Appendix C

New Management Measures Detailed Analysis

Pacific Coast Groundfish Fishery 2019-2020 Harvest Specifications and Management Measures

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C.1 *Salmon Incidental Take Statement: Mitigation Measures and Reserve Rule Analysis*

In late 2017, the National Marine Fisheries Service (NMFS) released results of the section 7 re-consultation and the 2017 Salmon Incidental Take Statement (ITS) after the completion of the re-consultation on the continued implementation of the Groundfish fishery management plan (FMP). The ITS included six reasonable and prudent measures[1] (RPMs) which require the Pacific Fishery Management Council (Council) and NMFS to take certain actions to address salmon bycatch in groundfish fisheries. These RPMs are non-discretionary and were developed based on the analysis in the biological opinion (BiOp) on the effects of the groundfish fishery on salmon. The RPMs included in this ITS are grouped by topic:

1. Monitoring;
2. Developing Measures to Keep Bycatch within Guidelines;
3. The Reserve;
4. New Times and Areas;
5. Identifying and Addressing High Bycatch Times/Areas/Conditions; and
6. Reporting and Evaluation.

The ITS provides terms and conditions (T&C) under each RPM that are also non-discretionary, and are required to implement each specific RPM. The Groundfish Management Team (GMT) considered the impacts analysis in the BiOp and the requirements of the RPMs in the ITS and provides the following information on process and options for Council consideration.

C.1.1 RPM 1: Monitoring

RPM 1 requires that "NMFS, in consultation with the Council, will review existing mechanisms for monitoring salmon bycatch in the groundfish fishery, and will develop mechanisms--if they do not already exist--that, a) provide timely inseason data regarding the amount and location of salmon bycatch by sector, and; b) provide timely inseason data regarding the geographic distribution of the at-sea whiting fleet."

In order to accomplish this, the T&C for RPM 1 requires NMFS to monitor inseason bycatch for the trawl fisheries (T&C 1.a.i.); assess the quality of this data and ensure it is comparable to or better than current collected information (T&C 1.a.ii.); monitor location of bycatch, collect coded-wire tags (CWT) and other biological information (specifically genetic samples from all whiting, bottom trawl, and non-whiting midwater trawl fisheries; T&C 1.a.iii); and, track the distribution of fishing effort (T&C 1.a.iv).

The GMT evaluated the Council and NMFS' ability to track the amount, and location, of any salmon bycatch by the sectors (whiting and non-whiting) and sub-sector (at-sea, individual fishing quota (IFQ), recreational, etc.) defined in the ITS. In order to assess, on an ongoing basis, the inseason bycatch of salmon against the guidelines in the ITS and the likelihood of a sector, or sub-sector, exceeding the guideline, NMFS would need this information inseason and a method of projecting or accounting for catch. Table C-1 below summarizes the timeliness and ability to project data inseason by sector and sub-sector.

Based on this evaluation, NMFS and the Council should be able to monitor salmon bycatch by species, area, and sector for the trawl fisheries on a weekly basis (T&C 1(a)(i)). Since the vast majority of historical

[1] The United States Fish and Wildlife Service (FWS) defines reasonable and prudent measures as an action that FWS or NOAA Fisheries believes necessary or appropriate to minimize the impacts (the amount or extent) of incidental take caused by an action that was subject to consultation.

bycatch has been from the trawl fisheries, the timely reporting of salmon bycatch in the trawl fishery should help ensure that inseason monitoring goals are met for all fisheries.

Table C-1. Summary of Current Catch Reporting and Projection Methods for Salmon Bycatch.

Sector	Sub-Sector	Reporting Time	Location Information Available	Biological Information Available c/	Source	Model for Projection?
Whiting	At-Sea	24 hours	Yes- coordinates of haul	Sex, length/frequency, CWT, adipose fin presence, genetic data d/	NORPAC	Yes (bootstrap or bycatch ratio)
	Shoreside	~24 hours or less	Yes- IFQ catch area at the trip level within 24 hours. Logbooks available within ~ 1 week. Haul-level estimates of salmon catch available the following year.	Sex, length/frequency, CWT, adipose fin presence, genetic data d/.	Maximized retention, salmon landed on etix w/ no value	Yes (bycatch ratio)
	Tribal	Weekly, automatic notification if over 20 Chinook in a single tow	Within U&A boundaries	Length frequency, CWT, adipose fin presence	Tribes	No
Non- Whiting	Midwater/ Bottom trawl	~24 hours or less	Yes- IFQ catch area at the trip level within 24 hours. Logbooks available within ~ 1 week. Haul-level estimates of salmon catch available the following year.	Sex, length/frequency, CWT, adipose fin presence, genetic data.	EM vessels: Report salmon landed on etix w/no value. Observed vessels that sort at sea: Report to PacFIN within 24 hours.	Yes (bycatch ratio)
	WA, OR, CA recreational bottomfish during open salmon seasons	Impacts are accounted for in pre-season salmon modeling and do not have to be attributed to non-whiting thresholds. See Table 2-53 from BiOp/ITS.				
	WA recreational bottomfish outside salmon season a/	One month lag	By marine catch area.	Retention prohibited	WDFW Not on RecFIN	Not available, but minor impacts
	OR rec. longleader (any month) and bottomfish outside salmon seasons a/	Preliminary 1 week lag, final 1 month lag	By broad grid of catch location.	Retention prohibited	ODFW Not on RecFIN	Not available, but minor impacts

Sector	Sub-Sector	Reporting Time	Location Information Available	Biological Information Available c/	Source	Model for Projection?
	California rec. bottomfish outside salmon season b/	Currently, no existing reporting structure to analyze salmon bycatch rec data outside of salmon season, but minor impacts.				
	Non-Nearshore	Not available until fall of following year	Only for select observed hauls	Sex, length/frequency, CWT, adipose fin presence, genetic data.	WCGOP Salmon Report	Not available, but minor impacts
	Nearshore	Not available until fall of following year	Only for select observed hauls	Sex, length/frequency, CWT, adipose fin presence, genetic data.	WCGOP Salmon Report	Not available, but minor impacts

a/ From "bottomfish" trip types only based on following formula: Landed + Discarded x DMR (16% barbless, 30% barbed) + "drop-off" mortality for fish that shake hook before being caught (5% x landed).

b/ From "bottomfish" trip types only based on following formula: Landed + Discarded x DMR (59% J-hook) + 5% "drop-off" all catch.

c/ Per T&C 1(a)(iii)(c), salmon taken as bycatch should be sampled for stock composition, coded wire tags, and other biological information including age, sex and size. For all trawl fisheries, this includes taking genetic samples from the bycatch.

d/ Shoreside and At-sea Whiting take genetic samples from Chinook salmon only.

C.1.2 RPM 2: Developing Measures to Keep Bycatch within Guidelines

RPM 2 requires that "The Council and NMFS will review existing regulatory mechanisms for reducing salmon bycatch and will revise these mechanisms or develop and implement new mechanisms to ensure that, should inseason data show the annual coastwide bycatch will exceed 11,000 Chinook or 474 coho for the whiting sector or 5,500 Chinook or 560 coho for the non-whiting sector, NMFS and the PFMC will take timely and effective inseason action to avoid an exceedance of these bycatch thresholds."

The T&Cs under RPM 2 require a range of responses from both the Council and NMFS. In our review and subsequent discussion, the GMT focused on T&C 2.a., which requires the Council to review existing mechanisms for avoiding or reducing bycatch inseason through the 2019-2020 biennial harvest specifications and management measures process. The GMT also provides some analysis on potential management measures that may be needed to keep sectors from exceeding their bycatch guidelines (T&C 2.b.). Specifically, the Council recommended that the GMT analyze the use of Bycatch Reduction Areas (BRAs) within the 2019-2020 biennial process for salmon bycatch reduction in the non-whiting mid-water trawl fishery. While preparing the analysis of BRAs, the GMT found some background information in the environmental assessment for the 2015 midwater clean-up rule on their development and historical use that seems pertinent to the Council's request.

The 2009-2010 harvest specifications and management measures implemented bycatch limits for overfished species and BRAs for the whiting sector. However, these bycatch limits were removed from regulation with implementation of trawl rationalization. Since implementation of the trawl IFQ program, the authority to close the Pacific whiting sector of the Shorebased IFQ fishery through an automatic action has been removed, and the use of the BRAs has been modified such that they are now considered to be a type of groundfish conservation area (50 CFR 660.11). Like rockfish conservations areas, the BRAs are areas closed to fishing by particular gear types, bounded by lines approximating particular depth contours (50 CFR 660.11). Regulations at 50 CFR 660.55 (c)(3)(i) continue to allow BRAs to be implemented through automatic action, but they can also be implemented through routine inseason action. Because BRAs had not previously been considered for use as a mitigation tool for salmon bycatch, there is no analysis to support their use in this way.

Below, the GMT reviews by sector (whiting and non-whiting) the current mitigation measures available for avoiding or reducing salmon bycatch, whether these measures are adequate for addressing salmon bycatch concerns inseason, and the potential need for additional mitigation measures. The primary emphasis is geared toward Chinook salmon, although considerations for coho salmon are also presented below.

C.1.2.1 Whiting

The whiting fisheries have historically stayed below the 11,000 Chinook salmon bycatch threshold, as overages would have occurred only twice in the past 16 years (Table C-2). Therefore, based on historical performance, there may be an infrequent need for inseason adoption of depth or area restrictions to stay within the whiting threshold. Furthermore, since 2002 (the start of the West Coast Groundfish Observer Program, WCGOP), the whiting fisheries have never exceeded the maximum of the combined salmon bycatch threshold (11,000 Chinook salmon) and the reserve amount (3,500 Chinook salmon) established in the 2017 ITS. However, they did come close in 2014, with a total of 14,393 Chinook salmon taken by all whiting sub-sectors (Table C-2).

Table C-2. Bycatch of Chinook salmon (#) by year for the whiting fisheries in relation to the 11,000 Chinook threshold for the whiting sector.

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
At-sea	1,679	2,648	805	3,963	1,209	1,321	722	319	714	3,990	4,232	3,737	6,685	1,808	3,051	3,769
Shorebased	1,062	425	4,206	4,018	839	2,462	1,962	378	2,997	3,727	2,333	1,313	7,554	2,424	733	1,394
Tribal	1,018	3,439	3,740	3,985	1,940	2,404	697	2,147	678	906	17	1,025	154	1	200	577
Total	3,759	6,512	8,751	11,966	3,988	6,187	3,381	2,844	4,389	8,623	6,582	6,075	14,393	4,233	3,984	5,740
% 11k threshold	34%	59%	80%	109%	36%	56%	31%	26%	40%	78%	60%	55%	131%	38%	36%	52%

Currently, one mitigation measure is available in Federal regulations which specifically helps reduce and avoid Chinook salmon bycatch by the whiting sector, known as the Ocean Salmon Conservation Zone (OSCZ). The OSCZ consists of all waters shoreward of a boundary line approximating the 100 fathom (183 m) depth contour. When triggered, the OSCZ is closed to fishing for the whiting fleet. This closure is implemented coastwide through automatic action when NMFS projects the Pacific whiting fishery may take in excess of 11,000 Chinook salmon within a calendar year (50 CFR 660.131(c)(3)).

An additional automatic authority exists in regulation, which requires NMFS to implement area closures via BRAs through automatic action to respond to concerns over high bycatch of non-whiting groundfish in the whiting sector. These area closures are triggered automatically when NMFS projects that the Pacific whiting sector will exceed a non-whiting groundfish allocation before attaining its whiting allocation (§ 660.130(e)(6)). As described above, it may also be implemented as a routine action for vessels using midwater groundfish trawl gear during the Pacific whiting primary season (§ 660.60(c)(3)). BRAs are currently available in regulation at 75, 100, or 150 fathom depth contours, and close the area shoreward of that depth contour.

In November 2017, the Council recommended an analysis of the efficacy of the OSCZ and its use over the past several years. The Council also recommended that BRAs be analyzed for use in mitigating salmon bycatch thresholds in the ITS and that the analysis include the potential addition of a depth contour of 200 fm (Agenda F.9, Preliminary Draft Council Motions, November 2017, Agenda Item F.9.a, Supplemental GMT Report 4, November 2017).

To gauge whether coastwide depth band closures could be effective in reducing Chinook salmon bycatch, the GMT analyzed historical Chinook salmon bycatch and fishing effort data for the non-tribal whiting sectors (at-sea and shoreside) by depth and area. Figure C-1 shows the bycatch rate of Chinook salmon (number/mt whiting) and the effort by month and depth for the at-sea fleets (2011-2017) and the shoreside fleet (2011-2016). The actual bycatch amounts, bycatch rates, and effort information is included in Attachment 1 (Tables A1-A6 for at-sea, Tables A7-A10 for shoreside whiting, Tables A11-A12 for shoreside non-whiting mid-water).

This analysis considers effort in conjunction with bycatch rates, to ensure that the closure of an area would impact overall salmon bycatch. For example, closing an area with a high bycatch rate but low effort would likely not adequately curtail salmon bycatch coastwide. At the same time, preserving heavily fished depths with low or modest bycatch rates would be essential to minimize disruptions to the groundfish fishery

sectors. In order to better visualize the bycatch rates and effort metrics simultaneously, Figure C-1 synthesizes and displays the data from the separate tables in Attachment 1 and allows for comparisons both in relation to each other, as well as amongst sectors (at-sea vs shoreside).

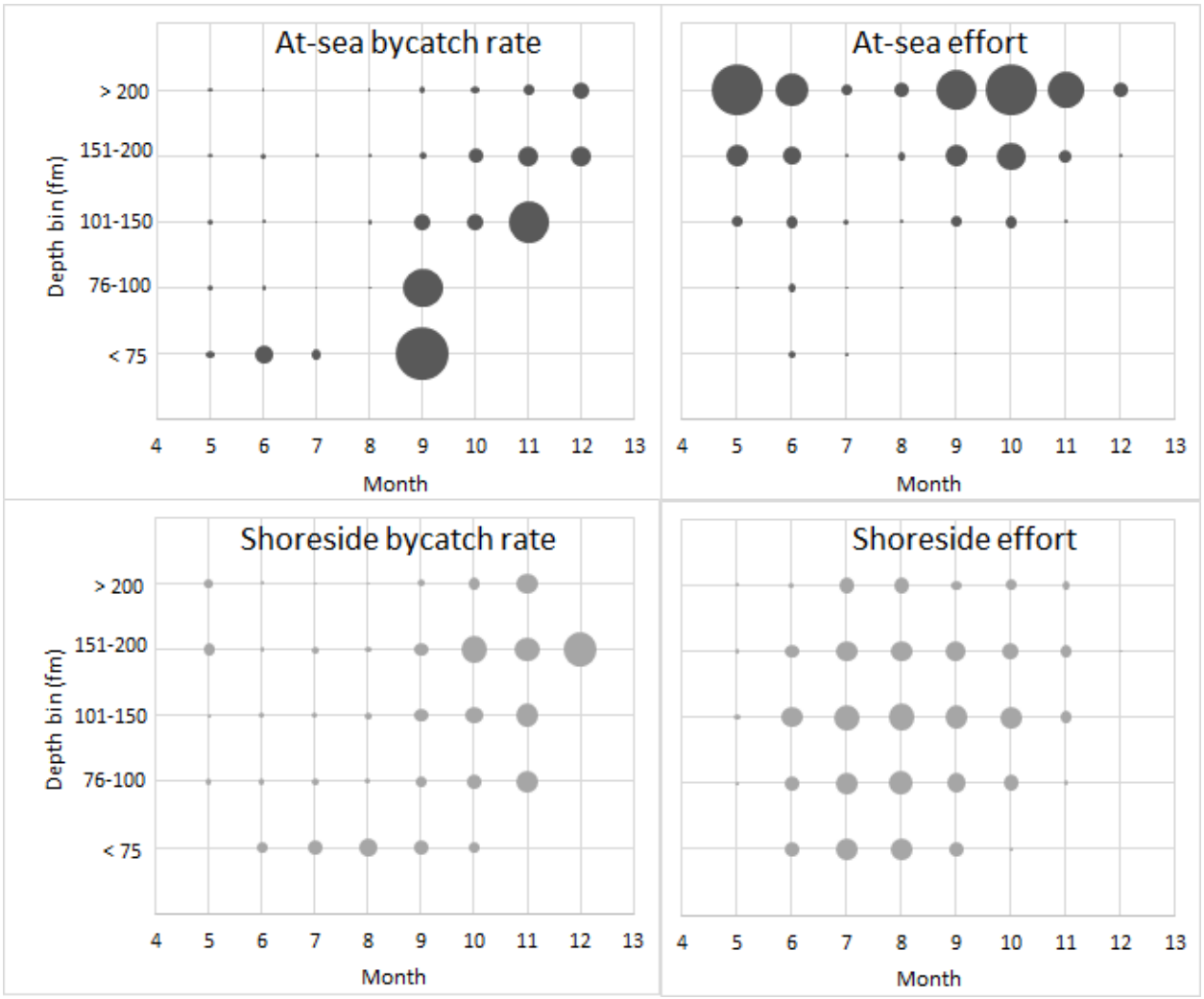


Figure C-1. Relative bycatch rates (# Chinook salmon/ mt whiting) and effort (% of hauls) for the whiting fisheries by month and depth. A comparison of bycatch rates and effort amongst sectors is possible because both sectors use the same units and scale.

Figure C-1 and all other figures in this section should be viewed with a few caveats in mind. First, depth for the at-sea sector reflects the average bottom depth of a haul in fm, which is ideal for evaluating depth closures, as they are based on bottom depth. In contrast, only depth of fishing is recorded for shoreside hauls, which can therefore lead to bias when evaluating depth restrictions based on bottom depth since they fish off the bottom. In other words, the bottom depths where shoreside fishing occurs are likely deeper than the fishing depths shown in Table C-1. Spatial analysis may be needed to determine if any correction for bias (e.g., adding x fm to account for depth off bottom) would be needed to fully evaluate impacts of depth restrictions.

A second caveat is that haul-level data is available at a finer scale for the at-sea sector compared to the shoreside sector. Landings and discards are sorted and recorded at the haul level for the at-sea sector, while the shoreside sector does not sort at-sea while operating under maximized retention. Trip-level totals from fish tickets therefore must be used in conjunction with haul-level logbook estimates to approximate true haul-level landings (including salmon).

If the Council chose to develop BRAs for salmon mitigation, they could be implemented at any latitudinal break that exists in regulation. Therefore, the GMT also analyzed historical bycatch data by depth and latitude to determine if regional BRAs could be more effective than coastwide depth restrictions. The GMT used the same latitude breaks used in the annual salmon bycatch report produced by NMFS. The most recent version is available at Agenda Item I.1.a, NMFS Report 2, March 2017. These particular latitude lines and regions were used as an example for preliminary analyses to promote Council and advisory body discussion. These regions are (Figure C-2):

1. North of Cape Falcon (45° 46’ N. lat.)
2. Cape Falcon (45° 46’ N. lat.) to Cape Blanco (42° 50’ N. lat.)
3. Cape Blanco (42° 50’ N. lat.) to 40° 10’ N. lat.
4. South of 40° 10’ N. lat. (although 0 catch or effort in this area)

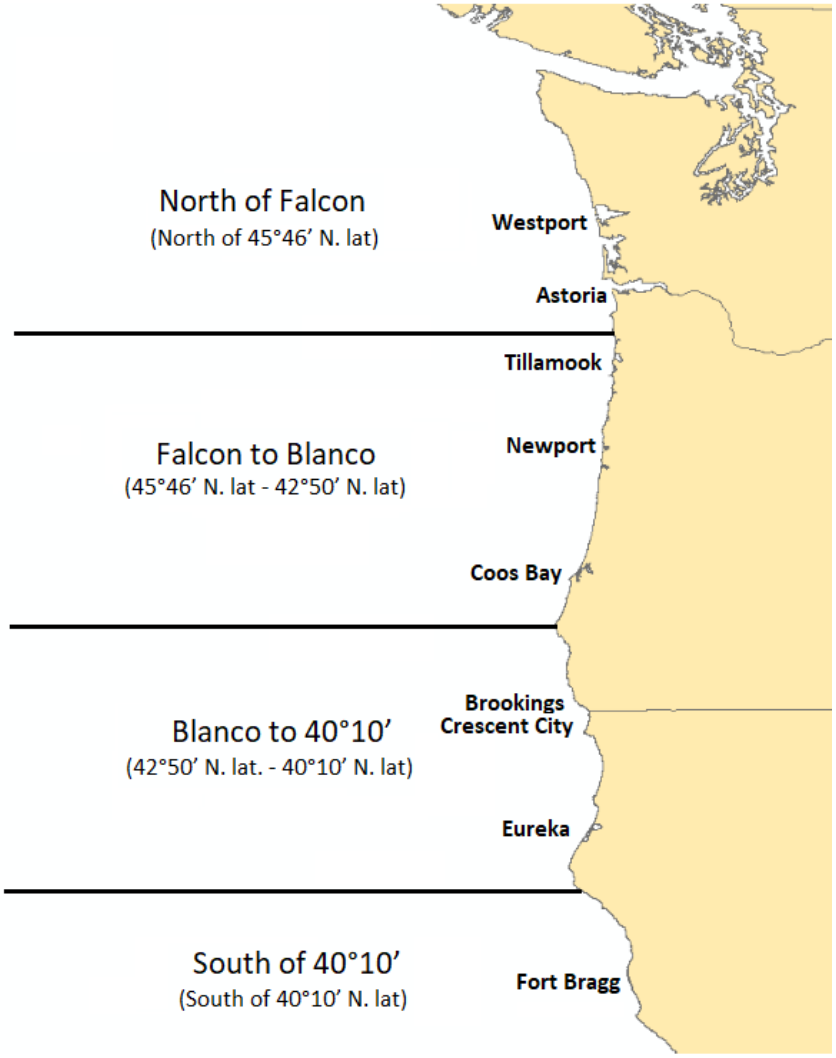


Figure C-2. Latitudinal breaks used to define the four regions used in the analysis.

At-sea whiting

The OSCZ (<100 fm) may not be an effective inseason measure to reduce at-sea Chinook salmon bycatch since only about 1 percent of effort between 2002 and 2017 occurred in those depths (Figure C-1; Tables A-1 through A-6,) and it is only triggered once the threshold is projected to be, or is, exceeded. Because a majority of the effort and whiting catch occurs outside of 100 fm, the bycatch rate in this depth bin (0-100 fm) is generally higher than the deeper depth bins. Despite higher bycatch rates, the low amount of effort may result in limited actual reductions in salmon catch resulting from implementing the OSCZ. For perspective, in 2014, the OSCZ went into place on October 14. Historically, as shown inTable C-9, there have been zero hauls shallower than 100 fm in October- December. Therefore, implementing the OSCZ had no perceivable impact on salmon bycatch based on recent years' fishing behavior. If the OSCZ were to be implemented earlier in the year or if vessels were to fish for whiting shallower in the future, the effects of implementing this mitigation measure could be different. Those impacts would need to be assessed based on the inseason information for that fishing year, including the amount of potential additional whiting catch, the location of fishing effort, and the time of year.

The development of a BRA for use in salmon mitigation may provide some benefit to mitigating salmon bycatch in the whiting fisheries. A BRA closure of the areas shoreward of 200 fm could reduce salmon bycatch since it could shift about 25 percent of the effort from the shallower depth bins (0-200 fm) into the deepest depth bins (> 200 fm), which typically has at least two to three times lower bycatch rates than the shallower depths (Table C-8). Inseason assessment of the location of salmon bycatch and the amount of whiting still unharvested would need to be considered. Although hauls by the at-sea fleet in depths greater than 200 fm have shown low Chinook salmon bycatch rates (Table C-7), the high effort in those same waters has resulted in the greatest amount of total Chinook salmon bycatch occurring in that depth bin.

Overall, the effectiveness of a depth restriction for the whiting fleet would be based on the sub-sector affected, time of year, and distribution of the whiting schools in a given year, and possibly salmon abundance (although Agenda Item I.1.a, NMFS Report 1, March 2017 indicates abundance is not a driver to bycatch); therefore, the GMT focused on qualitative comparisons at this time. Curtailing salmon bycatch through depth restrictions alone may have limited effectiveness due to the patchy nature of bycatch; however, area restrictions may have an effect on the stocks of salmon expected to be contacted depending on the time of year and latitude of the closure.

While the bycatch and effort analyses used to evaluate depth restrictions (Figure C-1 and Table C-7 through Table C-12 in Attachment 1) are shown for the at-sea sector as a whole for confidentiality purposes, the catcher-processor (CP) and mothership (MS) sectors are managed independently. Therefore, a BRA could be implemented on a sub-sector-specific basis for any of the non-tribal whiting sectors, including the at-sea sectors independent of each other, which could be more effective than a "one-size-fits-all" approach.

As noted above, a < 200 fm BRA could be the most effective for limiting at-sea bycatch, since it would shift the greatest amount of effort into the lowest bycatch depth bin (> 200 fm). However, a <200 fm BRA may have more profound effects on the MS sector, since 41.6 percent of their hauls are shallower than 200 fm compared to 11.2 percent for the CP sector (Figure C-3). If at-sea bycatch of Chinook salmon were disproportionately stemming from the CP sector, the adoption of a <200 fathom BRA for both at-sea sectors would potentially have a larger negative influence on the MS sector, with the CPs better equipped to shift effort to deeper depths. Based on past Groundfish Advisory Subpanel (GAP) feedback, the GMT understands that MS catcher vessels may lack the horsepower to fish deeper depths. It would therefore be helpful for the GAP to identify any depth restrictions that would result in de facto MS fishery closures.

The GMT stresses that the usefulness of implementing a BRA to lower bycatch of salmon would depend on the time of year. There is typically little at-sea effort in the summer months (July and August) when much of the fleets fish in Alaska. The level of activity in the surrounding months, when the highest bycatch rates occur in shallower depths, varies by year due to market price, fishing success in Alaska, and other factors. Additionally, one sector may fish later into the year than the other sector.

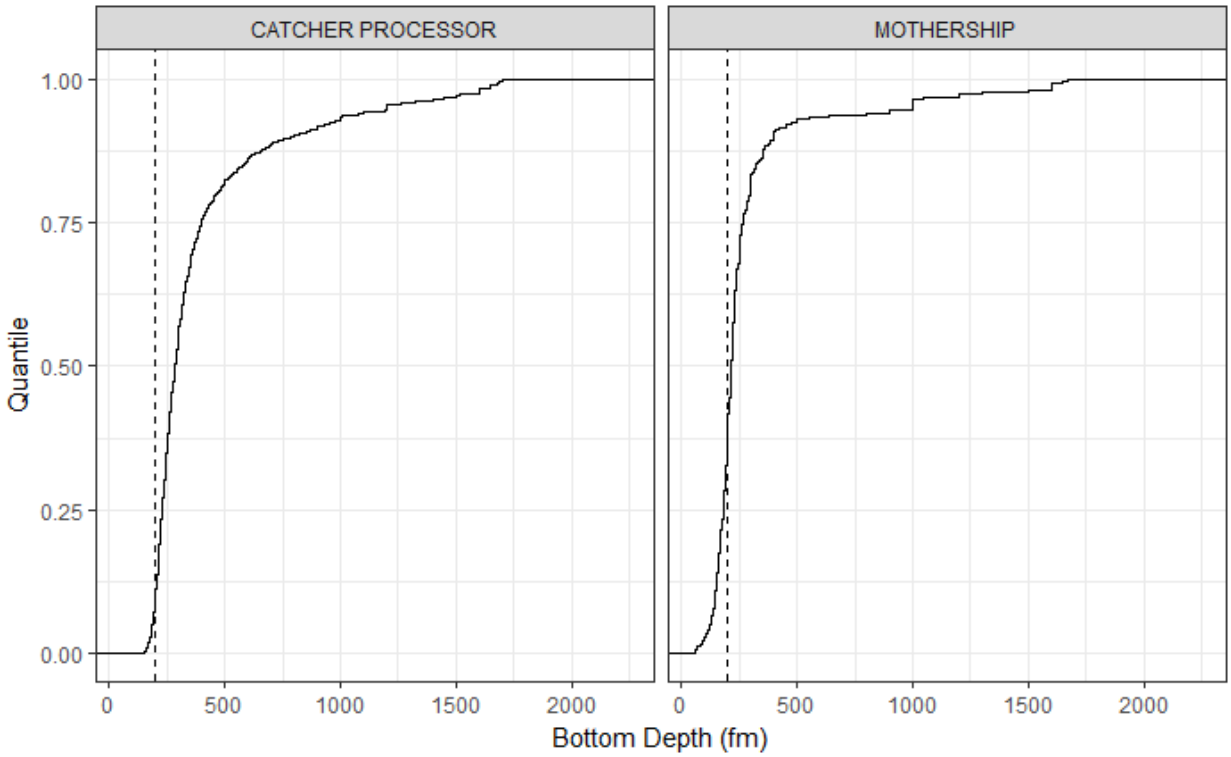


Figure C-3. Distribution of average bottom depth (fm) of hauls by at-sea sector, 2011-2017. Dashed line represents 200 fm.

The fishing behavior of the at-sea sectors is driven by the location of whiting schools and constraining rockfish species allocations or set-asides. Therefore, while the location of the majority of recent effort has been concentrated between Cape Blanco and Cape Falcon, Table C-12 shows that between 2011 and 2017, there is significant intra-annual and inter-annual variation. In recent years, the fleets have been limited by both Pacific ocean perch (POP) and darkblotched rockfish allocations. These constraints have led the sectors to fish more southerly, which has resulted in higher levels of Chinook bycatch (Figure 1-8 from the ITS). However, with the rebuilding of the POP and darkblotched rockfish stocks in 2017, higher annual catch limits (ACLs) in 2019-2020, and changes to set-aside management, the sectors may fish more northerly. As shown in Figure C-4, there are no discernable patterns of salmon bycatch rates in terms of area and depth. If the Council were to consider a BRA at a defined set of latitudes, it would likely need to be considered inseason to assess the location of high salmon bycatch rates.

In conclusion, the OSCZ (<100 fm) may be too shallow to be effective for reducing at-sea salmon bycatch by measurable amounts and would depend on the time of implementation. As the threshold is likely to not be exceeded until later in the year (if at all), there is little to no impact expected (based on historical trends), as fishing does not occur in this depth bin after October. However, deeper BRAs (especially <200 fm) could be effective to keep overall salmon numbers low for the at-sea sectors managed as a whole. The GMT again notes that sector-specific depth restrictions may be preferable, given possible differences in the depths each sector can fish due to operational limitations (e.g., horsepower). The Council should consider this information when developing its range of alternatives (ROA) for whiting mitigation measures below.

Depth Bin	Area Bin	May	June	July	August	Sept.	Oct.	Nov.	Dec.
0-75	N of Cape Falcon								
	Cape Falcon to Cape Blanco								
	Cape Blanco to 40 10 N. lat.								
76-100	N of Cape Falcon								
	Cape Falcon to Cape Blanco								
	Cape Blanco to 40 10 N. lat.								
101-150	N of Cape Falcon								
	Cape Falcon to Cape Blanco								
	Cape Blanco to 40 10 N. lat.								
151-200	N of Cape Falcon								
	Cape Falcon to Cape Blanco								
	Cape Blanco to 40 10 N. lat.								
>200	N of Cape Falcon								
	Cape Falcon to Cape Blanco								
	Cape Blanco to 40 10 N. lat.								

The color gradient goes from dark green (lowest bycatch rate, including zero) to red (highest bycatch rate). Blank cells represent zero hauls in that bin.
No fishing effort south of 40° 10' N. lat.

Figure C-4. Heat map of Chinook bycatch rates for the at-sea sectors by area, depth, and month, 2011-2017.

Shoreside whiting

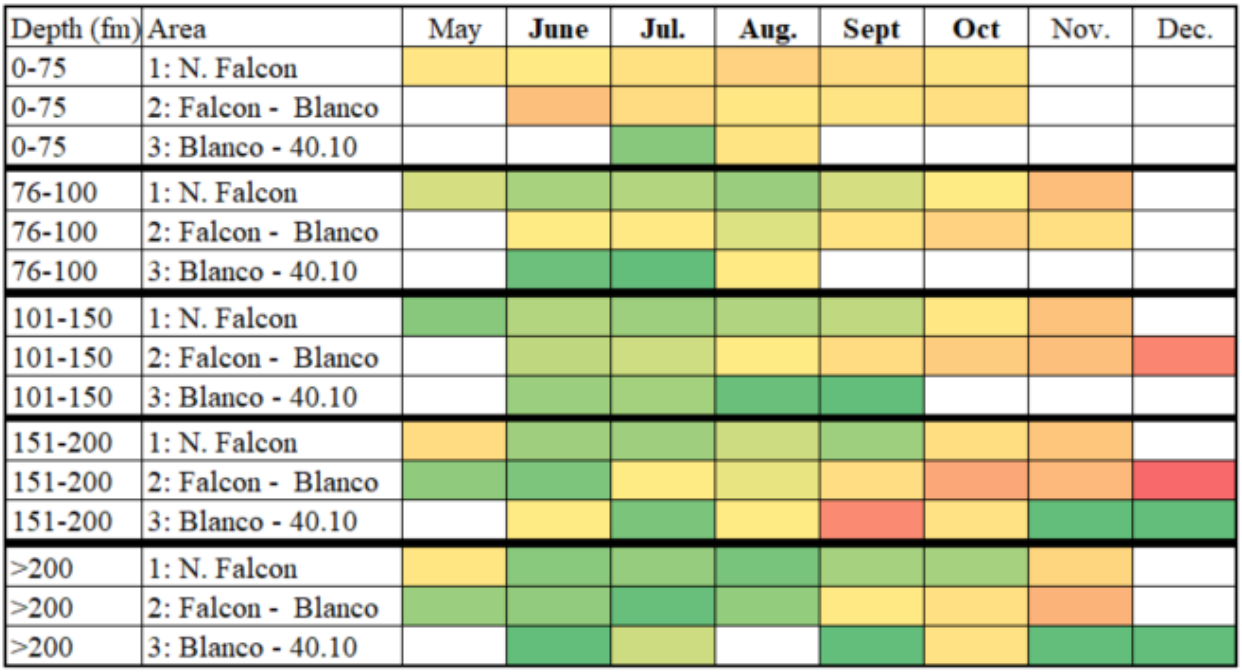
The shoreside whiting sector is similar to the at-sea sub-sectors in that both have considerably higher bycatch rates of Chinook salmon in "fall" months (September - December) compared to "summer" months (May - August). For instance, the average bycatch rate (# Chinook salmon / mt whiting) for shoreside whiting during fall months is 3.8 times higher than that of summer months (Table C-15). However, there are several large differences between at-sea and shoreside sub-sectors, which suggests that sub-sector specific mitigation measures may be more effective than implementing a depth or area restriction for the entire whiting sector.

As a reminder, all depths discussed in this section for shoreside represent fishing depth, and not bottom depth, upon which depth restrictions would be based. Therefore, the shoreside analyses presented below are likely biased shallow by the amount of fm they fish off the bottom. These biases could be rectified by further spatial analyses that link haul location to depth closure areas, which could help inform if depth restrictions would be effective for reducing salmon bycatch in the shoreside fisheries. However, note that precursory spatial analyses indicate their fishing locations based on haul coordinates that have similar depth distributions as those based on fishing depth from Figure C-1, which indicates that correction of the bias may not produce much for measurable results.

Another difference between at-sea and shoreside sub-sectors is that shoreside fishing occurs in shallower waters than in the at-sea sub-sectors. For instance, 92 percent of shoreside hauls occur shallower than 200 fm, compared to 24 percent by the at-sea sector (Table C-16 and Table C-9, respectively). The shoreside fishery is also more evenly distributed in effort across depth bins, and is centered on the 101-150 fathom depth bin, with a tailing off to the deeper and shallower depths.

Additionally, bycatch rates consistently decrease with depth for at-sea, but shoreside bycatch rates are homogeneous across depths (Figure C-1). The highest bycatch rates (~0.05 Chinook per mt of whiting) occur in the shallowest depth bin (0-75 fm) and second deepest (151-200 fm) depth bins, with an intermediate bycatch rate in the most heavily fished 101-150 fathom depth bin.

The lack of a relationship between bycatch rates and depth may hinder the ability to use depth restrictions to reduce salmon bycatch in the shoreside fishery. In short, there would not be much difference in salmon bycatch if a depth closure shifted shoreside effort to deeper depths with similar bycatch rates. Implementing a BRA within a defined set of latitudes does not appear to be an effective means for reducing shoreside bycatch of Chinook either, since the bycatch rates appear similar by region (Figure C-5). However, as with the at-sea sector, inseason data on the location of salmon bycatch and the amount of whiting allocation remaining would better inform how effective a BRA could be.



The color gradient goes from dark green (lowest bycatch rate, including zero) to red (highest bycatch rate). White cells represent zero hauls in that bin. No fishing effort south of 40°10' N. lat.

Figure C-5. Heat map of Chinook bycatch rates for the shoreside whiting sector by area, depth, and month, 2011-2016.

Similar to at-sea, implementation of the OSCZ (<100 fm) would not be expected to have much effect in the shoreside whiting sector since most effort already occurs beyond 100 fm later in the year, when the OSCZ would typically be implemented. More importantly, bycatch rates appear similar in depths shallower and deeper than 100 fm, which could simply shift effort out deeper without reduction in any salmon bycatch.

Also similar to at-sea, a <200 fm BRA closure could be effective for reducing bycatch for shoreside whiting since it would shift effort into one of the lower bycatch rate bins (76-100 fm is the lowest). However, the expected reductions in salmon bycatch associated with a <200 fm BRA closure would be less for shoreside than at-sea since the bycatch rate for shoreside does not decline as steeply with depth as for at-sea (Figure C-1).

While a <150 fm BRA may be effective for reducing bycatch for at-sea, it might not be as effective for shoreside, since effort could shift to the 151-200 fathom depth bin where the shoreside bycatch rates are generally the highest.

In conclusion, depth restrictions may not be an effective means to reduce bycatch of Chinook salmon in the shoreside whiting fisheries, since bycatch rates are similar by depth and region. The GMT is uncertain why bycatch rates are similar by depth for shoreside, but increase by depth for at-sea and would be interested to hear from the GAP and other industry members on this. As we mentioned above, the haul level data used in the analyses is more comprehensive for at-sea than shoreside (i.e., bottom depth instead of fishing depth, actual landings/discards for each haul instead of estimated landings). Note that the GMT could conduct further investigations into bycatch patterns for shoreside whiting that would resolve the fishing depth issue (i.e., by assigning hauls to depth bins or blocks based on coordinates). If desired, the Council should specify their preferred depth and area configurations.

Alternatives

Issue A: Whiting sector mitigation measures

The GMT proposes the following ROA as mitigation measures to address salmon take in the whiting sectors for Council consideration. These alternatives are not mutually exclusive and can be paired together. For example, the Council may choose to eliminate the OSCZ (Alternative 1) but develop BRAs for salmon mitigation through routine action (Alternative 2).

ROA for OSCZ:
No Action: Automatic Action once the whiting sectors (including tribal) are projected to, or reach the threshold of 11,000 Chinook salmon.
Alternative 1: Eliminate

ROA for BRAs:
No Action: Available at 75, 100, and 150 fm to minimize the incidental harvest of any protected or prohibited species taken in the groundfish fishery (this includes salmon)
Alternative 1: Maintain BRA lines at 75, 100, and 150 fm in regulation and add the 200 fm depth contour
Alternative 2: Maintain automatic action authority and revise regulations so that exceedance of the whiting salmon threshold of X would also trigger the automatic implementation of a BRA

For Alternative 1, the Council would have the ability to implement BRAs at either 75, 100, 150, or 200 fm coastwide, or at specific latitude bands, as a routine change through inseason action at a Council meeting and based on new information regarding salmon bycatch to date. If the Council were to select Alternative 2 for BRAs, the Council would need to provide guidance on the depth contours that would be available for mitigation against salmon bycatch. For example, under Alternative 2, a BRA would be triggered through automatic action once *X* number of Chinook salmon are taken in the whiting fisheries, with *X* being defined by the Council as the threshold of 11,000 Chinook salmon, or another lesser number that the Council chooses (e.g., 90 percent). The Council may also want to consider additional measures (e.g., hotspot closures) or implement rules to close the sector once a threshold is projected to be reached if the Reserve were to not be used (more detail below) outside the 2019-2020 biennial process.

C.1.2.2 Non-Whiting

The non-whiting sector for the ITS is comprised of the shorebased individual fishing quota non-whiting (i.e., bottom trawl, midwater trawl, and fixed gear or "gear switching") fleets, nearshore, non-nearshore, and the two specified recreational fisheries from Table C-1 (note that all tribal bycatch is attributed to the whiting sector). Unlike in the whiting sector, there are currently no available management measures specifically for mitigating salmon bycatch in the non-whiting fisheries, and the timeliness and detail of inseason data needed to do so is not as readily available as for all non-whiting sub-sectors.

Non-whiting commercial fixed gear and select recreational fisheries

Currently, the nearshore and non-nearshore (limited entry fixed gear or open access vessels) sub-sectors are only observed partially by WCGOP[2], and cannot be assessed inseason for bycatch. Recent bycatch levels have averaged around 54 Chinook salmon annually from 2011-2015, with a high of 124 Chinook salmon in 2013[3]. Therefore, when assessing total catch of salmon against the non-whiting threshold of 5,500 Chinook salmon, the Council may want to consider an approach that assumes a certain amount is taken by these fisheries and assess the trawl catch against the remaining amount. This value would not be in regulation, but rather would be an amount the Council could reference and consider for active inseason management of non-whiting trawl catch, either through routine or automatic action.

To improve estimates in fisheries with limited observer coverage, the Council could consider using the fixed gear logbook (with discards) that is to be developed as a part of the short tailed albatross ITS (T&C 2 of RPM 4; Agenda Item F.7, Attachment 1, November 2017) in the future. This logbook may provide information on salmon bycatch rates and location (depending on the format) as well as additional detail on location of fishing effort, which could be used to improve estimations of coastwide salmon bycatch in fisheries observed at less than 100 percent.

While recreational impacts from bottomfish fisheries during open salmon seasons are included in pre-season salmon modeling and therefore do not have to be attributed to the non-whiting threshold, impacts from other recreational groundfish fisheries must be counted against the non-whiting threshold (see Table 2-53 from the BiOp below). This includes the Oregon longleader fishery and the recreational bottomfish fisheries outside of salmon seasons. Note that conservative (high) Chinook impacts were analyzed in the BiOp for the Oregon longleader fishery[4] (12 Chinook) and the California recreational skiff fishery outside the salmon season[5] (18 Chinook) to provide more leeway in the BiOp. Impacts were not specified for the Washington and Oregon recreational groundfish fisheries outside salmon seasons, and were instead analyzed as part of the 250 Chinook buffer that also included uncertainty for commercial non-trawl fisheries. Chinook salmon impacts from the Oregon and Washington bottomfish fisheries outside the salmon seasons are expected to be negligible, since there are typically few bottomfish trips in Oregon during months closed to Chinook salmon (typically November through mid-March). Similarly, the Washington recreational groundfish fishery is closed from mid-October through mid-March resulting in very limited time when recreational groundfish season is open outside of salmon season.

[2] From 2012-2016, the following percentage of groundfish landings have been observed an average annually by WCGOP: Limited Entry Primary- 32 percent, Limited Entry DTL- 6 percent, OA DTL- 5 percent, and Nearshore- 7 percent (Somers, et al., 2016).

[3] The maximum of 124 Chinook was the highest across all observed years, 2002-2015.

[4] Oregon long-leader estimate was a conservative "assumed maximum" since it assumed 15 percent of the record high Oregon bottomfish trips (~100,000) would travel long distances offshore (25-40 miles) to the open shelf depths to fish the offshore long-leader fishery, which may be unlikely because they could instead fish close to port using traditional gear.

[5] CA recreational skiff fishery estimate outside salmon season was conservative since it was based on the 2012-2016 maximum that can be zero in some years. This estimate only includes private and rental boats surveyed at primary public-access sites accessible to the public, not CPFVs, private and rental boats surveyed at secondary public-access sites, or shoreside.

Table 2-53 from the Biological Opinion.

Table 2-53. Chinook and coho salmon mortality in ocean recreational groundfish fisheries and commercial groundfish non-trawl fisheries.

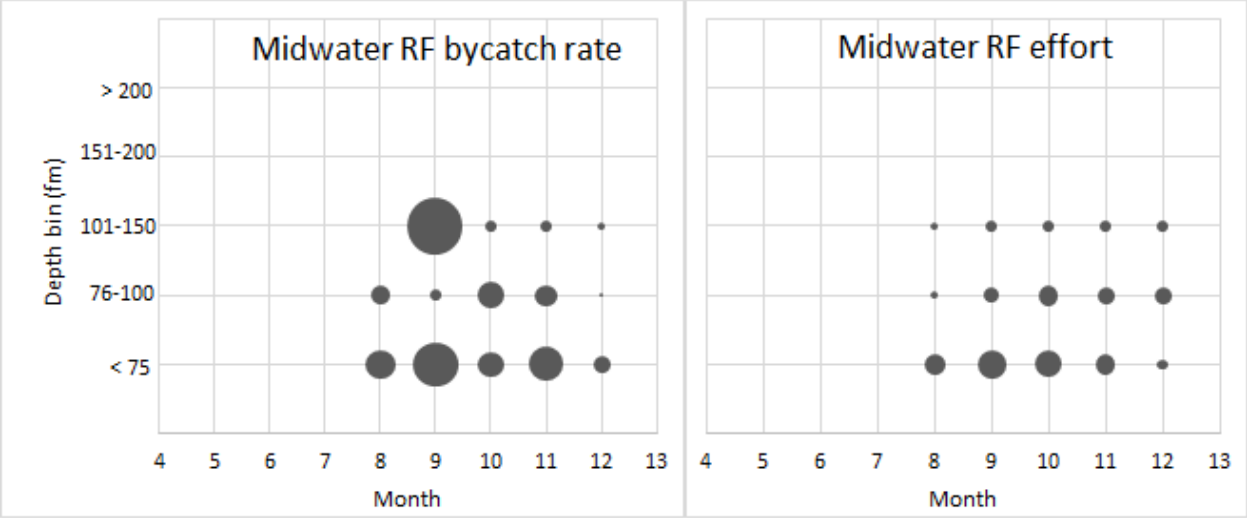
	Species	
Non-trawl groundfish fishery	**Chinook salmon (number)**	**Coho salmon (number)**
Commercial non-trawl[a/]	124	106
OR long-leader recreational[b/]	12	130
CA recreational skiff fishery[c/]	18	8
WA ocean bottomfish fishery[d/]	NA	NA
OR ocean bottomfish fishery[d/]	NA	NA
CA ocean bottomfish fishery[d/]	NA	NA
Buffer[e/]	250	250
Total	404	494

a/Maxiumum catch from 2002-2015; 100% discard mortality assumed; Table 5.
b/Bycatch rates were calculated from 2009-2011 long-leader EFPs
c/Ocean recreational groundfish fisheries outside of salmon season; 2012-2016. Chinook salmon mortality ranged from 0 to 17.78 per year; Coho 0 to 5.7 per year
d/Salmon catch by WA, OR, and CA ocean recreational groundfish fisheries is already accounted for in salmon pre-season modeling. Not reported here.
e/Buffer to account for OR and WA ocean recreational fisheries outside of the salmon season and uncertainty associated with commercial non-trawl estimates.

Non-whiting Mid-water Trawl

In November 2017, the Council recommended that BRAs, which are available as a routine inseason management measure at 660.60(c)(3) for the non-whiting midwater fishery in response to their take of non-whiting groundfish, be analyzed for use as a response to salmon bycatch and an additional BRA at 200 fm be considered.

With increased access to rebuilt canary rockfish, 2017 was the first year with a substantive target fishery for midwater rockfish in recent history. In the development of the BiOp and the 2017-2018 biennial harvest specifications and management measures, analysts used 2011-2016 haul-level data to inform mid-water non-whiting actions. Although there is bycatch rate and effort data by depth for the non-whiting midwater fishery from 2011-2016 (Table C-17 and Table C-18; Figure C-6; Figure C-7), there have been many significant recent changes in management of the fishery (e.g., drastically higher ACLs for canary and widow rockfishes) making it difficult to draw conclusions regarding the effectiveness of depth restrictions for reducing salmon bycatch going forward. This will likely be the same case even when haul level data becomes available for 2017, since so few salmon were caught in the trawl gear exempted fishing permit (EFP) and non-whiting mid-water fishery. Furthermore, there is insufficient data from 2011-2016 to investigate regional bycatch patterns for non-whiting midwater vessels since there were few hauls (482), and nearly all (90 percent) were north of Cape Falcon.



2017 trips have not yet been processed to link depth and catch.
Based on <50% whiting threshold.
Excludes hauls with <1 mt rockfish since unable to tell if these were "failed" whiting or rockfish hauls.

Figure C-6. Relative bycatch rates (# Chinook salmon/ mt rockfish) and effort (hauls) for the shoreside non-whiting mid-water fishery by month from 2011-2016 prior to increased midwater rockfish opportunity in 2017. There is insufficient data to show bycatch rate by area.

Depth bin	May	June	July	August	Sept.	Oct.	Nov.	Dec.
0-75								
76-100								
101-150								
151-200								
>200								

2017 trips have not yet been processed to link depth and catch.
Bycatch rate based on Chinook # per mt of combined midwater rockfish.
Based on <50% whiting threshold
Excludes hauls with <1 mt rockfish since unable to tell if these were "failed" whiting or rockfish hauls.
The color gradient goes from dark green (lowest bycatch rate, including zero) to red (highest bycatch rate). Blank cells represent zero hauls in that bin.

Figure C-7. Relative bycatch rates (# Chinook salmon/ mt mid-water rockfish) for the shoreside non-whiting mid-water fishery by month from 2011-2016 before the increase in the midwater rockfish opportunity in 2017 (EFP and post-May 15th midwater).

The GMT notes the Chinook bycatch rate in 2017 was 43 times lower than from 2011-2016 based on trip level data (haul level not finalized). The bycatch rate from the 2017-2018 trawl gear EFP and non-EFP non-whiting mid-water trips was 1 Chinook per 143 mt rockfish (42 chinook per 6,022 mt of widow, canary, and yellowtail rockfishes) in 2017 compared to 1 Chinook per 3.3 mt rockfish from 2011-2016 (1,412 Chinook per 4,702 mt rockfish). These stark differences in bycatch rates emphasize the GMT's concern with attempting to draw conclusions using 2011-2016 haul level data.

While there is limited data currently to inform the effectiveness of BRAs for the midwater rockfish fishery, the Council could make them available in regulation during the 2019-2020 biennial process and then use inseason data to inform whether they would be useful in mitigating salmon bycatch inseason.

Non-whiting bottom trawl

While BRAs for the non-whiting midwater trawl fishery are the only management measure currently being considered to address take of salmon by the non-whiting sector in the 2019-2020 biennium, the GMT would like to remind the Council that there is also potential for management measures for bottom trawl vessels to be developed within the essential fish habitat and rockfish conservation area (EFH/RCA) action item. In the Council's Preliminary Preferred Alternative (PPA) in November 2016, the Council recommended block areas closures be analyzed as a potential tool for mitigating salmon bycatch in the groundfish bottom trawl fishery. The Council is currently scheduled to take final action on the EFH/RCA item in April 2018. As a reminder, BRAs are currently designed to close shoreward of a specified fathom line between two latitude lines, while block area closures would be able to close between a set of latitude lines (e.g., North of Cape Falcon to the U.S.-Canada border) and a set of fathom lines (e.g., 100 to 150 fm). The Council could consider modifying BRAs to be more like block area closures.

