offshore of Point Arena Reef, Point Arena State Marine Protected Area, and the Point Arena North EFH Conservation Area. It would provide long-term protection for the trawl RCA in the central biogeographic region. Since the entire area is currently within the trawl RCA, there will be no displacement of current trawl effort. Additionally, nutrient-rich canyonhead and shelf-break habitat would be protected. Since large portions of the trawl RCA in this region may be reopened, it is critical that priority habitats sensitive to bottom trawl impacts remain protected. This proposal is designed to maintain a bottom trawl area located between the current RCA and the nearby Point Arena North EFH Conservation Area. This area intersects the northern boundary of the Greater Farallones National Marine Sanctuary.

35. Saunders Reef

Saunders Reef is a new proposed EFH Conservation area which would increase protection of shallow soft sediment shelf habitat, including known records of pennatulids. The southern boundary is drawn based on specific input from the fishing industry designed to maintain potential shrimp trawl grounds, and the northern boundary is drawn to create continuity with the Northern boundary of the Saunders Reef State Marine Conservation Area while avoiding significant trawl grounds. This area is an essential component of a proposed restructuring of the Point Arena South Biogenic EFH Conservation Area. The overall configuration of the proposed Saunders Reef EFH Conservation Area and the Pt. Arena Biogenic Reopening and extension (areas 36 and 37) achieves a 1:1 exchange between the total area reopened and closed. This is in contrast to the collaborative proposal for modifying the Pt. Arena Biogenic EFH Conservation Area which would result in a significant decrease in protected area. According to the EFH Phase I Report data, there is very low trawl intensity in this area. This and other proposed sites (36 to 38) are now within the Greater Farallones National Marine Sanctuary.



36. Pt. Arena Biogenic Reopening

In the Pt. Arena Biogenic Reopening, a significant section of the Pt. Arena Biogenic South EFH Conservation Area would be reopened for trawling. A substantial area of trawl grounds that were closed in 2006 would be reopened in soft sediment shelf habitat in the 60-100 fathom (about 110-180 m) depth range. This proposed reopening is based on a specific geographic request from the fishing industry to resume trawling in this area, and our proposal for reopening this area is contingent on the designation of additional closures in this region (Saunders Reef #35 and Pt. Arena Biogenic South Expansion #37) to compensate for any potential adverse impacts to EFH associated with this reopening. This reopening includes some sponge and pennatulid records and is among the major EFH protections in Northern California. It is, therefore, essential to mitigate impacts to protected habitat from this reopening through the protection of additional proposed closures.

37. Pt. Arena Biogenic South Expansion

The Pt. Arena Biogenic South Expansion is part of the proposed restructuring of the Pt. Arena South Biogenic EFH Conservation Area. It includes part of the trawl RCA area and incorporates the southern tip of the rocky reef feature outside the existing conservation area. The southeast waypoint was based on specific geographic input from the fishing industry. There is local knowledge about highly unique geological features in this area, described as large rocky pinnacles surrounded by soft bottom. According to the EFH Phase I Report data, there has been little to no recent trawl effort in this area.

38. Russian River (aka "The Football")

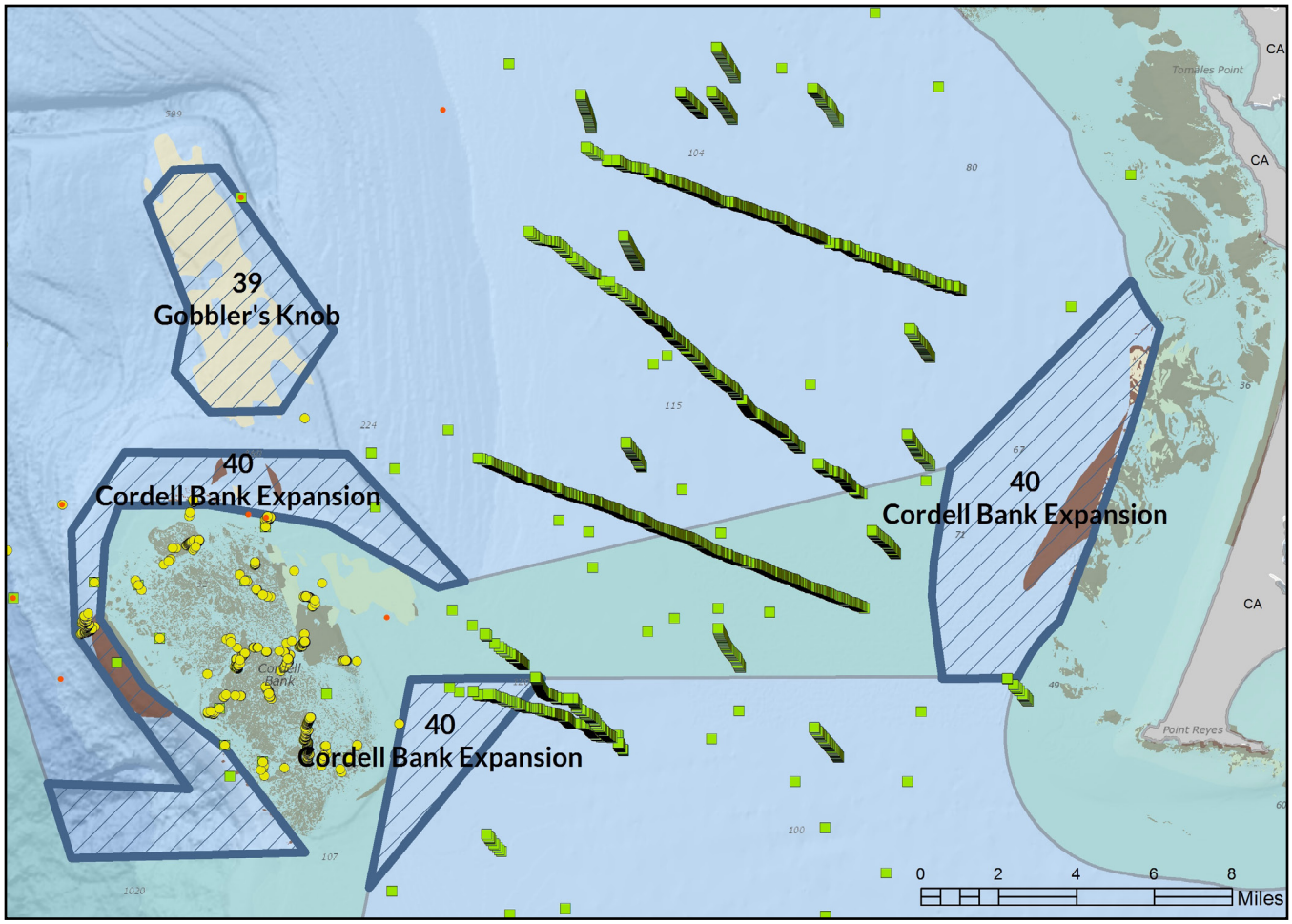
The Russian River site is a new proposed EFH Conservation Area fully within the trawl RCA. The area, known locally as "The Football," is a large rocky bank approximately 180 to 280 meters deep. Recent NOAA ROV surveys documented 22 coral colonies including eight colonies of a new gorgonian coral species (*Swiftia farallonesica*) (Graiff et al. 2016). NOAA also discovered a cat shark nursery with hundreds of egg casings. While the EFH data catalog does not show rocky habitat here, recent habitat mapping and underwater surveys confirmed extensive hard substrate of both high and low relief throughout the football area. Input from fishermen suggests that this area is highly productive for many groundfish species and this was confirmed by NOAA researchers who documented 16 species of *Sebastes*, plus flatfishes, lingcod and others. The majority of the NOAA research dives were inside the proposed area, however during a few outside the proposed area - deeper than 250 m – researchers discovered additional cat shark nursery habitat. There are also observations of the glass sponges *Farrea occa* and *Acanthascus dawsoni*, the demosponge *Ampilectus spp.*, and the Scleractinian coral *Desmophyllum sp.* (Stierhoff et al. 2011) in the proposal area. Since the entire area is currently part of the trawl RCA, there will be no displacement of recent trawl effort. In contrast to the much smaller polygon in the collaborative proposal, this proposal area contains extensive known presence of priority habitats that would be subject to adverse impacts if the RCA is reopened. This area is also part of the newly designated Greater Farallones National Marine Sanctuary.

39. Gobbler's Knob

Located to the south of Bodega Canyon, Gobbler's Knob is within the recently expanded Cordell Bank National Marine Sanctuary. According to local knowledge, this area was named by fishermen because it would "gobble" up trawl nets due to the various snags and trawl hangs in the area. This area includes the majority of a newly mapped mixed reef substrate that had not been identified when the PFMC made its final EFH decision in 2005 and there is significant overlap with trawl RCA.

A 2016 report from the Office of National Marine Sanctuaries describes the findings of nine dives conducted in the proposal area (Graiff et al. 2016). Primarily hard substrate was observed (93%) and the total density of fish was estimated to be 79 fish per 1,000 m^2 with nearly half of fish observations consisting of rockfish (at least 12 species) and about a quarter were flatfish (at least five species) (Graiff et al. 2016). Researchers documented pennatulids, sponges, mushroom coral, primnoid octocoral and other invertebrates (Graiff et al. 2016).

