Updated Collaborative Package of Changes to Groundfish Essential Fish Habitat Conservation Areas and the Trawl Rockfish Conservation Area

April 2016

Seth Atkinson
Tom Libby
Shems Jud
Brad Pettinger
Kate Kauer

Table of Contents

Introduction

This document contains an updated package of proposed modifications to groundfish Essential Fish Habitat (EFH) Conservation Areas and the Trawl Rockfish Conservation Area (RCA), with detailed descriptions of the rationale for each area.

As noted in submissions to the Pacific Fishery Management Council by the collaborative last year (September 2015 Briefing Book, Agenda Item H.8.b Public Comment 1 and Supplemental Public Comment 3), these changes were the product of two different collaborative working groups. One group focused on the region north of 40°10', and the other group focused on areas south of 40°10'. Different individuals and organizations participated in the collaborative process in each region. In both regions, however, the working groups maintained the goals of revising EFH and RCA regulations in order to improve habitat protection as well as increase fishing opportunity.

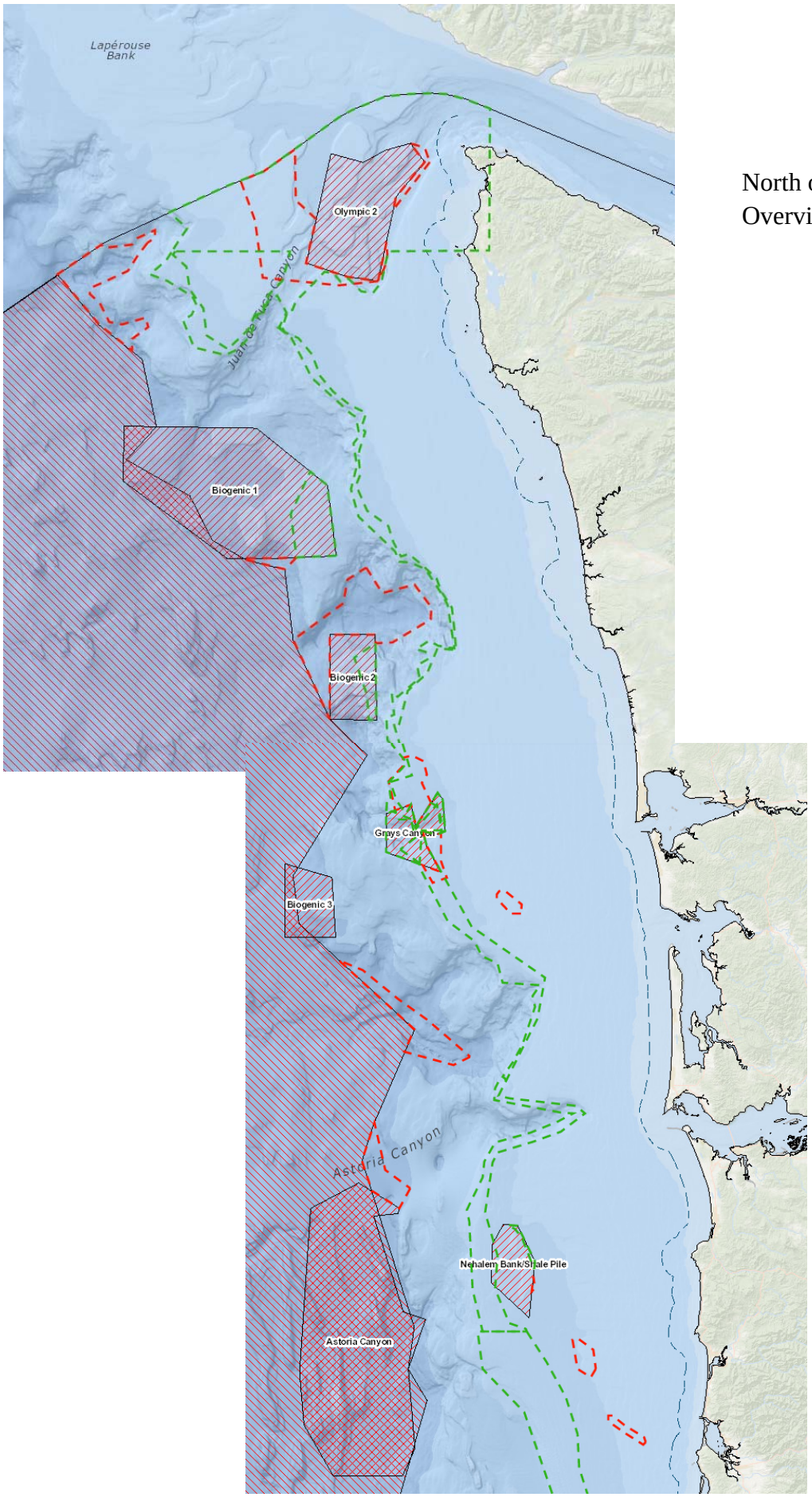
The first section of this document describes proposed changes from the Canadian border to 40°10'. The second section describes proposed changes from 40°10' to Point Conception. This package does not contain any proposed changes from Point Conception to the Mexican border, as a lack of active groundfish bottom trawlers made it impossible to form a collaborative working group for that part of the coast.

The proposed area modifications set forth in this document are understood to be consensus recommendations, whereby each set of recommendations (i.e., North 40°10' and South of 40°10') has the support of the respective participants in that collaborative group. The only exceptions are the areas off Newport, Oregon, which are discussed in more detail below.

North of 40°10’

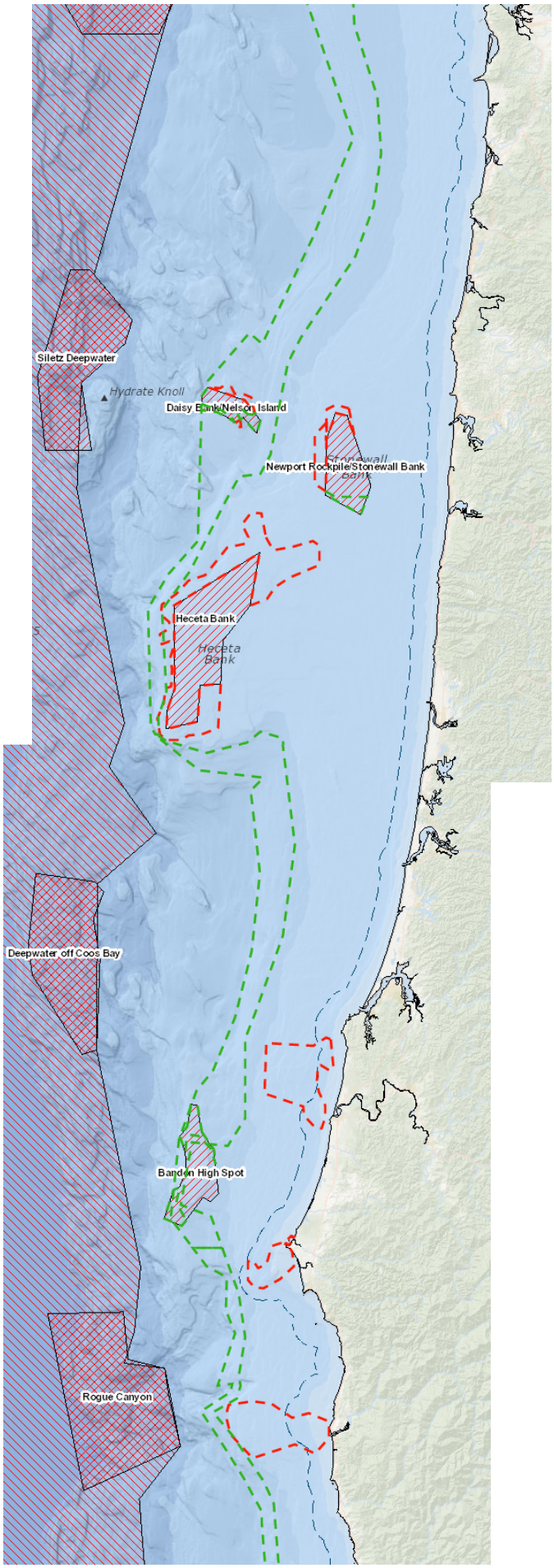
The northern collaborative working group held port meetings in Eureka, Brookings, Coos Bay, Newport, and Astoria. Smaller discussions also were held with individual participants in the bottom trawl fishery, including trawlers who fish out of Washington State. Overall, the northern group spoke with and received input from dozens of skippers and permit holders from all three West Coast states. Participating NGOs included Environmental Defense Fund (EDF) and the Natural Resources Defense Council (NRDC). Throughout the process, the twin goals of a robust fishing industry and a resilient benthic ecosystem served as guideposts for considering possible openings and closures.

In terms of biogeographic characteristics, the northermost portion of this region (i.e., north of Cape Falcon) has numerous offshore canyons, a steep shelf-slope break, and deepwater basins. Hard and mixed substrate is prevalent throughout the area. There are numerous records of black coral, gorgonian coral, glass sponges in the region, as well as many other types of structure-forming invertebrates. This northermost section of the coast also is a rich fishing ground, contributing much of the catch and revenue for fishery participants in Astoria, which is the largest non-whiting bottom trawl port on the coast. The area from Cape Falcon to 40°10’ is characterized by several significant nearshore rocky reefs, as well as major offshore banks and ridges. In this portion of the coast the continental shelf is relatively wide, and areas surrounding the banks and reefs tend to be comprised of soft sediment. Key trawl ports adjoining these productive fishing grounds include Newport, Coos Bay, Brookings / Crescent City, and Eureka.

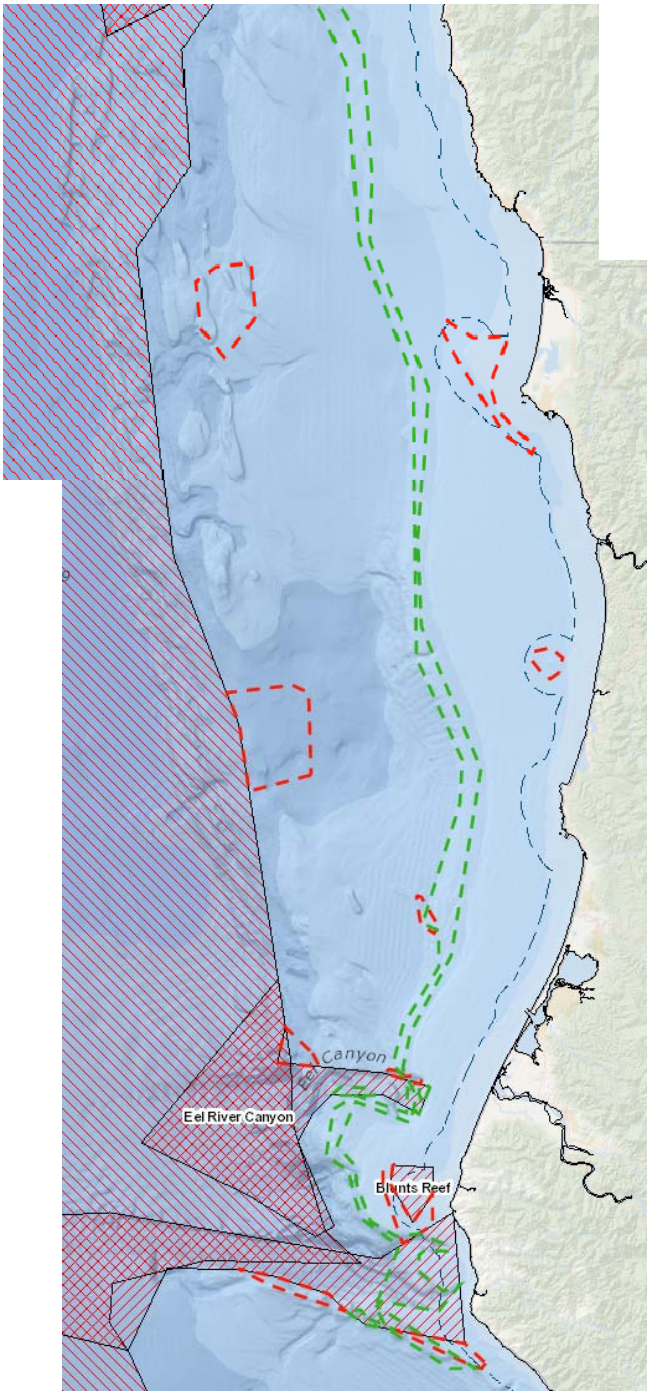


North of 40°10’
Overview

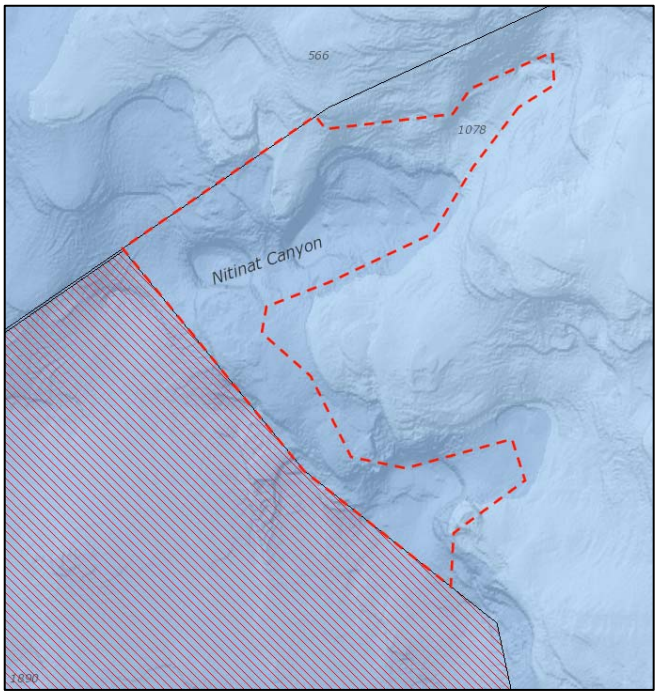
North of 40°10’
Overview (continued)



North of 40°10’
Overview (continued)



Nitinat Canyon



This is a steep canyon feature at the far northern end of the Exclusive Economic Zone, adjacent to the 700fm line. Several black coral and glass sponge observation records exist in the area, and much of the canyon is predicted to be high-suitability coral habitat.

Astoria fishermen mentioned that the canyon walls of Nitinat Canyon are very steep and can be difficult to fish, and that there are defunct cables in the area. The area under consideration also is quite deep, mostly deeper than 600fm. Overall this area was indicated to be low priority for fishing, in part due to the telephone cables running through it. The upper north side of the canyon, however, near the EEZ boundary, contains shrimping grounds that were historically important.

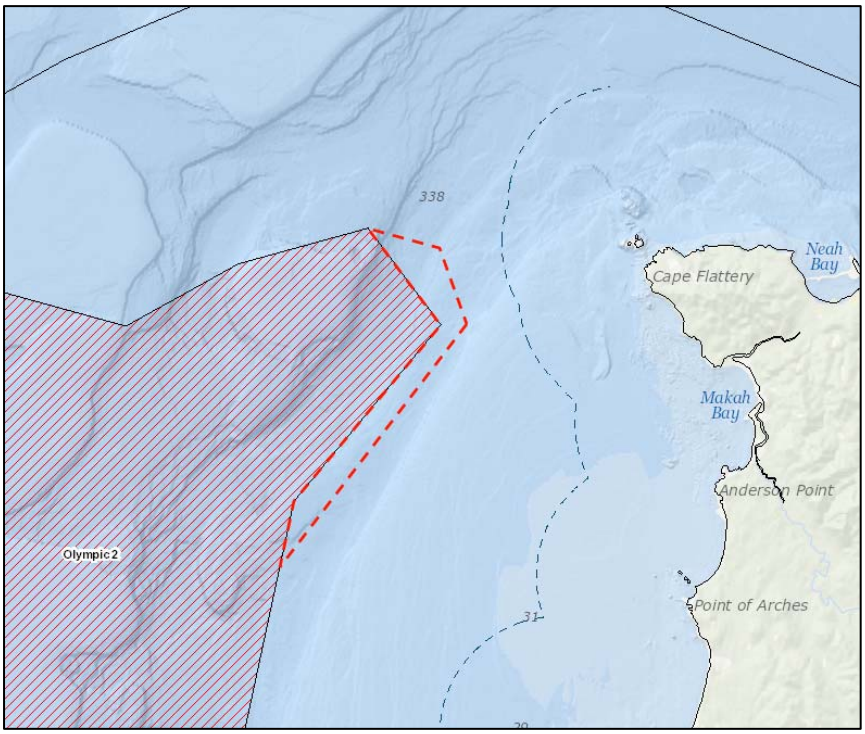
This shape was drawn based on fishermen's input, tracing the 400fm contour on the north side, which is sufficient to maintain the northern shrimping grounds. The line then drops down to the 600fm contour for the southern side of the canyon, and swings around the 600fm contour for the smaller canyon feature to the south. This configuration allows DTS tows on the slope to be maintained, while protecting the deeper areas. One waypoint was moved out to capture a glass sponge observation record, around the 537 reading on the nautical chart.

In terms of implementing this area, the majority of it is shallower than 700fm, so it may be preferable to designate an EFH Conservation Area rather than simply adjust the 700fm line here. If desired, the seaward edge of the shape could be moved outward somewhat to make a straight line (i.e., the seaward line of this shape does not have to run flush up against the 700fm line, it can overlap if needed).

Olympic 2 Northeastern Modification

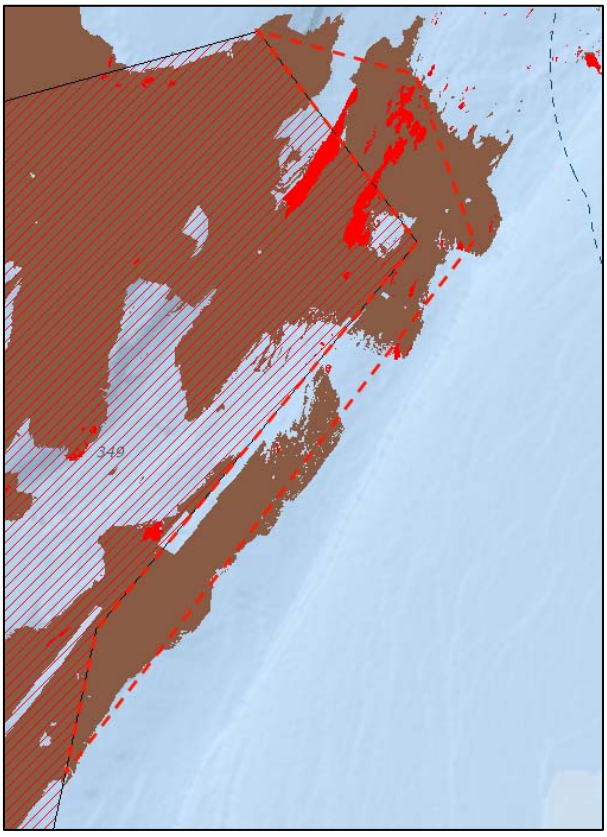
This is a thin strip of ground on the northeastern side of the existing Olympic 2 EFH Conservation Area. It was identified based on the presence of hard and mixed substrate, which in this area is mapped with high confidence. Research dives also have been conducted on the

edge of the existing Olympic 2 area, which found numerous gorgonian and stony corals. This strip of ground would provide a small buffer of unexplored area adjoining the dive sites.



Being north of Cape Alava and located on the shelf, this area currently is entirely covered by Trawl RCA. As such, the expansion of Olympic 2 EFH Conservation Area suggested here would simply maintain protection for the area, if and when the Trawl RCA is removed.

Fishermen indicated no current bottom trawl effort exists in this region, and while historical tows are located nearby, they generally avoided the hard bottom areas and utilized slightly shallower waters. The EFH Data Catalog bottom trawl effort layer for 2002-2006 corroborates this, showing high bottom trawl effort adjacent to the area identified here.

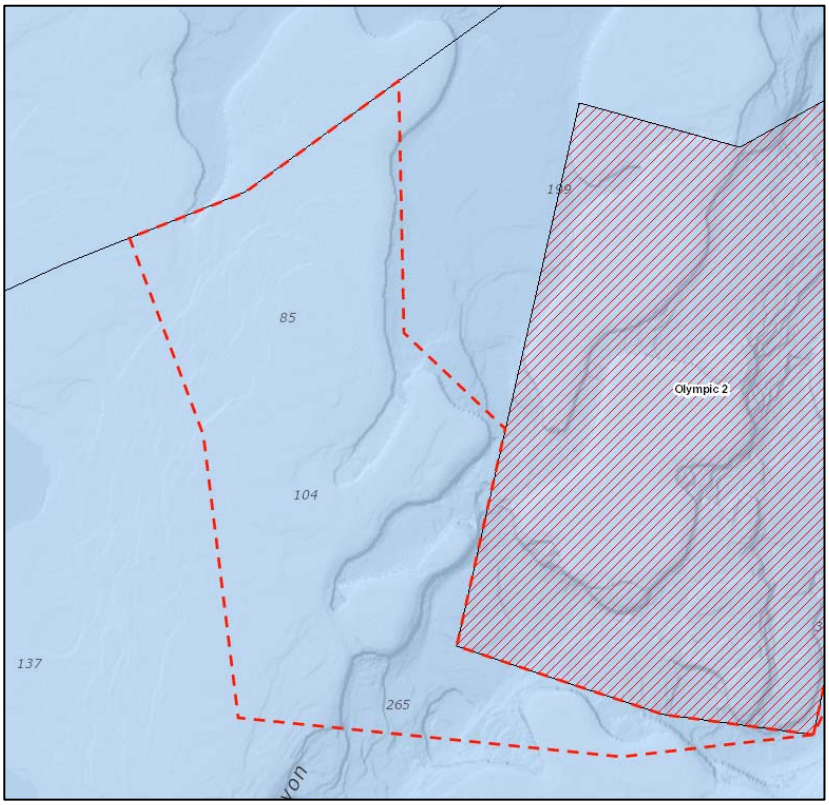


The shape sketched here is drawn tightly around the hard and mixed substrate areas (brown and red are mixed and hard substrate, respectively, in the image at left). The shape is slightly under-inclusive in order to avoid closing trawlable areas on the shoreward side.

This area, as well as the other two modifications to Olympic 2 EFH Conservation Area noted below, are located in the Makah Usual and Accustomed (U&A) fishing area. The western modification also may be located within the Quinault U&A. The coastal treaty tribes are autonomous sovereigns and manage their own fishing activities, and the changes described here would strictly apply to non-

tribal fishermen. The treaty tribes and NMFS are currently working to develop a Habitat Framework to better characterize habitats, as well as species dependence on them, within the U&As. The area modifications described here are not intended to replace or alter that process. Furthermore, any area modifications that are adopted ultimately by the PFMC will be subject to government-to-government consultation between the United States and the tribes, as underscored by the Council's June 2015 motion.

Olympic 2 Western Modification

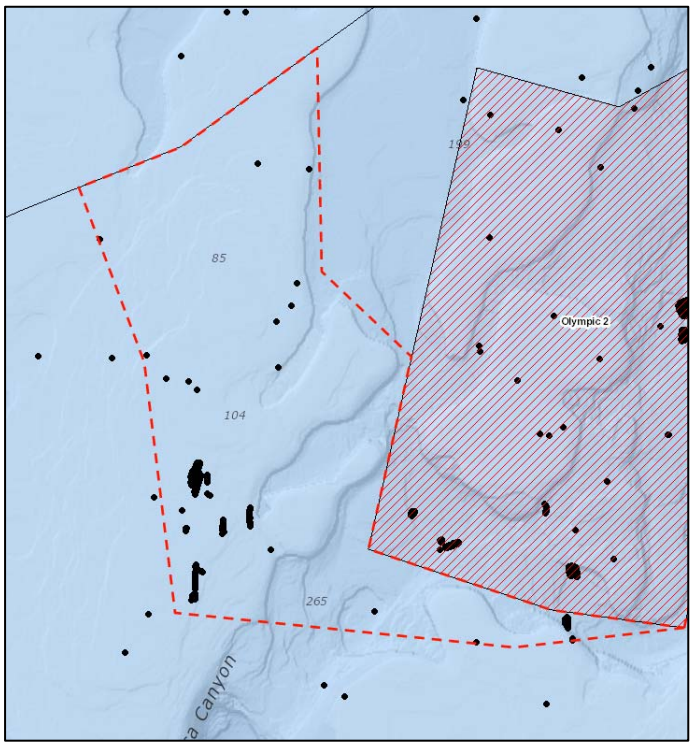


The upper Juan de Fuca canyon and adjoining shelf area was identified early on as a potential area of sensitive habitat, based on the presence of hard and mixed substrate (mapped with high confidence), numerous research dives, and abundant coral and sponge observations.

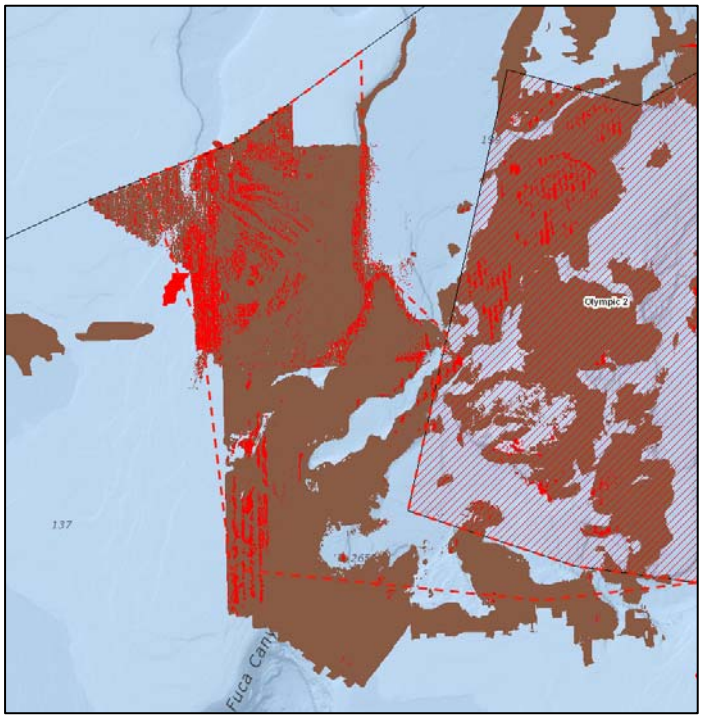
The collaborative group discussed with fishermen their usage patterns in this northern shelf area; fishermen indicated that the area shallower than 100fm has rough patches scattered around, and is not used heavily by non-tribal trawlers. Industry members generally agreed with the characterization of the seafloor presented by dive reports and substrate maps. While the northern shelf is not uniformly bad bottom, and there are tows scattered about the area (i.e., if a fisherman knows the area well, it is possible to skirt the rough patches and tow in certain spots), the area overall was indicated to be a relatively low-priority area for bottom trawling. The effort data from the EFH Data Catalog confirms this description. Bottom trawl effort from 2002-2006 shows a few pockets of activity on the northern part of the shelf, and some tows coming up Juan de Fuca canyon from the south. The 2006-2010 data layer also shows high effort in Juan de Fuca canyon, and little on the northern shelf.

A number of research dives have been conducted in this region, and some of them can be viewed as clusters of coral or sponge records in the EFH Data Catalog coral/sponge observation data

layer. Some of the dive sites are located within the current Olympic 2 EFH Conservation Area, while others are outside. One set of dive sites outside the EFH Conservation Area is located just south of it, while another set of dive sites is located to the west of it. These research dives observed numerous corals and sponges on the seafloor. Site characterization from the dives ranges from boulder and hard substrate areas to cobbles, gravel, and sand/mud. Mixed substrate areas encompass a range of grain sizes, including areas of sand and gravel or cobbles. High-relief areas appear to be relatively rare, though glacial erratics and other types of glacial sediment create relief in some areas.



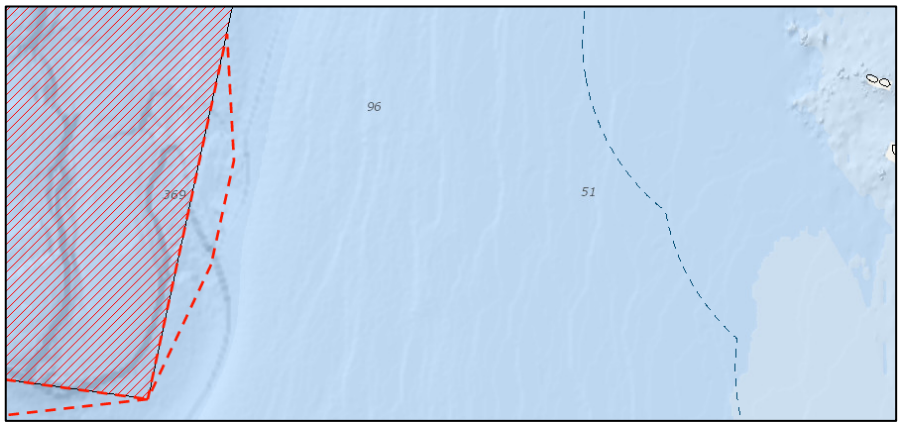
The area sketched here stays well inside 100fm, based on the feedback from fishermen, and sticks closely to the mapped hard and mixed substrate areas. On the south side, the shape is under-inclusive of the mixed substrate because at least one Astoria fisherman indicated that the area around the compass rose (on the nautical chart) and westward to the Juan de Fuca canyonhead is usable ground. On its north edge, the shape avoids an area of well-mapped soft substrate in the notch between the existing EFH Conservation Area and the hard/mixed substrate to the west; this area would stay open to maintain access to historical tows there. The shape also avoids pockets of higher-intensity bottom trawl activity as shown in the EFH Data Catalog layers. One research dive site would be excluded by the shape as drawn here—a set of dives conducted on the eastern side of Juan de Fuca canyon, visible as a cluster of coral-sponge observation records. In that area, researchers found mostly sea pens and sea whips, with no hard corals, and generally soft substrate.



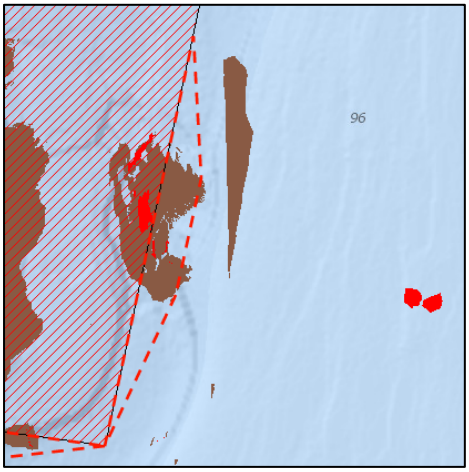
Note that the year-round Trawl RCA covers almost all of the shape proposed here. As such, extending the Olympic 2 EFH Conservation Area would provide continuity of protection when the RCA is lifted. This is important, as some of the research dive sites with documented hard and mixed substrate are located outside the current EFH Conservation Area but within the Trawl RCA, and therefore would be exposed to bottom trawling if the RCA were lifted but the EFH Conservation Area not extended to cover them.

As with the previous area, this area is located within at least one tribal U&A. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the relevant tribes.

Olympic 2 Southeastern Modification



This small expansion of Olympic 2 EFH Conservation Area is oriented around a distinct hard and mixed substrate feature that is mapped with high confidence. The eastern half of this feature is currently outside Olympic 2 EFH Conservation Area, and the expansion sketched here would bring out the southeastern boundary to fully encompass the feature. Research dives have been conducted in this area (straddling the boundary of the Olympic 2 area), finding bubblegum corals, gorgonians, and other hydrocorals.



Based on conversations with fishermen and the data layers, it appears there is no bottom trawl fishing in the area sketched here. One fisherman spoke to trawling along the 60-70fm contour, but south of the area indicated here. The EFH Data Catalog bottom trawl effort layer for 2002-2006 reflects fishing effort in a north-south pattern on the shelf to the east of the area sketched here, with little effort near the feature in question.

The area sketched here is fully within the Trawl RCA, and

the expansion of Olympic 2 would simply maintain protection for the area when the RCA is removed. The shape is drawn tightly around this hard/mixed substrate feature, in order to keep historical trawl areas unobstructed, and the area is slightly under-inclusive of the feature for this reason.

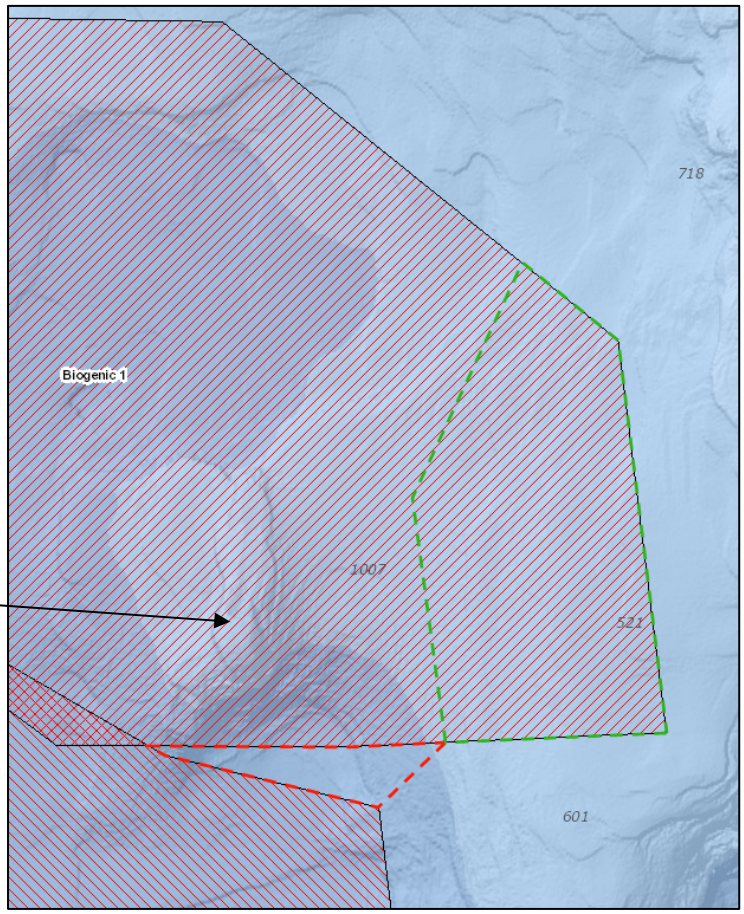
As with the previous areas, this area is located within at least one tribal U&A. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the relevant tribes.

Biogenic 1 Eastern Modification

Several Astoria fishermen described the eastern portion of Biogenic 1 EFH Conservation Area as being comprised of soft muddy bottom, and stated that it would be useful to have this area opento increase fishing opportunity. This area is known as a productive DTS (dover thornyhead sablefish) area, and does not have rough patches or pinnacles that would make it un-fishable from a bottom trawling perspective. The area indicated is primarily in the 300-450fm range.

No hard or mixed substrate shows up in the EFH Data Catalog layers for this area, though the confidence level in that data is mostly low (no multibeam surveys have been conducted). A number of coral and sponge observations are recorded in the area from the trawl survey, including black corals and glass sponges. No research dives have been conducted in the area, to the best knowledge of the collaborative.

The area for re-opening was originally sketched larger, and included the north-south oriented ridge located here. The re-opening line was moved east to maintain protection for the ridge, at the request of NGOs. The redrawn line was based on feedback from a fisherman knowledgeable about the area.



As with the previous areas, this area is located within tribal U&As. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the relevant tribes.

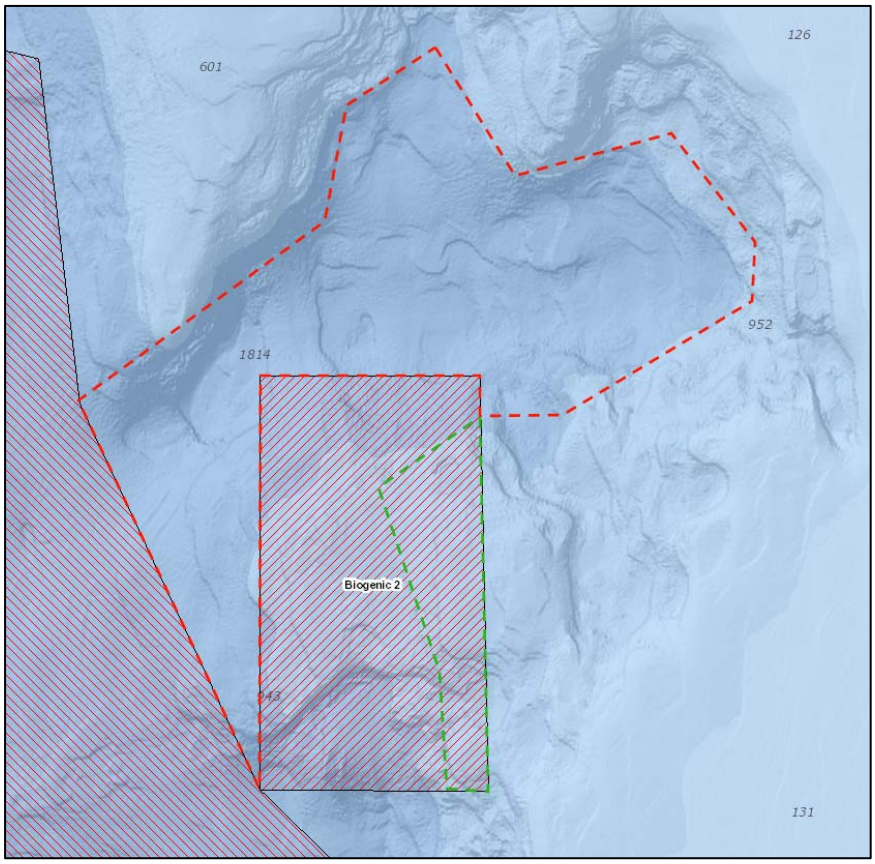
Biogenic 1 Southern Modification

This area, visible as the red dashed-line triangle in the map on the previous page, is designed to fill in an awkward gap between the 700fm closure and the Biogenic 1 EFH Conservation Area. Astoria fishermen indicated they do not trawl in the area. It is fairly deep, ranging from the 500s to over 800fm. This change is essentially cleanup, and was not a primary focal point of conversations with the fleet. This area could be implemented either as a modification to the 700fm line (because the wedge is largely beyond 700fm in depth), or as an expansion to the existing Biogenic 1 EFH Conservation Area.