Non-whiting Alternatives

Issue B: Reference point for tracking non-whiting bycatch of salmon
For tracking salmon bycatch inseason, the GMT proposes the following ROA for Council consideration. These reference points would be used to assess catch of the trawl sub-sectors (groundfish bottom and non-whiting midwater) inseason; however, these would not be established in regulation unless used for an automatic action. These alternatives are based on the maximum historical bycatch amounts in the nearshore and non-nearshore fisheries as well as the maximum for the recreational fisheries not accounted for in pre-season salmon modeling. When new data becomes available, the Council could consider modifying the reference point.

Non-whiting trawl reference point alternatives (minus deductions for fixed gear and recreational)
No Action: No reference point for tracking inseason
Alternative 1: 5,096 (5,550 threshold - 404 analyzed in the BiOp that includes: 124 for nearshore/non-nearshore (maximum bycatch) -18 maximum for CA recreational bottomfish fisheries outside salmon season - 12 assumed maximum OR longleader - 250 buffer for uncertainty for commercial non-trawl and OR/WA recreational bottomfish outside salmon seasons)

Issue C: Salmon mitigation measures for non-whiting midwater trawl
The GMT proposes the following ROA for mitigation measures to address salmon take in the non-whiting mid-water trawl sub-sector for Council consideration. As a reminder, these alternatives could be considered in the 2019-2020 harvest specifications and management measures, or in another process, but must be evaluated and recommended within three years of the publication of the ITS.

No Action: Status Quo (BRAs available to minimize the incidental harvest of any protected or prohibited species taken in the groundfish fishery (including salmon))
Alternative 1: Make BRAs available at 200 fm for non-whiting midwater trawl available in regulation for routine inseason action (Council recommends implementation to NMFS at a Council meeting) to minimize the incidental harvest of any protected or prohibited species taken in the groundfish fishery (this includes salmon)

Alternative 2: Make BRAs an automatic authority for non-whiting midwater trawl and revise regulations so that exceedance of the non-whiting salmon threshold of X Chinook salmon would trigger the automatic implementation of a BRA

As with the at-sea sectors, if the Council were to choose Alternative 2 and make BRAs an automatic authority, the Council would need to consider the threshold or trigger that would result in a BRA being implemented. Automatic actions are non-discretionary and would need to include clear directions for NMFS.

Developing a threshold or trigger that would prompt automatic BRA closures for non-whiting would be challenging since deductions would have to be made for all other non-whiting sectors. This includes commercial fixed gear and select recreational fisheries as discussed above plus another deduction for bottom trawl (noting all non-tribal is counted toward whiting). As seen in Table C-3, bycatch from the bottom trawl fishery has been under 1,000 Chinook per year since 2005 but at highly variable levels (e.g., 67 in 2006 vs. 984 in 2014).

Table C-3. Annual bycatch of Chinook salmon from the bottom trawl fisheries.

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
14,501	16,433	1,758	808	67	194	449	304	282	175	304	323	984	996	371

C.1.2.3 Coho Salmon

While the GMT's primary focus was Chinook salmon, RPM 2 does state that the Council and NMFS will review and develop mechanisms to prevent exceeding the coho salmon thresholds of 474 coho salmon for the whiting sector and 560 coho for the non-whiting sector, which are the historical maximums. Note that the non-whiting threshold includes a mortality buffer of 250 coho salmon (see Table 2-56 of the BiOp) for uncertainty in estimates. Unlike the exceedance of the Chinook salmon thresholds and reserve, exceedance of the coho salmon guidelines alone will result in re-consultation.

The GMT notes that bycatch of coho salmon in the whiting fishery is characterized by extreme volatility, which makes it impractical to evaluate factors (e.g., depth) that affect bycatch and would also cause projection models to be so uncertain as to have little inseason management value (e.g., 200 +- 400 fish). The most effective mechanism for staying within the whiting sector coho salmon threshold could therefore be outreach to industry. The same is true for non-whiting, noting there is less risk of an overage since the threshold of 560 is based on the maximum (310) plus a buffer of 250. Bycatch would have to nearly double the historical maximum for the non-whiting threshold to be exceeded.

Table C-4. Whiting sector bycatches of coho salmon by year in relation to 474 fish threshold.

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
At-sea	146	3	1	86	28	227	21	12	0	5	17	6	99	4	2	0
Shorebased	14	0	8	37	18	141	10	37	16	137	15	33	163	16	5	27
Tribal	23	193	207	344	3	107	21	57	5	27	0	91	0	0	1	6
Total	183	196	216	467	49	475	52	106	21	169	32	130	262	20	8	33
% 474 threshold	39%	41%	46%	99%	10%	100%	11%	22%	4%	36%	7%	27%	55%	4%	1%	7%

Table C-5. Non-whiting commercial sector bycatches of coho salmon by year.

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bottom Trawl	24	32	66	5	0	13	0	0	31	19	27	49	18	3
Midwater Rockfish	0	0	0	0	0	0	0	0	0	0	0	0	12	7
CS - Fixed Gear	0	0	0	0	0	0	0	0	0	0	0	0	15	0
Nearshore	0	0	45	0	0	12	42	71	42	63	16	19	69	29
Non-nearshore Fixed Gear	0	3	0	3	0	4	0	0	0	0	0	0	22	3
WA rec. bottomfish outside salmon season	0.6	2.1	22.2	11.7	10.5	50.8	1.5	33.1	17.2	29.6	26.4	21.5	22.6	21.0
OR rec. bottomfish outside salmon season	0.6	0.6	0.6	1.8	0.9	0.0	6.0	6.3	9.9	24.9	0.9	0.0	0.3	4.5
CA rec. bottomfish outside salmon season	--	--	--	--	--	--	--	--	--	--	0	0	0	0
Total a/	25.2	37.7	133.8	21.5	11.42	79.83	49.49	110.41	100.11	136.53	70.27	89.54	158.91	67.54
% of 560 threshold	5%	7%	24%	4%	2%	14%	9%	20%	18%	24%	13%	16%	28%	12%

a/ Does not include 130 for the assumed maximum for the Oregon longleader rec. fishery that was analyzed in the BiOp (Table 2-53).

C.1.2.4 RPM 3: The Reserve

RPM 3 requires NMFS and the Council to "develop and implement regulations regarding the Reserve and its use, ensuring that the Reserve will be available only to address unexpected high bycatch levels, and it will not be available as a matter of course to allow the sectors to exceed their bycatch guidelines" (RPM 3, p2-185). The ITS also provided three terms and conditions required to implement this RPM:

> 3. a. The Council and NMFS shall develop and implement initial regulations governing the Reserve of 3,500 Chinook salmon as part of the 2019-2020 biennial specifications and management measures. These regulations will be designed to, among other things, allow for inseason action to prevent any exceedance of a sector guideline plus the full amount of the Reserve and minimize the chance that the Reserve is used in three out of any consecutive five years.
>
> 3. b. NMFS shall monitor the use of the Reserve in 2019 and will provide a report to the Council during the process of developing the biennial specifications for 2021-2022. The report will summarize the use of the Reserve and recommend, if needed, changes to the regulations governing the Reserve.
>
> 3. c. If, at any time during the fishery, it is anticipated that the coastwide bycatch will exceed the annual Chinook salmon bycatch guideline of 11,000 for the whiting sector or 5,500 for the non-whiting sector, NMFS and the Council will take action to avoid an exceedance of either guideline. If either sector exceeds its guideline plus the Reserve, fisheries for that sector will close for the remainder of the year. If a sector exceeds its guideline plus the Reserve, but the other sector has not exceeded its guideline, only the sector that has exceeded its guideline plus the Reserve will be closed. If one sector has been closed for the remainder of the year under the above scenario, and the other sector reaches its guideline, all sectors would be closed for the remainder of the year. NMFS and the Council shall develop and implement regulations governing closure of the fishery sector(s) as described here as part of the biennial harvest specifications and management measures for 2019-2020.

In order to understand the requirements of RPM 3, the GMT focused on T&Cs 3a and 3c. T&C 3a specifically requires the Council and NMFS to develop inseason management practices governing the use of the reserve. T&C 3c provides specific criteria for when a sector (whiting or non-whiting), and potentially the entire groundfish fishery, would need to close automatically upon reaching or exceeding salmon bycatch guidelines provided in the ITS. Because T&C 3c requires the consideration of actions taken to address 3a, the GMT chose to look at how both T&Cs work together and then discussed each T&C individually below.

As the BiOp states throughout, the Reserve is not meant to be used as a matter of course. It is meant to be a "safety net to minimize disruption in the fishery where actions that were already taken to reduce bycatch were insufficient" (p1-25). The GMT took this to mean that the Reserve should not be partitioned out automatically if a sector were projected to or reached a threshold, but rather some consideration should be given to whether or not (1) depending on the timing in the season, there could be a disruption to the sector by closing the sector if they reach their guideline, and (2) there were actions previously taken to address salmon take and the degree to which these actions were sufficient to reduce the rate of salmon bycatch for that sector.

Based on that information, the Council and NMFS could decide whether or not a sector could have access to the reserve during a routine inseason agenda item at a Council meeting. Note that if a sector were to exceed a threshold between Council meetings, and there was no previous discussion or direction at the prior meeting, the sector would be allowed to continue fishing as normal unless a mitigation measure was available in regulation (e.g., BRA). Figure C-8 below provides a decision map illustrating this process.

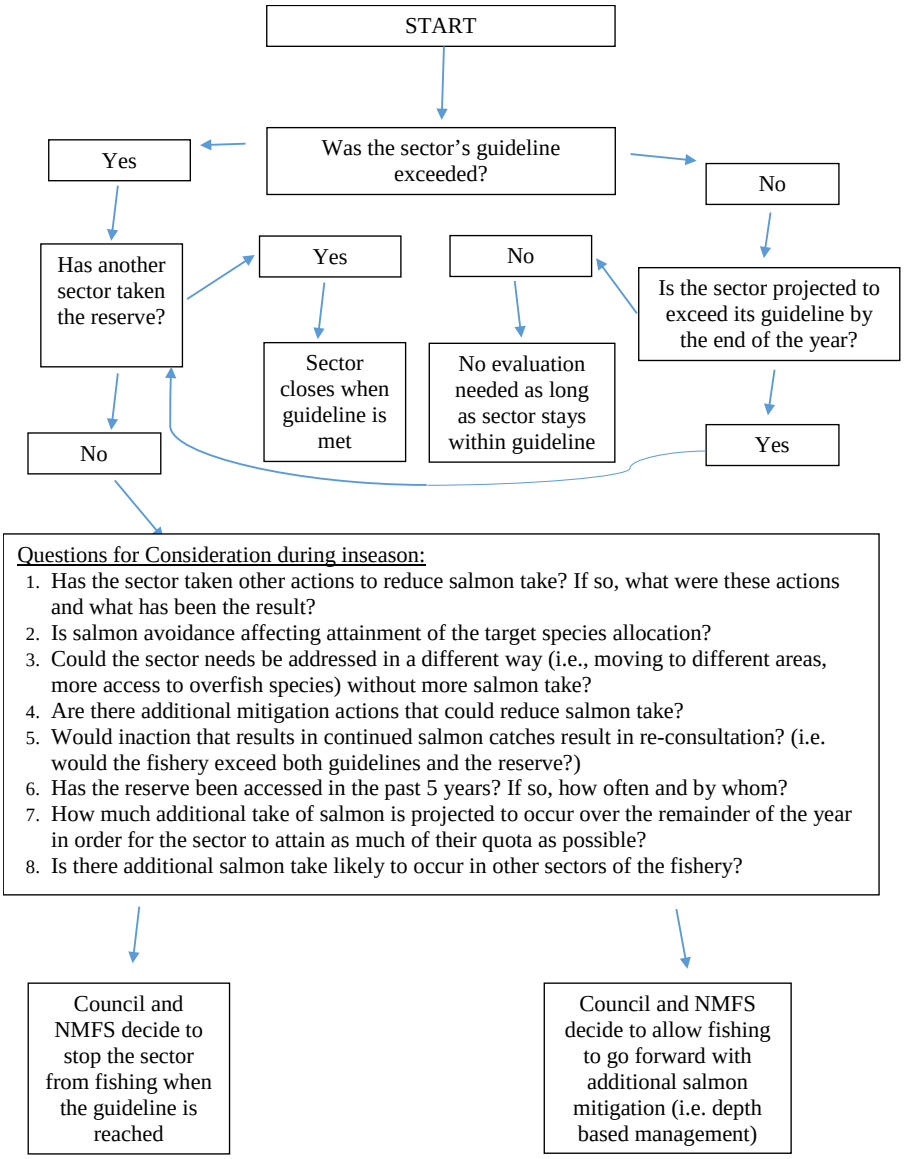


Figure C-8. Decision map for addressing risks to sector salmon bycatch guidelines in the 2017 Salmon BiOp.

As Figure C-8 shows, the only times when automatic action is required per the ITS are (1) if a sector exceeds or is projected to exceed their guideline plus the reserve, or (2) if one sector has already taken their guideline plus the reserve and the other sector exceeds or is projected to exceed their guideline. Beyond those two instances, NMFS and the Council would have the ability at a Council meeting to discuss questions, such as those in the "questions for consideration" box, and make an informed decision based on the best available science to either allow fishing to continue or to close a sector when they exceed or are projected to exceed

their guideline. As was mentioned under RPM 1, salmon take can be tracked inseason for the trawl fisheries, which are the most likely to take salmon. This inseason tracking ability may reduce the need for the automatic actions we currently have in regulation (i.e., the OSCZ) or develop additional automatic actions. An adaptive management approach, like the one described here, allows industry and the Council to react to ongoing and projected salmon take, and then make an informed decision.

However, there is some risk with this approach. As mentioned above, there is the possibility that salmon take by one sector could exceed their guideline between Council meetings. The Council would therefore need to accept the risk of allowing a sector to access the reserve, without triggering any mitigation measures, until it was addressed at the following Council meeting. Table C-6 illustrates the potential risk between Council meetings. This example focuses on the trawl fisheries (whiting, non-whiting bottom trawl, and non-whiting midwater trawl) which are the sub-sectors most likely to take salmon.

As can be seen from Table C-6, there are periods during the year (shaded in grey) that the Council would not have the ability to react inseason at a Council meeting to a sector exceeding a salmon bycatch threshold. However, it is unlikely that the Council would need to address an issue with salmon bycatch until later in the year when all sectors (whiting and non-whiting) are fishing. As shown in Figure C-1 and Figure C-6, September, October, and November tend to have the highest salmon bycatch rates in the whiting and non-whiting, specifically midwater trawl, fisheries.

Table C-6. Illustration of where and how the Council and NMFS would be able to respond to salmon bycatch by trawl fisheries. Cells shaded in light grey show where fishing takes place and there is no opportunity for the Council to react to bycatch of salmon.[6]

Time of Year	Whiting	Non-whiting Midwater Trawl	Non-whiting Bottom Trawl
January - March	Not fishing	Not fishing	Fishing
March CM	Not fishing	Not fishing	Fishing; Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; no inseason management measures currently available specifically for bottom trawl
April CM	Mid-April fishing begins in some parts	Mid-April fishing begins in some parts	Fishing; Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; no inseason management measures currently available specifically for bottom trawl
May	Mid-May all seasons and areas open to fishing	Mid-May all seasons and areas open to fishing	Fishing
June CM	Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; potential mitigation measures available inseason depending on Council action under RPM 2	Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; potential mitigation measures available inseason depending on Council action under RPM 2	Fishing; Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; no inseason management measures currently available specifically for bottom trawl
July - September	Fishing; automatic action authority potentially available depending on Council action under RPM2 and RPM3	Fishing; automatic action authority potentially available depending on Council action under RPM2 and RPM3	Fishing
September CM	Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; potential mitigation measures	Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; potential mitigation measures available	Fishing; Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; no inseason management measures currently available specifically for bottom trawl

[6] This table provides information on the normal course of fishing allowed under current regulations and does not reflect any exempted fishing which occurs under an exempted fishing permit.

Time of Year	Whiting	Non-whiting Midwater Trawl	Non-whiting Bottom Trawl
	available inseason depending on Council action under RPM 2	inseason depending on Council action under RPM 2	
October	Fishing; automatic action authority potentially available depending on Council action under RPM2 and RPM3	Fishing; automatic action authority potentially available depending on Council action under RPM2 and RPM3	Fishing
November CM	Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; potential mitigation measures available inseason depending on Council action under RPM 2	Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; potential mitigation measures available inseason depending on Council action under RPM 2	Fishing; Council will have data on salmon and could begin projecting bycatch of salmon for the year based off current bycatch rates; no inseason management measures currently available specifically for bottom trawl
December	Fishing; automatic action authority potentially available depending on Council action under RPM2 and RPM3	Fishing; automatic action authority potentially available depending on Council action under RPM2 and RPM3	Fishing

T&C 3a requires the Council and NMFS develop initial regulations governing the Reserve, which allow for inseason action to prevent any exceedance of a sector guideline plus the Reserve. The GMT has provided an ROA for Council consideration within this report to mitigate salmon bycatch, and will comment on the selection of a PPA in April. As more mitigation measures are developed under RPM 2 and other Council actions (i.e., EFH/RCA), the "toolbox" of mitigation measures will grow.

T&C 3c requires the development of regulations, through the 2019-2020 biennial harvest specifications and management measures, for an automatic authority which closes a sector (whiting or non-whiting) when that sector exceeds its guideline plus the reserve, or when one sector has been closed under the prior scenario and the other sector reaches its guideline. Then, all sectors would be closed for the remainder of the year. With those authorities in place beginning in 2019, the Council could be sure there is a safety net to close the sectors during the times highlighted in light grey in Table C-6, if the sector met the conditions of the automatic authority. Alternatives to implement the automatic authority were developed and are listed below for the Council's consideration.

Alternatives

Issue 5: Automatic authorities for salmon bycatch thresholds and the Reserve
No Action: No automatic authorities around the salmon thresholds will be implemented in regulation
Alternative 1: Include two automatic authorities in regulations that would

(1) close either sector (whiting or non-whiting) upon that sector having exceeded or being projected to exceed its salmon bycatch threshold and the reserve amount of 3,500, and
(2) close a sector (whiting or non-whiting) when one sector has been closed after exceeding or being projected to exceed its salmon bycatch threshold and the reserve amount of 3,500, and the second sector exceeds or is projected to exceed its salmon bycatch threshold.

Attachment 1: Data summaries of salmon bycatch and effort

Table C-7. Total At-Sea Chinook Catch (#s of fish) by month and depth, 2011-2017.

Depth Bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% of Total Chinook
0-75	409			0	117	0	0	0	1.9%
76-100	4	28	4		163	0	0	0	0.7%
101-150	106	56	1	6	1,054	917	767	0	10.7%
151-200	228	229	2	27	885	4,803	2,117	172	31%
>200	1,366	279	2	25	1,928	5,418	4,767	1,401	55.7%

*Some cells are merged to maintain confidentiality
*No tribal data included
*Records without bottom depth filtered out

Table C-8. At-Sea Bycatch Rate of Chinook (#/mt of whiting) by month and depth, 2011-2017.

Depth Bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0-75	0.112			N/A	1.122	N/A	N/A	N/A
76-100	0.009	0.006	0.004		0.629	N/A	N/A	N/A
101-150	0.012	0.006	0.001	0.007	0.107	0.097	0.659	N/A
151-200	0.007	0.009	0.006	0.005	0.02	0.076	0.166	0.16
>200	0.006	0.003	0	0.002	0.014	0.029	0.053	0.109

*N/A means no effort occurred (see below)
*Some cells are merged to maintain confidentiality
*No tribal data included
*Records without bottom depth filtered out

Table C-9. Number of Hauls in At-Sea Sector by month and depth, 2011-2017.

Depth Bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% of Hauls
0-75	103			0	4	0	0	0	0.5%
76-100	9	91	27		6	0	0	0	0.7%
101-150	185	205	44	25	198	202	24	0	4.5%
151-200	690	530	14	113	770	1,214	251	18	18.2%
>200	4,237	1,704	182	361	2,422	3,911	2,000	289	76.2%

*Some cells are merged to maintain confidentiality
*No tribal data included
*Records without bottom depth filtered out

Table C-10. Number of Chinook in At-Sea Sector by month and area, 2011-2017.

Area Bin	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% of Chinook
N of Cape Falcon	926	182	18		267	26	296	347	7.6%
Cape Falcon to Cape Blanco	438	498	35	29	3,678	10,398	5,436	280	76.2%
Cape Blanco to 40° 10' N. lat.	343	291	2	11	202	714	1,919	946	16.2%

Table C-11. Bycatch Rate in At-Sea Sector by month and area, 2011-2017.

Area Bin	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
N of Cape Falcon	0.008	0.004	0.002		0.011	0.005	0.016	0.077
Cape Falcon to Cape Blanco	0.007	0.009	0.008	0.003	0.024	0.048	0.097	0.048
Cape Blanco to 40° 10' N. lat.	0.004	0.012	0	0.007	0.02	0.02	0.065	0.264

Table C-12. Number of Hauls in At-Sea Sector by month and area, 2011-2017.

Area Bin	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% of Hauls
N of Cape Falcon	2,576	1,025	24	213	554	152	408	86	25.4%
Cape Falcon to Cape Blanco	1,175	1,105	143	241	2,653	4,460	1,209	136	56.1%
Cape Blanco to 40° 10' N. lat.	1,372	479	109	58	193	715	658	85	18.5%

Table C-13. Total Shoreside Whiting Chinook Catch (#s of fish) by month and depth, 2011-2016.

Depth bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% Chinook
0-75	c	302	1,145	1,885	566	41	---	---	24.0%
76-100	3	89	329	287	603	664	159	---	13.0%
101-150	10	168	250	407	1,222	2,071	939	c	30.9%
151-200	30	36	251	217	842	2,171	826	103	27.3%
>200	10	4	21	38	64	240	389	c	4.7%

c = data confidential due to less than 3 different vessels

Table C-14. Total Shoreside Whiting Catch of Whiting by month and depth, 2011-2016.

Depth bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% Hake
0-75	c	11,489	22,841	27,472	11,000	1,166	---	---	14.9%
76-100	366	11,570	26,578	38,484	28,234	16,426	1,438	---	24.8%
101-150	3,179	24,409	34,138	36,755	30,546	31,454	7,346	c	33.9%
151-200	953	7,947	19,372	20,972	19,515	13,481	6,174	389	17.9%
>200	592	1,145	10,757	13,055	5,120	7,606	3,669	c	8.5%

c = data confidential due to less than 3 different vessels

Table C-15. Shoreside Bycatch Rate of Chinook (#/mt of whiting) by month and depth, 2011-2016. Grand mean is the properly-weighted average bycatch rate for that depth bin (sum of total chinook / sum of total whiting).

Depth bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Grand mean
0-75	c	0.026	0.050	0.069	0.051	0.035	---	---	0.053
76-100	0.009	0.008	0.012	0.007	0.021	0.040	0.111	---	0.017
101-150	0.003	0.007	0.007	0.011	0.040	0.066	0.128	c	0.030
151-200	0.031	0.005	0.013	0.010	0.043	0.161	0.134	0.263	0.050
>200	0.017	0.003	0.002	0.003	0.012	0.032	0.106	c	0.018

c = data confidential due to less than 3 different vessels

Table C-16. Shoreside whiting number of hauls by month and depth, 2011-2016.

Depth bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	% Hauls
0-75	c	228	521	485	193	24	---	---	15.0%
76-100	9	241	487	622	404	276	27	---	21.4%
101-150	46	492	694	738	535	512	143	c	32.7%
151-200	17	212	479	479	452	290	148	7	21.6%
>200	10	36	259	272	107	143	78	c	9.4%

c = confidential due to less than 3 different vessels

Table C-17. Shoreside non-whiting number of hauls by month and depth, 2011-2016.

Depth bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
0-75	c	c	c	43	79	68	41	10	272
76-100		c	c	5	23	41	30	30	134
101-150		c		4	12	12	13	13	c
151-200								c	c
>200			c	c	c			c	6

c = data confidential due to less than 3 different vessels

Table C-18. Shoreside non-whiting bycatch rates (# Chinook per mt widow, yellowtail, and canary rockfishes) by month and depth, 2011-2016. GMT strongly emphasizes that these bycatch rates may not be reflective of the future, given the vast changes in the fishery that occurred in 2017.

Depth bin (fm)	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0-75	c	c	c	0.303	0.693	0.218	0.400	0.104
76-100		c	c	0.141	0.047	0.224	0.157	0.006
101-150		c		0.000	1.062	0.041	0.056	0.014
151-200								c
>200			c	c	c			c

c = data confidential due to less than 3 different vessels
Insufficient data to split regionally (90 percent of hauls from north of Falcon)
Note 2017 hauls have not been processed yet, which is when fishery effort re-emerged

C.2 *Additional Analysis*

Several measures are designated in the groundfish FMP and in regulation as routine. Routine in this context means those measures that have previously been analyzed and implemented in regulation. Additional analysis was requested for one routine measure that was proposed to be adjusted in the 2019-2020 biennium and is presented in Section B.1.1.

C.2.1 Updates to Rockfish Conservation Area Coordinates in California

Part A

1. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

This management measure proposes to modify the current Rockfish Conservation Area (RCA) boundaries in California to correct areas of crossover or to better-align depth contours with actual depths. The current RCA lines specified in regulation at 50 CRF 660.71 – 660.73 are intended to approximate the fathom isobaths throughout the extent of the RCAs. A crossover is defined as an area where one RCA line deviates too much from the isobath it is supposed to approximate and crosses another RCA line into an area that is either too shallow or deep for the depth that the RCA line is supposed to represent. RCA lines will be modified to achieve better alignment with their corresponding isobaths and to correct a subset of crossovers. In doing so, the stocks and fisheries that will be affected would be those in the shelf, and slope rockfish complexes, as well as some flatfish. These RCA line modifications are proposed for seven areas along the California coast.

Crossovers associated with RCA lines currently or likely to be used in management have been identified. Charts delineating the subset of areas for proposed modifications are provided in Attachment 2, and proposed modified waypoint coordinate tables are provided in Attachment 3.

The 75 fm depth contour is proposed to be modified at Santa Cruz Island in southern California. The 100 fm depth contour is proposed to be modified in the following areas: 1) Spanish Canyon in northern California, and 2) Delgada Canyon in northern California. The 125 fm depth contour is proposed to be modified in the following areas: 1) Delgada Canyon in northern California, 2) Cordell Bank northwest of San Francisco, 3) Point Año Nuevo in central California, 4), San Miguel Island in southern California, and 5) Anacapa Island in southern California. The 150 fm depth contour is proposed to be modified in the following areas: 1) San Miguel Island in southern California, and 2) Anacapa Island in southern California.

2. What was considered in order to optimize the performance of this measure?

Geographic Information System (GIS) software was used to identify all RCA line crossovers in California. Due to the abundance of small crossovers, only modifications to the crossovers associated with RCA lines currently or likely to be used in management have been proposed at this time. Modifications range from adding waypoints, moving an existing waypoint, and/or deleting a waypoint. RCA lines were compared to depth contour lines generated from National Geophysical Data Center coastal relief models to ensure that RCA modifications approximated actual depths as closely as possible. California's Law Enforcement Division (LED) personnel reviewed the proposed depth contour modifications and agreed they were reasonable and enforceable.

3. What and when was the Council's decision made, and how did it arrive at the decision?

The Council regularly examines the appropriateness of the coordinates defining the boundary lines used to define closed areas through the harvest specifications and management measure process. The Council has endorsed these changes to improve fishing practices while reducing bycatch of overfished species. The need to protect these species is the main reason for the creation of the RCAs, and modifications improve data used in bycatch models, while at the same time establishing and providing fair and equitable opportunities for harvesters and their communities (see part B, question 1 below).

4. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

As stated above (#3), the Council regularly examines the appropriateness of the coordinates defining the boundary lines used to define closed areas through the harvest specifications and management measure process. When deemed appropriate, the Council has supported recommended modifications.

Part B

1. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

The primary objective of this management measure is to eliminate issues caused by crossovers. Potential issues associated with crossovers include:

1. A change to the RCA depth used in management results in the opposite effect to that which was intended (i.e., localized reduction in fishing opportunity when the intent was to increase opportunity, or localized expansion in fishing opportunity when the intent was to protect a range of depths).
2. Confusion, on the part of all stakeholders, interpreting RCA closures when there are crossovers associated with the two lines that bound the RCA.

As part of the process of correcting crossovers, RCA lines will be modified to achieve better alignment with their corresponding isobaths. This will allow better access to target species by more accurately defining closed areas. By more accurately defining the depth contours, these proposed changes will increase the available fishing area in some areas by 6.3 mi^2, but decrease it in others by 4.6 mi^2, resulting in a net change of only 1.7 mi^2. In addition, mortality generated from fishing effort will better fit the bycatch model estimates since estimates assume that mortality is derived from specific fishing areas and the depths defining those areas.

The intent of the RCA is to protect overfished species by minimizing bycatch. Proposed modifications aim to maintain the intent of the RCA lines, while at the same time keeping the harvest levels of target species within acceptable harvest limits. These modifications are intended to allow improved access to target species by having specific latitude and longitude waypoint coordinates approximate depth contours as closely as possible. Achieving the described objectives will provide better opportunity to the fishing communities by helping participants to efficiently achieve their fishing harvest.

2. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate National Environmental Policy Act (NEPA) compliance strategy.
    a. How would you describe this new management measure (may select more than one)

- ■ Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
- ❑ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
- ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
- ❑ Designed to mitigate a negative economic or social effect.
- ■ Applies to only a small area of the total EEZ.

b. What resource(s) would the management measure likely affect, either positively or negatively?

- ❑ Physical EFH or Ecosystems
- ■ Biological Resources (target, non-target species)
- ❑ Protected Resources (mammals, ESA-listed)
- ❑ Economic, social, cultural

c. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.

- ❑ Physical EFH or Ecosystems
- ❑ Biological Resources (target, non-target species)
- ❑ Protected Resources (mammals, ESA-listed)
- ❑ Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects.' Remember both positive and negative effects.

1. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

These changes are not expected to result in changes in catch of target groundfish stocks compared to past catches or any of the harvest specifications approved for 2019-2020. These changes are not expected to increase the risk of overfishing and managed species are expected to remain within the ACLs.

    b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

These RCA boundary line changes may change the harvest patterns of the fishing community. However, any changes to the harvest patterns of the fishing community are expected to be very minor due to the fact that only small changes are being proposed for the boundary lines.

2. Other Fish
    a. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial, and to what stocks? How is this catch monitored? Are the affected stocks managed under another Federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

It is not anticipated that the catch of non-groundfish species will change as a result of these modifications because these modifications will make very small changes to fishable areas, and those who fish these areas will probably not alter their fishing behavior to any marked degree since they will continue to target groundfish species as they have in the past.

3. EFH and Ecosystems
    a. Will this management measure change fishing activity so as to adversely affect EFH compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

No anticipated effects are expected. Any EFH that is currently in effect or that may be adopted under amendment 28 to the Pacific Coast Groundfish FMP will remain in effect and not be affected by this action.

    b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

No anticipated effects are expected. An evaluation of the NOAA Deep Sea Coral database reveals that these small area modifications do not open any fishing areas that overlap areas known to support deep sea coral ecosystems.

    c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No anticipated effects are expected. These small area modifications are not likely to result in increased fishing effort by local participants in a manner that would result in impacts to biodiversity of ecosystem functioning.

4. Marine Mammals and ESA Species
    a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods, changes in the temporal and/or geographic distribution fishing effort.

No anticipated effects are expected. These small area modifications are not likely to result in increased fishing effort by local participants in a manner that would result in impacts to ESA-listed species.

5. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example, which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

Since these modifications are identified on a localized area basis, no major changes among user groups and fishing communities are anticipated. These modifications have the potential to improve fishing operations and the fishing communities they serve to a very small degree by improving the alignment of RCA boundaries to depth contours and by reducing confusion in interpreting RCA boundaries. It is anticipated that no negative impacts will be experienced by other fishing groups as a result of these modifications.

b. Can the proposed action reasonably be expected to significantly affect public health or safety?

No anticipated effects.

6. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

Repeat each set of questions for affected resources (Groundfish, other fish, EFH, ecosystems, ESA species, marine mammals, social, and economic).

a. Does the proposed management measure have non-negligible adverse effects to the resource? *If none, then stop and proceed to the next resource.*
b. Is it likely that any current or future fishery management actions may have overlapping effects with this management measure on the resource?
c. Is it likely that any current or future non-fishery management actions may have overlapping effects with this management measure on the resource?
d. Qualitatively or quantitatively, add the effects in (a), (b), and (c) projected to the end of 2020. Can the sum of the effects be considered 'significant'? Consider both positive and negative effects.
e. Whether significant or not, what is the proposed new management measure's contribution to the total effect? E.g., the incremental impact from this management measure to the cumulative effects on groundfish is negligible/high/medium.

Groundfish – There are no cumulative effects to groundfish because these small area modifications are not likely to result in increased fishing effort by local participants in a manner that would result in impacts to groundfish. The incremental impact from this management measure to the total cumulative effects on groundfish is negligible.

Other Fish – There are no cumulative effects to state-managed species because these small area modifications are not likely to result in increased fishing effort that would result in impacts to other fish in this area. The incremental impact from this management measure to the total cumulative effects on other fish species is negligible.

EFH – There are no cumulative effects to EFH because no changes are proposed to existing EFH inside the RCA as part of this management measure. The incremental impact from this management measure to the total cumulative effects on EFH is negligible.

Ecosystem – There are no cumulative effects to ecosystems because the proposed management measure is not expected to adversely affect vulnerable marine or coastal ecosystems or adversely affect biodiversity. The incremental impact from this management measure to the total cumulative effects on the ecosystem is negligible.

ESA species – There are no cumulative effects to ESA species because these small area modifications are not likely to result in increased fishing effort that would result in impacts to ESA listed species in this area. The incremental impact from this management measure to the total cumulative effects on ESA species is negligible.

Marine mammals – There are no cumulative effects to marine mammals because these small area modifications are not likely to result in increased fishing effort that would result in impacts to marine mammals in this area. The incremental impact from this management measure to the total cumulative effects on marine mammals is negligible.

Social – There are no cumulative social effects because this management measure is not expected to change distribution of fishing effort among user groups. The incremental impact from this management measure to the total cumulative effects on social impacts is negligible.

Economic – There are no cumulative economic effects because these small area modifications are not likely to result in increased fishing effort that would impact the groundfish fishery in this area. The incremental impact from this management measure to the total cumulative effects on economic impacts is negligible.

7. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

These small area modifications are not likely to result in increased fishing effort. Therefore, anticipated effects are not expected to be highly controversial.

    b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Similar RCA line coordinate changes have been made numerous times in prior biennial specification processes. In addition, these small modifications are not likely to result in increased fishing effort. Therefore, the proposed action's effects on the human environment are not likely to be highly uncertain or involve unique or unknown risks.

8. MSA National Standards
    a. Describe how the management measure is consistent with the 10 MSA National Standards.

The intent of RCAs is to protect overfished species by preventing fishing in areas where these species of concern are more likely to be found. This management measure will not jeopardize the safeguards of the RCAs and will increase the clarity and accuracy of the boundaries that define these areas. Clear and accurate boundaries may increase the likelihood that participants will more efficiently reach their individual harvest targets, and fishery sectors' harvest limits while protecting overfished species. This would address National Standard 1.

Adjustments to RCA lines are necessary because discrepancies exist between the RCA lines and the depth contours that they are based on. Best available fathom isobaths were used to achieve better alignment of RCA boundary lines to isobaths, which is consistent with National Standard 2.

Improvements to the clarity of the RCA boundaries are consistent with National Standard 5 because improvements will reduce confusion, which will increase efficiency and reduce costs.

Inherent in the RCA system, the goals of promoting conservation and minimizing bycatch of species of concern and non-target species has been addressed. This management measure improves RCAs by providing slight modifications to better match depth contours, thus meeting National Standard 9.

Attachment 2: Maps of proposed modifications to 75, 100, 125, and 150 fm RCA line waypoints.

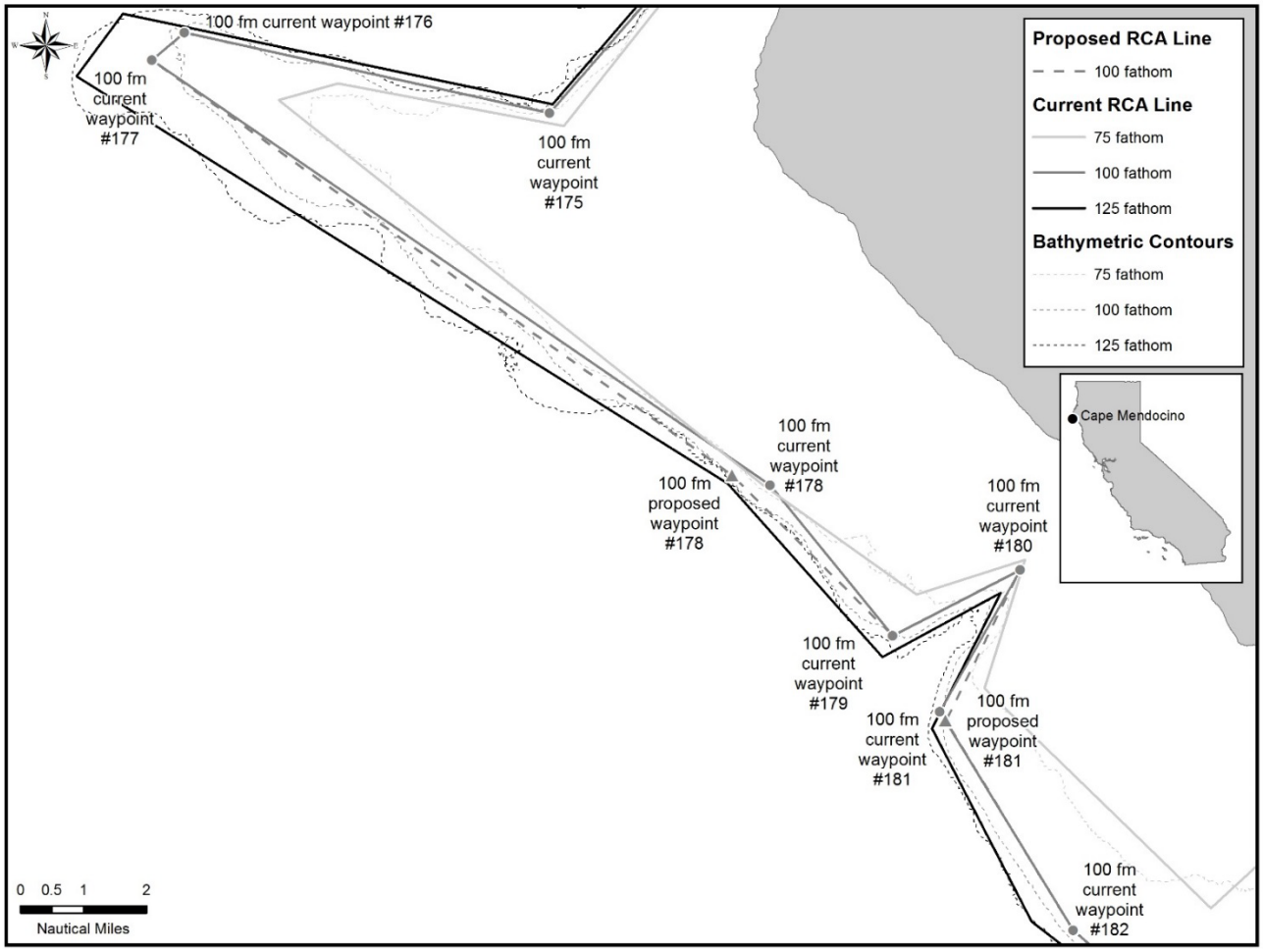


Figure C-9. Proposed 100 fm RCA line changes at Spanish Canyon. This proposed change would decrease the size of the limited entry trawl RCA by 2.7 mi² but increase the size of the non-trawl RCA north of 40°10' N. latitude by 1.7 mi².

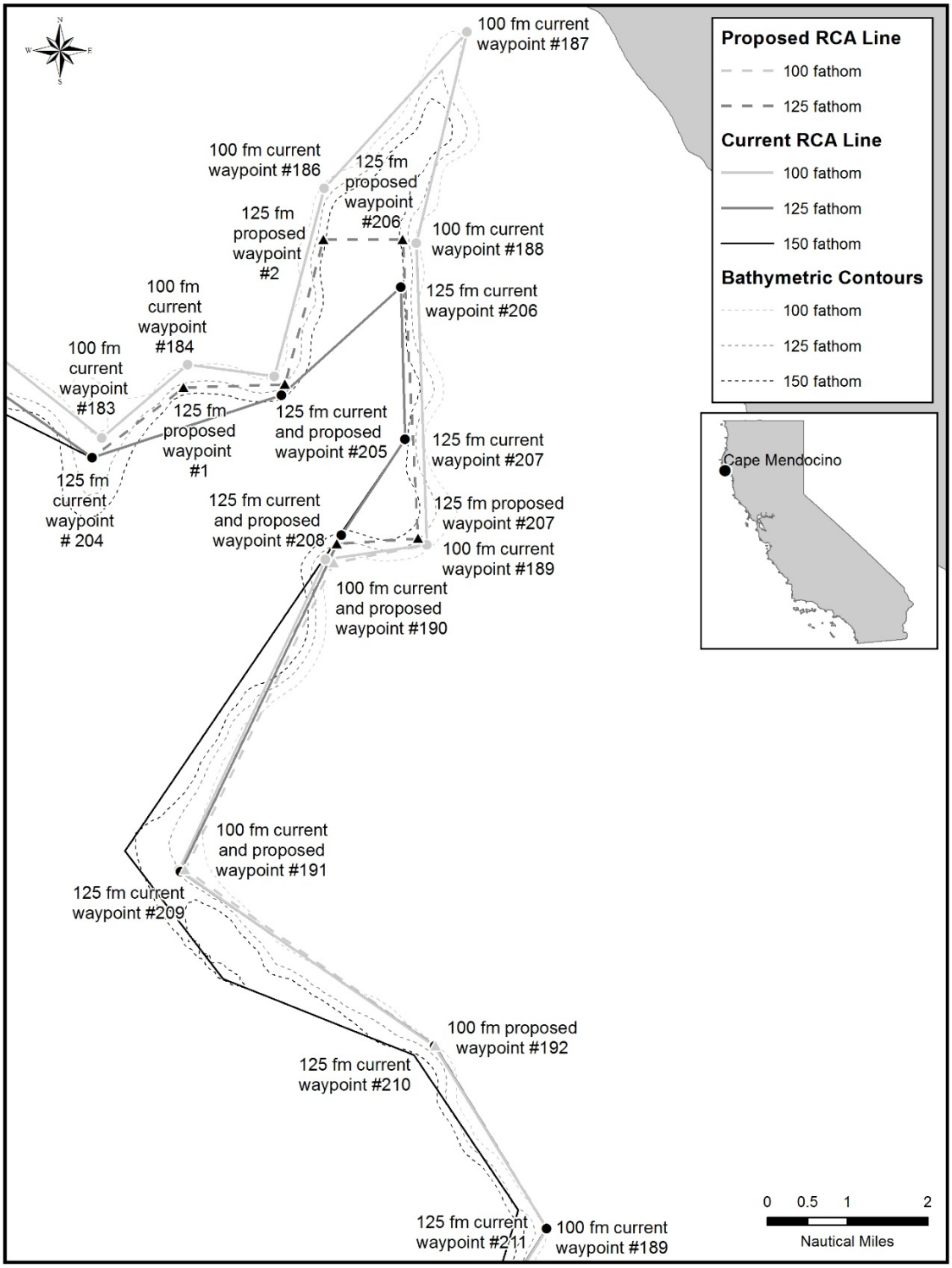


Figure C-10. Proposed 100 and 125 fm RCA line changes at Delgada Canyon. The proposed 100 fm change would increase the size of the limited entry trawl RCA by 0.4 mi². The proposed 125 fm change would decrease the size of the non-trawl RCA by 2.0 mi².

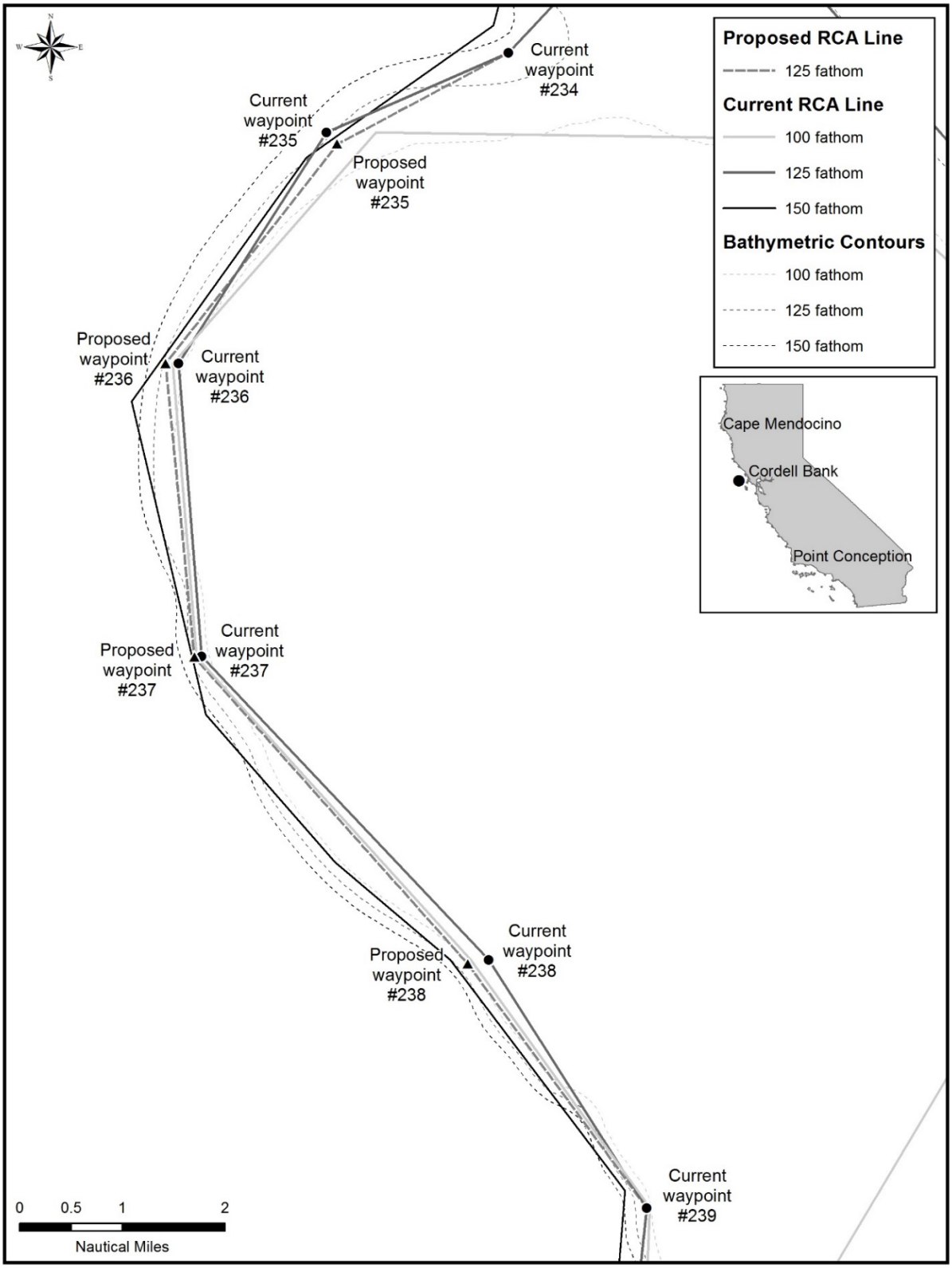


Figure C-11. Proposed 125 fm RCA line changes at Cordell Bank. The proposed 125 fm change would increase the size of the non-trawl RCA by 0.7 mi².

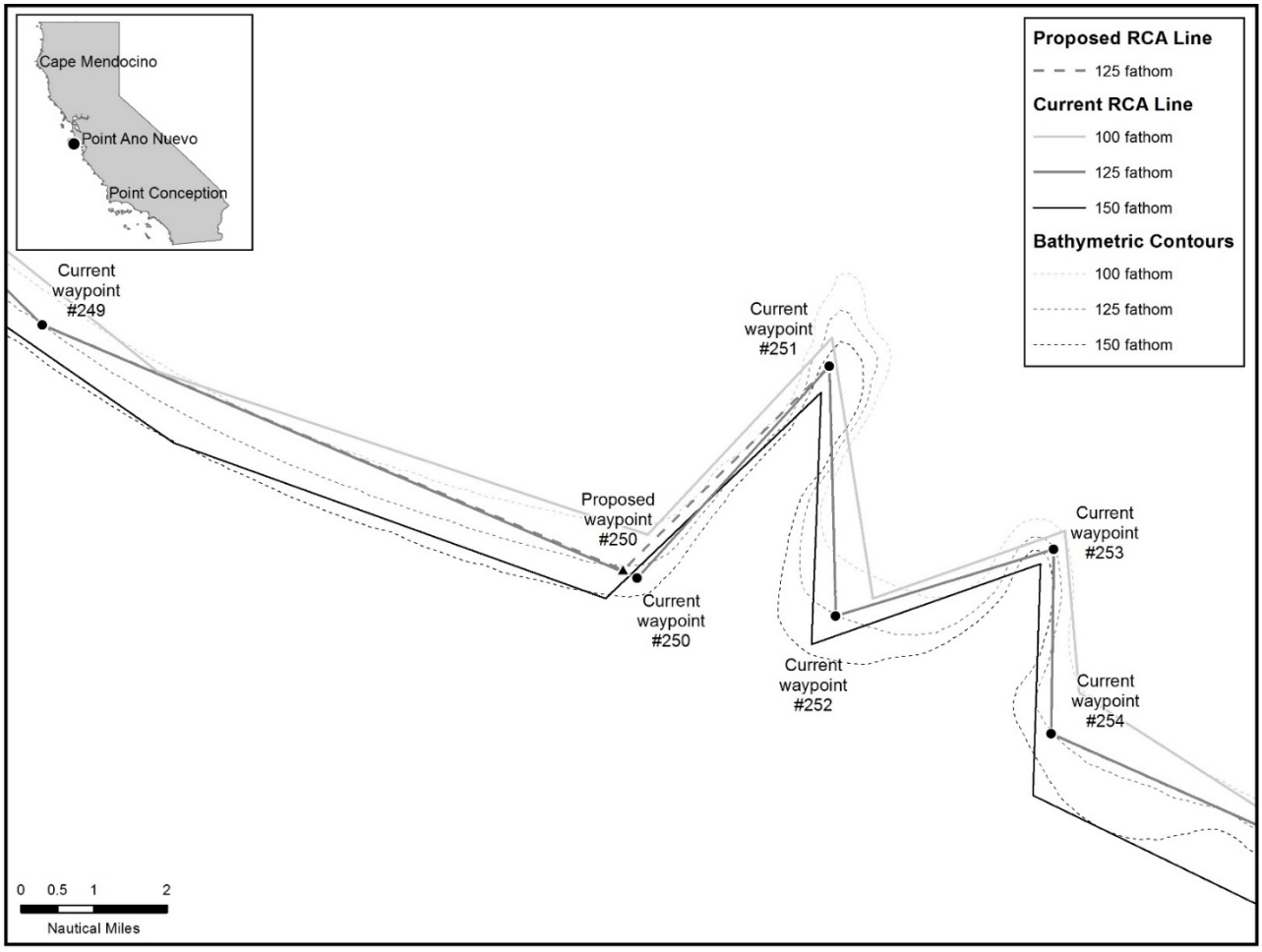


Figure C-12. Proposed 125 fm RCA line changes at Point Año Nuevo. The proposed 125 fm change would decrease the size of the non-trawl RCA by 0.4 mi².