The southern half of the area is within the trawl RCA and southern boundary maintains a mile-wide trawl path between this area and the proposed Cordell Bank EFH Conservation Area Expansion. The Northern boundary maintains an important trawl tow along the southern rim and edge of Bodega Canyon, allowing for continuous tows along the 200 fathom depth range on the western boundary of Gobbler's Knob and to the west of Cordell Bank.



40. Cordell Bank Expansion

The proposed Cordell Bank Expansion builds off the existing Cordell Bank EFH Conservation Area in three places. One section to the north and west of the current closure would protect rocky reef habitat on shelf and upper slope habitat, while increasing connectivity between the Cordell Bank area and the trawl footrpint conservation area. Much of the proposed area is inside the trawl RCA. It also incorporates a major study site documenting hard substrate and several invertebrate species, including gorgonians (Graiff et al. 2011). In total, over 2,400 observations of at least six deep sea coral species and over 60 observations of sponges were made here (Graiff et al. 2011).

The proposed modification to the southeast of the Cordell Bank EFH Conservation Area encompasses an area that local knowledge suggests contains significant trawl hangs and high risk of interaction with overfished species; some fishermen report voluntarily avoiding the area as a result. The southeast expansion encompasses areas surveyed by the Cordell Bank National Marine Sanctuary that contain significant pennatulids and other biogenic soft sediment habitat.

The proposed expansion to the east connects with state waters offshore the Pt. Reyes National Seashore. It includes the federal waters portion of a major hard reef feature that has been newly mapped and this area would create a corridor of protections from the shoreline to deep, offshore habitats. This area has had minimal trawl intensity in recent years according to trawl data in the EFH Data Catalog.

A wide, extensive area of RCA runs through the Cordell Bank National Marine Sanctuary. Without additional EFH Conservation Areas, as proposed here, removal of the RCA risks a significant increase in habitat impacts inside the Sanctuary. Given the widely recognized ecological importance of this area and newly identified priority habitats outside existing EFH Conservation Areas, a net increase in habitat protections is clearly warranted.

41. Rittenberg Bank

Rittenberg Bank is a new proposed EFH Conservation Area that adjoins the northwestern boundary of the existing Fanny Shoal EFH Conservation Area. The proposed area is identical to the area proposed by the Greater Farallones National Marine Sanctuary (GFNMS). The rationale for this area is based on visual surveys and mapping conducted by the GFNMS that indicate high habitat value for multiple groundfish species as well as habitat forming corals and sponges. The soft sediment area is important to crabbing, and we are proposing that only trawling be prohibited; all other gear, including fixed gear, would be allowed. Some fishermen indicated this soft sediment area between Rittenberg Bank and Fanny Shoal is potentially trawlable, but little to no recent trawl effort has occurred here and doing so would risk impacting the bank and surrounding environment. We consulted with NOAA's Deep Sea Coral Research and Technology Program on this proposed site and received feedback confirming this area is identified as having significant corals and sponges; it has earned the nickname "sponge heaven." Further information on this area can be found in the GFNMS proposal (GFNMS 2013) as well as the NOAA Deep-Sea Coral Research and Technology Program report on biogenic habitat in the GFNMS (Etnoyer et al. 2014).

42. Fanny Shoal Shelf Extension

The Fanny Shoal Shelf Extension is a proposed expansion of the Fanny Shoal/ Farallon Islands EFH Conservation Area that would widen the overall bottom trawl protections around Fanny Shoal and Rittenberg Bank to provide an even buffer around the hard substrate features there. The area proposed here encompasses some hard substrate extending from Fanny Shoal that is outside the current EFH Conservation Area. Most of the area is primarily soft substrate, and this would protect this representative habitat along the relatively wide portion of the continental shelf from bottom trawling. NMFS data suggests very low to no trawl activity in this area.

43. Cochrane Bank

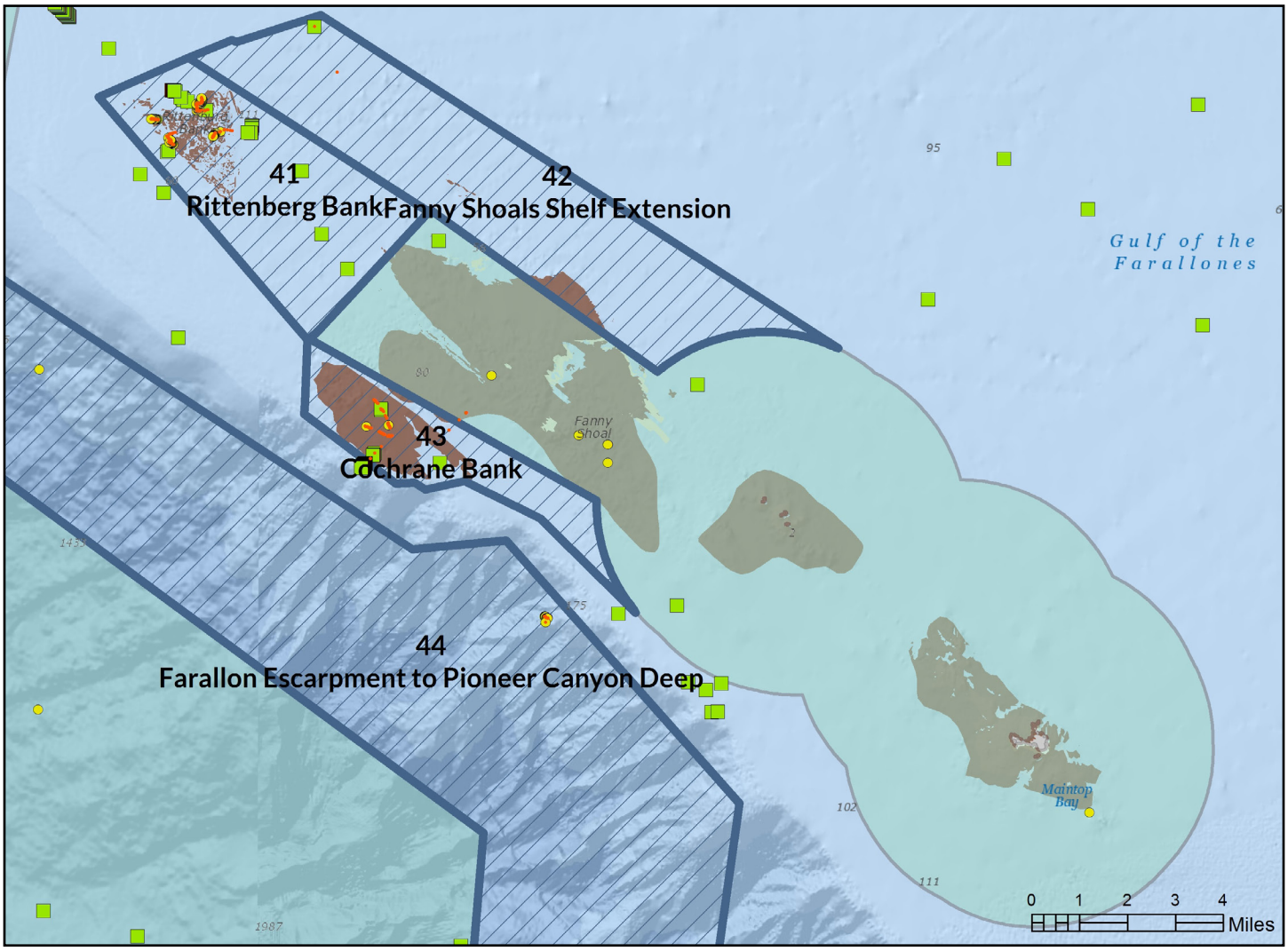
The Cochrane Bank proposal area adjoins the western boundary of the Fanny Shoal/ Farallon Islands EFH Conservation Area. This area is among the few newly identified hard substrate features in federal waters off California (EFHRC 2012). The area includes significant hard substrate and many biogenic habitat observations. GFNMS has done extensive surveys and mapping in the area and identified a long-lived species of black coral called Christmas Tree Coral (*Leiopathes dendrochristos*), which is used as habitat by multiple species of juvenile and adult groundfish (Graiff et al. 2011). This particular species was previously thought to inhabit only southern California waters. One black coral colony was observed with an adult rosy rockfish under it and many juvenile fish and crabs living in its branches. It was over two meters wide and estimated to be at least 100 years old. Etnoyer et al. (2014) conducted dives in this area and observed over 500 sponges, over 1,200 corals, primarily pennatulids, and 72 taxa of fish, primarily rockfish. Overfished yelloweye rockfish were observed here (Etnoyer et al. 2014).

This proposed area is similar to that being proposed by the Gulf of the Farallones National Marine Sanctuary for this feature. Our proposed area is slightly larger to more continuously adjoin with the state waters boundary surrounding the islands and to maintain an additional buffer around the hard substrate features. The overall configuration maintains an important continuous tow path between Fanny Shoals and the Farallon Escarpment.