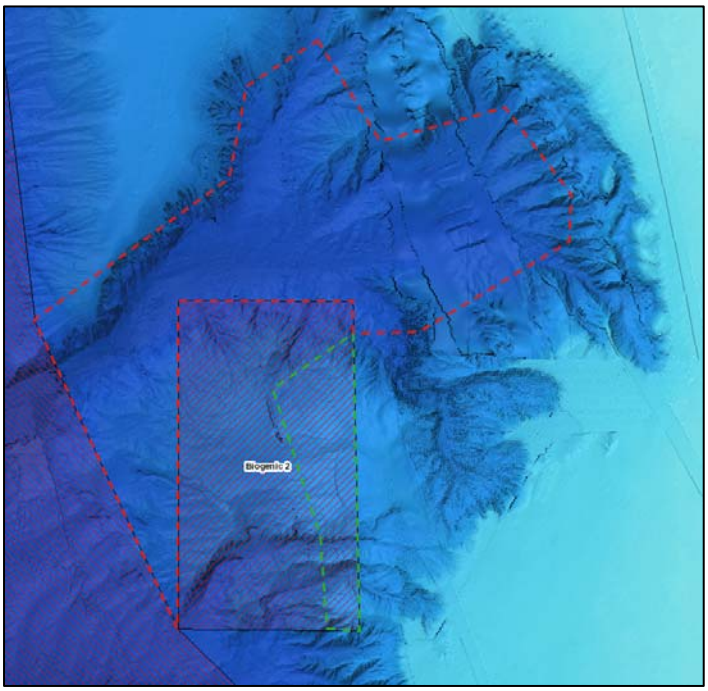
As with the previous areas, this area is likely located within tribal U&As. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the relevant tribes.

Biogenic 2 Northern Modification

This area is designed to expand protection for Quinault Canyon. Conservation groups were interested in the canyon feature based on the elevated productivity associated with canyon features, as well as some areas of localized higher coral/sponge bycatch reflected in the WCGOP observer data. Astoria fishermen confirmed the presence of corals and sponges on the northeast side of the canyon, consistent with records from the trawl survey. Fishermen also noted that the



central and southwestern parts of the canyon are very deep and not usable for bottom trawling. The upper sides of the canyon (300-500fm), however, were indicated as useful fishing grounds that should remain open. No hard or mixed substrate shows up in the EFH Data Catalog layers for this area, though the associated confidence level for the substrate information is low.



The initial shape sketched for this area tried to follow a contour line somewhat below 500fm (often around 600fm), to ensure that tows on the sides of the canyon remain open. Feedback from Astoria fishermen was received requesting that the northern boundary be moved deeper, so that it runs closer to the 773 reading on the nautical chart, and that the waypoint marking the northwest corner of the polygon be moved closer to the 650 reading. These changes were made, and one waypoint removed for simplicity, in the course of finalizing the shape.

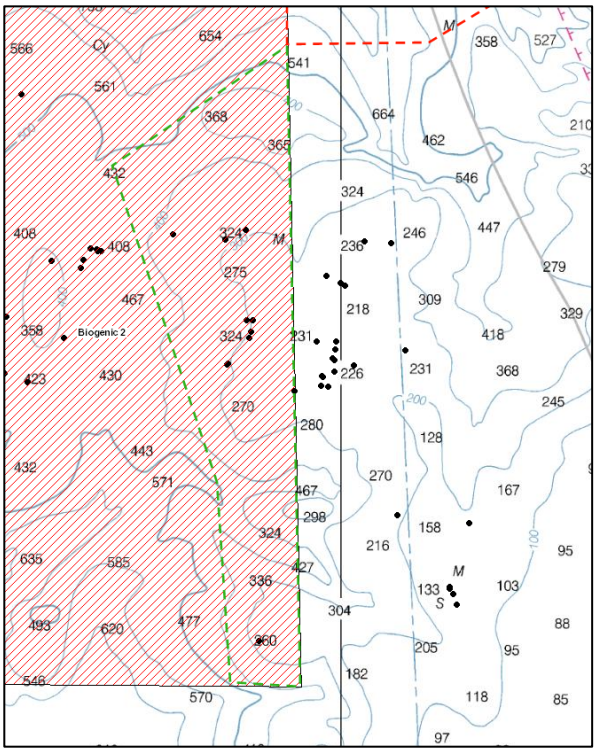
This area is part of a package with the reopening to Biogenic 2, described below. And as with the previous areas, this area is likely located within tribal U&As. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the relevant tribes.

Biogenic 2 Eastern Modification

This is a re-opening requested by Astoria fishermen to restore access to the full "cauliflower" area on the southeastern shoulder of Quinault Canyon (so named due to the appearance of the 300fm line on the nautical chart). Opening the area indicated would restore tows in the 300-400fm range. Astoria fishermen stated that opening this area would create improved opportunity for targeting the DTS complex.

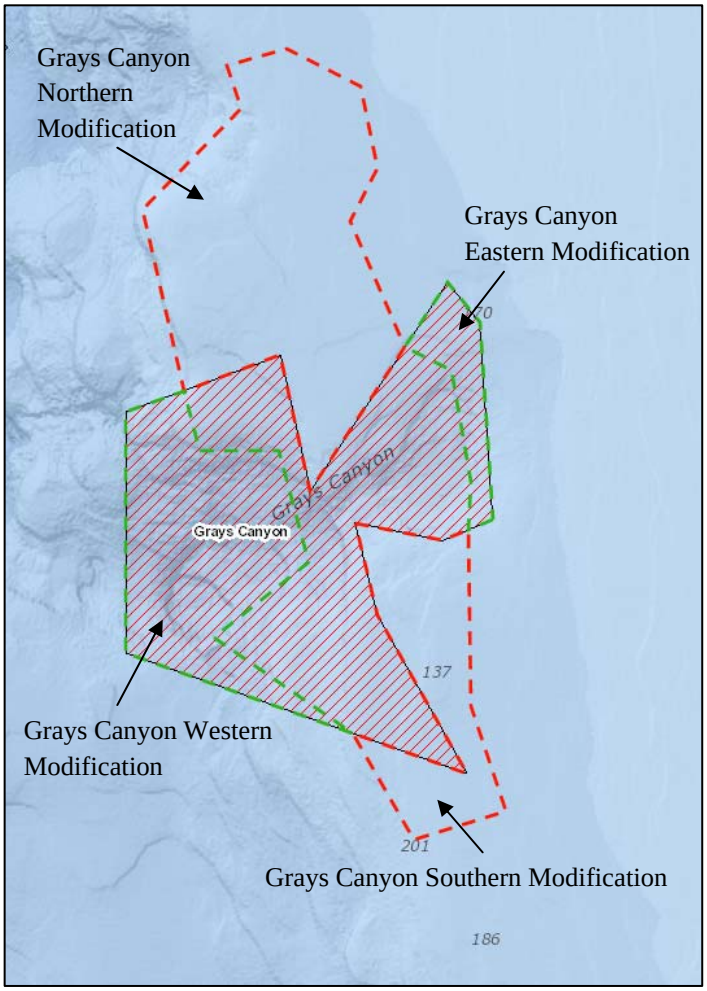
There are several coral and sponge observations in this potential re-opening area, all from trawl survey records. No research dives have been conducted in the area, to the best knowledge of the collaborative. Most of the records are sea pens and unspecified sponges, but there is at least one black coral record (*bathypathes sp.*), one stony coral (*scleractinia sp.*) record, and several glass

sponge (*aphrocallistes sp.*) records. Because of the source of these records—the trawl survey—the exact locations where these corals and sponges were growing is unclear. No hard or mixed substrate is recorded in this area, though high-resolution mapping has not been conducted.



Again, note that this area is part of a package with the expansion to Biogenic 2 described above. And as with the previous areas, this area is likely located within tribal U&As. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to consultation with the tribes.

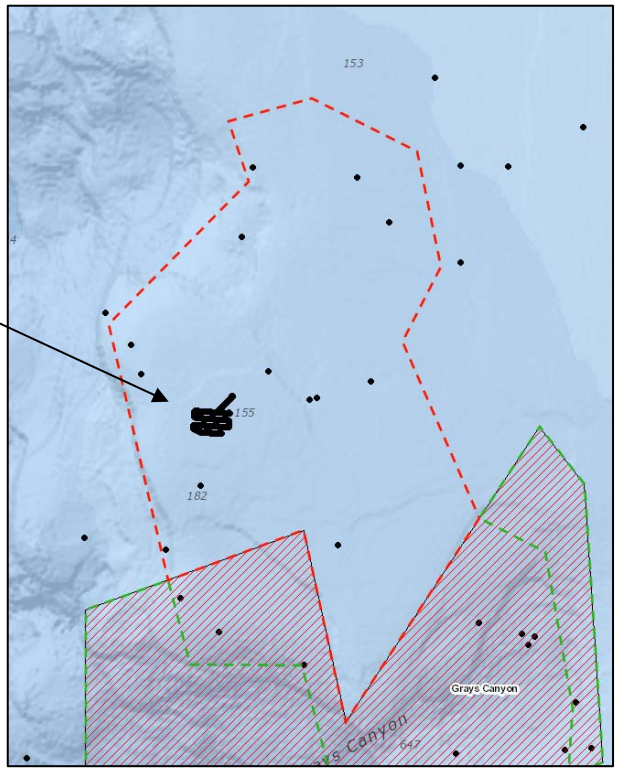
Grays Canyon Northern Modification



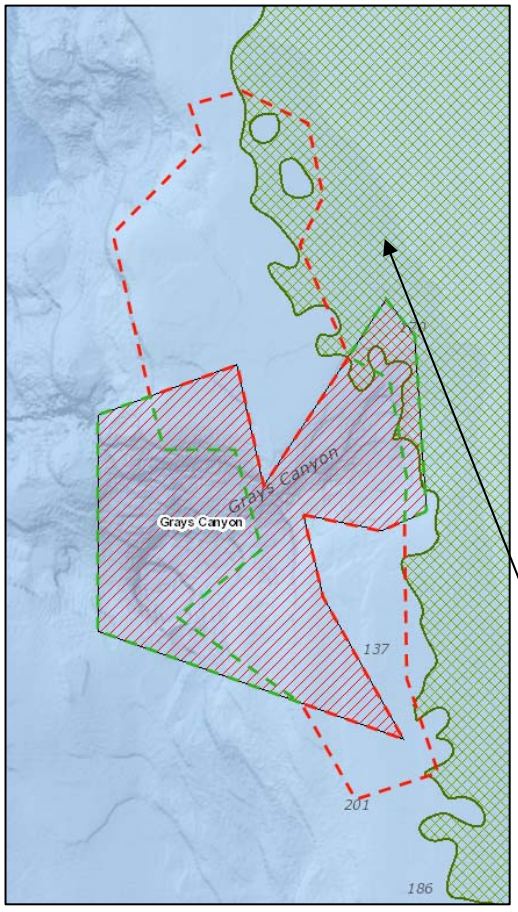
This area is known from research dives to have an unusually high density of sponges, and is referred to colloquially as a "glass sponge reef." Dr. Liz Clarke and Dr. Paul Johnson, among others, have studied the area and documented the volume of glass sponges as well as the likelihood that the sponges are accumulating into reef-like masses on the seafloor. The site characterization from Dr. Clarke's 2010 dives is published, and indicates this area to be relatively low relief, located at the edge of the continental shelf, and covered by sediment with areas of cobble and boulders and occasional exposed rocky bottom. A high density of sponges, along with groundfish presence, was quantified via video analysis of AUV transects. At least one Delta submersible dive was conducted in this area in the 1990s, the footage of which was analyzed by an OSU

grad student in 2006. The precise dive location is unclear, though, and the video findings were lumped together with other dive sites, making this a less useful source of information.

Some of the research dive sites are visible in the coral/sponge observation data layer in the EFH Data Catalog, as dense clusters of glass sponge observation records. Many of the dives, however, are not reflected in the EFH Data Catalog. Trawl survey records supplement the research dive data, providing a few additional coral and sponge observations for the area, including at least one glass sponge, black coral, and stony coral. Methane seeps also appear to be present in the area, but limited information is available on them.



In port meeting discussions, fishermen corroborated the scientists' site characterization, noting that there are some rough patches and a fair amount of corals and sponges on the north shoulder of Grays Canyon. There seemed to be general agreement that this area could be protected and would not represent much of a loss of fishing opportunity, so long as the lines are tailored well.



The original draft shape for this area was larger and extended farther east, but was reduced based on feedback from Astoria fishermen—including trawl track locations on plotters—showing that the eastern edge of the original sketch overlapped with important shrimping areas. The shrimp effort data layers tend to agree with the fishermen's feedback, as they overlapped with the eastern side of the original draft shape. (The shrimp data, shown with green cross-hatching to the left, is comprised of VMS pings, rather than trawl tracks, so it is only an indirect proxy for effort.) Based on this feedback, the area was reduced in size and re-drawn around the shrimp effort as shown in plotter screen shots, so as to leave the shrimp grounds open.

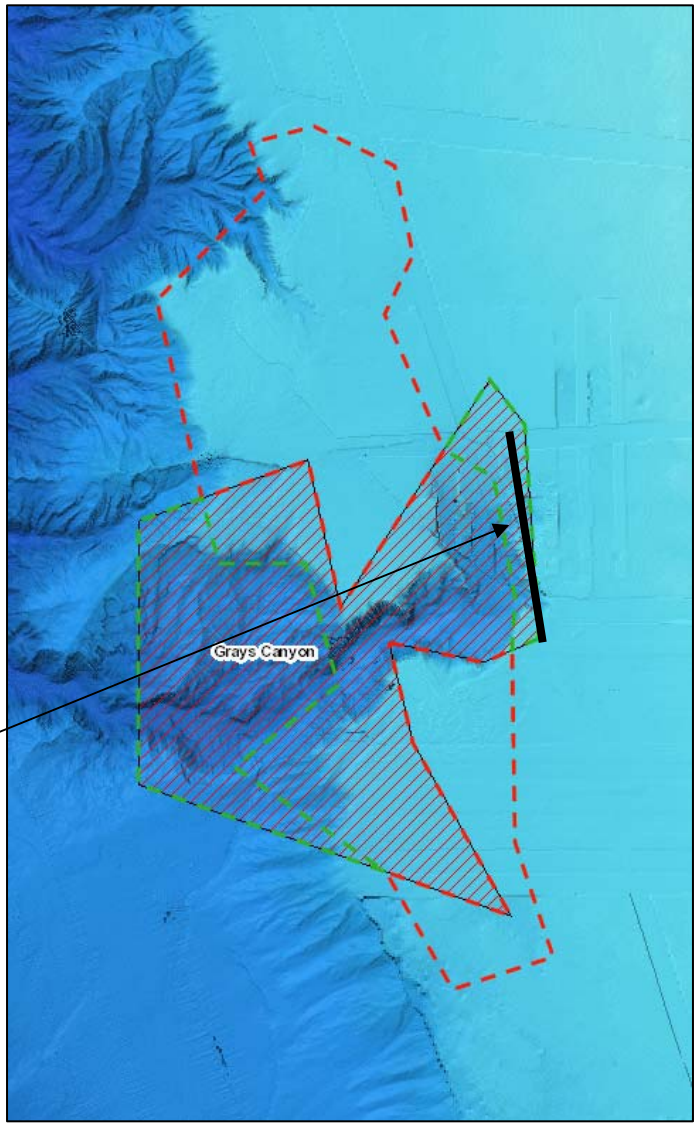
Part of the area proposed to be added to Grays Canyon EFH Conservation Area is currently within the 100-150fm Trawl RCA and therefore currently closed to bottom trawling. That portion of the area also shows no shrimping activity. Expanding the Grays Canyon EFH Conservation Area to cover this area would maintain protection going forward, assuming the RCA is removed.

This area is likely within at least one tribal U&A. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the tribes.

Grays Canyon Eastern Modification

In Astoria port meetings, fishermen mentioned that they would like access to the so-called "Dolly Parton tow," in order to increase fishing opportunity when canary rockfish quotas go up in the future. That tow runs north-south around 90-100fm in depth, across the canyonhead of Grays Canyon. Currently the boundary line of the Grays Canyon EFH Conservation Area is located very close to the tow area, making it difficult for fishermen to trawl there without getting a ticket due to drifting or movement during haul-back.

The re-opening sketched here would move the boundary line of Grays Canyon EFH Conservation Area to the west, opening up the canyonhead and giving fishermen room to access the "Dolly Parton tow" (shown here).



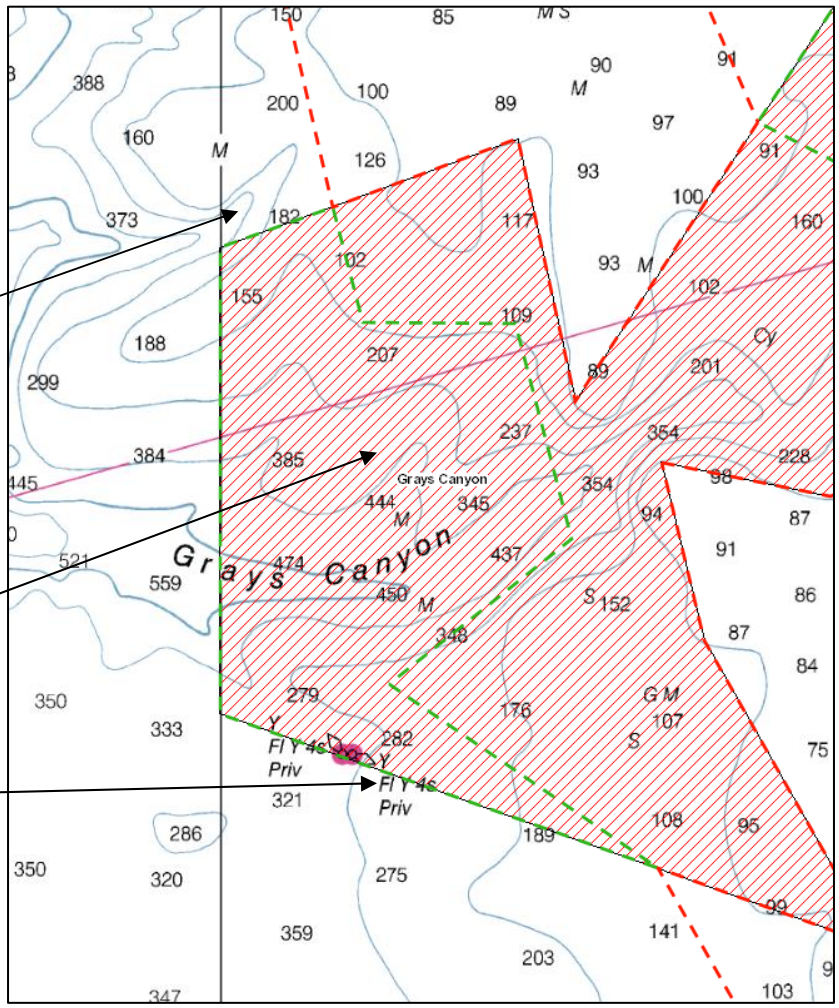
No hard or mixed substrate appears in the EFH Data Catalog substrate layers for this area, though the level of confidence in that information is low. Reports from fishermen suggest that the seafloor in and around the canyonhead is generally soft and muddy. A handful of glass sponge observations exist in this area, from trawl survey hauls.

There were a few dives in this area by the Delta submersible crew in the 1990s, and data from those dives was reported by a graduate student at OSU in a 2006 masters' thesis. One dive site was within the current Grays Canyon EFH Conservation Area, and is in the area of proposed reopening. Video analysis from the dives showed high number of crinoids, as well as sea urchins and sea pens. Some sponges and anemones were observed, as well as a few gorgonian-type corals. The video analysis was aggregated across all of the dives in the area (3 or 4 in total), so it is not specific to the one dive site located in the potential re-opening.

This area is likely within at least one tribal U&A. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the tribes.

Grays Canyon Western Modification

This re-opening is intended to restore fishing opportunity on the western side of the canyon. The northwestern tip of the current EFH Conservation Area gets very close to a tow running up a small canyon to the north of Grays Canyon (located here), making it difficult to access that tow without risking a ticket. The existing EFH Conservation Area also cuts off an east-west dover tow along the north wall of Grays Canyon, in the 200-300fm range (located approximately here). Finally, the current EFH area has compressed fishing along the south side of the canyon in the 350fm range (around here), and creates an enforcement risk for fishermen accessing those areas. For these reasons, Astoria trawlers were interested in



opening the west side of the Grays Canyon EFH Conservation Area.

The EFH Data Catalog substrate layers suggest this area is soft sediment, though confidence in that information is low as the area has not been mapped with high-resolution sonar. Fishermen agree that the area is primarily soft muddy bottom, and they noted that the area was heavily fished historically.

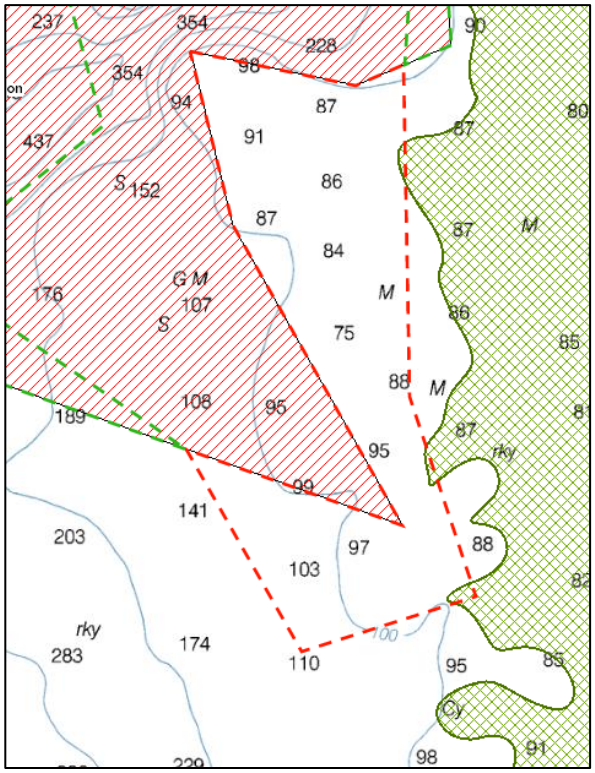
Even though the area sketched here for re-opening is predicted to have high suitability for corals and sponges, relatively few coral or sponge observation records exist in the EFH Data Catalog. One unspecified sponge, one sea pen, and three glass sponges were recorded by trawl survey hauls in the area.

The re-opening in this area is designed to be part of a package with the other modifications to Grays Canyon EFH Conservation Area (described above and below), which should improve both habitat protection and fishing opportunity.

Note that this area is likely within at least one tribal U&A. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the tribes.

Grays Canyon Southern Modification

This modification, taken together with the preceding changes, would re-orient the Grays Canyon EFH Conservation Area from an east-west hourglass shape to a north-south hourglass shape, opening the axis of the canyon and protecting the shoulders on both sides. This particular area is intended to expand protection on the south shoulder of the canyon, covering a small patch of predicted hard substrate as well as surrounding areas of likely soft bottom. At least one gorgonian-type coral was recorded by the trawl survey in this area, suggesting the presence of some hard or mixed substrate. A few fishermen also noted the presence of some trawl hangs in the area.



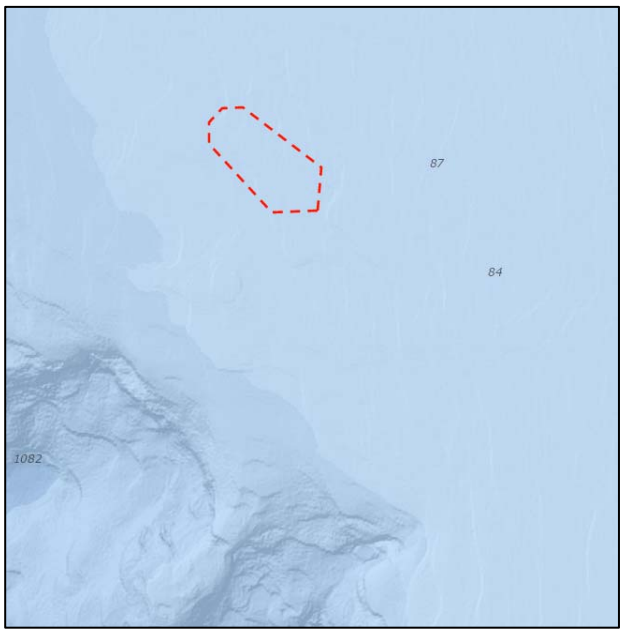
The original draft shape for this area extended further south and east, but Astoria fishermen provided

feedback that the draft version was too large and encroached on shrimping grounds in the 80fm range. The shrimp effort data layers (shown with green cross-hatching on the previous page) generally supported this feedback, though again, the shrimp data layers are based on VMS pings rather than tow lines and cannot be interpreted very precisely. Using a fisherman's plotter showing shrimp trawl tracks, the boundary line was redrawn and moved west so as to avoid shrimping areas. In the area that is no longer proposed to be closed, there is a "rky" notation on the nautical chart, but fishermen said any rocky-ness in that area is very limited and does not affect fishing.

Part of this southern extension is currently in the year-round Trawl RCA, so protection for that part would simply be maintained upon removal of the RCA. This area also may be within tribal U&As. The modification to EFH regulations suggested here would only apply to non-tribal bottom trawlers, and would be subject to government-to-government consultation with the tribes.

Willapa Shelf

This area is designed to encircle a set of trawl hangs known to exist in the 50-70fm depth on the shelf, north of Willapa Canyon. Some fishermen described this area as "clay humps," and said that the hangs were due to the presence of clay beds (as opposed to exposed bedrock or boulders). The EFH Data Catalog shows no hard substrate inside this polygon, and only a few small patches in the general vicinity. That said, the substrate data is low-confidence as multibeam mapping has not been conducted, and no research dives have been conducted.



Fishermen explained that there is heavy shrimping in this region, but they avoid areas with known trawl hangs. An early draft of this shape was circulated for feedback, and was subsequently revised based on specific feedback and plotter data from Astoria fishermen. Further revisions were made based on input from fishermen during the September 2015 Council meeting, shrinking the area to its current form.

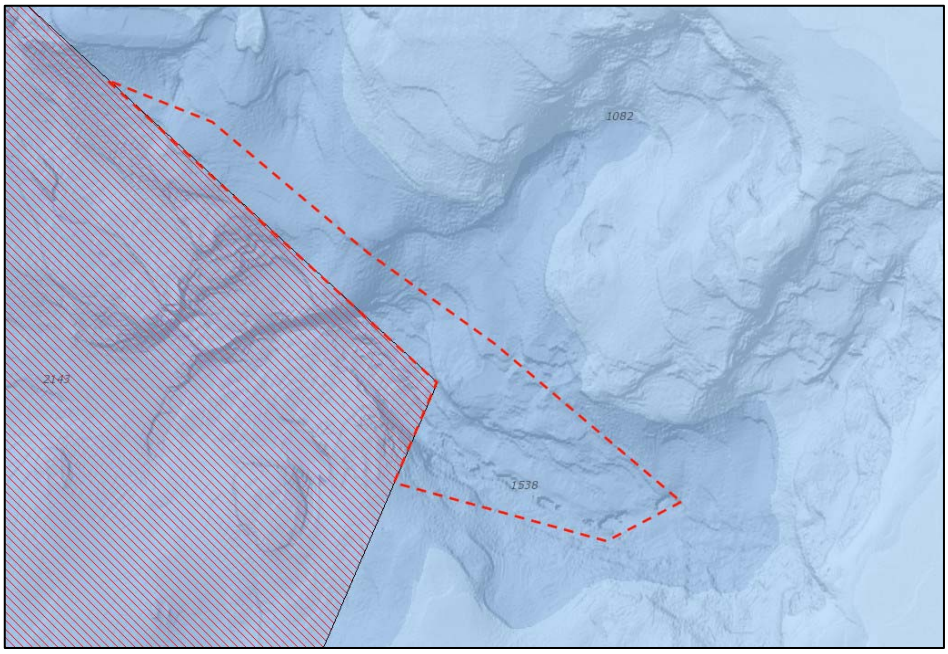
After these revisions, some coral observation records from the trawl survey that were located inside the original draft shape, are no longer included in the protected area. That said, the

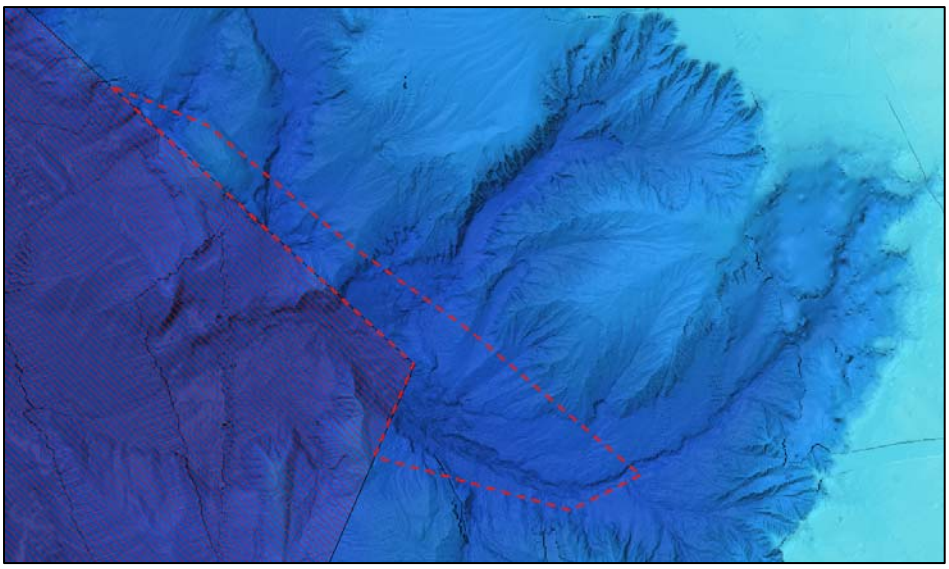
specific places where those corals were growing is uncertain, since the observations were recorded at the end of survey tows, not in situ.

There has been some discussion of whether or not it is worth the effort to put an EFH closure here, given the small size of the area and uncertain nature of the feature. The collaborative has included this in the coastwide package of proposed changes, but recognizes that it may also be appropriate to simply rely on industry avoidance to provide de facto protection.

Willapa Deep

This area originated in an interest by some NGOs in refining the 700fm line to include more of the deeper slope areas, and in particular canyon features given their upwelling function. The area sketched here was discussed in port meetings, and fishermen indicated it was low-value fishing grounds due to the depth (600-900fm). Little bottom trawl effort is shown by the EFH Data Catalog layers, and the area is too deep for shrimping. The area was included in the draft package circulated to the fleet for feedback, and received relatively little interest. The collaborative group believes that few people would be affected by the potential closure.

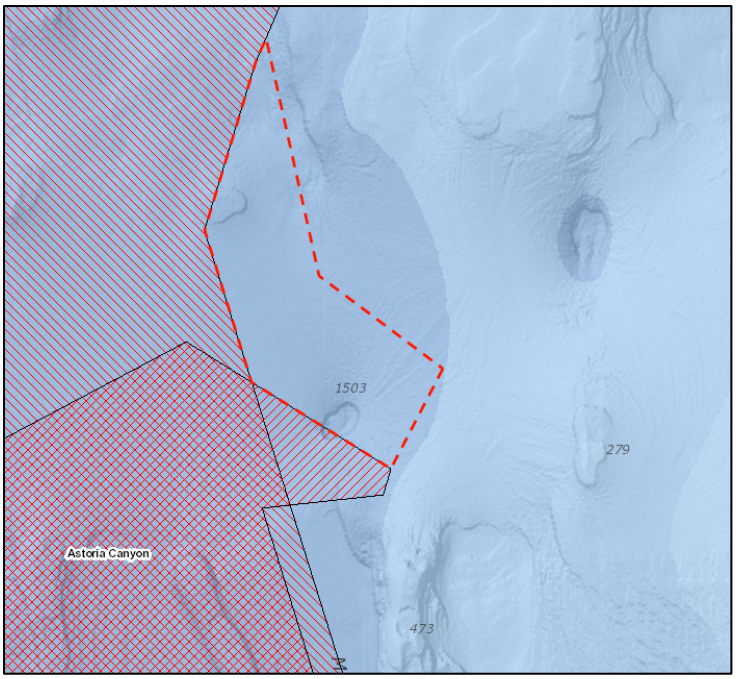




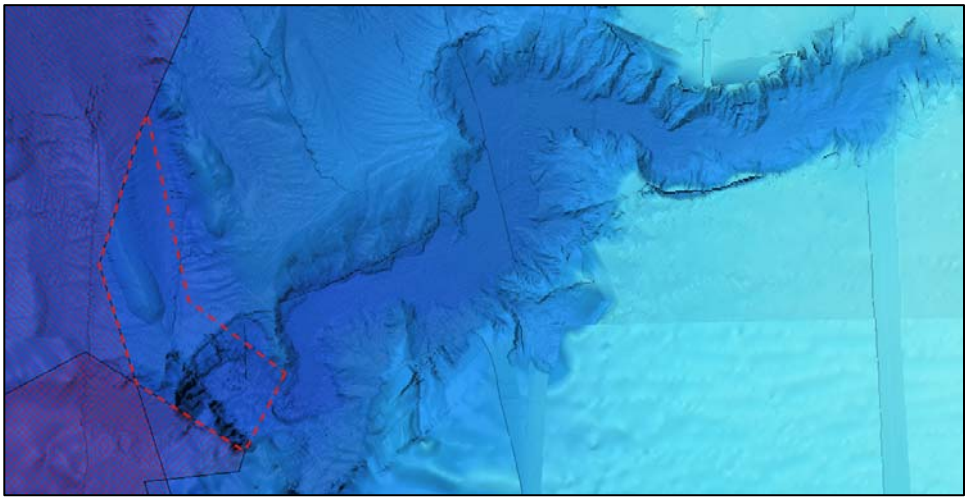
Substrate data layers in the EFH Data Catalog indicate this area is soft bottom, with a low confidence level. Coral and sponge observations from the trawl survey are located nearby, but not within this area. Portions of the area are predicted to have high-suitability habitat for corals, according to the EFH Data Catalog. No research dives have been conducted in the area.

In terms of implementation, this area probably should be classified as an adjustment to the 700fm line, rather than as a distinct EFH Conservation Area, as much of the area is beyond 700fm.

Astoria Deep



This area has a similar origin and discussion process to the Willapa Deep area described above. It was identified as a relatively deep area of the slope with little fishing effort and potentially valuable habitat due to its placement at the foot of Astoria Canyon. The southern half of the shape sketched here has fairly rugged topography and drops below 800fm, and the northern half encompasses an undersea ridge rising up above 600fm. Patches of inferred hard substrate exist in the EFH Data Catalog substrate layers, but fishermen's understanding is that these patches are likely clay or other types of dense sediment, rather than actual rock. A research dive was conducted in 2006 further up Astoria Canyon from this area, which found a high density of sea pens; it is unclear whether those organisms inhabit the deeper areas of the canyon as well.



The area sketched here was included in the draft package that went out to the fleet in June, with a specific request for input on whether anyone fishes in this area. No fishing was

indicated, and conversations in the Astoria port meetings reflected relatively little interest in the area. The area is very deep, and does not appear to receive any current fishing effort.

To implement this area, the 700fm line could be adjusted inward or the existing Astoria Canyon EFH Conservation Area could be expanded northward. In the latter case, it could make sense to draw the revised Astoria Canyon EFH Conservation Area so that there is some overlap on the seaward side, in case the 700fm line were to change in the future.