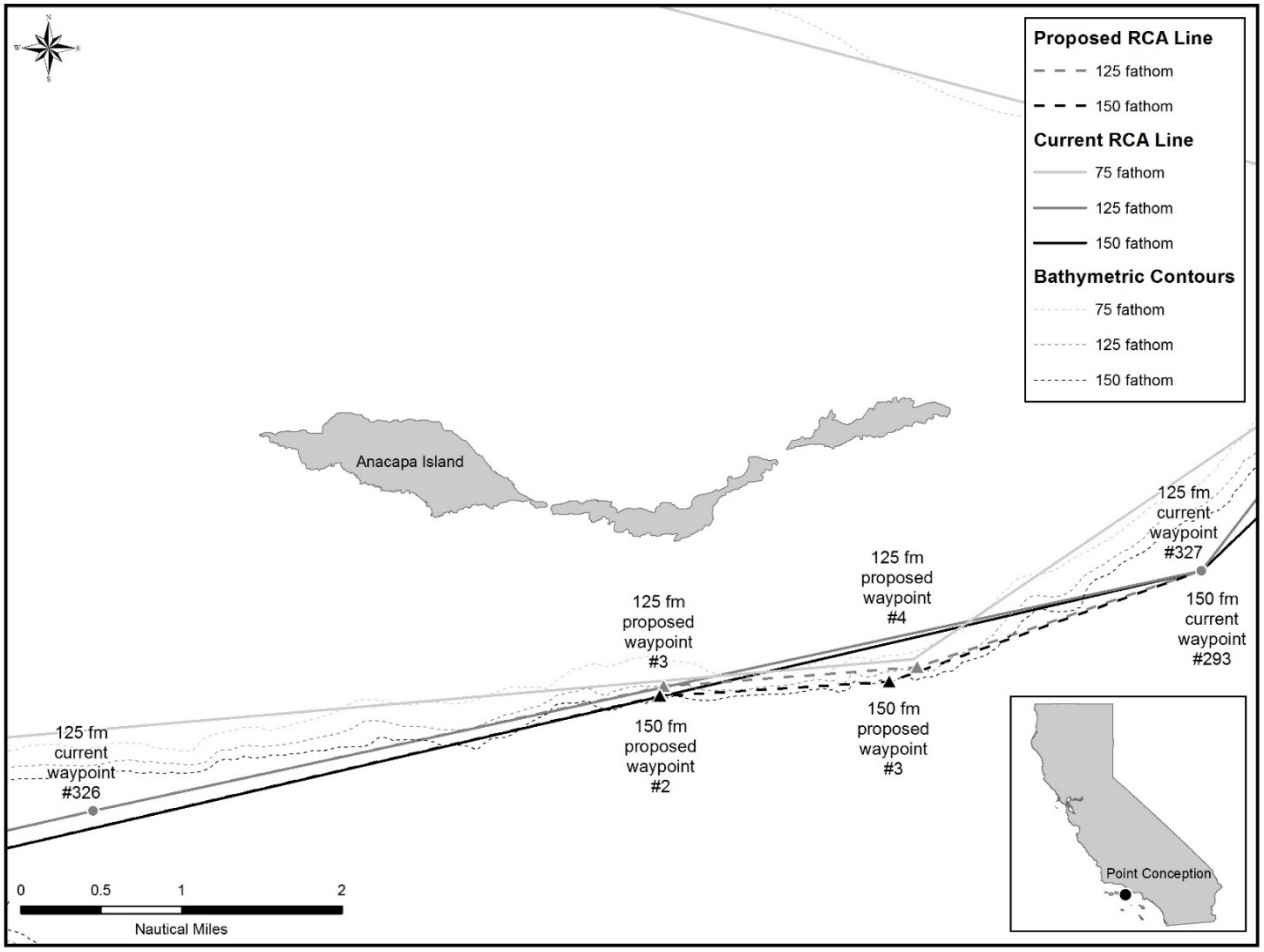


Figure C-13. Proposed 125 and 150 fm RCA line changes at Anacapa Island. The proposed 150 fm change would increase the size of the non-trawl RCA by 0.5 mi².

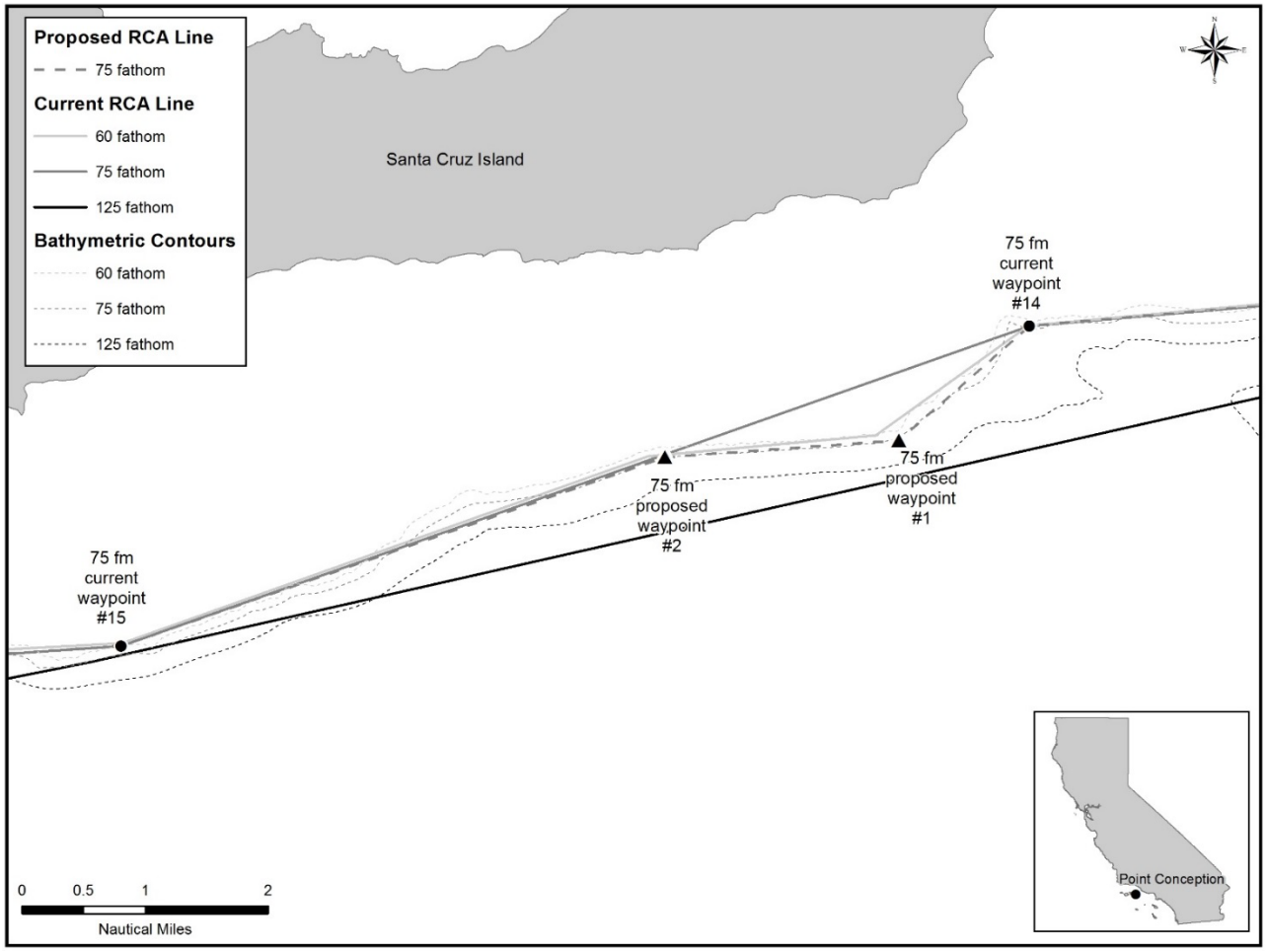


Figure C-14. Proposed 75 fm RCA line changes at Santa Cruz Island. The proposed 75 fm change would decrease the size of the non-trawl RCA by 1.2 mi^2.

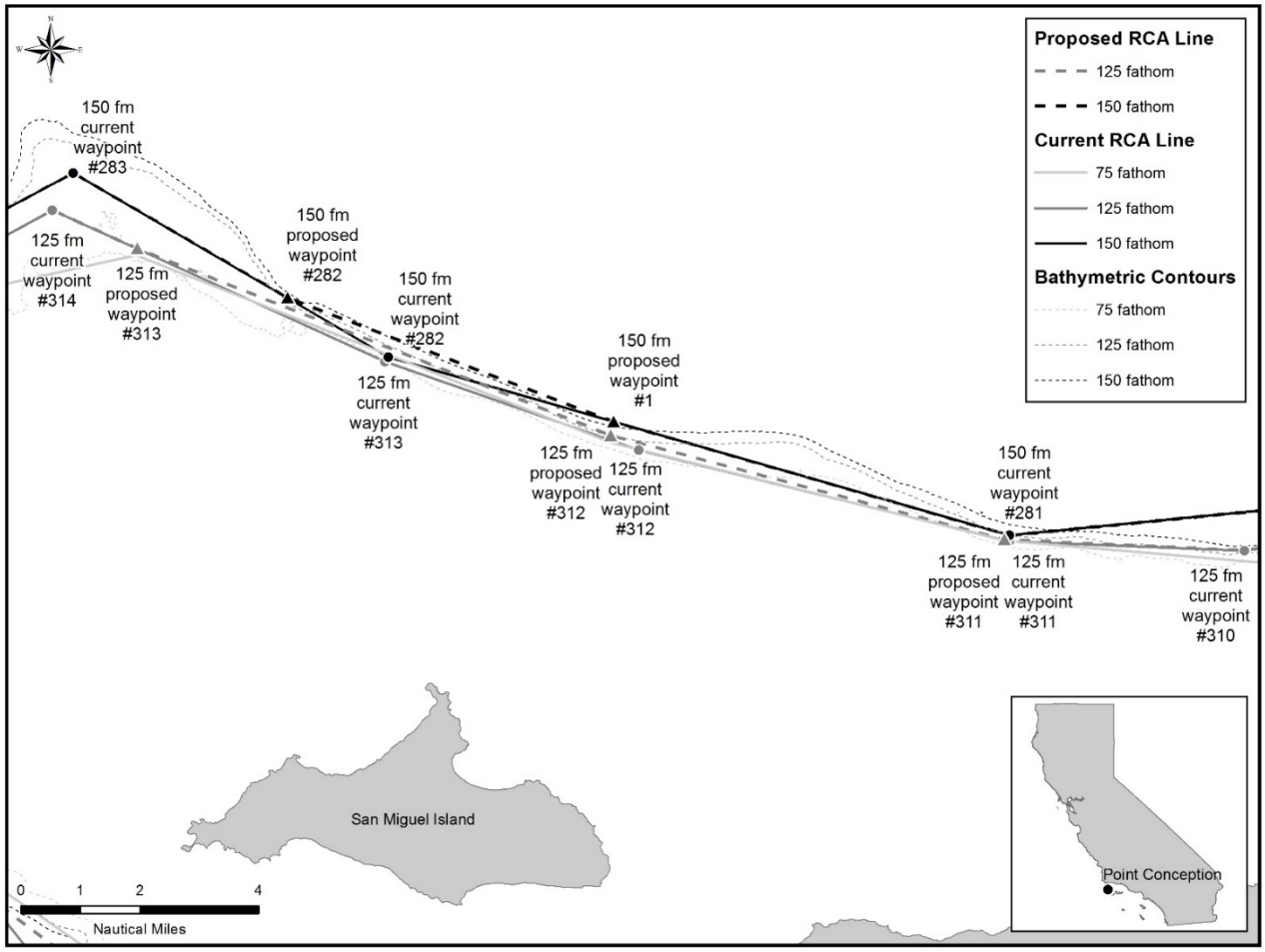


Figure C-15. Proposed 125 and 150 fm RCA line changes at San Miguel Island. The proposed 150 fm change would increase the size of the limited entry trawl and non-trawl RCAs by 1.3 mi².

Attachment 3. Coordinate tables for proposed changes to the 75 fm, 100 fm, 125 fm, and 150 fm RCA lines.

Table C-19. Coordinates for proposed modifications to the "75 fm (137 m) depth contour around the northern Channel Islands off the state of California" RCA line south of 34°27' N. latitude.

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
Santa Cruz Island									
14	No change	33	58.7	119	32.21				
New #1	Add					33	57.77	119	33.49
New #2	Add					33	57.64	119	35.78
15	No change	33	56.12	119	41.1				

Table C-20. Coordinates for proposed modifications to the "100 fm (183 m) depth contour used between the U.S. border with Canada and the U.S. border with Mexico" RCA line between 42° N. latitude and 34°27' N. latitude.

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
Spanish Canyon									
177	No change	40	16.29	124	34.36				
178	Move	40	10	124	21.12	40	10.13	124	21.92
179	No change	40	7.7	124	18.44				
180	No change	40	8.84	124	15.86				
181	Move	40	6.53	124	17.39	40	6.39	124	17.26
182	No change	40	3.15	124	14.43				
Delgada Canyon									
189	No change	40	1.17	124	8.8				
190	Move	40	1.03	124	10.06	40	1	124	9.96
191	Move	39	58.07	124	11.89	39	58.07	124	11.81
192	Move	39	56.39	124	8.71	39	56.39	124	8.69
193	No change	39	54.64	124	7.3				

Table C-21. Coordinates for proposed modifications to the "125 fm (229 m) depth contour used between the U.S. border with Canada and the U.S. border with Mexico" RCA line between 42° N. latitude and 33°50' N. latitude.

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
Delgada Canyon									
204	No change	40	2	124	12.97				
New #1	Add					40	2.67	124	11.83
205	Move	40	2.6	124	10.61	40	2.7	124	10.57
New #2	Add					40	4.08	124	10.09
206	Move	40	3.63	124	9.12	40	4.08	124	9.1
207	Move	40	2.18	124	9.07	40	1.23	124	8.91
208	Move	40	1.26	124	9.86	40	1.18	124	9.92
209	No change	39	58.05	124	11.87				
Cordell Bank									
234	No change	38	6.95	123	28.03				
235	Move	38	6.34	123	29.80	38	6.25	123	29.70
236	Move	38	4.57	123	31.24	38	4.57	123	31.37
237	Move	38	2.33	123	31.02	38	2.32	123	31.09
238	Move	38	0.00	123	28.23	37	59.97	123	28.43
239	No change	37	58.10	123	26.69				
Point Ano Nuevo									
249	No change	37	0.99	122	35.51				
250	Move	36	58.23	122	27.36	36	58.31	122	27.56
251	No change	37	0.54	122	24.74				
San Miguel Island									
310	No change	34	6.85	120	5.60				
311	Move	34	6.99	120	10.37	34	7.03	120	10.47
312	Move	34	8.53	120	17.89	34	8.77	120	18.46
313	Move	34	10	120	23.05	34	11.89	120	28.09
314	No change	34	12.53	120	29.82				
Anacapa Island									
326	No change	33	58.48	119	27.9				
New #3	Add					33	59.24	119	23.61
New #4	Add					33	59.35	119	21.71
327	No change	33	59.94	119	19.57				

Table C-22. Coordinates for proposed modifications to the "150 fm (274 m) depth contour used between the U.S. border with Canada and the U.S. border with Mexico" RCA line around the northern Channel Islands.

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
San Miguel Island									
281	No change	34	7.1	120	10.37				
282	Move	34	10.08	120	22.98	34	11.07	120	25.03
New #1	Add					34	9	120	18.4
283	No change	34	13.16	120	29.4				
Anacapa Island									
292	No change	33	55.88	119	41.05				
New #2	Add					33	59.18	119	23.64
New #3	Add					33	59.26	119	21.92
293	No change	33	59.94	119	19.57				

C.3 *New Management Measures Analysis*

New management measures may be adopted during the biennial specifications process and include those measures where the impacts have not yet been previously analyzed and/or have not been previously implemented in regulation. The Council has adopted several new management measures for analysis, as follows.

C.3.1 Stock Complex Restructuring

Part A

1. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

This proposed new management measure is a reorganization of stock complexes based on requests and rationale from the Oregon Department of Fish and Wildlife (ODFW) and the Washington Department of Fish and Wildlife (WDFW) (Agenda Item E.9.a, Supplemental ODFW Report 1, September 2017 and Agenda Item F.6.a, WDFW Report 1, November 2017, respectively). There are two separate proposals being considered that affect several stocks that mainly occur in nearshore state waters.

In Stock Complex Proposal 1 (Table C-23), Oregon blue/deacon rockfish (BDR) could continue to be managed within the Nearshore Rockfish complex north of 40°10' N. latitude (status quo) or be removed from the complex and paired with Oregon black rockfish to form a new Oregon black/BDR Complex (Option 1). Note that blue and deacon rockfish are separate species, but are referred to collectively since they were assessed together and therefore have joint harvest specifications.

There are three new options within Stock Complex Proposal 2 that pertain to the Other Fish Complex (Table C-24). Option 1 is the ODFW proposal to remove Oregon kelp greenling from the Other Fish Complex and pair it with Oregon cabezon to form a new Oregon kelp greenling/cabezon complex. Option 2 is the WDFW proposal to remove Washington kelp greenling and Washington cabezon from the Other Fish Complex and pair both together to form a new Washington kelp greenling/cabezon complex. Option 3 includes both Option 1 and Option 2.

These complex proposals pertain primarily to the commercial nearshore and recreational fisheries, as these are shallow water stocks infrequently encountered by the trawl sectors or other fisheries (< 1 mt removal each of each per year). The one exception is that removals of leopard shark have been as high as 5-10 mt for shoreside trawl, California halibut, and incidental OA fisheries each; however, these removals are not noteworthy since total removals from all fisheries have been 15 percent or less of the leopard shark component of the Other Fish Complex ACL.

Although the geographic scope of these complex proposals primarily pertains to Oregon and Washington, possible implications to California are also discussed, as the proposals would affect harvest specifications that include California (e.g., Other Fish Complex is coastwide).

Table C-23. Stock Complex Proposal 1. Alternative stock or stock complex harvest specifications for Oregon black rockfish (RF), Oregon blue/Deacon (BDR), and the Nearshore RF North of 40°10' N. lat. complex.

Option	Stock or Complex	2019			2020		
		OFL	ABC	ACL	OFL	ABC	ACL
Status Quo	Black RF (OR)	565.0	515.8	515.8	561.0	512.2	512.2
	Nearshore RF North Complex	203.2	182.9	182.9	200.4	180.5	180.5
	---*BDR (OR) a/*	112.3	101.5	101.5	108.8	98.4	98.4
Option 1	**New:** Black RF/BDR Complex (OR)	677.3	617.4	617.4	669.8	610.5	610.5
	Nearshore RF North Complex	90.9	81.4	81.4	91.6	82.1	82.1

a/ Values contribute to the Nearshore RF North Complex

Table C-24. Stock Complex Proposal 2. Alternative stock or stock complex harvest specifications for the stock complex proposal that pertains to Other Fish complex, kelp greenling, and cabezon.

Option	Stock or Complex	2019			2020		
		OFL	ABC	ACL	OFL	ABC	ACL
Status Quo	Cabezon (OR)	49.0	46.8	46.8	49.0	46.8	46.8
	Other Fish	479.5	420.2	420.2	465.0	406.4	406.4
	---*Cabezon (WA) a/*	5.5	4.6	4.6	5.4	4.5	4.5
	---*Kelp Greenling (CA) a/*	118.9	99.2	99.2	118.9	99.2	99.2
	---*Kelp Greenling (OR) a/*	180.9	171.1	171.1	166.5	157.5	157.5
	---*Kelp Greenling (WA) a/*	7.1	5.9	5.9	7.1	5.9	5.9
	---*Leopard Shark a/*	167.1	139.4	139.4	167.1	139.4	139.4
Option 1 (ODFW only)	Other Fish	298.6	249.1	249.1	298.5	248.9	248.9
	New: Cabezon/K. Greenling (OR)	229.9	217.9	217.9	215.5	204.3	204.3
Option 2 (WDFW only)	Other Fish	466.9	409.7	409.7	452.5	396.0	396.0
	New: Cabezon/K. Greenling (WA)	12.6	10.5	10.5	12.5	10.4	10.4
Option 3 (Both)	Other Fish	286.0	238.5	238.5	286.0	238.5	238.5
	New: Cabezon/K. Greenling (OR)	229.9	217.9	217.9	215.5	204.3	204.3
	New: Cabezon/K. Greenling (WA)	12.6	10.5	10.5	12.5	10.4	10.4

a/ Values contribute to the Other Fish Complex

2. What was considered in order to optimize the performance of this measure?

Optimal performance of the stock complex proposals focused on four factors: (1) improving the purpose and benefits of stock complex management (e.g., better meeting stock complex criteria in the FMP (Section 4.7.3) and National Standards and enhanced management flexibility; (2) changes to fishery allocations based on the alternative ACL structures (noting no FMP complications since none have formal Amendment 21 allocations); (3) and ability to meet conservation objectives (e.g., ODFW indicated they would set their state HGs to the component stocks' ACL contributions regardless of whether they are for individually managed stocks or as contributions to the complex, to prevent use of "inflators").

In addition, the GMT showed that Stock Complex Proposal 1 would not be of detriment to either Washington or California, as their state HGs (federally established) of the Nearshore Rockfish North Complex would be the same for both options (i.e., OR blue/deacon left in the complex or taken out) (Agenda Item F.9.a, Supplemental GMT Report 3, November 2017).

3. What and when was the Council's decision, and how did it arrive at the decision?

The Council decided to further investigate the stock complex proposals as a new management measure for the 2019-2020 biennium during the November 2017 PFMC meeting. The decision was presumably based in large part due to the ODFW (Agenda Item E.9.a, Supplemental ODFW Report 1, September 2017) and WDFW (Agenda Item F.9.a, WDFW Report 1, November 2017) reports supporting complex reorganization.

4. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

Reconfiguration of stock complexes is a fairly routine action, with the last major overhaul occurring during the 2015-2016 biennium (Agenda Item H.4, Situation Summary, November 2013). Note that the majority of groundfish stocks are managed within complexes and not individually (77 percent; 114 of 148). These tallies include the same species from different management areas (e.g., OR black rockfish vs. WA black rockfish).

As mentioned in the WDFW report (Agenda Item F.9.a, WDFW Report 1, November 2017), the current composition of the Other Fish Complex pertaining to Proposal 2 has not been given much thought in regards to the practicality of management of the contributor stocks. The Other Fish Complex originated as a compilation of stocks that did not match well with other complexes, and consisted of very dissimilar species (e.g., ratfish, skates, sharks, grenadier, greenling, cabezon, and codling). The current configuration of the Other Fish Complex is a result of some of these stocks being removed from the complex, as ecosystem component species, and big skate being removed to be managed with its own stock-specific harvest specifications. In summary, the WDFW report is correct that the current Other Fish Complex configuration of cabezon, greenlings, and leopard shark is an artifact from the past that likely warrants further consideration.

NMFS was supportive of further analysis of both stock complex proposals in the harvest specifications package (Agenda Item F.9.a, Supplemental NMFS Report 1, November 2017). As a component of this measure, NMFS recommends specific sideboards to prevent harvest of Oregon cabezon or Oregon black rockfish to exceed their overfishing limit (OFL) contributions within any new stock complex. These sideboards would help alleviate some of the concerns raised during the November 2017 Council discussion to ensure that inflator stocks could not be used as means to breach component OFLs of other stocks (concept described below).

Finally, the SSC notes "that OFLs endorsed from stock assessments can be used as stand-alone OFLs or as OFL contributions to stock complexes, including these stock complex proposals" (Agenda Item F.6.a, Supplemental SSC Report 1, November 2017). In short, all of the proposed complex options would be scientifically justified for Council consideration.

Table C-25 contains the recent historical mortality of species under the proposed stock complex re-configurations. Note that the 2017 Oregon black rockfish ACL and the 2017 Oregon cabezon ACL and OFL have been exceeded based on preliminary data (Agenda Item H.8.a, Supplemental ODFW Report 1, March 2018). As described in the sections below, the ODFW proposals would provide less protection for these stocks but would provide more management flexibility to increase fishery stability.

Table C-25. Historical mortality of species under stock complex re-configurations.

Other Fish Species	2012	2013	2014	2015	2016	2017
Cabezon (WA)	7.048	6.051	5.013	4.678	5.192	5.172
Kelp greenling (WA)	2.145	2.672	2.27	1.47	1.956	1.159
Grand Total	**9.193**	**8.723**	**7.283**	**6.148**	**7.148**	**6.331**

Oregon Kelp Greenling

Year	Commercial GF landings	Commercial GF Disc mort	Rec. Ocean Boat TM	Rec. Shore + Estuary TM	P shrimp TM	IOA	Research	Total Mort	ACL	OFL
2013	21.8	2.4	8.0	19.5	0.0	0.0	<.1	51.7	NA	NA
2014	15.4	6.2	3.8	19.5	0.0	0.0	<.1	44.9	NA	NA
2015	12.9	1.0	4.0	19.5	0.0	0.0	<.1	37.4	NA	NA
2016	8.4	0.6	2.7	19.5	0.0	0.0	<.1	31.2	NA	NA
2017 b/	10.5	**2.6**	3.1	14.6	**0.0**	0.0	<.1	30.8	NA	NA

a/ Not recent estimates, but based on historical MRFSS sampling...reduced in 2017 to account for season closure

b/ Discard mortality estimates not finalized until Aug 2018 - based on average

Oregon Cabezon

Year	Commercial GF landings	Commercial GF Disc mort	Rec. Ocean Boat TM	Rec. Shore + Est TM a/	P shrimp TM	IOA	Research	Total Mort	ACL	OFL
2013	19.8	0.8	12.4	1.4	0.0	0.0	<.1	34.4	47.0	49.0
2014	15.4	0.9	9.1	1.4	0.0	0.0	<.1	26.8	47.0	49.0
2015	16.3	2.3	10.3	1.4	0.0	0.0	<.1	30.3	47.0	49.0
2016	15.9	1.2	11.4	1.4	0.0	0.0	<.1	29.9	47.0	49.0
2017 b/	28.5	1.3	22.0	0.3	0.0	0.0	<.1	52.1	47.0	49.0

a/ Not recent estimates, but based on historical MRFSS sampling...0.3 is result of prime S+E catch month closed in only 2017

b/ Discard mortality estimates not finalized until Aug 2018 - based on average

Oregon Black Rockfish

Year	Commercial GF landings	Commercial GF Disc mort	Rec. Ocean Boat TM	Rec. Shore + Estuary TM a/	P shrimp TM	IOA	Research	Total Mort	ACL	OFL
2013	106.4	1.6	315.7	13.7	NA	NA	<.1	437.3	NA	NA
2014	122.5	1.8	349.6	13.7	NA	NA	<.1	487.6	NA	NA
2015	121.3	1.8	462.9	13.7	NA	NA	<.1	599.7	NA	NA
2016	105.2	1.6	417.2	13.7	NA	NA	<.1	537.6	NA	NA
2017 b/	124.0	1.9	407.0	10.3	NA	NA	<.1	543.1	527	577

a/ Not recent estimates, but based on historical MRFSS sampling...reduction in 2017 reflects fishery closure

b/ Preliminary projection. Final estimates provide by WCGOP in late summer 2018.

c/ Not available in WCGOP total mortality reports since OR black and CA black were estimated together, although negligble for both

d/ Nearshore model based estimate based on WCGOP observed hauls - is not an official WCGOP estimate since those only n4010

Oregon BDR (blue/deacon										
Year	Commercial GF landings	Commercial GF Disc mort	Rec. Ocean Boat TM	Rec. Shore + Estuary TM a/	P shrimp TM	IOA	Research	Total Mort	ACL	OFL
2013	5.0	1.7	23.7	0.0	NA	NA	<.1	30.4	NA	NA
2014	3.9	1.3	18.2	0.0	NA	NA	<.1	23.5	NA	NA
2015	1.5	0.5	29.7	0.0	NA	NA	<.1	31.7	NA	NA
2016	2.1	0.7	21.2	0.0	NA	NA	<.1	23.9	NA	NA
2017 b/	5.1	**1.7**	24.4	0.0	**NA**	NA	<.1	31.2	NA	NA

a/ Not recent estimates, but based on historical MRFSS sampling...0.3 is result of prime S+E catch month closed in only 2017
b/ Preliminary projection. Final estimates provide by WCGOP in late summer 2018.
c/ Not available in WCGOP total mortality reports for OR BDR (only for entire area north of 4010 since in complex)
d/ Nearshore model based estimate based on WCGOP observed hauls - is not an official WCGOP estimate since those only n4010

Part B

3. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

The primary objectives of the stock complex proposals are: (1) better alignment of stocks per the complex goals and definitions as defined in the FMP and National Standard 1; (2) reduced management complexity; and (3) enhanced management flexibility (e.g., "easier ability to implement inseason actions").

The stocks being considered in the stock complex proposals (i.e., kelp greenling, cabezon, black rockfish, blue rockfish, and deacon rockfish) are predominately shallow water nearshore stocks that occur primarily within state waters, and thus nearly all the removals (>99 percent for all) are attributed to the recreational and commercial nearshore fisheries that are subject to joint state and Federal management. More conservative state regulations exist for these fisheries (e.g., bag limits, trip limits, and limited entry state permitting for the nearshore), and the WDFW and ODFW reports speak to these complex proposals as a means to improve their management capabilities. In summary, the primary objectives and benefits are social (e.g., enhanced management ability and flexibility).

4. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

d. How would you describe this new management measure (may select more than one)

- ❑ X Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
- ❑ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
- ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
- ❑ X Designed to mitigate a negative economic or social effect.
- ❑ X Applies to only a small area of the total EEZ.

e. What resource(s) would the management measure likely affect, either positively or negatively?
    - ❑ Physical EFH or Ecosystems
    - ❑ Biological Resources (target, non-target species)
    - ❑ Protected Resources (mammals, ESA-listed)
    - ❑ X Economic, social, cultural

f. If the management measure is mitigating or offsetting an effect on a resource, identify that resource. NA
    - ❑ Physical EFH or Ecosystems
    - ❑ Biological Resources (target, non-target species)
    - ❑ Protected Resources (mammals, ESA-listed)
    - ❑ Economic, social, cultural

Part C - Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects.' Remember both positive and negative effects.

9. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

Risk of overfishing

As mentioned above, the majority of groundfish stocks on the US West Coast are managed within complexes. The proposed reconfigurations do result in changes to harvest specifications based on how the OFL, acceptable biological catch (ABC), and ACL contributions of individual stocks are combined within a complex. For example, if OR blue/deacon were removed from the Nearshore Rockfish North Complex, then it would reduce the harvest specifications of the complex which are based on the sum of all the contributors.

The Groundfish FMP defines that "overfishing" is used to denote situations where catch exceeds, or is expected to exceed, the established OFL. For complexes, the OFL established in regulation is the sum of the OFL contributions from each contributor (Table 1a to Part 660, Subpart C of the West Coast Groundfish Regulations). None of the candidate stocks or stock complexes of the proposals have been overfished in the past (WCGOP Total Mortality Reports).

Risks of overfishing by definition are greater for individually managed stocks than for stocks managed within complexes. For example, it would be considered overfishing if the OFL of stock A were exceeded if managed individually but not if the OFL contribution of stock A were exceeded as part of a complex (as long as the complex OFL were not exceeded). Therefore, by definition, the complex proposals reduce the risk of overfishing since there would be a greater shift towards complex management (i.e., Oregon black rockfish and Oregon cabezon which are currently managed individually would be managed within complexes).

Impacts to managed stocks

Shifting to complex management does introduce the potential to adversely affect managed stocks, since stocks managed with stock-specific harvest specifications are provided greater protection that those managed in complexes. That is because management measures are structured not to exceed ACLs of individual stocks, and ACLs of complexes as a whole, whereas the same regulatory rigor does not extend

to managing the individual ACL contributions of stocks within a complex except in rare cases (e.g., a Federal HG is currently used for blue/deacon rockfish within the Nearshore Rockfish South Complex).

Accordingly, one of the main concerns with stocks complexes is the use of "inflator" stocks, which means that harvest specifications of a contributing stock (e.g., component OFL or ACL) could be exceeded via coverage from residual from other stocks with low attainment (as long as the total complex OFL or ACL is not exceeded). Concerns with inflator stocks are heightened when there are large differentials in the contributions amongst stocks since residual of a more prolific stock could be similar or greater than the total OFL of lesser stocks.

Note that Proposal 2, Option 2 ("WDFW only") would decrease concerns with "inflator" stocks and instead would provide enhanced protection. That is because WA kelp greenling and WA cabezon would be removed from the Other Fish Complex and managed together as new complex, and in the process, they would be severed from two potential inflators from the Other Fish Complex. Oregon kelp greenling and leopard shark are the potential inflators since they have much higher relative OFLs contributions (>150 mt for each) than WA kelp greenling and WA cabezon (<10 mt for each) and because they are low attainment stocks (<25 percent per year for each) of which the residual could provide inflator cushion. There remains some potential that WA kelp greenling could act as an inflator stock to WA cabezon as recent catch of WA cabezon has been higher than the component ACL, and sufficient residual exists with WA kelp greenling. Management under a state-specific stock complex, however, provides more flexibility to implement management measures needed to keep catch within not only the stock complex ACL but individual stock ACL contributions through state rulemaking.

Conversely, the ODFW proposals create inflator potential that does not currently exist. In Proposal 1, there is currently no inflator potential with Oregon black rockfish since they are managed individually. If paired with Oregon blue/deacon rockfish to form a new Oregon black/blue/deacon complex as proposed (Option 1 of Proposal 1), then blue/deacon rockfish could be used as an inflator for black rockfish, or vice versa.

Similarly, there is currently no inflator potential with Oregon cabezon since they are managed individually. If Oregon kelp greenling are removed from the Other Fish Complex and paired with Oregon cabezon to form a new complex as proposed (Options 1 and 3 of Proposal 2), then Oregon kelp greenling, which are a current potential inflator to the Other Fish Complex (described above), could be used a potential inflator for Oregon cabezon, or vice versa.

There could consequently be concerns with the ODFW proposals due to the 2017 overages of the Oregon black rockfish ACL and the 2017 Oregon cabezon ACL and OFL; however, the March 2018 inseason ODFW report (Agenda Item H.8.a, Supplemental ODFW Report 1, March 2018) documents that there is little conservation risk to the cabezon stock despite the overage:

"A review of recent catch history and the 2009 stock assessment, which informed harvest specifications through 2020, suggests that there is little conservation concern associated with the 2017 overage. The assessment found the stock to be at 52 percent depletion, and included 12-year forward projections of yield and depletion. These projections assumed that the full OFL would be caught in each year, under the base case catch scenario. From 2009 through 2017, this would have resulted in cumulative total mortality of 441 mt, with the depletion level gradually coming down to the target reference point of 40 percent at the end of 2017.

However, actual cabezon catches in Oregon over this time period have been much lower, totaling 346.1 mt (cumulative), which is closer to the alternative low-catch scenario in the 2009 assessment's decision table (Figure 1). This has left 94.9 mt more biomass in the water than was anticipated by the 2009 assessment, despite the 5.1 mt ACL overage in 2017. In theory, this would put the stock at a higher depletion level today than 40 percent; for reference, under the low-catch scenario, depletion was projected to be 54 percent at the end of 2017."

The ODFW inseason report primarily focuses on cabezon presumably due to the OFL overage, but also speaks briefly to the 2017 overage of the Oregon black rockfish ACL. While Oregon cabezon has been managed with stock-specific harvest specifications since 2009, Oregon black rockfish was previously managed (before 2017) as single stock south of 46°16' north latitude).

There was however an Oregon black rockfish HG before 2017 that ODFW successfully managed to. As shown in Table 1 from the ODFW inseason report, the multi-year total mortality from 2012-2016 (2,062 mt) was 88.9 percent of the multi-year total HGs (2,320 mt). Although the 2015 Oregon black rockfish HG was exceeded by 20 mt, this was offset by 278 mt that was not utilized in the other years (i.e., 2013, 2014, and 2016).

Note that if the proposal to lump Oregon black rockfish with Oregon blue/deacon were approved, it would represent a shift back to the pre-2017 management structure for Oregon black rockfish (i.e., ODFW specified each would be managed with a HG set equal to the component ACL). Again, this would provide less protection, but ODFW has a demonstrated a recent history of being able to manage to their black rockfish HGs.

This also underscores some of the advantages with the complex proposals. If multi-year mortality is tracking well within the multi-year harvest specifications, then there is little conservation-based need for drastic inseason actions for periodic and minor overages. For example, ODFW had to close their 2017 recreational fisheries due to the ACL overage (due to requirement to managed to ACLs), but did not have to close their 2015 fisheries despite going over the HG since the overall multi-year mortality was within limits.

In conclusion, the ODFW complex proposals provide less protection to stocks but provide greater management flexibility to enhance fishery stability. If adopted, it would be detrimental if the enhanced flexibility resulted in chronic ACL/OFL contribution overages. If this were to happen, the Council could consider revoking the complexes at a later date.

Sidebars to prevent harvests in excess of OFL contributions

Again, note that the WDFW proposal would improve protections of managed stocks compared to management in the status quo Other Fish Complex.

Given that the ODFW proposals introduce the potential for use of inflator stocks that could adversely affect Oregon cabezon and Oregon black rockfish, this is presumably the main reason why NMFS recommended that appropriate sideboards be included in the analysis to prevent harvests in excess OFL contributions.

ODFW notes that the 2017 recreational overage issue was the result of unanticipated record high effort during the month of August that overrode the anticipated savings from a 2017 preseason reduction in the state-specified bag limit of black rockfish (Agenda Item E.10.a, Supplemental REVISED ODFW Report 1, September 2017).

To reduce the risk of future overages, Oregon has proposed the following "side-bars":

(1) specified that "if an Oregon black/blue/deacon complex is created, the state of Oregon would then set the harvest guidelines (of total mortality) for black rockfish and for blue/deacon rockfish based on their component ACL contributions, and would monitor and track catch to enable management to these harvest guidelines" Agenda Item E.9.a, Supplemental ODFW Report 1, September 2017. The same was said for Oregon kelp greenling and Oregon cabezon during Council discussion in November 2017 (i.e., managed to ACL contributions).

(2) committed to a more responsive inseason catch monitoring that involves review of preliminary estimates based on a one-week lag instead of the current approach based on a one-month lag (Agenda Item F.13.a, Supplemental ODFW Report 1, November 2017).

(3) reduced their aggregate recreational groundfish bag limit as specified in state regulations from seven to five fish per day for 2018 to prevent quota breaches and better sustain year-round fisheries (http://www.dfw.state.or.us/news/2017/12_dec/120817.asp).

(4) improved their inseason modeling capabilities to account and plan for the volatile nature of the fishery such as the 2017 overage that was based on unexpected record effort. The previous modeling approach only used point estimates, which are sufficient for ball-park estimates if catch and effort remain similar to past years, but do not describe what the plausible outcome of future catch could be based on atypically high or low catch rates or effort. The new modeling do exactly that by providing risks of quota overages that encapsulate the volatility catch rates and effort in the fisheries even for situations that have never occurred before (e.g., possibility that effort in 2019 could break all-time records). The reduction in the state bag limit for 2018 was based in large-part to keep catch within quotas even under higher than normal catch rates and/or efforts (Lynn Mattes, ODFW sport groundfish project leader, personal communication).

(5) promoted development of the sport offshore midwater (longleader) fishery via state and Federal rule in order to increase opportunity for healthy underutilized shelf stocks (e.g., widow and yellowtail rockfishes) that in turn reduces impacts and dependency on shallow water nearshore stocks such as cabezon and black rockfish.

In conclusion, the ODFW proposals do introduce inflator concerns that do not currently exist since their proposed state HGs (state-specified) could be exceeded. However, Oregon has given a commitment that they would manage to the state HGs set equal to the component ACLs if the ODFW complex proposals were adopted and have already taken the above actions to reduce the chance of future overages. Another sideboard that could be used are Federal HGs for stocks managed within the complexes, such as currently used for blue/deacon rockfish in the Nearshore Rockfish South complex. Use of Federal HGs could provide greater justification for the Council to consider Federal inseason reductions.

Potential benefits

In the worst case, there would likely be only rare and minor overages of the Oregon state HGs (set to component ACLs) or component OFLs based on past history and the future commitments. This would not be problematic from a conservation perspective as long as any overages were "paid back" over the span of the ten-year OFL projection period based on the stock assessment output. Note that stock assessments and the resulting OFLs from the projection tables are structured to obtain long-term maximum sustainable yield (MSY); however, this requires that the OFLs be fully removed over the long term (see section 4.4 of the FMP). For individually managed stocks, it is difficult to obtain the ACL in a given year, let alone a multi-year period, since the ACLs are treated as a cap. For stocks managed in a complex, there is greater leeway to manage to ACL or OFL contributions as a target without the need for dire management responses for slight overages.

Complex management therefore provides a more flexible, and holistic, approach to meet long-term MSY and conservation objectives, while enhancing fishery stability. This longer-term, and more holistic, way of thinking is gaining attention at the national level via alternative approaches such as the revised National Standard 1 guidelines that allow consideration for two new carryover provisions (e.g., ACLs) that would allow "paying it forward" and the multi-year catch policy for determining overfishing. While the ODFW proposals introduce inflator concerns that do not currently exist since the Oregon state HGs could be exceeded, the Oregon state HGs and stated courses of proposed state actions would create an extra level of protection compared to the majority of other Federal stocks managed in complexes that are without HGs (state or Federal) or protections.

C.3.2 Remove automatic authority established in conjunction with Amendment 21-3 for darkblotched rockfish and POP in the at-sea sector

Part A

1. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

Under Amendment 21-3, POP and darkblotched rockfish are managed as sector-specific set-asides for the at-sea sectors based on the percentages outlined in section 6.3.2.3 of the FMP and regulations at 660.55. Set-asides will be managed on an annual basis unless there is a risk of a harvest specification being exceeded, unforeseen impact on another fishery, or conservation concerns, in which case inseason action may be taken. However, NMFS has the automatic authority to close either at-sea sector if a sector were projected to exceed their set-aside value for either species and the buffer. There is currently no buffer proposed for analysis in 2019-2020, and therefore, in essence, darkblotched rockfish and POP would be managed as allocations for the at-sea sectors. Under this new management measure, the Council is considering removing the automatic authority for these species so that they are managed like all other at-sea set-asides.

2. What was considered in order to optimize the performance of this measure?

In addition to the original analysis shown in Agenda Item G.2.a, Supplemental WDFW Report 2, June 2016 and Agenda Item F.7.a, WDFW Report, September 2016, the GMT examined the risk of the at-sea sector exceeding the No Action set-asides values using the bootstrap methodology, and the likelihood of exceeding the ACL or impacting another sector. In Section A.2.5, Table A-51 through A-54 showed the risk of the at-sea sectors exceeding the set-aside values for darkblotched rockfish and POP and the allocation values for widow and canary rockfish and the likelihood of closure (i.e., not attaining whiting allocation). The validity of results from this bootstrap methodology is dependent on conditions in the coming years being similar to those in the baseline used for the bootstrap (2000-2017). While darkblotched rockfish and POP would be managed as set-asides, the lack of a buffer and the presence of the automatic authority described above would make the values act as allocations. Under these conditions, the CP sector would have a ~1 in 20 chance of exceeding the darkblotched rockfish set aside in 2019 and 2020. For the MS sector, the risk is ~1 in 100. There is no perceived risk for either sector in exceeding the POP set-aside due to ~15x magnitude higher ACL proposed for 2019-2020.

However, with the automatic authority provision removed from regulation, the at-sea sectors could increase their likelihood in attaining their whiting allocation. Table C-26 through Table C-29 below show the risk of each sector exceeding the set-aside value for darkblotched rockfish and POP, assuming that the only "triggers" for a simulated season being closed are the whiting, widow rockfish, and canary rockfish allocations for 2019. Similar to No Action, these projections are based on past conditions and behaviors being representative of the future. If the fleet were to modify its move-on rules based on the reduced chance of being shut down by an overage, the bootstrap results might underestimate the likelihood of an overage. Furthermore, with widow and canary rockfishes remaining as allocations, there could be some additional incentive to avoid those species in favor of additional bycatch of darkblotched. (With POP's ACL being significantly higher in 2019-2020, any additional catch due to avoiding widow and canary is likely to be well within the higher proposed allocations.) From 2009-2017, a majority of the years had more hauls that were positive for both darkblotched and widow rockfish compared to hauls with only darkblotched or darkblotched and canary rockfish. However, the percentage of the total amount of hauls with both darkblotched and widow present ranged from 1.2 to 32.8 percent in the CP sector and 2.4 to 29 percent in the MS sector. Based on the variation and the unknown future ocean conditions (e.g., whiting school

location), it is uncertain whether there would be a change in the catch of darkblotched if the fleets were avoiding widow (i.e., more darkblotched-only hauls or fewer widow and darkblotched hauls).

As shown, both sectors increase the likelihood of attaining their whiting allocations than under the current at-sea set-aside management regulations. The CP sector increases the chance of attaining the whiting allocation from ~87 percent to 93.2 percent in 2019 and 91.9 percent in 2020, and the MS sector increases their chances by ~2 percent.

Table C-26: Landing projections for the CP sector under the No Action Alternative for 2019 using the bootstrap methodology assuming the automatic authority provision is removed from regulation. No Action allocations are provided on the left for reference. Bolded text indicates values that are higher than the allocations or set-asides.

Stock	CP All./Set-Aside (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	123,312	72,462	113,350	123,312	123,312	123,312	123,312	123,312	123,312	123,312	123,312
Canary rockfish	16	0.1	0.1	0.1	0.3	0.6	1.2	2.1	4.1	5.8	8.4
Darkblotched rockfish	21.8	0.4	0.7	2.7	3.9	7.2	11	20.2	**24.5**	**34.1**	**56.6**
POP	237.1	0.2	0.3	0.4	1.6	6.4	12	18.8	31.4	46.2	61.4
Widow rockfish	358.3	4.8	6.9	11.6	22.1	62.2	127.1	308.4	**360**	**407.7**	**436.7**

Table C-27: Landing projections for the CP sector under the No Action Alternative for 2020 using the bootstrap methodology assuming the automatic authority provision is removed from regulation. No Action allocations are provided on the left for reference. Bolded text indicates values that are higher than the allocations or set-asides.

Stock	CP All./Set-Aside (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	123,312	69,229	105,421	123,312	123,312	123,312	123,312	123,312	123,312	123,312	123,312
Canary rockfish	16	0.1	0.1	0.1	0.3	0.6	1.2	2	3.9	5.7	7.8
Darkblotched rockfish	23.2	0.4	0.7	2.6	3.8	7.1	11.1	20.3	**24.5**	**32.1**	**54.2**
POP	231	0.2	0.3	0.4	1.7	6.5	12.3	18.7	31.5	46	63.5
Widow rockfish	338.8	4.9	7	11.6	22.1	62.5	128.5	311.7	**342.5**	**391.4**	**417.4**

Table C-28: Landing projections for the MS sector under the No Action Alternative for 2019 using the bootstrap methodology assuming the automatic authority provision is removed from regulation. No Action allocations are provided on the left for reference. Bolded text indicates values that are higher than the allocations or set-asides.

Stock	MS All./Set-Aside (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	87,044	76,799	87,044	87,044	87,044	87,044	87,044	87,044	87,044	87,044	87,044
Canary rockfish	30	0.1	0.2	0.3	0.5	1.1	2.3	4	8.4	20.4	**32.2**
Darkblotched rockfish	15.4	0.3	0.4	0.7	2.6	6.3	9.6	12.5	13.7	**16.9**	**24.4**
POP	167.4	0.1	0.2	0.3	1.3	3.6	6.4	9.2	25.8	35.4	45.7
Widow rockfish	253	2.2	2.5	23.1	49.3	72.9	95.7	135	217.6	**255.2**	**263.4**

Table C-29: Landing projections for the MS sector under the No Action Alternative for 2020 using the bootstrap methodology assuming the automatic authority provision is removed from regulation. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations or set-asides.

Stock	MS All./Set-Aside (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	87,044	72,374	87,044	87,044	87,044	87,044	87,044	87,044	87,044	87,044	87,044
Canary rockfish	30	0.1	0.2	0.3	0.5	1.1	2.3	4.4	8.5	20.4	**32.2**
Darkblotched rockfish	16.4	0.3	0.4	0.7	2.6	6.4	9.5	12.5	13.7	**16.9**	**24.3**
POP	163.0	0.1	0.2	0.3	1.3	3.6	6.3	9	24.7	35.6	45.8
Widow rockfish	239.1	2.2	2.6	22.9	48.5	72.7	95.7	135.9	222.5	**241.8**	**249.5**

In addition, while darkblotched rockfish and POP would be managed as sector-specific set-asides, all other at-sea set-asides are managed for the at-sea sector as a whole (i.e., CP and MS combined). As examined in Agenda Item F.7.a, WDFW Report, September 2016, the likelihood of both sectors exceeding the combined set-aside values can be looked at to determine the contribution of the at-sea sector to the overall risk to the trawl allocation and ACL. Due to the fact that there are no simulated seasons that project either sector exceeds their set-aside amount for POP, only darkblotched rockfish is examined below.

Table C-30: Simulated projected combined catch of darkblotched rockfish in the at-sea sectors. Bolded text indicates values higher than the combined set-aside value.

Year	Combined Set Aside Amount (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
2019	37.2	1.1	1.4	5.8	9.2	15.5	20.1	24.6	28.6	**44.4**	**67.8**
2020	39.6	1.1	1.4	5.8	9.1	15.5	20.2	24.6	28.4	**42.3**	**67**

As shown in Table C-30, there is a 1:100 chance that the at-sea sectors combined would catch in excess of their combined darkblotched set-aside amounts. However, even if they were to catch ~67 mt in that 1 in 10,000 chance, there would be minimal risk to the trawl allocation or the ACL unless attainment in the IFQ sector increases substantially. Since 2011, the IFQ sector has taken an average of 38.4 percent of their allocation, and as shown in of Section A.2.4, Table A-47 and Table 4-48, the shorebased IFQ sector is projected to take 37 percent of their allocations in 2019 and 2020. That is a residual of over 500 mt that would be able to compensate for any overage in the at-sea sectors. Furthermore, the non-trawl allocation of 37.4 and 39.9 mt for 2019 and 2020 is likely to have little if any removals resulting in no risk to the ACL.