44. Farallon Escarpment to Pioneer Canyon

Farallon Escarpment to Pioneer Canyon Deep is a proposed area adjacent to the 700 fathom EFH Footprint Closure. The Escarpment is an impressive and unique geologic feature with exceptionally steep slope and numerous submarine canyons ranging in depth from about 160 m to over 1,600 m. There was no hard substrate in this area identified in the 2012 EFHRC report, however, ROV evidence indicates that continental shelf bedrock is exposed on the fault scarps (a step in the slope where one side of the earthquake fault has moved) and that the exposed areas of bedrock provide habitat for fish and three-dimensional corals and sponges. Hard substrate was confirmed for a site in the eastern portion of the area across from Cochrane Bank (Etnoyer et al. 2014). At this study site, 200 coral observations were made including bubblegum and mushroom corals (Etnoyer et al. 2014). A total of 69 sponges were observed at this site, as well as 10 taxa of fish (Etnoyer et al. 2014). The majority of this area is predicted to be highly suitable for corals.

The proposal area is subject to little to no recent trawl effort. The shoreward boundary is specifically designed to maintain a valuable trawl tow path between this area and Cochrane Bank. The shoreward boundary generally follows the 200 fathom contour and incorporates a portion of the trawl RCA west of the Farallon Islands. At this point the shoreward boundary moves further offshore to deeper water - following the 600 fathom depth contour (the deepest extent of previous trawling in this region) - and connects with the base of Pioneer Canyon. Please refer to the GFNMS proposal for additional information and data about this area (GFNMS 2013).


41
Rittenberg Bank
42
Fanny Shoals Shelf Extension
43
Cochrane Bank
44
Farallon Escarpment to Pioneer Canyon Deep
Gulf of the Farallones
Fanny Shoal
Maintop Bay
95
80
175
102
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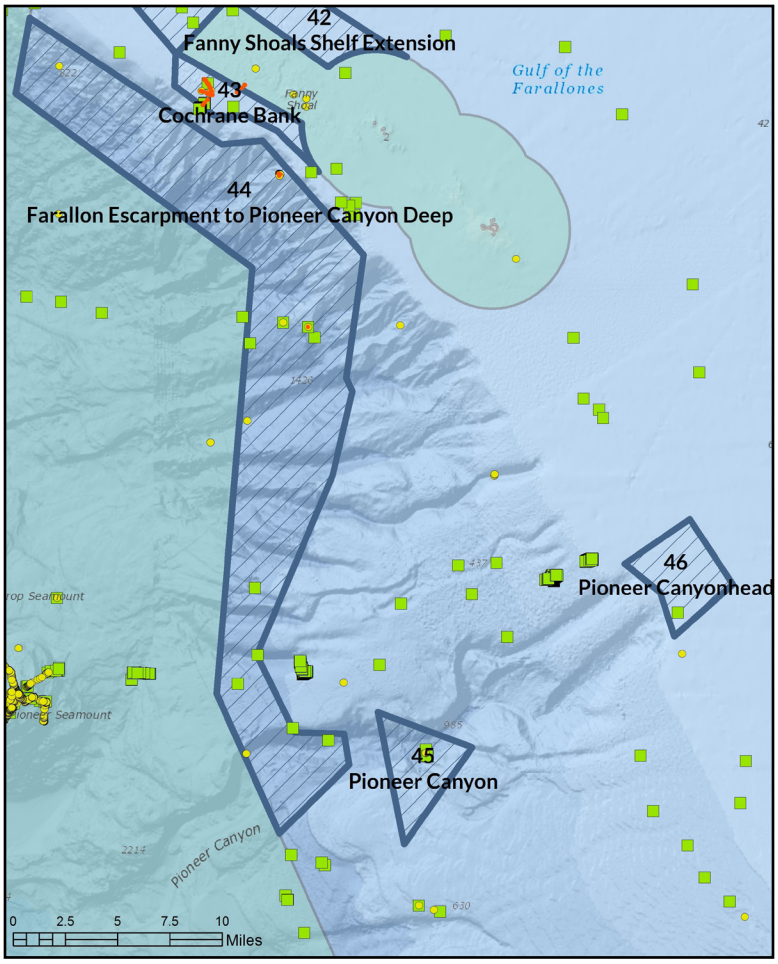
45. Pioneer Canyon

This proposed EFH Conservation Area encompasses slope canyon habitat in an area with multiple coral and pennatulid observations. This area was identified in collaboration with the Greater Farallones National Marine Sanctuary, and the Sanctuary facilitated meetings with fishermen to refine the boundaries. The boundaries are designed to maintain continuous tow paths along depth contours on the northern edge of Pioneer Canyon, the southern edge of Pioneer Canyon, and a "canyon jump" tow in deeper waters. According to the EFHRC data on trawl intensity, this area contains virtually no recent trawl intensity off California.

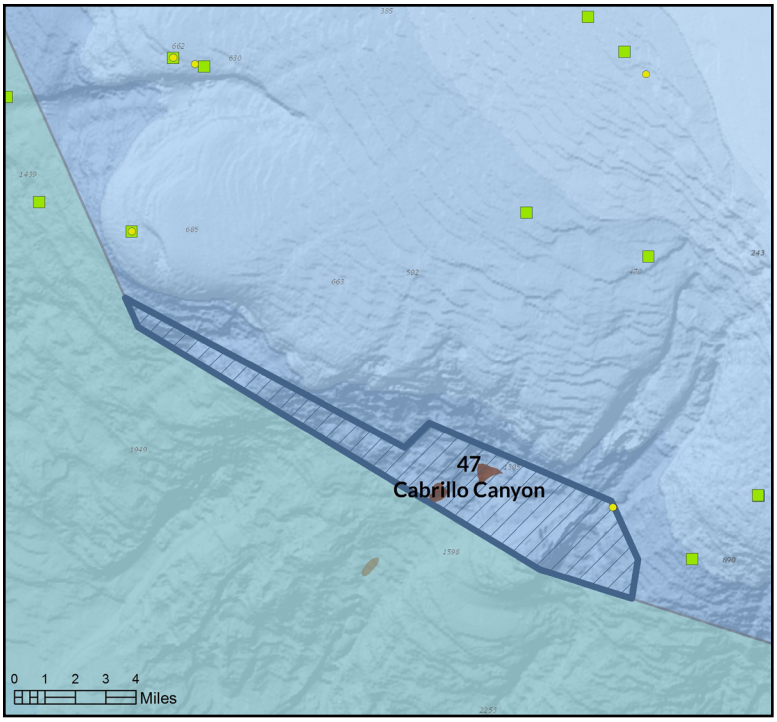


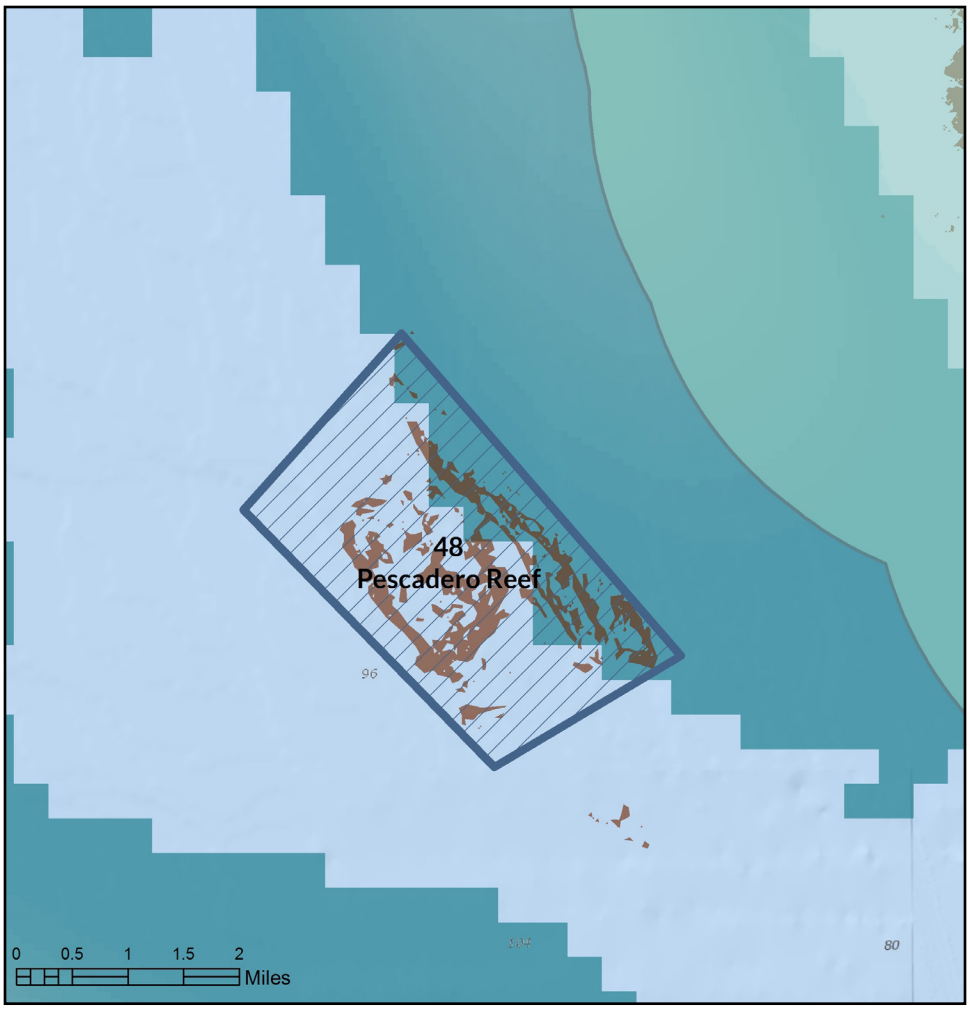
46. Pioneer Canyonhead

Pioneer Canyonhead is a proposed new EFH Conservation Area slightly shoreward of the current trawl RCA at the head of Pioneer Canyon. The boundaries were determined based on specific geographic feedback from the fishing industry and are designed to include areas with high quality habitat for a wide suite of groundfish species—both overfished and target species (e.g., widow rockfish). It includes high abundance and occurrence of greenstriped rockfish and Petrale sole based on NWFSC models. Local knowledge indicates that this area contains some hard substrate features not currently identified in the EFH Data Catalog. The area has high predicted coral suitability and was identified in the context of establishing EFH Conservation Areas focused on current RCA boundaries so that important habitat is protected into the long-term as overfished species rebuild. This site encompasses very little to no recent trawl intensity off California.