Shale Pile Northeast Side

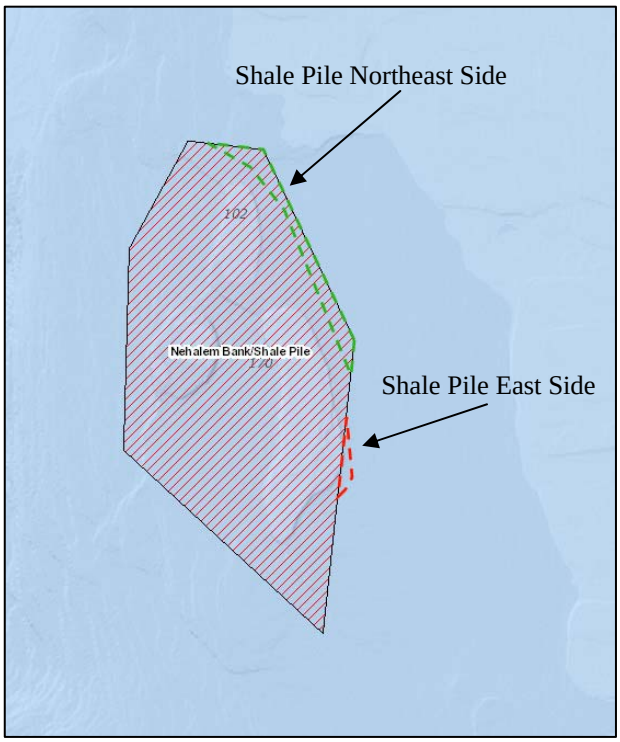
The Shale Pile marks the first of several areas that were discussed with the Newport trawl fleet. These areas include Garibaldi Reef, Stonewall Bank, Daisy Bank, and Heceta Bank, as well as the Trawl RCA between 45°46' and 43°57'. Unlike elsewhere along the coast, the shapes shown in this document for the Newport region do not have consensus, and should not be viewed as recommendations from the collaborative.

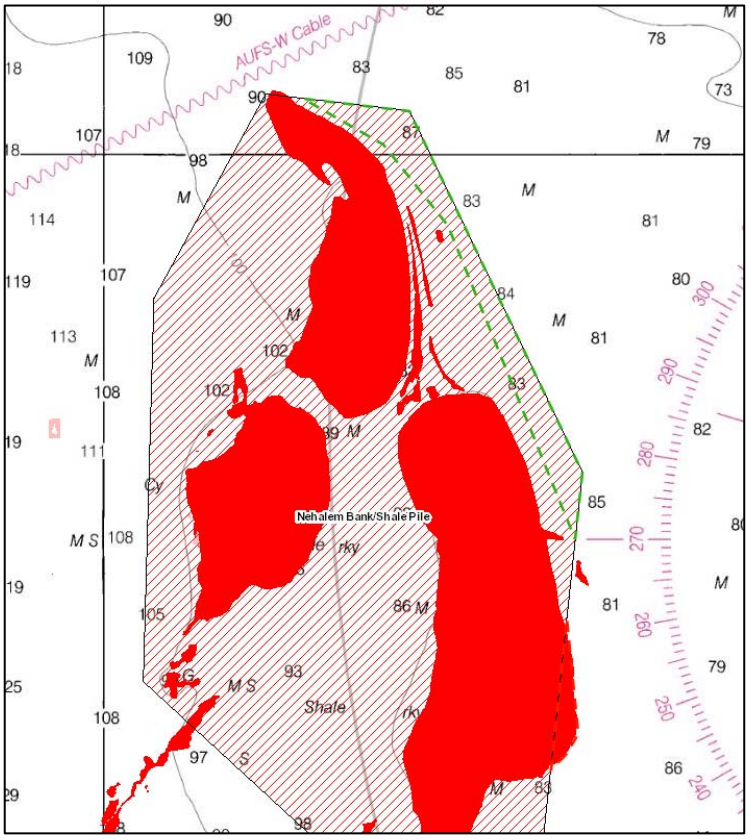
The collaborative group met with members of industry from Newport seven times over the past year and a half, most recently in January 2016. Despite significant differences in perspective and difficult initial meetings, participants appeared to be nearing consensus at the end of the most recent meeting. Due to a miscommunication, however, it appears the substance of the emerging consensus was not confirmed sufficiently by the participants in subsequent weeks. The result was that shapes for the Newport region were sent to the project team for analysis, on the belief that they represented consensus recommendations, when in fact they did not have consensus.

Because the analytical process was already underway when this miscommunication was discovered, the Newport area shapes remained in the coastwide package as analyzed by the project team (see Agenda Item F.5.a, EFH and RCA Project Team Report). These shapes are shown and described here, in order to provide a full accounting of what was analyzed by the project team. These shapes, however, must not be interpreted as being agreed to or having consensus. They simply represent the most recent iteration of the discussions in Newport, and should be regarded as nothing more than an update on the status of the conversation.

Discussions will continue at the April Council meeting, with the goal of reaching consensus.

The Shale Pile is a current EFH Conservation Area located on the shelf around 70-90fm in depth, south of the Columbia River mouth. The area is designed to protect known a hard substrate feature, consisting of three distinct exposed bedrock ridges. The Shale Pile area was raised in Newport discussions as an existing EFH Conservation Area that could be modified to improve fishing opportunity in the region. Fishermen stated that the current boundary of the Shale Pile creates an enforcement risk along the northeast side, as certain trawl tows pass near the EFH Conservation Area and vessels can be in danger of drifting into the closed area and receiving a ticket. For this reason, fishermen proposed removing a section of the Shale Pile EFH Conservation Area along its northeast side.



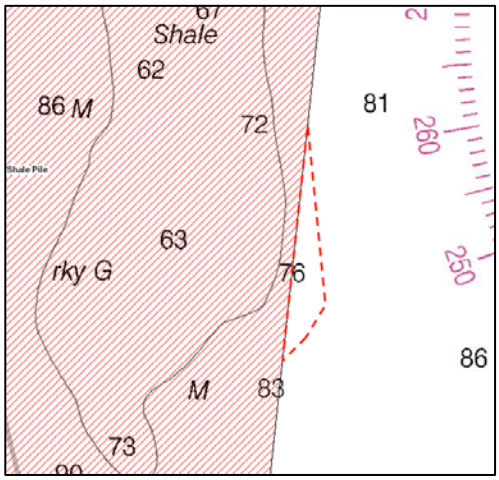


The area shown here was drawn to open a small strip along the northeast side of the Shale Pile, with the intent of reducing the enforcement hazard that fishermen face. The re-opening area is limited to soft substrate, and provides a slight buffer around the areas of hard substrate in order to reduce the risk of trawl gear passing over the hard areas (given the lateral offset that can occur between vessel and gear).

As stated above, this shape should not be regarded as a consensus recommendation, and the area is subject to ongoing discussion.

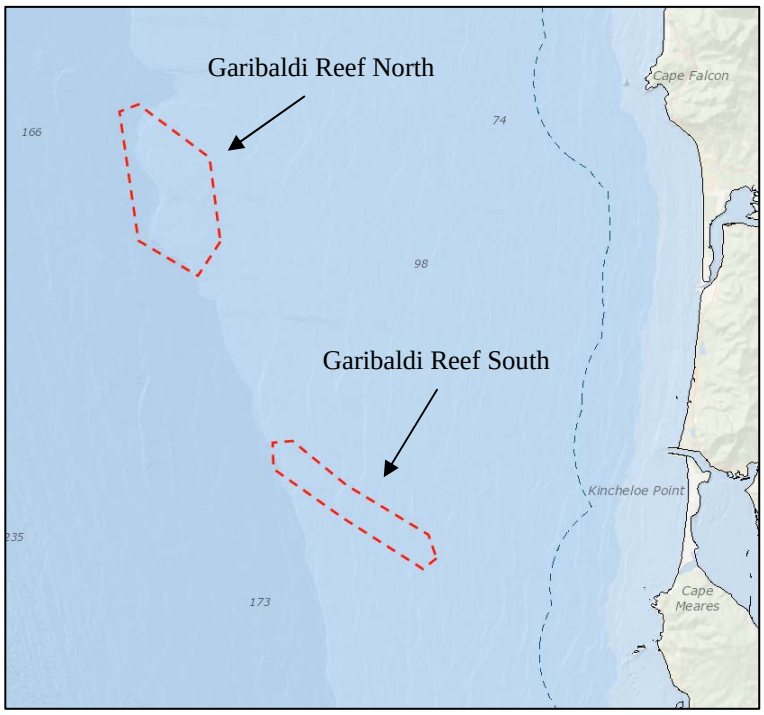
Shale Pile East Side

This is a small area of hard substrate that extends out from the east side of the existing closed area at the Shale Pile. The idea emerged in Newport port meetings that a slight expansion of the Shale Pile EFH Conservation Area could be enacted here, in order to offset somewhat the re-opening that is desired on the northeast side. Again, the shape shown here should not be regarded as a consensus recommendation. The area continues to be subject to discussion, and no agreement exists as to the current shape.

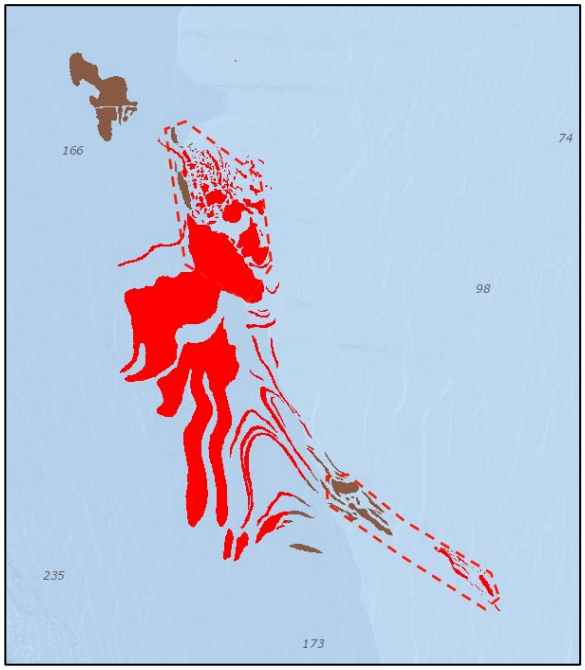


Garibaldi Reef North

Garibaldi Reef was identified initially based on the hard substrate designation in the EFH Data Catalog, which in this area is mapped with medium confidence. The collaborative discussed the area with members of industry in Astoria and Newport, and included a draft shape for this area that was essentially an outline of the hard substrate areas. The straw man package included a specific request for feedback on this area, as it was acknowledged that the draft shape needed work.



In feedback from industry, the northern collaborative group heard several relevant things about this area. First, shrimp fishermen indicated that the "fingers" of hard substrate on the southern end of the reef have areas of soft sandy bottom between them, and those sandy areas can be good for shrimping. The shrimp VMS ping data layers tend to support this, as they cover at least the southern and eastern portions of the reef. Shrimp fishermen expressed a preference that the "fingers" portion of the reef not be closed, so they can continue to tow up the sandy stretches between the fingers.

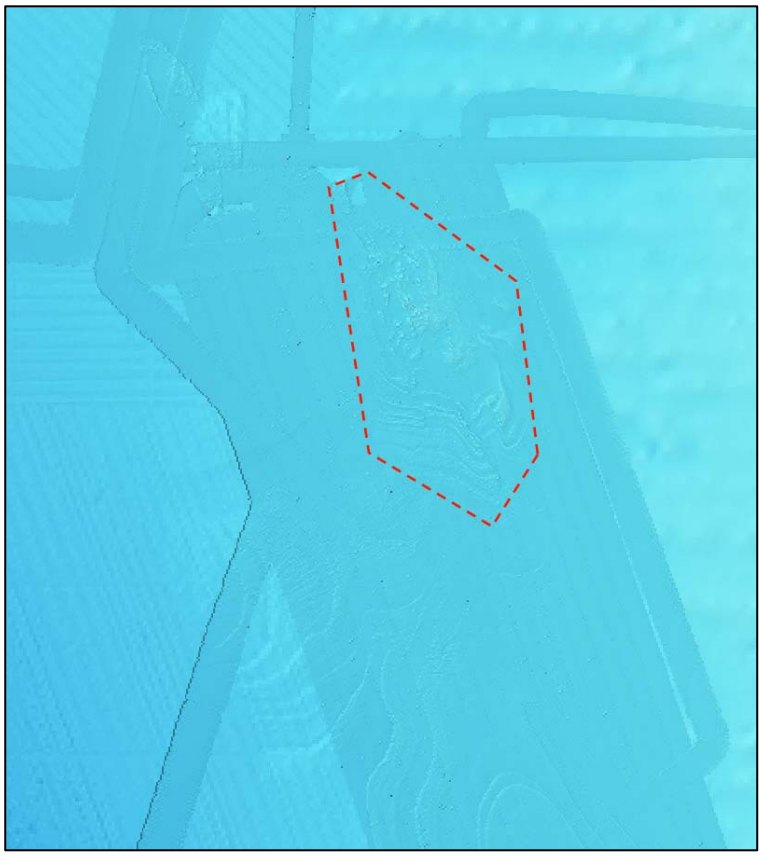


Second, a groundfish trawler mentioned that Garibaldi Reef can be a good place to target widow and yellowtail rockfish. While these species are usually targeted with midwater gear (and therefore would not be affected by the EFH changes under discussion), some fishermen do not have the ability to use midwater gear and would be limited by a bottom trawl closure. The EFH Data Catalog bottom trawl effort layers show minimal effort over Garibaldi Reef in both time frames, but midwater gear usage in the area may not be reflected in those data sets. In any case, there was some reluctance from a groundfish perspective to see a closure on the reef because it could limit opportunities to target widow and yellowtail rockfish.

In the 1990s, Delta submersible dives were conducted on the northern and southern ends of the reef. The northern dives found a high number of sponges and crinoids, as well as gorgonian corals. The southern dive sites found abundant sea urchins, some crinoids and sea pens and sponges, and relatively few gorgonian corals. Other than these research dives, all the coral/sponge records in the area are from the trawl survey, and they are mostly sea pen observations (with one black coral record on the northern part of the reef).

Based on the scientific information and the feedback from industry, the northern collaborative group made an attempt to re-draw the shape around Garibaldi Reef. On the north side, the shape was made just a bit smaller, to try to allow some widow and yellowtail targeting with bottom trawl gear around the sides of the reef. The northern area was not reduced very much, however, because the northern submersible dives clearly showed sensitive habitat and little room existed to shrink the area while still including the dive sites. On the southern end, the boundary line was brought inward significantly, so as to allow shrimping in the sandy beds between the fingers of rock. This involved exposing the southern dive sites, but because those sites did not find the same kind of sensitive habitat as the northern sites, this was regarded as less problematic. Also, shrimp fishermen indicated they exclusively target the sandy areas between the fingers, making it unlikely that they are actually trawling on the spots where the southern dives occurred. The resulting shape was included in the September 2015 draft package submitted by the collaborative (see September 2015 Briefing Book, Agenda Item H.8.b Public Comment 3).

Based on subsequent feedback and conversations with the Newport fleet, the Garibaldi Reef shape was further trimmed, such that only the northernmost portion of the feature would be covered by a closure. It seemed to be the sense of industry that this area is the most rugged (and



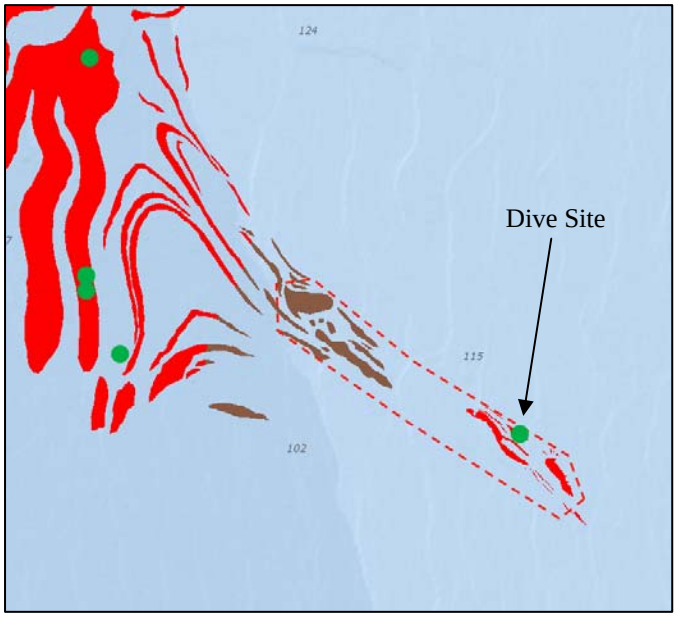
most unusable from a trawl perspective) part of the feature. The new bathymetry data in the EFH Data Catalog, shown to the left, appears to confirm this characterization. The bathymetry data also shows another rugged patch to the northwest as well as the ridge formations to the south.

The revised Garibaldi Reef shape now excludes all of the dive sites except one.

Even with the most recent round of trimming, the Garibaldi Reef area (now labeled "Garibaldi Reef North") should not be regarded as a consensus recommendation. The shape shown here is only a reflection of the current state of discussions, and further conversations remain necessary before any of the Newport areas reach the level of consensus.

Garibaldi Reef South

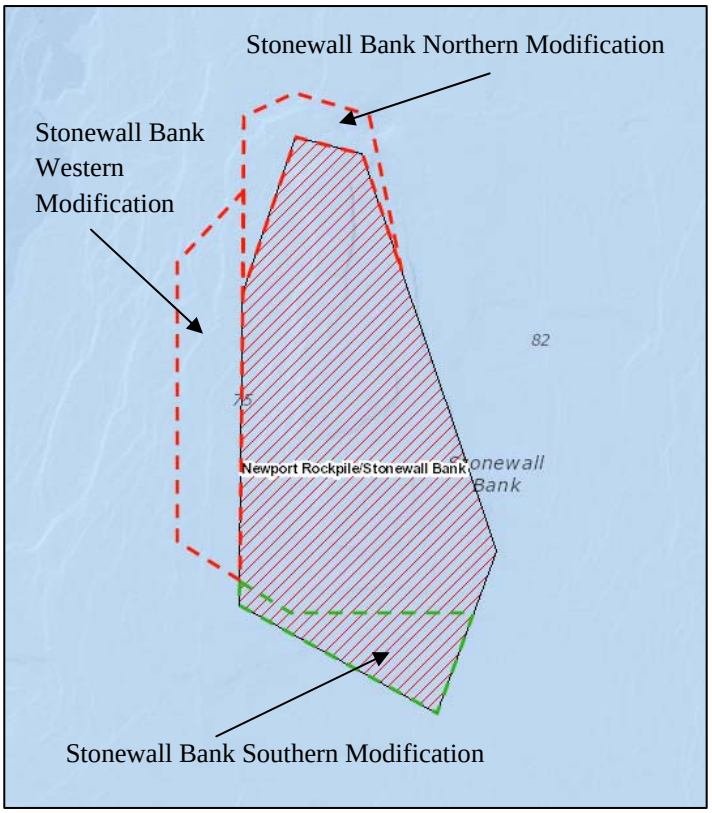
In the course of discussing the Garibaldi Reef area, it became clear that a closure encompassing the entire feature would not be workable from an industry perspective, due to the shrimping activity that takes place between the "fingers" of hard substrate on the south-central portion of the reef. This led to the question of whether two separate areas could be established to provide protection for the more rugged areas of hard substrate, while leaving the central portion open for shrimping. The shape shown here, Garibaldi Reef South, is an attempt to do that, though it does not have consensus and



should not be viewed as a recommendation. It is simply shown to provide a full accounting of the shapes that were sent (based on a misunderstanding) to the project team for analysis.

The shape shown here traces the southeastern-most protrusion of hard and mixed substrate on Garibaldi Reef, and encompasses a dive site (shown on the previous page) where high densities of gorgonian corals were observed. Early feedback from industry indicates that this area may be too large, and that any shape proposed for the south side of Garibaldi Reef would have to be smaller. This will be discussed in further conversations with the Newport fleet.

Stonewall Bank Northern Modification
Stonewall Bank Western Modification

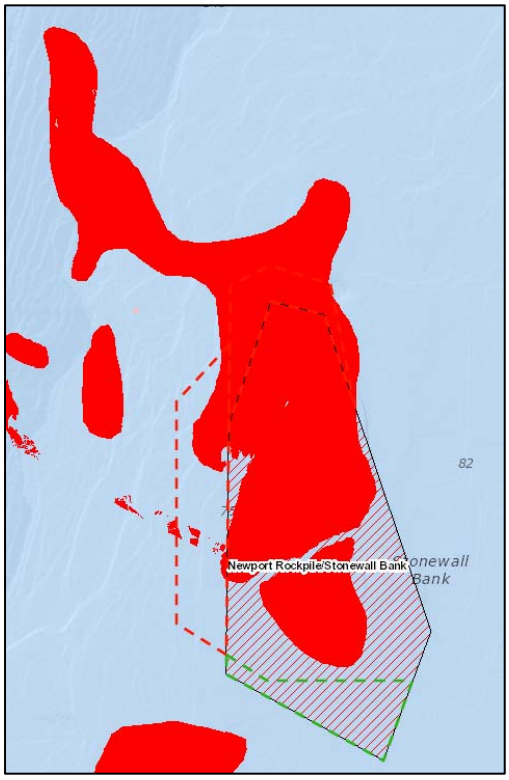


Stonewall Bank was initially identified for discussion based on the likely hard substrate that runs north from the existing Stonewall Bank EFH Conservation Area. The substrate data is designated low and medium confidence according to the EFH Data Catalog.

In discussions in Newport and Astoria, the collaborative group asked members of industry about this area of likely hard substrate, and heard that some spots are indeed rough and not towable. It was also noted that some spots are soft bottom and fishable, and that fishermen would not want to see them closed. In particular, fishermen mentioned there are a few points where it is possible to tow a bottom trawl across the area designated as hard substrate by the EFH Data Catalog, suggesting that the bottom in those spots is either not hard, or if it is hard, that it is flat and does not have hangs.

Some coral and sponge observation records exist in the in the area, primarily from the trawl survey, including gorgonian-type corals. One research dive was conducted in 2013, just north of the existing EFH closure and within the likely hard substrate area indicated by the EFH Data Catalog. The substrate at the dive site was characterized as 78% mud, 15% cobble, and 7% boulder, and the level of relief was classified as 92% low-relief, 4% medium-relief, and 4% high-relief (with medium defined as 1-2 meters and high defined as over 2 meters of relief).

Structure-forming invertebrates were observed, though observations were aggregated from four dive sites in the Stonewall Bank area and specific results for this dive site are not available. Across the four dive sites in the area, observations included anemones, sponges, sea pens, cup coral, gorgonian coral, and hydrocorals.



With this information in mind, the collaborative group included a draft shape in the straw man package that was circulated to industry, essentially tracing the boundary of the hard substrate according to the EFH Data Catalog. The collaborative asked industry members for specific feedback on which areas are rough bottom, and what kind of shape, if any, might be workable for a northward expansion of Stonewall Bank EFH Conservation Area.

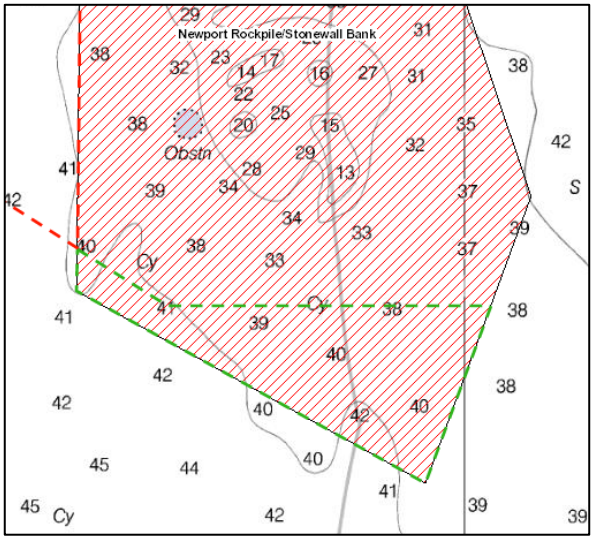
Early feedback indicated that the hard substrate boundary from the EFH Data Catalog was not workable from an industry perspective, and was not warranted as much of the area in fact is not hard bottom. The area was discussed in subsequent port meetings, and members of industry indicated that it might be possible to expand the existing EFH Conservation Area on the north and west sides, if the south side were re-opened.

Further discussions refined the location of the potential re-opening area—limited to the soft substrate portion on the south of the current closure—as well as the possible additions on the north and west side. Because the northern and western additions originated separately, they are drawn here as two distinct shapes adjoining each other. This is not intended as a meaningful distinction, however, and the two shapes likely should be combined into a single one.

It is important to note that while the concept of changes to Stonewall Bank EFH Conservation Area is sound, the specifics have not been agreed to. The lines shown above are simply one iteration in the process of moving toward consensus, and further conversations are needed before the changes can be considered final and supported by stakeholders.

Stonewall Bank Southern Modification

This re-opening is located on the south side of Stonewall Bank EFH Conservation Area, and should be regarded as part of a package with the modifications noted above (which would add area on the north and west sides). The EFH Data Catalog shows this area as soft substrate, and fishermen confirmed that the area is trawlable. Industry members indicated that opening the south side of the existing EFH area would improve fishing opportunity.



Daisy Bank Northern Modification
Daisy Bank Western Modification
Daisy Bank Southeastern Modification
Daisy Bank Southern Modification

Daisy Bank is a known high spot off Yaquina Head, currently covered in parts by a no-bottom-trawl EFH Conservation Area as well as the Trawl RCA. The feature is complex, with a plateau at the top of the bank in the 80-100fm range, steep slopes on the sides of the plateau, and then several lower ridges and humps surrounding the plateau. High-resolution mapping was conducted in 2012, and the bathymetry maps in the EFH Data Catalog show the feature clearly.

The current EFH Conservation Area at Daisy Bank is oriented east-west, covering the plateau and some of the surrounding areas. Substrate data (medium confidence) indicates mostly mixed substrate, with a few patches of inferred hard substrate. Several coral and sponge records from the trawl survey exist in the area, including some glass sponges.

Two submersible dives were conducted on Daisy Bank in the 1990s, the video from which was analyzed in an OSU master's thesis in 2006. They found a number of sponges, some crinoids and basketstars, and few other invertebrates. Sponges were more common at the dive site higher up on the bank. Dive footage showed the substrate to be cobble/boulder up on the plateau, and soft sediment with pebble/cobble below the sides of the bank.

More recently, four ROV dives were conducted on Daisy Bank in 2013. One dive site was located on a lower ridge west of the plateau, one site was on a slope-trench heading down from

Daisy Bank further west, one site was to the north of the bank on flatter surrounding terrain, and one site was shoreward of the bank around some of the smaller features surrounding the plateau. Video from those dives showed anemones, sponges, sea pens, and gorgonian-type corals, though results were not broken out by site, so the specific locations are unclear. Seafloor characterization ranged from all mud on the one hand to a majority cobble with bedrock and boulders on the other. Relief was generally low (defined as less than one meter of relief).

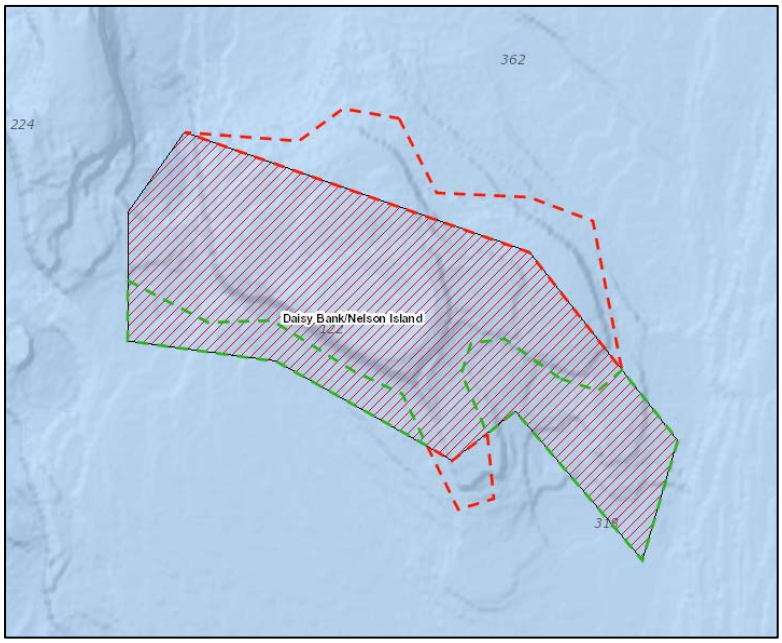
Currently the year-round Trawl RCA covers Daisy Bank fully, as well as the surrounding area. No shrimping activity occurs in the Trawl RCA around Daisy Bank, given the depth range.

The northern collaborative group discussed Daisy Bank with fishermen and NGO representatives, both in the Newport port meetings and in individual conversations. Some fishermen expressed an interest in reducing the size of the Daisy Bank EFH Conservation Area (tailoring it to their view of the untrawlable spots) or removing it altogether, while NGO representatives expressed interest in expanding its size. Industry representatives and fishermen indicated opposition to any significant expansion.

The collaborative group included a draft modification to Daisy Bank EFH Conservation Area in the straw man package circulated to the fleet for feedback. The shapes in the straw man package would have reoriented the trawl closure in a north-south direction, cutting off the eastern and western ends of the current closure and adding areas on the north and south sides. No specific feedback on ways to adjust the shape was received from the fleet. The collaborative group subsequently revised the straw man shape based on the available information. The boundary was re-drawn based on the high-resolution bathymetry data from 2012, tracing the plateau and lower ridges with a moderate buffer around them. The lines were then adjusted to include areas where research dives had been conducted, as many of the ROV and submersible dives documented sensitive habitat.

The revised shape received no support, however, and in subsequent Newport port meetings during winter 2015-16 the Daisy Bank area was revisited. Several goals for the Daisy Bank area emerged from the discussions. First, fishermen indicated that the southwestern side of the existing EFH area cuts off trawl tows that historically ran up to and along the base of the bank, and that a re-opening of the southwestern portion of the area would improve fishing opportunity. Second, there may be potential for a small expansion of the EFH area on the north side of the bank, to better cover the lower hill-type ridges that flank Daisy Bank on that side. Third, members of industry noted a historical tow on the southeastern side of the bank that the current EFH area cuts off. That tow runs in the V-shaped notch or canyon between the low hills on the southeastern side of the bank, and was a productive lingcod area. Fourth, it may be possible to adjust the boundary line in other ways to better match the actual feature (i.e., the bank and lower ridges flanking it).

While these goals for modifying Daisy Bank may be straightforward, implementing them is less so. The collaborative working group sketched out shapes in an attempt to address all of these goals, which are shown to the right. These shapes were, due to a miscommunication, included in the package sent to the project team for analysis, but they do not have the support of stakeholders. It is important to understand that this set of changes is not the preferred or agreed-upon way of implementing the goals for Daisy Bank; it is nothing more than one step in a dialogue, and early indications from industry suggest that this configuration is not acceptable.



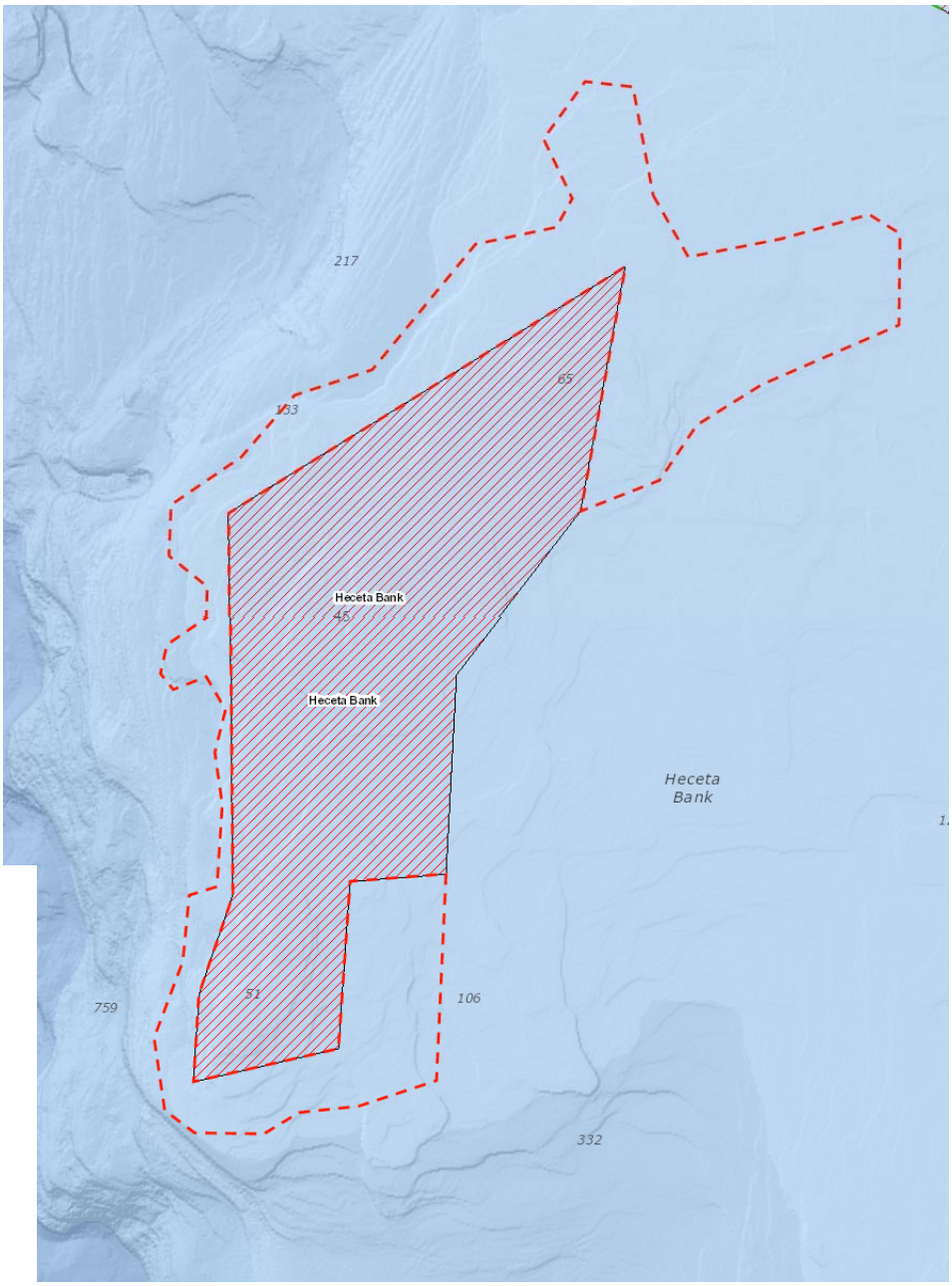
Finally, note that because Daisy Bank is covered by the Trawl RCA, whether or not the bank or its surroundings are open to trawling will depend on what happens with the RCA in this region.

Heceta Bank Modification

This area, like the other areas in the Newport region, does not have consensus and should not be regarded as a recommendation. Further discussions are underway to determine whether a consensus shape can be identified for modifying the Heceta Bank EFH area.