3. What and when was the Council's decision and how did it arrive at the decision?

When the Council developed Amendment 21, the thought behind the within trawl formula for the three overfished trawl species (darkblotched rockfish, POP, and widow rockfish) was to set values high enough

for the at-sea sectors recent bycatch but then the EIS stated that "vessels in these sectors are very mobile when fishing whiting and could move to other areas and depths to avoid attaining their respective total catch limits." Furthermore, set-asides were designed to "accommodate the projected bycatch in these fisheries…[and] are needed for those species incidentally caught in the at-sea whiting fisheries that are not managed with a bycatch limit" (Amendment 21 EIS). At the time that Amendments 20 and 21 were developed, there was a need to have allocations, and a closure mechanism, for the four trawl dominant overfished species (canary, darkblotched, and widow rockfish, and POP). These species had very low ACLs and the Council didn't want to unnecessarily strand fish in the at-sea allocations, but also wanted to allow the IFQ sector to operate as effectively as possible.

While the at-sea sector is mobile, the fleets have been constantly moving (resulting in large operational costs) to avoid bycatch of POP or darkblotched rockfish and the possible shutdown of the fishery, while also trying to find whiting schools, which vary by year in location and magnitude. The Council has spent time during several inseason agenda items, and had an emergency Council meeting in October 2014, to find available additional allocation of POP or darkblotched rockfish for the at-sea sectors. On top of that avoidance, the 2017 salmon situation put a bigger burden on the fleet to avoid salmon bycatch.

The Council originally took action on Amendment 21-3 in September 2016[7]. At that time, the ACLs for darkblotched rockfish and POP were significantly lower than the proposed No Action ACLs for 2019-2020. There were concerns that the at-sea sectors would exceed their set-aside values and the buffer (25 mt for POP in 2017 and 2018, 50 mt for darkblotched rockfish). While there would likely be no risk to the ACLs, the Council did not want to create an inequitable opportunity. Therefore, in the motion, the Council directed NMFS to close the at-sea sectors if the set-aside plus the buffer were projected to be exceeded.

With the new assessments for darkblotched rockfish and POP in 2017 showing that both stocks are rebuilt, and POP being several times greater in magnitude than expected, the Council did not see a need in November 2017 to establish a buffer for the 2019-2020 biennium. Furthermore, the IFQ sector, which is the primary fleet targeting both species, and would have been the most impacted by the at-sea fleet taking more than their set-asides and the buffer amount combined, would have increased allocations compared to 2017 and 2018. Corresponding vessel limits would increase (lowering the risk of lightning strikes) and more quota pounds would be available on the market. Plus, as described above, the IFQ sector has averaged an attainment of 38.4 percent for darkblotched rockfish and 42.6 percent for POP. Even with the proposed removal of the RCA off Oregon and California, it is unlikely that the IFQ sector would take a majority of their allocation with other constraining species (e.g., sablefish) or market constraints. Finally, there is relatively little catch of either species in the non-trawl sector, resulting in the non-trawl allocation being a kind of "buffer" against exceeding the ACL.

4. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

As described under Part 3, the use of an automatic closure for exceeding the set-aside plus a buffer was discussed at length by the Council when considering Amendment 21-3 and when proposing this management measure. Even with the removal of this provision, NMFS can still take routine inseason action as described in CFR 660.150 and 660.160 (excerpt below).

> (ii) Groundfish species with at-sea sector set asides will be managed on an annual basis unless there is a risk of a harvest specification being exceeded, unforeseen impact on another fishery, or

[7] http://www.pcouncil.org/wp-content/uploads/2016/09/0916decisions.pdf

conservation concerns in which case inseason action may be taken. Set asides may be adjusted through biennial specifications and management measures process as necessary.

Bycatch Reduction Areas (BRAs), are available through routine inseason action for midwater trawl gear for three conservation purposes, including "preventing the overfishing of any groundfish species by minimizing the direct or indirect catch of the species" (660.60 (c)(3)(i). BRAs are currently available in regulation at 75, 100, or 150 fathom depth contours, and close the area shoreward of that depth contour to fishing. Additionally, if NMFS projects that a whiting sector will exceed an *allocation* for a non-whiting groundfish species before taking their whiting allocation, NMFS can implement a BRA through automatic action. The Council is currently considering making darkblotched rockfish and POP, as well as canary and widow rockfish, permanent set-asides with amounts established through the biennial specifications process as part of the catch shares review follow-on actions (November 2017 Council Decision Summary). All other set-asides for the at-sea sector are set biennially, and are generally set high enough to cover the recent year period's maximum mortality. The current formula for establishing set-aside amounts for darkblotched and POP would give the sectors more darkblotched and POP than they have historically caught. However, those catch amounts have come at a high operational cost to the at-sea sectors.

During the follow on process, the Council may want to consider amending the regulations to allow BRAs to be used to control catch of set-aside species through automatic action. If the IFQ sector were to increase attainments of these stocks, or any other set-aside stocks (e.g., sablefish), it may warrant having a mechanism available to control catch in the at-sea sector between Council meetings (i.e., before routine inseason action could occur). The at-sea sectors want to be able to maintain the ability to manage themselves, and have stated that they are committed to move-along rules or protocols to limit bycatch of rockfish.

Part B

1. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

This management measure is intended to provide economic relief to the at-sea sectors in their ability to target their whiting allocation. Currently, the at-sea sectors move constantly to avoid potential shut down of the fishery because of the possibility of exceeding a set-aside, or allocation, of bycatch species. Whiting school size and location vary year to year, and therefore the fleet's fishing activity is dependent on the ability to fish when and where the whiting are. If darkblotched rockfish and POP are managed similar to all other set-asides, the at-sea sectors could catch their whiting allocations without additional burden or risk to exceeding the ACL, each other, or another sector.

2. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

    a. How would you describe this new management measure (may select more than one)
        - ❑ Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ■ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.

- ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
- ■ Designed to mitigate a negative economic or social effect.
- ❑ Applies to only a small area of the total EEZ.

b. What resource(s) would the management measure likely effect, either positively or negatively?

- ❑ Physical EFH or Ecosystems
- ■ Biological Resources (target, non-target species)
- ❑ Protected Resources (mammals, ESA-listed)
- ■ Economic, social, cultural

c. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.

- ❑ Physical EFH or Ecosystems
- ❑ Biological Resources (target, non-target species)
- ❑ Protected Resources (mammals, ESA-listed)
- ❑ Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects'. Remember both positive and negative effects.

1. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

With the removal of the automatic authority, the at-sea sectors may be able to increase their attainment of their respective whiting allocations with little to no risk of overfishing the whiting, darkblotched rockfish, or POP stocks. As shown above, there is an increase in the likelihood of attaining the whiting allocation (Table C-26 through Table C-29) compared to Tables XX in Chapter X (DHCR). As described above, there could be an increase in catch of darkblotched rockfish and POP with the removal of the automatic authority (i.e., exceed the set-aside), although the risk to the allocations and ACLs is low given the low attainment in the trawl sector in recent years. Consequently, there is little risk of overfishing, so long as attainment by non-at-sea sectors is low. If attainment by these sectors increases in the future, the at-sea sector could be restricted if necessary to stay within ACLs. Overall, it is not expected to adversely affect managed species.

    b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

By removing the automatic authority, the at-sea sector could see increases in catch of whiting, and potentially darkblotched rockfish and POP as well as other groundfish species that co-occur on whiting targeted trips. Managing darkblotched rockfish and POP, which have been the most constraining species to the at-sea fleet in recent years, as regular set-asides (i.e., no closure when exceeded, except for certain cases) would allow vessels to fish for whiting without having to move immediately after catching only a small number of fish of either bycatch species. Other set-aside species catch (shown in Table X-XX in Section XX) may change with changes in fishing behavior based on relaxed co-op rules for darkblotched and POP.

2. Other Fish

a. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and to what stocks? How is this catch monitored? Are the affected stocks managed under another federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

The removal of the automatic authority and management of darkblotched rockfish and POP like other set-asides may lead to a change in fishing behavior and therefore could impact non-groundfish species. As written, NMFS could take automatic authority to close the sector if the set-aside for darkblotched rockfish or POP were exceeded, similar to an allocation. Vessels may be able to fish longer in an area, even if they encounter POP and darkblotched rockfish, with the removal of the automatic authority (i.e., managed like all other set-asides). Table C-31 below shows the recent catch of species by management group from 2009-2017 in the at-sea sectors. This range is intended to provide a perspective of pre and post IFQ years. There is currently no model to predict non-groundfish landings, but catch is evaluated every biennium. As shown, catches have varied, with the largest variation in coastal pelagic species. In 2009, there was over 3,000 mt of Humboldt squid caught, and most recently spiked in 2017 with jack mackerel. While catches may vary with this management measure if vessels alter their fishing behavior, the impacts are likely to be within the normal range of bycatch of non-groundfish species.

Table C-31: Total catch of non-groundfish by management group in the at-sea sectors, 2009-2017. All catch in mt except for salmon (in numbers of fish).

Year	Coastal Pelagic Species	Crab	Highly Migratory Species	Unidentified	Other (EC species, halibut, unspecified sharks)	Shrimp	Salmon
2009	3845.85	0.00	0.36	0.13	56.51	0.00	374
2010	148.33	0.00	1.02	0.11	171.08	0.00	728
2011	14.36	0.00	0.95	0.60	303.56	0.02	4,060
2012	17.20	0.00	0.11	0.27	137.49	0.01	4,327
2013	89.75	0.04	0.68	0.16	307.13	0.00	3,810
2014	109.94	0.00	2.08	1.54	273.58	0.00	6,798
2015	131.85	0.00	2.36	6.04	396.21	0.00	1,841
2016	256.30	0.00	4.37	2.96	501.37	0.00	3,099
2017	644.52	0.00	4.44	16.36	371.52	0.00	3,788

3. EFH and Ecosystems
    a. Will this management measure change fishing activity so as to adversely affect essential fish habitat compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

There are likely no adverse impacts to EFH compared to No Action since there are no anticipated changes in gear, methods, or overall distribution of fishing effort, and midwater gear has little to no interactions with EFH. Fishing effort varies by year in the at-sea fleet currently, as it is dependent on the movement and availability of whiting schools. Therefore, while the fleets may be more relaxed in their bycatch rules compared to status quo and fish longer in certain spots, the overall impact on EFH will be minimal.

b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

No.

c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No.

4. Marine Mammals and ESA Species
   a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

The removal of the automatic authority provision may result in adverse effects to ESA-listed species and/or non-listed seabirds. However, whether or not a given year's impacts are due to this action versus the normal variation in interaction is uncertain. The at-sea sectors have historically interacted with Chinook salmon (and other species of salmonids), eulachon, and a variety of birds and marine mammals. Data from the Northwest Fisheries Science Center's reports on protected species (2002-2014) was used in the following summary (Jannot, et.al, 2016). This span of years covers a range of at-sea management, with sector-specific whiting allocations going into place in 2007, sector-specific groundfish allocations in 2009, and the IFQ program beginning in 2011.

With regard to marine mammals, the at-sea sectors have most frequently interacted with stellar sea lions followed by California sea lions. From 2002-2014, there were 161 recorded interactions with marine mammals, with the majority being individuals observed feeding on catch (87) and killed by gear (65). However, the number and type of interactions vary by year, with 2014 having 31 recorded interactions (22 of which were feeding on catch), and 2010 having the highest amount of marine mammals killed (13). Based on the variation in these catches and the management regime over that time, it is unlikely that the removal authority will have any additional impact on marine mammals.

Eulachon bycatch has typically been zero since 2002, with a prominent spike in 2011 for the CP sector of 1,268 observed individuals. This exceeded the expected take for the entire groundfish fishery of 1,004 eulachon. Again, the removal of the automatic authority is likely to not cause any adverse effects to eulachon because there is likely a relationship between bycatch and the abundance level. Re-consultation is still ongoing, and the new threshold has yet to be determined. However, the Council's non-salmon ESA working group has stated that the current ITS take amount may not be appropriate, and recommended that the threshold include a large variation to account for fluctuations in abundance (Agenda Item F.5.a, GESW Report, April 2017).

There were almost 2,200 interactions with seabirds in the at-sea sector from 2002-2014, with the vast majority being northern fulmars boarding vessels (1650). Of greatest concern though, is the interaction with short-tailed albatross. There has been only one sighting of a short-tailed albatross feeding on catch on a MS catcher vessel in 2011. However, short-tailed albatross are rare, and black footed albatross are used as a proxy for informing interactions. Based on black-footed albatross observations, it is believed that there are additional impacts for short-tailed albatross, particularly for CPs, when they are releasing fish processing waste and have trawl gear deployed (Agenda Item F.5.a, NMFS Report 6, April 2017). Again, there are likely no adverse effects from this action (i.e., removing the automatic authority provision).

For salmon, there may be additional impacts depending on the change in fishing behavior. With the removal of the automatic authority provision, vessels may extend fishing time in an area with a higher bycatch rate compared to the status quo. However, preliminary analysis suggests that there is not a clear relationship between salmon, darkblotched, and POP bycatch. For example, in 2014, the MS sector had high bycatch of darkblotched resulting in the shutdown of the fishery and an emergency Council meeting to reopen the fishery in October. In that year, the whiting sector also exceeded the 11,000 Chinook salmon threshold. The MS sector had over 1,300 hauls that year, with 12.71 percent being positive for darkblotched and no Chinook and 13.94 percent being positive for Chinook with no darkblotched (or POP) present. Only 6.2 percent of hauls had both. It is uncertain whether there would be a specific adverse impact on salmon with this action, as there are many factors (e.g., location of whiting schools, time of year, other constraining species) that result in increased salmon interactions.

5. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example, which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

This management measure would not change the distribution of catch opportunity among user groups, but is intended to give the at-sea sectors increased opportunities to harvest their whiting allocation by eliminating the fear of automatic closure due to the exceedance of a set-aside value for an incidentally caught species, and allowing them to fish longer for whiting in spots that previously would have been vacated if one or two darkblotched rockfish or POP were caught.

    b. Can the proposed action reasonably be expected to significantly affect public health or safety?

No.

6. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

The proposed action will have negligible adverse effects on all resources other than economics, which will see positive impacts. For economic effects, the benefits, which cannot be explicitly quantified, are expected to be limited to the at-sea sectors as a whole, as the removal of the automatic authority would affect the at-sea sectors primarily. There may be some associated cumulative impacts with the development of the mitigation measures for meeting the terms and conditions of the salmon biological opinion released in 2017. The Council and NMFS are considering developing BRAs for salmon mitigation. If the Council were to implement a BRA to shift effort off salmon, it could increase effort on the slope, thereby increasing the probability of catch.

7. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

No.

b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No.

8. MSA National Standards
    a. Describe how the management measure is consistent with the 10 MSA National Standards.

As described in Agenda Item F.7.a, WDFW Report, September 2016, the management of darkblotched rockfish and POP as set-asides for the at-sea sectors primarily deals with National Standards 7 and 8.

National Standard 7 (NS7) and National Standard 8 (NS8), read as follows:

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet [National Standard 2], in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

Under the automatic authority for set-aside management and the absence of a buffer for darkblotched rockfish and POP results in the set-asides acting as allocations thereby eliminating the flexibility that was one of the core drivers of the original action. Darkblotched rockfish and POP bycatch can accumulate quickly, resulting in the fleets not being able to respond in a timely manner. Set-asides are intended to provide a way to account for incidental catch, but provide some flexibility if a high bycatch ("lightning strike") type event or a number of smaller bycatch events, were to occur. Removal of the automatic authority from regulation would be expected to reduce costs and adverse impacts related to No Action. The at-sea sectors would not only be able to increase the likelihood of attaining their whiting allocation (and lower the risk of foregone yield and economic benefits), but also would allow the fleets to relax their co-op management measures. In other words, the concern of being closed due to exceeding an allocation has resulted in the fleets constantly moving to avoid bycatch of darkblotched and POP in recent years. This could result in fishing on other set-aside stocks, like sablefish, or non-groundfish species, like salmon.

Finally, there is some consideration of NS 5, which states:

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

When assessing the efficiency of a regulation, the guidelines state that

(ii) Management regimes that allow a fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) for a particular level of catch and initial stock size are considered efficient. Restrictive measures that unnecessarily raise any of those costs move the regime toward inefficiency.

In recent years, the Council, its advisory bodies, and NMFS have spent a large amount of time and resources (including an emergency Council meeting in October 2014) on finding additional allocation to shift to the at-sea sectors. By keeping the automatic authority provision, the management of the at-sea sectors remains inefficient and takes resources away from other actions and sectors. If darkblotched rockfish and POP were managed with no automatic authority provision (like all other set-asides), action would only be needed if

there was a conservation concern, risk to a harvest specification, or an unforeseen impact to another sector. The co-op system has proven to be effective at managing bycatch within restrictive limits, and there is an incentive to continue to have the flexibility to construct their seasons in a way that is most beneficial to their operations.

C.3.3 Lingcod and Sablefish Discard Mortality Rates in the Shorebased IFQ Program

Part A

1. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

This new management measure would result in quota pounds (QPs) for sablefish and lingcod being debited from IFQ accounts based on the discard mortality rates (DMRs) endorsed by the SSC and utilized elsewhere in management instead of the current approach that debits 100 percent of all catch regardless of survival. The purpose of this action is to provide IFQ participants with discard survival credits for lingcod and sablefish to better meet some of the objectives of the IFQ program, and align discard mortality rates with those used in year-end catch accounting. The need is to increase attainment of co-occurring target species, and increase marketability and value of retained catch by eliminating the need to retain small fish that are not economically marketable, or desirable.

In general, the fishery management system allocates an amount of fish to the sector to cover fishing mortality by that sector. However, the trawl IFQ program manages the trawl allocation with quota based on catch rather than mortality (essentially assuming a 100 percent discard mortality rate). Since catch for some species is discarded and survives, for those species the trawl sector's actual mortality is necessarily less than what it is allocated (so long as catch is not in excess of the QPs issued each year). This measure would provide credit for lingcod and sablefish, increasing the opportunity for the trawl sector to take its full allocation of those two species.

This management measure would reduce the current 100 percent IFQ discard mortality rates (DMRs) used in catch accounting of QPs for lingcod and sablefish to the lesser DMRs that have been endorsed by the SSC (Table C-32) and are utilized elsewhere in management (i.e., WCGOP estimates of total mortality and stock assessment catch streams). Although this new management measure would provide "survival credits" for industry, it would also represent a shift from conservative and buffered DMRs to lesser DMRs that reflect the best available science. For many other species, discard survival rates are not believed to be high enough to warrant consideration of a survival credit.

This management measure would pertain to the coastwide shorebased IFQ fishery, and would primarily affect the sablefish and lingcod stocks from all management areas. However, the resulting "savings" of trawl sablefish could possibly increase landings of co-occurring species such as Dover sole, shortspine thornyheads, and longspine thornyheads (described in detail later).

Adoption of this new management measure is not expected to result in large increases to benefits or changes to fishing behaviors or mortality of groundfish or non-groundfish species. Gross revenue analyses provided below demonstrate that it could be a losing proposition for IFQ participants, both trawl and fixed gear (FG), to increase their discarding of sablefish in general if provided the "credits"; therefore, discarding patterns would be expected to remain similar to the low IFQ-era levels given the lack of incentive for greater discarding. For lingcod, no major changes are expected since fixed gear impacts are negligible and there would be no incentive for bottom trawlers to increase discarding. They would receive a benefit from the lingcod discard survival credit that would allow them to come somewhat closer to the total mortality the sector is allocated (in general, the trawl sector under-attains its lingcod allocation by considerable amounts).

Since minimal changes to discards are expected for sablefish, the main difference is that landings and mortality would be expected to increase by the amount of QP savings/gains the credit would provide, which could be a gain of one-half the trawl discards (9-21 mt per year) and four-fifths the IFQ FG discards (11-

20 mt per year) which could be converted into additional landings. The resulting gains in landings and mortality could therefore be an extra 5-11 mt for trawl and 9-16 mt for IFQ FG, which would only be about a 1 percent increase in total coastwide IFQ mortality (discussed in detail below).

Table C-32. Current and proposed IFQ DMRs that would be used to debit quota pounds for sablefish and lingcod. Note the proposed DMRs are endorsed by the SSC and are utilized elsewhere in management (e.g., WCGOP estimates of total mortality and stock assessment removals).

Species	Gear	Proposed DMRs ("survival credit")	Current IFQ DMRs
Lingcod	Bottom Trawl	50%	100%
	Fixed Gear	7% a/	100%
Sablefish	Bottom Trawl	50%	100%
	Fixed Gear	20% b/	100%

a/ Only for hook and line gear
b/ Applies to both pot and hook and line gear

2. What was considered in order to optimize the performance of this measure?

Optimization of the performance of this management measure has centered on IFQ program goals, expected benefits, and potential shifts in discarding practices (discussed in detail below).

3. What and when was the Council's decision and how did it arrive at the decision?

The current approach that debits all catch including discards was adopted in Amendment 20 (see section E.2.1.4): "Discarding will be allowed, though all fish discarded will also have to be covered by QP ". The main Council rationale for this decision was to reduce discards and associated mortality, and to also enhance the ability to account for total groundfish mortality in conjunction with a 100 percent monitoring requirement (Objectives 3 and 1 respectively from the Pacific Coast Limited Entry Trawl Fishery FEIS).

The Council elected to analyze this new management measure that would provide survival credits for discards as part of the 2019-2020 biennial harvest specification and management measures process from the November 2017 PFMC meeting.

The Council arrived at this decision based on the following events following adoption of Amendment 20: (1) "IFQ survival credits" of sablefish and lingcod was selected by the Council for further investigation during the June 2017 Omnibus Prioritization Process (Agenda Item G.6, Council Action, June 2017); (2) the GMT verified and the SSC provided an implied endorsement ("no change") that the lesser DMRs used elsewhere in management were appropriate (Agenda Item F.3.a, GMT Report 1, June 2017 and Agenda Item F.3.a, Supplemental SSC Report, June 2017, respectively); and (3) the GMT scoped the purpose and need, policy trade-offs, expected benefits, and potential shifts in discarding in another June 2017 report (Agenda Item F.3, Attachment 1, June 2017).

4. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

The following excerpt from a June 2017 GMT report in regards to policy trade-offs associated with this new management measure to original Amendment 20 catch share program goals is worth noting (Agenda Item F.3, Attachment 1, June 2017):

"There are policy trade-offs for the Council to consider in relation to the Amendment 20 program goals. When the catch shares program was developed, one of the main objectives was to reduce discards and associated mortality (Objective 3, Pacific Coast Limited Entry Trawl Fishery FEIS). Allowing survival credits for these species in the IFQ fishery would likely increase discards, and be counter to that objective (e.g., trawl discards of sablefish were reduced from 5-15 percent before IFQ to one percent or less thereafter; Appendix).

On the other hand, allowing use of discard mortality rates less than 100 percent could help better achieve some of the other IFQ program objectives such as increased attainments of IFQ stocks (e.g., survival credits of sablefish could increase access to Dover sole and thornyheads) as well as increasing the value of IFQ stocks (i.e., due to higher landings and/or highgrading to obtain higher value fish; Objectives 2, 5, 6, Pacific Coast Limited Entry Trawl Fishery FEIS)."

In summary, there are policy trade-offs for either option (i.e., credit or not); neither option accomplishes all the IFQ program goals.

Part B

1. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

The primary objectives of this new management measure are economic and are geared toward potentially increasing IFQ landings and/or revenues of lingcod, sablefish, and co-occurring species constrained by sablefish such as Dover sole, shortspine thornyhead, and longspine thornyhead. However, analyses below show that there may not be much added revenue benefits via adoption of this new management measure, which was echoed by the Groundfish Advisory Subpanel (Agenda Item F.3.a, Supplemental GAP Report, June 2017). Therefore, the primary benefits could instead be social in that it could reduce frustration amongst industry that the DMRs used to debit their QP accounts are higher than the DMRs used for final estimates of discard mortality.

Although the main objectives are economic and social, IFQ participants would still be strictly held to their individual and IFQ sector allocations thereby ensuring conservation objectives continue to be met.

2. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

    a. How would you describe this new management measure (may select more than one)

        [X] Technical correction or a change to a fishery management action or regulation,

which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.

- ❑ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
- ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
- [X] Designed to mitigate a negative economic or social effect.
- ❑ Applies to only a small area of the total EEZ.

b. What resource(s) would the management measure likely affect, either positively or negatively?

- ❑ Physical EFH or Ecosystems
- ❑ Biological Resources (target, non-target species)
- ❑ Protected Resources (mammals, ESA-listed)
- [X] Economic, social, cultural

c. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.

- ❑ Physical EFH or Ecosystems
- ❑ Biological Resources (target, non-target species)
- ❑ Protected Resources (mammals, ESA-listed)
- ❑ Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects'. Remember both positive and negative effects.

1. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

This new management measure is expected to increase the mortality that relates to harvest specifications by modest amounts because the survival credits would provide QP savings/gains for discards that could be used to increase landings. For example, trawlers would "get back" one-half of their QP (50 percent savings) for each pound of sablefish discarded and IFQ fixed gear (FG) would get back four-fifths of their QP (80 percent savings). Only modest increases are expected because discards are relatively low compared to landings and the survival credit is not expected to increase the incentive for greater discarding (described below).

Although adoption of the survival credits could increase landings and thus mortality, IFQ participants' total fishing mortality would still be strictly held to their individual and sector allocations. As discussed above, adoption of the survival credit would remove a mortality buffer that reduces their ability to achieve the full IFQ allocations as estimated by WCGOP for official year-end catch accounting purposes (i.e., mortality vs. harvest specifications). As would be the case even if no action is taken, there are always risks that the IFQ fishery could exceed its established allocations due to QP carry-over provisions that result in more QP being available during the year than provided in the annual IFQ sector allocation. Surpluses and deficits of up to 10 percent of the QP in a vessel's account can be carried over from one year to the next. Allowing survival credits that could increase landings and total mortality could exasperate those risks to levels that are comparable to risks for species which are believed to have 100 percent discard mortality.

This new management measure could therefore increase the risk of overfishing (defined as exceeding an OFL) for perhaps the high attainment sablefish stock north of 36° N. lat. (the remainder are low attainment). While it would not be expected, it would become more possible that mortality by the IFQ sector could exceed its allocation, but this would not be expected to adversely affect these stocks beyond what is accounted and planned for in the long term (i.e., ACLs would have to be exceeded every year, since stock assessment ten-year forecasts used to set OFLs, and ACLs assume full ACL removals each year). Further, under the IFQ program, if the allocation is exceeded in one year due to carryover, there will be that much less quota available the following year, during which it is the likely that the allocation will be under-attained.

This action also increases the importance of the DMR being correct or else actual mortality could be underestimated. In this fashion, an additional element of uncertainty is added into the management system. Concerns with underestimating actual DMRs would be heightened if adoption of the credit led to large increases in discarding. While there were considerable declines in discarding following adoption of IFQ in 2011 with the 100 percent DMR, discards are expected to remain at low IFQ-era levels and not return to the higher pre-IFQ levels if provided the credit. That is, costs to discard remain high even with the credit, and are expected to outweigh the potential benefits (described in greater detail below).

This new management measure also has the potential to increase mortality of stocks that co-occur with sablefish. As often suggested by the GAP, sablefish is believed by many to be a constraining stock for the trawl fishery that limits access to Dover sole and thornyheads. If given "survival credits" for sablefish, then the trawl sector could potentially increase the landings of these co-occurring stocks, which would be beneficial for meeting MSY goals, as these stocks are underutilized (e.g., 15 percent and 48 percent or less ACL attainment in 2016, respectively).

b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

This management measure has the potential to change catch of groundfish stocks in relation to past performance and management reference points. However, any changes are expected to be minor since the "survival credits" are not expected to increase the incentive for discarding and thus not affect fishing behaviors in general. Investigation of potential complications arising from increased incentives for discarding was a main recommendation from the SSC report pertaining to survival credits (Agenda Item F.3.a, Supplemental SSC Report, June 2017).

Detailed analysis of potential changes associated with the survival credit are described in the section for: (1) bottom trawl sablefish; (2) bottom trawl co-occurring stocks to sablefish; (3) fixed gear IFQ sablefish; (4) lingcod in general.

Bottom trawl sablefish

Support for this new management measure is predominately stemming from sablefish, since it is the highest value non-whiting species, and is highly attained. Given that there are different size grades of sablefish of which larger fish fetch higher prices per pound, there is high incentive to land the largest sablefish grades to maximize revenues.

If provided survival credits for sablefish, it could increase the incentive to discard for two main reasons. First, it might provide an incentive to high-grade, which is defined as discarding smaller and less valuable grades of sablefish in attempts to catch larger and more valuable grades of sablefish. Second, discarding

of sablefish could provide QP savings/gains that could be used to increase landings of co-occurring stocks constrained by sablefish (i.e., Dover sole and thornyheads).

Although survival credits could provide incentives for discarding, there would still be some considerable costs of discarding with the survival credit. These costs include the operational costs related to the labor involved with discarding and the additional fishing effort to replace the discarded fish and losses in gross revenue (exvessel value) that occur when a fish is discarded. If the benefits of discarding with the survival credit do not outweigh the costs, then there would be a disincentive to discard and thus no increases to discarding or fishing patterns in general would be expected. This is the main reason why the SSC report on the survival credit specifically stated that analysis should focus on whether or not the credit creates an incentive for discarding (Agenda Item F.3.a, Supplemental SSC Report, June 2017).

As such, this analysis focused on if the survival credit would create incentive for discarding by the degree to which total gross revenue may be increased by high grading. The ideal approach would have been to gauge expected profit margins, but there is insufficient information regarding total benefits and costs of discarding to do so (e.g., extra tow times). However, before considering the operational costs of high-grading, it is useful to identify the gains in gross revenues that would be available to off-set those costs. If the gains in gross revenue are low, they are unlikely to offset the additional operational costs of highgrading.

Positive "net gross revenues" mean they could receive more revenue than they would lose by discarding, which would contribute to offsetting operational costs of discarding costs and potentially create an incentive to discard. Negative gross revenues mean that there would be no opportunity to offset discarding operational costs, and further, that fishers could lose more revenue than they would gain by discarding, which would maintain a disincentive for discarding.

Again, "net gross revenue" is total ex-vessel revenue minus the revenue lost to discarding, and was standardized to expected revenue per pound of fish discarded for consistency purposes. For example, there would be $0.50 net gross revenue if the lost revenue per pound of discarding is $1.00 and the gained revenue per pound is $1.50. Lost gross revenue is defined as the ex-vessel price per pound of each grade of sablefish discarded, since a fish thrown back is not one they can sell. The gained revenue is the expected amount in revenue the fishermen could obtain after discarding that fish, which is based on the survival credit savings (i.e., one-half QP gained back per pound discarded) multiplied by the price per pound of what they could land with those one-half QP savings.

It is important to note that high-grading is an attempt by fishermen to land larger and higher price fish, and it would be risky for bottom trawlers to attempt to high-grade if given the survival credit. That is because failed attempts could result in rather substantial revenue loses. For example, a trawler who discards one pound of extra small would lose $1.30 (price per lb) and would gain back one-half QP that they could use to attempt to high-grade. If they wound up catching another extra small in the process, then their return would only be $0.65 (½ QP x $1.30 per pound), which would represent a net loss of $0.65. Conversely, there is also a chance that high-grading could pay off. For example, they could gain $0.20 if they discarded one pound of extra small (ex-vessel revenue = $1.30) and wound up catching a large grade for a $1.50 net return to gross ex-vessel revenue (½ QP back via the survival credit x $3.0 per lb).

To determine potential net gross revenues of high-grading, the probability of catching each of the different sablefish grades must be factored in. The expected return of high-grading is based summing the probability of catching each grade multiplied by its respective price per pound, which is akin to a weighted average expected return. Note that previous GMT analyses overestimated the expected returns of high-grading since they assumed that fishermen would be able to perfectly upgrade all their smaller catches to larger and more valuable grades without fail. Selectively catching only larger grades like that does not appear possible,

because if it were, trawlers would already be doing it to maximize their revenues, and they are not (89 percent of catch is from extra small to medium grades).

It is unlikely that increases in sablefish revenue resulting from the survival credits will increase sablefish discarding by bottom trawlers since the net gross revenues of high-grading are negative for all grades (Table C-33). In other words, they would be expected to be better off by landing and selling all their sablefish catch. For every pound of extra small they discard, they would be expected to lose -$0.28 in net gross revenue. Worse losses would be expected for the larger grades: -$1.08 for small; -$1.18 for medium; -$1.98 for large; and -$2.38 for extra large.

Table C-33. Expected net gross revenue returns of discarding a pound of sablefish by grade in attempts to high-grade with the survival credit. For example, the expect return of discarding one lb of extra small sablefish is a loss of $0.28 in revenue since the costs to discard ($1.3) outweigh the expected returns ($1.02).

Grade	% Landings	Sablefish price per lb (cost to discard)	% landings x price per lb x 1/2 QP "return" (sum is basis of expected return)	Expected Sablefish return	Net gross revenue sablefish highgrading
Extra Small	24.3%	1.3	0.16	1.02	-0.28
Small	29.9%	2.1	0.31	1.02	-1.08
Medium	34.7%	2.2	0.38	1.02	-1.18
Large	11.1%	3	0.17	1.02	-1.98
Extra Large	0.0%	3.4	0.00	1.02	-2.38
	Expected Sable return = sum of % landings x price per lb =		**1.02**		

However, if discarding of sablefish also resulted in higher landings of co-occurring stocks (e.g., Dover sole or thornyheads), this could make discarding more profitable and prone to occur. Accordingly, the net gross revenue projections of high-grading alone from Table C-33 were expanded to include the potential benefits of extra catch of co-occurring species that could potentially occur. Projections were based on the same catch ratios used by Dr. Lisa Pfeiffer to evaluate potential increases of Dover and thornyheads via additional trawl sablefish quota from the 5-Year Catch Share Program Review Report (Agenda Item F.2.a, Catch Shares Analysts Report, June 2017). Each extra pound of trawl sablefish was modeled to add 4.95 lbs of Dover sole, 0.63 of longspine thornyhead, and 0.5 lbs of shortspine thornyhead. If these full gains were truly to occur, which may be overestimated (described below), then the added non-sablefish ex-vessel value of discarding one pound of sablefish with the survival credit would be an extra $1.45 total for these co-occurring stocks = [½ QP sablefish gained back x (4.95 lbs Dover x $0.45 per lb + 0.63 lbs shortspine x $0.60 per lb + 0.5 lbs longspine x $0.60 per lb).

Although discarding of sablefish to attempt to high-grade to larger sablefish appears to be a losing proposition with the survival credit, the added value of co-occurring species could result in positive net gross revenues if trawlers were to discard their extra small (+$1.17 per lb discarded), small (+$0.37 per lb discarded), and medium grades (+$0.27 per lb discarded). This could create a high incentive to discard if provided the survival credit. For instance, they could be able to nearly double their revenues by discarding extra smalls; keeping one pound of sablefish fetches $1.30, whereas discarding that same pound fetches a $1.02 expected return of sablefish plus a possible $1.45 return in co-occurring stocks for a total possible return of $2.47 and a net gross revenue of $1.17 ($2.47 minus the $1.30 for the discarded pound).

Table C-34. Expected net gross revenue returns of discarding each grade of sablefish based on the high-grading returns (from Table C-33) plus returns in co-occurring species such as Dover sole and thornyheads. For example, the benefits of discarding a pound of extra small sablefish ($1.02 + $1.45) are expected to outweigh the costs ($1.30).

Grade	% Landings	Price per lb (sablefish cost)	% landings x price per lb	Expected Sablefish high-grade return	Expected co-occurring return	Net gross revenue
Extra Small	24.3%	1.3	0.16	1.02	1.45	1.17
Small	29.9%	2.1	0.31	1.02	1.45	0.37
Medium	34.7%	2.2	0.38	1.02	1.45	0.27
Large	11.1%	3	0.17	1.02	1.45	-0.53
Extra Large	0.0%	3.4	0.00	1.02	1.45	-0.93

Therefore, potential changes in discarding practices associated with the survival credit hinge on a big and uncertain assumption that trawlers would be able to recoup their sablefish revenue losses with rather large gains from co-occurring species such as Dover sole and thornyheads. This might not be the case if market constrains the landing of other co-occurring stocks, which has been often stated by both trawlers and processors during public testimony. In that case, the expected returns in co-occurring species from this analysis would be overestimated, and no increases to discarding would be expected since the benefits would be outweighed by the costs. In fact, trawlers have specifically stated that the assumed gains in co-occurring species from the catch shares analysis that were used as the basis of this survival credit analysis were overstated: “if the plants are not buying Dover sole and thornyheads as is, why would I expect to catch that much more with additional sablefish?”.

In conclusion, minimal changes are expected for trawl sablefish discard patterns if the survival credit were adopted, since the costs are expected to outweigh the costs of discarding. Although there would be less penalty to discard with the survival credit, the penalty would still remain high (only get back one-half QP) especially compared to the trip limit era (which were effectively zero to the individual, since trip limits were only based on landings).

As such, trawl discards of sablefish would be expected to remain at the same low levels of the post-IFQ era and not return to the higher levels of the trip limit era (Table C-35). Since no changes to discard patterns are expected due to adoption of the credit, the only difference of note could be minor increases of landings (5-11 extra mt per year) associated with them "getting back" half their current discards of sablefish. The overall difference in mortality due to an extra 5-11 mt of landings per year would be negligible (0.3-0.8 percent extra per year). This would provide benefit to industry, as they would be able to convert a portion of their non-marketable discards (current IFQ discards) to landings.

Table C-35. Bottom trawl discards of sablefish in relation to landings by era. If provided the credit, then landings are expected to increase by 5-11 mt per year, which is the amount in QP savings they would get back for discarding (= IFQ era discards x ½).

Year	Program	Landings	Discards	% Discards	Discard mort.	% Discard mort.
2007	LE trawl	2,418	371	13.3%	185	7.1%
2008	LE trawl	2,864	187	6.1%	93	3.2%
2009	LE trawl	2,999	320	9.6%	160	5.1%
2010	LE trawl	2,506	479	16.1%	240	8.7%
2011	IFQ	1,677	9	0.6%	5	0.3%
2012	IFQ	1,440	8	0.5%	4	0.3%
2013	IFQ	1,401	8	0.5%	4	0.3%
2014	IFQ	1,279	21	1.6%	11	0.8%

IFQ fixed gear sablefish

The same cost-benefit analysis that was used for trawl was used to evaluate if an FG survival credit of 80 percent (i.e., current DMR is 100 percent and proposed is 20 percent) could create the incentive for increased discarding.

Similar to trawl, attempting to high-grade with the survival credit would likely be a losing proposition in general for IFQ FG. That is because their expected gross revenue from attempting to high-grade (+$2.42 per pound discarded) is outweighed by the gross revenue lost from high-grading except for with the extra smalls (+$0.49 per pound discarded). As with trawl, the expected return is based on the chances that they could catch any of the grades while attempting to high-grade, which includes risks of failed attempts where they catch the same or smaller grades.

It is doubtful that the extra $0.49 per pound that could be gained by discarding extra smalls would be worth the time or effort. That is because IFQ FG appears to nearly exclusively target sablefish (96 percent of total landings) despite there being rather high potential net gross revenues for other stocks, especially compared to the $0.49 sablefish potential for high-grading extra smalls. For example, the potential net gross revenue for targeting shortspine thornyhead, which is the second-most commonly landed IFQ FG stock (48 mt of 3,473 mt), is over $2.00 per pound based on a lease cost of only $0.02 per pound (January 2018 auction

price via Jefferson State Trading Company) compared to an average landed price per pound of $2.16 (for IFQ FG).

While perhaps not a perfect example, since it might be more time consuming or costly to try to catch shortspine thornyheads, it does provide supporting rationale as to why greater IFQ fixed gear discarding of sablefish would not be expected with the survival credit for any grade. Assuming the ratios and prices used in this analysis are correct and consistent across the fleet, time, and fishing areas, the question is whether fishers would incur the costs of fishing under the IFQ program (including the costs of at-sea monitoring) in order to catch a $0.49/lb fish. If the answer is no, then discard survival credit would be less likely to result in high-grading. If there are particular fishermen, times, or fishing areas where a better return can be gained, then this analysis might understate the potential incentive for discarding.

Since minimal additional increases in discarding for IFQ FG would be expected, the main difference with a survival credit could be an increase in landings by roughly 80 percent of the discards (Table C-36). That is because 80 percent of their discards could be converted to QP savings/gains that would go back into their accounts and could be spent on more landed catch. The projected increases in landings are projected to be minor (9-17 mt per year), as that would represent about a 1-2 percent increase in total mortality.

In conclusion, the survival credit is not expected to increase discarding for bottom trawl or IFQ FG, since the costs of discarding would be expected to outweigh the benefits. Therefore, the main difference with adoption of the credit would be an increase of landings equal to the IFQ era discards multiplied by the credit, as this would represent the amount of QP savings they would get back that could be spent on landings. In both cases, the expected increases to landings would be minor since discards have been low for both during the IFQ era. Although higher landings would increase IFQ attainments, they would still be strictly held to their individual and sector allocations, which maintains a low risk to the ACL. Risks to IFQ allocations are mainly attributed to carry-over, and any extra risks associated with survival credits would be best addressed in future carry-over decision-making processes, since the two are linked.

Table C-36. Expected net gross revenue returns of discarding a pound of IFQ FG sablefish by grade in attempt to high-grade with the survival credit.

Grade	% Landings	Sablefish price per lb (cost to discard)	% landings x price per lb x 4/5 QP savings (sum is basis for expected return)	Expected Sablefish return	Net gross revenue
Extra Small	18.5%	1.9	0.29	2.42	0.52
Small	27.0%	2.9	0.62	2.42	-0.48
Medium	35.4%	3.1	0.89	2.42	-0.68
Large	18.8%	4.1	0.62	2.42	-1.68
Extra Large	0.3%	4.0	0.01	2.42	-1.58
		Sum is expected sable return =	**2.42**		

Table C-37. Projected change in historical IFQ fixed gear discards and landings, had the survival credit been available in the past. Expected gains in landings (9-17 mt) would only increase mortality by 1-2 percent by year.

Year	Original			Expected with 80% survival credit		
	Landings	Discards	Discard mort	Landings	Discards	Discard mort
2011	1,116	20	4	1,131	20	4
2012	934	21	4	950	21	4
2013	523	11	2	532	11	2
2014	761	13	3	771	13	3

Bottom trawl and IFQ FG lingcod

Although the survival credit would apply to both trawl lingcod and trawl sablefish, the analysis of this new management is primarily focused on impacts stemming from the sablefish survival credit. That is because the two main potential benefits of discarding sablefish are not thought to be nearly as prevalent for lingcod (i.e., no price benefit of high-grading to larger lingcod nor are lingcod thought to be a constraint to other stocks).

Additionally, since lingcod are a low attainment IFQ stock[8] and fetch high prices, the main focus with or without the survival credit would be to land as much of their catch as possible and to try to catch even more. There is little if any benefit of discarding marketable and legal-size lingcod (22" minimum north of 42° N. lat.; 24" minimum south of 42° N. lat.) just to replace it with other marketable legal-size lingcod. As evidence, note that the lingcod discard rate has been low during the IFQ era (Table C-37**)** of which the main reason for the discards as reported to the observer program (see section 3-9 of the observer manual) has been lack of markets or sub-legal fish (Table C-38). For example, 88 percent of northern discards and 99 percent of southern discards have been for these reasons.

No changes to fishing patterns are therefore expected to result if bottom trawlers are provided survival credits for lingcod. Again, they would be expected to retain everything that is legal and marketable regardless if given a survival credit for discarding or not. One of the main benefits would be that individual vessels would be able to increase their revenue for a given amount of quota. For example, if 9.2 percent of the fish are discarded (as in 2014) and 68.1 percent of the discards are because they are sublegals, then the maximum take under status quo a vessel is using is about 6.3 percent of its lingcod QP to cover discards (9.2% x 68.1%). It might also be significant for the occasional vessel which approaches the annual vessel QP limit for lingcod. Such a vessel could land more fish than it could without the discard credits.

For IFQ FG, no changes are expected since there are only minor amounts of lingcod landings (< 3 mt) and discards (< 0.5 mt) per year. The IFQ fixed gear appears to be selectively targeting only sablefish (>95 percent of their total catch).

Table C-38. Bottom trawl landings and discards of lingcod +-4 years of implementation of IFQ in 2011.

Year	Era	Landings	Discards	% Discards	Discard mort.	% Discard mort.
2007	LE trawl	117	144	55.1%	72	38.1%
2008	LE trawl	107	79	42.6%	40	27.0%
2009	LE trawl	108	115	51.4%	57	34.6%
2010	LE trawl	72	18	20.2%	9	11.3%
2011	IFQ	241	41	14.4%	20	7.7%
2012	IFQ	342	30	8.1%	15	4.2%
2013	IFQ	321	24	6.9%	12	3.6%
2014	IFQ	221	22	9.2%	11	4.8%

[8] The projected 2019 IFQ lingcod attainments are 42 percent for north of 40°10' N. lat. (854 mt of 2,047 mt) and 8 percent for south of 40°10' N. lat. (36 mt of 443 mt) compared to 98 percent for north of 36° sablefish (2,529 mt of 2,581 mt).

Table C-39. Rationale for bottom trawl discards of lingcod.

Discard reason	North of 42° (OR + WA)		South of 42° (CA)	
	Pre-IFQ	**IFQ**	**Pre-IFQ**	**IFQ**
Lack of market	44.6%	19.9%	28.0%	4.3%
Regulatory - other a/	27.7% a/	12.0%	14.7% a/	0.7%
Regulatory - sublegal a/	27.7%	68.1%	57.3%	95.0%

a/ They only report to a single regulatory category that could be for any reason. Regulatory category fish below the size limit had to have been sublegals.

Other Fish

c. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and to what stocks? How is this catch monitored? Are the affected stocks managed under another federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

This management measure is not expected to result in considerable changes to fishing or discard practices, thus no notable negative impacts are expected to non-groundfish. Note that non-groundfish estimates are produced on a one-year lag which would delay evaluation timeframes.

2. EFH and Ecosystems

a. Will this management measure change fishing activity so as to adversely affect essential fish habitat compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

This management measure is not expected to result in considerable changes to fishing practices, thus no notable negative impacts to EFH or ecosystems are expected.

b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

This management measure is not expected to result in considerable changes to fishing or discard practices, thus no notable negative impacts are expected.

c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

This management measure is not expected to result in considerable changes to fishing or discard practices, thus no notable negative impacts are expected.

3. Marine Mammals and ESA Species
    a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

There are interactions between the Pacific coast groundfish fishery (including the shorebased IFQ fishery) and ESA salmon, ESA non-salmon, and marine mammals.

In regards to ESA non-salmon, the 2012 Biological Opinion concluded that the continued action of the Pacific coast groundfish fishery is "not likely to jeopardize the continued existence and is not likely to destroy or adversely modify designated critical habitat of green sturgeon, eulachon, and leatherback sea turtles, and is not likely to jeopardize humpback whales. (Note that the eastern distinct population segment [DPS] of Steller sea lions was subsequently de-listed.)

(Agenda Item F.5, Situation Summary, April 2017).

The same conclusion was determined for ESA salmon in the 2017 Biological Opinion (NMFS Consultation Number: F/WCR-2017-7552).

There are also interactions with non-ESA marine mammals as documented in a Northwest Fisheries Science Center report.

This management measure is not expected to result in considerable changes to fishing practices, thus no notable negative impacts are expected to ESA species or marine mammals.

4. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example, which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

The benefits in additional landings of sablefish associated with the credit are similar but slightly greater for IFQ FG (9-17 mt in extra landings; Table C-36) than for trawl (5-11 mt in extra landings; Table C-35).

    b. Can the proposed action reasonably be expected to significantly affect public health or safety?

This management measure is not expected to result in considerable changes to fishing or discard practices, thus no notable negative impacts are expected to safety or public health.

5. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

Since this management measure is not expected to result in considerable changes to fishing or discard practices, the cumulative effects associated with other changes for the current and foreseeable future are expected to be minor.

These include: (1) proposed new management that would liberalize the shoreward non-trawl RCA from 100 fm to 75 fm in the area off Northern California (40°10' N. lat. - 42° N. lat.) that would pertain to IFQ FG; (2) the new salmon mitigation measures/reserve rules being analyzed as a new management measure that stem from the ITS of the 2017 Biological Opinion, which would pertain to all IFQ gears; (3) the trawl EFPs (Electronic Monitoring and the Year-Round Coastwide Midwater Trawl & Gear Modification EFP; (4) the ongoing development of Amendment 26 that would remove blackgill rockfish from the southern slope complex to be managed with stock-specific harvest specifications and revised trawl and non-trawl allocations; (5) the ongoing development of Amendment 28 that could modify EFH and trawl RCAs; (6) mitigation measures stemming from the ITS for Short-tailed Albatross such as modifications to streamer line requirements and fixed gear logbook; and possibly others.

Repeat each set of questions for affected resources (Groundfish, other fish, EFH, ecosystems, ESA species, marine mammals, social, and economic).

a. Does the proposed management measure have non-negligible adverse effects to the resource? *If none then stop and proceed to the next resource.*

None.

6. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

No.

b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Any analyses that attempt to project behavioral responses to conditions that have not yet occurred are inherently uncertain. The risks are low, as individual accountability measures would apply regardless if provided credit or not.

7. MSA National Standards
    a. Describe how the management measure is consistent with the 10 MSA National Standards.
        i. (1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

As described in detail above, the new management measure is not expected to increase the risk of overfishing and could increase the ability to obtain optimum yields.

i. (2) Conservation and management measures shall be based upon the best scientific information available.

This new management measure would reflect a shift toward using the best scientific information available.

i. (3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

NA

i. (4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

There is no inequality or discrimination associated with the new management measure.

i. (5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

As described above, conservation and fishery utilization are both considered.

i. (6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Risks of variation are mitigated by the IFQ fisheries being held to the highest of standards.

i. (7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

NA

i. (8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

As detailed above, this new management measure could increase the landings and overall value of fishery resources.

i. (9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

This new management measure is not expected to increase discarding nor discard mortality of sablefish or lingcod, and is not expected to alter fishing behaviors and thus not change bycatch of other species.

i. (10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

NA

C.3.4 Adjustments to the Non-Trawl Rockfish Conservation Area in California

Part A

5. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

This management measure would modify the seaward boundary of the non-trawl Rockfish Conservation Area (RCA) from the California/Oregon border (42° N. latitude) to Cape Mendocino (40°10' N. latitude). The non-trawl RCAs are currently 30 fm to 100 fm; this action would modify the seaward boundary from 100 fm to 75 fm and would only apply to non-trawl commercial fisheries.