47. Cabrillo Canyon

Adjacent to the 700 fathom trawl footprint closure, this site includes significant depths that extend beyond 700 fathoms that were not included in the 2006 EFH trawl closures. This area includes corals observed with ROV video by the Monterey Bay Aquarium Research Institute, as well as hard substrate and high predicted coral habitat. Discussions to date with industry have indicated this area is deep enough so as not to disrupt trawl tows, and the area encompasses minimal recent trawl intensity. It also contains an isolated rocky feature identified in the EFH Phase I Report substrate data.





48. Pescadero Reef

The proposed Pescadero Reef area is designed to protect one of the few hard substrate features open to trawling along the shelf in this region. To address concerns raised in discusions with the trawl industry, this proposal keeps open a wide channel between the California state waters boundary and the proposal area,and the conservation area is drawn tightly around the reef feature. This feature was identified as an area of interest in collaboration with the Greater Farallones National Marine Sanctuary, and the Sanctuary helped facilitate regional discussions with the fishing industry to refine the boundaries of this area. There may be flatfish tows around this feature, but little to no recent trawl effort has occurred in the proposal area according to trawl data in the EFH Data Catalog. Trawl data in the EFH Catalog are buffered giving the appearance of possible trawling on the western edge of the reef when in fact there is likely none.

49. Ascension Canyonhead

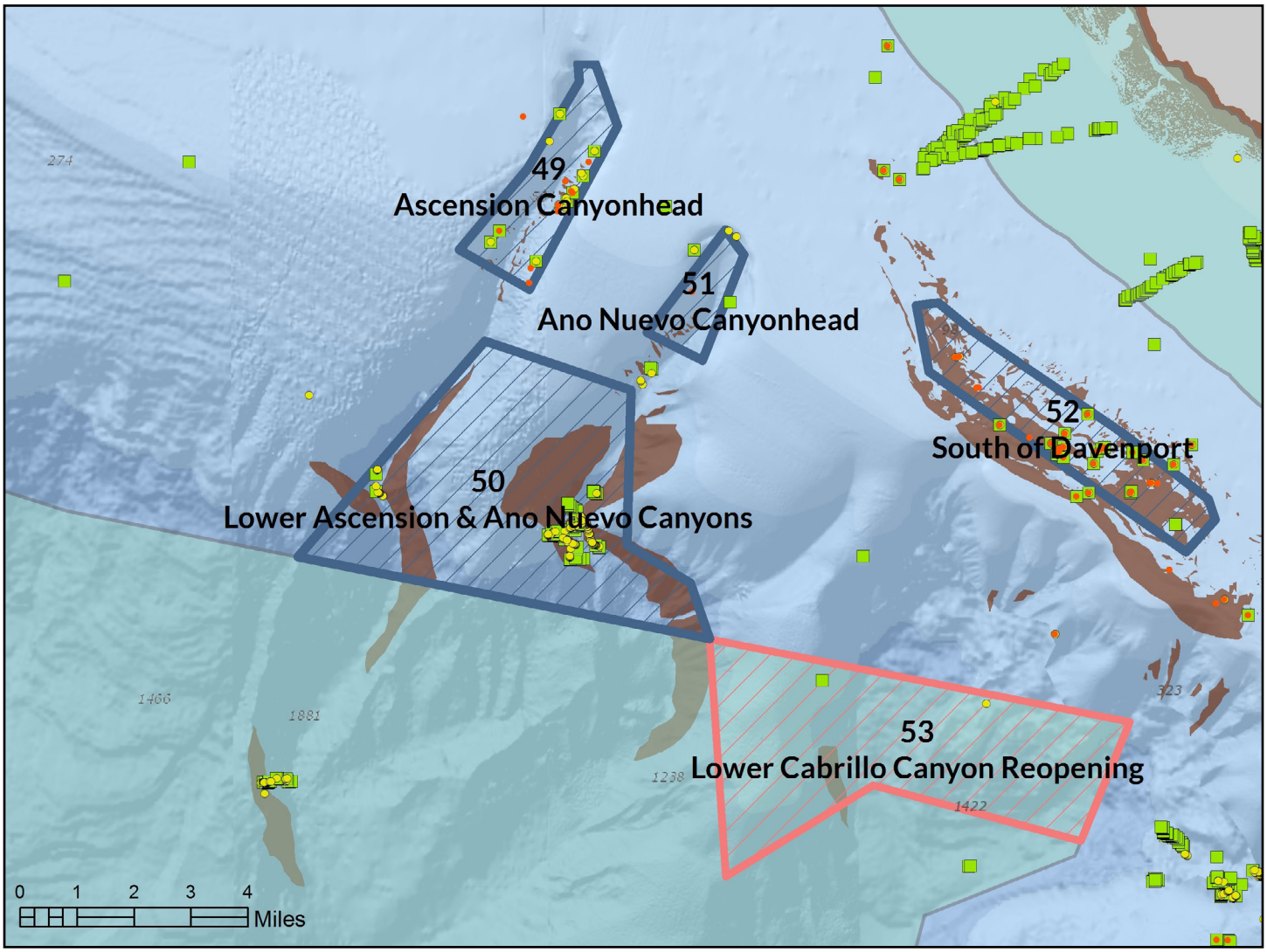
Ascension Canyonhead is a proposed new EFH Conservation area encompassing 4.1 square miles of upper Ascension Canyon. This area, along with areas 50 and 51, overlaps with the Sanctuary Ecologically Significant Area (SESA) for Año Nuevo and Ascension Canyon (MBNMS SESA 2016). This SESA is characterized by relatively high densities of seabirds and marine mammals. The area includes 18 coral observations, 10 sponge observations, and nine pennatulid observations. This closure is targeted to include the majority of biogenic habitat records and hard substrate features in the canyon. Much of this area is within the current trawl RCA, but the boundaries are drawn to include identified priority habitat features. The specific boundaries were drawn based on input from the fishing industry and are designed to maintain a “horseshoe tow” between Ascension Canyonhead and Año Nuevo Canyonhead, a tow along the northern canyon edge, and a continuous tow path between these canyonheads and the proposed closure of the deeper parts of these canyons.

50. *Lower Ascension & Año Nuevo Canyons*

The proposed Lower Ascencion and Año Nuevo Canyons EFH Conservation Area is part of the consensus agreement contained in the Monterey Bay National Marine Sanctuary's (MBNMS) EFH Proposal, and we worked with MBNMS to include this area as a part of our proposal. Please refer to the MBNMS Proposal for detailed information on the rationale for including this area.

51. *Año Nuevo Canyonhead*

Año Nuevo Canyonhead is a proposed new EFH Conservation Area encompassing a portion of the upper Año Nuevo Canyon from 150 to 170 meters depth. The area includes hard substrate features within the upper canyon, and there are multiple biogenic records collected in trawl surveys in the immediate vicinity. Much of this area is within the current trawl RCA, but the boundaries are drawn to include priority features of the canyon. Input from the fishing industry was considered and the shape is designed to maintain important nearby tow paths (as described for area 49).



52. South of Davenport &

53. Lower Cabrillo Canyon Reopening

South of Davenport is a new proposed EFH Conservation Area and Lower Cabrillo Canyon is a proposed reopening. Both areas are identical to the consensus agreement contained in the Monterey Bay National Marine Sanctuary's EFH Proposal and we worked with MBNMS to include this area as a part of our proposal. We provided additional analysis in our 2013 proposal, but please refer to the MBNMS Proposal for a detailed rationale for this area (MBNMS 2013).

Overlap with the Monterey Bay National Marine Sanctuary Proposal.

On July 31, 2013 the Monterey Bay National Marine Sanctuary submitted a proposal to the Council to modify EFH Conservation Areas in the region of the Sanctuary. That proposal represents the product of an eleven-month stakeholder process to identify ecologically important habitat areas, propose new EFH Conservation Areas and to propose the re-opening of parts of existing EFH Conservation Areas. The overall goal of the MBNMS proposal is to protect more total area and more sensitive habitats within the Sanctuary while improving fishing opportunities.