Heceta Bank was identified for discussion based on the presence of hard and mixed substrate outside the current EFH Conservation Area. The western portion of the bank has been subject to high-resolution mapping, and a band of hard and mixed substrate extends out past the existing EFH Conservation Area, to approximately the 100fm contour line. The eastern and northern portions of the bank have been mapped with medium and low confidence levels; the resulting data layers show hard substrate extending out from the existing EFH Conservation Area to the north, surrounding the tip of the current closed area, and forming two fingers heading north and northeast. On the eastern side of the bank, the existing EFH Conservation Area aligns fairly well with the substrate data layers, except in the southeast corner where some hard and mixed

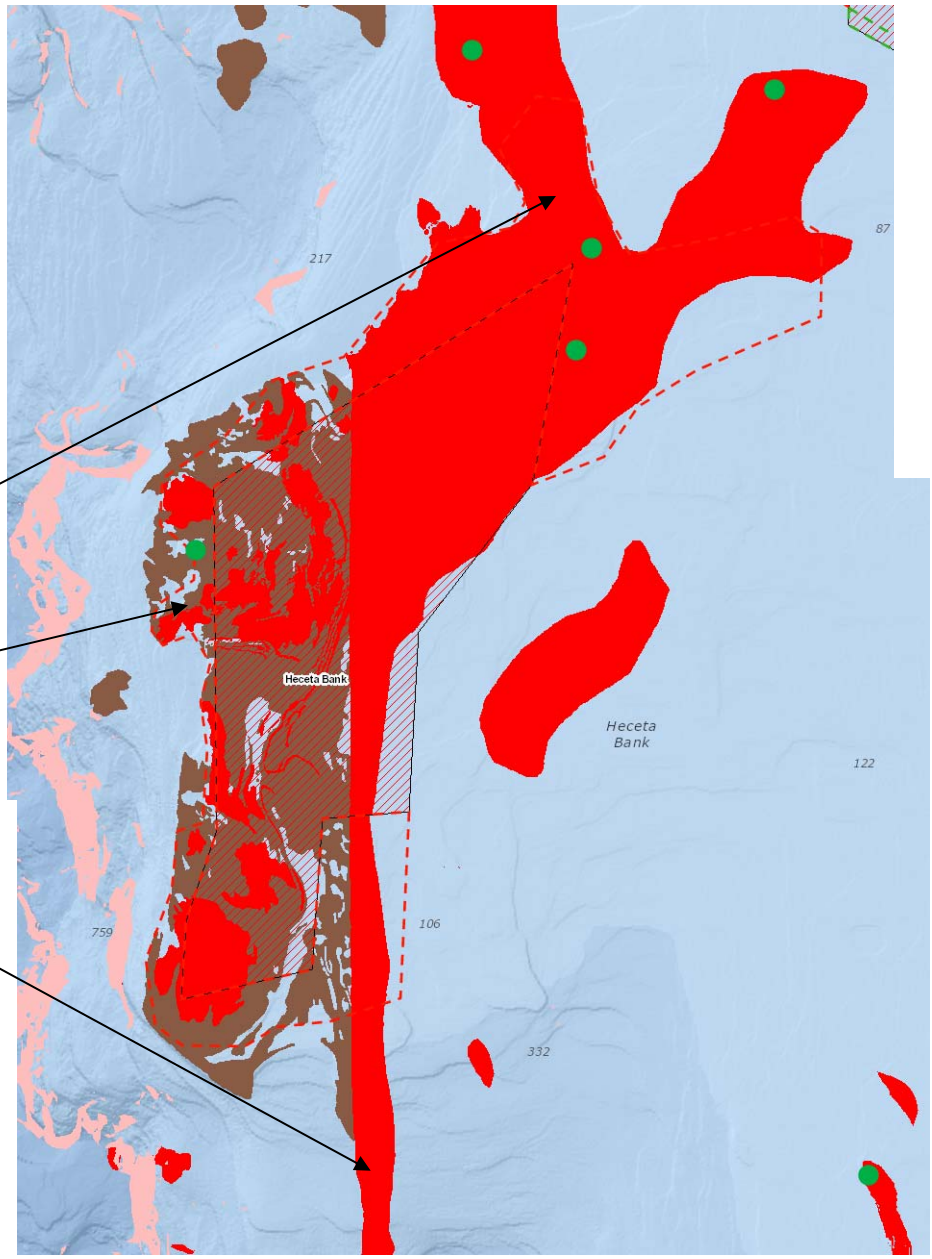
substrate extends out from the current boundary. Also, a smaller patch of likely hard substrate exists shoreward of Heceta Bank, as a distinct area.



One research dive was conducted by the Delta submersible in the 1990s to the west of the existing EFH Conservation Area, in the area of mixed and hard substrate. Video footage from that dive showed a high amount of crinoids, as well as a few sponges, anemones, and gorgonian corals. In 2013, five ROV dives were conducted in the area of hard substrate to the north and east of the EFH Conservation Area. These areas are shown by green dots in the map on the following page. Some of the dive sites showed a significant amount of exposed bedrock, while other sites were dominated by boulders and cobbles, and still other sites were primarily mud with some boulders. Most sites were classified as low-relief (defined as under one meter of relief), while a few sites showed more rugged topography. Video footage showed anemones, sponges, cup corals, and gorgonian corals, though the dive report does not provide quantification by site, so it is not clear how many of these invertebrates were found in each location.

The top of Heceta Bank is known to be a nursery area for rockfish; this area already is covered by the existing EFH Conservation Area. The question raised by NGO representatives was whether protection could be extended around the sides and base of the bank, to cover the feature

more fully and include the areas of hard and mixed substrate that are currently outside the EFH Conservation Area.



Heceta Bank was discussed in port meetings in Newport and Coos Bay. Coos Bay fishermen were more familiar with the south end of Heceta Bank, whereas Newport fishermen were more familiar with the north. Fishermen generally verified the understanding of substrate provided by the data layers, noting two fingers of hard bottom extending out from the current closure on the north side, and rough patches inward of 100fm on the western side of the bank. One aspect of the substrate data that fishermen indicated was inaccurate is the long "tail" extending southward from the current EFH Conservation Area. In the experience of fishermen, hard substrate on the south side of Heceta Bank generally peters out around 85fm in depth. There may be some patches of mixed substrate further south (i.e., deeper), but most people said that outside 85fm is fishable with bottom trawl gear, and any bad spots are small and can be worked around.

The collaborative group heard that relatively few bottom trawlers are currently fishing around the sides and base of Heceta Bank, though that could change with increased canary rockfish quotas. The EFH Data Catalog effort layers generally show effort to be low or absent in these areas, though small numbers may be obscured due to confidentiality restrictions.

In terms of whether industry members would want to fish these areas in the future, the collaborative heard different opinions. Coos Bay fishermen said they tend to avoid the hard and mixed areas, and indicated some willingness to consider expanding the EFH Conservation Area around these areas. Conversations in Newport yielded other views, with some fishermen stating they can and want to trawl in the hard/mixed substrate areas, and that if the existing EFH Conservation Area were lifted, they would go further up and trawl across the top of Heceta Bank.

The northern collaborative sketched an initial draft shape around the hard and mixed substrate areas, and included that shape in the straw man package that was circulated to the fleet in summer 2015. On the south end of the bank a line approximating 85fm was drawn, based on the input of Coos Bay fishermen that it was important to be able to fish 90fm and deeper on the south side. The western boundary line was drawn roughly along the 100fm contour, also based on input from industry that this was approximately where the rough ground starts. On the north side of the bank, the draft shape essentially outlined the hard substrate fingers. In addition to hard and mixed substrate, the draft shape included various coral and sponge records (primarily from the trawl survey), consisting of unidentified sponges, glass sponges, gorgonian corals, and soft corals.

In the fourth round of port meetings, the collaborative group heard opposition to any expansion of the existing EFH Conservation Area from some Newport fishermen and industry representatives. Coos Bay fishermen generally confirmed their earlier descriptions of what would be workable for them on the southern end of the bank. And NGOs provided feedback on the straw man package stating that the Heceta Bank area should be larger than what was sketched in the draft shape.

Given the diverging opinions, the collaborative group determined this area would require significant further work in order to achieve consensus. The shape was revised based on feedback from Newport requesting a trim on the southeastern corner, to open up the 75fm contour so as to maintain a particular tow. The notch between the two northern fingers also was enlarged slightly, to account for historical effort in this area as shown by the 2002-2006 data layer. And the boundary of the northwestern finger was moved out slightly to account for research dives in the vicinity. The resulting shape was included in the draft package submitted by the collaborative in September 2015, but it was noted at that time that the shape did not have consensus and did not constitute a recommendation.

Further port meetings in Newport were held in winter 2015-16, at which a new version of the Heceta Bank shape was sketched. Industry members provided detailed information about the western side of the bank, and precisely which areas were and were not fishable, resulting in the squiggly line on the western boundary of the shape shown above. On the western side of the bank the substrate data is high-confidence (the area has been mapped with multibeam sonar), and

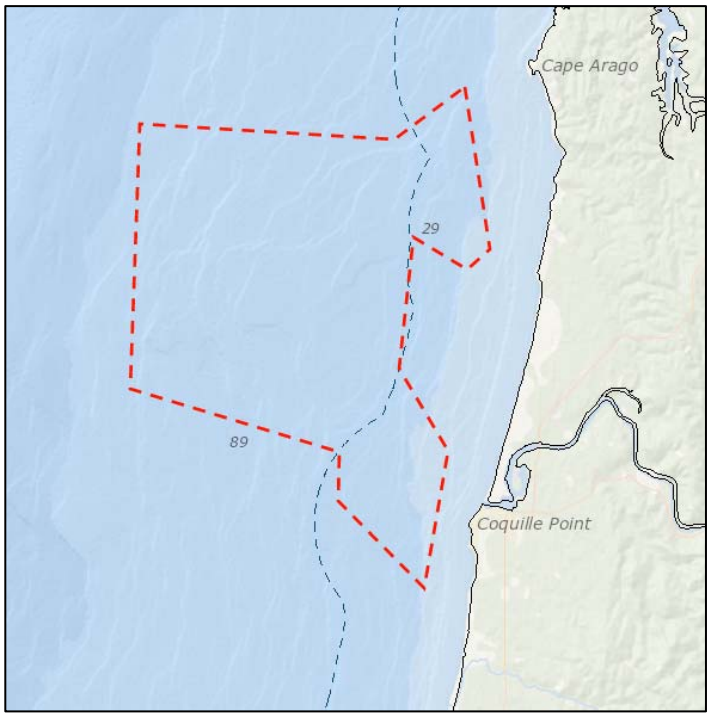
most of the mixed and hard substrate areas are covered by the shape as revised. Some of the hard and mixed substrate areas are excluded, based on concerns by industry of drifting into the closure when towing nearby. The northern fingers also were revised during the port meetings to include more ground on the eastern finger and less on the north finger, based on industry knowledge about which areas are usable fishing grounds.

The shape after this latest round of revisions is shown in the maps above. Note that it does not have consensus, and industry members from Newport have voiced concerns that it does not provide enough space for them to tow along the western side of the bank without risking a ticket. Further conversations are needed to determine whether the area can be revised to address these concerns.

Arago Reef

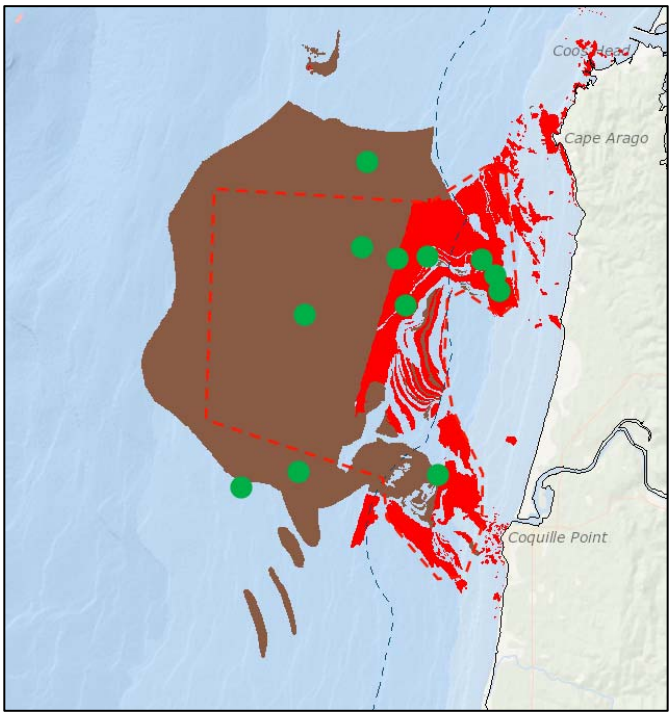
Arago Reef is a well-known reef feature in shallow water just south of Coos Bay. It was identified for discussion based on the idea that bottom trawlers may already be avoiding the area, and that it contains documented sensitive habitat.

The EFH Data Catalog substrate layers show a large area of mixed substrate (mapped with low confidence) beginning in the 70fm range and extending in toward shore. Closer to shore, higher-resolution mapping has been conducted, and the substrate layers show hard bottom in the 30fm range around the state waters line, with two distinct lobes of hard substrate coming in toward shore, one on the north side and one on the south side. The reef is located primarily in federal waters, but the lobes are located in state waters. The area of state waters between these two lobes is soft sediment, in the 10-30fm range.



A number of ROV dives were conducted on Arago Reef in 2011. Video footage showed gorgonian-type and hard corals, as well as other invertebrates and various rockfish species including tiger and yelloweye. Site characterization ranged from mixed substrate to exposed

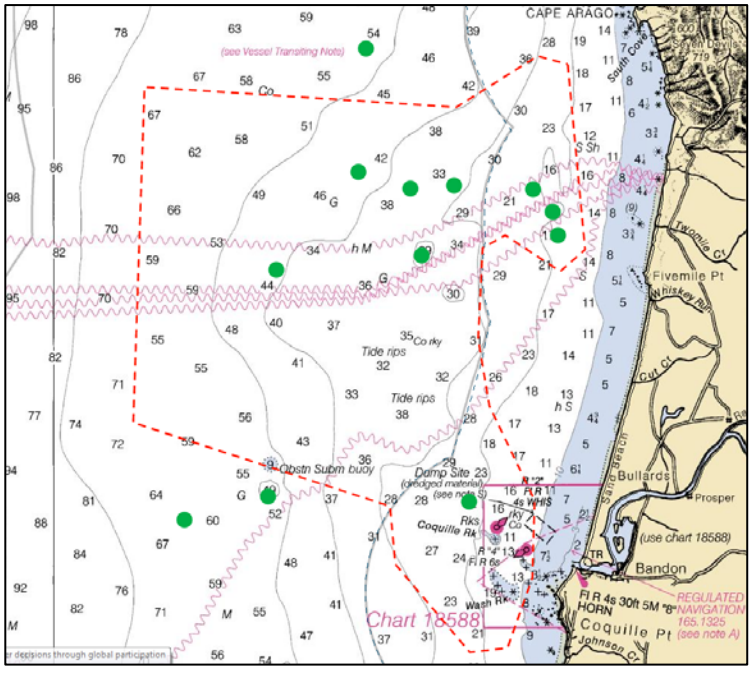
bedrock, generally moderate to low relief. Dive sites are shown as green dots in the map below. A few coral and sponge observation records exist from the trawl survey, including stony corals. Many of the trawl survey cells on Arago Reef are designated as blocked due to obstruction from the reef, so coral and sponge observation records from the survey are sparse.



Arago Reef was discussed with Coos Bay fishermen, who indicated they generally avoid it both when shrimping and bottom trawling for groundfish. EFH Data Catalog effort layers reflect this avoidance, with no visible bottom trawl effort on Arago Reef. Shrimp effort data layers are unclear; they cover Arago Reef but because the data layers were constructed with VMS pings rather than tow tracks, this likely reflects shrimpers transiting over the area.

A draft shape was sketched for this area with coordinates provided by Coos Bay fishermen. The initial shape was a simple rectangle, running from about 65fm depth shoreward to roughly the state waters line. This shape was included in the straw man package circulated to the fleet. Feedback was received from NGOs indicating the area should be larger, as the draft shape was under-inclusive of the hard and mixed substrate.

In the fourth round of port meetings this area was revisited and discussed further, and based on conversations with Coos Bay fishermen it was extended shoreward to capture the two lobes of well-mapped hard substrate in state waters. The revised eastern (shoreward) line was tailored to leave room for shrimping or beach dragging in the shallow waters between the two hard substrate lobes, while also protecting a significant amount of the shallow reef area.



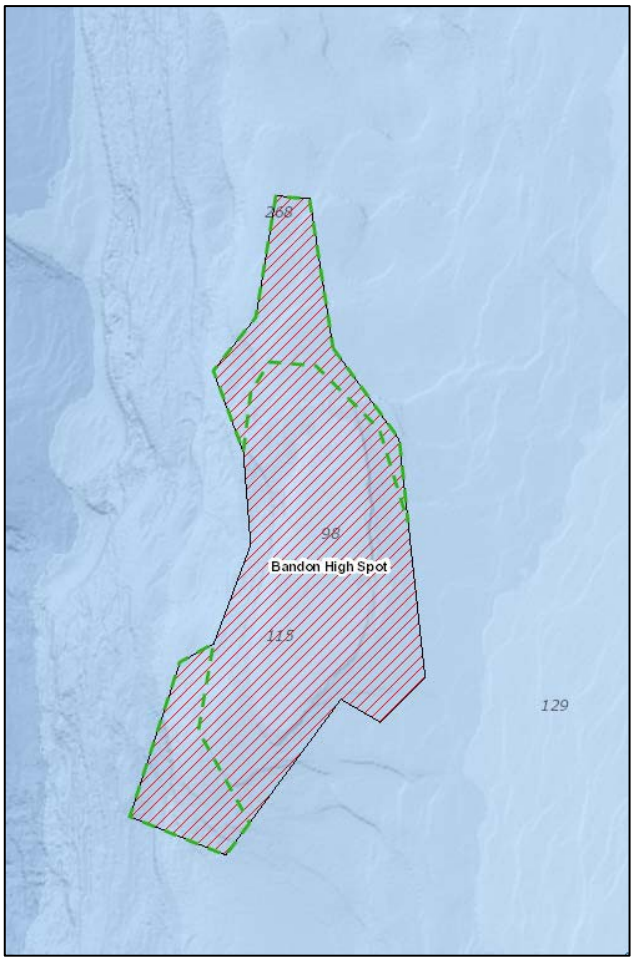
The revised shape is still under-inclusive of the hard and mixed substrate, but for specific reasons. In the shallow waters, which are well-mapped, the revised shape captures nearly all of the hard substrate. Just a few patches of hard substrate fall outside the revised shape—some extending northeast toward Cape Arago and some extending southeast toward Coquille Point. These were not included because fishermen were hesitant to extend the closure all the way to shore, in case it would create an enforcement problem for transiting or accessing the area of soft bottom in the middle.

In the deeper waters, the substrate designations have low confidence, and fishermen indicated that the data layers overstate the true extent of the reef. On the north side of the reef there is significant shrimping effort, and fishermen were concerned with drawing a boundary farther north in that it might cut off some of the shrimp grounds. One research dive was conducted in the northern part of the reef, outside the revised shape but inside the mixed substrate as indicated by the data layers (43.29483° N lat., 124.52400° W long.), and video from that dive showed all soft sediment and low relief, with few corals or sponges. This suggests to the collaborative that the northern line should be drawn southward of that dive site, so the current location of the line may be approximately right.

The south side of the reef also is important for shrimping, and the line was designed to provide ample space for that effort. One research dive was conducted on the south side, in the area designated as mixed substrate in the data layers but outside the draft shape (43.14583° N lat., 124.56882° W long.), and video footage showed the seafloor to be mostly soft sediment and low relief, with some gorgonian corals, some branching sponges, and a few other invertebrates. While this is slightly more sensitive habitat than the dive site on the north side, it does not appear to be part of the core reef area, so the collaborative group viewed it as indicating the southern line is in approximately the right place. On the western side of the reef, this type of dive site comparison is not available, so the placement of the line is relying primarily on fishermen's input and their characterization that the reef ends in the 65-70fm depth range.

Bandon High Spot Northern Modification

In the port meetings, Coos Bay fishermen identified the Bandon High Spot EFH Conservation Area as a currently-closed area that they were interested in regaining access to. Specifically, they pointed to the north and south ends of the ridge, and indicated the current EFH Conservation Area overstates the extent of the feature. This section discusses the northern end of Bandon High Spot, and the following section discusses the southern end.

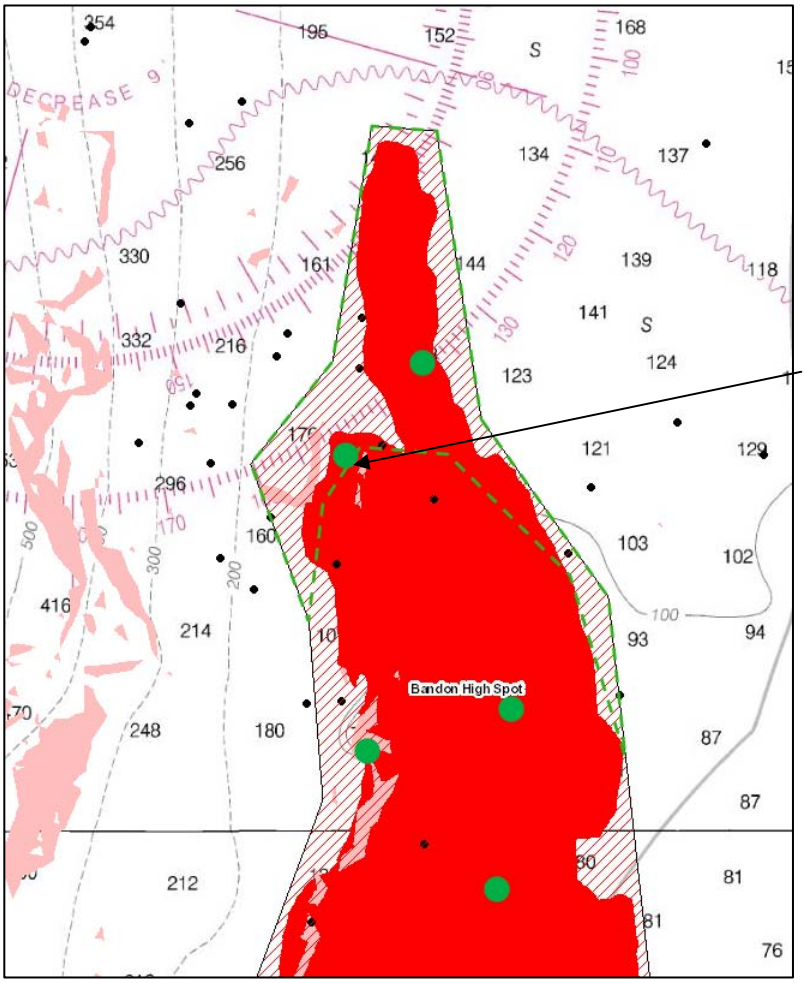


With respect to the north end of Bandon High Spot, industry members described the area as being generally soft bottom and lacking sensitive habitat features, and noted that it was a productive area for summertime dover tows. They requested a change to re-open the north end of Bandon High spot roughly around the 100fm contour. Based on this input, a draft shape was sketched with fishermen that essentially truncated the north end of the current closure, and this shape was circulated to the fleet and NGOs for feedback as part of the straw man package in the summer of 2015.

In the fourth round of port meetings, the collaborative gathered feedback and attempted to synthesize it with respect to this area. Fishermen indicated the reopening should be slightly larger, and should curve around and down the shoreward (eastern) side of the current closure. A slightly larger version of the reopening was sketched in that meeting, for consideration. Feedback from NGOs, on the other hand, indicated the reopening should be smaller. Several research dives and EFH Data Catalog layers were cited, as showing the presence of sensitive habitat.

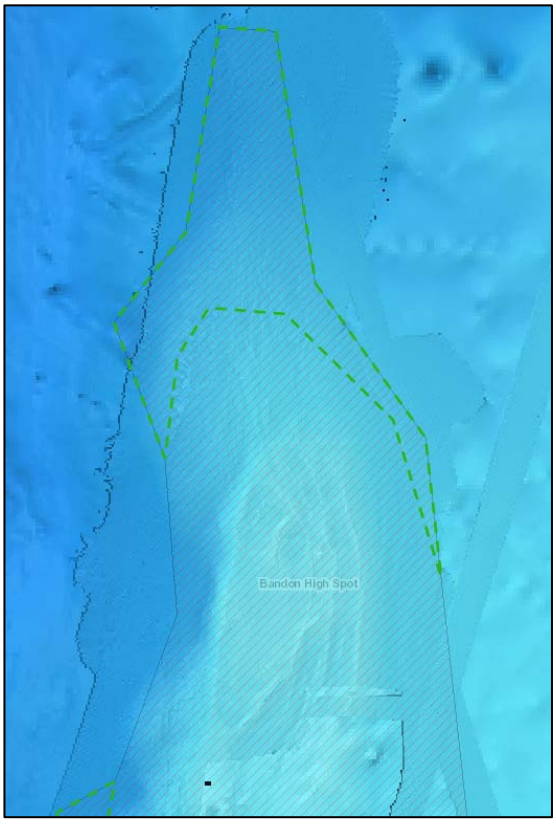
In terms of data, a substantial amount is known about this area. The Bandon High Spot is a distinct feature, visible in the 2012 high-resolution bathymetry as a north-south ridge along the shelf-slope break. Substrate maps show a solid area of hard substrate running north-south along the ridge; the confidence rasters give this designation a medium confidence level. Several coral and sponge observations exist in the area from the trawl survey, including some glass sponges.

Three submersible dives were conducted on the north end of Bandon High Spot by the Delta submersible in the 1990s, the results of which were reported in an OSU master's thesis in 2006. Two of these dives were located out around the base of the ridge, and found sea pens and sea urchins, with mostly soft sediment on the bottom. One dive was located at a point partway up the side of the ridge (i.e., further south and at a higher elevation), and found sponges living on a mixed cobble/boulder bottom. These dives are represented with black dots in the map on the following page (unfortunately indistinguishable from other black dots representing trawl survey coral/sponge observations).



More recently, several ROV dives were conducted on Bandon High Spot in 2011. The dives are visible in the map to the left as green dots. One dive site was located in the northern area, close to the base of the ridge feature on the seaward side (43.07847° N lat., 124.85647° W long.). Video footage from that dive showed some gorgonian-type corals and sponges, as well as some other invertebrates. The seafloor was characterized as almost all soft sediment and low relief.

The northern collaborative believes the research dives provide a more definitive source of information than the EFH Data Catalog substrate layer, especially given the medium confidence level attached to that data layer. It seems likely that the north end of the Bandon High Spot does not in fact have hard substrate extending all the way to the edge of the existing closure, as shown by the substrate data layer, and instead becomes soft bottom at some earlier point. Fishermen's input is consistent with this; they characterized the seafloor as being a kind of "black sand" on the north end of Bandon High Spot, rather than hard substrate.

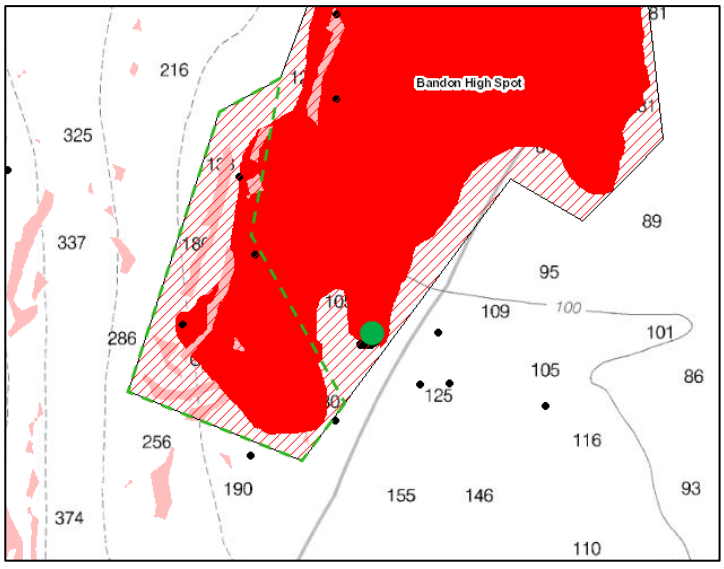


With all this information, as well as the re-sketched shape from Coos Bay meeting four and the NGO feedback, the collaborative group made a few revisions to the shape. Around the main feature, the re-opening line was moved north slightly to keep more of the sides of the ridge within the closure. In particular, the line was adjusted to keep the third Delta submersible dive site noted above within the

EFH Conservation Area. This was viewed as important due to the seafloor characterization at that site being cobbles and boulders—a habitat type that is subject to more disturbance from trawl gear than sand or mud. By contrast, the two Delta submersible dive sites farther north showed soft bottom around the base of the ridge; these areas would be included in the re-opening. In terms of the ROV dive site on the seaward side of the ridge, the collaborative group was uncertain whether or not it should be included in the re-opening. Gorgonian corals and sponges are sensitive to trawling, but on the other hand soft bottom is generally more resilient. The group eventually decided it would be appropriate to include the dive site in the proposed re-opening, with the understanding that this decision could be revisited if necessary. As a final note, what happens in this area will depend on the Trawl RCA being lifted in this part of the coast, as much of the re-opening outlined here is also covered by the year-round RCA.

Bandon High Spot Southern Modification

As with the north end of Bandon High Spot, fishermen in Coos Bay indicated a desire to regain access to the south end of the area. They noted a productive dover tow around the 170fm contour, so in the second and third port meetings a small triangle was sketched on the southwest corner of the Bandon High Spot to allow access to that tow. This shape was included in the straw man package that was circulated to the fleet for feedback.



The southern end of Bandon High Spot, similar to the northern end, is indicated to be hard substrate by the EFH Data Catalog with a medium level of confidence. Fishermen stated that in their experience the hard substrate stops around 120fm, and anything outside that depth is generally fishable.

In terms of feedback, several NGOs indicated they supported the proposed re-opening as drawn in the straw man package (i.e., the small triangle on the southwest corner). Feedback from the fleet was received in the fourth port meeting in Coos Bay, where industry members indicated the re-opening should be larger. Fishermen explained that their interest in having access to the area was broader than just the 170fm tow noted above, and shallower areas offer productive groundfish fishing as well. Based on instructions from fishermen, a new version was sketched in Coos Bay meeting four,

which covered the whole southern end of the current closure rather than just the southwest corner, and extended in to 100fm at its shallowest point.

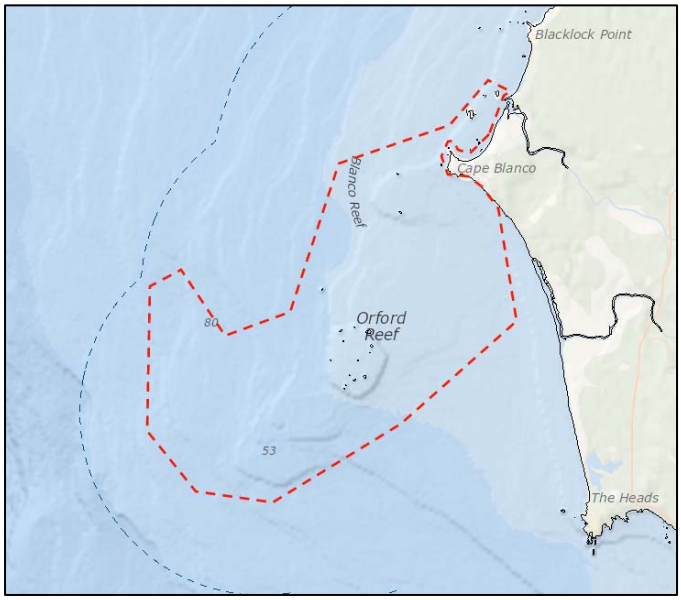
In light of the diverging feedback on this area, the collaborative group revisited the data layers and available information for the southern end of Bandon High Spot. In addition to the substrate data layer, several coral and sponge observations are recorded from the trawl survey—primarily unidentified sponges, sea pens, and soft corals. A research dive was conducted by the Delta submersible in 1993 at the south end of the ridge, visible as a black dot (next to a green dot) in the map on the previous page. Video analysis from that dive was reported in a 2006 OSU master's thesis, and showed a high abundance of red whip corals, a gorgonian-type coral. More recently, a NOAA research cruise on the FSV Bell Shimada was conducted in 2010, revisiting the same area explored by the Delta crew. The site characterization report from that dive (visible as a green dot in the map above) indicates the substrate was rock covered with a layer of mud. Video analysis corroborated the earlier dive findings, as dense colonies of red whip corals were observed, as well as moderate sponge coverage. Flatfishes, thornyheads, and some rockfish were also noted, as were shark egg cases.

Based on the dive site findings and the earlier description of hard substrate extending out to 120fm, the northern collaborative made a few changes to the area proposed by fishermen in the fourth Coos Bay meeting. Specifically, the waypoints were moved to push the southern boundary down and provide a larger buffer around the dive site, and to approximate the 120fm line slightly better.

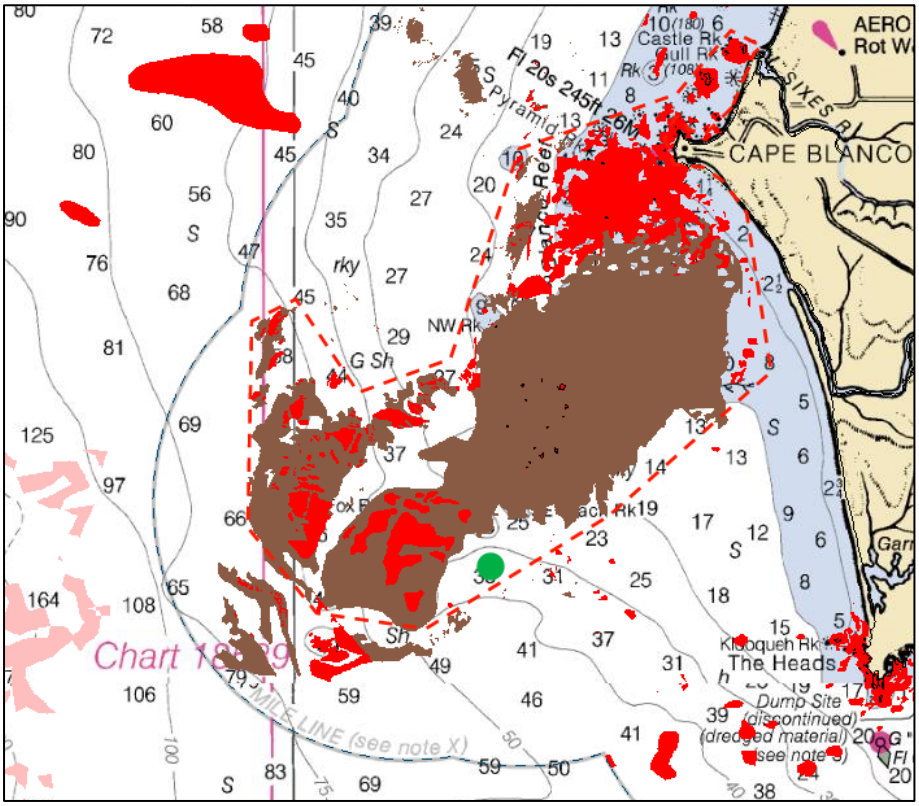
As with the northern end of Bandon High Spot, what happens in this area will depend on the Trawl RCA being lifted in this part of the coast, as much of the re-opening outlined here is also covered by the year-round Trawl RCA.

Blanco Reef

This area was identified early on, as a well-known reef feature just south of Cape Blanco. In discussions with Coos Bay and Brookings fishermen, most people said it is difficult to bottom trawl there, if it is possible at all. The collaborative group consulted the EFH Data Catalog substrate layers and nautical charts and found good correspondence with fishermen's understanding of the area. High-confidence



substrate mapping around the 3-mile line shows the outside boundary of the reef delineated with hard and mixed substrate, and medium-confidence mapping shoreward of there shows the body of the reef as mostly mixed substrate with some hard-bottom pockets. Easily-identified landmarks like Fox Rock and Cape Blanco helped to cross-reference fishermen's knowledge with the data layers. The effort data layers corroborated that very little (if any) bottom trawl effort takes place around Blanco Reef, and shrimpers avoid the area as well.

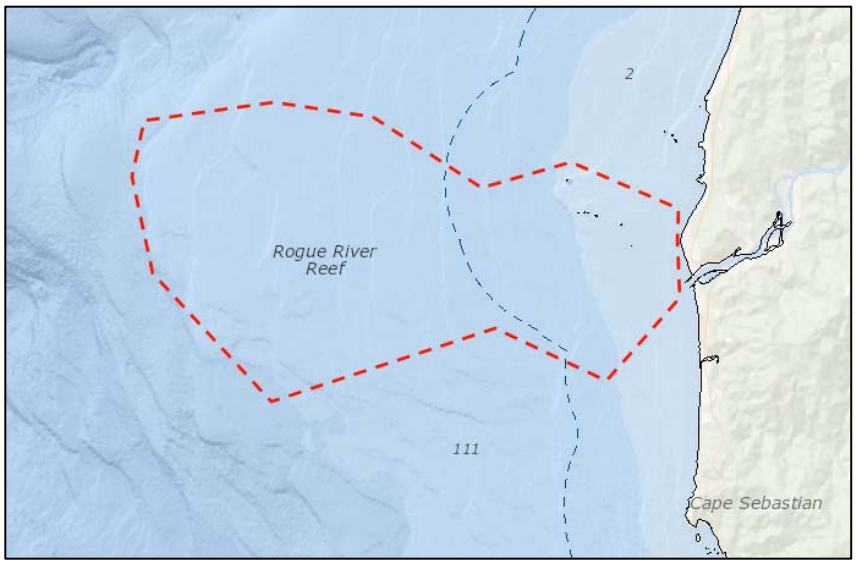


In the third round of port meetings the group drew a draft shape for Blanco Reef, and that shape was circulated to the fleet as part of the straw man package. In the fourth round of port meetings the shape was refined, to ensure shrimping and flatfish dragging would not be impinged upon by the proposed bottom trawl closure. This meant tightening up the boundary, and excluding a small amount of hard and mixed substrate on the southwestern corner of the reef.

After the fourth round meetings, the collaborative group did minor cleanup to remove excess waypoints and straighten lines to the extent possible. The southeastern boundary line was also moved outward slightly, relative to the revised shape from meeting four, in order to encompass an area where a ROV research dive was conducted (42.75603° N lat., 124.61458° W long., visible as a green dot in the map above). Video footage from the ROV showed some hard corals and a few gorgonian corals and sponges, as well as numerous other invertebrates. Footage also showed a dense school of canary rockfish, and quillback rockfish, yellowtail/olive rockfish, and yelloweye rockfish. The site was characterized as roughly even thirds hard substrate, mixed substrate, and soft substrate. This dive site appears to represent the margin of the reef, so the boundary line was adjusted to encompass it. These final revisions were vetted and are believed to be acceptable to all stakeholders.