Modifications to RCAs are designated as a routine management measure in the groundfish FMP. The National Marine Fisheries Service (NMFS) has routinely made modifications to RCAs via inseason action for commercial trawl, commercial fixed gear, and recreational fisheries. Because the seaward boundary of the non-trawl RCA in the proposed area has been in place for over a decade, additional analysis is provided here to help inform potential impacts of this action.

RCAs were originally established in the early 2000s to protect rockfish species, which had recently been declared overfished. The primary goal of the non-trawl RCA between 42° N. latitude and 40°10' N. latitude was to protect widow, canary, and yelloweye rockfish. These closures were intended to close areas (or to restrict access) in the main portion of the species' depth range to reduce encounters and mortality, thereby allowing the stock to rebuild more quickly. In conjunction with RCAs, trip limit reductions (including no retention) were implemented to reduce catches (and overall mortality) and help stocks rebuild more quickly. While RCAs have been successful in reducing encounters with overfished species, they have also reduced access to many co-occurring healthy target stocks which are found in similar depths.

The groundfish fleet in California is comprised of many small vessels, which were impacted when RCAs were implemented. An important shelf rockfish fishery for widow and yellowtail, which used to occur between the California/Oregon border and Cape Mendocino was severely impacted when the non-trawl RCA was implemented because it restricted access to prominent fishing grounds. Non-trawl landings of shelf rockfish into ports in the Crescent City and Eureka areas resulted in a yearly average of 162 mt between 1990 and 2000 with a high of 452 mt in 1990. Although individuals still tried to target shelf rockfish species, they were unsuccessful because they could no longer find them in economically viable quantities in the areas that were open to fishing. Non-trawl landings of shelf rockfish into Crescent City and Eureka resulted in a yearly average of only 3.4 mt between 2001 and 2010 with a high of 8.8 mt in 2001.

Widow rockfish was declared rebuilt in 2011, followed by canary rockfish in 2015. Given that these stocks are rebuilt, it is appropriate to consider modifications to the non-trawl RCA. Modifications to RCAs have been implemented by NMFS to allow access to healthy stocks as long as interactions with other overfished species remain within allowable limits. This action will still maintain the 86 percent of the non-trawl RCA and continue to provide protections to species, but will allow access to healthy target stocks which are currently inaccessible due to the configuration of the current non-trawl RCAs.

This management measure will increase access to shelf rockfish species (i.e., yellowtail and widow rockfish) in California between 42° N. latitude and 40°10' N. latitude. Although canary rockfish may be encountered and can be retained as of 2017, any increased impacts are expected to remain below allocation limits because mortality will be limited through cumulative trip limits.

This management measure is not expected to increase encounters with yelloweye rockfish. The preferred habitat for yelloweye rockfish is rocky outcrops and pinnacles. Although yelloweye rockfish have been found over soft muddy bottom near rocky outcrops, movement away from rocky outcrops tends to be minimal. A majority (99.7 percent) of the predicted seabed habitat in the area to be opened is soft muddy bottom (Figure C-16), whereas the substrate tends to be more of a mix of rocky outcrops and soft bottom north of 42° N. latitude farther north, where the biomass is estimated to be larger (Table C-40, Figure C-17, Figure C-18) (Gertseva and Cope, J.M. 2017; Love, 2002).

The depth range for yelloweye rockfish is from 8 fm to 300 fm. Adults are found primarily between 50 fm and 100 fm, and tend to occur in shallow water in the northern parts of their geographic range (Love, 2002). The AFSC Triennial Survey and Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Bottom Trawl Survey[9], combined, recorded 0.14 mt of yelloweye rockfish between 42° N. latitude and 40°10' N. latitude from 1977-2015; 0.06 mt from the NWFSC West Coast Groundfish Bottom Trawl Survey (2003-2015) between 50fm – 100fm. As noted in the 2017 yelloweye rockfish stock assessment, the bottom trawl survey is limited, however, it indicates known areas of abundance correspond with major rocky outcrops.

Given the original intent of the non-trawl RCA was to offer protection to overfished rockfish, the areas in which the non-trawl RCAs cover hard substrate are likely the most beneficial to species such as yelloweye rockfish. With over 99 percent of soft seabed habitat within the area of interest, as well as only 0.14 mt recorded over a period of 38 years of a trawl survey, the impacts to yelloweye rockfish in the proposed area are likely to be minimal.

Table C-40. Percent of seabed habitat between 75-100 fm off the coast of Washington, Oregon, and Northern California.

Area	Habitat	Area (mi^2)	%
WA	Soft	1412.153	89.7%
	Mixed	140.3846	8.9%
	Hard	21.55685	1.4%
OR	Soft	2335.702	86.8%
	Mixed	83.61147	3.1%
	Hard	270.9084	10.1%
CA	Soft	140.3277	99.7%
	Hard	0.380395	0.3%

This management measure will also increase fishable area available to the directed Pacific halibut fishery, yet it is not likely to result in increased yelloweye rockfish encounters because the fishing activity occurs over soft bottom habitat in specific areas due to the patchy distribution of Pacific halibut off northern California. Although there are reports of yelloweye rockfish bycatch from the Pacific halibut fishery, the bycatch usually occurs north of 42° N. latitude, likely due to the proximity of the preferred habitat of both species.

Moreover, the non-trawl allocation for yelloweye rockfish increases from 13.4 mt in 2017 to 21.3 mt in 2019 and 22.2 mt in 2020 under No Action. Under Alternative 1, the allocation would be 30.5 mt in 2019 and 31.4 mt in 2020. The substantial increase in the allocation, under either alternative, significantly

[9] Data source: West Coast Groundfish Bottom Trawl Survey. NOAA Fisheries, NWFSC/FRAM, 2725 Montlake Blvd. East, Seattle, WA 98112

reduces yelloweye rockfish constraints on the non-nearshore fixed gear fishery. Lastly, it is likely that fishermen will actively avoid and/or minimize interactions with this stock because yelloweye rockfish is overfished and retention is prohibited in commercial fixed gear fisheries.

Participants in the Trawl Individual Fishing Quota program who utilize gear switching would also be affected by this management measure, but because individuals in this program are fully accountable for both retained and discarded catch, impacts are not expected to increase (or cannot be quantified) for these species from this management measure for similar reasons stated above: minimal retention of canary rockfish; a majority of the substrate between 75fm -100 fm is not preferable for yelloweye rockfish leading to small amounts of yelloweye rockfish to be reported; and increases in the yelloweye rockfish Shorebased IFQ allocation from 1.1 mt to 1.9 mt (No Action) or 2.7 mt (Alternative 1) would reduce constraints on the fishery.

6. What was considered in order to optimize the performance of this measure?

The original intent of the RCAs and the ongoing need to restrict access to these areas in light of optimistic outlooks on overfished stocks was considered to optimize performance of this measure. Because many stocks have been declared rebuilt (i.e., widow and canary)) it is appropriate to modify the non-trawl RCA to allow access to healthy target stocks while still maintaining a large portion of the RCA which will provide protections as other stocks continue to rebuild.

Widow rockfish was declared rebuilt in 2011 and canary rockfish in 2015. Yelloweye rockfish is forecast to be rebuilt by 2025 according to the 2017 rebuilding analysis[10] which is 12 years ahead of schedule. In addition, the 2017 yelloweye stock assessment[11] indicates that 2017 spawning output (323 million eggs) and Age 8+ biomass (3,711 mt) are the highest these values has been since 2007. No change to yelloweye rebuilding progress is expected as a result of this action.

7. What and when was the Council's decision and how did it arrive at the decision?

At the September 2017 meeting, the Council adopted consideration for new management measures for the directed commercial Pacific halibut fishery in California and Oregon, and commercial fixed gear groundfish fisheries with alternatives that included movement of the non-trawl RCA boundary from 100 fm to 75 fm for vessels participating in the directed commercial Pacific halibut fishery. At the November 2017 meeting, the Council decided not to forward measures that only affected the directed commercial Pacific halibut fishery, noting various complexities (enforcement, etc.) because this is a derby fishery.

8. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

The Council routinely modifies RCAs for both the trawl and non-trawl fisheries during inseason actions and biennial specifications. In 2014, NMFS recommended liberalizations to the trawl RCA north of 40°10' N. latitude[12] to allow increased access to target species, mainly petrale sole. In 2013 and 2015, NMFS implemented changes to the non-trawl RCA between 43° N. latitude and 40°10' N. latitude to restore access to target stocks, mainly nearshore species and lingcod after the shoreward boundary had been changed from the 30 fathom line to the 20 fathom depth contour in 2009. In 2013, the shoreward boundary of the non-trawl RCA between 43° N. latitude and 42° N. latitude changed from the 20 fathom depth contour to 30 fathom line. In 2015, the shoreward boundary of the non-trawl RCA between 42° N. latitude and 40°10'

[10] https://www.pcouncil.org/wp-content/uploads/2018/01/2017_yelloweye_rebuilding_Final.pdf
[11] https://www.pcouncil.org/wp-content/uploads/2017/12/Yelloweye_rockfish_2017_Final.pdf
[2] http://www.westcoast.fisheries.noaa.gov/publications/nepa/groundfish/misc_ea/rca_ea_3_4_14.pdf

N. latitude also changed from the 20 fathom depth contour to 30 fathom line. In 2017, NMFS implemented changes to the seaward non-trawl RCA for the area between 40°10' N. latitude and 34°27' N. latitude and the shoreward non-trawl RCA for the area south of 34°27' N. latitude.

Part B

5. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

The objective of this management measure is to allow increased opportunity to catch target species, which are inaccessible due to the current RCAs. This management measure will also restore access to historical fishing grounds to fleets in California that were severely restricted due to implementation of the RCAs in the early 2000s. Non-trawl landings of shelf rockfish into ports in the Crescent City and Eureka areas resulted in a yearly average of 162 mt between 1990 and 2000 with a high of 452 mt in 1990. Non-trawl landings of shelf rockfish into Crescent City and Eureka resulted in a yearly average of only 3.4 mt between 2001 and 2010.

Modifications to RCAs in the trawl fishery have been implemented routinely to allow access to target species (e.g., petrale sole), and this management measure would afford the commercial fixed gear fisheries in California the same opportunity.

6. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

    g. How would you describe this new management measure (may select more than one)
        - ❑ Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ■ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
        - ❑ Designed to mitigate a negative economic or social effect.
        - ❑ Applies to only a small area of the total EEZ.

    h. What resource(s) would the management measure likely effect, either positively or negatively?
        - ❑ Physical EFH or Ecosystems
        - ■ Biological Resources (target, non-target species)
        - ❑ Protected Resources (mammals, ESA-listed)
        - ■ Economic, social, cultural

    i. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.
        - ❑ Physical EFH or Ecosystems
        - ❑ Biological Resources (target, non-target species)
        - ❑ Protected Resources (mammals, ESA-listed)
        - ❑ Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects'. Remember both positive and negative effects.

10. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

Target stocks

This management measure is expected to increase catch of widow, yellowtail, and other healthy shelf rockfish species by allowing access to depths in which they are most prevalent. No adverse impacts are anticipated for target stocks. The non-trawl fisheries are currently managed with cumulative trip limits, and any increases in catch are expected to remain within allowable harvest limits.

Widow and yellowtail rockfishes cannot be accessed to their fullest extent due to the current RCA depth restrictions that were originally implemented to protect overfished species (e.g., canary rockfish). Since canary rockfish has been declared rebuilt, allowing some access back inside the RCA is appropriate to access abundant healthy stocks like widow and yellowtail rockfish, and at the same time not jeopardize the stock status of other overfished species such as yelloweye rockfish.

Table C-41 summarizes the Baseline projected impacts for groundfish stocks compared to non-trawl allocations. All are far below their respective allocations. In 2016, retention of canary rockfish was prohibited; therefore reported values account for bycatch only.

Table C-41. Summary of projected impacts under Baseline compared to non-trawl allocations.

Stock	Management Area	2016 Total Mortality Fixed Gear (mt)	2016 Non-Trawl Allocation (mt)
Yellowtail rockfish	North of 40°10' N. lat.	1.81	638
Widow rockfish	Coastwide	1.28	169
Shelf rockfish	North of 40°10' N. lat.	3.00	748
Canary rockfish	Coastwide	2.08	51.3
Yelloweye rockfish	Coastwide	0.8	12.1

Starting in 2017, limited retention of canary rockfish was permitted for fixed gear fisheries. Although modifying the RCAs may increase encounters of canary rockfish, trip limits will limit the amount of canary rockfish that can be legally landed. As a result, once a trip limit is reached, fishermen will likely avoid encountering canary rockfish, as it becomes financially burdensome spending extra time sorting and discarding any additional canary rockfish.

Overfished species (yelloweye rockfish)

Yelloweye rockfish is encountered north of 40°10' N. latitude, with encounters increasing with latitude, typically over high relief pinnacles. The likelihood of this management measure increasing encounters of yelloweye rockfish is small because only 0.3 percent (0.38 mi^2 out of 140.51 mi^2) of the predicted seabed

habitat type in the area to be opened is classified as "hard" (Figure C-16) presumably leading to the small amount of bycatch (9.25 lbs) that has been reported between 75 fm -100 fm in various surveys. In addition, 0.12 mi² of the 0.38 mi² of "hard" habitat to be opened as a result of the RCA change will actually remain closed to the commercial fishery because it overlaps with the Mattole Canyon State Marine Reserve. Finally, it is likely that fishermen will actively try to avoid and/or minimize interactions with this stock because yelloweye rockfish cannot be retained in the non-trawl fixed gear fishery.

b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

As noted previously, this management measure is expected to increase catch of widow, yellowtail, and other healthy shelf rockfish species by allowing access to depths in which they are most prevalent. Table C-41 summarizes projected impacts for groundfish stocks expected to be affected by this measure compared to their respective non-trawl allocations. All are far below their respective allocations.

11. Other Fish
    a. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and to what stocks? How is this catch monitored? Are the affected stocks managed under another federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

Commercial non-trawl fixed gear fisheries are subject to Federal observer coverage by WGCOP. WGCOP documents and calculates both landings and discards annually[13]. According to the 2016 WGCOP total mortality report, few non-groundfish species are encountered in the fixed gear fisheries coastwide. California halibut, Dungeness crab, California sheephead, and deepsea sole are non-groundfish species that have been observed in this fishery at very low levels. Catch of these non-groundfish species is not expected to change as a result of this management measure. Deepsea sole are found in very deep depths already accessible, and modifying the depth restrictions will have no effect. Both California halibut and California sheephead have a more southerly distribution and are not found in this area, nor in these depths.

12. EFH and Ecosystems
    a. Will this management measure change fishing activity so as to adversely affect essential fish habitat compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

This measure is not expected to change fishing activity as to adversely affect EFH compared to the current or baseline as analyzed in the 2015-2016 FEIS. EFH which prohibits fishing with bottom trawl gear other than demersal seine is currently designated in some areas that are already open to fishing under No Action. There are no EFH closures applicable to fixed gear in the proposed action area. Any EFH closures currently in effect will remain in place and will not be affected by this action. In a separate decision, the Council is contemplating modifying EFH and/or adding additional EFH areas, however, these closures will only be applicable to bottom contact with trawl gear, not fixed gear, and would therefore have no effect or bearing on this action.

[13]Data are summarized coastwide and are not stratified north and south of 40°10′ N. lat.

b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

Anticipated effects will be minimal because of the small number of documented observations of deep sea corals in this area where seabed habitat is classified as "soft." An evaluation of the NOAA Deep Sea Coral database reveals that there have been 8 observations of sea pens, 3 observations of sponges, and 1 observation of black coral in the area between the 100 and 75 fathom RCA line that would be opened (Figure C-19). In addition, fixed fishing gear has minimal effect on sensitive habitat unlike other gears such as trawl gear.

c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No anticipated effects. Fishing activity currently occurs seaward of the 100 fathom RCA line and increasing the fishable area by allowing fishing seaward of the 75 fathom line is not expected to have adverse effects on biodiversity or ecosystem functioning.

13. Marine Mammals and ESA Species
    a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

This management measure is not expected to affect ESA-listed species and/or non-listed marine mammals and seabirds. No leatherback sea turtles were observed as bycatch in the most recent five-year period (2011-2015). Encounters of eulachon and green sturgeon have been associated with trawl gear, not fixed gear. Also in the time period of 2011-2015, one humpback whale was observed taken in 2014, but at depths much greater than the depths associated with this proposed management measure. Between 2010 and 2015, one short-tailed albatross was also taken in 2011. As described in Table 2-45 of the 2017 Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion, salmon are predominantly encountered with trawl gear, not fixed gear. WCGOP data from 2002-2015 indicate that the average coastwide bycatch of salmon in the non-IFQ fixed gear fleet is 54 Chinook, with a high of 124 individuals. While there have been some bycatch in the non-trawl groundfish fishery between 42° N. latitude and 40°10' N. latitude, the amount has been comparatively insignificant and this management measure is not expected to change this.

14. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example, which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

This measure is expected to increase catch opportunities in California ports between 42° N. latitude and 40°10' N. latitude, particularly in ports like Crescent City and Eureka which used to have a strong non-trawl shelf rockfish fishery that resulted in yearly average landings of 162 mt between 1990 and 2000 with a high of 452 mt in 1990. California's groundfish fleet is unique and comprised of many more non-trawl fixed gear fishermen compared to other states, and many of these fishermen relied on shelf rockfish species such as yellowtail and widow as a staple in their fishery portfolios. Restoring access to areas where yellowtail and widow rockfish are accessible to non-trawl fishermen will have positive social and economic effects on these ports. The scale of these positive impacts cannot yet be quantified due to recent significant

increases in yellowtail limits and the unresolved question of whether or not this increase in combination with the proposed RCA modification will provide enough economic incentive for nearshore fishermen to fish in these depths. This measure is not expected to negatively impact any user groups. This measure would not have any effect on allocations, so it would not affect any other sector's allowable harvest levels or ability to harvest those fish.

IFQ

From 2011 to 2016, WCGOP observed set data by IFQ vessels exercising the gear switching option revealed that no IFQ fixed gear activity occurred shoreward of the 250 fathom RCA line between 42° N. latitude and 40°10' N. latitude. Therefore, if a shift of the non-trawl RCA seaward boundary into 75 fm were to be implemented, there would probably be very few or no expected changes to the IFQ fixed gear vessel fishing pattern and landings because the fleet is not currently fishing in this area.

Non-IFQ

Examination of WCGOP observed sets by the non-IFQ fixed gear fleet reveals that 36 percent of those sets took place in waters shallower than the shoreward RCA boundary of 30 fm and 64 percent in waters deeper than 100 fm. Of those sets made in waters deeper than 100 fm, the majority of them (79 percent) were made in waters from 150 fm and deeper because of targeting sablefish.

No adverse impacts are anticipated for target stocks. Recent effort in the areas close to the depths to be opened (described below) infers that changes in effort will be small and fixed gear fisheries are currently managed with cumulative trip limits. Any increases in catch are expected to remain within allowable harvest limits.

Figure C-20 depicts areas where WCGOP observed non-IFQ hook-and-line fishing effort occurred and Figure C-21 depicts areas where WCGOP observed non-IFQ pot fishing effort occurred in relation to the non-trawl RCAs from 2011 to 2015 between 42° N. latitude and 40°10' N. latitude[14]. Due to confidentiality issues, these illustrations use relative line density to mask actual fishing locations. As such, in some areas it may appear that fishing took place within the RCAs or much closer to the boundaries than it actually did. Locations of fixed gear sets were approximated by creating straight line features from the start and end points of sets. Straight line features represent an approximation of actual fishing patterns because actual sets are not likely straight and may also skirt the boundaries of closed areas like RCAs without actually entering them. Relative intensity of fishing effort for each gear type was then calculated as the total length of all lines intersecting a standardized area. In addition, areas that included less than three unique vessels due to either patchy effort or low observer coverage rates were excluded from the map to preserve confidentiality.

b. Can the proposed action reasonably be expected to significantly affect public health or safety?

No anticipated effects.

15. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably

[14]http://www.pcouncil.org/wp-content/uploads/2017/03/F5a_NMFS_Rpt1_ElectricOnly_FishingEffort_rpt_2017_Apr2017BB.pdf

foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

Repeat each set of questions for affected resources (Groundfish, other fish, EFH, ecosystems, ESA species, marine mammals, social, and economic).

a. Does the proposed management measure have non-negligible adverse effects to the resource? *If none then stop and proceed to the next resource.*
b. Is it likely that any current or future fishery management actions may have overlapping effects with this management measure on the resource?
c. Is it likely that any current or future non-fishery management actions may have overlapping effects with this management measure on the resource?
d. Qualitatively or quantitatively, add the effects in (a), (b), and (c) projected to the end of 2020. Can the sum of the effects be considered 'significant'? Consider both positive and negative effects.
e. Whether significant or not, what is the proposed new management measure's contribution to the total effect? E.g., the incremental impact from this management measure to the cumulative effects on groundfish is negligible/high/medium.

Groundfish – Trip limit adjustments proposed for sablefish, slope rockfish, darkblotched rockfish, longspine thornyhead, and shortspine thornyhead will not result in cumulative effects to groundfish because these species occur in much greater depths than the 75 to 100 fathom depth range of this proposed change. Lingcod trip limit adjustments may result in a cumulative impact with this management measure since lingcod occur in the area but it is expected to be negligible and will not put lingcod at risk of overfishing because trip limits will be in place to ensure that catch does not exceed ACLs.

Other Fish - There are no cumulative effects to other fish because there are no other commercial fixed gear actions being contemplated that would affect other fish in this area. Several state-managed species, which could be encountered in commercial fixed gear fisheries, are not found within the geographic scope of the proposed action. The incremental impact from this management measure to the total cumulative effects on other fish species is negligible.

EFH - There are no cumulative effects to EFH because no changes are proposed to existing EFH for commercial fixed gear fisheries between 42° N. latitude and 40°10' N. latitude. Under a separate process, the Council is considering modifying EFH along the west coast and removing the trawl RCA. Given that both these actions are limited to trawl gear, and not fixed gear, the incremental impact from this management measure to the total cumulative effects on EFH is negligible.

Ecosystem - There are no cumulative effects to ecosystems because the proposed management measure is not expected to adversely affect vulnerable marine or coastal ecosystems or adversely affect biodiversity. The incremental impact from this management measure to the total cumulative effects on the ecosystem is negligible.

ESA Species - There are no cumulative effects to ESA species as a result of this action. Although salmon, eulachon, leatherback sea turtles, green sturgeon, humpback whales, and short-tailed albatross do occur in this geographic area, they are either rarely or not commonly encountered with fixed gear. The incremental impact from this management measure to the total cumulative effects on the ecosystem ESA-listed species is negligible.

Marine Mammals - There are no cumulative effects to marine mammals because in the time period of 2011-2015, no marine mammals were taken in this area at the depths associated with this action. The incremental impact from this management measure to total cumulative effects on marine mammals is negligible.

Social - This management measure will have minor positive social impacts by restoring a portion of historical fishing grounds in California whose fisheries were curtailed due to the implementation of the RCAs in the early 2000s.

Economic - This management measure will have positive economic impacts by restoring a portion of historical fishing grounds in California that were eliminated due to the implementation of the RCAs in the early 2000s. The scale of these positive impacts cannot yet be quantified due to recent significant increases in yellowtail rockfish limits and the unresolved question of whether or not this increase in combination with the proposed RCA modification will provide enough economic incentive for nearshore fishermen to fish in these depths. Some increase in landings and revenue could be expected by allowing access to depths in which species are most prevalent.

16. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

The proposed action on the quality of the human environment is not highly controversial because this action will still maintain a large portion of the non-trawl RCA and provide protection to species. In addition, widow rockfish was rebuilt in 2011 followed by canary rockfish in 2015. Given that these stocks are rebuilt, it is appropriate to consider modifications to the non-trawl RCA. Yelloweye rockfish is forecast to be rebuilt by 2025 according to the 2017 rebuilding analysis[15] which is 12 years ahead of schedule. Although yelloweye rockfish have been found over soft muddy bottom near rocky outcrops, movement away from rocky outcrops tends to be minimal. As noted in the 2017 yelloweye rockfish stock assessment, the bottom trawl survey indicates known areas of yelloweye abundance correspond with major rocky outcrops. The likelihood of this management measure increasing encounters of yelloweye rockfish is small since 99.7 percent of the predicted seabed habitat in the area to be opened is soft and not preferred yelloweye rockfish habitat.

    b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No, the proposed action's effects on the human environment are not likely to be highly uncertain or involve unknown or unique risks.

17. MSA National Standards
    a. Describe how the management measure is consistent with the 10 MSA National Standards.

Modifying the non-trawl RCAs is consistent with the following National Standards: (1) result in more optimal yield without overfishing; (2) based on the best scientific information; and (8) take into account/benefit fishing communities. This action is consistent with National Standard 1 by providing the greatest overall benefit to the nation by allowing harvest of healthy stocks which are currently being underutilized (e.g., widow and yellowtail rockfish). Prior to canary rockfish being declared overfished, the non-trawl fixed gear fisheries used to support a vibrant shelf rockfish fishery, which was eliminated when the RCAs were implemented. This action is also consistent with National Standard 2 by utilizing the best

[15] https://www.pcouncil.org/wp-content/uploads/2018/01/2017_yelloweye_rebuilding_Final.pdf

available scientific information, which indicates that canary rockfish is no longer overfished and has rebuilt to healthy levels. Further, this management measure leaves in place a large portion of the non-trawl, which would continue to provide protection to, yelloweye and other rockfish. This action is also consistent with conservation requirements and takes into account the importance of fishery resources to fishing communities. Many coastal communities in central and northern California are comprised with non-trawl fishermen who depend on income from fixed gear fisheries. This measure will re-establish access to many important shelf rockfish stocks, which will benefit local economies.

Attachment 4

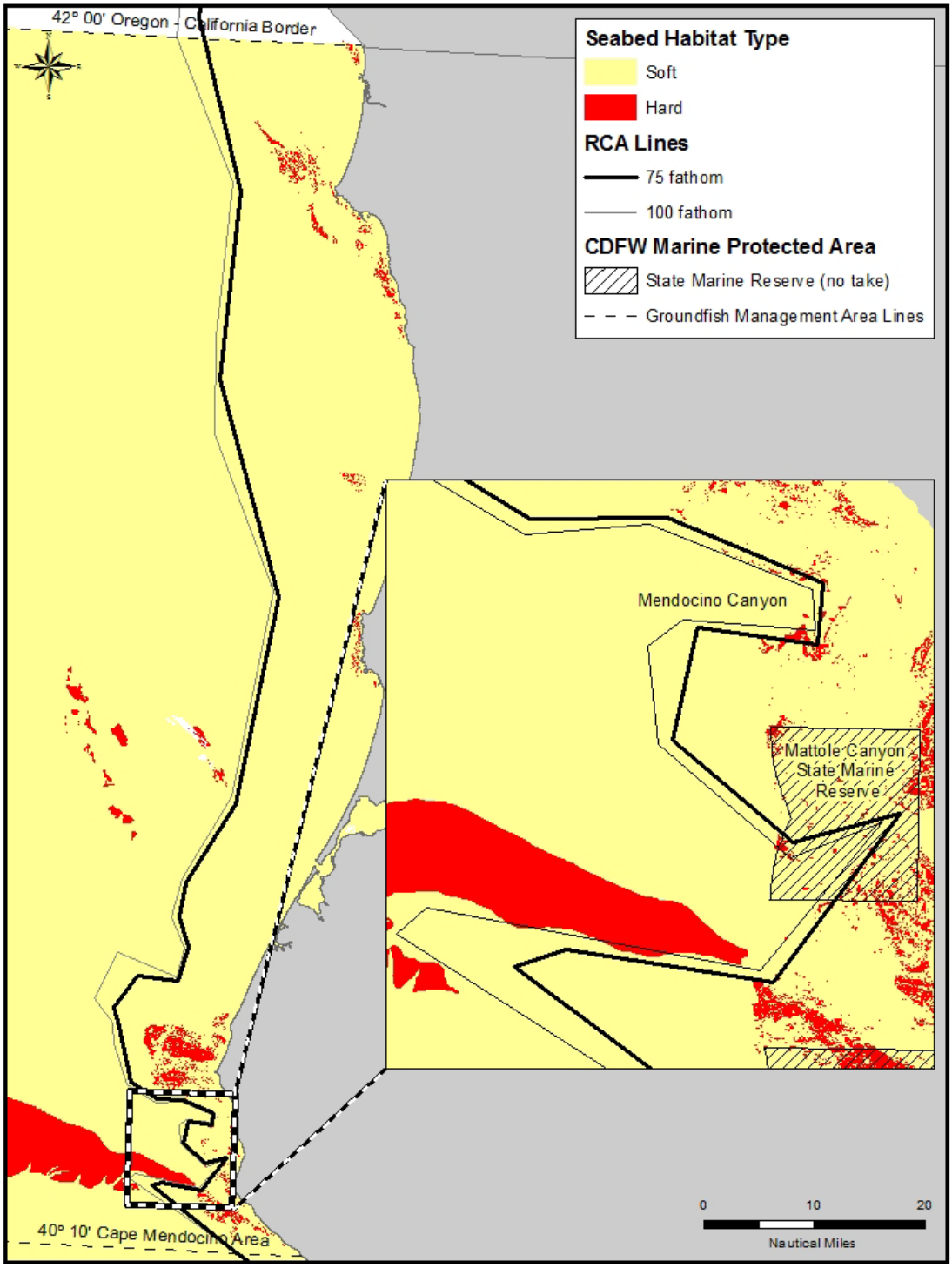


Figure C-16. Seabed habitat type between 42° N. latitude and 40°10' N. latitude from the Pacific Groundfish EFH 5-Year Review that illustrates that the majority of seabed habitat between the 75 and 100 fathom RCA lines was classified as "Soft". Mendocino Canyon and Mattole Canyon (see inset map) are the only areas where seabed classified as "Hard" is present. (Note: Mattole Canyon will remain closed to all commercial fishing as a result of the Mattole Canyon State Marine Reserve)

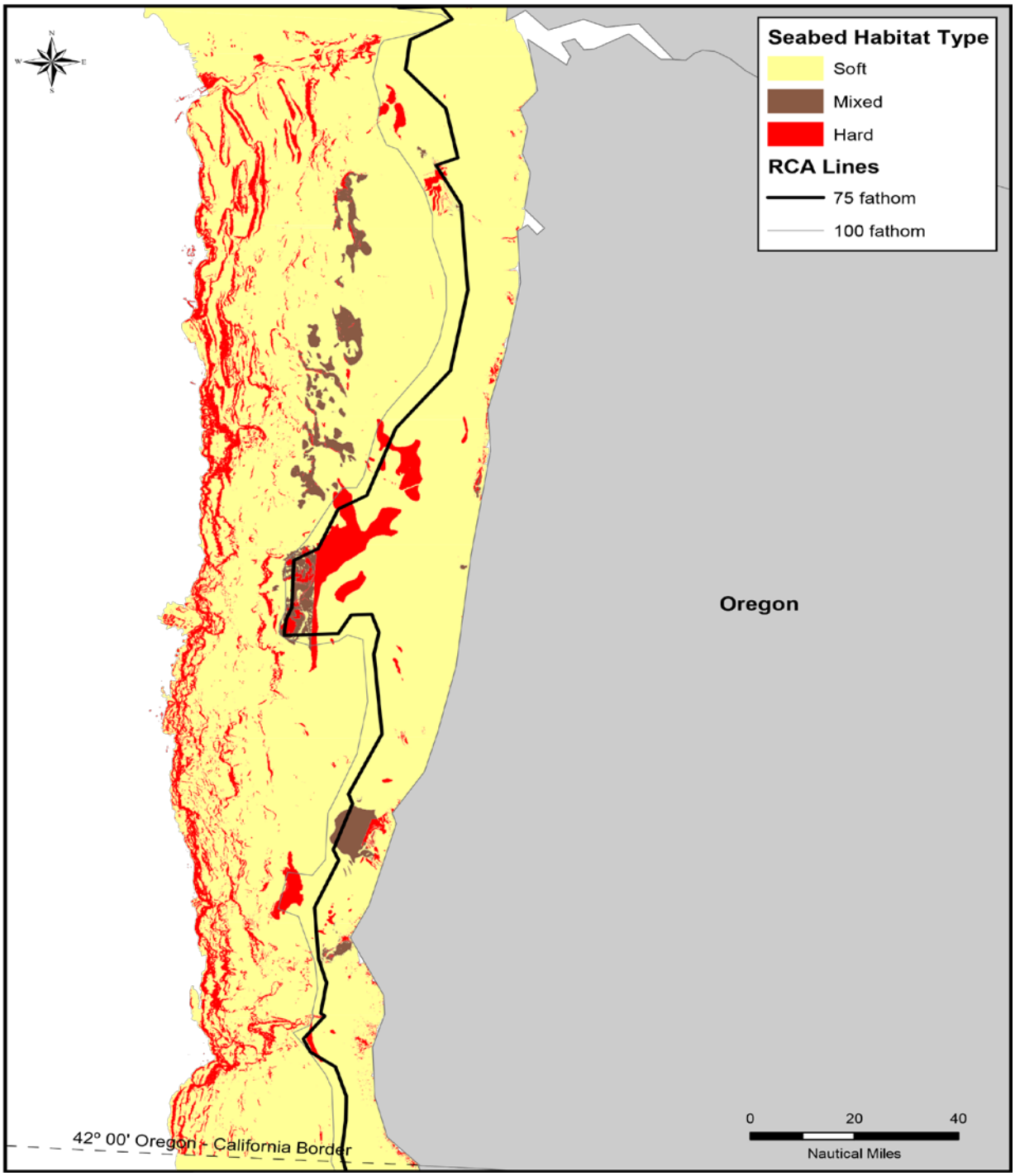


Figure C-17. Seabed habitat type off Oregon from the Pacific Groundfish EFH 5-Year Review that illustrates the seabed habitat between the 75 and 100 fathom RCA lines.

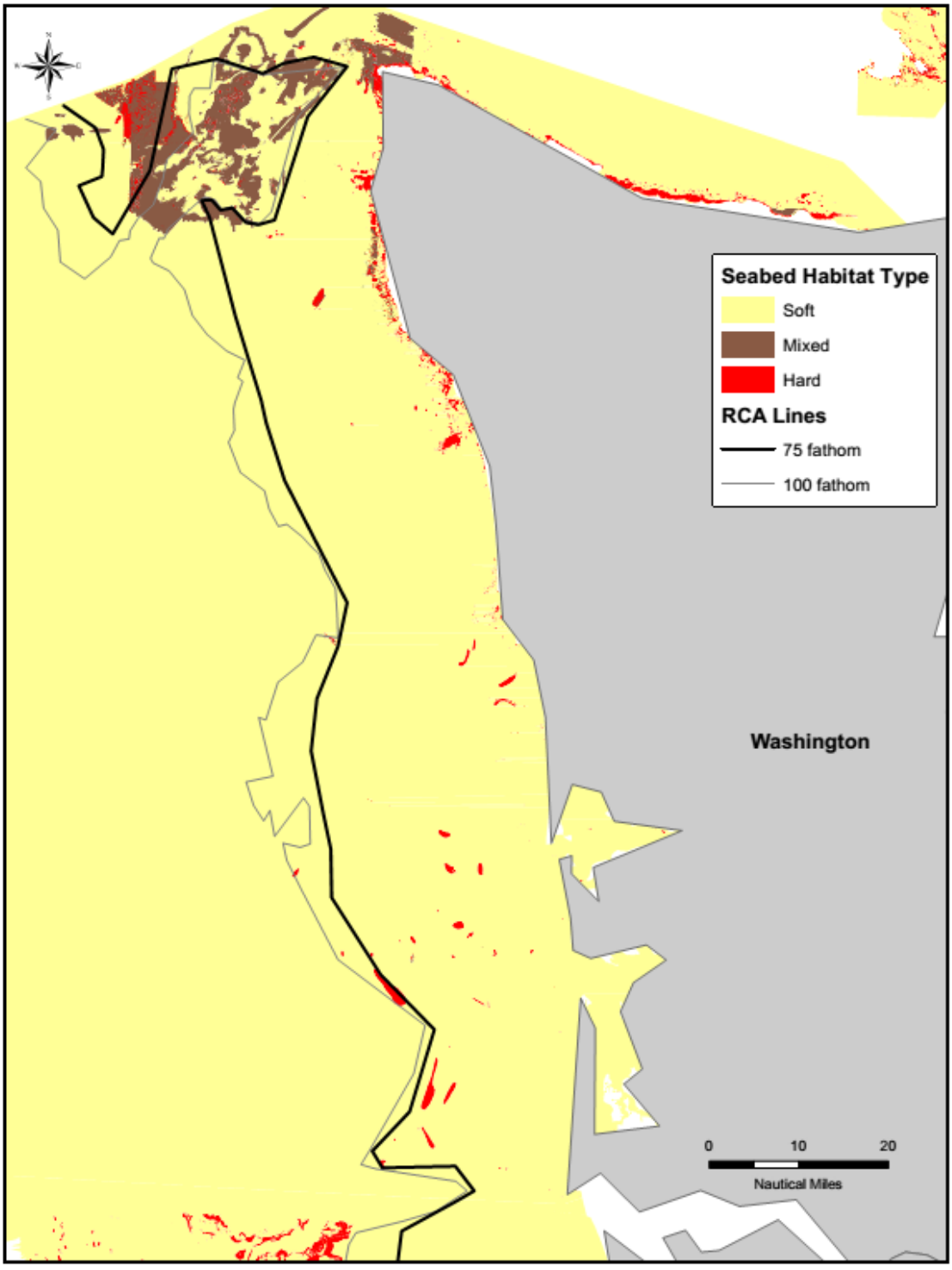


Figure C-18. Seabed habitat type off Washington from the Pacific Groundfish EFH 5-Year Review that illustrates the seabed habitat between the 75 and 100 fathom RCA lines.

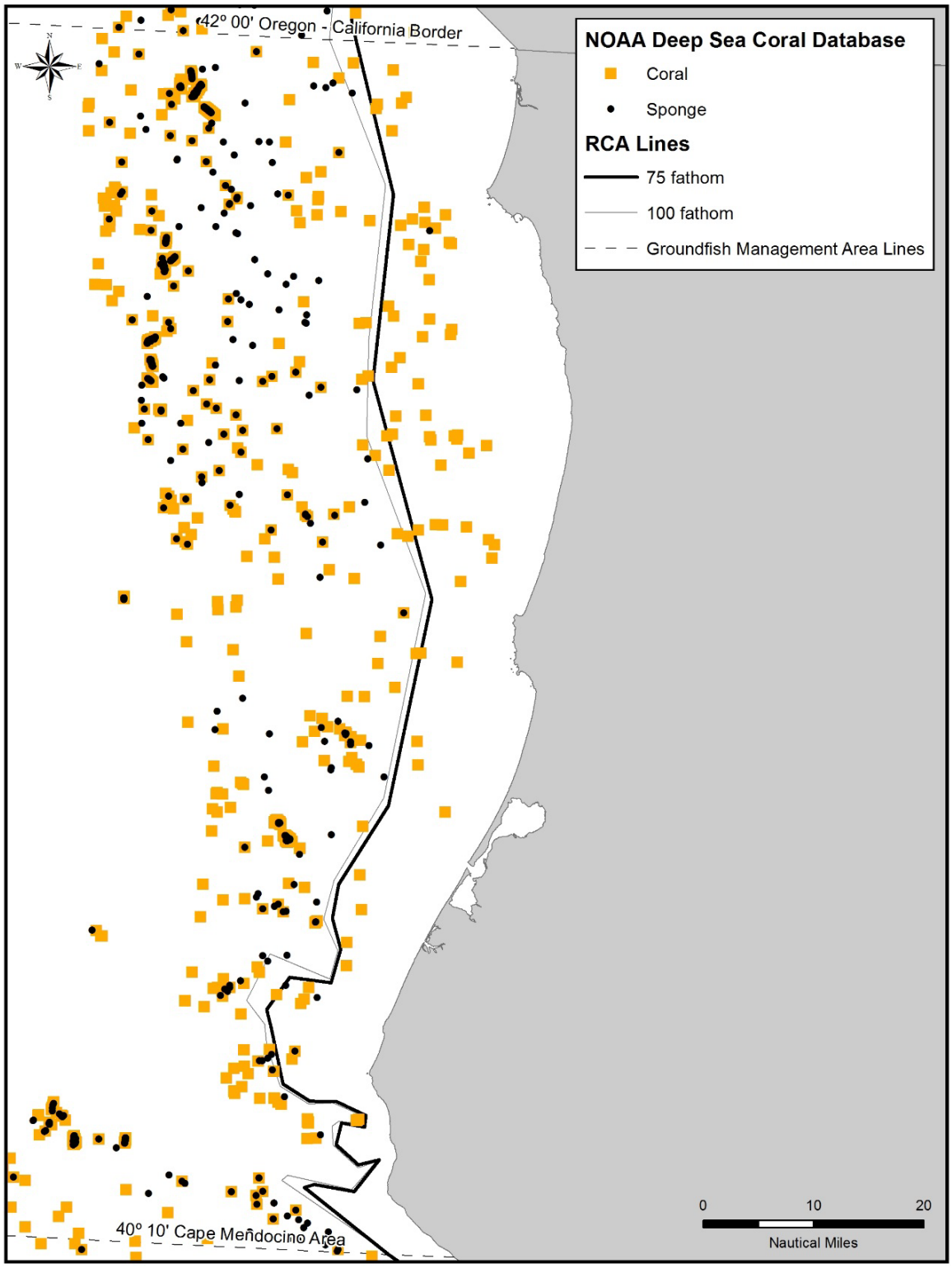


Figure C-19. Sponge/coral observations between 42° N. latitude and 40°10' N. latitude from the NOAA Deep Sea Coral Database.

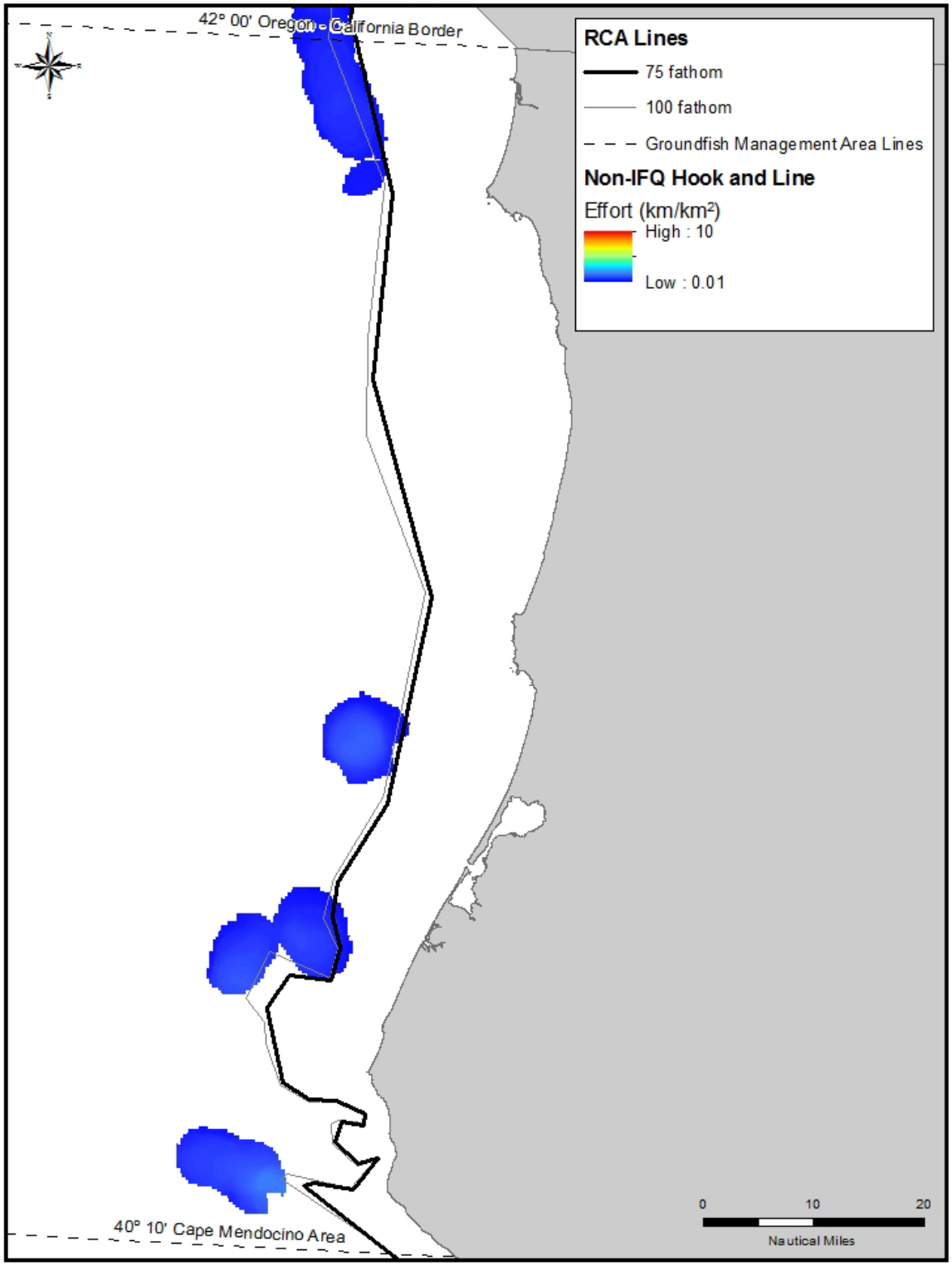


Figure C-20. 2011 to 2015 non-IFQ hook and line fishing effort observed by the West Coast Groundfish Observer Program between 42° N. latitude and 40°10' N. latitude.

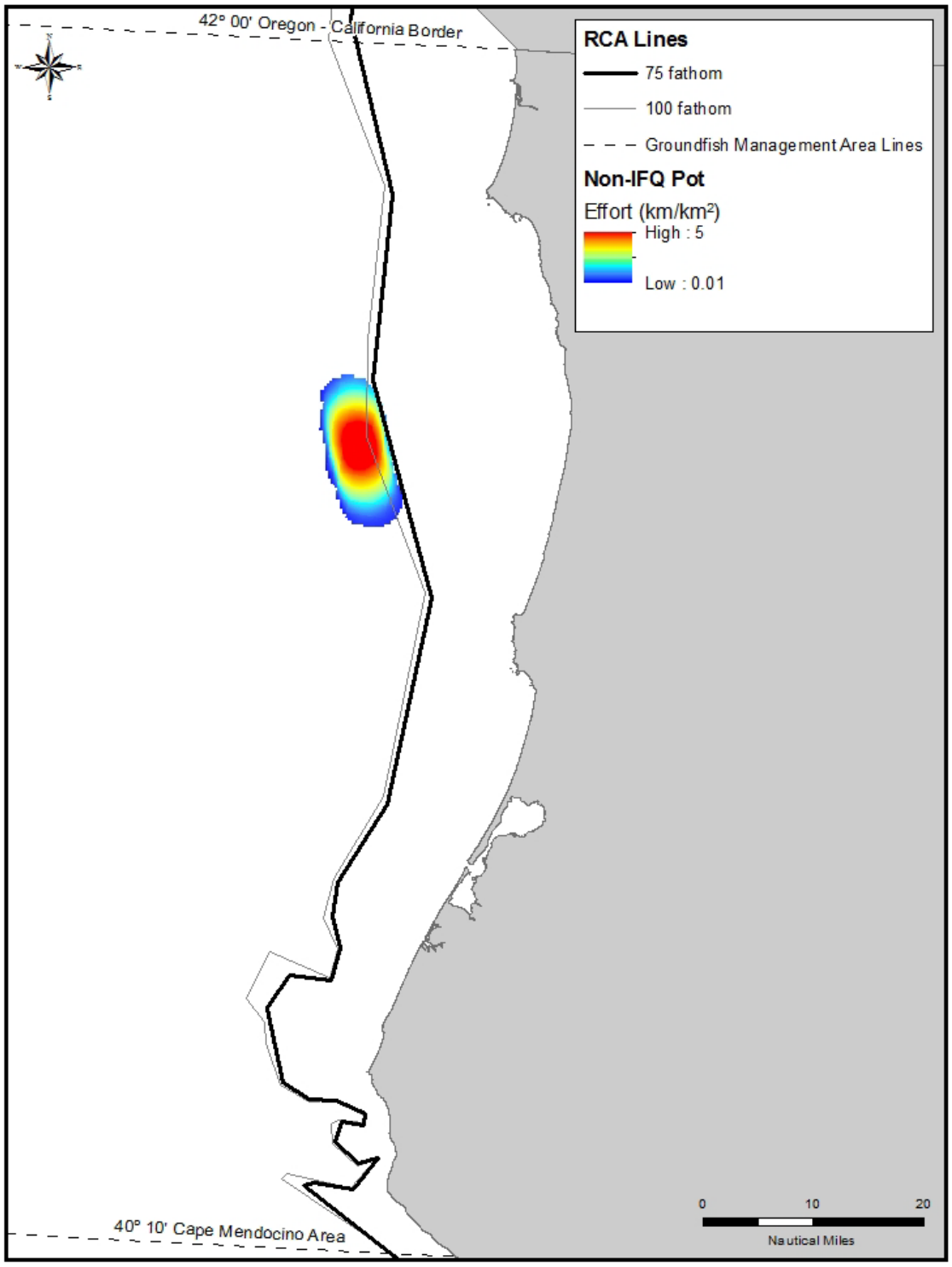


Figure C-21. 2011 to 2015 non-IFQ pot fishing effort observed by the West Coast Groundfish Observer Program between 42° N. latitude and 40°10' N. latitude.

C.3.5 Modify Commercial Fixed Gear Depths inside the Western Cowcod Conservation Area

Part A

9. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

This management measure would modify the allowable fishing depths for the commercial fixed gear fishery inside the western Cowcod Conservation Area (CCA) from 20 fm to 30 fm or 40 fm and add new waypoints approximating 30 and 40 fm depth contours around Santa Barbara Island, San Nicolas Island, Tanner Bank, and Cortes Bank (Figure C-22).

Nearshore rockfish, shelf rockfish, cabezon, kelp greenling, California scorpionfish, and lingcod can be retained shoreward of the 20 fm depth contour within the CCA when trip limits authorize such fishing. Other Flatfish may also be taken year-round at any depths when using no more than 12 #2 or smaller hooks.

While there are current 30 and 40 fm depth contours specified in regulation at 50 CRF 660.71-660.73, none have been specified inside the CCA, which are proposed to be used by recreational and commercial fisheries. This management measure proposes to add new waypoints to approximate the 30 fm and 40 fm depth contours inside the CCA. Charts delineating the areas are provided in Attachment 5, and proposed waypoint coordinate tables are provided in Attachment 6.

This management measure is expected to increase catch of shelf rockfish, bocaccio, nearshore rockfish, cabezon, greenling, and California scorpion fish, – but mortality is expected to be well within the non-trawl allocations and harvest specifications. Although this measure could increase catch of lingcod, a trip limit reduction proposed for 2019-2020 is expected to keep catches within the non-trawl allocation and harvest specifications. This measure could also have some minor increased interactions with cowcod. This management measure will not likely affect canary and yelloweye rockfish because they are not commonly found in this area.