Oceana participated in that process and we worked with the MBNMS to include those consensus areas in our proposal. *Our proposal is identical to the MBNMS proposal for 13 of the 15 areas*. The MBNMS proposal notes there was not full agreement for the proposed sites at the La Cruz Canyon Complex and West of Piedras Blancas. The MBNMS proposal includes two separate sites for these areas where our proposal includes one contiguous site for the purpose of maintaining continuity and net overall habitat protections in light of the RCA being reopened here.

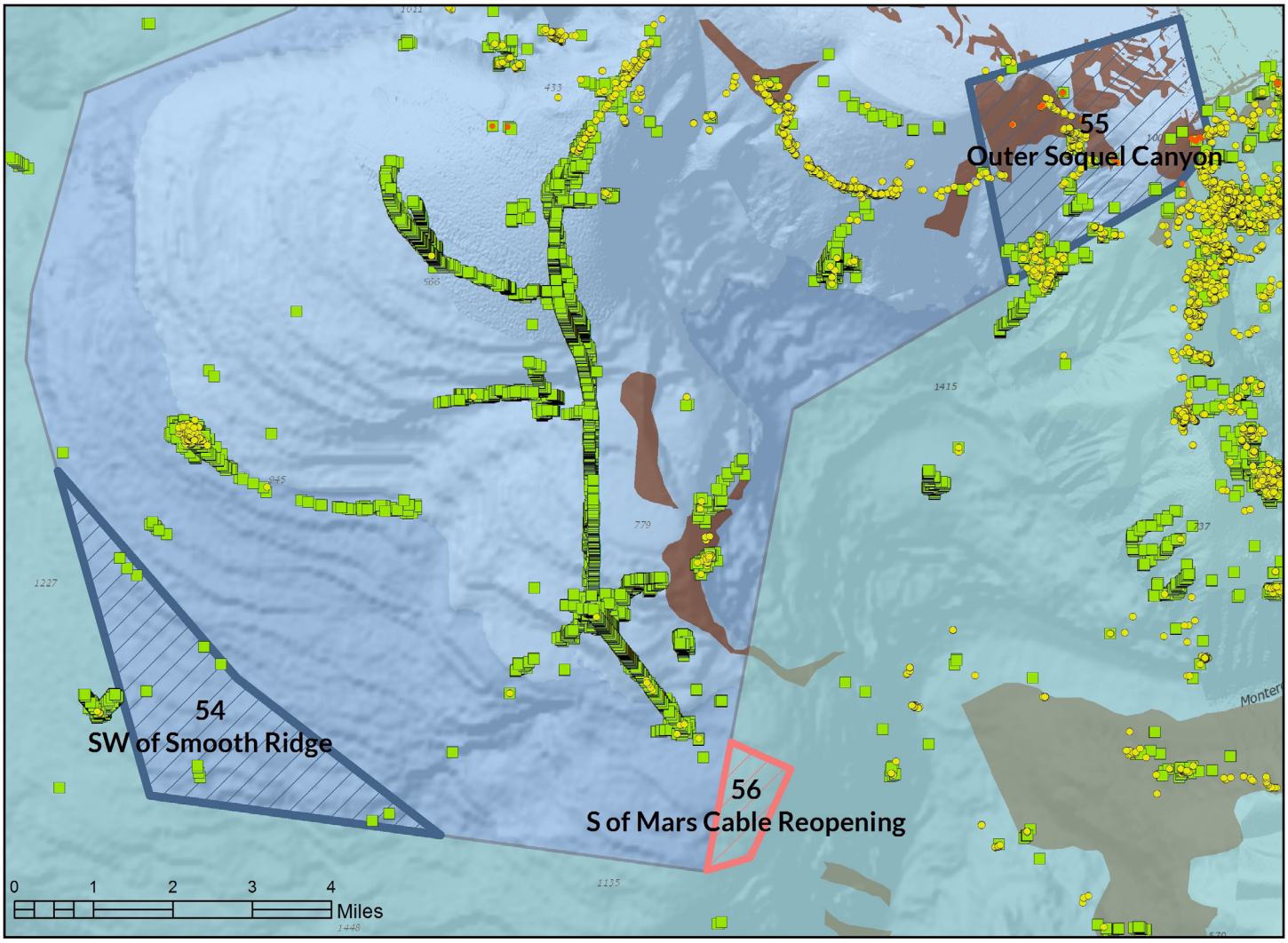
Ascension Canyonhead (#49) and Año Nuevo Canyonhead (#51) address the fact that the MBNMS consensus process did not consider reopening the trawl RCA and so with these closures there is still an overall net gain of protection for all priority habitats in the Sanctuary even if the RCA is removed.

54. SW of Smooth Ridge,

55. Outer Soquel Canyon, &

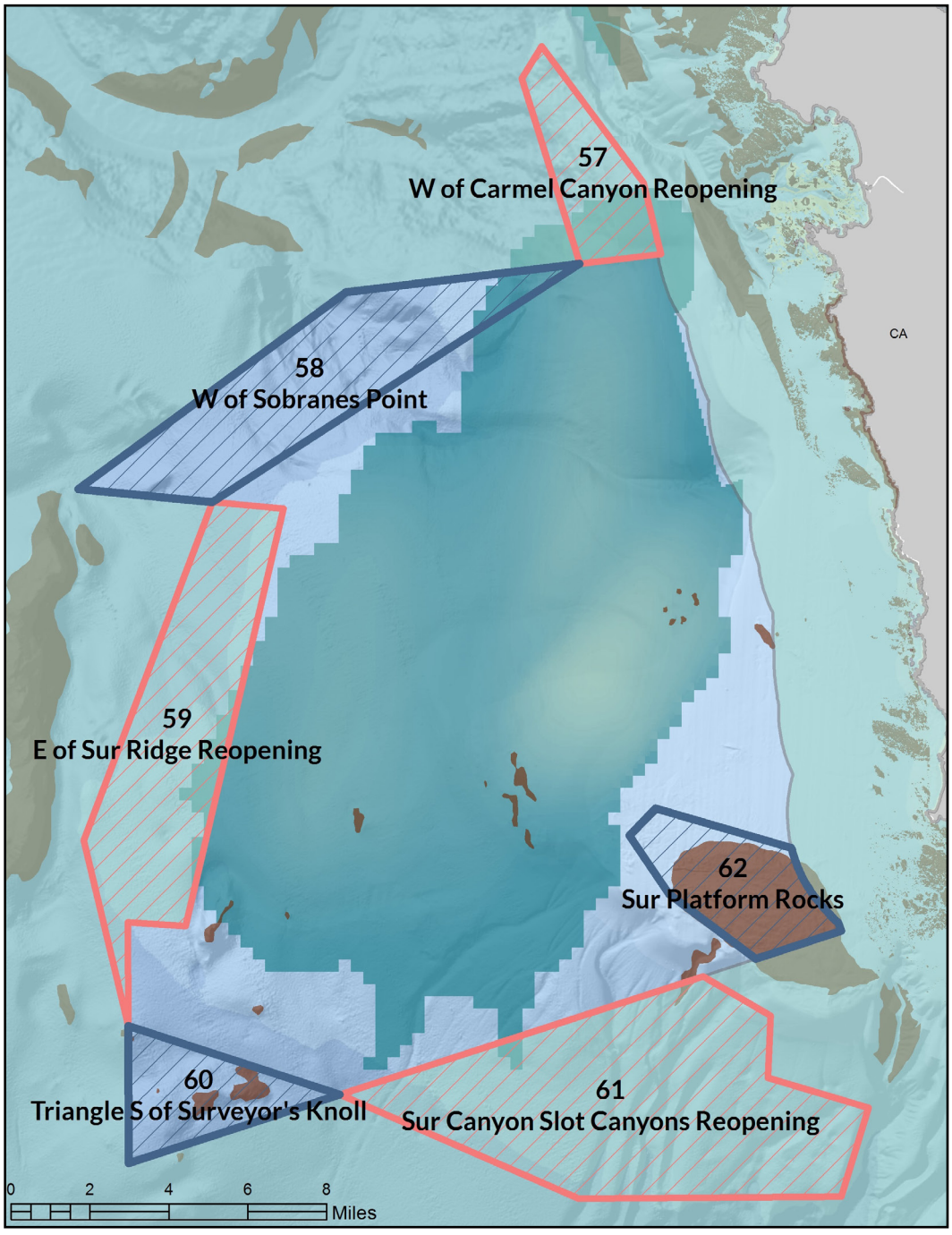
56. South of Mars Cable Reopening

SW of Smooth Ridge and Outer Soquel Canyon are proposed new EFH Conservation Areas and South of Mars Cable is a reopening, all of which are part of the consensus agreement contained in the Monterey Bay National Marine Sanctuary's EFH Proposal. We worked with MBNMS to include these areas as parts of our proposal. We provide additional analysis in our 2013 proposal, but please refer to the MBNMS Proposal for a detailed rationale for including these areas (MBNMS 2013). Additional information on the ecological diversity of these new proposal areas (54 and 55) is available through the MBNMS Sanctuary Ecologically Significant Areas technical reports (MBNMS SESA 2016).