Rogue River Reef

This is a significant reef feature with hard substrate starting essentially at the shoreline and extending several miles out. The hard substrate patches get more sparse through the 30-60fm range (though the confidence level in the data is low), and then in the 60-75fm range a large area of hard substrate is indicated (also with low confidence).



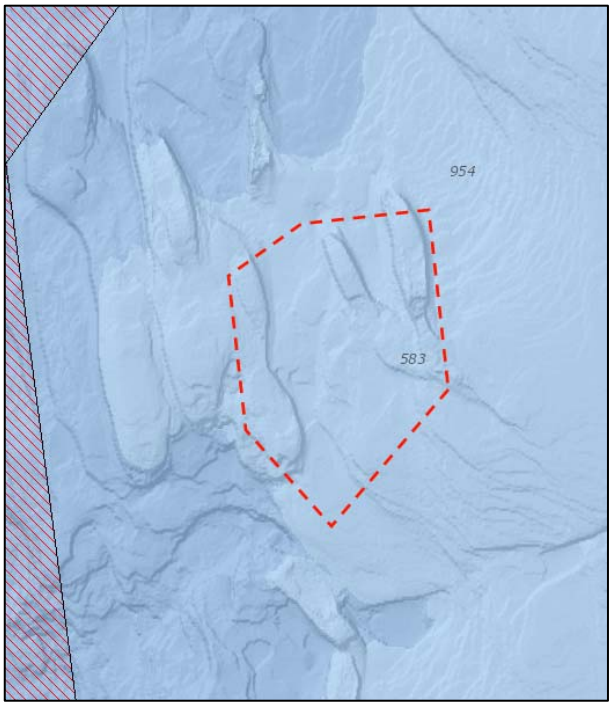
Coos Bay and Brookings fishermen confirmed the substrate data is more or less accurate. They noted that the nearshore reef is well-defined and not trawled, and the offshore reef also is pretty rough. The area in between has soft and mixed substrate, with some usable parts for bottom trawling, but is not fished too often. Fishermen indicated they tow for groundfish around the sides of Rogue Canyon (seaward and to the north of this area), and catch shrimp on the shelf to the north and south of this area, but generally they avoid the area in question because it is not necessarily more productive than adjacent areas and there are some rough patches.

The EFH Data Catalog effort layers reflect fishermen's characterization of the area as infrequently used. Groundfish bottom trawl effort in both periods (2002-2006 and 2006-2010) shows activity outside the RCA and around the shelf-slope break, but nothing on the shelf in this area. Shrimp VMS pings show activity in the middle of the shelf (in the 40s and 50s), but it is unclear whether these pings represent vessels transiting, sleeping, or fishing. Crabbing takes place around the nearshore reef, but would not be affected by the closure under consideration.

Given the two distinct reefs and the mixed area between, and the relatively low priority placed on the area from a fishing perspective, conservation groups were interested in this area as a potential place to provide continuous protection from the shore all the way across the shelf. A rough shape was sketched encompassing this area, in the third round of port meetings with Coos Bay and Brookings fishermen. The northern and southern boundaries were drawn in an hourglass shape to maintain tows on the shelf heading north from the reef and south from the reef. The outer edge of the area was drawn generally no deeper than 85fm, to allow tows on the outside if needed.

The draft shape was included in the straw man package circulated to the fleet for feedback. In the fourth round of port meetings, the shape was modified based on specific feedback from Coos Bay fishermen about the usable fishing grounds south of the reef, bringing the southern boundary up slightly to approximate the Loran 14030 line. After the port meetings concluded, the collaborative group cleaned up a few edges and removed excess waypoints, yielding the shape shown above.

Brush Patch



This is an area that was identified initially by fishermen, who noted that high concentrations of a particular coral species come up in the net whenever this area is trawled. The area's name comes from the type of coral that grows there, which has a brush or shrub-like appearance. Fishermen familiar with the area generally agreed that they tried to avoid the area due to the high invertebrate bycatch.

The Brush Patch is located in on the continental slope in fairly deep water (400-500fm), just south of the Oregon-California border. While no hard or mixed substrate shows up in the EFH Data Catalog data layers for this area, it has not been mapped and the associated confidence level is low. Several coral and sponge observation records are located in this area from the trawl survey, including black corals, gorgonian corals, and glass sponges.

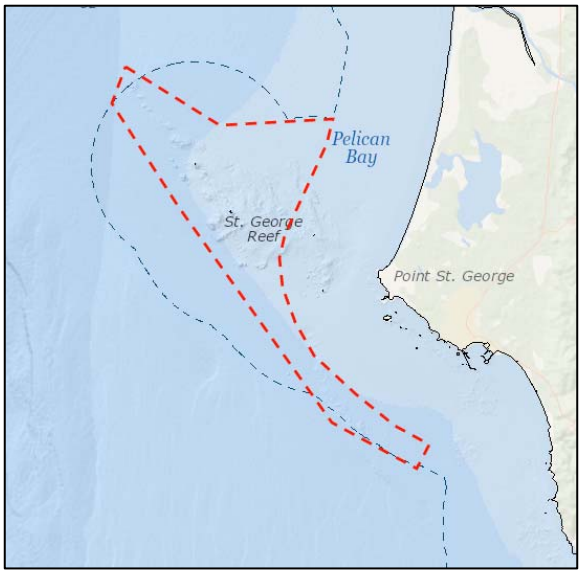
Given the sensitive biogenic habitat in this area, the collaborative discussed the possibility of an EFH closure. An initial draft shape was sketched based on waypoints provided by industry, and that shape was included in the straw man package circulated for feedback. In the fourth round of port meetings the shape was revised slightly, based on feedback from fishermen to include the high spot (above 400fm) on the northeast corner.

The purpose of this shape is to mark off the area where there is a lot of coral growth and avoid impacts to that area, while also not interfering with groundfish trawling in adjacent areas. Also, closing this area is intended to resolve the coral bycatch issue from the 2006-2010 WCGOP observer data in the EFH Data Catalog, which shows a hotspot just to the south and west of the

area. The collaborative understands that coral and sponge bycatch is recorded at the end of the tow, so the actual area where the invertebrates are encountered can be anywhere within the length of a trawl tow of the hotspot. Given the known coral abundance at the Brush Patch, the best interpretation the collaborative group could come to was that the bycatch hotspot was reflecting occasional tows through the Brush Patch, so closing the area should eliminate the hotspot.

Saint George Reef

Saint George Reef is a well-known rocky reef located mostly in California state waters, just offshore of Point Saint George. The reef feature runs southeast-northwest, ending just outside state waters.



While Saint George Reef is almost entirely in California state waters, most of it is farther than 3 nautical miles from shore. Several of the pinnacles of Saint George Reef protrude above the surface of the water, and these offshore rocks extend outward the boundary of state waters. The farthest offshore is Northwest Seal Rock, and California state waters form a semicircle around this rock with a radius of 3 nautical miles.

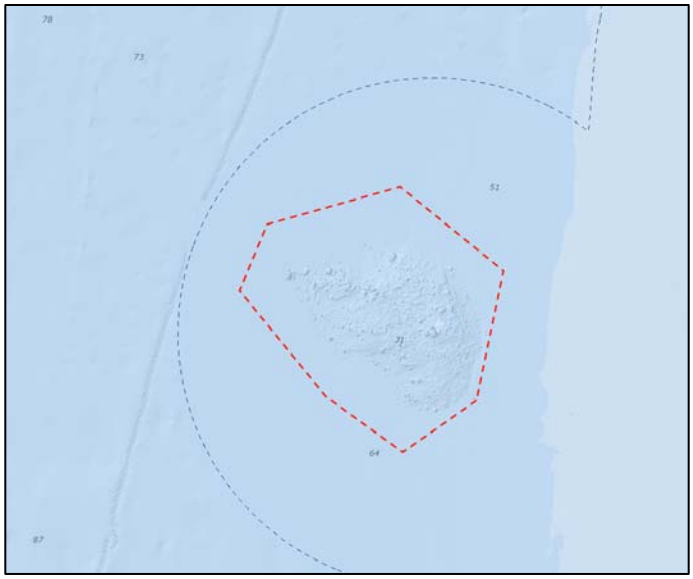
In meetings with Brookings and Eureka fishermen, the northern collaborative discussed the Saint George Reef area. Bottom trawlers indicated they tended to avoid the reef, and the data layers illustrated this—bottom trawling effort heat maps show no effort on Saint George Reef, and historical trawl effort shows little overlap with the reef feature. Fishermen did mention that they trawl for shrimp in the 30-50fm range to the north and south of the reef, and sometimes in the 60-90fm range outside the reef.

The shape shown here would cover the parts of Saint George Reef that are beyond 3 miles from shore. The seaward boundary lines are drawn around the hard substrate of the reef, as verified by fishermen's understanding. Note that a state marine conservation area (Point Saint George SMCA) covers part of the shape as sketched, so some of the ground is already closed. The shape as drawn cuts across the SMCA diagonally, encompassing about half of it.

The collaborative group understands that the California Department of Fish & Wildlife has indicated it does not have the ability to implement a bottom trawl closure corresponding to this area, so the area is being omitted from analysis by the project team. Despite its doubtful status, the area is included here for completeness.

Reading Rock Reef

Reading Rock is an exposed rock north of Trinidad Head, in northern California. The rock is part of a submerged reef in the 20-30fm range, represented in the EFH Data Catalog substrate layer as a distinct patch of hard substrate. Fishermen's understanding of the area matches the NOAA data fairly well, in terms of placement and extent of the reef.

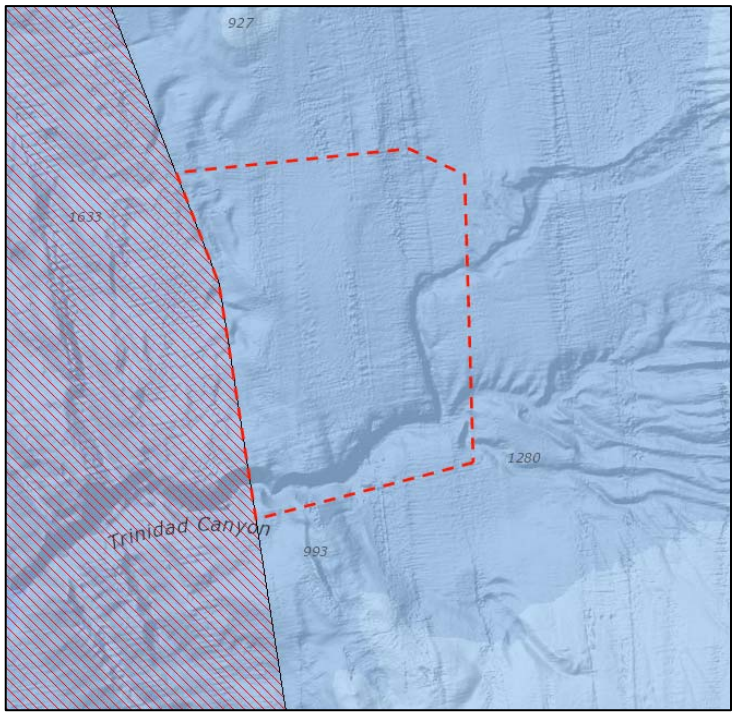


Some groundfish bottom trawling took place historically in the area, but fishermen indicated they generally avoid the reef. Historical trawl effort patterns confirm this, as most tows run either on the shoreward or seaward sides of the reef. While a few tow lines run across the reef, these are likely curved tows that are misrepresented by the endpoint-to-endpoint method of drawing tow lines with state logbook data. Fishermen noted that in this area, shrimp effort stays offshore of the reef, generally in the 40fm range.

The shape shown here was drawn based on the substrate data and nautical chart, to encompass the reef and a small buffer around it. Initially there was concern with maintaining access to tows that go around the reef (both on the outside and inside), but it was pointed out that a California state marine reserve and state marine conservation area exist in the area, so those tows are not viable in any case. With the configuration shown here, it should still be possible to tow north from Reading Rock.

The collaborative group understands that the California Department of Fish & Wildlife has indicated it does not have the ability to implement a bottom trawl closure corresponding to this area, so the area is being omitted from analysis by the project team. Despite its doubtful status, the area is included here for completeness.

Trinidad Canyon



The upper portion of Trinidad Canyon is a broad basin in deep water. Tributary canyons run up to the shelf-slope break on the east side of the basin, and on the west side a single steep trench drops off to the abyssal plain. This area was identified for discussion by conservation groups based on the canyon feature, coral and sponge observations, and low trawl effort.

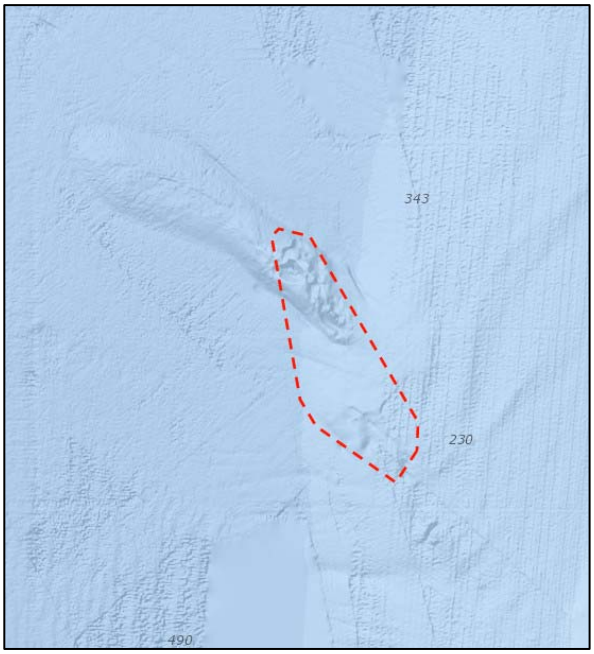
In port meetings, Eureka and Brookings fishermen indicated there may have been some historical effort in this area, but due to the depth (most of the area is in the 600s, and the trench drops down to over 800fm) nobody is currently fishing there. Brookings fishermen said they tow on the north side of the basin in the 600fm range, but generally do not go any further south than that. Eureka fishermen suggested parts of the basin may have been fished for black cod and thornyheads at some point in the past, and the south side of the basin (south of the trench) is actively used today. EFH Data Catalog effort layers show consistently low effort in the area, and historical trawl effort patterns show very low effort in the basin. No shrimping activity takes place in the vicinity, given the depth.

Fishermen noted they occasionally found brain coral in the northeast end of the area, near the 633 reading and "h" notation on the nautical chart. Several coral and sponge observations are recorded in the basin from the trawl survey, including black coral and glass sponges.

In port meetings a draft shape was sketched for this area with the intent of avoiding active fishing grounds while also encompassing some of the coral areas and part of the deep sedimentary basin. The area was included in the straw man package circulated to the fleet, and discussed in follow-up meetings. Relatively little feedback was received on the area, reflecting low interest in the area from a fishing perspective. After the final round of port meetings, a few adjustments were made to clean up the shape and remove excess waypoints.

As a final note, if this area is adopted as an EFH Conservation Area, it might make sense to draw the seaward boundary out slightly (and possibly in a straight line), to create a bit of overlap between the 700fm line and the EFH Conservation Area. This would allow for future adjustments to the 700fm line without risking opening up a gap between the two areas.

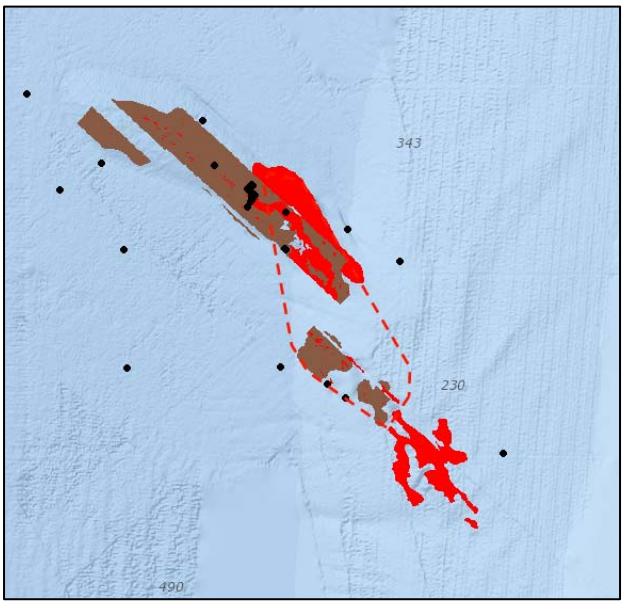
Mad River Rough Patch



This is a ridge that runs northwest-southeast at around 200 fathoms in depth, due west of the Mad River. It is visible in the bathymetry data layer, and substrate has been mapped with high confidence in some areas, indicating that the ridge is a known feature for scientists. The substrate maps show hard and mixed substrate along the ridge (in the recently mapped areas), and some hard substrate extending to the southeast (in unmapped areas). Part of the ridge is covered by the year-round Trawl RCA.

Fishermen confirmed there is a patch of rough ground here, with a number of trawl hangs. The area in general is heavily trawled, though, so fishermen indicated that if an EFH Conservation Area were added here, it would be critical to get the design right so that the many tows running around and near the rough ground are not cut off. The EFH Data Catalog effort layers confirmed this, showing high bottom trawl effort outside the RCA around the ridge feature.

The collaborative group worked based on fishermen's plotter data showing the hang locations to draw a fairly tight shape around the known bad ground. The draft shape ended up encompassing the southeastern half of the ridge and a bit of surrounding area; the trawl hang locations did not map onto the ridge feature exactly, but rather were offset slightly to the southeast.

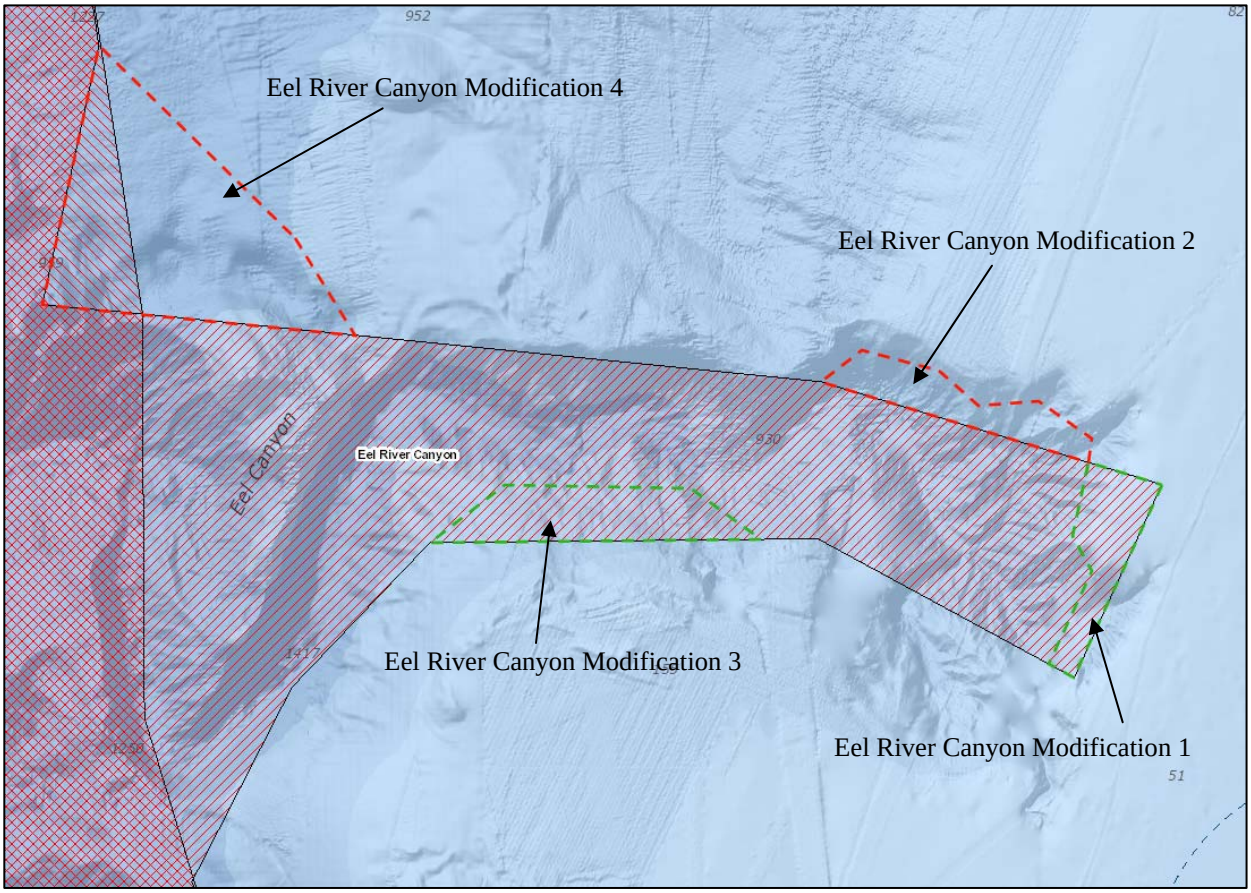


The draft shape was circulated for feedback in the straw man package with a specific request for input on the waypoints, given the high usage of surrounding areas. Feedback was received from NGOs recommending the area be expanded to include the full ridge feature and surrounding areas of the RCA. This area was noted as a good candidate for providing protection around the shelf-slope break, in addition to the ridge feature.

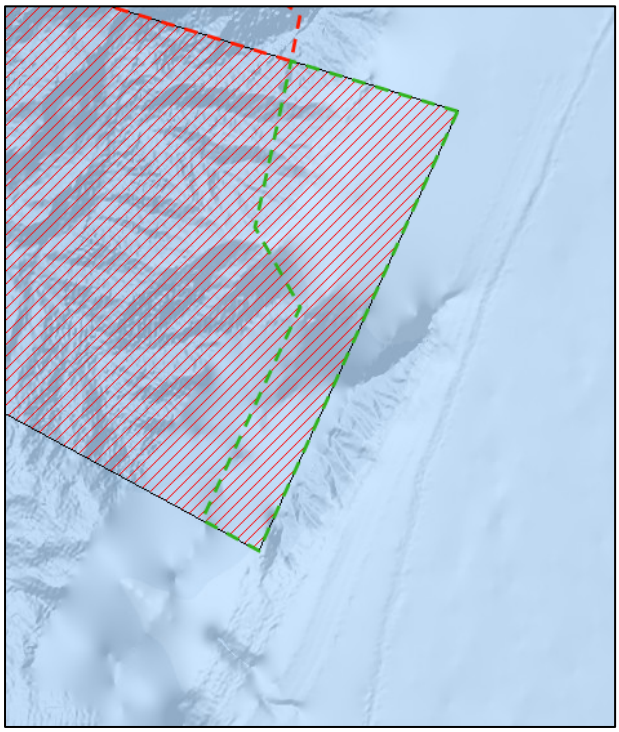
In follow-up discussions it was noted that MBARI conducted at least one research dive with an ROV in this area in 1997. Researchers found abundant mushroom coral, as well as some sea pens. The substrate and relief characterization from the dive is not known. The dive site is located outside the draft shape, and is visible in the map on the previous page as a cluster of black dots.

In the course of reviewing input and cleaning up the shapes, the group discussed whether it could make sense to expand the southern boundary of the draft shape a bit, in order to include the full extent of the mixed substrate on the south side. This change was made, and is reflected in the shape shown in the map above. The MBARI dive site remains outside the shape, as does most of the adjoining RCA.

Eel River Canyon Modification 1



Eel River Canyon Modification 1 is an area that was requested to be opened by the 2013 EFH proposal from Fishermen's Marketing Association. It is comprised of shallow waters around the canyonhead of Eel River Canyon, on the eastern end of the existing EFH Conservation Area. Depths range from 30fm on the northeast corner to around 200fm on the southwest side of the potential reopening. The request for reopening was based on the fact that the EFH Conservation Area established in Amendment 19 extended too far onto the shelf, and cut off shallow tows that historically ran around the canyonhead. Fishermen in Eureka reiterated this, and indicated that a reopening in this area would be useful in restoring fishing opportunity.

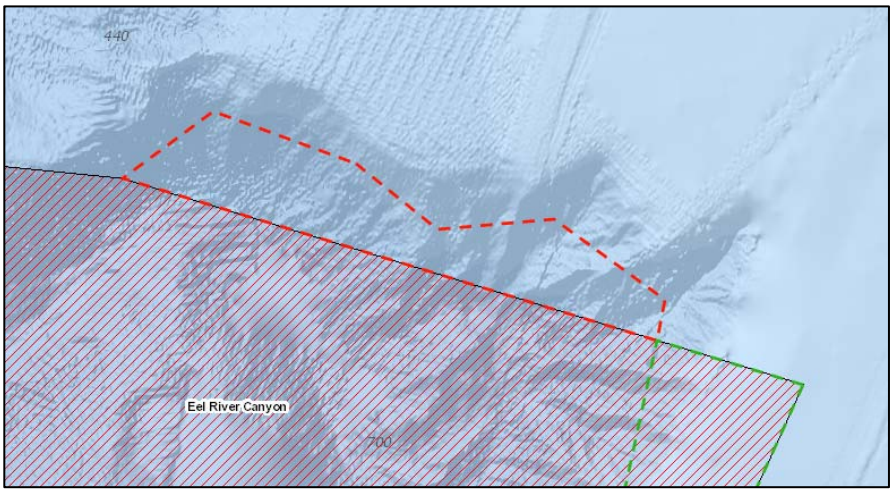


In terms of habitat features, part of this area is shallow shelf and part of it covers the uppermost slope of Eel River Canyon. This uneven coverage is a result of the rectangular shape of the existing EFH Conservation Area mapping onto the zig-zag edge of the canyonhead. Shelf and slope areas both appear to be soft sediment according to the EFH Data Catalog; fishermen agreed with that characterization. One sea pen observation record exists in the area, from the trawl survey.

In the Eureka port meetings, this shape was initially sketched to match the 2013 Fishermen's Marketing Association proposal. That draft shape used the 75fm line as defined by NOAA waypoints, to mark the reopening boundary. The reopening idea was circulated in the straw man package to the fleet, and generally supportive feedback was received. NGO representatives indicated this seemed to be a sensible change, especially in conjunction with the other changes to Eel River Canyon discussed in the next few sections.

In the final round of scrutiny and adjustments, the collaborative group modified the shape slightly to match up with the revised addition on the north side (see Eel River Canyon Modification 2), and to better match the actual contour. Because the main purpose of this reopening is to restore access to north-south tows along the shelf, the group attempted to reshape the area to accomplish that purpose while reopening less of the deeper waters of the canyon.

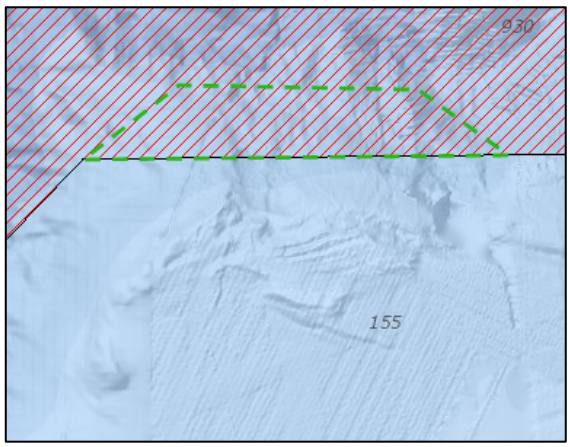
Eel River Canyon Modification 2



This area was identified by NGO representatives as a place where the boundary of Eel River Canyon EFH Conservation Area could be modified to better match the actual canyon feature. The bathymetry data layer and nautical charts show Eel River Canyon dropping off steeply in this area, with depths going from 100-400fm over the course of less than a mile. A research dive was conducted by MBARI in 1997, in the 200-350fm range. Scientists found mostly mushroom corals and sea pens along the canyon wall. Substrate characterization from the ROV dive is unavailable but the EFH Data Catalog layers suggest it is soft sediment.

A draft version of this shape was circulated to the fleet in the straw man package, and no concerns were raised. After the final port meetings, the collaborative group went back and scrutinized the effort data layers to double-check that the new boundary line would not affect any fishing on the north side of the canyon. Given the current configuration of the RCA (which cuts across this area), no real effort seaward of the RCA passes through this area. On the shoreward side of the RCA, a handful of shelf tows either begin or end around the canyon edge, so the draft shape was reduced in size in order to avoid creating an enforcement risk there.

Eel River Canyon Modification 3



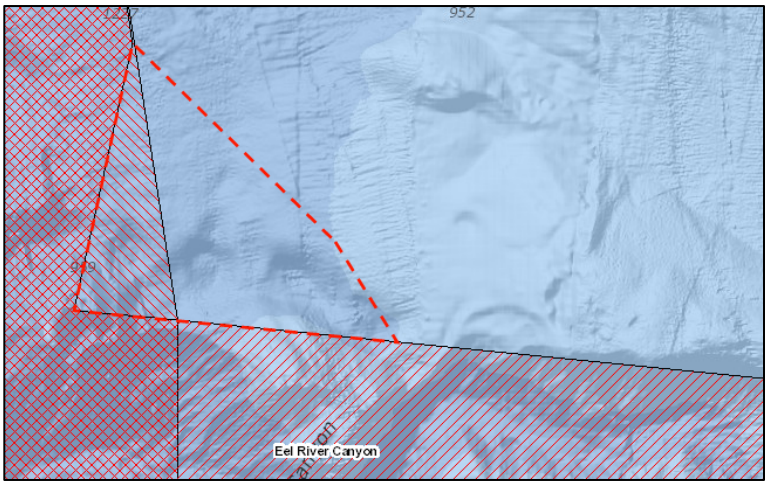
This proposed re-opening, located on the south side of the existing Eel River Canyon EFH Conservation Area, is based on feedback from fishermen in Eureka. Trawlers in that port indicated that they used to tow around the 350fm contour on the south side of the canyon, and the EFH Conservation Area established in Amendment 19 cut off those tows. They described the area as productive dover sole fishing grounds, with soft muddy bottom.

Substrate records in the EFH Data Catalog agree with the characterization as soft substrate, though the confidence level is low. No coral or sponge records exist in the area from the trawl survey, and no research dives have been done to the best knowledge of the collaborative. Effort maps from the EFH Data Catalog show some effort in the earlier (2002-2006) period, with less in the recent (2006-2010) period.

The shape shown here was initially drawn in a Eureka port meeting, and was intended to more or less trace the 400fm contour line on the nautical chart. Fishermen indicated this would provide them with sufficient room to tow along the side of the canyon and then turn southward to continue to tow.

The draft shape was included in the straw man package circulated in June, and got generally positive feedback. Because the draft shape directly addressed fishermen's request, and conservation groups had no concerns, no further modifications were made.

Eel River Canyon Modification 4



This area came up as an attempt to get at the sponge bycatch hotspot that exists on the north side of Eel River Canyon. The WCGOP sponge bycatch data layer for 2002-2006 shows a distinct hotspot on the north side of Eel River Canyon, and to a lesser degree the 2006-2010 data layer does as well. These areas were discussed in the Eureka port meetings, in an attempt to pinpoint the source of the invertebrate bycatch. Several fishermen noted a commonly-used tow that comes down from the north in the 200-300fm range and bends west along the north flank of the canyon, ending somewhere around the 356 reading on the nautical chart. Other fishermen mentioned deep-water tows on the north side of the canyon. No clear consensus emerged, however, on where the sponge bycatch was coming from.

A few people mentioned that the ridge or hill under the 384 reading on the nautical chart was known to have high concentrations of invertebrates. The ridge is mostly underneath the existing Eel River Canyon EFH Conservation Area, but the north side of it is currently exposed. This

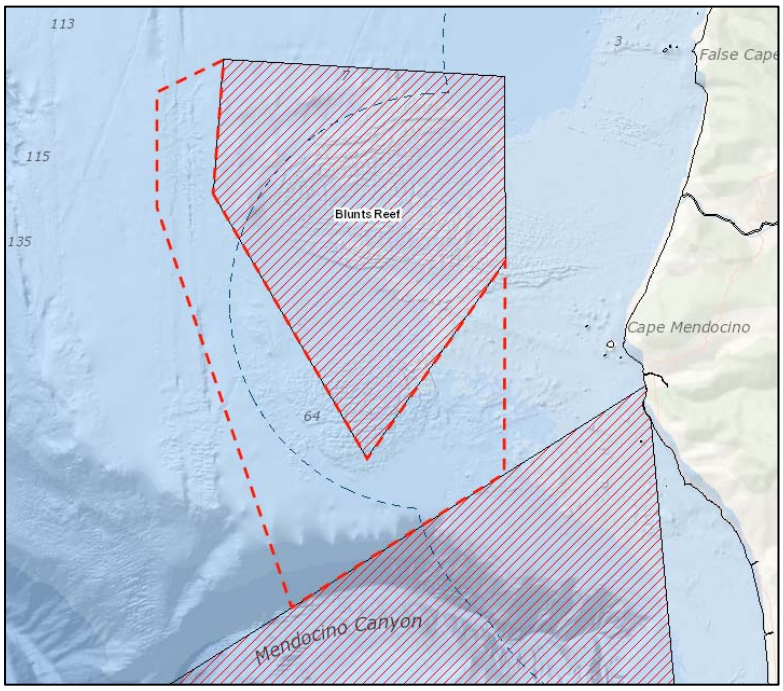
area was discussed several times, and finally in the last Eureka port meeting a small triangle was drawn for a potential extension of the Eel River Canyon EFH Conservation Area to cover the north side of the ridge. By drawing a box around this area, the hope was to close off the source of sponge bycatch and get rid of the hotspot on the north side of the canyon.

In terms of the habitat data layers in the EFH Data Catalog, one black coral observation record exists in the area from the trawl survey, and the substrate maps show the area to be soft sediment (though with a low confidence level). In terms of bottom trawl effort, the data layers from both time periods (2002-2006 and 2006-2010) are similar, showing a low level of effort on the east side of the area (possibly an artifact of spatial aggregation techniques) and no effort on the west side. Historical trawl patterns show very low levels of effort on the east side, and almost no effort out in the 600fm range.

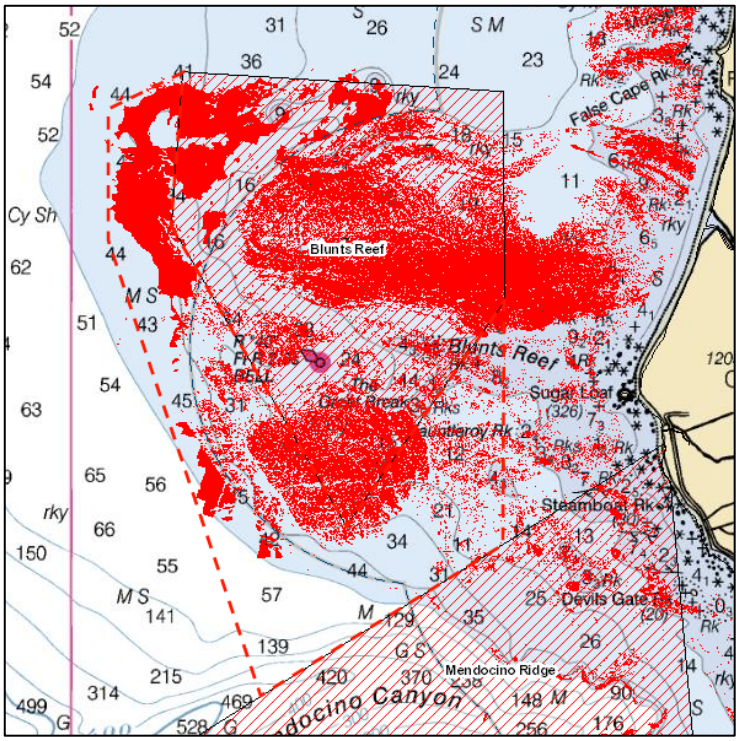
In the process of cleaning up shapes and cross-referencing the data layers, the collaborative group realized the triangle shape created an awkward point for fishermen to navigate around, and given the nonexistent effort on the western side, decided to extend the shape westward out to the existing deepwater line. This expanded the shape somewhat (though in an area with no effort), and made a less jagged boundary. Further modifications were made to turn the boundary into a straight line, encompassing more of the deep area around 600fm.

Blunts Reef Modification

This shape is designed to incorporate the full extent of the rocky reef areas around Blunts Reef, and to connect up with the existing Mendocino Ridge EFH Conservation Area to the south as well as a state marine reserve.



The EFH Data Catalog substrate layers show hard bottom (assessed with medium confidence) extending to the west and south beyond the existing EFH Conservation Area. The reef is generally shallow, occupying the 30-45fm range off Cape Mendocino. Eureka fishermen confirmed that this area is generally rocky.