10. What was considered in order to optimize the performance of this measure?

Cowcod was last assessed in 2013, and at that time it was rebuilding much quicker than anticipated. Cowcod is expected to be rebuilt by 2020, assuming full removal of the ACL, which is 48 years ahead of schedule. Given that removals have consistently been far below the ACL, it is possible that the stock has already reached its rebuilding target.

The latest stock assessments for canary rockfish and bocaccio indicate that these stocks are no longer overfished and have rebuilt. Yelloweye rockfish continues to make satisfactory rebuilding progress and is currently estimated at 28.4 percent of B_0.

The more optimistic outlook on the status of cowcod from the most recent assessment along with more optimistic outlooks for other stocks were considered to optimize performance of this measure. Because many stocks are rebuilding much quicker than anticipated (cowcod) or have been declared rebuilt (bocaccio rockfish), modifications to the allowable depth restrictions are considered. Modifications would allow access to healthy target stocks while still closing the depths where the overall density of cowcod is the greatest (100 to 130 fm; SAFE 2016[16]) to provide protections to cowcod as the stock continues to rebuild.

[1616] http://www.pcouncil.org/wp-content/uploads/2017/02/SAFE_Dec2016_02_28_2017.pdf

11. What and when was the Council's decision and how did it arrive at the decision?

Three proposals were submitted for consideration in the 2019-2020 specifications to modify the CCA at the September 2017 PFMC meeting. The first proposal was to modify the CCA boundaries, which would have affected all groundfish fisheries. The second and third proposals increased the allowable fishing depth inside the CCA for recreational and fixed gear commercial fisheries. At its November 2017 meeting, the PFMC decided to remove the first proposal from the 2019-2020 specification process and consider it in a stand-alone analysis, given interactions and complications with ongoing EFH/RCA modifications in that area.

12. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

Two CCAs (Western and Eastern) were originally established in 2001 as an overfished species rebuilding measure. These area closures were intended to close off areas to fishing in the main portion of cowcod's depth range (overall distribution 22 to 270 fm, with the highest density 100-130 fm; SAFE, 2016) to reduce encounters and mortality, allowing the stock to rebuild more quickly. The western CCA encompasses 5,126 mi² and is located in the Southern California Bight south of Point Conception.

The CCA is also expected to provide protections for bronzespotted rockfish, a stock with similar life history characteristics, habitat associations, and vulnerability to fishing as cowcod (2009-2020 SPEX[17]). Commercial landings of bronzespotted dropped in the late 1980s and have remained at low levels from 1990 to present. While the hook-and-line fishery traditionally accounted for most of the landings, the Southern California gillnet fishery in the early 1980s accounted for most of the mortality during the period of apparent decline, consistent with the movement of effort to deeper and rockier habitats in that fishery.

The Council routinely modifies RCAs for trawl and non-trawl fisheries during inseason actions and biennial specifications. In 2014, NMFS recommended liberalizations to the trawl RCA north of 40°10' N. latitude[18] to allow increased access to target species, mainly petrale sole. In 2013 and again in 2015, NMFS implemented changes to the shoreward boundary of the non-trawl RCA north of 42° N. latitude and between 42° N. latitude and 40°10' N. latitude respectively to allow access to target stocks, mainly nearshore species and lingcod. In 2017, NMFS implemented changes to the seaward non-trawl RCA for the area between 40°10' N. latitude and 34°27' N. latitude and the shoreward non-trawl RCA for the area south of 34°27' N. latitude.

In the 2009-2010 biennial specifications and management measure process, CDFW staff conducted an analysis similar to this proposal that evaluated increasing depth restrictions inside the CCA to 30 fm and 40 fm for the recreational fishery (2009-2010 Spex). As part of its Final Preferred Alternative, the Council recommended modifying the recreational depth restrictions inside the CCA to 30 fm. This decision was disapproved by NMFS in its Final Rule (76 FR 27508) due to concerns of proposed impacts to cowcod, especially juveniles, which could delay rebuilding. NMFS also indicated that because the ACL for cowcod was low (4 mt at that time), any measures that potentially increased cowcod mortality required better information on potential biological and economic effects to support such a change. At the time of NMFS' disapproval, cowcod was at 4.5 percent of unfished biomass with a projected time to rebuild of 2071. The OFL and ACL established for 2011-2012 were 13 mt and 4 mt respectively. For 2019-2020, a similar

[17]https://www.pcouncil.org/groundfish/current-season-management/past-management-cycles/2009-2010-final-environmental-impact-statement/

[18] http://www.westcoast.fisheries.noaa.gov/publications/nepa/groundfish/misc_ea/rca_ea_3_4_14.pdf

proposal is being considered to modify depths inside the Western CCA for the recreational groundfish fishery (See Section C.3.6),

Part B

7. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

The objective of this management measure is to allow increased opportunity to catch target stocks which are inaccessible due to the current depth restrictions.

8. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

    j. How would you describe this new management measure (may select more than one)
        - ❑ Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ■ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
        - ❑ Designed to mitigate a negative economic or social effect.
        - ■ Applies to only a small area of the total EEZ.

    k. What resource(s) would the management measure likely affect, either positively or negatively?
        - ❑ Physical EFH or Ecosystems
        - ■ Biological Resources (target, non-target species)
        - ❑ Protected Resources (mammals, ESA-listed)
        - ❑ Economic, social, cultural

    l. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.
        - ❑ Physical EFH or Ecosystems
        - ❑ Biological Resources (target, non-target species)
        - ❑ Protected Resources (mammals, ESA-listed)
        - ❑ Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects'. Remember both positive and negative effects.

18. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

<u>Non-overfished stocks</u>

No adverse impacts are anticipated for non-overfished stocks south of 40°10' N. latitude - shelf rockfish, bocaccio, nearshore rockfish, and lingcod. Recent commercial fixed gear fishing effort has been very low.

According to WCGOP data, twelve hauls from five vessels have been observed in the western CCA in the 0 to 20 fm depth range between 2002 and 2016. Recent (2011 to 2015) commercial fixed gear fishing effort outside of the CCA has also been very low (See Attachment 5, Figure C-23 to Figure C-26). Anecdotal reports from commercial groundfish fishery participants indicate that there is currently not enough economic incentive under the 20 fm depth restriction to justify trips to the remote western CCA. Proposed depth changes within the CCA would allow greater access to valuable deeper species and would create the economic incentive that would justify trips. As a result, a small increase in the number of fixed gear vessels fishing in this area may occur, but the size increase cannot be quantified. A redistribution of depth of catch is also expected as a result of the increased depths. No additional increase in mortality is expected for bronzespotted rockfish because they are found between 41 fm and 205 fm – outside the depth range of the proposed action.

Commercial vessels targeting highly migratory species (yellowtail, tuna, and white seabass) which are found in deeper depths where rockfish retention is prohibited also operate in the CCA. Allowing rockfish retention in deeper depths is expected to provide some more opportunities for targeting migratory species and increase revenues.

As noted earlier, new opportunities in deeper depths will increase economic incentive and may increase the number of fixed gear vessels fishing in the CCA, but the increase would likely still be limited by the remote location of the western CCA. Any increases in catch will likely be low and be limited by the 2-month catch limits. As a result, impacts are expected to remain well within ACLs and/or non-trawl allocations and pose a low risk to overfishing (Table C-42 through Table C-47).

Table C-42. Total mortality (mt) of minor nearshore rockfish south of 40°10' N. latitude compared to annual catch limit (data source: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	ACL	% of ACL
2011	336.54	99.86	436.10	1,001	43.5%
2012	357.28	84.97	442.25	990	44.7%
2013	400.69	93.43	494.12	990	49.9%
2014	499.79	95.41	595.20	990	60.1%
2015	564.85	109.53	674.38	1,114	60.5%
2016	551.00	89.25	640.25	1,006	63.6%

Table C-43. Total mortality (mt) of bocaccio south of 40°10' N. latitude compared to non-trawl allocation (data source: WCGOP Total Mortality Reports.)

Year	Recreational	Commercial	Total	Non-trawl allocation	% of non-trawl allocation
2011	103.20	2.30	105.50	189.6	55.6%
2012	124.73	3.35	128.08	189.6	67.5%
2013	130.84	3.87	134.71	236.7	56.9%
2014	99.53	5.87	105.40	249.6	42.2%
2015	90.46	7.63	98.09	258.8	37.9%
2016	68.60	2.44	71.04	368.7	19.3%

Table C-44. Total mortality (mt) of shelf rockfish south of 40°10' N. latitude compared to non-trawl allocation (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	Non-trawl allocation	% of non-trawl allocation
2011	306.19	19.90	326.09	615	53.0%
2012	354.31	23.23	377.54	615	61.4%
2013	364.24	30.27	394.51	587	67.2%
2014	348.34	34.30	382.64	587	65.2%
2015	485.43	46.74	532.17	1,383	38.5%
2016	390.30	34.19	424.49	1,384	30.7%

Table C-45. Total mortality (mt) of lingcod south of 40°10' N. latitude compared to non-trawl allocation (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	Non-trawl allocation	% of non-trawl allocation
2013	381.27	36.25	417.52	606	68.9%
2014	492.43	57.88	550.31	580	94.9%
2015	602.87	82.11	684.98	547	125.2%
2016	582.90	59.39	642.29	515	124.7%

Table C-46. Total mortality (mt) of California scorpionfish south of 34°27' N. latitude compared to annual catch limit (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	ACL	% of non-trawl allocation
2011	99.56	3.25	102.81	135	76.2%
2012	116.26	3.19	119.45	126	94.8%
2013	112.00	1.72	113.72	120	94.8%
2014	122.62	2.37	124.99	117	106.8%
2015	81.42	2.26	83.68	114	73.4%
2016	73.00	6.57	79.57	111	71.7%

Table C-47. Estimated total mortality (mt) of kelp greenling (California) compared to ABC contribution of the Other Fish complex. The Other Fish complex ACL is provided for context (data sources: WCGOP Total Mortality Reports and Nearshore Model).

Year	Recreational	Commercial a/	Total	ABC b/	% of ABC	Other Fish complex ACL
2011	22.63	2.04	24.67	111	22.2%	5,575
2012	12.88	5.12	18.0	111	16.2%	5,575
2013	13.66	5.53	19.19	82.5	23.3%	4,717
2014	12.56	5.03	17.59	82.5	21.3%	4,697
2015	17.57	6.42	23.99	99.2	24.2%	242 c/
2016	10.7	4.91	15.61	99.2	15.7%	243 c/

a/ Commercial mortality estimates are the annual landings plus an estimated discard produced by the Nearshore Model. Note the Nearshore Model discard is calculated similarly to the WCGOP estimation method except the model uses all years of WCGOP data (2002-2016) to generate estimates. Additionally, the Nearshore Model has an extra stratification (North of 42º N. lat., 42º – 40º 10' N. lat, and South of 40º 10' N. lat.) that can allow for area-specific discard and mortality estimates.

b/ The ABCs listed are the kelp greenling (CA) contributions to the Other Fish complex ACL.

c/ The significant reduction in the Other Fish complex ACL is due to the removal of the ecosystem component (EC) species from the complex.

Overfished species (Cowcod)

No adverse impacts are anticipated for cowcod south of 40°10' N. latitude beyond those already accounted for in the integrated alternatives. Although overall cowcod distribution is 22 fm to 270 fm, the highest densities are found in depths of 100 fm to 130 fm (SAFE, 2016). No cowcod catch was documented in WCGOP observed fixed gear sets made in the western CCA between 2002 and 2016. In 2014, the NFWSC hook-and-line survey for shelf rockfish was allowed to operate inside the CCA. In the two years that the survey has been allowed to operate inside the CCA, zero cowcod have been encountered inside 40 fm. Throughout the entirety of the 12 year survey, zero cowcod have been encountered outside the CCA in those same depths. All of the cowcod encountered inside the CCA were in depths of 40 fm or greater (Table C-48). Therefore, substantial increases in take are not expected.

Table C-48. NWFSC Hook and Line Survey catch and catch rate of cowcod by depth stratum inside and outside of the CCAs, 2004 – 2016 (data: courtesy John Harms, NWFSC).

Depth stratum[a/] (fm)	Valid hooks deployed[b/]		Cowcod catch (n)		Cowcod catch rate (n per valid hook)	
	Outside CCA	Inside CCA	Outside CCA	Inside CCA	Outside CCA	Inside CCA
20 - 40	10,282	1,933	0	0	0.00000	0.00000
40 - 50	30,261	2,038	1	4	0.00003	0.00196
50 - 60	19,689	2,932	7	3	0.00036	0.00102
60 - 70	13,610	1,363	47	11	0.00345	0.00807
70 - 80	12,257	1,484	88	19	0.00718	0.01280
80 - 90	9,518	1,301	55	12	0.00578	0.00922
90 - 100	5,174	780	41	19	0.00792	0.02436
> 100	2,863	1,352	79	21	0.02759	0.01553
Total catch			318	89		

a/ The H&L survey's depth range is 20 - 125 fm
b/ Sampling outside the CCAs began in 2004; sampling inside the CCAs began in 2014

As noted in the recreational analysis (see Section C.3.6), prior to implementation of the CCA (1999-2000) 5.9 percent of recreational cowcod encounters occurred in depths of 40 fm or less, whereas after implementation (2004-2009) 6.8 percent of the encounters occurred in those same depths. There are some similarities (i.e., depths fished, gear type) between the recreational fishery and portions of the commercial fixed gear fishery. Therefore, it expected that this trend would likely apply to portions of the commercial fishery as well.

This management measure poses a low risk of overfishing, given that mortality has consistently remained well below the ACL (previously OY) since 2003. Any increase in impacts are expected to remain well within ACLs and/or non-trawl allocations (Table C-49).

Table C-49. Total mortality of cowcod south of 40°10' N. latitude by year (source: Dick et al 2013 & WCGOP Total Mortality reports).

Year	Recreational	Commercial	Total	OY/ACL	% OY/ACL
2003	0.48	0.22	0.70	4.8	14.6%
2004	0.45	0.95	1.40	4.8	29.2%
2005	0.15	1.15	1.30	4.2	30.9%
2006	0.07	2.20	2.27	4.2	54.0%
2007	0.30	2.03	2.33	4	58.2%
2008	0.25	0.48	0.73	4	18.2%
2009	0.21	1.45	1.66	4	41.5%
2010	0.19	1.00	1.20	4	30.0%
2011	0.83	0.02	0.85	4	21.2%
2012	0.84	0.00	0.84	3	21.0%
2013	1.52	0.19	1.71	3	57.0%
2014	0.75	0.19	0.94	10	9.4%
2015	0.47	0.39	0.86	10	8.6%
2016	0.70	0.28	0.98	10	9.8%

The 2014 cowcod rebuilding analysis evaluated the tradeoffs of time to rebuild under higher harvest levels (Table C-50). This rebuilding analysis showed that large changes in mortality and exploitation rates did not have an appreciable effect on rebuilding times. For example, increasing the baseline ACT by over 500 percent (23.0 mt) is only expected to add three years to rebuilding. Therefore, even if mortality was higher than projected there would be a negligible effect on time to rebuild or rebuilding progress.

Table C-50. Rebuilding reference points for select model runs from 2014 cowcod rebuilding analysis (Dick and MacCall, 201419).

Model Run	Baseline ACL in 2015	ACL 4mt*	ACL 5 mt	ACL 6 mt	ACL 7mt	50% prob by 2022
Exploitation rate in 2015	0.007	0.0036	0.0045	0.0054	0.0063	0.0203
50% prob recovery by	2020	2019	2019	2019	2019	2022
2015 ACL (mt)	7.8	4.0	5.0	6.0	7.0	22.7
2016 ACL (mt)	8.0	4.1	5.1	6.2	7.2	23.0

*Equivalent to the Council's baseline ACT of 4 mt.

b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

As noted previously, this management measure is not expected to make substantial changes to catch of target or overfished stocks compared to past catches and management reference points. Under the current regulations, 40.4 mi^2 (or less than 1 percent of the entire CCA) is open to fishing in 20 fm or less. Increasing the depth to 30 fm depth restriction would increase the fishable area within the CCA to 98.3 mi^2 (1.9 percent

[19] http://www.pcouncil.org/wp-content/uploads/Cowcod_Rebuilding_Analysis_140523.pdf

of CCA). Under a 40 fm depth restriction, the area would increase to 147.2 mi^2 (Table C-51 and Table C-52). Note that an area around Santa Barbara Island that is currently open under the 20 fm depth restriction would be closed under the 30 fm or 40 fm depth restrictions, but that both the proposed 30 fm or 40 fm change would still result in a net gain of fishable area. These areas represent very small increases compared to the coastal nearshore and shelf areas south of 40°10' N. latitude that are already open to commercial fixed gear fishing.

Some increase in retention of nearshore rockfish, shelf rockfish, cabezon, kelp greenling, and California scorpionfish may occur, but is expected to remain well within ACLs and/or non-trawl allocations. Non-trawl allocations for shelf rockfish south of 40°10' N. latitude have increased from 587 mt in 2014 to 1,383 mt in 2016 and 1,576 mt in 2017, while commercial trip limits for shelf rockfish species have remained stable with only moderate adjustments. In 2016, only 30.7 percent of the non-trawl allocation was attained; no further trip limit adjustments are being proposed for 2019-2020. Total mortality of nearshore and bocaccio rockfish south of 40°10' N. latitude is also well below the non-trawl allocation limits, with the commercial sector making up a small portion of the existing total mortality compared to the recreational sector. In addition, recent commercial fixed gear fishing effort within the CCA has been very low. Anecdotal reports from commercial groundfish fishery participants indicate that this proposed change will likely increase, but not substantially, the number of vessels travelling to this remote location. Opening a comparatively small area should not pose a conservation risk for nearshore, shelf, or bocaccio rockfish.

Table C-51. Summary of open fishing areas (mi2) inside the western Cowcod Conservation Area under a 20 fm (baseline), 30 fm, and 40 fm depth restriction.

Area	Area (mi^2)		
	20 fm	30 fm	40 fm
Santa Barbara Island	3.6	4.5	6.3
San Nicolas Island	32.8	71	107.4
Tanner Bank	0.3	4.5	8.5
Cortes Bank	3.7	18.3	25
Total Open Area	40.4	98.3	147.2

Table C-52. Percent increase in open fishing areas under a 30 fm or 40 fm depth restriction inside the western CCA compared to baseline (20 fm).

Depth Statistic	20 fm	30 fm	40 fm
Total Open Area (mi^2)	40.4	98.3	147.2
Area increase (mi^2)	-	57.9	106.8
% Increase	-	143%	264%
% total CCA[a/]	0.8%	1.9%	2.9%

a/ Total area inside the CCA is 5,126 mi2

19. Other Fish
    a. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and to what stocks? How is this catch monitored? Are the affected stocks managed under another federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

According to the 2016 WCGOP Total Mortality Report, few non-groundfish species (e.g., California halibut and California sheephead) are encountered as bycatch in the nearshore fixed gear fishery south of 40°10' N. latitude. Catch of these non-groundfish species is not expected to change as a result of this management measure. California halibut and California sheephead are both shallow dwelling species that are already accessible under the baseline depth restrictions. Therefore, simply modifying allowable depths is not expected to increase catches of these species, since they tend to be found in shallower depths in which fishing is already permitted.

Several commercial state-managed fisheries operate in this area and depth – market squid, urchin, California spiny lobster, yellowtail, and white seabass. This measure is not expected to have any effect on market squid, urchin, and California spiny lobster because the incidental take of rockfish does not provide an added economic incentive to fish within the 20 to 40 fm depth range in the CCA. These fisheries also operate in depths deeper than those proposed by this management measure. Fishing effort for yellowtail and white seabass inside the CCA may increase as a result of economic incentives tied to being able to retain rockfish catch between 20 and 40 fm within the CCA, but the magnitude of this increased effort and the impacts it may have is expected to be small. In addition, white seabass is managed under a state Fishery Management Plan with low levels of fishery exploitation, and the risk of overfishing from this management measure is expected to be low.

20. EFH and Ecosystems

    a. Will this management measure change fishing activity so as to adversely affect essential fish habitat compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

This measure is not expected to change fishing activity as to adversely affect EFH compared to the current or baseline as analyzed in the 2016-2017 FEIS. EFH which prohibits fishing with bottom contact gear is currently designated in an area off Santa Barbara Island that is already open to fishing inside the CCA under No Action. A state Marine Protected Area, which prohibits fishing, was also designated in this same area (See Attachment 5, Figure C-7).

Any EFH that is currently in effect will remain in effect and not be affected by this action. The Council is contemplating modifying EFH and/or adding additional EFH areas under a separate action, but those potential modifications are only applicable to trawl gear and would therefore have no effect or bearing on this action.

    b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

No anticipated effects. Fishing activity occurs in shallow depths where deep sea coral ecosystems are not found. An evaluation of NOAA Deep Sea Coral database reveals that no deep sea corals have been observed around Santa Barbara Island, San Nicolas Island, or Cortes Bank under baseline depths (Figure C-28, Figure C-30, Figure C-34); some observations have been documented at Tanner Banks (Figure C-31). Increasing the depths to 30 fm or 40 fm is not expected to adversely affect coral ecosystems because fixed fishing gear has minimal effect on sensitive habitats, unlike other gears such as trawl gear. As previously mentioned, fishing already occurs in these depths and areas for state-managed fisheries, so no additional negative effects are expected simply as a result of this change.

    c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No anticipated effects. Fishing activity occurs in these areas, and increasing allowable fishing depths is not expected to have any effect on biodiversity of ecosystem functioning.

21. Marine Mammals and ESA Species
    a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

No anticipated effects. This management measure is not expected to affect ESA-listed species and/or non-listed marine mammals and seabirds because they are not vulnerable to the fishing gear or are not found in the depths and area under the scope of action. While leatherback sea turtles are known to occur in this area, none have been taken as bycatch in any U.S. west coast commercial groundfish fishery sectors since 2011. Since 2006, there has only been one observed leatherback sea turtle encountered in any U.S. west coast groundfish fishery, which occurred in 2008 in an area and depth outside the geographic scope of this management measure. Also in the time period of 2011-2015, one humpback whale was observed taken in 2014 but in an area and depth outside the geographic scope of this management measure. Between 2010 and 2015, one short-tailed albatross was also taken in 2011 in an area and depth outside the geographic scope of this management measure.

22. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example, which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

Although changes are proposed under separate actions for the recreational and fixed gear commercial fisheries, no change in distribution of catch is expected between user groups. Management measures for both fisheries are designed to ensure they remain within their respective allocations. This management measure is expected to provide a positive economic impact for vessels fishing inside the CCA, though the exact scale of this impact cannot be estimated at this time.

    b. Can the proposed action reasonably be expected to significantly affect public health or safety?

No anticipated effects.

23. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

Repeat each set of questions for affected resources (Groundfish, other fish, EFH, ecosystems, ESA species, marine mammals, social, and economic).

    a. Does the proposed management measure have non-negligible adverse effects to the resource? *If none then stop and proceed to the next resource.*

b. Is it likely that any current or future fishery management actions may have overlapping effects with this management measure on the resource?
c. Is it likely that any current or future non-fishery management actions may have overlapping effects with this management measure on the resource?
d. Qualitatively or quantitatively, add the effects in (a), (b), and (c) projected to the end of 2020. Can the sum of the effects be considered 'significant'? Consider both positive and negative effects.
e. Whether significant or not, what is the proposed new management measure's contribution to the total effect? E.g., the incremental impact from this management measure to the cumulative effects on groundfish is negligible/high/medium.

Groundfish – Lingcod trip limit adjustments may result in a cumulative impact with this management measure since lingcod occur in the area, but will not put lingcod at risk of overfishing because trip limits will be in place to ensure that catch does not exceed ACLs. Trip limit adjustments proposed for sablefish, slope rockfish, darkblotched rockfish, longspine thornyhead, and shortspine thornyhead are outside of the geographic area (i.e., north of 40°10' N. latitude) of this proposed change and will therefore not result in a cumulative effect. The proposed canary rockfish closure in Period 2 will not result in a cumulative effect to groundfish because this species is not commonly found in this area. Although a similar action is being proposed for the recreational fishery in this same area, the incremental impact from this management measure to the total cumulative effects on groundfish is negligible.

Other Fish – There are no cumulative effects to state-managed species because there are no other commercial actions being contemplated that would affect other fish in this area. The incremental impact from this management measure to the total cumulative effects on other fish species is negligible.

EFH – There are no cumulative effects to EFH because no changes are proposed to existing EFH inside the CCA as part of this management measure. Under a separate process, the Council is considering modifying EFH along the west coast and removing the trawl RCA. Given that both these actions are limited to trawl gear, and not fixed gear, the incremental impact from this management measure to the total cumulative effects on EFH is negligible.

Ecosystem – There are no cumulative effects to ecosystems because the proposed management measure is not expected to adversely affect vulnerable marine or coastal ecosystems or adversely affect biodiversity. The incremental impact from this management measure to the total cumulative effects on the ecosystem is negligible.

ESA species – There are no cumulative effects to ESA as a result of this action. Although leatherback sea turtles, humpback whales, and short-tailed albatross do occur in southern California, they are either rarely or not commonly encountered with fixed gear inside the 20 to 40 fathom depth range. The incremental impact from this management measure to the total cumulative effects on ESA species is negligible.

Marine mammals – There are no cumulative effects to marine mammals because in the time period of 2011-2015, no marine mammals were taken in this area at the depths associated with this action. The incremental impact from this management measure to the total cumulative effects on marine mammals is negligible.

Social – There are no cumulative social effects because this management measure is not expected to change distribution of fishing effort among user groups. The incremental impact from this management measure to the total cumulative effects on social impacts is negligible.

Economic – Lingcod trip limit reductions are proposed along with the increases in fishable area inside the CCA proposed with this management measure. It is unclear what the cumulative economic effect of these

two opposing changes will be. Trip limit adjustments proposed for sablefish, slope rockfish, darkblotched rockfish, longspine thornyhead, and shortspine thornyhead are outside of the geographic area (i.e., north of 40°10' N. latitude) of this proposed change and will therefore not result in a cumulative economic effect. The proposed canary rockfish closure in Period 2 will not result in a cumulative effect because this species is not commonly found in this area. The incremental impact from this management measure to the total cumulative effects on economic impacts is likely negligible.

24. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

The proposed action on the quality of the human environment will not likely be highly controversial because cowcod is rebuilding much quicker than expected, and this proposed management measure will still keep over 97 percent of the entire CCA closed to fishing.

    b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No, the proposed action's effects on the human environment are not likely to be highly uncertain or involve unknown or unique risks.

25. MSA National Standards
    a. Describe how the management measure is consistent with the 10 MSA National Standards.

This management measure proposes to replace the depth-based inner boundary of the western CCA with a waypoint-based 30 or 40 fathom RCA line. The intent of the RCA concept is to prevent overfishing, while at the same time protecting overfished species by preventing fishing in areas where these species of concern are more likely to be found. This management measure would not jeopardize this concept, and at the same time would allow the fishing communities to better access target stocks to help them achieve their harvest limits. Additionally, this management measure has very little chance of causing any of the impacted species to become overfished, or for overfishing to occur. This would address National Standard 1.

This management measure is also consistent with National Standard 2 because it is based on the best scientific information available, which suggests that cowcod is nearly rebuilt and higher levels of mortality are not expected to jeopardize its rebuilding progress.

Inherent in the RCA system, the goal of minimizing bycatch of species of concern and non-target species has been addressed. This management measure improves the RCA method by providing slight modifications that improve monitoring of fishing activity, thus meeting National Standard 9.

Attachment 5

Charts of overview of western Cowcod Conservation Area, WCGOP fishing effort, and 30 fm and 40 fm RCA lines around Santa Barbara Island, San Nicolas Island, Tanner Bank, and Cortes Bank.

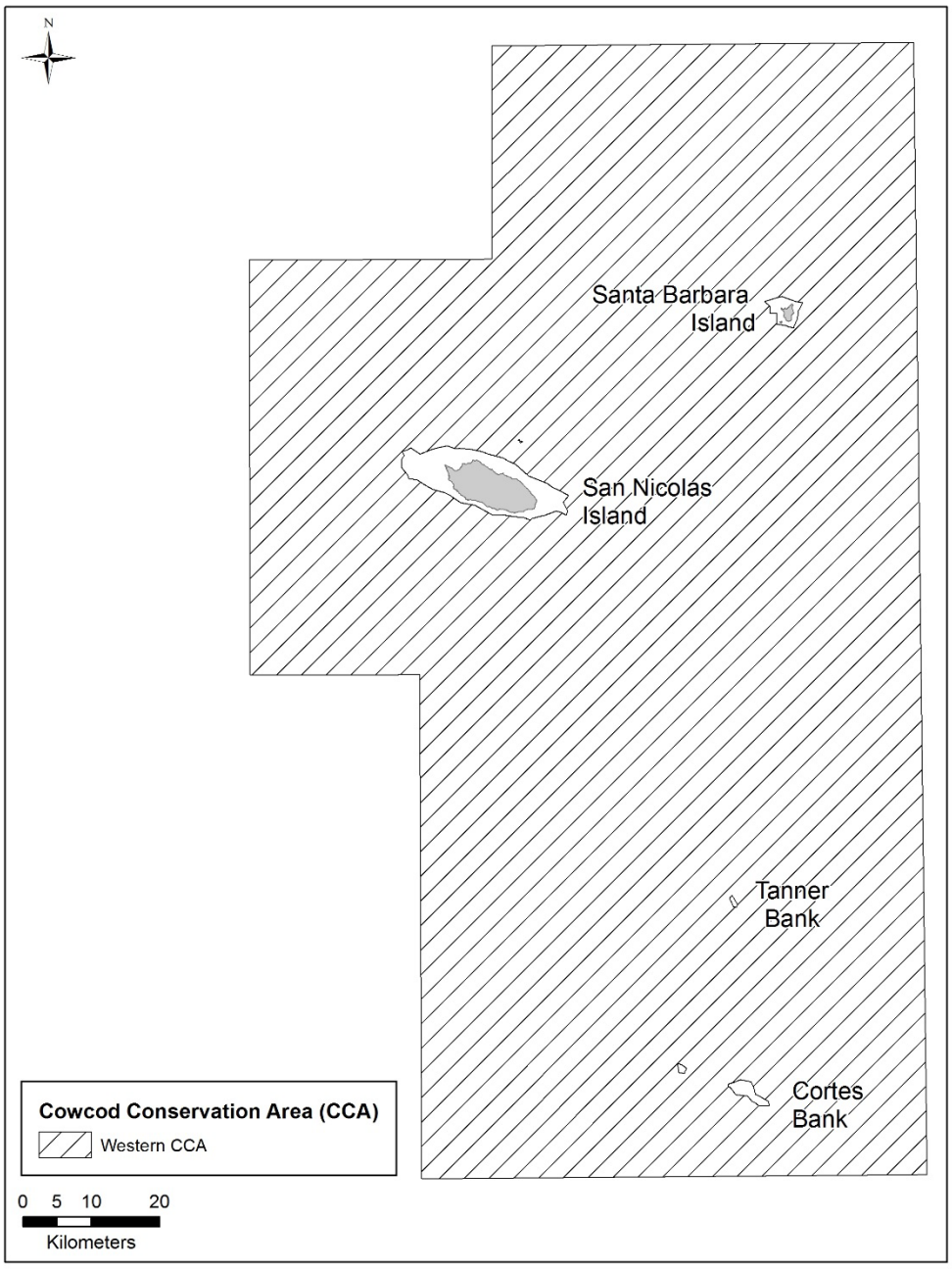


Figure C-22. Overview of western Cowcod Conservation Area.

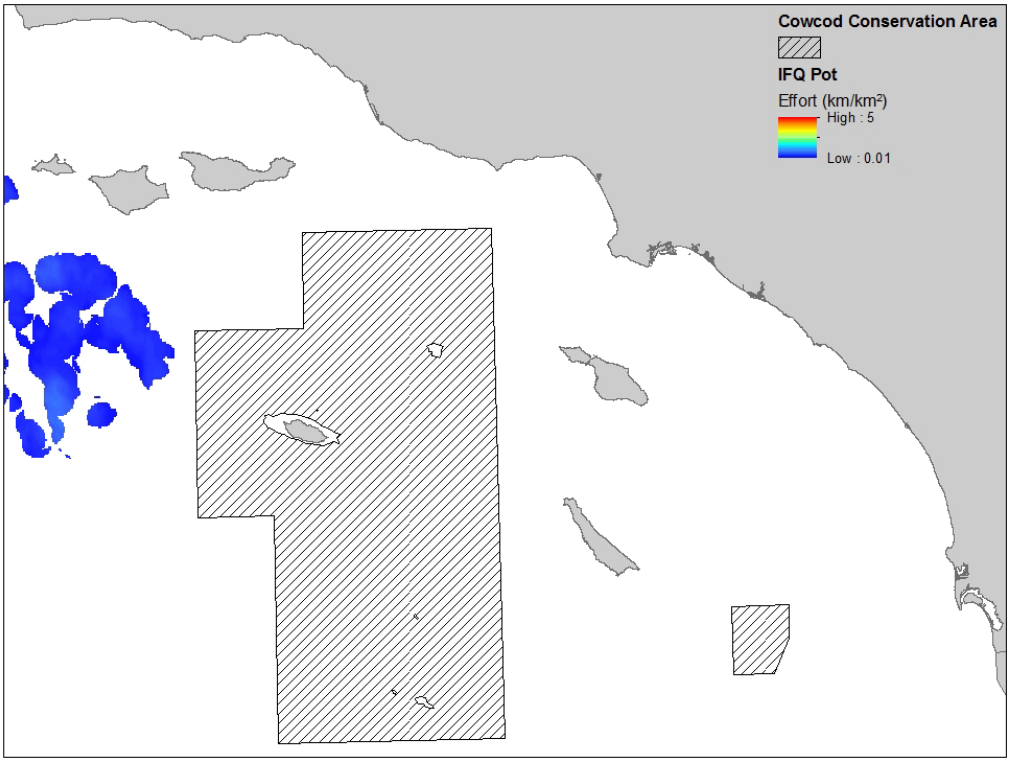


Figure C-23. IFQ pot fishing effort observed by the West Coast Groundfish Observer Program (2011 to 2015).

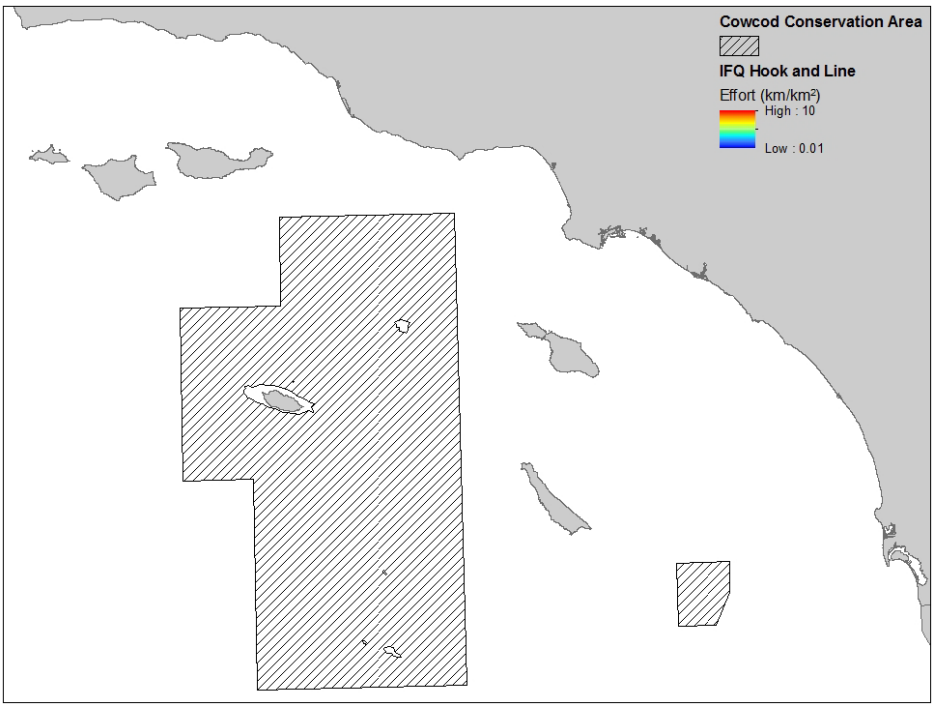


Figure C-24. IFQ hook-and-line fishing effort observed by the West Coast Groundfish Observer Program (2011 to 2015).

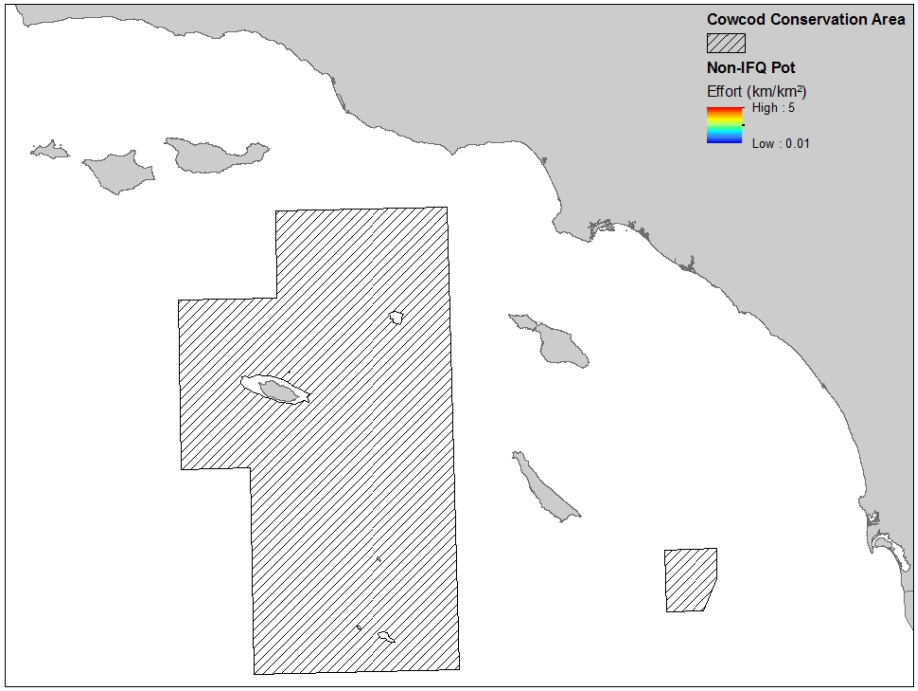


Figure C-25. Non-IFQ pot fishing effort observed by the West Coast Groundfish Observer Program (2011 to 2015).

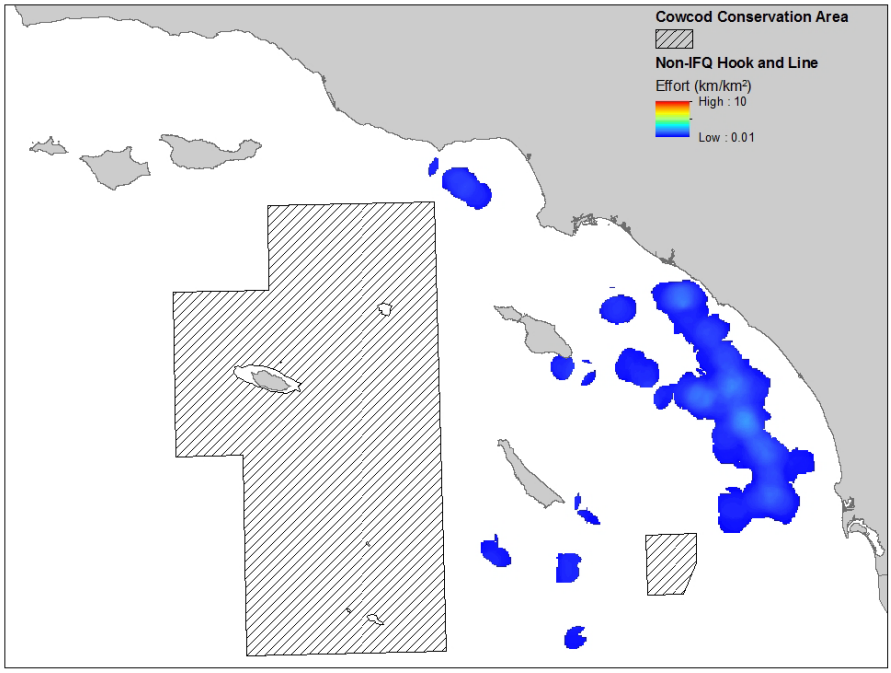


Figure C-26. Non-IFQ share hook-and-line fishing effort observed by the West Coast Groundfish Observer Program (2011 to 2015).

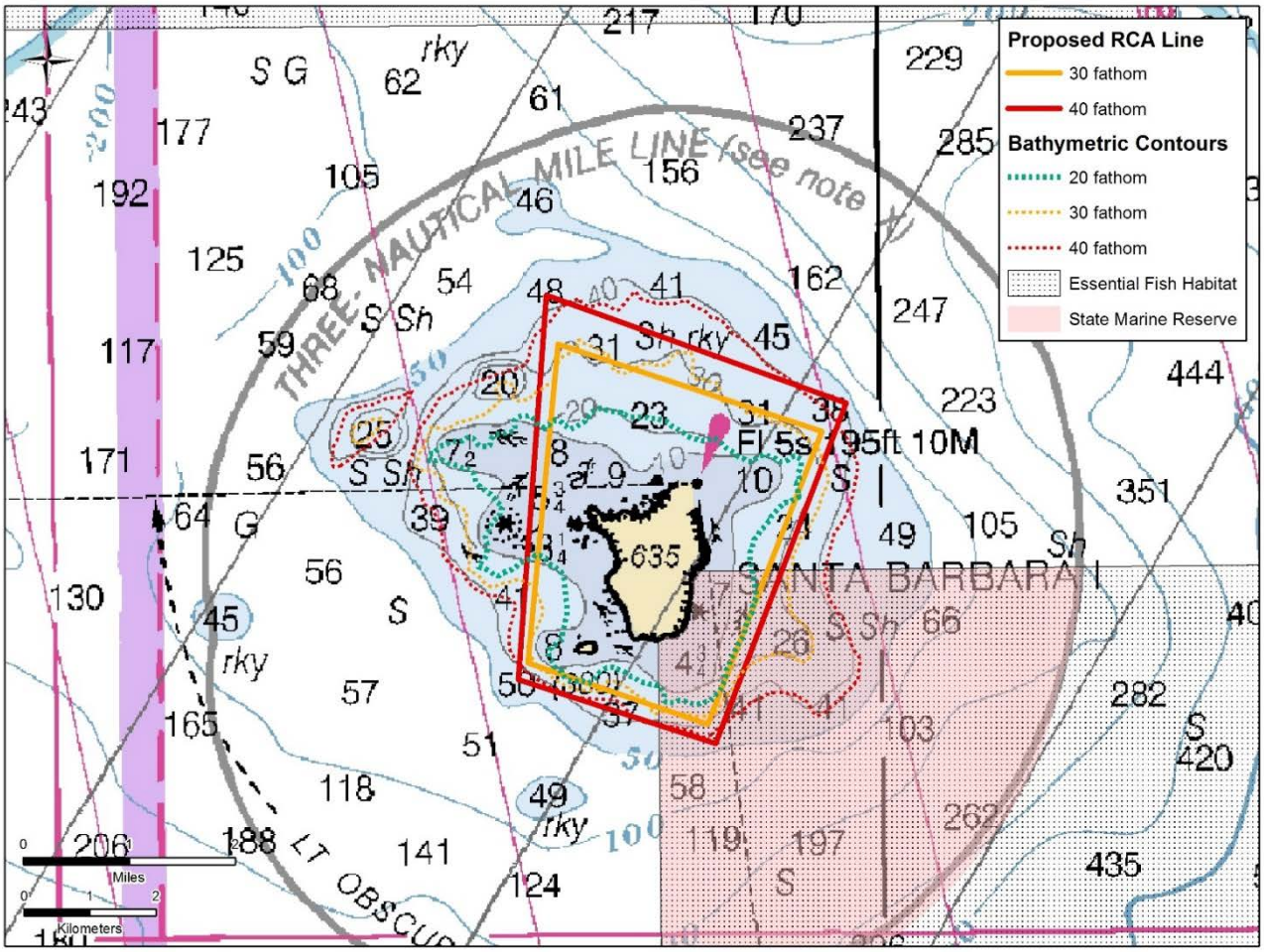


Figure C-27. Proposed 30 fm and 40 fm RCA lines around Santa Barbara Island. Note that an area around Santa Barbara Island that is currently open under the 20 fm depth restriction would be closed under the 30 fm or 40 fm depth restrictions. The 30 fm proposed change would still result in a net gain of 0.9 mi² of fishable area, and the 40 fm proposed change would result in a net gain of 2.7 mi².

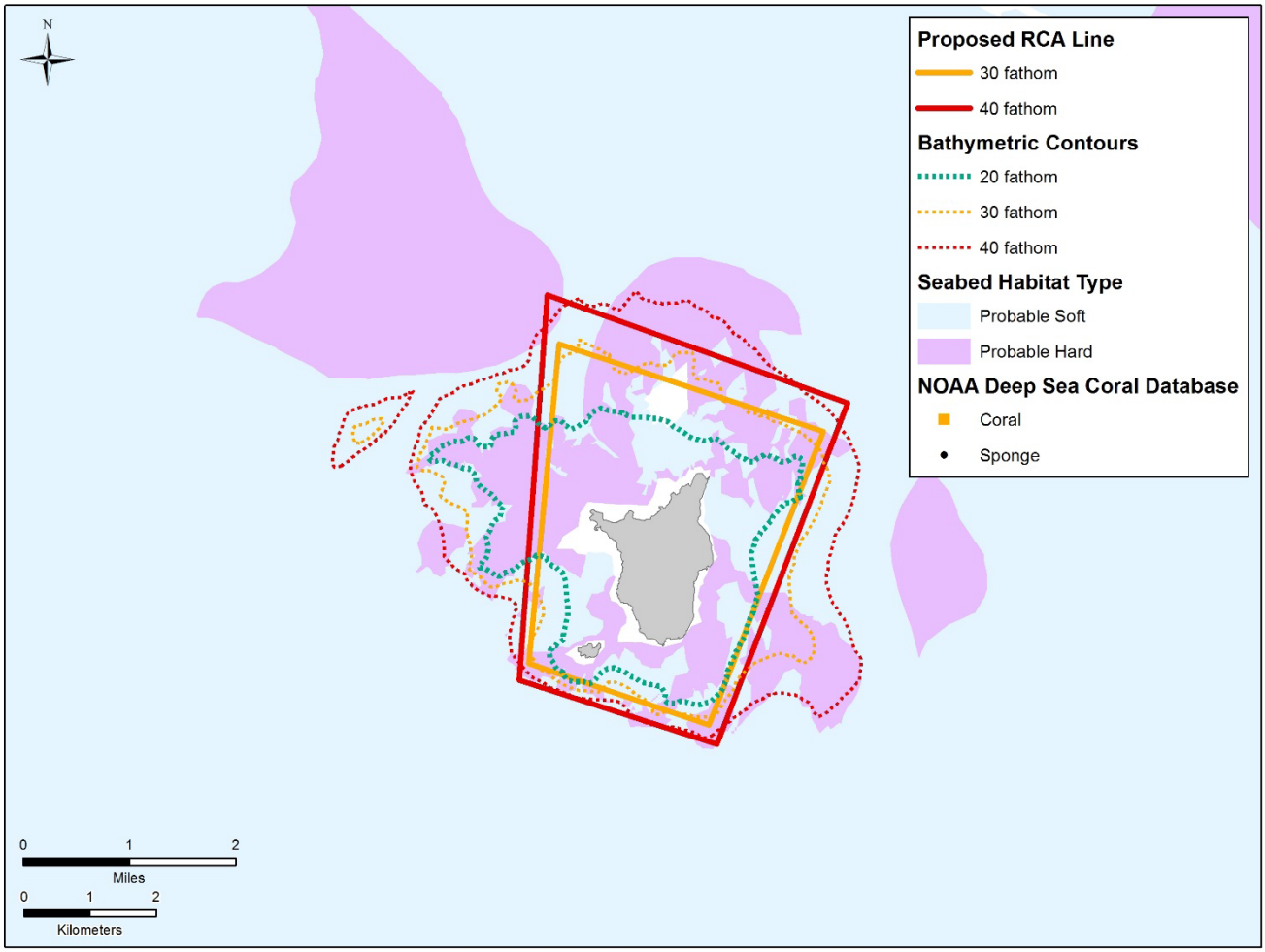


Figure C-28. Proposed RCA changes around Santa Barbara Island including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

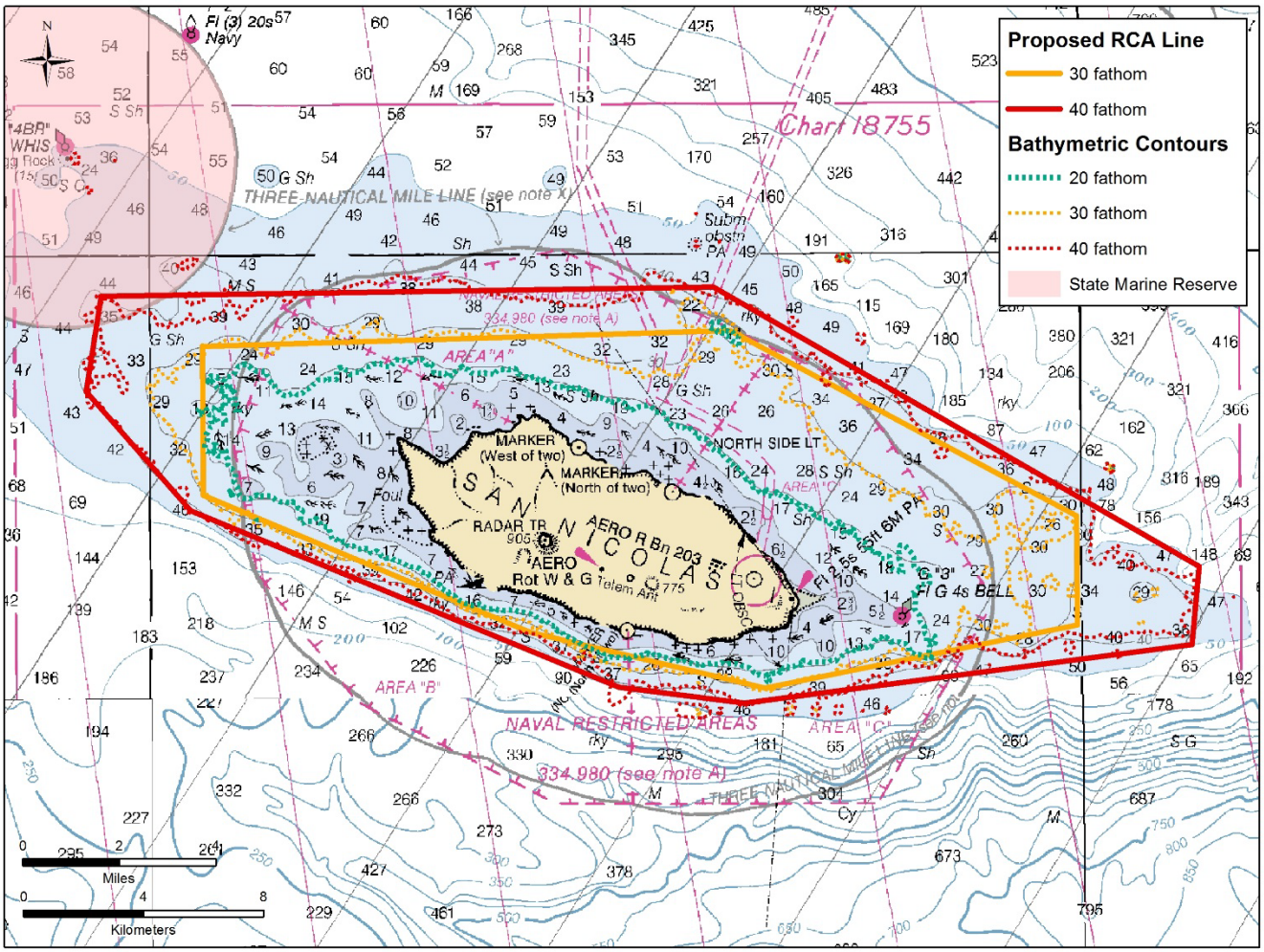


Figure C-29. Proposed 30 fm and 40 fm RCA lines around San Nicolas Island.