57. to 62. West of Carmel Canyon Reopening, W of Sobranes Pt., East of Sur Ridge Reopening, Triangle South of Surveyor's Knoll, Sur Canyon Slot Canyons Reopening & Sur Platform Rocks

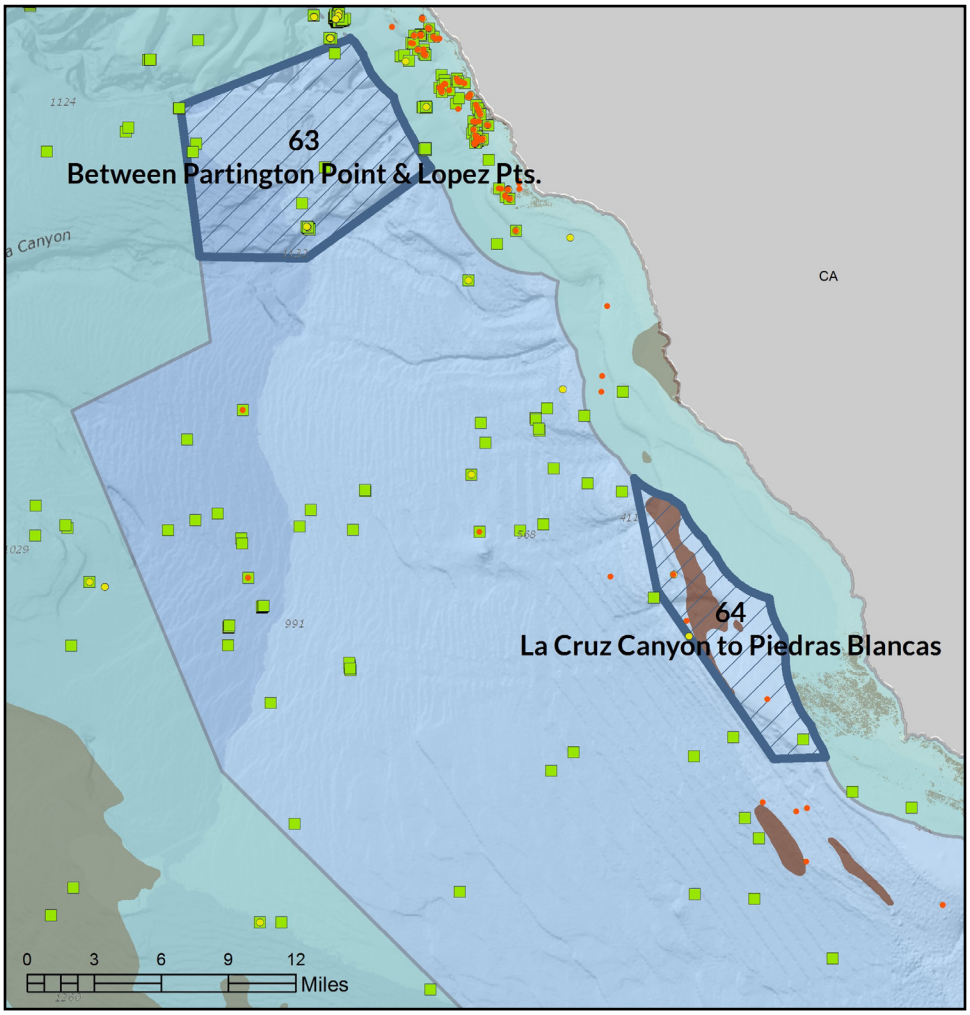
Each of these proposed EFH Conservation Areas and reopenings are part of the consensus agreement contained in the Monterey Bay National Marine Sanctuary's EFH Proposal. We worked with MBNMS to include this area as a part of our 2013 proposal. We provide additional analysis in our 2013 proposal, but please refer to the MBNMS Proposal for a detailed rationale for changes in this area (MBNMS 2013). Additional information on the ecological diversity of these proposal areas is available in the MBNMS Sanctuary Ecologically Significant Areas technical reports (MBNMS SESA 2016). The below map shows the proposed conservation area changes, seafloor bathymetry, hard substrate, and the recent trawl effort southwest of Monterey Bay.



63. Between Partington & Lopez Pts.

Between Partington Point and Lopez Point is a new proposed EFH Conservation Area that is part of the consensus agreement contained in the Monterey Bay National Marine Sanctuary's EFH Proposal. We provide additional analysis in our proposal, but please refer to the MBNMS Proposal for a detailed rationale for including this area (MBNMS 2013).

64. La Cruz Canyon to Piedras Blancas



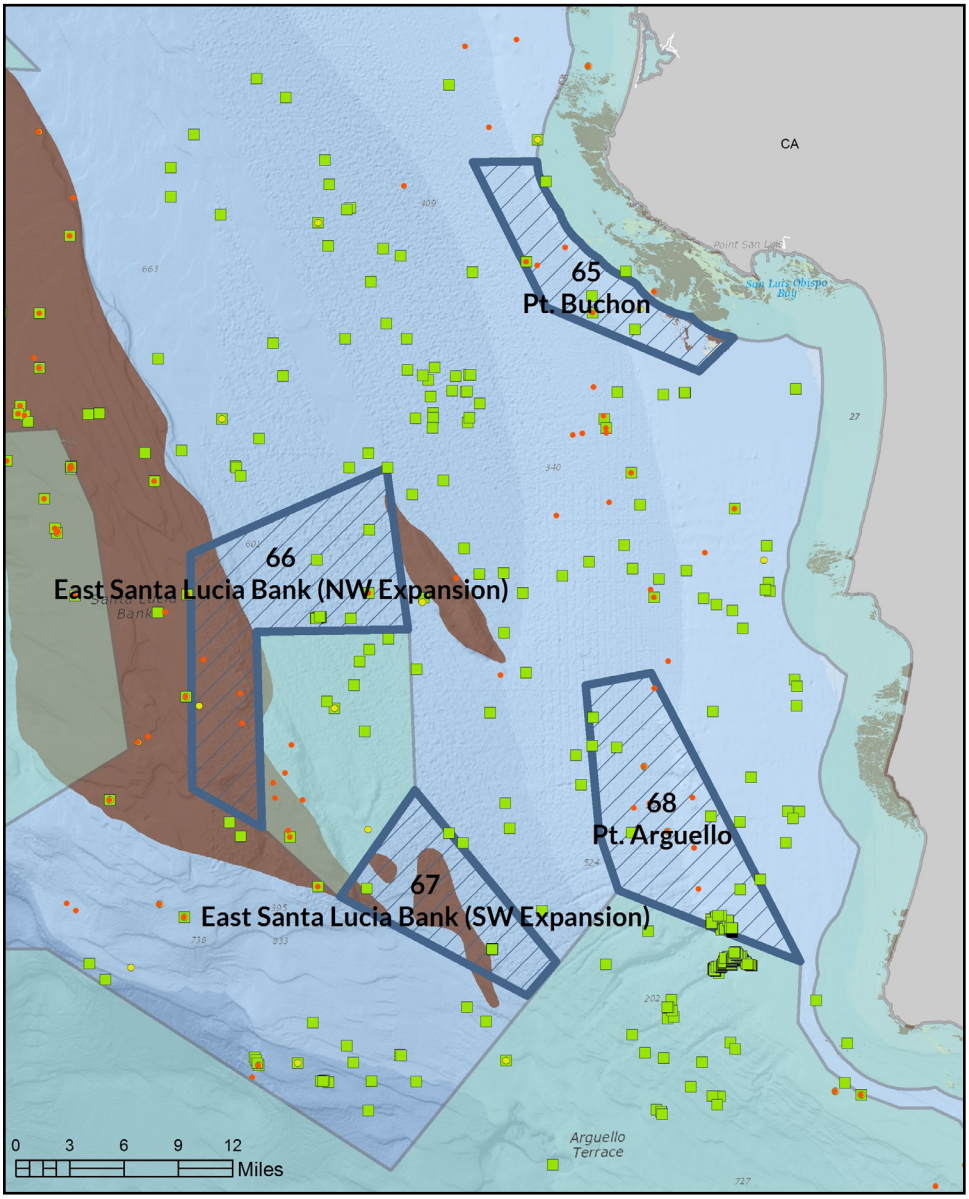
La Cruz Canyon to Piedras Blancas is a new proposed EFH Conservation Area encompassing part of the nearshore canyon, hard substrate and trawl RCA. Situated adjacent to the Piedras Blancas State Marine Protected Area, pennatulids, sponges, and corals have been observed here, including gorgonians and glass sponges. This nearshore area includes the upper reaches of two submarine canyons and reaches a depth of nearly 400 m. The area encompasses the current trawl RCA and extends to the state waters boundary to include important nearshore habitat. The northern boundaries encompass one of the few hard substrate features in this region. The southern boundaries include the portion of the Piedras Blancas reef extending into federal waters, providing substantial habitat connectivity and management benefits. This proposed area is a slightly larger, more comprehensive alternative to Areas 14 and 15 of the MBNMS proposal which did not obtain consensus across stakeholders. Specifically, our proposal differs by providing continuous protections across several priority habitat features and adjacency to state waters to provide uninterrupted ecological connectivity from the shoreline to the outer extent of these priority habitats.