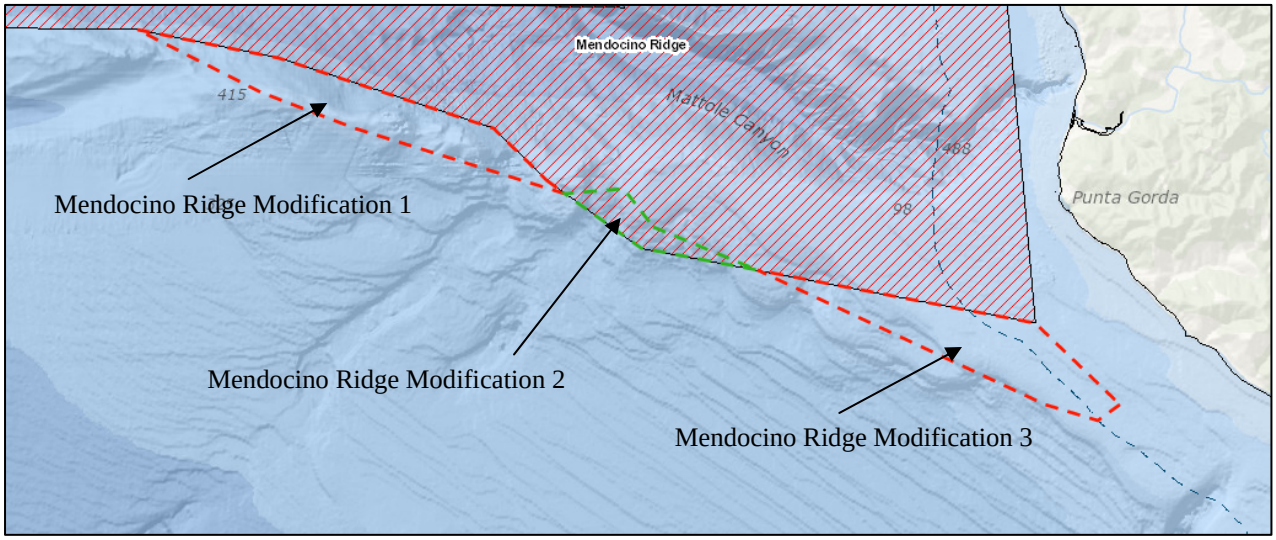
In terms of usage, Eureka fishermen indicated they do not trawl this far inshore; in the region around Cape Mendocino most bottom trawling takes place either shoreward of the RCA in the 80-100fm range, or outside the RCA in deeper water. Effort data layers more or less match this description, with little effort over Blunts Reef in the earlier time period (2002-2006) and almost none in the later time period (2006-2010). Historical trawl information confirms that little if any effort crossed the reef. There is crabbing in the area and there may be fixed gear fishing as well, but those activities would not be affected by the expansion described here. Also there is a state marine reserve in this area—South Cape Mendocino SMR—running from shore out to the edge of state waters, so some of this area is already closed.

A draft shape was drawn around the hard substrate areas, and circulated for feedback in the straw man package. Generally positive feedback was received from NGOs, and industry members indicated it would not affect them. In the final round of port meetings, the collaborative group made a few adjustments to the Blunts Reef area, primarily to straighten out the lines.

The collaborative group understands that the California Department of Fish & Wildlife has indicated it does not have the ability to implement a bottom trawl closure corresponding to the state waters portion of this area, so that portion of the area is being omitted from analysis by the project team. Maps of the full shape are included here for completeness.

Mendocino Ridge Modification 1
Mendocino Ridge Modification 2
Mendocino Ridge Modification 3

These modifications to the existing Mendocino Ridge EFHCA are intended to adjust the southern boundary to better match the usable and non-usable areas.



Fishermen indicated they trawl along the south side of the escarpment, but rarely if ever use the north side. There was pretty good consensus that anything northward of the 200fm line is rough bottom and difficult to trawl. This includes the area called "the peanut" (because the 200fm line makes a peanut shape on the chart). A draft shape was drawn to encompass this area, which would add to the existing EFH Conservation Area. Specifically, a line was traced that started at the peanut and ran northwest along the ridge, and southeast until the line hit the current EFH Conservation Area. This area, labeled "Mendocino Ridge Modification 1," shows up in the EFH Data Catalog as hard substrate, but with a low confidence level. No coral or sponge observation records are located in the area. There is a small amount of historical trawl activity in this area, but most tows end before they reach this point.

Fishermen also noted there is a corner of the existing EFH Conservation Area that is soft bottom and fishable, which would be helpful to restore access to. The area is located on the southwest side of the current closure, near the 234 reading on the chart. EFH Data Catalog substrate layers confirm fishermen's understanding that this is a soft sediment area (though confidence is low), and no coral or sponge observations are recorded in the area. A draft shape was sketched to re-open this area, essentially continuing the line that had been drawn in deeper waters around the 200fm contour. The area clipped off by the line was designated as a draft shape for reopening, and labeled "Mendocino Ridge Modification 2." After this draft shape was circulated for feedback, it was modified in the fourth round of port meetings at the request of Eureka fishermen who provided specific feedback indicating a cut inward, near the 120 reading on the chart, would be helpful.

Closer in to shore, fishermen characterized the area as having some rough patches located off the south side of the existing EFH Conservation Area, in the 50-140fm depth range. They indicated these areas are generally avoided when bottom trawling. To sketch a draft shape for adding this

area to the Mendocino Ridge EFH Conservation Area, the same line (which had started out as the 200fm line out by the peanut) was continued further shoreward. By drawing the line all the way to state waters a wedge was created, and the wedge was named "Mendocino Ridge Modification 3." This shape would protect the eastern end of the escarpment and any rocky patches, and would maintain protection for part of the area currently covered by the year-round Trawl RCA. The EFH Data Catalog layers show a bit of hard substrate on the shallow end of the wedge (around 50fm), and no coral or sponge observation records. Historical trawl data shows little relevant effort in the area.

The net effect of these three changes is to straighten out the southern boundary line of the Mendocino Ridge EFH Conservation Area, while opening up some soft bottom areas and protecting some areas of more sensitive habitat. These shapes were included in the package circulated to the fleet, and received generally positive feedback.

Trawl RCA Canada to 48°00'

The Trawl RCA was discussed in port meetings, and fishermen indicated interest in removing it. Fishermen believe that a full opening is appropriate, given the bycatch reduction incentives and accountability measures in place with the catch share program. NGO representatives tended to agree on the accountability created by the catch share program, and deferred to industry on the acceptable level of risk regarding bycatch.

From Canada south to Cape Alava (48°10'), the Trawl RCA extends from shore to the 150fm line, seasonally moving out to the 200fm line. Under this regulation, bottom trawling is prohibited across the entire shelf north of 48°10'. South of there, the year-round Trawl RCA occupies the area between the 100fm and 150fm lines. Given the shape of the shelf-slope break, the 100-150fm Trawl RCA runs south from the 48°10' line, bends east, and heads up Juan de Fuca Canyon, extending back up to the 48°10' line. From there, the 100-150fm Trawl RCA reverses course and runs along the eastern side of Juan de Fuca Canyon, and on down the coast.

There is a significant overlap between the northern Trawl RCA and the potential modifications to Olympic 2 EFH Conservation Area described above. The changes proposed to Olympic 2 EFH Conservation Area are designed to provide protection for areas that contain sensitive habitat features, such as hard/mixed substrate or documented coral/sponge abundance, and many of these areas are located in the Trawl RCA. As such, removal of the RCA without an expansion of the EFH area would risk exposing a number of the sensitive habitat features—an outcome viewed as problematic by some stakeholders.

Because the modifications to Olympic 2 EFH Conservation Area are intertwined with the Trawl RCA, the collaborative group designated the portion of RCA north of 48°00' as a distinct area for consideration. Changes to this subset of the Trawl RCA are intended to be linked to changes to the Olympic 2 EFH Conservation Area, as a package, in order to account for the connections between them. Specifically, re-opening the Trawl RCA from the Canadian border to 48°00' is included as a recommendation from the collaborative, in conjunction with the modifications to the Olympic 2 EFH area. Lastly, note that changes to the Trawl RCA may involve government-to-government consultation with coastal treaty tribes, as virtually the entire RCA in this region is within tribal U&As.

Trawl RCA 48°00' to 45°46'

South of Juan de Fuca Canyon, the collaborative group heard general support from industry for removing the Trawl RCA. Fishermen were not concerned, by and large, with the potential for hitting overfished species. Rather, they voiced a desire to take responsibility for their own bycatch, given the full accountability that comes with catch shares and 100% observer coverage.

Fishermen also indicated that the Trawl RCA between Juan de Fuca Canyon and 45°46' is primarily comprised of soft muddy bottom. The substrate data layers in the EFH Data Catalog agree with this characterization, showing only a few isolated patches of hard or mixed substrate in this section of the Trawl RCA (although confidence level in the substrate data is low for most of the RCA). One patch of hard and mixed substrate exists on the east side of Quinault Canyon, as well as one patch south of Grays Canyon (which would be captured by the proposed changes to Grays Canyon EFH Conservation Area), and one patch southwest of Nehalem Bank.

There are a number of coral and sponge observation records in the Trawl RCA south of Juan de Fuca Canyon and north of 45°46'. Most of the records are from the trawl survey and are comprised of unidentified sponges and sea pens, though some black coral and glass sponge records also exist. One research dive site is located within this area, on the very north end (close to Juan de Fuca Canyon). At that dive site, scientists observed muddy bottom and sea pens.

A relatively small portion of the Trawl RCA in this region would be converted to an EFH closure, under the package of modifications described above. Specifically, just the areas of the Trawl RCA to the north and south of Grays Canyon would be included in newly-designated EFH Conservation Areas. Given the predominantly soft muddy bottom of the Trawl RCA in this part of the coast, stakeholders generally viewed this as sufficient to ensure the important habitat features in the RCA are protected. The question of representative habitat protection (i.e., maintaining a certain percentage of the shelf-slope break closed) received less focus in the port

meeting discussions, but it was noted that overall effort levels are much lower than in the past, and this confers a degree of habitat protection across the entire northern region.

Re-opening the Trawl RCA from 48°00' to 45°46' is a recommendation of the collaborative. Note that in this part of the coast, much of the Trawl RCA is within tribal U&As, so any changes would be subject to government-to-government consultation.

Trawl RCA 45°46' to 43°57'

As a rough approximation, the portion of Trawl RCA from 43°57' to 45°46' represents the Newport region of the coast, whereas south of 43°57' more or less represents the Coos Bay region.

The northern collaborative group understood its instructions from the Council to be to discuss an integrated package of changes to the RCA and EFH areas, and see if a set of changes to both types of areas could be found that all stakeholders would support, which would increase fishing opportunity and also improve the protection of sensitive habitat. As such, the potential for opening the Trawl RCA was discussed in port meetings, and feedback was requested from fishermen and other stakeholders as to how best to approach the RCA.

According to both the EFH Data Catalog layers and fishermen's input, the year-round Trawl RCA in the region from Cape Falcon to 43°57' is primarily soft bottom. A few areas of inferred hard substrate exist, but those areas (pink in the substrate maps) are known to be unreliable and fishermen indicated they are likely clay or other soft sediment. Around Daisy Bank and Heceta Bank some patches of regular hard and mixed substrate are found inside the Trawl RCA, mapped to varying degrees of confidence. Fishermen indicated that other than a few spots, essentially all of the Trawl RCA in this section of the coast is usable ground, and in the port meetings they identified several specific areas of the RCA where historical tows are located. In terms of bycatch risk, fishermen stated a willingness to manage the risk themselves, given the full accountability provided by the ITQ system and 100% observer coverage.

Based on the discussions in Newport port meetings, the collaborative group included a draft full reopening of the Trawl RCA for this region of the coast in the straw man package that was circulated to the fleet. Feedback from industry members and representatives was generally positive on this aspect of the straw man package. Conservation groups expressed concern about the overall package in this region, and specifically indicated that more of the RCA should remain protected via expansions to EFH Conservation Areas.

Because the changes to EFH and the Trawl RCA are regarded as a package, if the Newport region of the coast reaches consensus on EFH modifications, removal of the Trawl RCA in this region would also be a recommendation of the collaborative.

Trawl RCA 43°57' to 42°50'

The area from 43°57 to Cape Blanco is intended to reflect the Coos Bay region of the coast. The Trawl RCA in this region appears to be mostly soft bottom, according to both the EFH Data Catalog and fishermen's knowledge. South of Heceta Bank, a "tail" of likely hard substrate shows up in the EFH Data Catalog, but this area is mapped with a low confidence level and fishermen indicated that in their experience it does not exist. The north and south ends of Bandon High Spot EFH Conservation Area are located within the Trawl RCA, and hard substrate is indicated by the EFH Data Catalog in these spots. As discussed above, research dives suggest these patches of hard substrate are inaccurate, and fishermen's understanding of the bottom is consistent with that.

In the Coos Bay port meetings, fishermen discussed the Trawl RCA thoroughly and indicated that it is essentially all usable ground, and specific historical tows in the RCA were identified. Fishermen also stated clearly that they are willing and ready to manage bycatch risk, if the Trawl RCA is opened up. They expressed a desire to take advantage of the full accountability provided by the ITQ system and 100% observer coverage.

Conservation groups noted that in this part of the coast, the new EFH protection under consideration is located shallow waters (Arago Reef), and that represents a different type of ecosystem from the shelf-slope break, where not only the Trawl RCA is under consideration for opening, but two additional spots of EFH closure also are under consideration for opening (Bandon High Spot north and south ends). Some NGO representatives noted that increasing protection in one biogeographic region does not necessarily offset the removal of protection in other regions. That said, the net effect of the changes to EFH and RCA regulations in this part of the coast would be to shift trawl closures from covering generally unremarkable areas to covering identified features with sensitive habitat. In that sense, most of the conservation groups acknowledged the changes for this region of the coast as representing an improvement. NGOs also supported the fact that the changes in this section of the coast also will offer a clear improvement in fishing opportunity.

Based on the discussions between fishermen and NGO representatives, the package of changes to EFH described above for the Coos Bay region has consensus support, and is accompanied by a recommendation to open the Trawl RCA in this portion of the coast.

Trawl RCA 42°50' to 40°10'

In the region from Cape Blanco to 40°10', the year-round Trawl RCA is comprised of the area between the 100fm line and the modified 200fm line. Substrate data layers indicate the Trawl RCA in this region is primarily comprised of soft sediment. Small patches of inferred hard substrate exist off Oregon, but as noted above, the accuracy of these areas is unclear.

In terms of regular (not inferred) hard substrate and mixed substrate, a small part of the outer reef at Rogue River Reef appears to extend into the RCA, the Mad River Rough Patch overlaps in part with the RCA, and hard substrate at Mendocino Ridge is located in the RCA. Of these areas, the Mad River Rough Patch is under consideration for adding as an EFH Conservation Area, and the area at Mendocino Ridge already is located in an EFH Conservation Area. The Trawl RCA outside Rogue River Reef currently is not included in this package as part of an EFH Conservation Area, but that part of the RCA was discussed in port meetings with the question of whether it could be added to the Rogue River Reef EFH area. No conclusion was reached, but discussions may continue in the upcoming months regarding that area.

The proposed Reading Rock Shelf-Slope Break area covers a significant amount of area currently within the Trawl RCA. Other proposed EFH areas cover portions of the Trawl RCA in this region, including Mad River Rough Patch, Eel River Canyon Modification 2, Blunts Reef, and Mendocino Ridge Modification 3.

The Trawl RCA was discussed in port meetings and fishermen indicated that the RCA is generally soft muddy bottom, other than the areas noted above. They described the RCA as an unremarkable area, in terms of substrate, structure-forming invertebrates, and topographic relief. The coral and sponge observation data layer more or less agrees, showing an amount of coral and sponge records in the Trawl RCA that is roughly similar to that found in other areas on the slope.

In port meetings and with the straw man package fishermen were asked whether they were comfortable with the Trawl RCA being opened, and whether there were any areas they would like to stay closed. Essentially all the feedback received by the northern collaborative indicated that fishermen favored opening the RCA fully, and were willing to assume the bycatch risk. Several industry members specifically mentioned the full accountability provided by the ITQ system and 100% observer coverage, and voiced a desire to take advantage of that accountability and deal with their own bycatch.

Feedback received from conservation groups indicated that further protection of the shelf-slope break in this region of the coast would be preferable. Several NGOs explicitly supported the Reading Rock Shelf-Slope Break area for this reason, and asked that the Mad River Rough Patch be enlarged to cover more of the potentially recovered RCA areas. Overall, though, most conservation groups acknowledged the changes for this region of the coast were positive, and the package as a whole could be supported, especially given the improvements in fishing opportunity that will be created.

Because industry members appear able to account for their own bycatch, and the package of changes to EFH in this region of the coast has consensus support, the collaborative recommends opening the Trawl RCA reopening from Cape Blanco to 40°10'.

40°10’ to Point Conception

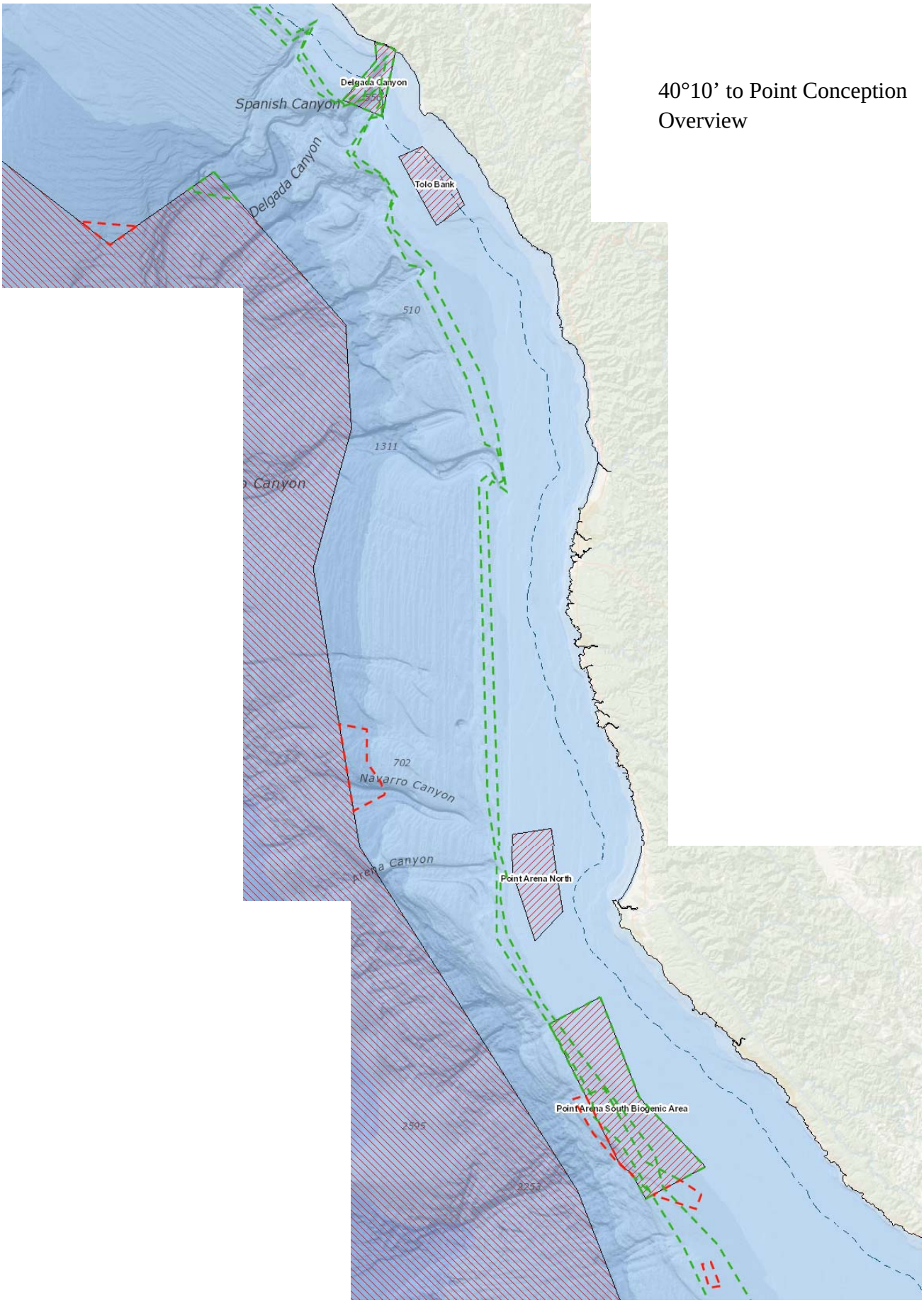
The collaborative group working on the central region built on established working relationships between industry members and The Nature Conservancy (TNC). Discussions spanned a number of California ports including Fort Bragg, Half Moon Bay, Monterey, and Morro Bay. Other NGOs participating in the central collaborative group included EDF and NRDC.

Participants were able to identify common goals of revising EFH and RCA areas in order to improve habitat protection, as well as increase fishing opportunity. The working group initiated a collaborative approach that used fishermen’s knowledge of the local areas and scientific data from a variety of collaborative research projects in the region. Numerous port meetings were held, and supplemental information was gathered through individual outreach. Relevant information included habitat and catch data, as well as historical and current fishing patterns.

Numerous port meetings were held, and supplemental information was gathered through individual outreach. Participants identified the common goals of increasing fishing opportunity and protecting seafloor habitat, and considered potential EFH and RCA area modifications in light of these goals. Relevant information included habitat and catch data, as well as historical and current fishing patterns.

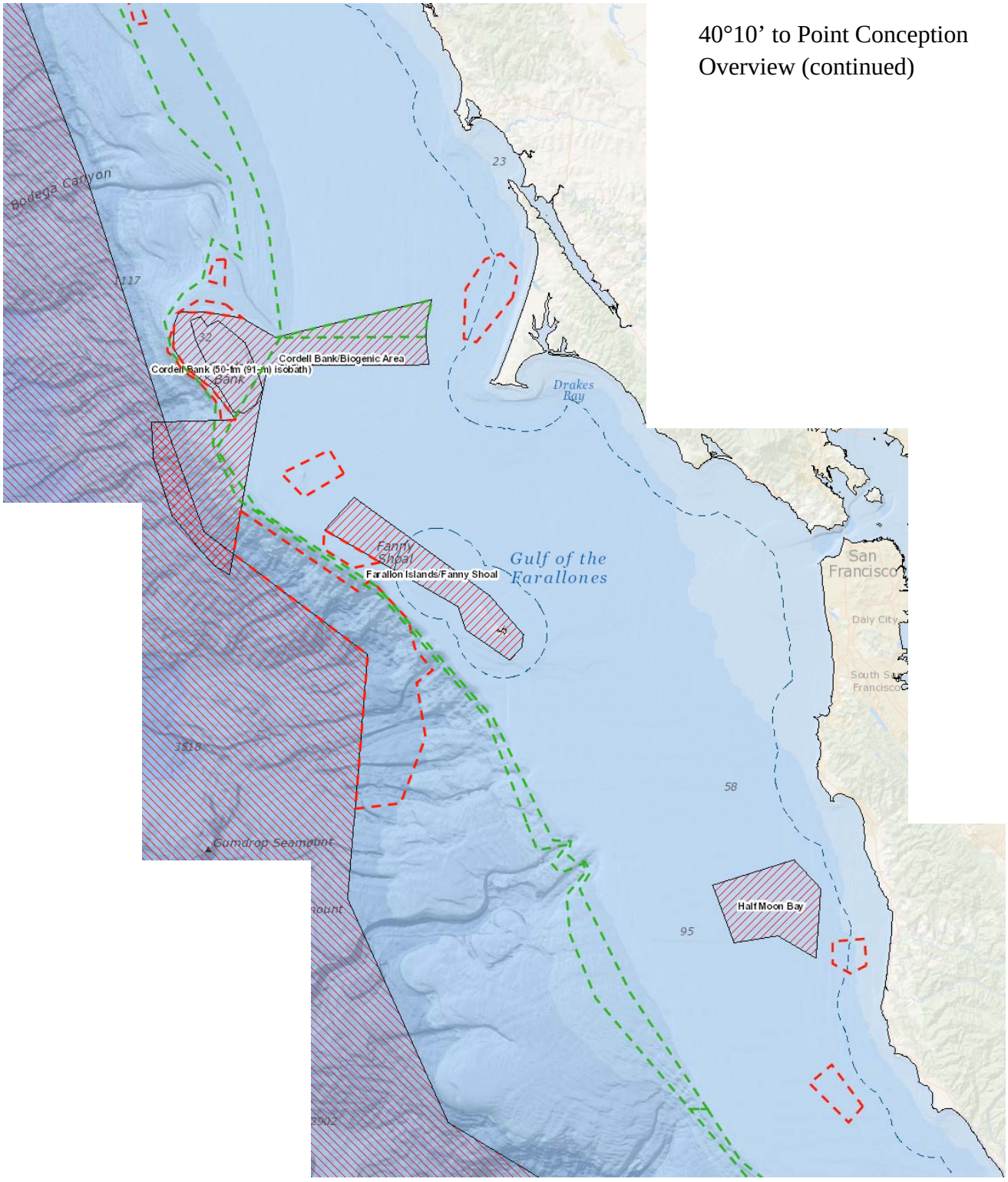
In terms of biogeographic characteristics, the region south of 40°10’ has a narrow continental shelf around Shelter Cove and Fort Bragg, south of which the shelf broadens. Around San Francisco and Monterey Bay the shelf is wide, narrowing again south of Point Sur. Several canyon complexes exist along the slope in this area, and a few seamounts mark the offshore waters. Cordell Bank and the Farallon Islands represent structural complexity on the shelf. The largest trawl port in the region is Fort Bragg, but there are also groundfish trawlers based out of Half Moon Bay, Monterey, and Morro Bay. Significant bottom trawl effort occurred in this region in the 1970s-1990s, focused primarily on the outer shelf and upper slope.

Three National Marine Sanctuaries are located in this region of the coast: the Greater Farallones National Marine Sanctuary (GFNMS), Cordell Bank National Marine Sanctuary (CBNMS), and Monterey Bay National Marine Sanctuary (MBNMS). Representatives from the Sanctuaries provided input on concepts and areas under consideration, and the MBNMS 2013 EFH proposal was incorporated fully into the collaborative proposal. The GFNMS 2013 EFH proposal was also considered and addressed by the collaborative.

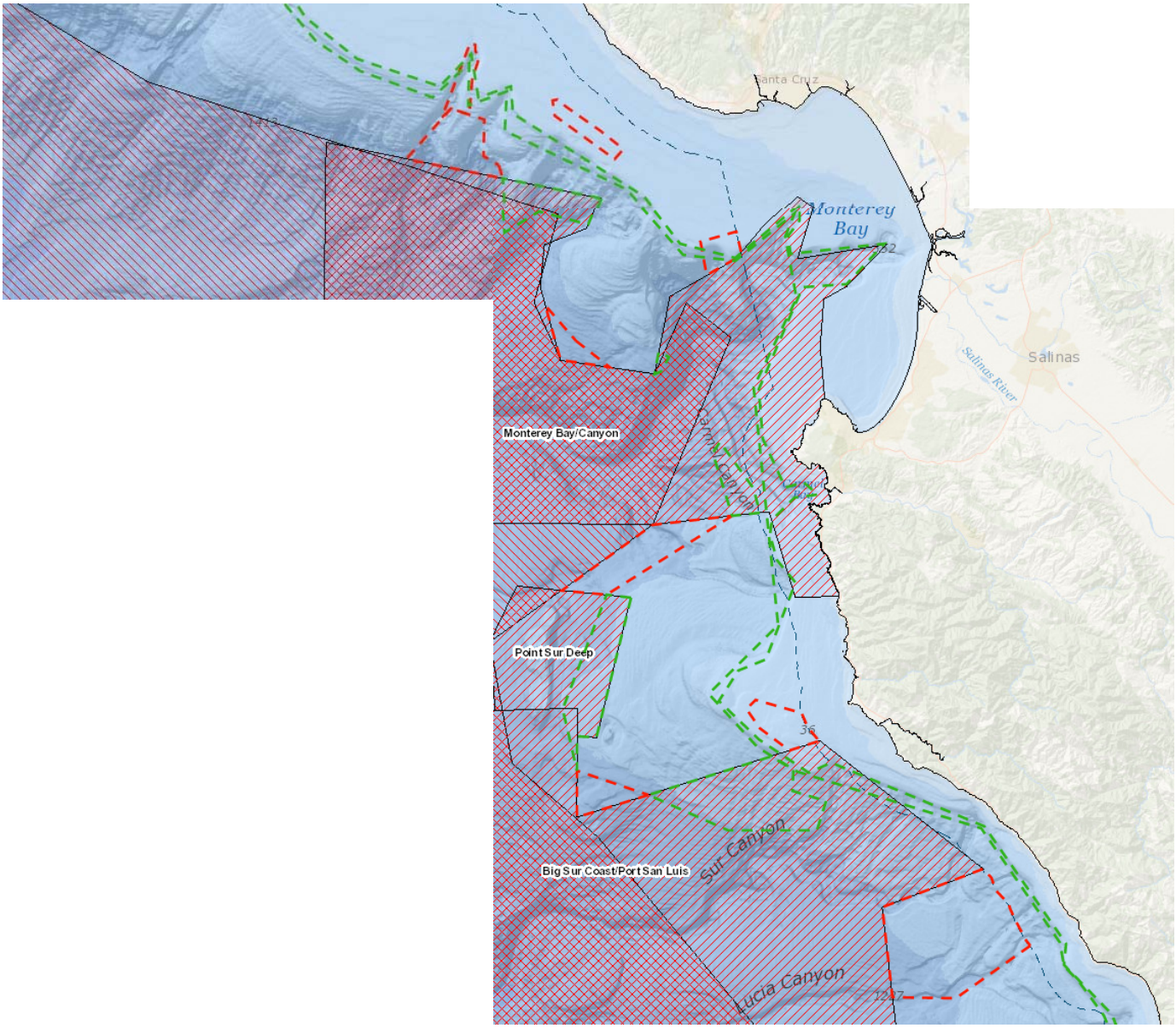


40°10’ to Point Conception Overview

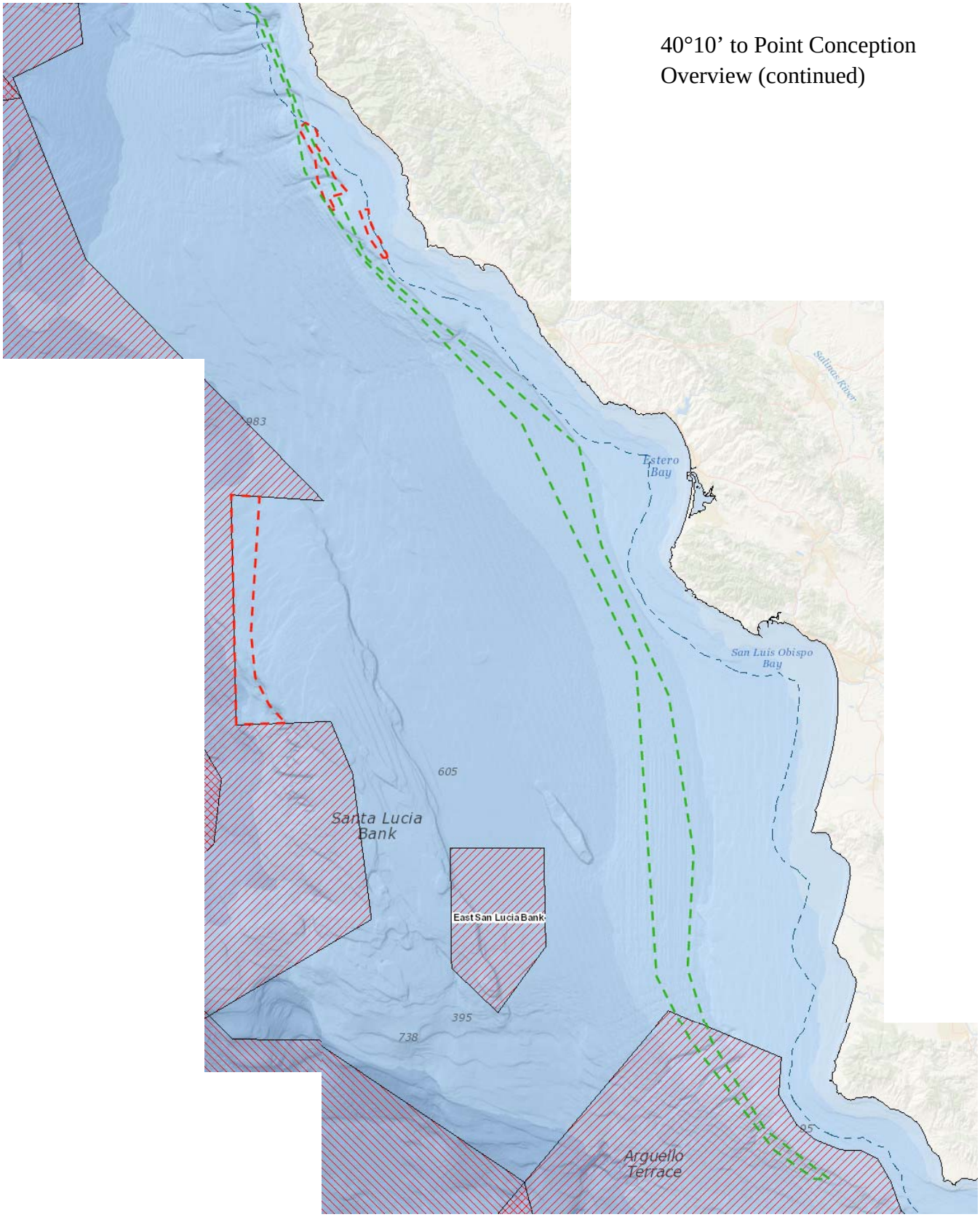
40°10’ to Point Conception Overview (continued)



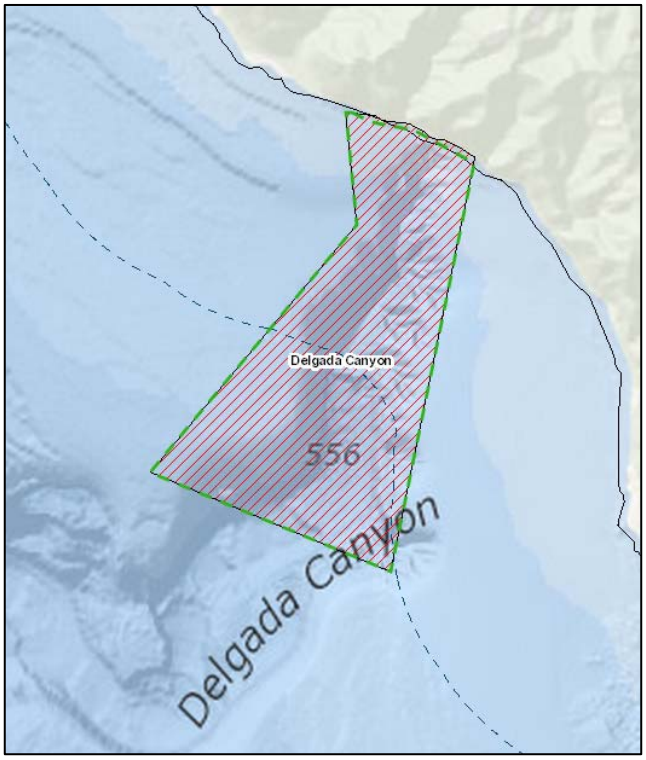
40°10’ to Point Conception
Overview (continued)



40°10’ to Point Conception
Overview (continued)



Delgada Canyon



During port meetings, fishermen described this area as soft, muddy bottom, with minimal rocky habitat or structure-forming invertebrates. EFH Data Catalog layers show no coral or sponge observation records in the area, and only a few small patches of hard substrate. Fishermen also noted the shelf areas nearby are valuable shrimping grounds.

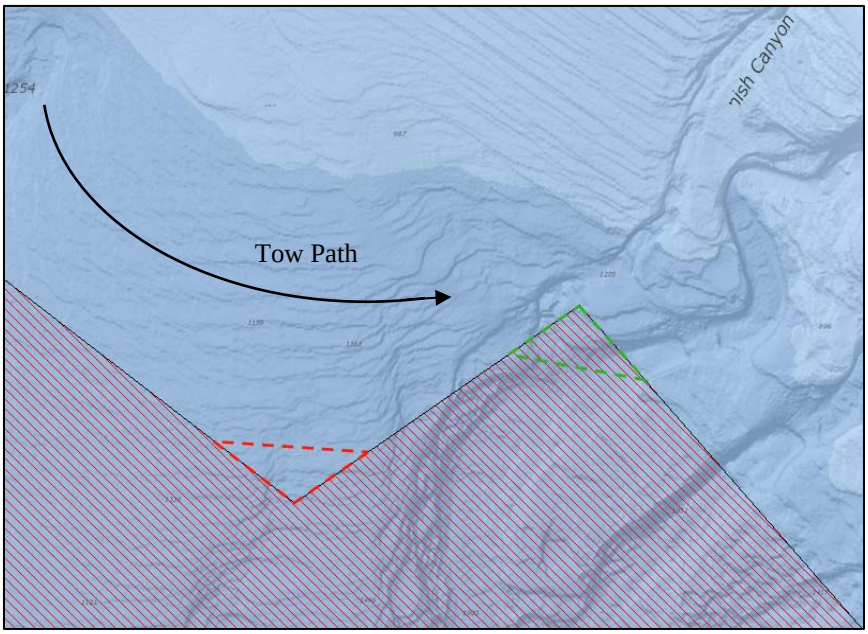
Fishermen indicated that they thought this EFH closure had been made in error during the Amendment 19 process. Their understanding of the agreement made in 2006 was that Delgada Canyon would not be included as an EFH Conservation Area, whereas Tolo Bank would be included. In the final rule, however, both areas were included as EFH closures. Fishermen said that removing the Delgada Canyon EFH closure was a mandatory starting point for them engaging in any discussions along the rest of the coast in this region.