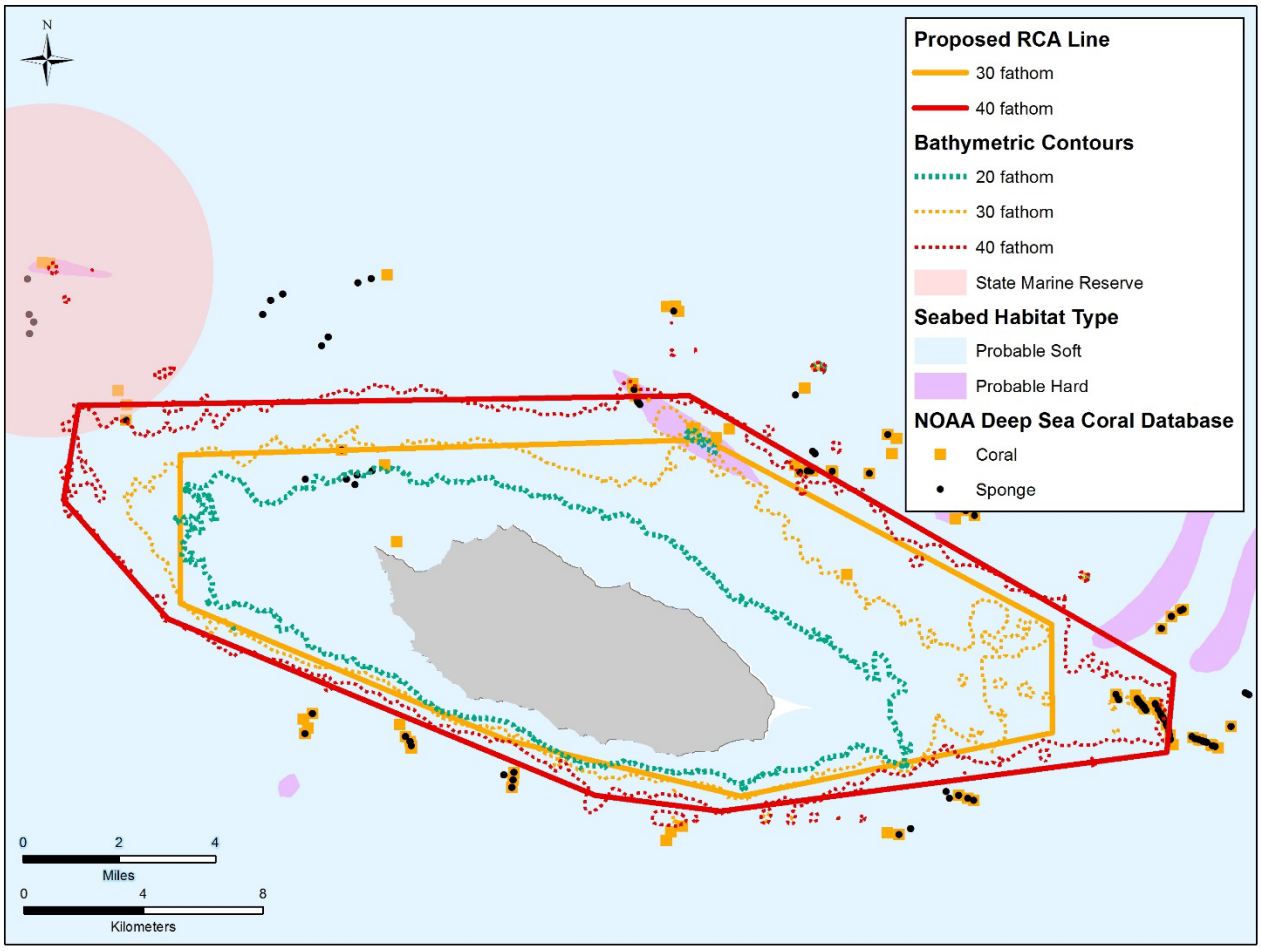


Figure C-30. Proposed RCA changes around San Nicolas island including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

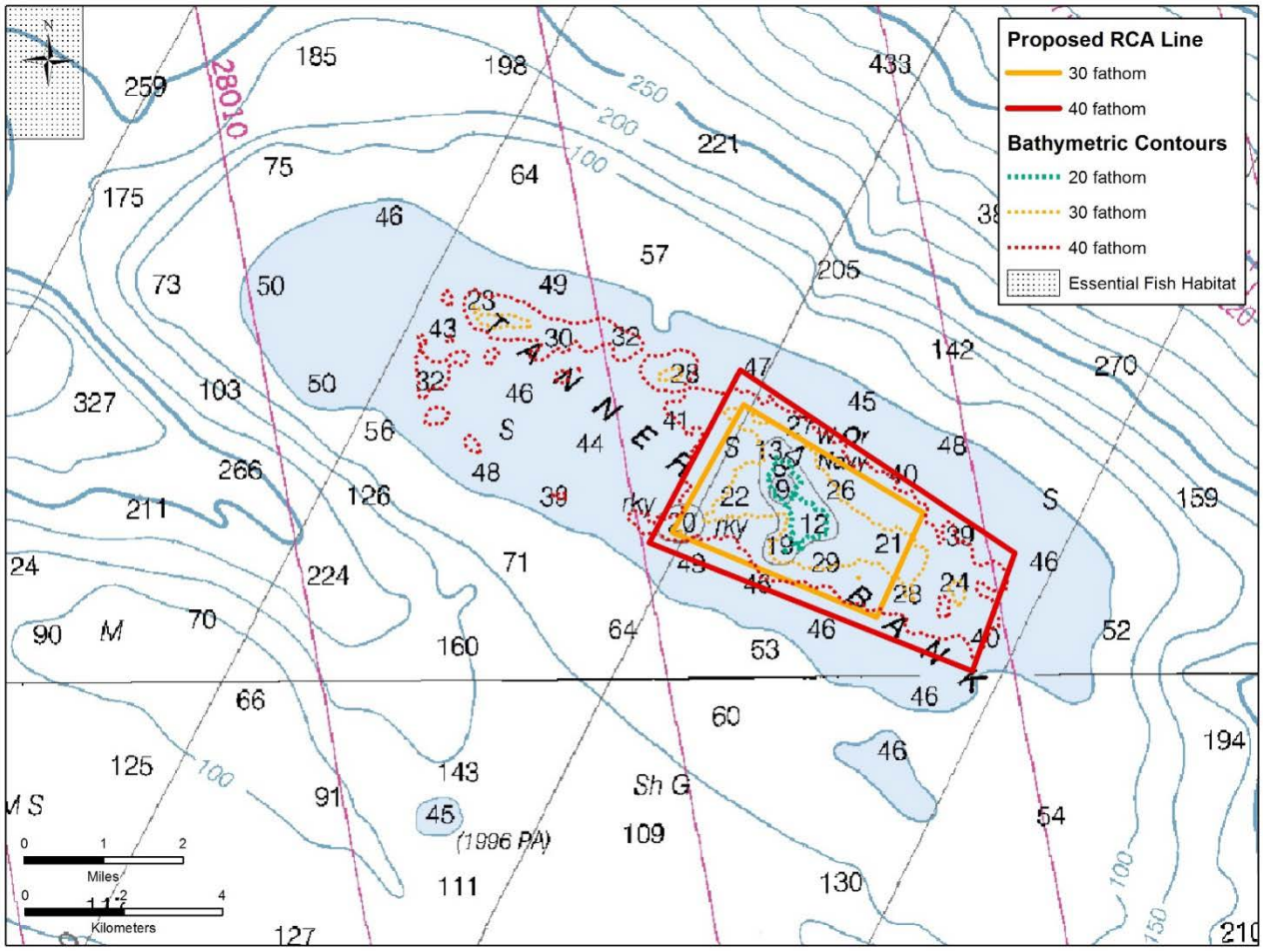


Figure C-31. Proposed 30 fm and 40 fm RCA lines around Tanner Bank.

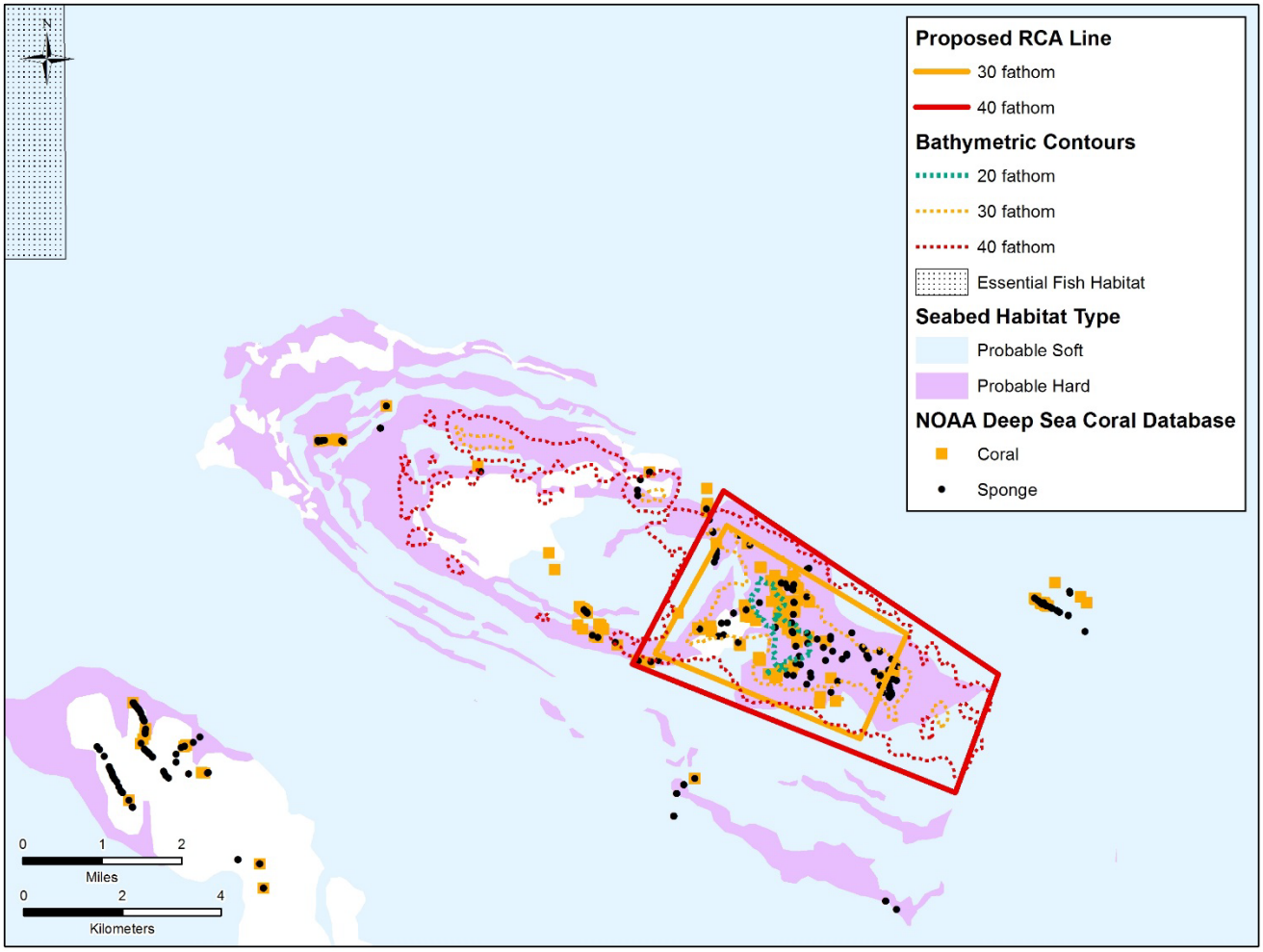


Figure C-32. Proposed RCA changes around Tanner Bank island including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

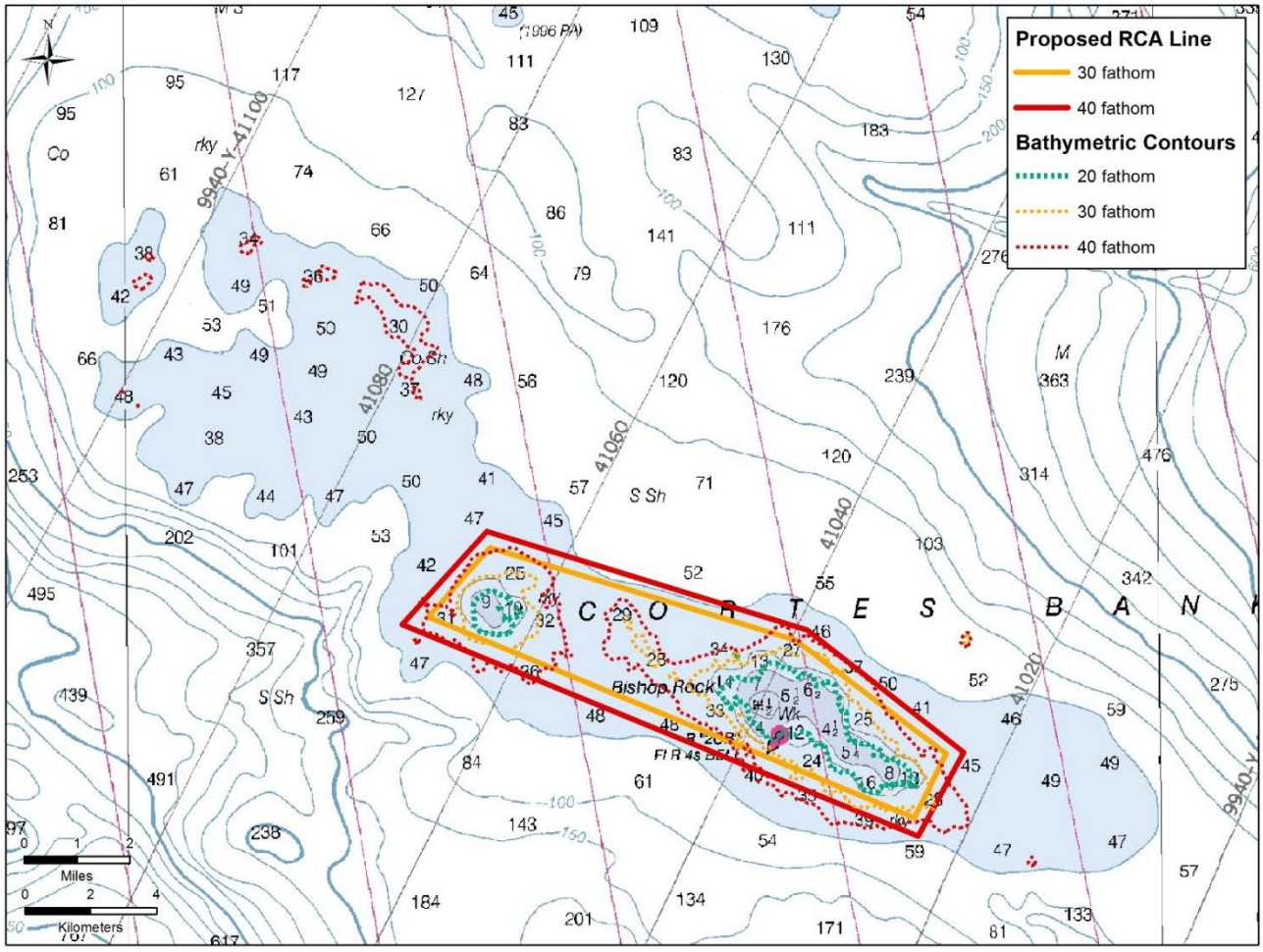


Figure C-33. Proposed 30 fm and 40 fm RCA lines around Cortes Bank.

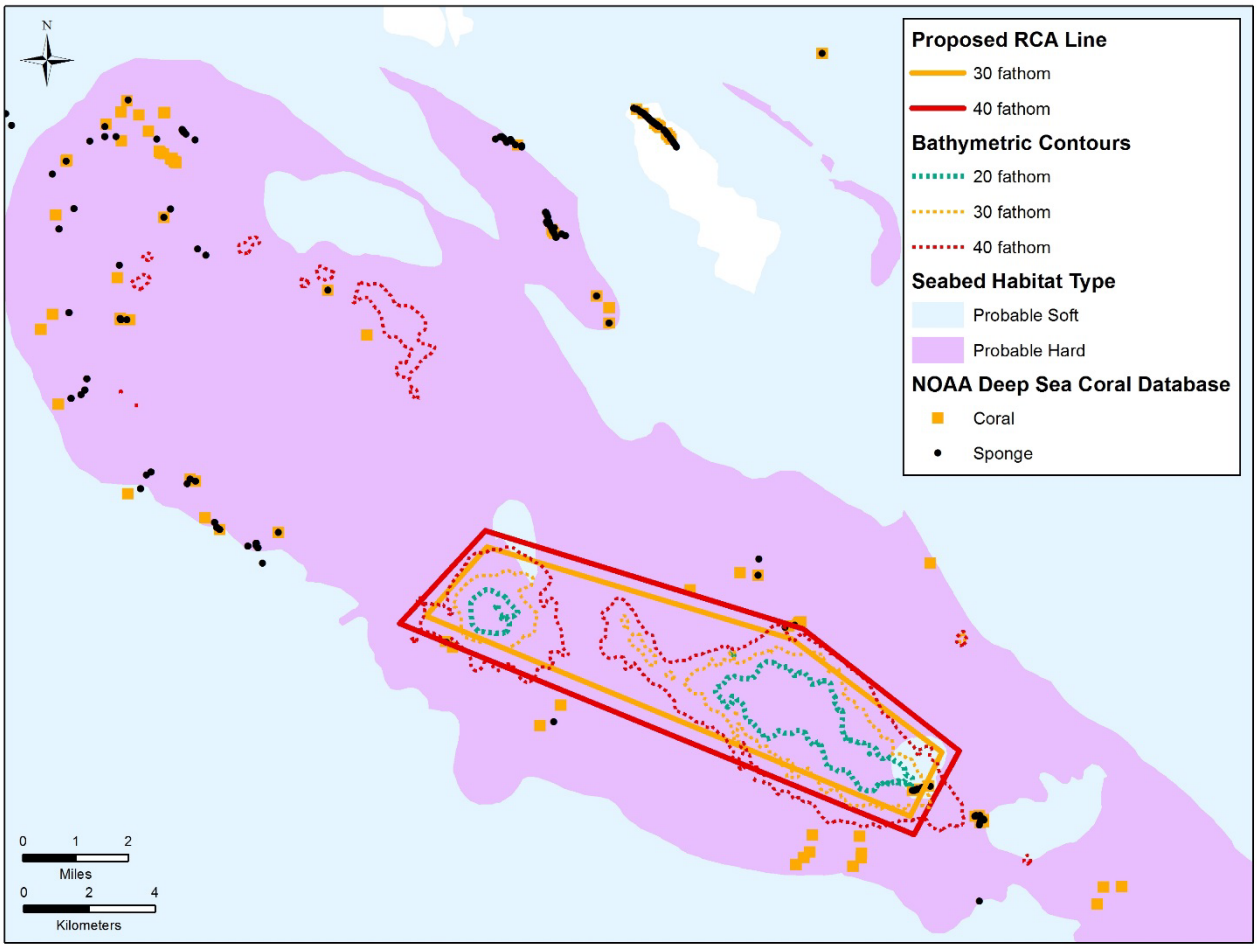


Figure C-34. Proposed RCA changes around Cortes Bank including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

Attachment 6

Coordinate tables for 30 fm and 40 fm RCA lines around Santa Barbara Island, San Nicolas Island, Tanner Bank, and Cortes Bank.

30 Fathom Coordinates

Table C-53. Proposed 30 fathom coordinates for Santa Barbara Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	30.38	119	3.15
2	Add	33	29.64	119	0.58
3	Add	33	27.24	119	1.73
4	Add	33	27.76	119	3.48
5	Add	33	30.38	119	3.15

Table C-54. Proposed 30 fathom coordinates for San Nicolas Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	18.39	119	38.87
2	Add	33	18.63	119	27.52
3	Add	33	15.24	119	20.10
4	Add	33	13.27	119	20.10
5	Add	33	12.16	119	26.82
6	Add	33	13.20	119	31.87
7	Add	33	15.70	119	38.87
8	Add	33	18.39	119	38.87

Table C-55. Proposed 30 fathom coordinates for Tanner Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	43.02	119	8.52
2	Add	32	41.81	119	6.20
3	Add	32	40.67	119	6.82
4	Add	32	41.62	119	9.46
5	Add	32	43.02	119	8.52

Table B- 15. Proposed 30 fathom coordinates for Cortes Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	29.73	119	12.95
2	Add	32	28.17	119	7.04
3	Add	32	26.27	119	4.14
4	Add	32	25.22	119	4.77
5	Add	32	28.6	119	14.15
6	Add	32	29.73	119	12.95

40 Fathom Coordinates

Table C-56. Proposed 40 fathom coordinates for Santa Barbara Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	30.78	119	3.27
2	Add	33	29.87	119	0.34
3	Add	33	27.08	119	1.65
4	Add	33	27.62	119	3.58
5	Add	33	30.78	119	3.27

Table C-57. Proposed 40 fathom coordinates for San Nicolas Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	19.30	119	41.05
2	Add	33	19.42	119	27.88
3	Add	33	14.31	119	17.48
4	Add	33	12.90	119	17.64
5	Add	33	11.89	119	27.26
6	Add	33	12.19	119	29.96
7	Add	33	15.42	119	39.14
8	Add	33	17.58	119	41.38
9	Add	33	19.30	119	41.05

Table C-58. Proposed 40 fathom coordinates for Tanner Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	43.40	119	8.56
2	Add	32	41.36	119	5.02
3	Add	32	40.07	119	5.59
4	Add	32	41.51	119	9.76
5	Add	32	43.40	119	8.56

Table C-59. Proposed 40 fathom coordinates for Cortes Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	30	119	12.98
2	Add	32	28.33	119	6.81
3	Add	32	26.29	119	3.8
4	Add	32	24.91	119	4.7
5	Add	32	28.48	119	14.66
6	Add	32	30	119	12.98

C.3.6 Modify Recreational Depths inside the Western Cowcod Conservation Area

Part A

13. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

This management measure would modify the allowable fishing depths for the recreational fishery inside the western Cowcod Conservation Area (CCA) from 20 fm to 30 fm or 40 fm and add new waypoints approximating the 30 and 40 fm depth contours around Santa Barbara Island, San Nicolas Island, Tanner Bank, and Cortes Bank (Figure C-35).

Under the baseline Federal regulations, minor nearshore rockfish, cabezon, kelp greenling, lingcod, and shelf rockfish can be retained shoreward of 20 fm from March through December 31. California scorpionfish can be retained January 1-August 31. Petrale sole and starry flounder may be taken year-round at any depths within the CCA. Other Flatfish may also be taken year-round at any depths when using no more than 12 #2 or smaller hooks.

While there are current 30 and 40 fathom depth contours specified in regulation at 50 CRF 660.71-660.73, none have been specified inside the CCA, which are proposed to be used by recreational and commercial fisheries. This management measure proposes to add new waypoints to approximate the 30 fm and 40 fm depth contours inside the CCA. Charts delineating the areas are provided in Attachment 5, and proposed waypoint coordinate tables are provided in Attachment 6.

This management measure is expected to increase catch of shelf rockfish, bocaccio, and deeper nearshore rockfish - but mortality is expected to be well within the non-trawl allocations and harvest specifications. Although this measure could increase catch of lingcod, a bag limit reduction proposed for 2019-2020 is expected to keep catches within the non-trawl allocation and harvest specifications. No changes are expected for cabezon and greenling because they are already accessible under the current depth restrictions. This measure could also result in minor increased interactions with cowcod. This management measure will not likely affect canary and yelloweye rockfish because they are not commonly found in this area.

14. What was considered in order to optimize the performance of this measure?

Cowcod was last assessed in 2013, and at that time it was rebuilding much quicker than anticipated. Cowcod is expected to be rebuilt by 2020, assuming full removal of the ACL, which is 48 years ahead of schedule. Given that removals have consistently been far below the ACL, it is possible that the stock has already reached its rebuilding target.

The latest stock assessments for canary rockfish and bocaccio indicate that these stocks are no longer overfished and have rebuilt. Yelloweye rockfish continues to make satisfactory rebuilding progress and is currently estimated at 28.4 percent of B_0.

The more optimistic outlook on the status of cowcod from the most recent assessment along with more optimistic outlooks for other stocks were considered to optimize performance of this measure. Because many stocks are rebuilding much quicker than anticipated (cowcod) or have been declared rebuilt (bocaccio), modifications to the allowable depth restrictions are considered to allow access to healthy target

stocks while still closing the depths where the overall density of cowcod is the greatest (100 fm to 130 fm; SAFE, 2016[20]) to provide protections to cowcod as the stock continues to rebuild.

15. What and when was the Council's decision and how did it arrive at the decision?

At the September 2017 PFMC meeting, three proposals were submitted for consideration in the 2019-2020 specifications process to modify the CCA. The first proposal was to modify the outer boundary of the western CCA, which would have affected all groundfish fisheries. The second and third proposals increased the allowable fishing depth inside the CCA for recreational and fixed gear commercial fisheries. At its November 2017 meeting, the PFMC decided to remove the first proposal from the 2019-2020 specification process and consider it in a stand-alone analysis given interactions and complications with ongoing EFH/RCA modifications in that area.

16. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

Two CCAs (Western and Eastern) were originally established in 2001 as an overfished species rebuilding measure for cowcod, which had been recently declared overfished. These area closures were intended to close off areas to fishing in the main portion of the species' depth range (overall distribution 22 fm to 270 fm, with the highest density 100 fm -130 fm; SAFE, 2016) to reduce encounters and mortality, allowing the stock to rebuild more quickly. The western CCA encompasses 5,126 mi² and is located in the Southern California Bight south of Point Conception.

The CCA is also expected to provide protections for bronzespotted rockfish, a stock with similar life history characteristics, habitat associations, and vulnerability to fishing as cowcod (2009-2010 SPEX). Commercial landings of bronzespotted dropped in the late 1980s and have remained at low levels from 1990 to present. While the hook-and-line fishery traditionally accounted for most of the landings, the Southern California gillnet fishery in the early 1980s accounted for most of the mortality during the period of apparent decline, consistent with the movement of effort to deeper and rockier habitats in that fishery.

In the 2009-2010 biennial specifications and management measure process, CDFW staff conducted an analysis that evaluated increasing depth restrictions inside the CCA to 30 fm or 40 fm for the recreational fishery (2009-2010 Spex). That analysis included a summary of historical fishing data to explore cowcod encounters prior to implementation of the CCA, a summary of cowcod encounters from then-current fishery data, effects on co-occurring target species, and proposed coordinates for new 30 fathom and 40 fathom depth contour lines.

As part of its Final Preferred Alternative, the Council recommended modifying the recreational depth restrictions inside the CCA to 30 fm. This decision was disapproved by NMFS in its Final Rule (76 FR 27508) due to concerns of proposed impacts to cowcod, especially juveniles, which could delay rebuilding. NMFS also indicated that because the ACL for cowcod was low (4 mt at that time), any measures that potentially increased cowcod mortality required better information on potential biological and economic effects to support such a change. At the time of NMFS' disapproval, cowcod was at 4.5 percent of unfished biomass with a projected time to rebuild of 2071. The OFL and ACL established for 2011-2012 were 13 mt and 4 mt, respectively.

In 2013, a new stock assessment was conducted which suggested a significant improvement in the status of cowcod. Cowcod was estimated to be at 34 percent B_0 and projected to rebuild 48 years ahead of schedule (2020 versus 2068). This new stock assessment explored ecosystem effects and updated habitat preferences

[20] http://www.pcouncil.org/wp-content/uploads/2017/02/SAFE_Dec2016_02_28_2017.pdf

of juvenile cowcod based on new research published since the previous full assessment in 2007. The assessment also noted that the 2013 annual rockfish recruitment and ecosystem assessment survey conducted by NOAA Fisheries Santa Cruz Laboratory encountered the highest numbers of cowcod in the 30-year history of the survey and suggested the potential for a strong 2013 year class.

In response to the significantly improved status of cowcod, NMFS implemented an OFL, ACL, and annual catch target (ACT) of 66.6 mt, 10 mt, and 4 mt respectively for 2016 – significantly higher than in prior years. Although the best available science suggested an ACL more than double that in prior years would not jeopardize the stock or rebuilding progress, the Council chose to implement a lower ACT (4 mt) due in part to the change in perception of stock status and uncertainty in the assessment in order to maintain current regulations and not allow increased mortality.

In 2011 the Council also adopted discard mortality rates reflecting the use of descending devices for cowcod, canary, and yelloweye rockfish, and California Recreational Fisheries Survey (CRFS) samplers have been collecting data (onboard and dockside) on descending device use for inclusion in management. The reduction in mortality due to descending device use is reflected in catch estimates, and the reduction in discard mortality facilitates rebuilding of overfished stocks.

In 2014, the NWFSC hook-and-line survey for shelf rockfish was allowed to operate inside the CCA. In the two years that the survey has been allowed to operate inside the CCA, zero cowcod have been encountered inside 40 fm. Throughout the entirety of the 12-year survey, zero cowcod have been encountered outside the CCA in those same depths. All of the cowcod encountered inside the CCA were in depths of 40 fm or greater (Table C-60).

Table C-60. NWFSC Hook and Line Survey catch and catch rate of cowcod by depth stratum inside and outside of the CCAs, 2004 – 2016 (data: courtesy John Harms, NWFSC).

Depth stratum[1] (fm)	Valid hooks deployed[2]		Cowcod catch (n)		Cowcod catch rate (n per valid hook)	
	Outside CCA	Inside CCA	Outside CCA	Inside CCA	Outside CCA	Inside CCA
20 - 40	10,282	1,933	0	0	0.00000	0.00000
40 - 50	30,261	2,038	1	4	0.00003	0.00196
50 - 60	19,689	2,932	7	3	0.00036	0.00102
60 - 70	13,610	1,363	47	11	0.00345	0.00807
70 - 80	12,257	1,484	88	19	0.00718	0.01280
80 - 90	9,518	1,301	55	12	0.00578	0.00922
90 - 100	5,174	780	41	19	0.00792	0.02436
> 100	2,863	1,352	79	21	0.02759	0.01553
Total catch			318	89		

[1] The H&L survey's depth range is 20 - 125 fm

[2] Sampling outside the CCAs began in 2004; sampling inside the CCAs began in 2014

Part B

9. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g.,

allowing increased opportunity to catch target species? Does it have a social benefit of making fishing opportunity among different user groups more equitable?)

The objective of this management measure is to allow increased opportunity to catch target stocks which are inaccessible due to the current depth restrictions.

10. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

    m. How would you describe this new management measure (may select more than one)
        - ❑ Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ■ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
        - ❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).
        - ❑ Designed to mitigate a negative economic or social effect.
        - ■ Applies to only a small area of the total EEZ.

    n. What resource(s) would the management measure likely affect, either positively or negatively?
        - ❑ Physical EFH or Ecosystems
        - ■ Biological Resources (target, non-target species)
        - ❑ Protected Resources (mammals, ESA-listed)
        - ❑ Economic, social, cultural

    o. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.
        - ❑ Physical EFH or Ecosystems
        - ❑ Biological Resources (target, non-target species)
        - ❑ Protected Resources (mammals, ESA-listed)
        - ❑ Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects'. Remember both positive and negative effects.

26. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

<u>Non-overfished stocks</u>

No adverse impacts are anticipated for non-overfished stocks south of 40°10' N. latitude - shelf rockfish, bocaccio, and nearshore rockfish. An increase in the number of boats fishing in this area is not expected due to the remoteness of the Western CCA, but an increase in number of trips, catch, and a redistribution of depth of catch is expected as a result of the increased depths.

Allowing access to deeper depths inside the CCA is expected to increase the number of groundfish trips between 10 and 20 percent, particularly out of Ventura and Los Angeles given their proximity to San Nicolas and Santa Barbara Islands. This would provide additional revenues to boat crews in the form of fish processing and tips.

Some CPFVs operating in the CCA target migratory species (yellowtail, tuna, and white seabass) which are found in deeper depths where rockfish retention is prohibited. Allowing rockfish retention in deeper depths is expected to provide some more opportunities for targeting migratory species and increase revenues.

Having access to deeper depths is important to anglers because it spreads effort into deeper waters, reducing pressure on shallower dwelling species, and provides greater access to highly desirable deeper nearshore (copper rockfish) and shelf rockfish (vermillion rockfish) which are not accessible under the current 20 fm depth restriction.

No additional increase in mortality is expected by changing depth limits inside the CCA because RecFISH model projections for the southern management area assumes that the allowable fishing depths inside the CCA are the same as outside. Impacts are expected to remain well within ACLs and/or non-trawl allocations and pose a low risk to overfishing (Table C-61 through Table C-66; Table C-68).

No additional increase in mortality is expected for bronzespotted rockfish because they are found between 41 fm and 205 fm – outside the depth range of the proposed action.

CDFW performs monthly tracking on recreational species. In the event that encounters are tracking higher than anticipated, CDFW could take inseason action through its state process to implement shallower depth restrictions to reduce interactions.

Table C-61. Total mortality (mt) of minor nearshore rockfish south of 40°10' N. latitude compared to annual catch limit (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	ACL	% of ACL
2011	336.54	99.86	436.10	1,001	43.5%
2012	357.28	84.97	442.25	990	44.7%
2013	400.69	93.43	494.12	990	49.9%
2014	499.79	95.41	595.20	990	60.1%
2015	564.85	109.53	674.38	1,114	60.5%
2016	551.00	89.25	640.25	1,006	63.6%

Table C-62. Total mortality (mt) of bocaccio south of 40°10' N. latitude compared to non-trawl allocation (data sources: WCGOP Total Mortality Reports.)

Year	Recreational	Commercial	Total	Non-trawl allocation	% of non-trawl allocation
2011	103.20	2.30	105.50	189.6	55.6%
2012	124.73	3.35	128.08	189.6	67.5%
2013	130.84	3.87	134.71	236.7	56.9%
2014	99.53	5.87	105.40	249.6	42.2%
2015	90.46	7.63	98.09	258.8	37.9%
2016	68.60	4.89	71.04	368.7	19.3%

Table C-63. Total mortality (mt) of shelf rockfish south of 40°10' N. latitude compared to non-trawl allocation (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	Non-trawl allocation	% of non-trawl allocation
2011	306.19	19.90	326.09	615	53.0%
2012	354.31	23.23	377.54	615	61.4%
2013	364.24	30.27	394.51	587	67.2%
2014	348.34	34.30	382.64	587	65.2%
2015	485.43	46.74	532.17	1,383	38.5%
2016	390.30	34.19	424.49	1,384	30.7%

Table C-64. Total mortality (mt) of lingcod south of 40°10' N. latitude compared to non-trawl allocation (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	Non-trawl allocation	% of non-trawl allocation
2013	381.27	36.25	417.52	606	68.9%
2014	492.43	57.88	550.31	580	94.9%
2015	602.87	82.11	684.98	547	125.2%
2016	582.90	59.39	642.29	515	124.7%

Table C-65. Total mortality (mt) of California scorpionfish south of 34°27' N. latitude compared to annual catch limit (data sources: WCGOP Total Mortality Reports).

Year	Recreational	Commercial	Total	ACL	% of ACL
2011	99.56	3.25	102.81	135	76.2%
2012	116.26	3.19	119.45	126	94.8%
2013	112.00	1.72	113.72	120	94.8%
2014	122.62	2.37	124.99	117	106.8%
2015	81.42	2.26	83.68	114	73.4%
2016	73.00	6.57	79.57	111	71.7%

Table C-66. Estimated total mortality (mt) of kelp greenling (California) compared to ABC contribution of the Other Fish complex. The Other Fish complex ACL is provided for context. (Data sources: WCGOP Total Mortality Reports and Nearshore Model).

Year	Recreational	Commercial a/	Total	ABC b/	% of ABC	Other Fish Complex ACL
2011	22.63	2.04	24.67	111	22.2%	5,575
2012	12.88	5.12	18.0	111	16.2%	5,575
2013	13.66	5.53	19.19	82.5	23.3%	4,717
2014	12.56	5.03	17.59	82.5	21.3%	4,697
2015	17.57	6.42	23.99	99.2	24.2%	242 c/
2016	10.7	4.91	15.61	99.2	15.7%	243 c/

a/ Commercial mortality estimates are the annual landings plus an estimated discard produced by the Nearshore Model. Note the Nearshore Model discard is calculated similarly to the WCGOP estimation method except the model uses all years of WCGOP data (2002-2016) to generate estimates. Additionally, the Nearshore Model has an extra stratification (north of 42º N. lat., 42º – 40º 10' N. lat, and south of 40º 10' N. lat.) that can allow for area specific discard and mortality estimates.
b/ The ABCs listed are the kelp greenling (CA) contributions to the Other Fish complex ACL.
c/ The significant reduction in the Other Fish complex ACL is due to the removal of the ecosystem component (EC) species from the complex.

Overfished species (Cowcod)

No adverse impacts are anticipated for cowcod south of 40°10' N. latitude beyond those already accounted for in the integrated alternatives. No additional increase is expected because RecFISH model projections for the entire southern management area assume that the allowable fishing depths inside the CCA are the same as outside. In the two years prior to CCA implementation, thousands of anglers were interviewed by the Marine Recreational Fisheries Statistical Survey (MRFSS) program and 17 cowcod were reported, 5.9 percent were encountered in depths less than 40 fm (i.e., 1 of 17). From 2004-2009, in the areas open to 60 fm outside the CCA, 6.8 percent of cowcod encounters were in waters less than 40 fm (2 fish out of 29).

An evaluation of more recent data (2010-2015) of discards observed by onboard observers reveals that 7.3 percent of cowcod were encountered in depths of 30 fm or less. Because these data were collected by an onboard observer, they are assumed to have a low degree of uncertainty (Table C-67). A similar analysis was conducted on all cowcod encounters from both onboard observers and angler-reported catches for Private/Rental and CPFV modes from 2012 to 2016 (Table C-68). Although these data have a slightly greater uncertainty because they rely in part on an angler's ability to accurately identify cowcod, they show a similar trend of increasing cowcod encounters in depths greater than 40 fm.

CDFW performs weekly tracking on cowcod in addition to other species. In the event that encounters are tracking higher than anticipated, CDFW could take inseason action through its state process to implement shallower depth restrictions to reduce interactions.

Table C-67. Number of cowcod discarded by depth bin on Commercial Passenger Fishing Vessels (CPFV) from 2010 to 2015. Data are for fish encountered south of Point Conception (34°27' N. latitude) where depth data was recorded by an onboard sampler. Data from RecFIN; detailed depth data for 2016 are not available from RecFIN.

Depth Bins (fm)	Number of Fish	Percent of Encounters
0-10	4	7.3%
11-20	0	0.0%
21-30	0	0.0%
31-40	7	12.7%
41-50	30	54.5%
51-60	14	25.5%
>60	0	0.0%
Total	**55**	**100%**

Table C-68. Number of cowcod encountered (kept or released) by depth bin on Commercial Passenger Fishing Vessel (CPFV) and Private/Rental Boats from 2012 to 2016 (does not include data from PR2 mode for 2012 or 2013) from CRFS sample data. Data are for fish encountered south of Point Conception (34°27' N. latitude) where depth data was recorded. Data are from CDFW/CRFS.

Depth Bins (fm)	Number of Fish	Percent of Encounters
0-10	1	0.8%
11-20	5	3.8%
21-30	7	5.3%
31-40	22	16.7%
41-50	79	59.8%
51-60	16	12.1%
>60	2	1.5%
Total	**132**	**100%**

This management measure poses a low risk of overfishing cowcod, given that mortality has consistently remained well below the ACL (previously OY) since 2003. Any increase in impacts to cowcod are expected to remain well within ACLs and/or non-trawl allocations (Table C-69).

Table C-69. Total mortality of cowcod south of 40°10' N. latitude by year (source: Dick et al 2013 & WCGOP Total Mortality reports).

Year	Recreational	Commercial	Total	OY/ACL	% OY/ACL
2003	0.48	0.22	0.70	4.8	14.6%
2004	0.45	0.95	1.40	4.8	29.2%
2005	0.15	1.15	1.30	4.2	30.9%
2006	0.07	2.20	2.27	4.2	54.0%
2007	0.30	2.03	2.33	4	58.2%
2008	0.25	0.48	0.73	4	18.2%
2009	0.21	1.45	1.66	4	41.5%
2010	0.19	1.00	1.20	4	30.0%
2011	0.83	0.02	0.85	3	28.3%
2012	0.84	0.00	0.84	3	21.0%
2013	1.52	0.19	1.71	3	57.0%
2014	0.75	0.19	0.94	3	31.3%
2015	0.47	0.39	0.86	10	8.6%
2016	0.70	0.28	0.98	10	9.8%

The 2014 cowcod rebuilding analysis evaluated the tradeoffs of time to rebuild under higher harvest levels (Table C-70). This rebuilding analysis showed that large changes in mortality and exploitation rates did not have an appreciable effect on rebuilding times. For example, increasing the baseline ACT by over 500 percent (23.0 mt) is only expected to add three years to rebuilding. Therefore, even if mortality was higher than projected, there would be a negligible effect on time to rebuild or rebuilding progress.

Table C-70. Rebuilding reference points for select model runs from 2014 cowcod rebuilding analysis (Dick and MacCall, 201421).

Model Run	Baseline ACL in 2015	ACL 4mt*	ACL 5 mt	ACL 6 mt	ACL 7mt	50% prob by 2022
Exploitation rate in 2015	0.007	0.0036	0.0045	0.0054	0.0063	0.0203
50% prob recovery by	2020	2019	2019	2019	2019	2022
2015 ACL (mt)	7.8	4.0	5.0	6.0	7.0	22.7
2016 ACL (mt)	8.0	4.1	5.1	6.2	7.2	23.0

*Equivalent to the Council's baseline ACT of 4 mt.

b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

As noted previously, this management measure is not expected to make substantial changes to catch of target or overfished stocks compared to past catches and management reference points. As noted previously, RecFISH model projections assume that the allowable fishing depths inside the CCA are the same as outside.

[21] http://www.pcouncil.org/wp-content/uploads/Cowcod_Rebuilding_Analysis_140523.pdf

Under the current regulations, 40.4 mi^2 (or less than 1 percent of the entire CCA) is open to fishing in 20 fm or less. Increasing the depth to 30 fm depth restriction would increase the fishable area within the CCA to 98.3 mi^2 (1.9% of CCA). Under a 40 fm depth restriction, the area would increase to 147.2 mi^2 (Table C-71, Table C-72). Note that an area around Santa Barbara Island that is currently open under the 20 fm depth restriction would be closed under the 30 fm or 40 fm depth restrictions but that both the proposed 30 fm or 40 fm change would still result in a net gain of fishable area. The number of anglers travelling to this remote location is not expected to increase substantially with this proposed change, but there may be a small increase in the catch and change in the depth of catch as a result of the increased depths.

Table C-71. Summary of open fishing areas (mi2) inside the western Cowcod Conservation Area under a 20 fm (baseline), 30 fm, and 40 fm depth restriction.

Area	Area (mi^2)		
	20 fm	30 fm	40 fm
Santa Barbara Island	3.6	4.5	6.3
San Nicolas Island	32.8	71	107.4
Tanner Bank	0.3	4.5	8.5
Cortes Bank	3.7	18.3	25
Total Open Area	40.4	98.3	147.2

Table C-72. Percent increase in open fishing areas under a 30 fm or 40 fm depth restriction inside the western CCA compared to baseline (20 fm).

Depth Statistic	20 fm	30 fm	40 fm
Total Open Area (mi^2)	40.4	98.3	147.2
Area increase (mi^2)	-	57.9	106.8
% Increase	-	143%	264%
% total CCA[a/]	0.8%	1.9%	2.9%

a/ Total area inside the CCA is 5,126 mi^2

27. Other Fish
    a. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and to what stocks? How is this catch monitored? Are the affected stocks managed under another federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

According to the 2016 WCGOP Total Mortality Report, few non-groundfish species (e.g., California halibut and California sheephead) are encountered as bycatch in the California recreational fishery. Catch of these non-groundfish species is not expected to change as a result of this management measure. California halibut and California sheephead are both shallow dwelling species that are already accessible under the baseline depth restrictions. Therefore, simply modifying allowable depths is not expected to increase catches of these species since they tend to be found in shallower depths in which fishing is already permitted.

Several state and federally-managed recreational fisheries operate in this area and depths using similar gears – yellowtail, tuna, and white seabass. While this measure could have some increase, the magnitude is expected to be small. These stocks are managed under state and/or Federal Fishery Management Plans with low levels of fishery exploitation, and the risk of overfishing from this management measure is expected to be low.

28. EFH and Ecosystems
    a. Will this management measure change fishing activity so as to adversely affect essential fish habitat compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

This measure is not expected to change fishing activity as to adversely affect EFH compared to the current or baseline as analyzed in the 2016-2017 FEIS. EFH which prohibits fishing with bottom contact gear is currently designated in an area off Santa Barbara Island that is already open to fishing inside the CCA under No Action. A state Marine Protected Area, which prohibits fishing, was also designated in this same area (See Attachment 5, Figure C-36).

Any EFH that is currently in effect will remain in effect and not be affected by this action. The Council is contemplating modifying EFH and/or adding additional EFH areas under a separate action, but those potential modifications are only applicable to trawl gear, and would therefore have no effect or bearing on this action.

    b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

No anticipated effects. Fishing activity occurs in shallow depths where deep sea coral ecosystems are not found. An evaluation of NOAA Deep Sea Coral database reveals that no deep sea corals have been observed around Santa Barbara Island, San Nicolas Island or Cortes Bank under baseline depths (Figure C-37, Figure C-39, Figure C-43); some observations have been documented at Tanner Banks (Figure C-41). Increasing the depths to 30 fm or 40 fm is not expected to adversely affect coral ecosystems because recreational fishing gear has minimal effect on sensitive habitats unlike other gears such as trawl gear. As previously mentioned, fishing already occurs in these depths and areas for state managed fisheries, so no additional negative effects are expected simply as a result of this change.

    c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No anticipated effects. Fishing activity currently occurs in these areas, and increasing allowable fishing depths is not expected to have any effect on biodiversity of ecosystem functioning.

29. Marine Mammals and ESA Species
    a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

No anticipated effects. This management measure is not expected to affect ESA-listed species and/or non-listed marine mammals and seabirds because they are not vulnerable to recreational fishing gear.

30. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example,

which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

Although changes are proposed under separate actions for the recreational and fixed gear commercial fisheries, no change in distribution of catch is expected between user groups. Management measures for both fisheries are designed to ensure they remain within their respective allocations. This management measure is expected to provide a positive economic impact for vessels fishing inside the CCA with an estimated 10 percent to 20 percent increase in the number of trips and increased revenue to boat crews from fish processing and tips.

b. Can the proposed action reasonably be expected to significantly affect public health or safety?

No anticipated effects.

31. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

Repeat each set of questions for affected resources (Groundfish, other fish, EFH, ecosystems, ESA species, marine mammals, social, and economic).

a. Does the proposed management measure have non-negligible adverse effects to the resource? *If none then stop and proceed to the next resource.*
b. Is it likely that any current or future fishery management actions may have overlapping effects with this management measure on the resource?
c. Is it likely that any current or future non-fishery management actions may have overlapping effects with this management measure on the resource?
d. Qualitatively or quantitatively, add the effects in (a), (b), and (c) projected to the end of 2020. Can the sum of the effects be considered 'significant'? Consider both positive and negative effects.
e. Whether significant or not, what is the proposed new management measure's contribution to the total effect? E.g., the incremental impact from this management measure to the cumulative effects on groundfish is negligible/high/medium

Groundfish – Changes are being considered to canary, cabezon, and lingcod bag limits, California scorpionfish seasons (year-round in SMA), and stock complex changes. Although a similar action is being contemplated for the commercial fixed gear fishery in this same area, the incremental impact from this management measure to the total cumulative effects on groundfish is negligible.

Other Fish – There are no cumulative effects to state-managed species because there are no other recreational actions being contemplated that would affect other fish in this area. The incremental impact from this management measure to the total cumulative effects on other fish species is negligible.

EFH – There are no cumulative effects to EFH because no changes are proposed to existing EFH inside the CCA as part of this management measure. Under a separate process, the Council is considering modifying EFH along the west coast and removing the trawl RCA. Given that both these actions are limited to trawl gear, and not fixed gear, the incremental impact from this management measure to the total cumulative effects on EFH is negligible.

Ecosystem – There are no cumulative effects to ecosystems because the proposed management measure is not expected to adversely affect vulnerable marine or coastal ecosystems or adversely affect biodiversity. The incremental impact from this management measure to the total cumulative effects on the ecosystem is negligible.

ESA species – There are no cumulative effects to ESA species as a result of this action. Although leatherback sea turtles and humpback whales do occur in this geographic area, they are not commonly encountered with recreational gear. The incremental impact from this management measure to the total cumulative effects on ESA species is negligible.

Marine mammals – There are no cumulative effects to marine mammals as a result of this action. Although humpback whales do occur in this geographic area they are not commonly encountered with recreational gear. The incremental impact from this management measure to the total cumulative effects on marine mammals is negligible.

Social – There are no cumulative social effects because this management measure is not expected to change distribution of fishing effort among user groups. The incremental impact from this management measure to the total cumulative effects on social impacts is negligible.

Economic – This measure is expected to have a positive cumulative economic effect by increasing revenues for the recreational fishery in southern California. The incremental impact from this management measure to the total cumulative effects on economic impacts is negligible.

32. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

The proposed action on the quality of the human environment will not likely be highly controversial because cowcod is rebuilding much quicker than expected and this proposed management measure will still keep over 97 percent of the CCA closed to fishing.

    b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No, the proposed action's effects on the human environment are not likely to be highly uncertain or involve unknown or unique risks.

33. MSA National Standards
    a. Describe how the management measure is consistent with the 10 MSA National Standards.

This management measure proposes to replace the depth-based inner boundary of the western CCA with a waypoint-based 30 or 40 fm RCA depth contour line. The intent of the RCA is to prevent overfishing, while at the same time protecting OFS by preventing fishing in areas where these species of concern are more likely to be found. This management measure would not jeopardize this concept, and at the same time would allow the fishing communities to better access target stocks to help them achieve their harvest limits. Additionally, this management measure has very little chance of causing any of the impacted species to become overfished, or for overfishing to occur. This would address National Standard 1.