65. Pt. Buchon

Point Buchon includes an important area of the trawl RCA in nearshore federal waters adjacent to the Pt. Buchon State Marine Protected Area. It follows the state waters boundary to include key hard and mixed substrate off Avila. The included portion of the RCA is in an area of steep slope and high predicted coral habitat. Boundaries were drawn to avoid key halibut trawl grounds off Avila and historic pink shrimp trawl grounds to the south while including key habitat features inside and near the RCA. There is currently no recent data available for trawl intensity in this region, but information on trawling from 2000-2005 indicates very low effort in this area.

66. East Santa Lucia Bank (NW Expansion)

This northern extension of the existing East Santa Lucia Bank EFH Conservation Area encompasses an area with multiple biogenic habitat records. It also extends it to the west to include additional hard substrate on the Bank itself. This site offers to protect a significant amount of hard substrate that is currently open to trawling. According to NMFS trawl surveys, the area on the Bank contains multiple coral records and several distinct areas with glass sponges. There is little current information on trawl effort in this area due to the extremely low fishing effort throughout this region in recent years, although previous data on trawl effort from 2000-2005 suggests this area had low effort relative to other areas in the region.

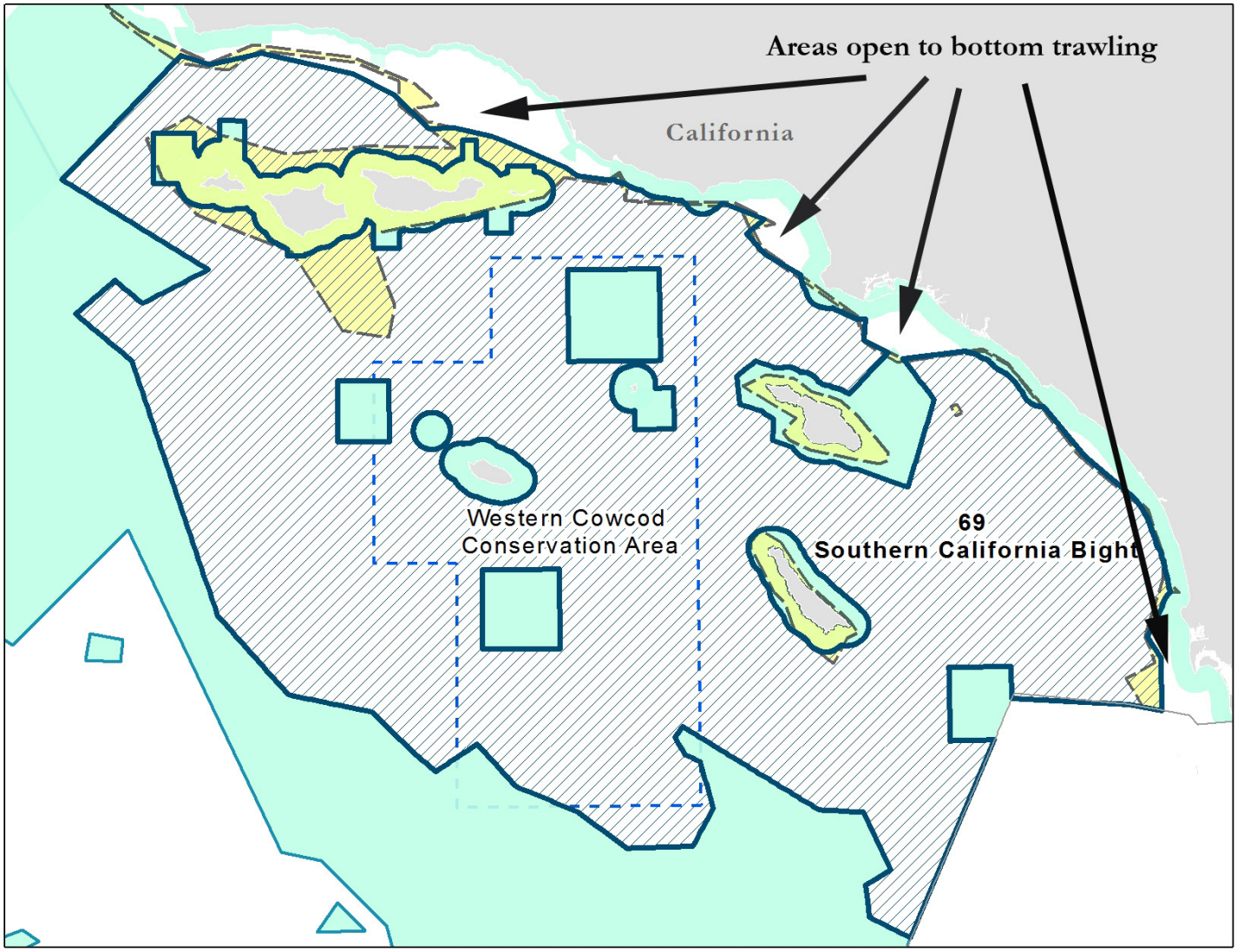


67. East Santa Lucia Bank (SW Expansion)

East Santa Lucia Bank (Southeast Expansion) is the proposed addition to the south of the existing East Santa Lucia Bank EFH Conservation Area. This area connects East Santa Lucia Bank to the Point Conception EFH Conservation Area. It contains significant hard substrate at the southernmost end of Santa Lucia Bank and multiple sea pen records from trawl surveys. There is no recently available data on trawl effort for this area, due to the extremely low effort in this region in recent years. However, from previous 2000-2005 logbook data, it appears that this proposal area would not impact important trawl grounds on either side of the conservation area.

68. Pt. Arguello

Point Arguello adjoins the existing Pt. Conception EFH Conservation Area and includes a portion of the trawl RCA. The proposal area includes a significant feature at the northern end within the current trawl RCA that was identified in discussions with fishermen, as well as additional canyonhead habitat not encompassed in the current Pt. Conception EFH Conservation Area. It also includes multiple sponge and other biogenic habitat records, including gorgonian corals. Boundaries for this area were drawn to avoid trawl paths to the north as indicated by 2000-2005 trawl logbook information. It is critical that priority habitats here remain protected to ensure no net increase in potential adverse impacts associated with the reopening of the trawl RCA in this region.

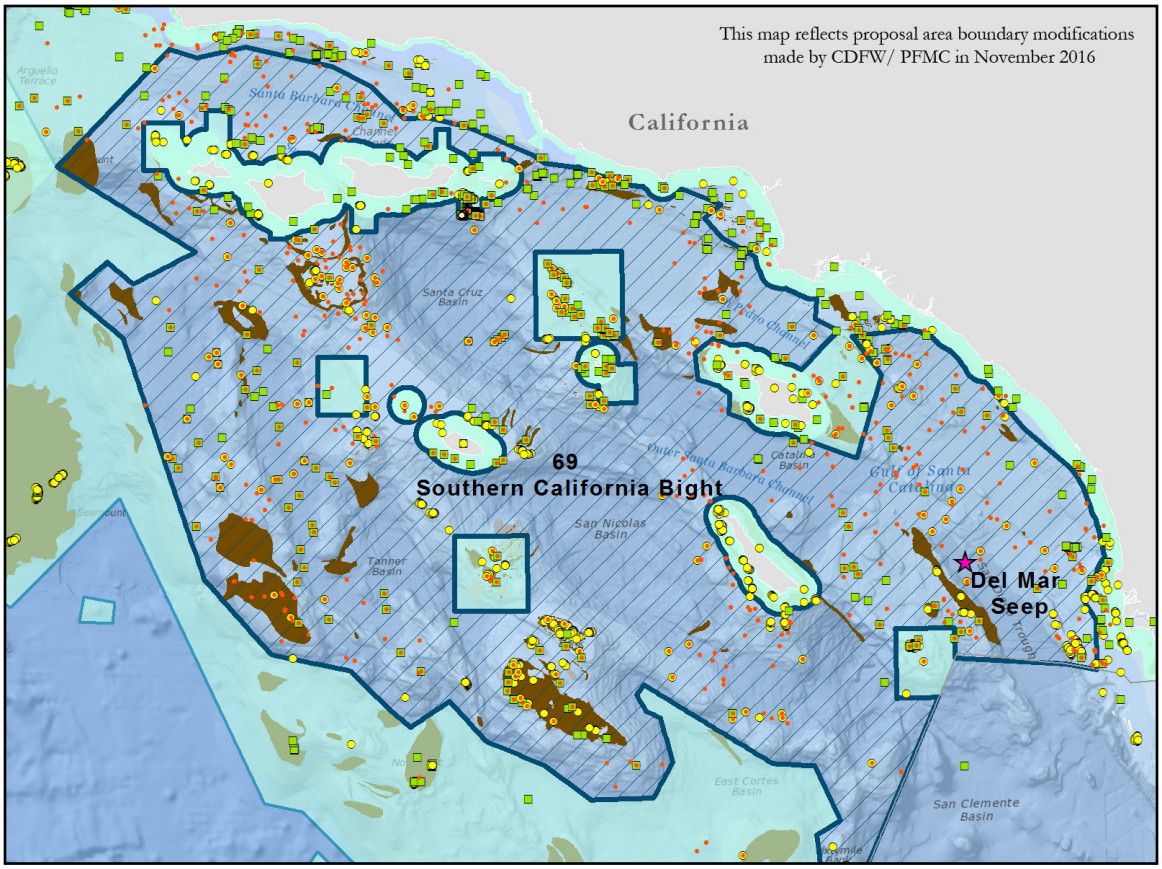


Overview Map 9. Southern Biogeographic Region showing the proposed EFH Conservation Area for the Southern California Bight, existing state water groundfish trawl closures and EFH Conservation Areas, plus the trawl RCA (yellow) and the Western Cowcod Conservation Area (blue dashed line). In addition to surrounding areas in the Bight, this proposal area would designate the Western Cowcod Conservation Area as an EFH Conservation Area closed to bottom trawling.