Part of this area is located in California state waters. No action would be required from the State of California, however, to implement this change; the area from zero to three miles offshore would remain closed to bottom trawling under state law. Removing the Delgada Canyon EFH Conservation Area would only open the portion of the area that lies in federal waters. (And full opening of the federal waters portion would also depend on disposition of the Trawl RCA, which passes through the existing EFH Conservation Area.)

Spanish Canyon Line Adjustment 1
Spanish Canyon Line Adjustment 2

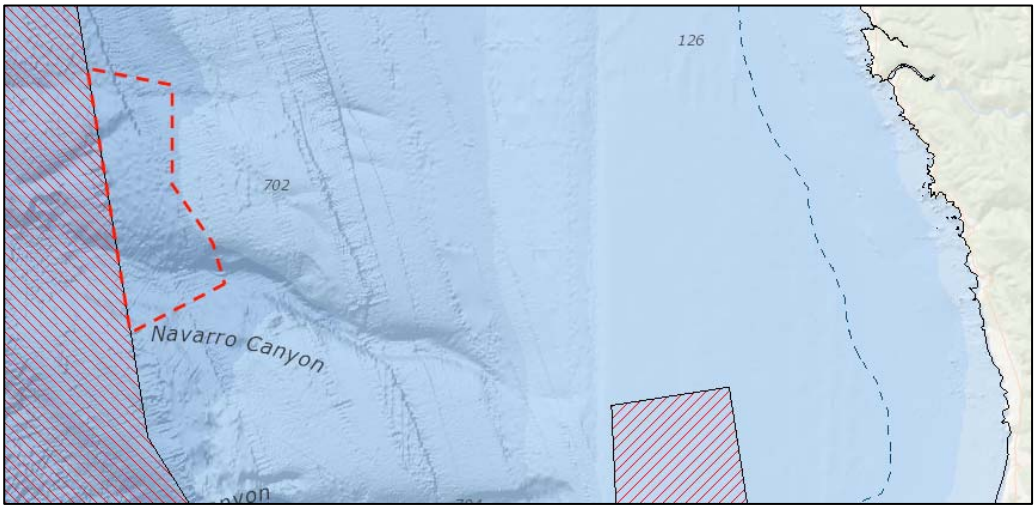
This is a small adjustment requested by a Eureka fisherman who participated in the northern collaborative process. The areas are listed here because they lie south of 40°10', but the recommendation was itself a product of the north of 40°10' discussions.

The fisherman indicated there are DTS tows that begin in the 500-600fm range on the Mendocino escarpment and head south from there, curving eastward as they go. These tows finish just short of the protruding tip of the 700fm line at the base of Spanish Canyon. One fisherman described difficulty avoiding the 700fm line at the end of the tow, and mentioned that currents and wind can easily push a boat into the closed area when gear is being hauled back.



To remedy this issue, the fisherman proposed re-opening the tip of the 700fm line that sticks out to the north. The change would allow boats to drift into that area while hauling back gear. No concerns were voiced about this request by other stakeholders. In order to offset the opening, a small matching triangle was drawn to move the 700fm line out, southwest of the opening. The net effect of these two changes is to smooth out the 700fm line as it curves around to the east. These changes are understood to be non-controversial and represent only a small amount of area.

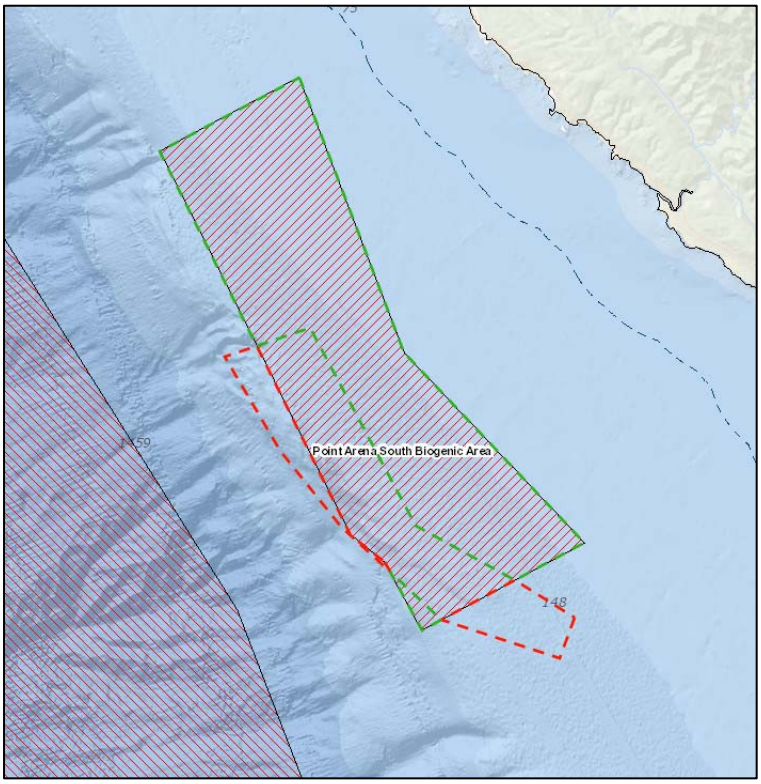
Navarro Canyon



This is a new shape that would cover the midsection of Navarro Canyon, as it runs down the continental slope. The area has little to no bottom trawl effort based on the EFH Data Catalog effort layers, as well as on historical trawl patterns from industry records. The area ranges from 550fm to over 800fm in depth, and one undersea cable runs through the middle of it. Discussions during port meetings

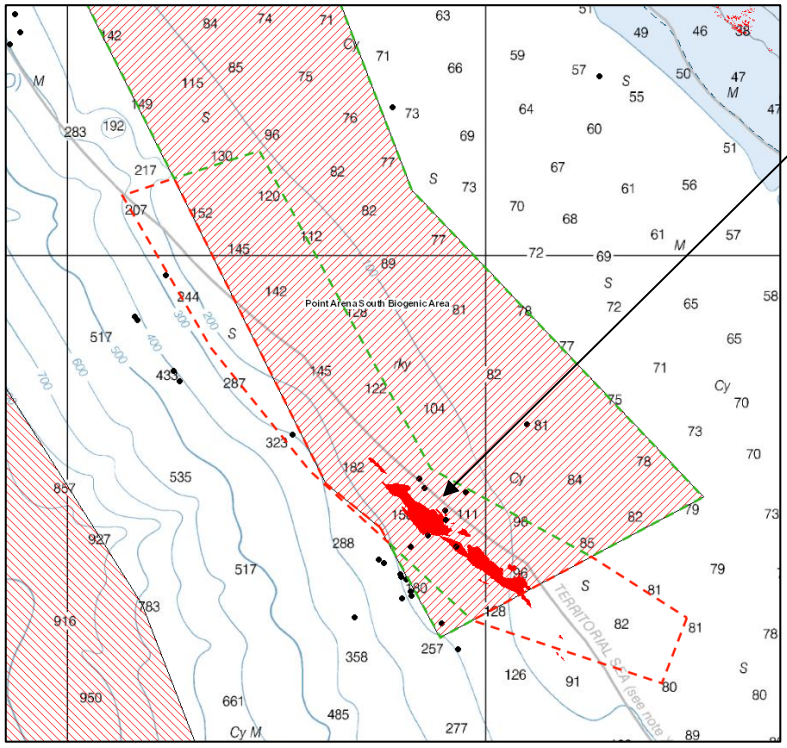
focused on covering the canyon feature while avoiding historical trawl areas and maintaining fishing opportunity in the region. This area could be implemented as either a 700fm line adjustment or as a distinct EFH Conservation Area.

Point Arena South Modification 1
Point Arena South Modification 2
Point Arena South Modification 3
Point Arena South Modification 4



These changes would reconfigure the existing Point Arena South Biogenic Area EFH Conservation Area, replacing the existing hourglass shape with an oblong shape curving across the shelf-slope break. The changes were discussed primarily during port meetings in Fort Bragg.

Fishermen characterized the existing Point Arena South area as largely soft muddy bottom, except for the southwestern corner of the existing area. The EFH Data Catalog substrate layers



confirm this, showing the area as likely soft bottom, with a patch of hard substrate on the southwestern corner. The soft bottom areas are proposed to be re-opened, while the hard substrate areas would be retained. Fishermen also identified some areas of mixed substrate outside the current EFH area, and these areas are proposed to be added to the EFH area.

Historical trawl effort is located throughout the Point Arena South

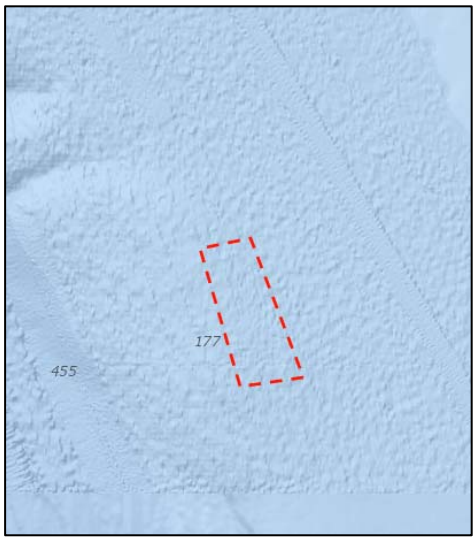
Area, with the heaviest fishing along the shelf-slope break. Re-opening the soft sediment portions of this EFH Conservation Area would increase fishing opportunity in the region.

In the part of the current EFH Conservation Area that would be re-opened, coral and sponge observation records are limited to two sea pens and one unidentified sponge from the trawl survey. The southwestern corner, which would be retained, shows a number of coral and sponge observation records, including glass sponges and soft corals.

Note that the Trawl RCA covers some of this area, so the disposition of the RCA will affect whether this area is ultimately open to bottom trawling.

The Football

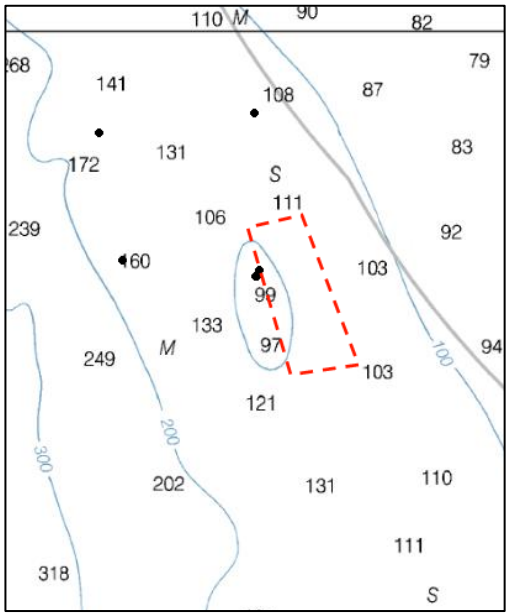
The Football is a known hard bottom feature north of Bodega Canyon, which was discussed during Fort Bragg port meetings. Fishermen identified it as a historically important fishing area.



Several research dives were completed at this site in September 2014, which documented a high diversity of fish species in the area. A new species of coral was discovered at this site, and several nests and hundreds of catshark eggs were observed on the seafloor. Four years earlier, another NOAA dive team surveyed the seafloor at this site and documented a moderate to steep incline covered with fine sediment and intermittent large boulders. No large habitat-forming corals were observed in those dives and the overall density of corals and anemones was relatively low. Several cup corals (*desmophyllum sp.*) were observed hanging down from a sedimentary scarp and several unidentified anemones (*urticina sp.*) were found on hard substrate. This site also has a few glass sponge and sea pen observation records from trawl surveys.

During port meetings it was discussed whether a potential closure in this area could be connected to the Point Arena South area. Fishermen were skeptical of this idea, and reiterated the importance of the area for fishing, despite relatively little effort being visible in the EFH Data Catalog or other bottom trawl data.

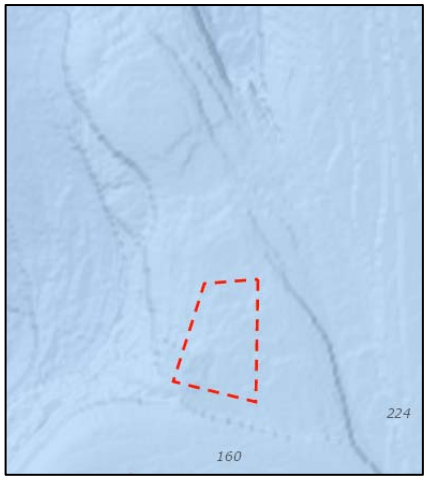
Ultimately, industry sketched the shape shown here as a compromise covering half of the Football (visible as an oval-shaped loop of the 100fm line in the chart to the right). The idea was to provide some protection for the feature in light of research findings—a new coral species and an elasmobranch nursery—while still leaving part of the feature available for fishing.



Note that this shape is quite small, which may present some difficulty with enforcement.

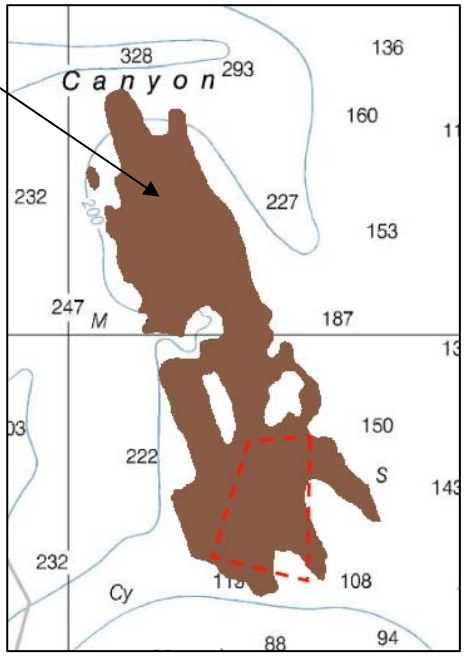
Gobbler's Knob

This is an area of low relief mixed substrate in the 100-150fm range, north of Cordell Bank. Fishermen indicated the area has known trawl hangs, and offered the shape sketched here based on areas they avoid.

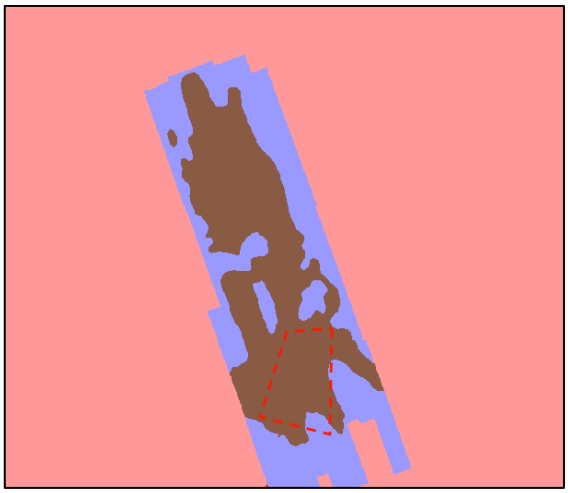


There has been limited sampling in this area, but the seafloor is understood to be a mix of boulder/cobble and flat layered sedimentary rock on the shelf. Based on ROV surveys from 2007, the biological community includes a mix of rockfish species, lingcod and rays. One in situ coral observation from a 2012 dive is recorded close to, but not within, the shape sketched here.

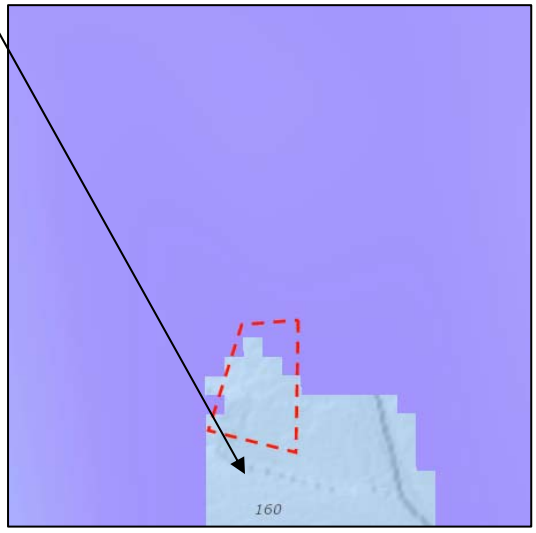
In the map to the right, brown areas indicate mixed substrate. This area has been mapped with multibeam sonar, so the substrate data is considered high-confidence.



The coverage of the multibeam sonar survey is shown on the following page, with blue areas indicating multibeam coverage and pink areas indicating no coverage. The brown areas are NOAA's interpretation of the backscatter data (again, with brown indicating mixed substrate). As is visible from the blue area, Gobblers Knob is a known feature that was specifically targeted in a mapping expedition.

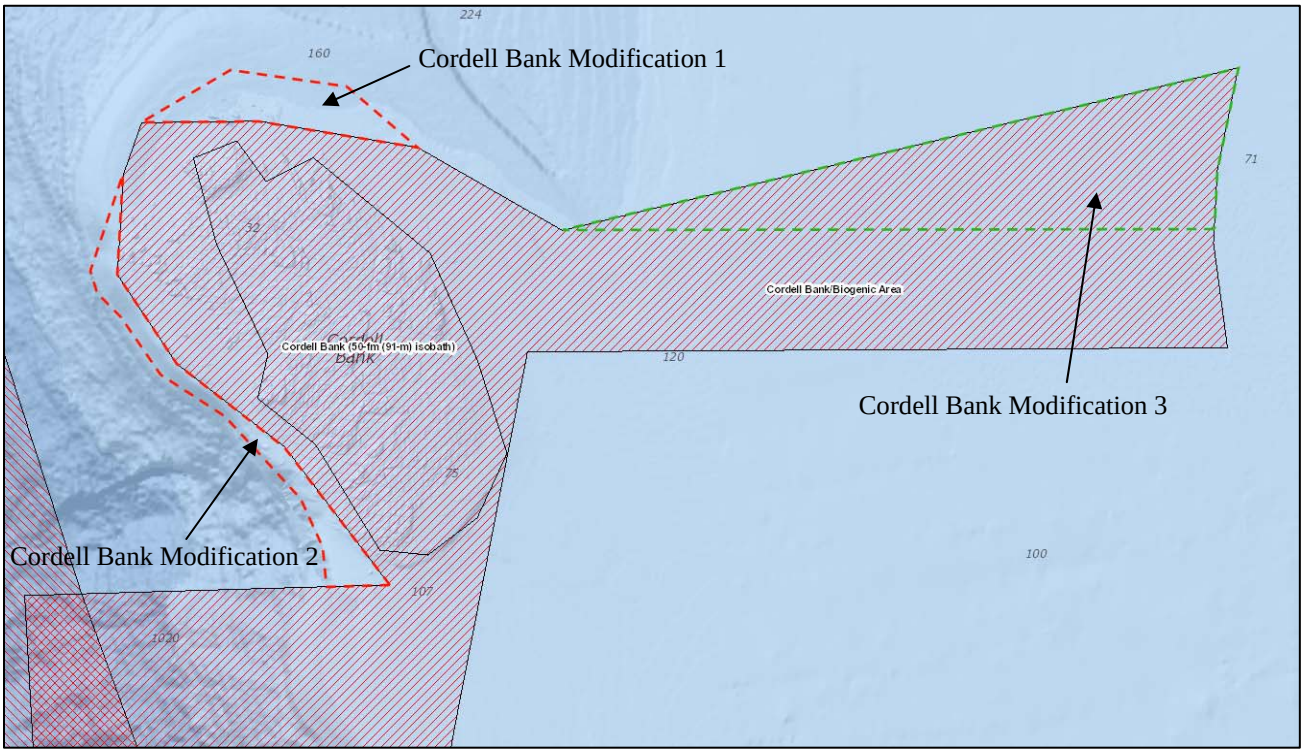


The EFH Data Catalog effort layers show relatively little bottom trawl activity within the shape sketched here. In the map below, blue and purple hues indicate low effort, and areas with no color (through which the light-blue background map is visible) indicate no effort.



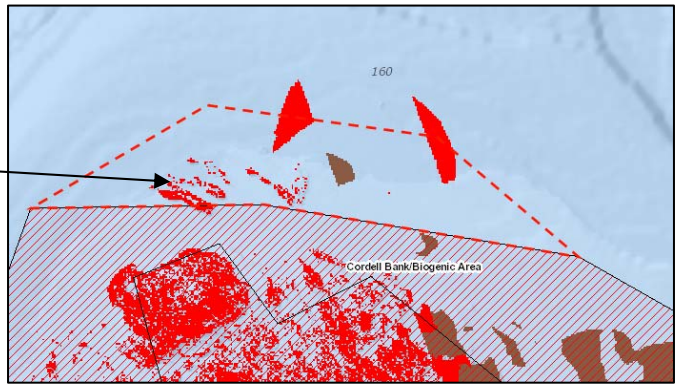
During port meetings, it was discussed whether to connect the proposed new Gobbler's Knob EFH area with the existing Cordell Bank EFH area to the south. Fishermen indicated that despite the low levels of historical and current effort, the area between Gobbler's Knob and Cordell Bank is comprised of soft sandy bottom and is good for trawling. For this reason, the Gobbler's Knob area was not connected with the Cordell Bank EFH area.

Cordell Bank Modification 1



Cordell Bank Modification 1 is a proposed extension of the existing Cordell Bank EFH Conservation Area to cover hard and mixed substrate on the north side of the bank.

Cordell Bank Modification 1 is the area on the north side of the bank. This area has hard and mixed substrate (shown by red and brown respectively, in the map to the right). Part of the area was mapped with multibeam sonar (visible from the granular texture of the hard substrate data); the remaining parts have only low-confidence substrate data.



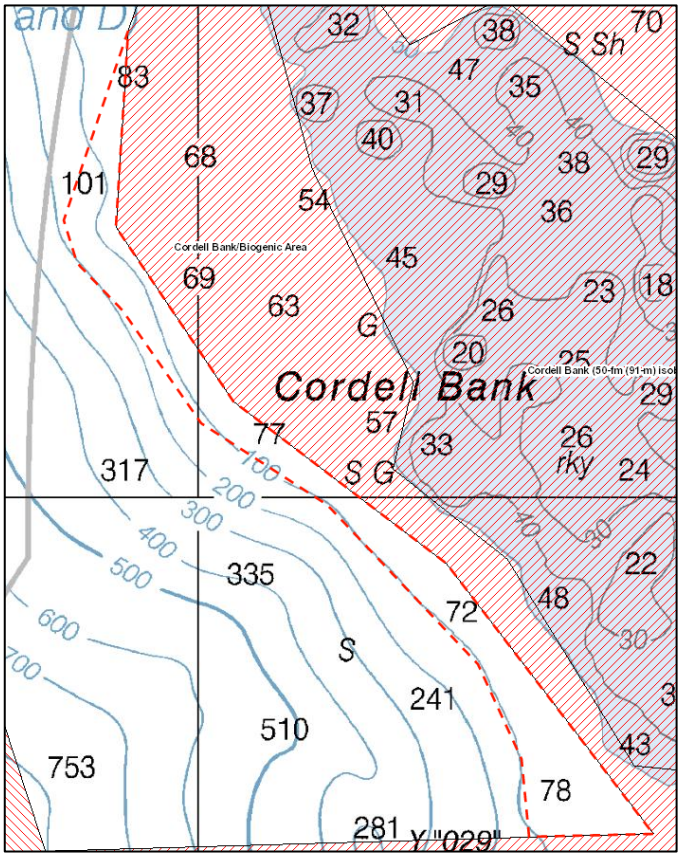
There is very limited historic fishing effort documented in this area. A NOAA submersible dive conducted by the Cordell Bank National Marine Sanctuary observed gorgonian-type corals (*swiftia sp.*) in the area.

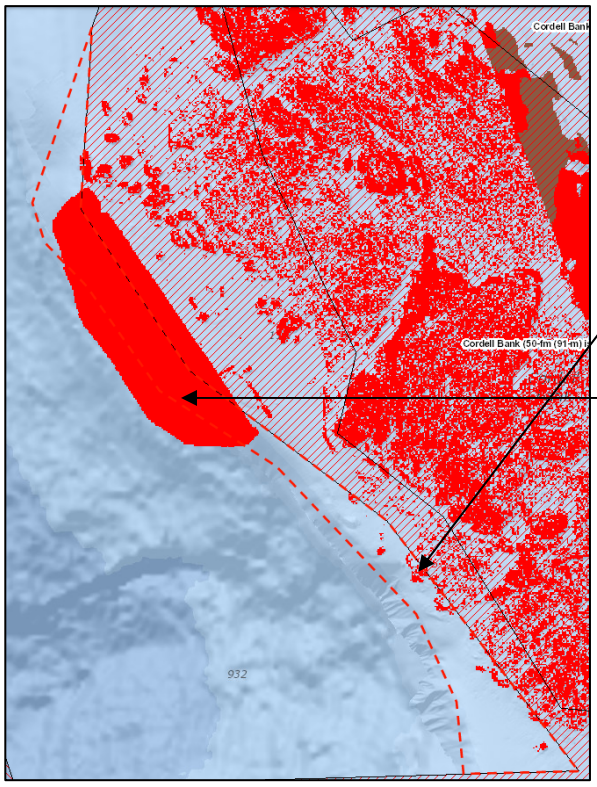
In general, the habitat data corresponded fairly well to fishermen's understanding of the area, and it was concluded that this area could be protected without significantly impinging on bottom trawl fishing opportunity.

Cordell Bank Modification 2

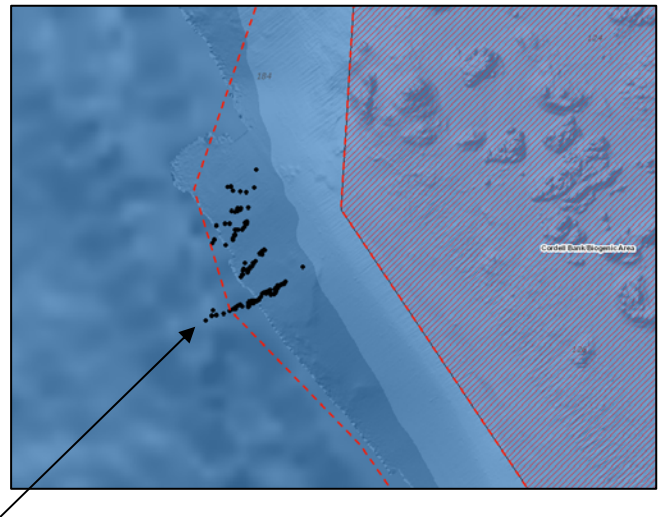
This is a second modification to the existing Cordell Bank EFH Conservation Area, intended to cover the seaward edge of the bank and protect areas of hard substrate and boulder/coral habitat.

The shape sketched here was the product of significant discussion between industry and NGO representatives, with input from the Cordell Bank National Marine Sanctuary. If approved, the new western edge of the Cordell Bank EFH Conservation Area would run along the 100fm line northward, and briefly bend out to a westernmost point where it would be roughly at a depth of 200fm. From there, it would bend back in and connect with the existing boundary line for the EFH Conservation Area.





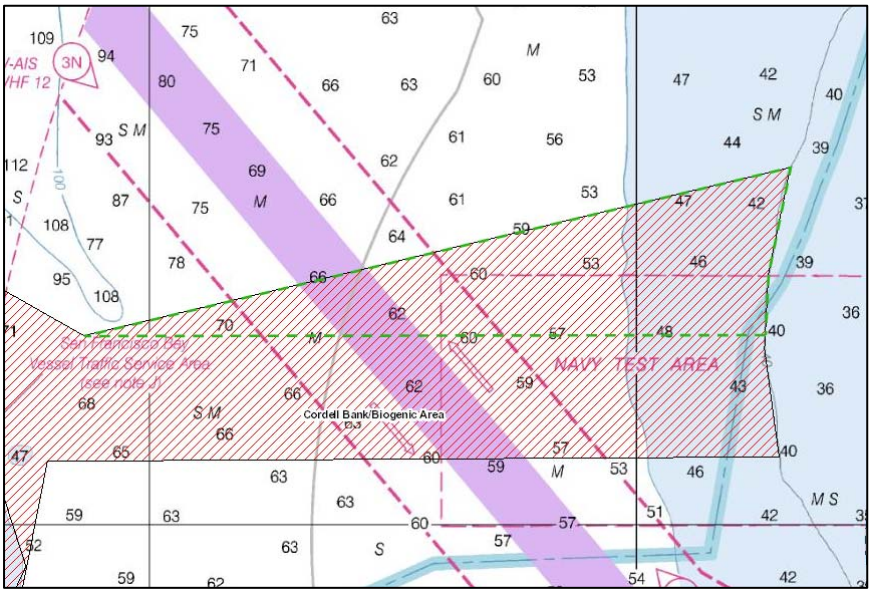
The western edge of Cordell Bank has patchy hard substrate which is mapped with medium confidence (visible as small red dots in the map to the left), as well as a larger area of likely hard substrate which is mapped with low confidence (visible as a large red blob in the map to the left) dropping down the escarpment. Fishermen indicated that in their experience the patch of low-confidence hard substrate is less extensive than suggested by the data layer, and may only extend out to about 100fm in depth.



The northern end of this shape extends slightly deeper in order to protect a section of ground that has been explored by the Cordell Bank National Marine Sanctuary using ROV surveys and at least one Delta submersible dive. In this area, the Sanctuary found boulders and numerous rockfish, along with a significant number of gorgonian-type (*plumarella spp.*) corals. Some of these coral observations are visible in the EFH Data Catalog as coral records (black dots in the map above and right), with the ROV transects appearing as lines of black dots due to coral density.

Along the western side of Cordell Bank, most bottom trawling takes place in the 200-300fm depth range or deeper. Yet because the escarpment is steep in this region, the contour lines are close together and the difference between 300fm and 100fm may only be a matter of several hundred yards east-west distance. Fishermen indicated that currents can be strong in this area, and there is a concern about drifting into a closure if the line is drawn precisely along the edge of their trawl routes. For this reason, the shape shown above is tailored slightly and does not include all of the coral/sponge observations or all of the likely hard substrate.

Cordell Bank Modification 3

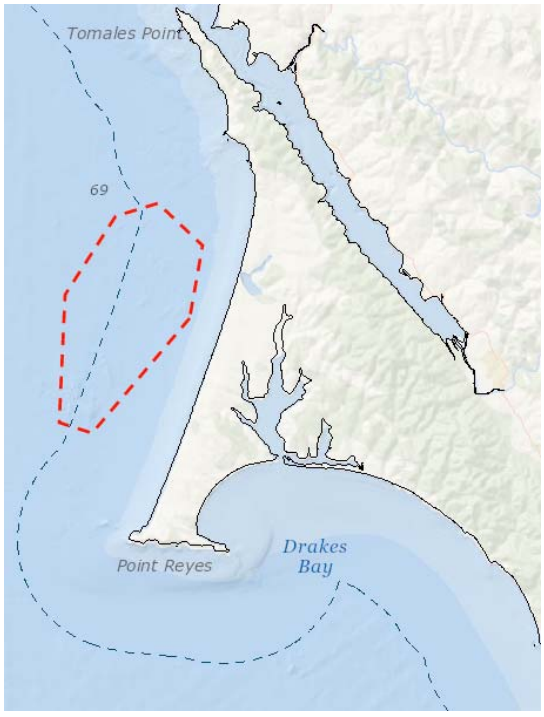


This modification, shown in the map to the right, would open part of the existing Cordell Bank EFH Conservation Area on the shelf in the 40-90fm range.

In port meetings, fishermen indicated that the existing EFH Conservation Area cut off historical tows running north-south along the shelf, and that if part of the area could be re-opened, it would allow extension of tows farther south, particularly in the shallower depths. The current configuration for this shape—a narrowing of the shelf closure which maintains the east-west extent of the closure—was considered preferable to cutting through the shelf closure, because it retains protection across all depths.

No hard or mixed substrate is believed to exist in the area proposed for opening. Fishermen agree that the area is soft muddy bottom. Industry records and the EFH Data Catalog both indicate that the area was lightly trawled historically. Numerous sea pen observation records exist in this area, and experts at the Cordell Bank National Marine Sanctuary indicate that this area is typical rich shelf habitat, with high levels of invertebrate infauna and epifauna such as sea pens, sea whips, brittle stars, and octopus.

Point Reyes Reef

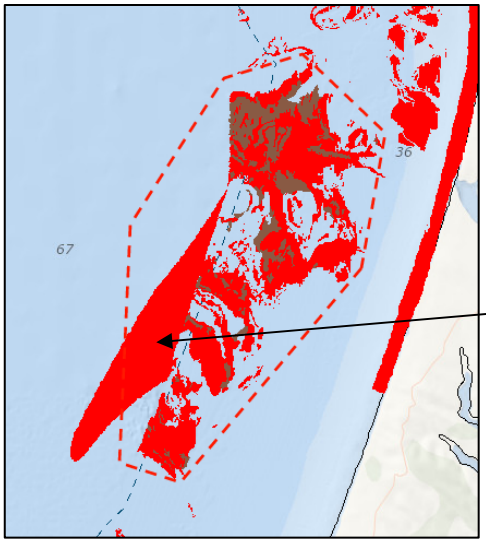


This proposed EFH Conservation Area would cover a shallow rocky reef area that straddles the California state waters line. During port meetings, fishermen generally confirmed that the area was hard bottom and not suitable for trawling. There are no historical records of trawl fishing effort in this area.

Because the state waters portion of this area is already closed to bottom trawling, it would not require any implementation from the State of California. This is how EFH Conservation Areas that cross into state

waters were designated in Amendment 19, such as Blunts Reef, Mendocino Ridge, Delgada Canyon, Tolo Bank, Monterey Bay/Canyon, and Big Sur Coast/Port San Luis. Because state waters were already closed to trawling, no action was required from the state, and the designation as an EFH Conservation Area was regarded simply as a recognition of the habitat value of the area.

If desired, this area (along with all other areas in this package that cross into California state waters, as noted above) could be modified to only include the federal portion. This would mean cutting the area, and making the state waters line its shoreward boundary, in order to have the shape only cover federal waters. The practical effect would be the same, as state waters are already closed. This would represent a different approach than was taken in Amendment 19, and would produce EFH shapes that are truncated along the state waters line.

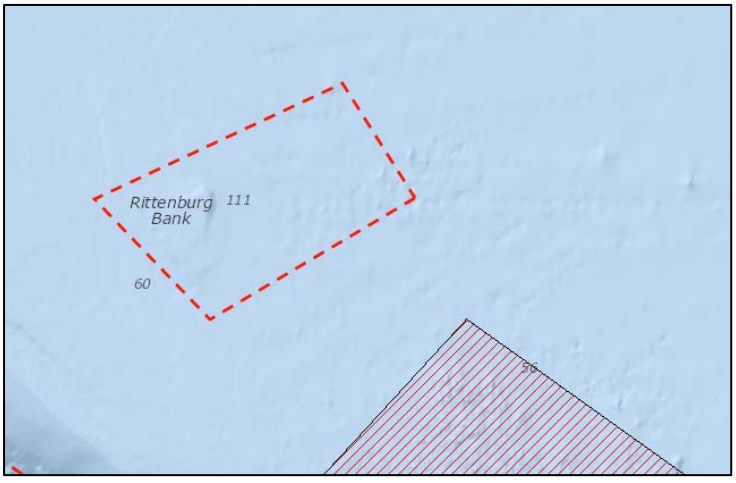


The substrate data in the nearshore area is high-confidence—visible in the granular texture of the red and brown shapes in the map to the left. Beyond three miles, the seafloor has not been mapped with multibeam sonar, and the substrate data is low-confidence. This is visible in the coarse texture of the red blotches on the western side of the reef.

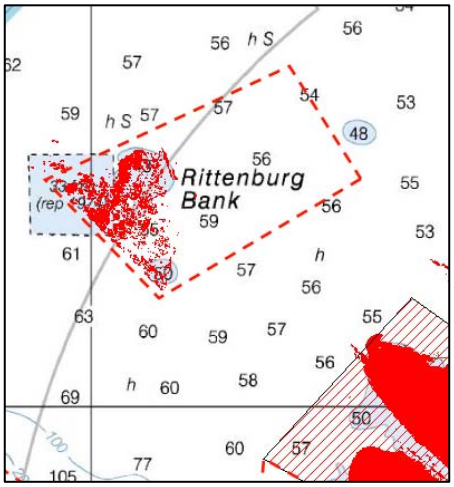
The proposed area contains no coral or sponge observation records. ROVs have observed both canary and yelloweye rockfish.

Rittenburg Bank

Rittenburg Bank is a reef area between Fanny Shoal and Cordell Bank. It was mapped with high-resolution sonar in a USGS expedition in 2011, which resulted in a published report. The Greater Farallones National Marine Sanctuary has done a number of research dives on the bank and observed rocky habitat with abundant corals and sponges; many of these observations are recorded in the EFH Data Catalog.