This management measure is also consistent with National Standard 2 because it is based on the best scientific information available which suggests that cowcod is nearly rebuilt, and higher levels of mortality are not expected to jeopardize its rebuilding progress.

Inherent in the RCA system, the goal of minimizing bycatch of species of concern and non-target species has been addressed. This management measure improves the RCA method by providing slight modifications that improve monitoring of fishing activity, thus meeting National Standard 9.

Attachment 7

Charts of overview of western Cowcod Conservation Area and 30 fm and 40 fm RCA lines around Santa Barbara Island, San Nicolas Island, Tanner Bank and Cortes Bank.

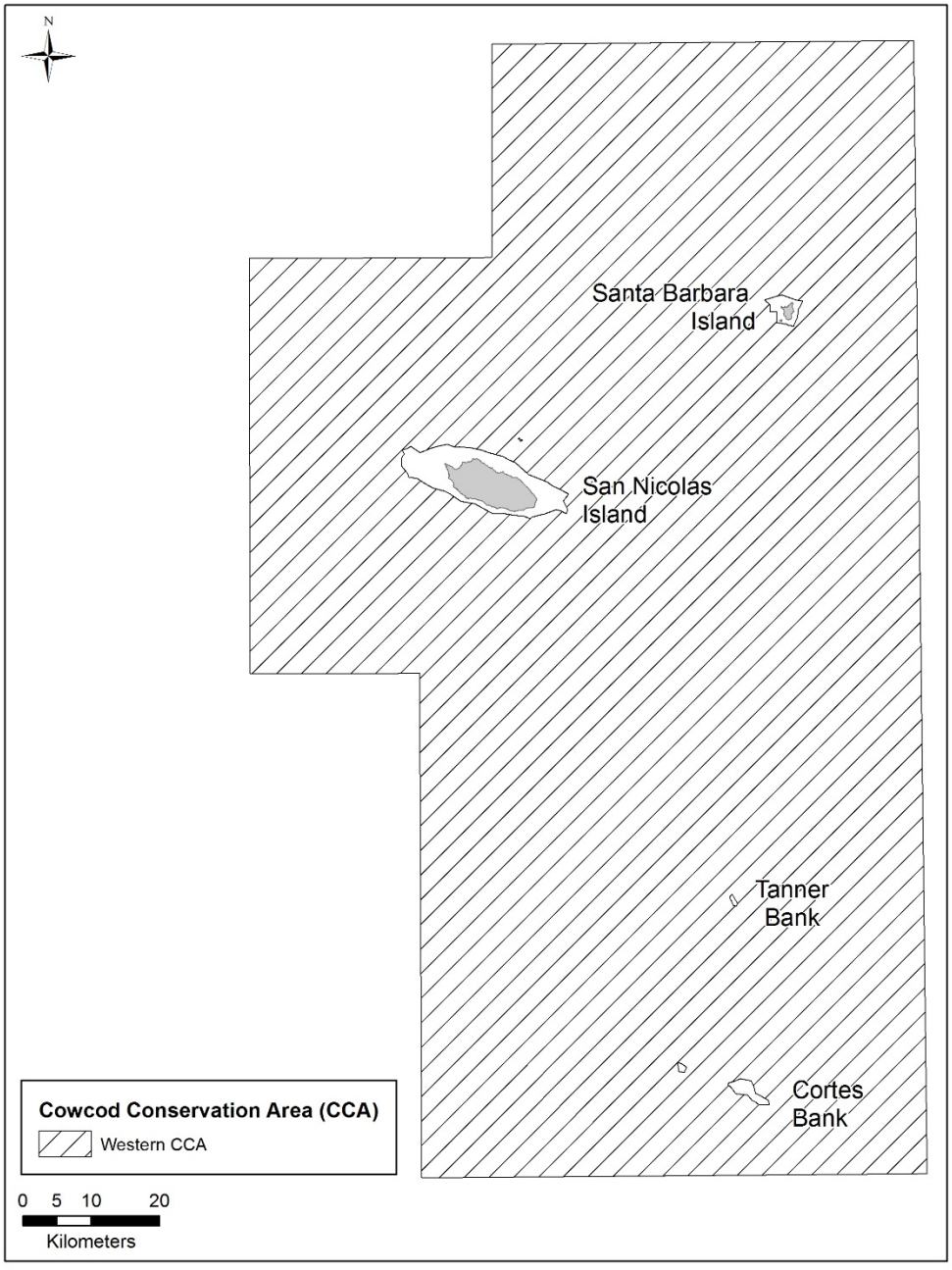


Figure C-35. Overview of western Cowcod Conservation Area.

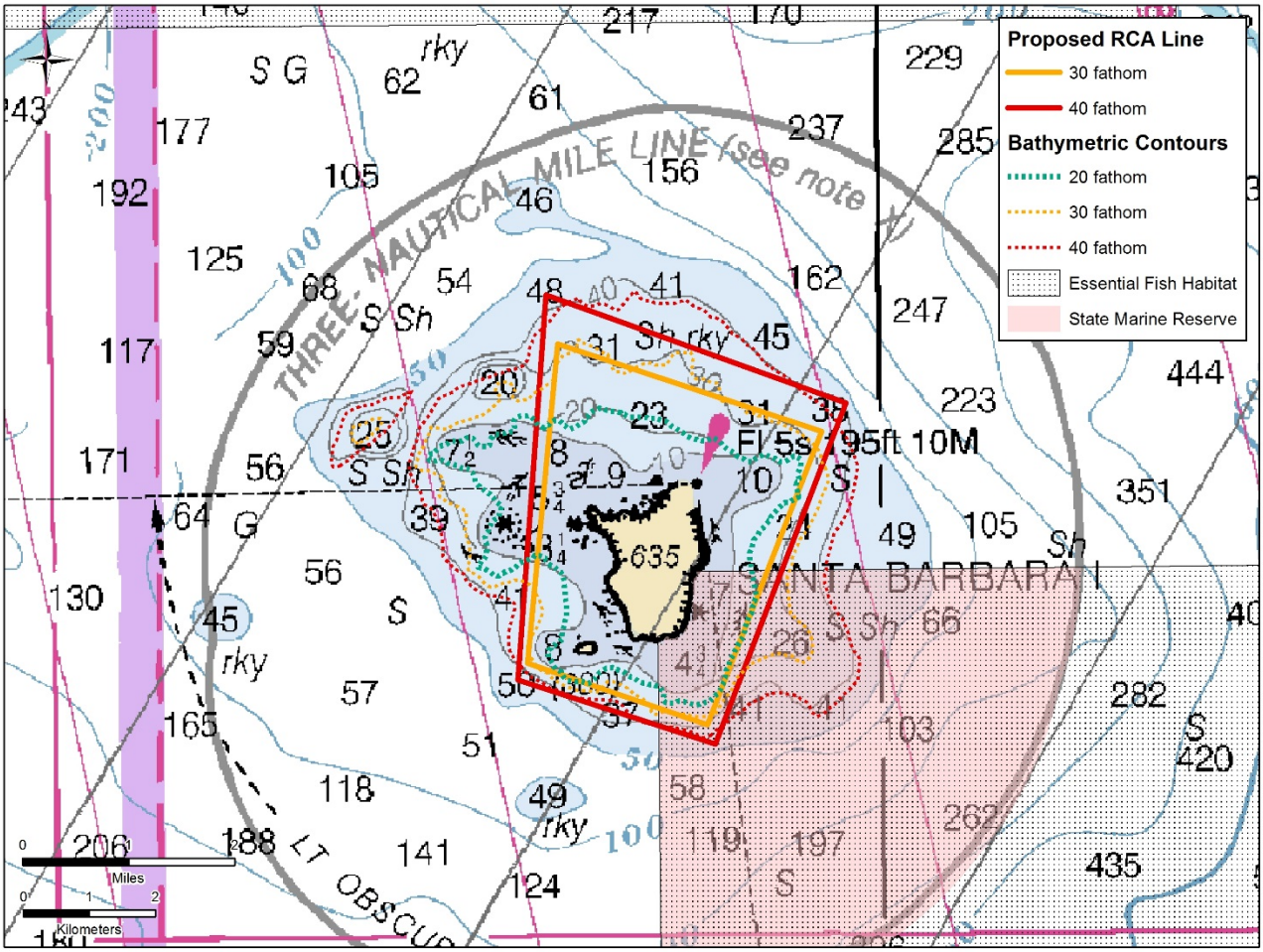


Figure C-36. Proposed 30 fm and 40 fm RCA lines around Santa Barbara Island. Note that an area around Santa Barbara Island that is currently open under the 20 fm depth restriction would be closed under the 30 fm or 40 fm depth restrictions. The 30 fm proposed change would still result in a net gain of 0.9 mi² of fishable area and the 40 fm proposed change would result in a net gain of 2.7 mi².

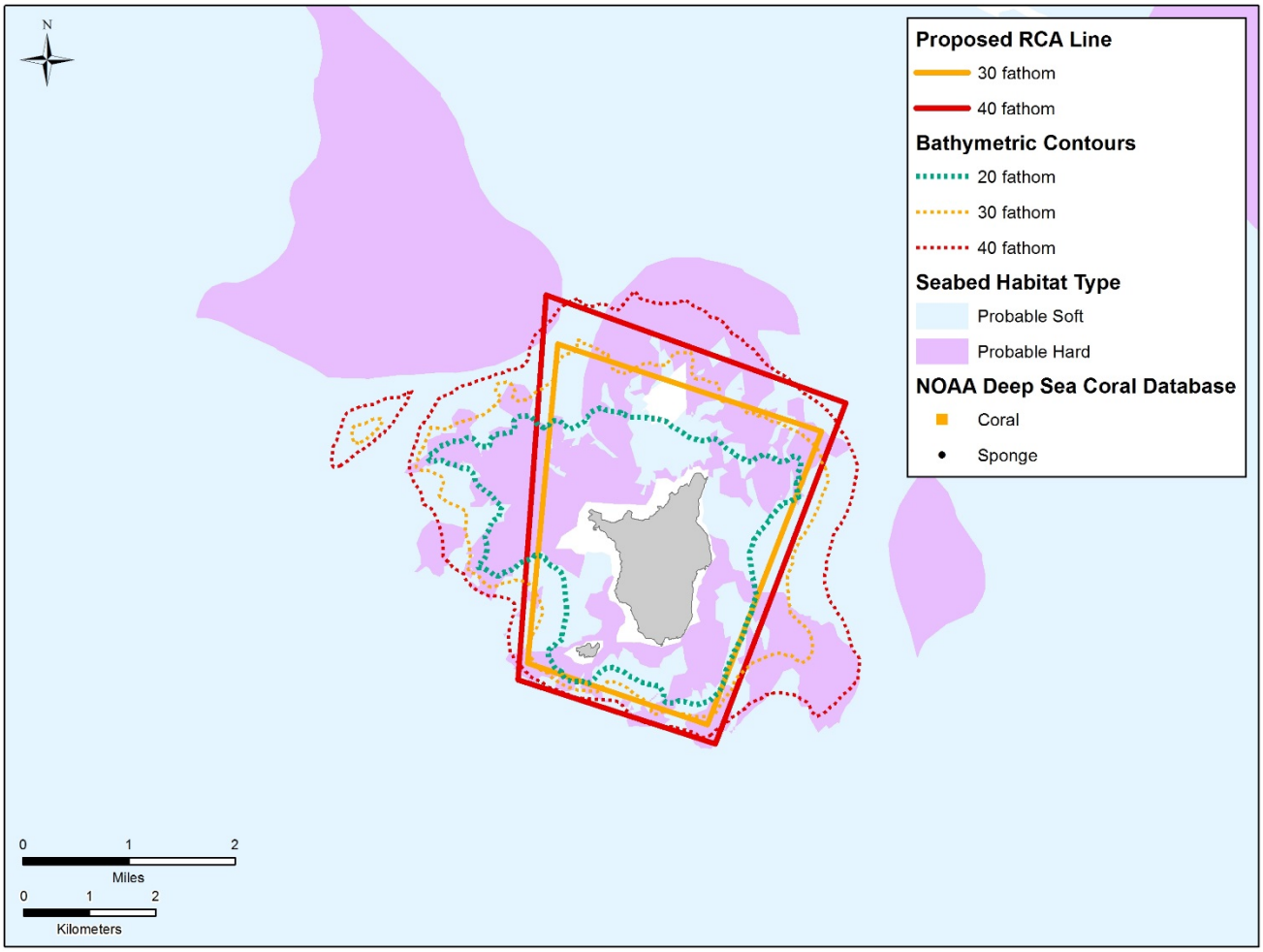


Figure C-37. Proposed RCA changes around Santa Barbara Island including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

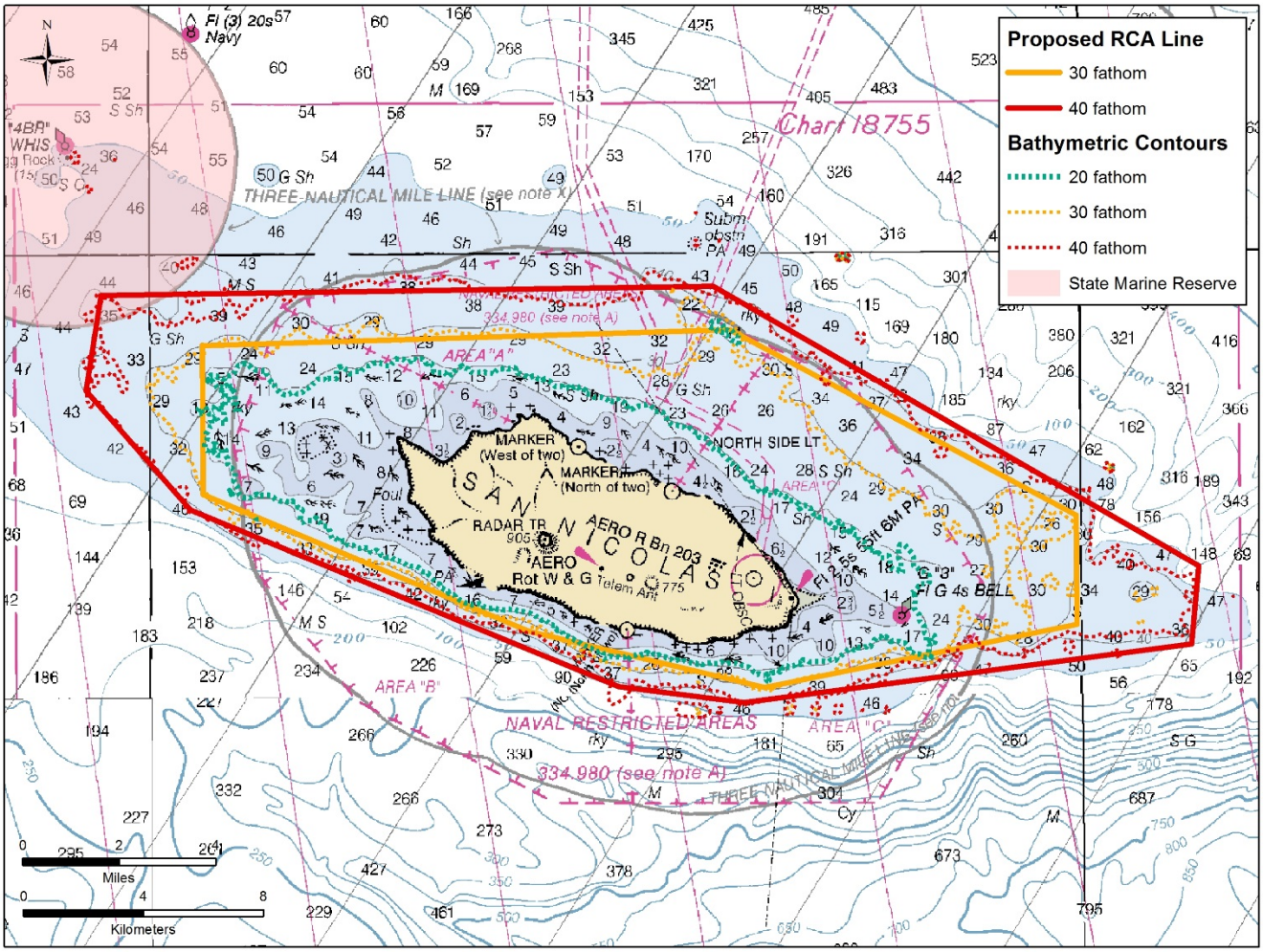


Figure C-38. Proposed 30 fm and 40 fm RCA lines around San Nicolas Island.

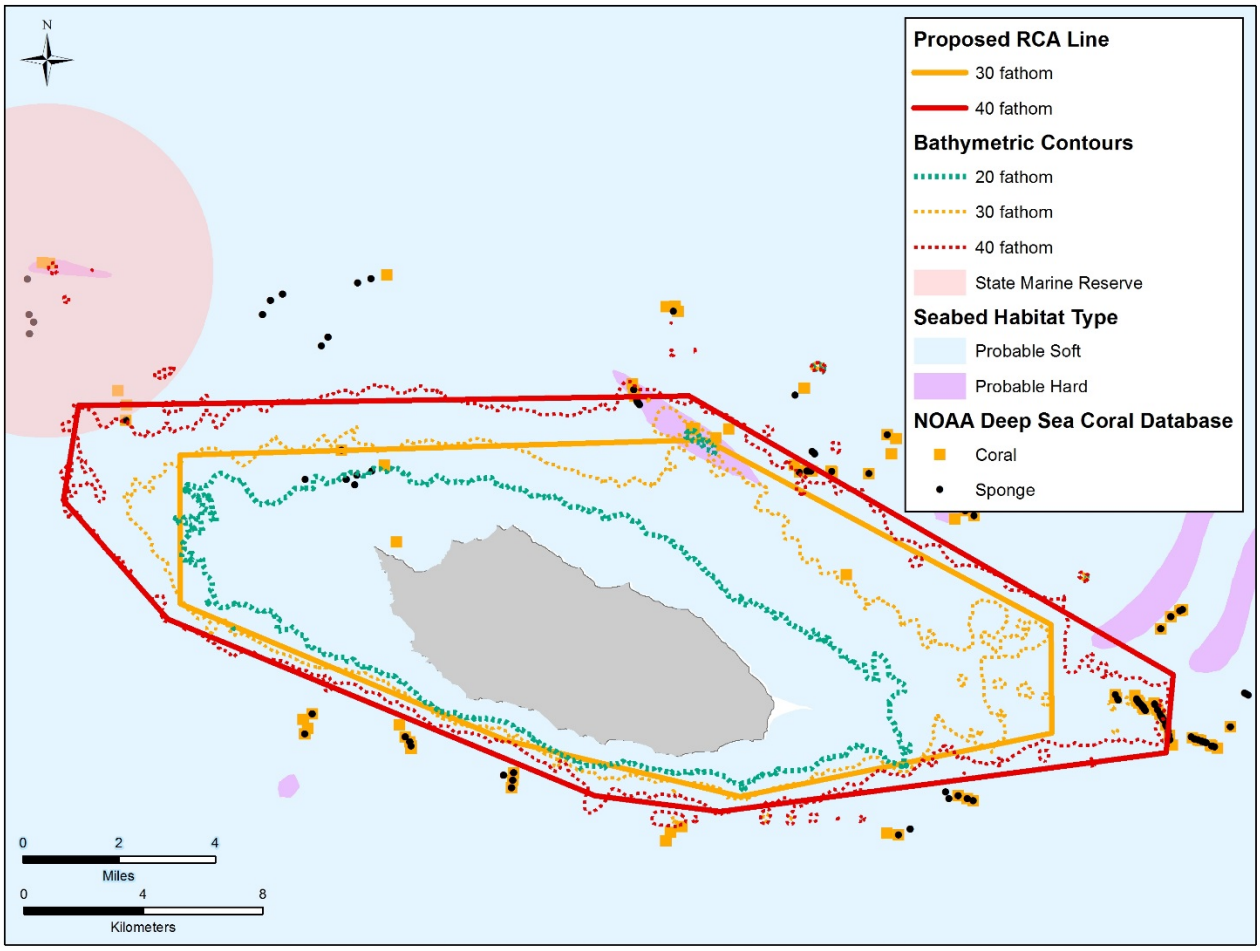


Figure C-39. Proposed RCA changes around San Nicolas island including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

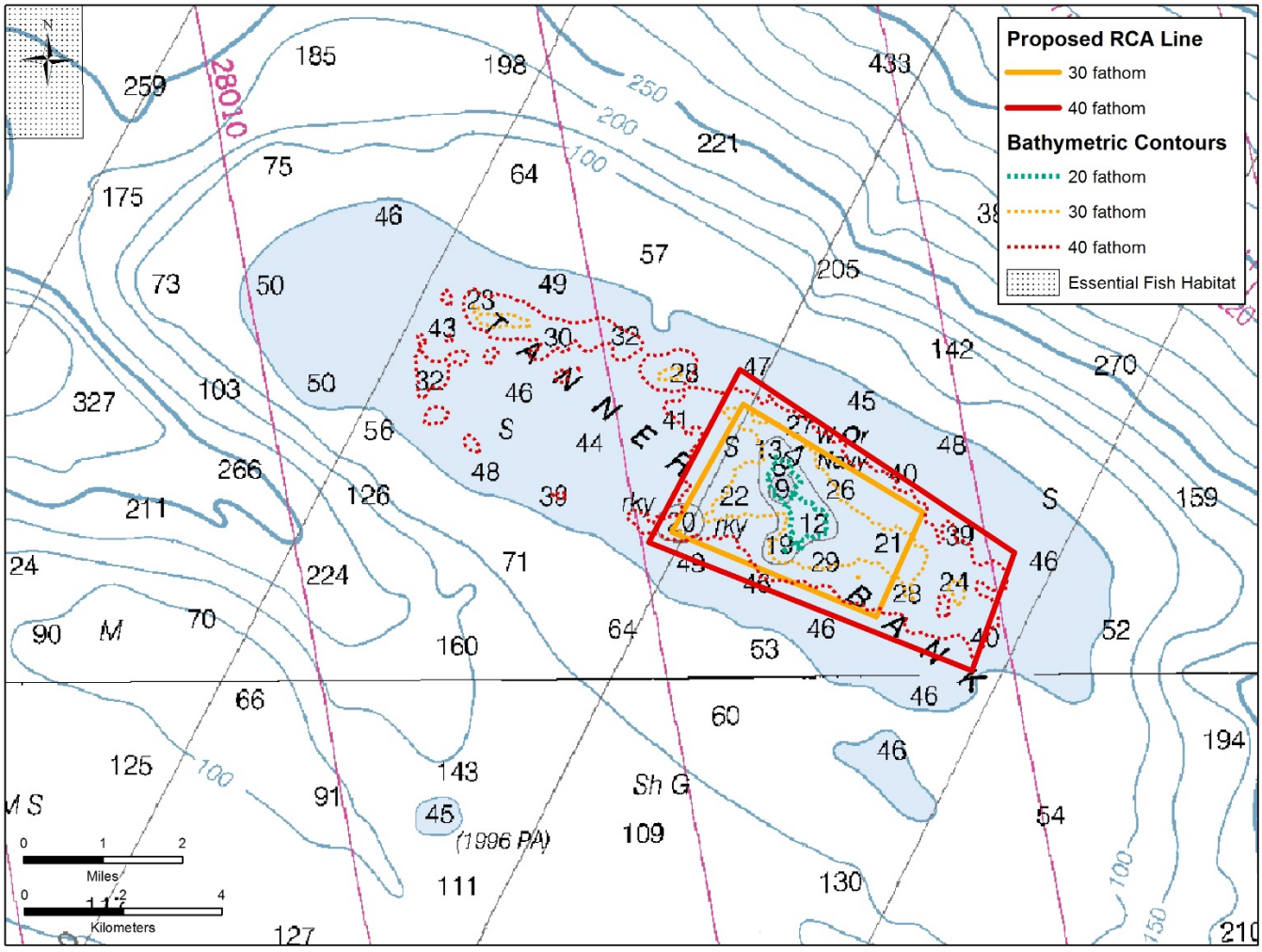


Figure C-40. Proposed 30 fm and 40 fm RCA lines around Tanner Bank.

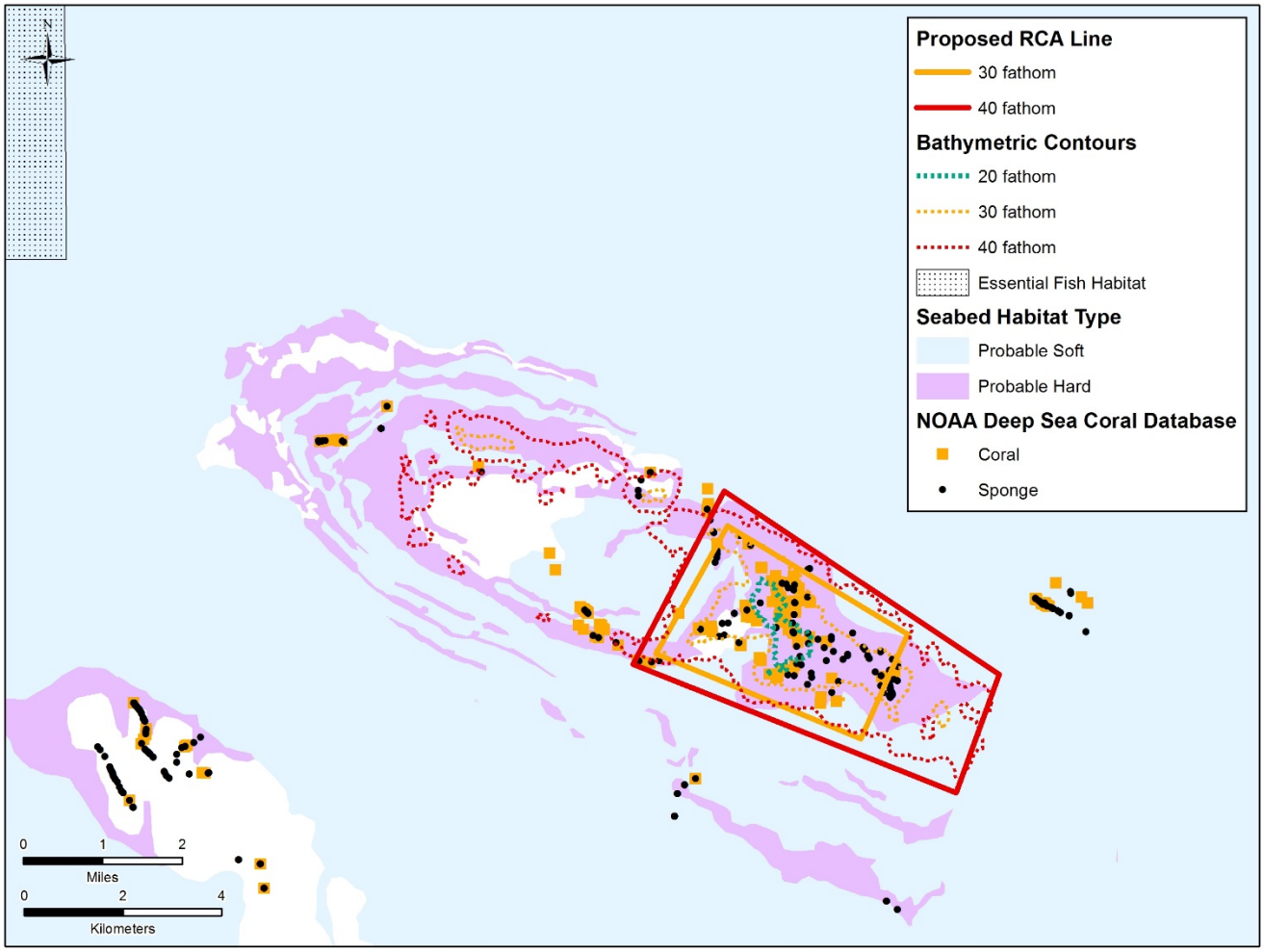


Figure C-41. Proposed RCA changes around Tanner Bank island including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

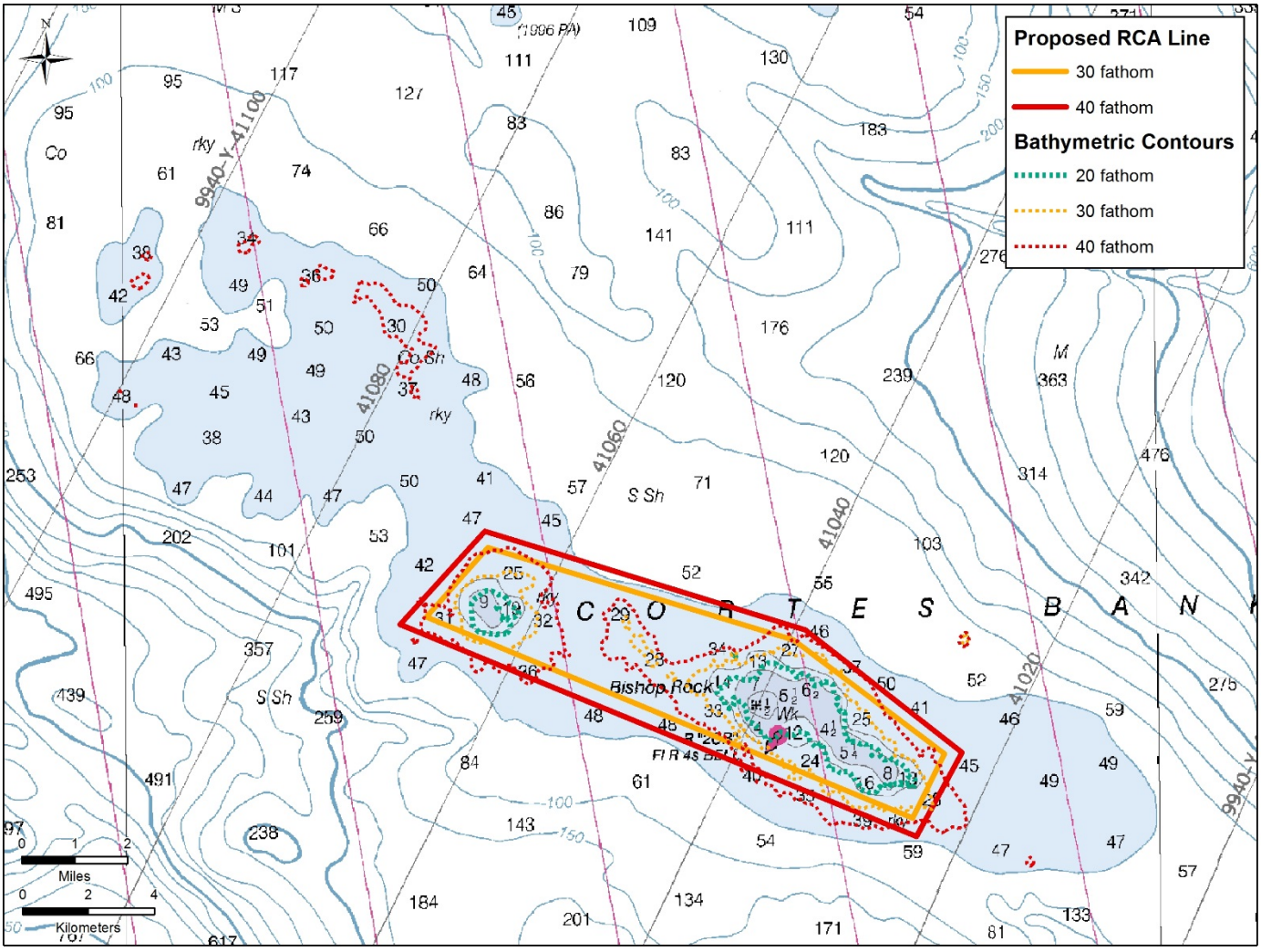


Figure C-42. Proposed 30 fm and 40 fm RCA lines around Cortes Bank.

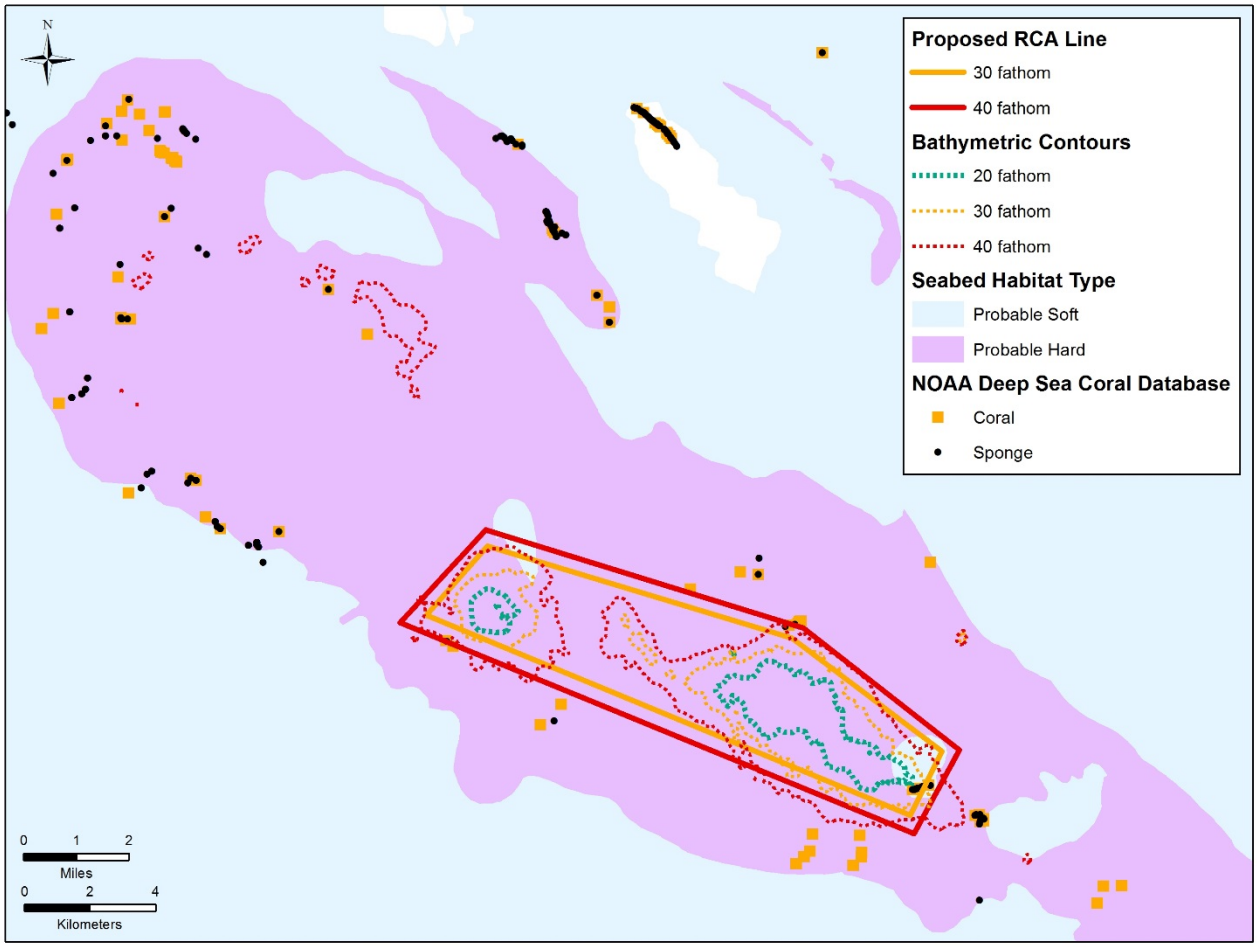


Figure C-43. Proposed RCA changes around Cortes Bank including habitat type and sponge/coral observations (source: Pacific Groundfish EFH 5-Year Review and NOAA Deep Sea Coral Database).

Attachment 8

Coordinate tables for 30 fm and 40 fm RCA lines around Santa Barbara Island, San Nicolas Island, Tanner Bank, and Cortes Bank.

30 Fathom Coordinates

Table C-73. Proposed 30 fathom coordinates for Santa Barbara Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	30.38	119	3.15
2	Add	33	29.64	119	0.58
3	Add	33	27.24	119	1.73
4	Add	33	27.76	119	3.48
5	Add	33	30.38	119	3.15

Table C-74. Proposed 30 fathom coordinates for San Nicolas Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	18.39	119	38.87
2	Add	33	18.63	119	27.52
3	Add	33	15.24	119	20.10
4	Add	33	13.27	119	20.10
5	Add	33	12.16	119	26.82
6	Add	33	13.20	119	31.87
7	Add	33	15.70	119	38.87
8	Add	33	18.39	119	38.87

Table C-75. Proposed 30 fathom coordinates for Tanner Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	43.02	119	8.52
2	Add	32	41.81	119	6.20
3	Add	32	40.67	119	6.82
4	Add	32	41.62	119	9.46
5	Add	32	43.02	119	8.52

Table C-76. Proposed 30 fathom coordinates for Cortes Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	29.73	119	12.95
2	Add	32	28.17	119	7.04
3	Add	32	26.27	119	4.14
4	Add	32	25.22	119	4.77
5	Add	32	28.6	119	14.15
6	Add	32	29.73	119	12.95

40 Fathom Coordinates

Table C-77. Proposed 40 fathom coordinates for Santa Barbara Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	30.78	119	3.27
2	Add	33	29.87	119	0.34
3	Add	33	27.08	119	1.65
4	Add	33	27.62	119	3.58
5	Add	33	30.78	119	3.27

Table C-78. Proposed 40 fathom coordinates for San Nicolas Island.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	33	19.30	119	41.05
2	Add	33	19.42	119	27.88
3	Add	33	14.31	119	17.48
4	Add	33	12.90	119	17.64
5	Add	33	11.89	119	27.26
6	Add	33	12.19	119	29.96
7	Add	33	15.42	119	39.14
8	Add	33	17.58	119	41.38
9	Add	33	19.30	119	41.05

Table C-79. Proposed 40 fathom coordinates for Tanner Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	43.40	119	8.56
2	Add	32	41.36	119	5.02
3	Add	32	40.07	119	5.59
4	Add	32	41.51	119	9.76
5	Add	32	43.40	119	8.56

Table C-80. Proposed 40 fathom coordinates for Cortes Bank.

Order	Action	LatDeg_New	LatMin_New	LongDeg_New	LongMin_New
1	Add	32	30	119	12.98
2	Add	32	28.33	119	6.81
3	Add	32	26.29	119	3.8
4	Add	32	24.91	119	4.7
5	Add	32	28.48	119	14.66
6	Add	32	30	119	12.98

C.3.7 Removal of Daily Vessel Quota Pound (QP) Limits

Part A

1. Describe the new management measure.
    - What stocks will it affect? What fisheries will it affect? What is the geographic scope?

The following species with daily QP limits will be affected: bocaccio (south); cowcod (south); darkblotched; Pacific halibut; Pacific ocean perch; yelloweye rockfish, and Pacific halibut. The only fishery that will be affected is the shorebased trawl IFQ sector, with a geographic scope of Washington, Oregon, and California.

2. What was considered in order to optimize the performance of this measure?

Vessel limits in vessel accounts restrict the amount of QPs that any vessel can catch or hold. Annual QP vessel limits are a set percentage of the IFQ sector allocation, and NMFS calculates and publishes a table annually showing the quota pound equivalents. Unused QP vessel limits, also called ‘‘daily vessel limits,’’ apply to overfished species and cap the amount of overfished species QPs any vessel account can have sitting available in their account on a given day, which is lower than the annual QP vessel limit. If a vessel account owner held the full daily vessel limit amount available in their account and then caught 20,000 pounds, they could bring in 20,000 more pounds from a quota share or other vessel account, up to the daily and annual vessel limit.

The Council and NMFS established daily vessel limits to prevent hoarding of available overfished species QPs in any one vessel account, since the IFQ sector allocations of some overfished species are so low. Full evaluation of the current impacts of this provision is difficult because it requires an assessment of the QP account balances in every account for each day of the year and for those accounts that were at the daily limit and later acquired additional QP, a determination of the source of that additional QP. The daily limits are set equal to the control limits.

While the annual vessel QP limit limits the amount of used and unused QP in a vessel account, the daily limit limits the amount of unused QP that can be in a vessel account at any one time. Daily limits attempt to limit a person’s ability to acquire additional QP from others before those QP are needed. Theoretically, QP that would be in excess of the daily limit are left on the market for others to acquire. Because daily limits are set at the level of the QS control limits (Table 81) they have no effect on those who only use QP from their own QS account.

Table 81. Accumulation limits for species for which there is a daily QP limit.

	QP Limit		QS Control Limit	Daily QP Limit	
	Percent	2017 Pounds	Percent	Percent	2017 Pounds
Remaining Overfished Species and Pacific Halibut					
Cowcod South of 40°10' N.	17.7%	546	17.7%	17.7%	546
Pacific halibut (IBQ) North of 40°10' N.	14.4%	20,860	5.4%	5.4%	7,822
Yelloweye rockfish	11.4%	276	5.7%	5.7%	138
Recently Rebuilt Species (Expected to be Removed from the Daily QP Limit List)					
Bocaccio rockfish South of 40°10' N.	15.4%	102,668	13.2%	13.2%	88,001
Darkblotched rockfish	6.8%	76,096	4.5%	4.5%	50,358
Pacific ocean perch North of 40°10' N.	6.0%	179,858	4.0%	4.0%	119,905

For cowcod, because all of the accumulation limits are set at the same level (QP, QS, and daily) it is not clear that the daily limit has any effect. Additionally, for any daily limit, there are a few work arounds which limit the policies effectiveness in encouraging QP to remain on the market until needed. First, sales contracts can be signed but the QP transfers not implemented until a vessel account has room under the daily limit. Second, entities can temporarily acquire trawl permits and use them to establish a second vessel account in which they can store QP (similar to what risk pools do).

If a vessel does not land more than the daily limit during the year, then the daily limit is not constraining. Table 82 indicates that for the remaining overfished species and Pacific halibut, from 2011 through 2017 there has been only one instance of a vessel landing more than the daily limit. With respect to recently rebuilt species, there has generally been at least one vessel landing more than the daily limit each year for Pacific ocean perch but far less for bocaccio and darkblotched rockfish. The greatest number of encounters occurred for widow rockfish, for which daily limits were removed on December 26, 2017.

Because daily limits do not constrain the total catch during a year but just the process of QP transfer, if in the future there was a need to reinstate the policy that action could be taken without substantially disrupting the fishery.

Table 82. Total number of vessels with catch of daily limits species and number of vessels with annual deliveries in excess of the daily limits.

		2011	2012	2013	2014	2015	2016	2017	Total Encounters with Dai Limit (201 2017)
Remaining Overfished Species and Pacific Halibut									
Cowcod South of 40°10' N.	Total # Vessels	4	7	11	11	8	7	8	
	# Vessels > Daily Limit	0	0	0	0	0	0	0	
Pacific halibut (IBQ) North of 40°10' N.	Total # Vessels	79	76	76	68	70	72	74	
	# Vessels > Daily Limit	0	1	0	0	0	0	0	
Yelloweye rockfish	Total # Vessels	14	14	16	19	11	15	24	
	# Vessels > Daily Limit	0	0	0	0	0	0	0	
Recently Rebuilt Species (Expected to be Removed from the Daily QP Limit List)									
Bocaccio rockfish South of 40°10' N.	Total # Vessels	10	13	19	16	10	8	11	
	# Vessels > Daily Limit	0	0	0	0	1	0	1	
Darkblotched rockfish	Total # Vessels	86	91	86	81	85	79	86	
	# Vessels > Daily Limit	0	0	0	0	0	0	1	
Pacific ocean perch North of 40°10' N.	Total # Vessels	70	73	69	64	69	69	73	
	# Vessels > Daily Limit	1	3	0	1	1	1	2	
Species Previously Removed from the Daily QP Limit List									
Canary rockfish	Total # Vessels	56	54	55	59	53	53	66	
	# Vessels > Daily Limit	0	1	0	0	3	1	1	
Widow rockfish	Total # Vessels	63	68	67	61	62	63	71	
	# Vessels > Daily Limit	1	0	2	3	4	4	2	1

3. What and when was the Council's decision and how did it arrive at the decision?

Now that bocaccio and darkblotched rockfish and Pacific ocean perch are rebuilt, the Council has proposed to remove the daily vessel limit, which were designed to apply to overfished species, through the 2019-2020 biennial specifications package. The Council slated removal of the daily QP limit for possible inclusion as a management measure for the 2019-2020 biennium during the November 2017 PFMC

meeting, based on the recommendation of the Community Advisory Board (CAB) recommendation (Agenda Item F2a Supplemental CAB Report 1).

4. Is there any other background information that was important to the Council's decision? For example, has this measure been previously discussed by the Council, if so what was the outcome?

Daily QP limits for the rebuilt canary and widow rockfish were removed in prior rulemakings.

Part B

1. What is the objective of this management measure?
    - Does it have a conservation purpose? (e.g., managing catch within ACLs? mitigating impacts to habitat or protected species?) Does it have a social/economic purpose? (e.g., allowing increased opportunity to catch target species? Does it have a social making fishing opportunity among different user groups more equitable?)

    This management measure is intended to streamline administrative burden for participants by reducing a limit on daily holding of quota pounds. This may have some social/economic benefit for participants, and may potentially allow for increased attainment of IFQ allocations if vessel behavior changes in response to the elimination of the daily limits; however the analysis above demonstrates the current limits many not have been constraining to most vessels. This may result in workload burden/cost savings to the NMFS in terms of no longer having to track daily quota pound usage in the vessel accounting system.

2. The following screening is intended to help NMFS understand the broad implications of the management measure and to determine the appropriate NEPA compliance strategy.

a. How would you describe this new management measure (may select more than one)

☒Technical correction or a change to a fishery management action or regulation, which does not result in a noticeable change in any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.

❑ Has potential for noticeable change to any of the following: fishing location, timing, effort, authorized gear types, or harvest levels.
❑ Designed to mitigate some other environmentally negative effect (e.g., cap, closed area, bag limit).

☒Designed to mitigate a negative economic or social effect.

❑ Applies to only a small area of the total EEZ.

b. What resource(s) would the management measure likely effect, either positively or negatively?

❑ Physical EFH or Ecosystems
❑ Biological Resources (target, non-target species)
❑ Protected Resources (mammals, ESA-listed)

☒Economic, social, cultural

c. If the management measure is mitigating or offsetting an effect on a resource, identify that resource.

❑ Physical EFH or Ecosystems
❑ Biological Resources (target, non-target species)

❑ Protected Resources (mammals, ESA-listed)

☒Economic, social, cultural

Part C – Keeping in mind the responses provided in part 2 above, briefly answer the following questions. Please focus on the issues of importance; if there are no potential effects, say 'no anticipated effects'. Remember both positive and negative effects.

1. Groundfish
    a. How does any change in catch relate to harvest specifications and the risk that overfishing will occur? Can the proposed measure reasonably be expected to adversely affect managed fish species?

The IFQ sectors may be able to increase their attainment of their respective allocations with little to no risk of overfishing the bocaccio (south); cowcod (south); darkblotched; Pacific halibut; Pacific ocean perch; yelloweye rockfish, and Pacific halibut stocks. The proposed measure cannot reasonably be expected to adversely affect managed fish species.

    b. Will this management measure change catch of groundfish stocks compared to past catches and management reference points? If no, describe in a few sentences why not. If yes, what stocks would be substantially affected?

No, the measure is not expected to change catch of groundfish stocks, as the measure was put in place to prevent individual hoarding of quota pounds but was not expected and has not been demonstrated to impact catch of any stocks. Vessel limits will continue to remain in place that are expected to keep individual vessel fishing levels constant throughout the next biennium.

2. Other Fish
    a. Will this management measure affect catch of non-groundfish species? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and to what stocks? How is this catch monitored? Are the affected stocks managed under another federal FMP or by a state? Do other management plans include harvest specifications? Is it possible to assess the contribution of the measure, if any, to overfishing risk of a non-groundfish stock?

    No, this management measure would only affect quota pound account managers operations with respect to bocaccio (south); cowcod (south); darkblotched; Pacific halibut; Pacific ocean perch; and yelloweye rockfish IFQ, and Pacific halibut IBQ pounds.

3. EFH and Ecosystems
    a. Will this management measure change fishing activity so as to adversely affect essential fish habitat compared to no-action effects? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

No, this management measure would only affect quota pound account managers operations and is not expected to alter fishing activity in any way. Thus, no changes are expected that would adversely affect essential fish habitat compared to the no-action effects.

    b. Can the proposed measure reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

No.

c. Can the proposed measure reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No.

4. Marine Mammals and ESA Species
    a. Will this management measure result in adverse effects to ESA-listed species and/or non-listed marine mammals and seabirds? If no, describe in a few sentences why not. If yes, is the magnitude of change substantial and why? Describe the mechanism linking the management measure to adverse impacts. For example, changes in fishing gear or methods; changes in the temporal and/or geographic distribution fishing effort.

No, this largely administrative management measure would only affect quota pound account managers operations and is not expected to alter fishing activity in any way.

5. Social and Economic
    a. Will this management measure change the distribution of catch opportunity among user groups, fishing communities, states, or regions? If no, describe in a few sentences why not. If yes, is the magnitude of the change substantial? Why is it substantial? For example, which user groups are likely to see increased catch opportunity? Which may lose catch opportunity?

No, this largely administrative management measure would only affect quota pound account managers operations and is not expected to alter fishing activity in any way. Because quota share ownership and subsequent annual distribution of quota pounds are not affected by the daily quota pound limit, the measure is not expected to change the distribution of catch opportunity at all.

b. Can the proposed action reasonably be expected to significantly affect public health or safety?

No.

6. Cumulative effects

Past fishery and non-fishery actions have created the baseline conditions. For fishery management actions, consider current (put into place recently but the effects may not be visible) or "reasonably foreseeable future items (actions that the Council is moving forward with). For Specs, consider the 19/20 preferred alternative and the routine management measures.

Repeat each set of questions for affected resources (Groundfish, other fish, EFH, ecosystems, ESA species, marine mammals, social, and economic).

Social and economic:

a. Does the proposed management measure have non-negligible adverse effects to the resource? *If none then stop and proceed to the next resource.*

None.

The incremental impact from this management measure to the cumulative effects on groundfish is negligible.

7. Other
    a. Are the proposed action's effects on the quality of the human environment likely to be highly controversial? (science of the effects, not the perception)

No.

    b. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No.

8. MSA National Standards
    a. This management measure is primarily relevant to National Standards 5 and 7:
        i. (5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
        ii. (7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Eliminating daily limits may provide quota pound account owners and managers with additional flexibility for account operations that may result in increased efficiency in the utilization of quota pounds on a daily basis. Annual quota pound usage will continue to be restricted, so annual utilization is not expected to change significantly with the elimination of the daily limit. This management measure will potentially decrease the costs to account operators of maintaining operations under the daily limit, and will eliminate potentially unnecessary duplication with the annual vessel quota pound limit and quota share accumulation limits. This may result in workload burden/cost savings to the NMFS in terms of no longer having to track daily quota pound usage in the vessel accounting system.