69. Southern California Bight

The Southern California Bight region is exceptionally biologically and geologically diverse. Many offshore islands and banks create unique physical conditions that support a high abundance and diversity of biogenic habitats. We are proposing that this area, beyond the current bottom trawl footprint, be designated as an EFH Conservation Area closed to bottom trawling.

The basis for this proposed area is to maintain a precautionary approach consistent with the Council's approach in Amendment 19 of prohibiting trawling in un-trawled areas outside the existing trawl footprint. It is responsive to new data and information all indicating this region contains phenomenal biogenic and physical habitat diversity. Plus, the various banks off the Southern California Bight are highly valuable for recreational fishing.



Protection from bottom trawling will ensure continued productive habitats for both recreational and fixed gear commercial fisheries.

Researchers have documented thousands of coral colonies and sponges here. There are over 3,300 coral observations, over 10,200 sponge observations, and over 5,600 pennatulid observations according to the NOAA Deep Sea Coral Database. Additionally, the recent discovery of the Del Mar Seep in the northern portion of the San Diego Trough (and included in this proposal area) has garnered significant scientific interest. A mosaic of habitat including microbial mats and carbonate rock substrates supports high densities of sponges and other important seafloor species at the seep area (Grupe et al. 2015). Researchers have documented important managed fish species within this seep habitat including longspine thornyhead and Dover sole, with longspine thornyheads appearing closely associated with seep activity (Grupe et al. 2015). Grupe et al. (2015) suggest that a relationship between methane seeps and rockfish may exist based on findings at this site.

What is more, the area contains over 800 square miles of hard substrate as identified in the EFH Phase I Report. A significant portion of the area is predicted to be highly suitable coral habitat (Guinnotte & Davies 2012). This closure fully encompasses the boundaries of the Channel Islands National Marine Sanctuary and would, thereby, increase the amount of Sanctuary area currently protected from bottom trawling.

Protecting this area would be consistent with NOAA's precautionary policy regarding deep-sea corals (NOAA 2010). It would create a "study first" system in which areas where the industry seeks approval to trawl would have to be first studied and explored, and a determination made that bottom trawling would not adversely affect vulnerable habitats in the area. While a "feature-based" approach of only protecting known priority habitats may be appropriate in areas where bottom trawling occurs or in areas that have been fully mapped and explored, the vast areas of unexplored habitat and the continued new discoveries of additional vibrant priority habitats in previously unexplored areas warrants a precautionary approach.

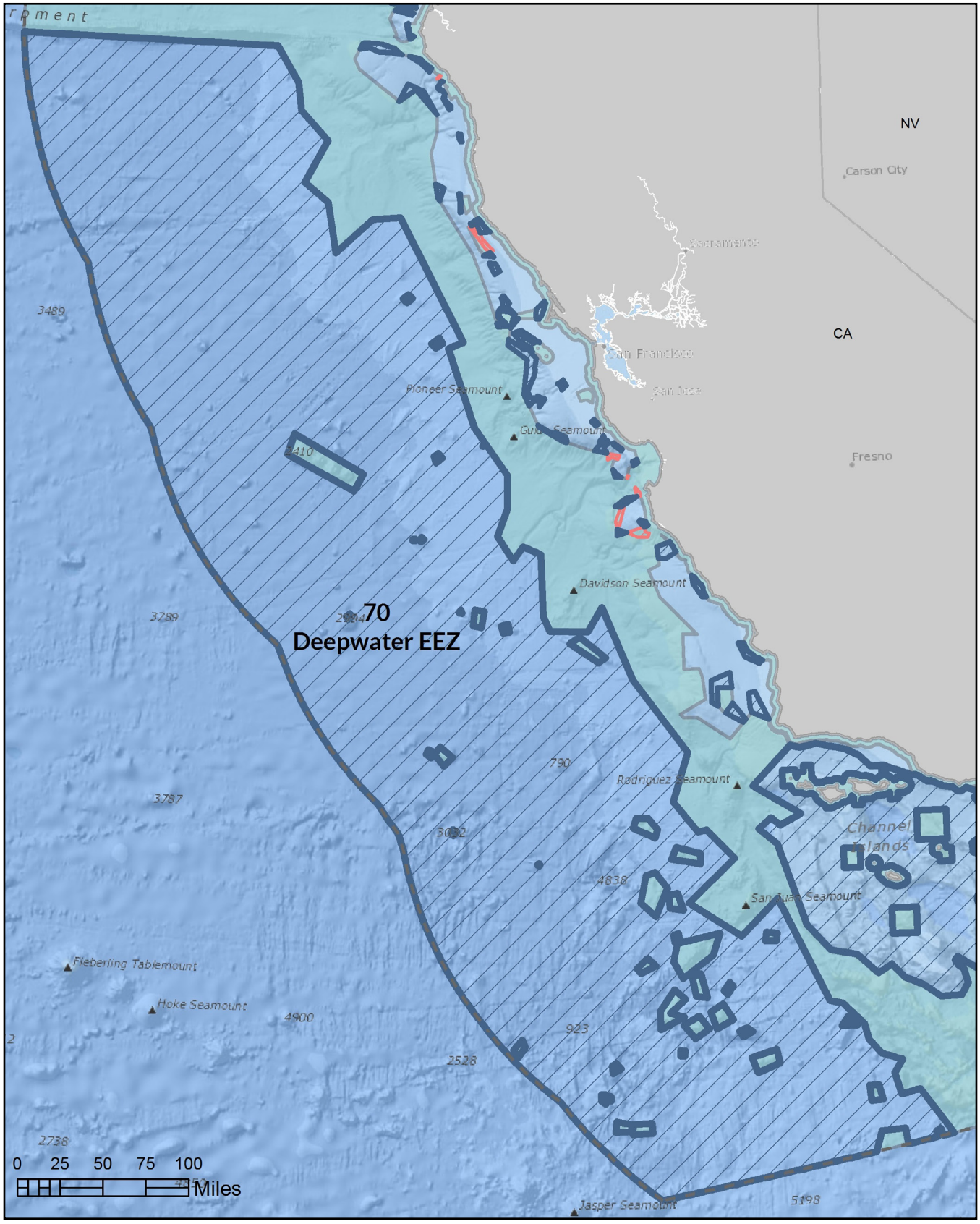
The boundaries of this area have been drawn based on discussions with the Southern California fishing industry and are intended to maintain all current trawl tow areas in the four nearshore areas where halibut, sea cucumber, and ridgeback prawn trawling occur (see overview map 9). In federal waters, areas shallower than the following depths would remain open to trawling: 100 fathoms from Oceanside to Mexican Border; 100 fathoms at San Pedro Bay; 100 fathoms at Santa Monica Bay; and 120 fathoms from Hueneme Canyon to Pt. Conception.

70. Deep-water Conservation Area > 3,500 meters

At the April 2016 meeting the Council selected a preliminary preferred alternative to prohibit bottom contact fishing in the deep-water area off California (>3,500 meters) using its discretionary MSA Section 303(b) authorities. The proposed Deep-water Closure would add to the 700-fathom trawl footprint closure, protecting this area from not only bottom trawling, but all bottom contact between the 3,500 meter depth contour and the outer extent of the U.S. EEZ. This area would protect ~ 123,222 square miles of seafloor habitat. These protections are consistent with the Council's recommendation in 2005 that was later partially disapproved by NMFS because the area was not designated as EFH. With new MSA authorities for protecting habitats, ecosystem and corals, the Council can now complete this action.

This area includes 195 distinct coral observations including black coral *Bathypathes alternata* and stony coral *Fungiacyathus marenzelleri*, the gorgonian coral *Chrysogorgia* sp., mushroom coral *Anthomastus robustus*, bamboo corals *Keratoisis* sp. and *Lepidisis* sp. and 1,141 pennatulid observations. These coral observations indicate the area contains essential deep sea coral ecosystems. According to the EFH Data, the deepest identified depth within the U.S. West Coast EEZ is 4,810 meters. Protecting this area would not displace any groundfish fishery effort.

These deep-water areas are known to be highly sensitive to fishing impacts. The Final Rule implementing the 2006 EFH Regulations states that "NMFS acknowledges that features that occur beyond 3,500 m include hydrothermal vents, soft-bottom sediments, and hard bottom areas with high biogenic structures such as deep sea corals. All or most of the deep sea environment may be highly sensitive to impact, including at very low levels of fishing effort (e.g. a single contact), and have extended recovery times (over seven years)" (NMFS 2006). Clearly a precautionary approach is warranted.


70
Deepwater EEZ
NV
Carson City
CA
Fresno
Pioneer Seamount
Davidson Seamount
Rodriguez Seamount
Channel Islands
San Juan Seamount
Jasper Seamount
Fieberling Tablemount
Hoke Seamount
3489
3410
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3787
790
4838
4900
923
2528
2738
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