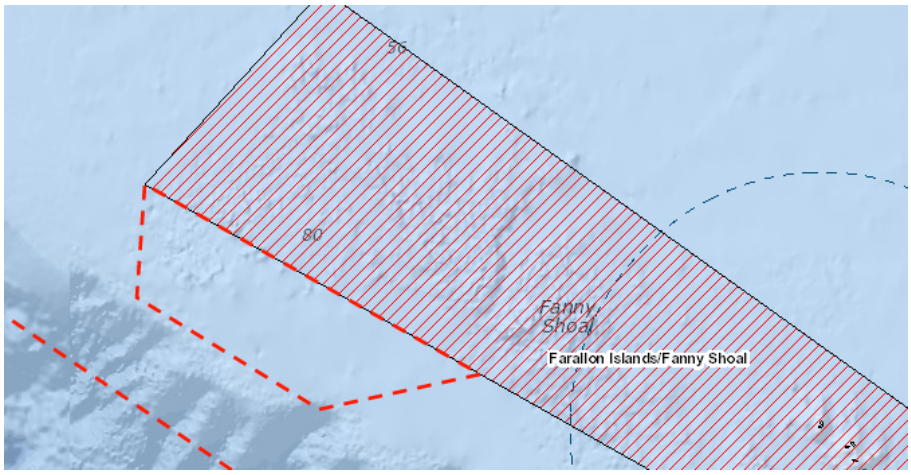
During port meetings, fishermen agreed that this area has hard bottom and known trawl hangs. Fishermen also noted that rough bottom extends eastward from the mapped bank, and suggested that if an EFH Conservation Area is to be established here, it would make sense to include the eastern area.



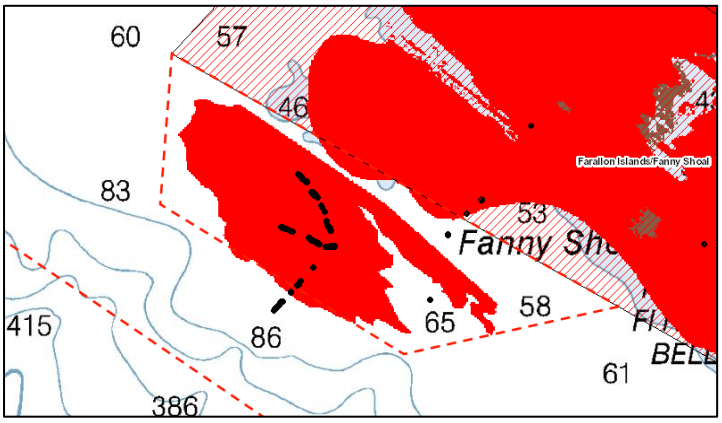
The GFNMS 2013 EFH proposal included a shape that would have connected the existing Farallon Islands/Fanny Shoal EFH Conservation Area to Rittenburg Bank. However, the area between Rittenburg Bank and the existing Farallon Islands/Fanny Shoal EFH Conservation Area is understood by fishermen to be soft sandy bottom, and regarded as an important fishing ground. For this reason, the original concept proposed by GFNMS was modified into a stand-alone EFH Conservation Area over Rittenburg Bank.

Numerous coral and sponge observation records exist on Rittenburg Bank, from research dives. Most of these coral and sponge records would be included in the area as drawn here.

Farallon Islands Modification



This is a proposed expansion of the existing Farallon Islands/Fanny Shoal EFH Conservation Area, designed to cover a rocky reef that sticks out from the western side of the existing closure. The reef is sometimes referred to as "Cochrane Bank," and has been mapped with multibeam sonar, yielding high-confidence substrate information. Research dives have observed a vibrant reef ecosystem with numerous corals and sponges, including a range-extending observation of a Christmas tree coral (*Antipathes dendrochristos*).

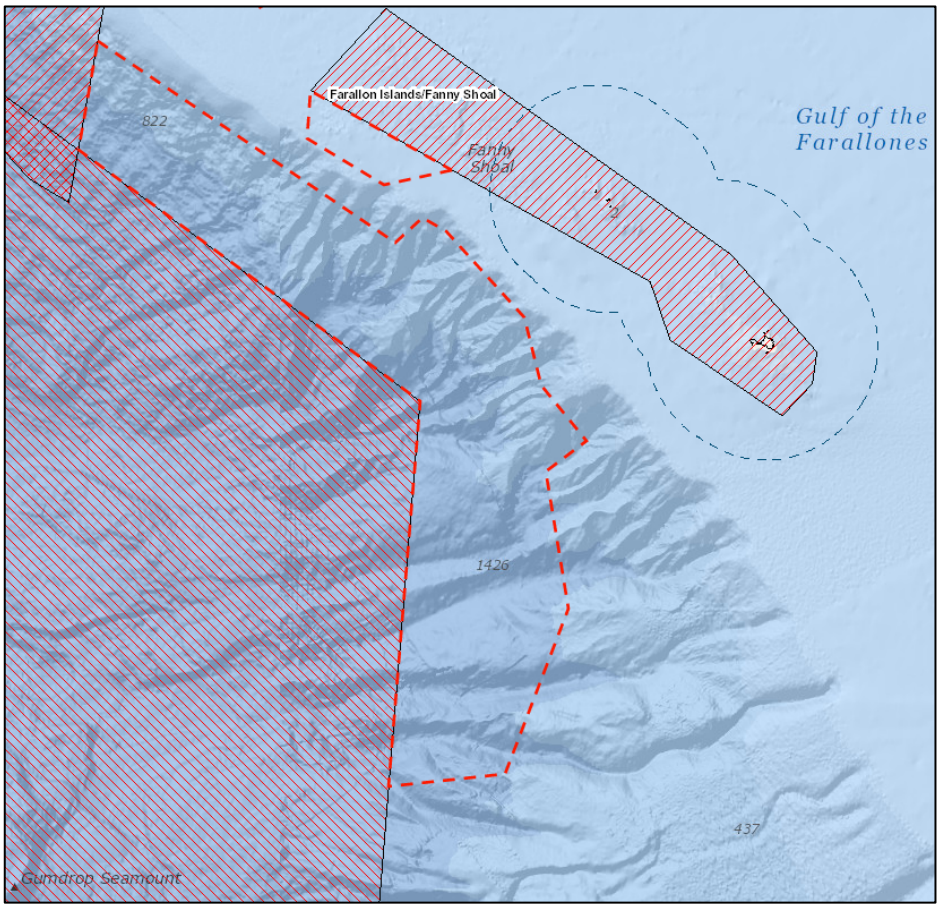


The polygon proposed here is intended to be identical to the area proposed by GFNMS in 2013. As is visible in the map to the left, the shape excludes a small amount of hard substrate (red patch) and a few coral and sponge observation records (black dots), but the excluded observation records are primarily sea pens.

During port meetings, fishermen identified this area as rough bottom that is not conducive to trawling. Fishermen did indicate, however, that important tows for chilipepper rockfish exist in the 80 and 90fm depth zones along the outer edge of the shelf in this area and sufficient space is needed to prevent drifting into the EFH area. The proposed boundary line approximates the 70fm line.

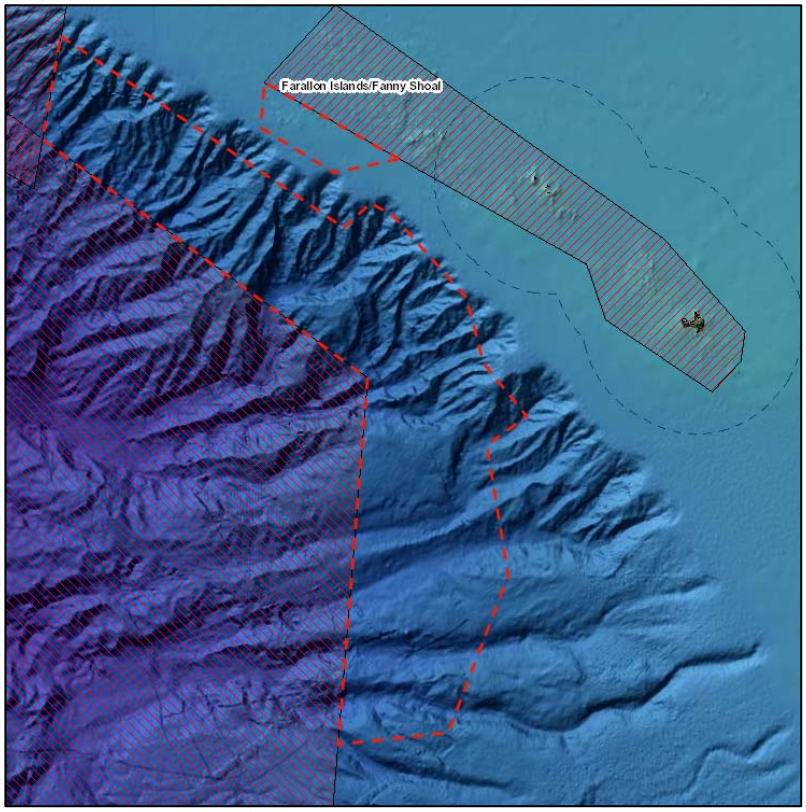
Farallon Escarpment

This is a distinctive area of the upper slope, with a very steep drop-off, numerous crevasses ("headless canyons"), and exposed bedrock along fault scarps. GFNMS conducted research dives on the Farallon Escarpment 2012, and mapped the area with multibeam sonar in 2011. The area is known habitat for several rockfish species. During port meetings fishermen described schools of bank rockfish in the area, and ROV dives observed blackgill, aurora, and other rockfish. Several coral and sponge observation records are located in this area, including bubblegum coral and finger



sponge observations from ROV dives. More generally, the slope and circulation patterns of this area, combined with exposed bedrock in places, are believed to create high-value habitat for structure-forming invertebrates.

Minimal historical and current trawl effort exists within the boundary of this shape. The boundary line is intended to adjoin the existing Cordell Bank EFH Conservation Area to the north, and the existing 700fm line on the seaward side.



On the shoreward side, the boundary is drawn deeper than the 200fm contour on the north end of the shape, to allow for fishing along the shelf-slope break. Around the Farallon Islands the boundary rises up to the 100fm contour and continues at that depth southward, tracking the edge of the Trawl RCA. This would protect the fault scarps and crevasses that GFNMS has explored, and provide durable protection for a portion of the Trawl RCA. To the South, the boundary runs out to the 500-600fm depth range to avoid historical fishing areas, and stops near the base of Pioneer Canyon.

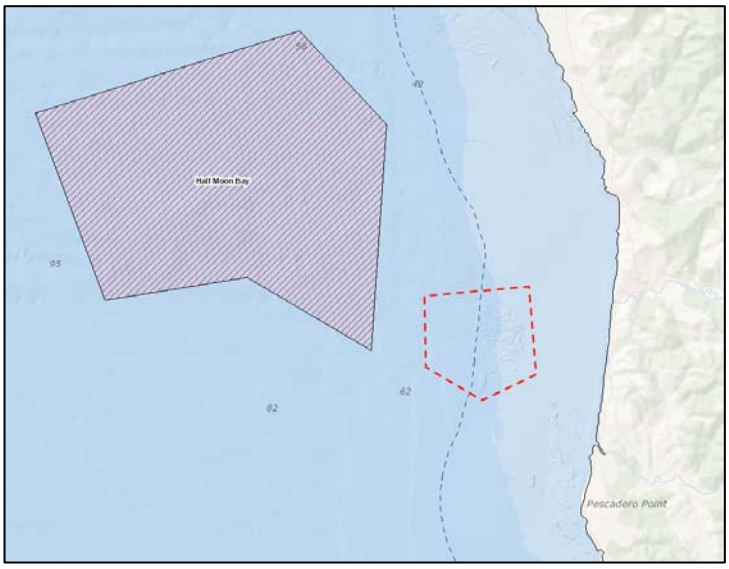
This area was discussed with fishermen first in 2013, with no clear resolution reached. Conversations continued during the collaborative process. The shape here is supported by participants in the collaborative, so long as it is included as part of the larger collaborative proposal (including revisions to the Trawl RCA), which increases fishing opportunity.

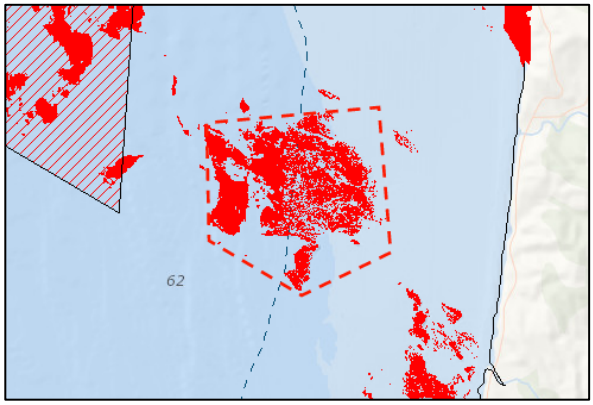
Pescadero Reef

This is an area of known hard substrate that straddles the California state waters line. There are multiple observations of canary and bocaccio rockfish in this area from the compiled geodatabase of overfished species observational data. During port meetings, fishermen identified this area as rough bottom that may not be conducive to bottom trawling. There is very

limited historic fishing effort in this area.

The size and location of this area was discussed in detail, including the idea of joining it with the existing Half Moon Bay EFH Conservation Area. Fishermen indicated that important fishing grounds exist in the area between Pescadero Reef and the existing EFH area, and thus the boundaries of this shape were drawn to allow for fishing between the two areas.

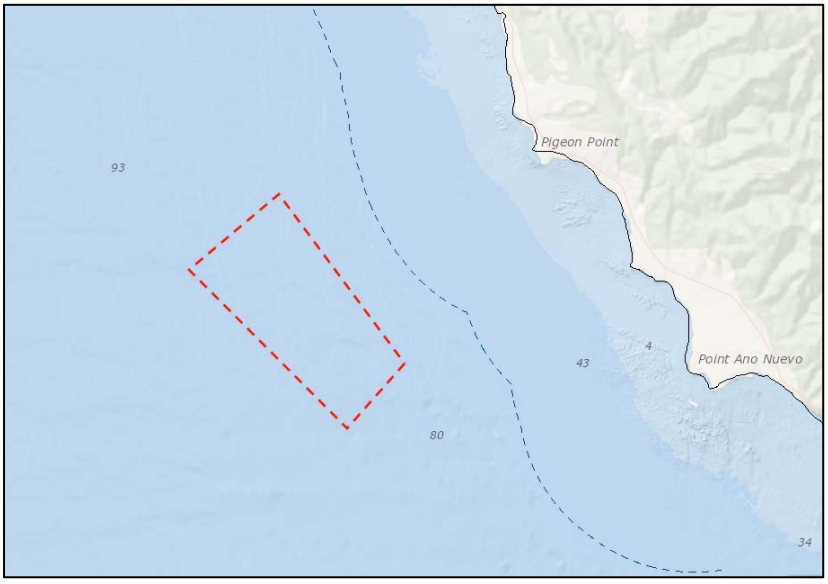




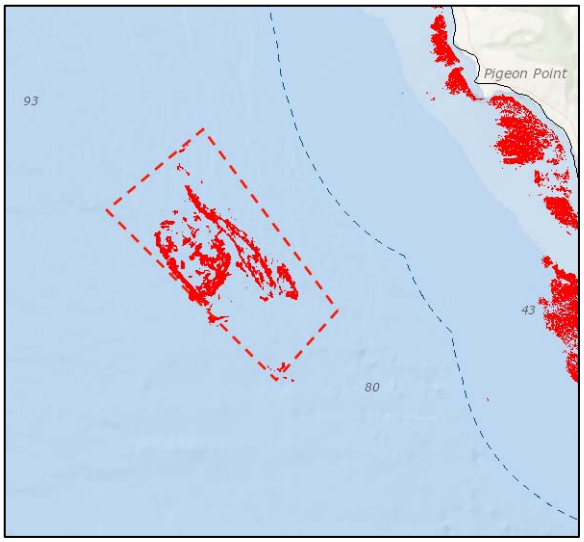
Note that roughly half of this area is located in state waters, and is already closed to bottom trawling under California state law. If this shape is designated as an EFH Conservation Area, no action would be required from the State of California to implement it, similar to how areas were designated in Amendment 19. Alternatively, the shape could be truncated at the three-mile line so as to only include the portion in federal waters.

Pigeon Point Reef

This rocky reef lies in the 40-50fm depth range, off Pigeon Point. The EFH Data Catalog substrate data layer shows a distinct patch of hard substrate, and during port meetings fishermen confirmed there is rough substrate in this area. Fishermen described the reef area as not being conducive to trawling due to hangs, though there are flatfish tows around the reef. The bathymetry and substrate data in this area are low confidence, as no multibeam sonar



survey has been conducted, but there is agreement between the substrate data layer and fishermen's understanding of the area. Industry records show no bottom trawling in the area, and the EFH Data Catalog effort data layers appear to confirm this (although they are blurred due to confidentiality restrictions, making them difficult to interpret precisely).

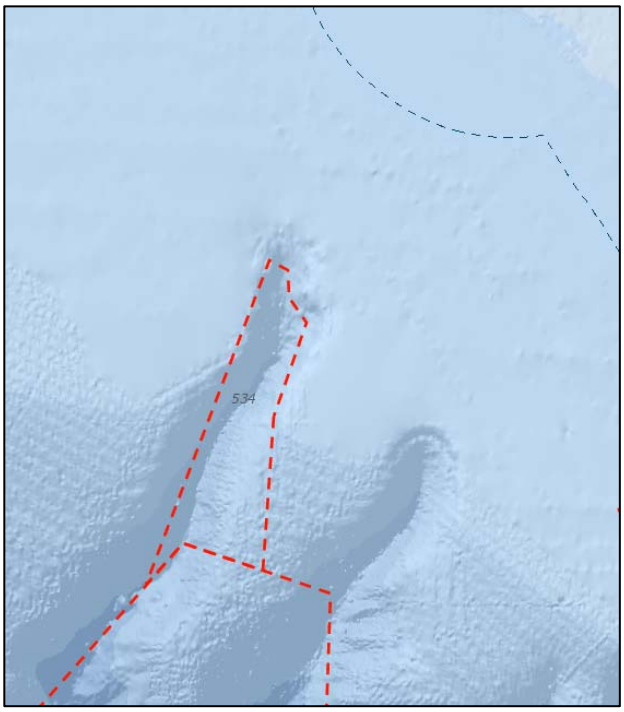


The Nature Conservancy and partners observed this area with a video lander during the Exempted Fishing Permit Rockfish Conservation Area study and found canary and yelloweye rockfish, among other species. No ROV or submersible transects have been conducted, to the best knowledge of the collaborative.

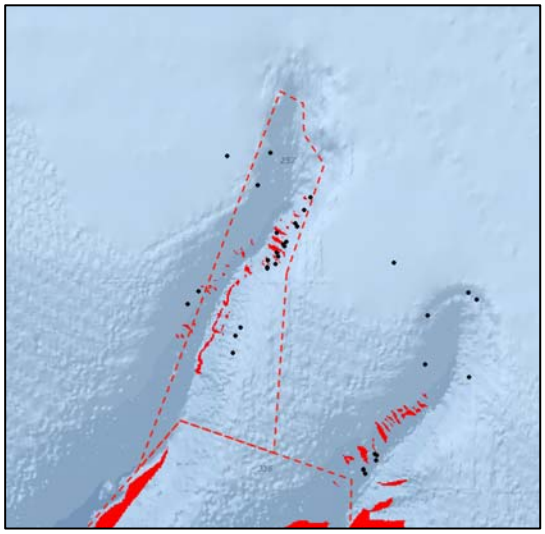
This area is located entirely in federal waters. Bottom trawling for California halibut takes place in sandy bottom areas just outside the three-mile line in region of the coast, so it is important to leave sufficient room for these boats to pass between the Pigeon Point Reef area and the state waters line.

Ascension Canyonhead

Ascension Canyon is a distinct feature cutting into the shelf just south of Point Año Nuevo. Researchers describe Ascension Canyon as largely comprised of deep fine-sediment habitats with rocky outcrops. The canyonhead starts at around 70fm on the shelf, dropping quickly into a straight, steep, and narrow canyon body. Scientists have studied this area with submersible dives and observed brittle stars, hermit crabs, sea cucumbers, pink urchins, and crinoids, as well as several species of rockfish. Corals and sponges also have been observed, including fan-type and stony corals. While the majority of the canyon is soft bottom, there are understood to be patches of hard substrate at the steepest parts of the canyon.



During port meetings with Monterey area fishermen, industry members generally agreed with this site characterization. The head of Ascension Canyon has relatively low historical and current bottom trawl effort. Fishermen described setting their trawls at the shoreward curve of the 100fm line at the very top of the canyon, and dropping down on the shoreward side of the RCA. Alternatively, they set on the north side of the RCA and tow north away from the canyon.

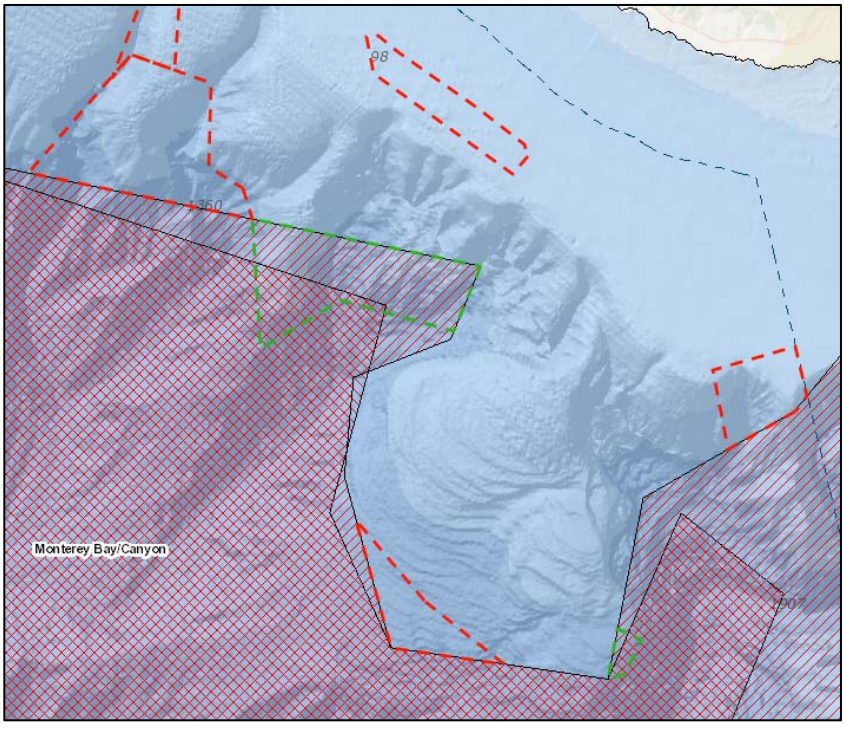


This shape was drawn carefully with fishermen to ensure trawl tows around Ascension Canyonhead remain open. Having done so, the proposed EFH Conservation Area also protects around six square miles of canyon, and connects to the "Ascension and Año Nuevo Canyon Complex" area from the 2013 MBNMS proposal.

In the image to the left, black dots represent coral and sponge observation records, and red patches show hard substrate.

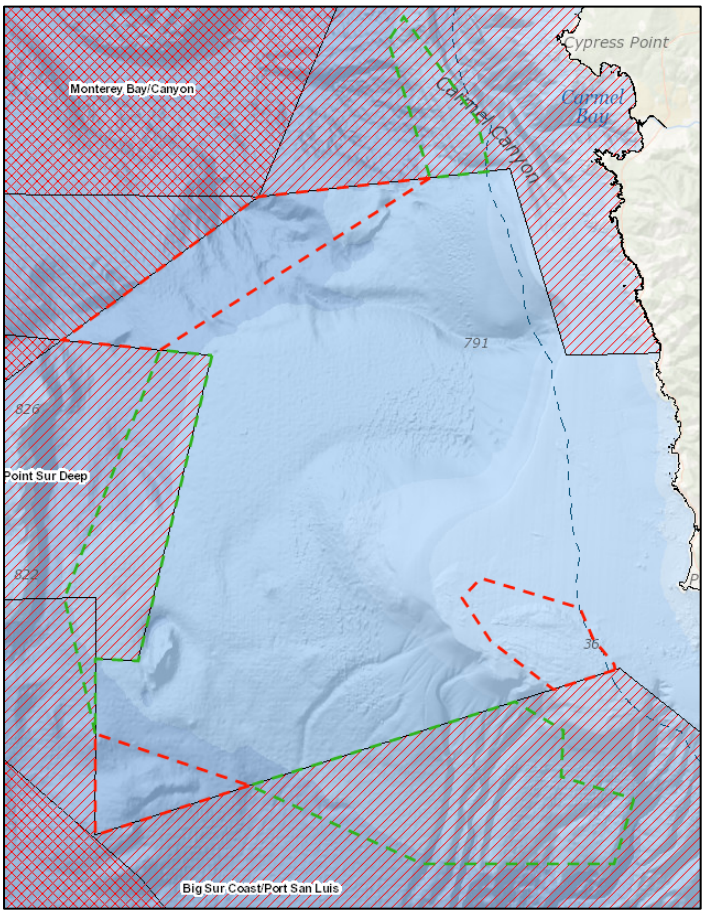
MBNMS Ascension and Año Nuevo Canyon Complex
MBNMS Lower Portion of Cabrillo Canyon
MBNMS South of Davenport
MBNMS Outer Soquel Canyon
MBNMS Southwest of Smooth Ridge
MBNMS South of Mars Cable

These areas are incorporated without change from the MBNMS 2013 EFH Proposal. Descriptions, rationales, and supporting analysis can be found in the November 2013 Briefing Book, Agenda Item H.7.a, Attachment 5.



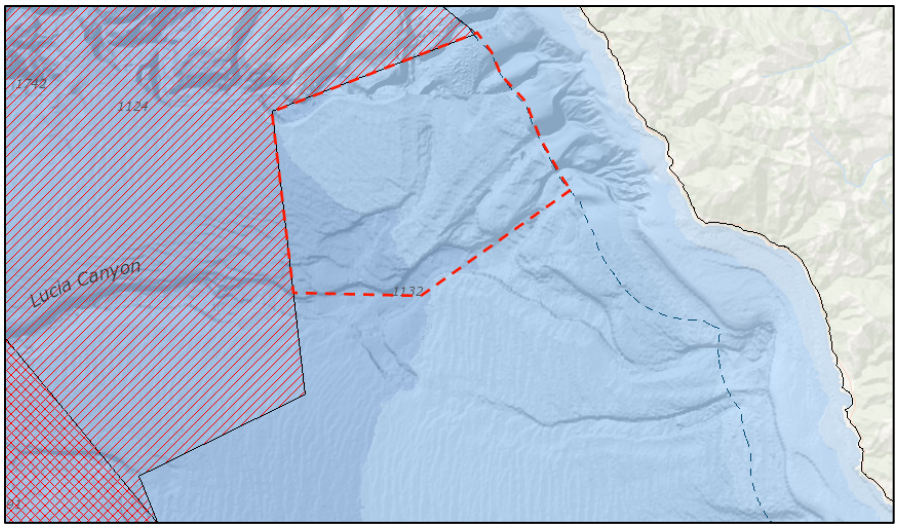
MBNMS West of Carmel Canyon
MBNMS West of Sobranes Point
MBNMS East of Sur Ridge
MBNMS Triangle South of Surveyors Knoll
MBNMS Sur Canyon Slot Canyons
MBNMS Point Sur Platform

These areas are incorporated without change from the MBNMS 2013 EFH Proposal. Descriptions, rationales, and supporting analysis can be found in the November 2013 Briefing Book, Agenda Item H.7.a, Attachment 5.

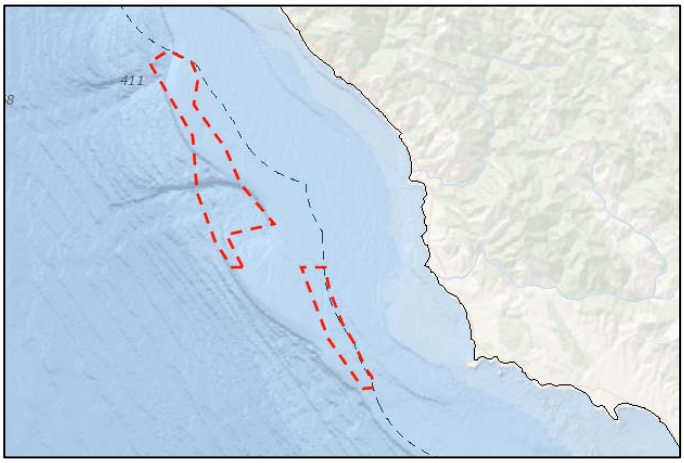


MBNMS Between Partington Point and Lopez Point

This area is incorporated without change from the MBNMS 2013 EFH Proposal. Description, rationale, and supporting analysis can be found in the November 2013 Briefing Book, Agenda Item H.7.a, Attachment 5.

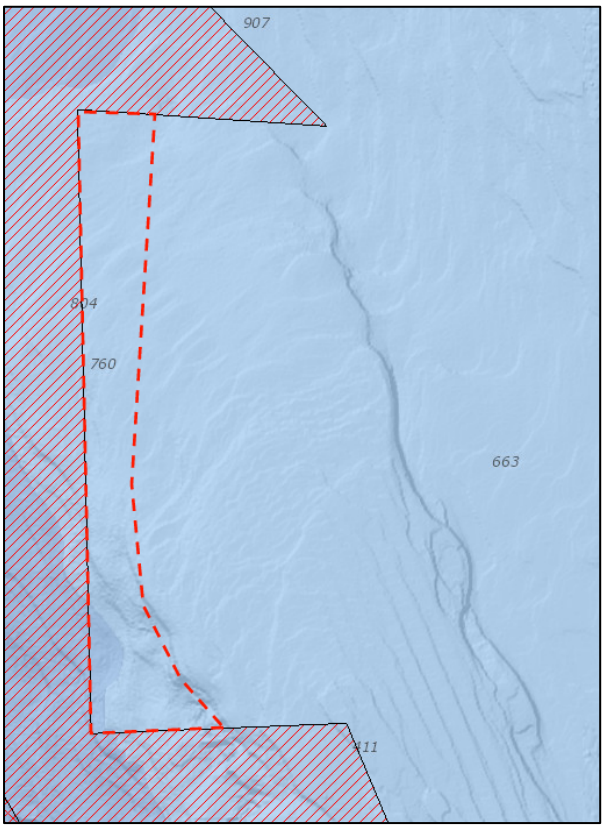


MBNMS La Cruz Canyon
MBNMS West of Piedras Blancas SMCA



These areas are incorporated without change from the MBNMS 2013 EFH Proposal. Descriptions, rationales, and supporting analysis can be found in the November 2013 Briefing Book, Agenda Item H.7.a, Attachment 5.

Big Sur Coast Modification



This proposed modification would expand the current Big Sur Coast/Port San Luis EFH Conservation Area by including a strip of ground on the northwest flank of Santa Lucia Bank. This area covers benthic habitat in the 400fm range, with portions of the area extending deeper than 500fm.

The EFH Data Catalog indicates that the majority of the area is hard substrate, but the associated confidence level is low. Actual hard substrate may be more patchy in nature.

A few coral and sponge observation records are listed in the EFH Data Catalog for this area, primarily sea pen type invertebrates caught during the trawl survey. No ROV or submersible work has been done in this area, to the best knowledge of the collaborative.

This area was designed to avoid areas with historic trawling, while also increasing protection of hard substrate. Note that a series of undersea cables run through the north end of this area, connecting to Morro Bay on shore.

Trawl RCA 40°10’ to 37°07’

In the region between 40°10’ and Año Nuevo, the year-round Trawl RCA covers the area between the 100fm and 150fm Code of Federal Regulations lines, including a wide patch around Cordell Bank. The Trawl RCA was discussed at length during port meetings, and fishermen indicated that other than a few hard spots, the Trawl RCA is generally soft muddy bottom in this region of the coast. Fishermen believe that a full opening of the RCA is appropriate, given the bycatch reduction incentives and accountability measures in place with the catch share program.

Substrate data layers confirm that the Trawl RCA in this region primarily is comprised of soft sediment, with a few small patches of hard or mixed substrate. Hard or mixed substrate is known and mapped at Point Arena South Biogenic Area, Gobbler’s Knob, and Cordell Bank. The mapped hard substrate areas within the Trawl RCA at Point Arena South Biogenic Area and Cordell Bank are currently covered by EFH Conservation Areas, and would not be opened to bottom trawling upon removal of the Trawl RCA, because EFH coverage would be maintained under the reconfiguration proposed here. The mixed substrate at Gobbler’s Knob would be partially exposed, upon removal of the Trawl RCA; part of it would be covered by a proposed new EFH Conservation Area at Gobbler’s Knob (described above).

The EFH Data Catalog shows relatively few coral and sponge observation records within the Trawl RCA in this region of the coast. Exceptions to this generalization are found at The Football, Point Arena South Biogenic Area, Cordell Bank, Cochrane Bank, and more broadly in the Pioneer Canyon area. Of these areas with relatively high coral and sponge observations, Point Arena South Biogenic Area and Cordell Bank are already covered by EFH Conservation Areas and the relevant coverage would not be removed by the changes proposed here. The Football would receive partial coverage by the new EFH Conservation Area recommended above. Cochrane Bank would be fully covered, with only a handful of sea pen observation records falling outside the proposed EFH area. Pioneer Canyon would not receive any new EFH protection under the changes described above, so corals and sponges currently covered by the RCA in that area could be exposed upon removing the RCA.

Removing the Trawl RCA would result in a decrease in protection for the shelf-slope break, in this region of the coast. Removal of the Trawl RCA would be offset to some degree by new EFH coverage, if the shapes described above are adopted. Specifically, the Cordell Bank EFH Conservation Area is proposed to be expanded westward and northward, adding shelf-slope break coverage in that area. The Farallon Escarpment area proposed above would provide some coverage of the shelf-slope break west of the Farallon Islands. Lastly, the new EFH areas proposed above for The Football and Gobbler’s Knob, while not located precisely on the shelf-slope break, do provide some protection in this general depth range.

Re-opening the Trawl RCA from 40°10’ to Año Nuevo is included as a recommendation from the collaborative.

Trawl RCA 37°07’ to 34°27’

In the region between Año Nuevo and Point Conception, the year-round Trawl RCA covers the area between the 100fm and 150fm Code of Federal Regulations lines. The Trawl RCA was discussed in port meetings, and fishermen indicated interest in removing the Trawl RCA. Fishermen believe that a full opening of the Trawl RCA is appropriate, given the bycatch reduction incentives and accountability measures in place with the catch share program.

The data layers indicate that the Trawl RCA between Año Nuevo and Santa Cruz is comprised primarily of soft bottom, with a few patches of hard substrate at Ascension Canyon and south of Santa Cruz. The hard substrate at Ascension Canyon would be covered by the proposed Ascension Canyonhead EFH area described above. Between Santa Cruz and Carmel, the Trawl RCA contains a mixture of hard and soft substrate, but the Trawl RCA is almost entirely covered by the existing Monterey Bay/Canyon EFH Conservation Area, and thus would not be opened to bottom trawling by a removal of the Trawl RCA.

South of Carmel the Trawl RCA is mostly soft sediment, with a few mapped patches of hard substrate in slot canyons around Point Sur. Most of these patches are covered by either an existing EFH Conservation Area (and would not be changed by this proposal) or are located in California state waters, and therefore would not be exposed to bottom trawling upon removal of the Trawl RCA. Off of Morro Bay the available mapping indicates the Trawl RCA is mostly soft substrate, except for one large patch of likely hard substrate at La Cruz Canyon. This patch would be covered by the MBNMS La Cruz Canyon proposed EFH Conservation Area, so it would not be exposed to bottom trawling upon removal of the Trawl RCA.

There are relatively few corals and sponge observation records in the Trawl RCA in this region. Observation records tend to be from the NMFS annual bottom trawl survey and are comprised of sea whips and sea pens, as well as sponges and occasional soft corals. Research dives in the Trawl RCA have been conducted around Point Sur and Lopez Point, as well as off Carmel and within Monterey Bay. The EFH Data Catalog indicates that corals and sponges were observed during these dives. Most of the areas with research dives would remain protected upon lifting the Trawl RCA, due to coverage by an existing EFH Conservation Area, state waters, or a proposed new/expanded EFH Conservation Area.

Removing the Trawl RCA would result in some decrease in protection for the shelf-slope break, in this region of the coast. However, removal of the Trawl RCA would be offset to a limited degree by new EFH coverage, if the shapes described above are adopted. Specifically, the proposed Ascension Canyonhead EFH area would protect habitat within the current Trawl RCA, as would the MBNMS Outer Soquel Canyon area. To the south, the MBNMS La Cruz Canyon area would encompass a portion of the Trawl RCA.

Re-opening the Trawl RCA from Año Nuevo to Point Conception is included as a recommendation from the collaborative.