

**GROUND FISH MANAGEMENT TEAM REPORT ON  
 BIENNIAL HARVEST SPECIFICATIONS FOR 2021-2022 FISHERIES – FINAL ACTION**

The Groundfish Management Team (GMT) received an overview from Mr. John DeVore of Pacific Fishery Management Council (Council) staff, spoke with members of the Groundfish Advisory Subpanel (GAP), and offers the following comments and recommendations for the 2021-2022 harvest specifications final preferred alternative (FPA).

**Species with Default Harvest Control Rules**

The GMT recommends the Council maintain the default harvest control rule (HCR) and adopt the resulting harvest specifications for all stocks and stocks complexes, as shown in Tables 2-2 and 2-3 in [Supplemental REVISED Attachment 1](#), except for cowcod south of 40° 10' N. lat., Oregon black rockfish, petrale sole, sablefish, and shortbelly rockfish, as FPA for 2021-2022.

***Annual Catch Limits Outside the Range Previously Analyzed***

During discussions with the National Marine Fisheries Service (NMFS) West Coast Region (WCR) and General Counsel (GC) staff last fall, sixteen of the proposed annual catch limits (ACLs) being considered for 2021-2022 were identified as outside of the range of impacts previously projected in the 2015-2016 environmental impact statement (EIS; Table 1). While the default HCRs analyzed in that EIS were applied to these species, the resulting ACLs for those species are higher than the projected range of ACLs and the associated impacts of those ACLs. The table in Appendix 1 shows the species, the ACL range from the 2015-2016 EIS, 2017-2020 ACLs, and the projected 2021-2022 ACLs. The higher ACLs for some of these species resulted from recent assessments and may have been discussed in the 2017-2018 or 2019-2020 environmental assessments (EAs). For those species with ACLs outside of the 2015-2016 ACL range that were not discussed in prior harvest specifications cycles, additional analysis and justification is included in the draft analytical document.

**Table 1. The species for which the default HCRs produce 2021-2022 ACLs outside the range analyzed in the 2015-2016 EIS. \* indicates species with alternative HCRs also being considered. Additional information in Appendix 1.**

Big skate	Bocaccio S of 40° 10' N. lat.	Cabazon (CA)	California scorpionfish
Canary rockfish	Chilipepper S of 40° 10' N. lat.	Cowcod (40° 10' - 34° 27' N. lat.)*	English sole
Lingcod N. of 40° 10' N. lat.	Lingcod S of 40° 10' N. lat.	Pacific cod	Pacific ocean perch
Petrale sole*	Shortbelly rockfish*	Starry flounder	Widow rockfish

## Species with Alternative Harvest Control Rules

For cowcod south of 40° 10' N. lat., Oregon black rockfish, sablefish, and shortbelly rockfish, the GMT recommends the Council adopt all their preliminary preferred alternatives (PPAs) from November 2019 as FPAs at this meeting (Alternative 1; Table 2). For petrale sole, based on new information further described below, the GMT recommends the Council adopt No Action as the FPA for 2021-2022 (Table 2). We briefly summarize our rationale for these recommendations for each of the stocks below. Additional information has been included in our reports at the past three Council meetings and is included in the analytical document for this action.

**Table 2. Alternatives to the default HCR by species. Council’s PPAs from November 2019 are bolded, GMT recommendations are italicized. The GMT’s recommendations are the same except we now support No Action for petrale sole, whereas the Council and GMT have previously supported Alternative 1.**

Species	No Action: default HCR	Alt 1	Alt 2
Cowcod south of 40° 10' N lat.	ACL=ABC, P*= 0.45	<i>ACL = ABC, P* =0.40</i>	ACL = ABC, P* = 0.30
OR black rockfish a/	ACL = ABC, P* = 0.45	<i>“Case-by-case ABC” ACL = 2020 ABC/ACL</i>	-----
Petrale sole	<i>ACL=ABC, P* =0.45</i>	<b>ACL=ABC P* 0.40</b>	“Stair-step” ACLs
Sablefish Part 1: Select coastwide ABC	ABC P* =0.40	<i>ABC P* =0.45</i>	-----
Sablefish Part 2: Select method to apportion ABC to ACLs N+S 36° N. lat.	Method 1: Long-term survey avg. (73.6% N; 26.4% S) <i>Method 2: 5-year survey average (78.4% N; 21.5% S)</i>		
Shortbelly rockfish	ABC P* =0.40 ACL=500 mt	<i>ABC P* = 0.40 ACL=3,000 mt</i>	EC species

a/ In complex with Oregon blue/deacon rockfish, but managed by the state of Oregon to species component ACL contribution.

### ***Cowcod South of 40° 10' N. lat.***

**The GMT recommends the Council select Alternative 1 (ACL = ABC, P\* = 0.40) for cowcod south of 40° 10' N. lat. as FPA.** This will allow the Council to consider the full 40-60 mt annual catch target (ACT) range as the primary means to manage this stock in a conservative, but flexible, manner. ACTs are a management measure, so the Council will specify their PPA under Agenda Item G.6. ACTs are catch targets that could be exceeded inseason without a mechanism to stop catch.

The GMT does not have any conservation concerns with managing cowcod using ACTs. The ACT is proposed for a further split between the trawl and non-trawl fishery, and retention will continue to be prohibited in the non-trawl fishery as another means to ensure total mortality will remain well below all proposed ACTs and/or ACLs being considered. IFQ mortality is expected to remain low given fleet consolidation and due to the new EFHCA closure of the Southern California Bight where cowcod are more common. Additionally, the application of ACTs for cowcod allows the Council flexibility to take a precautionary approach in order to maintain catches below the ACL. Selecting Alternative 1 with the application of a lower ACT value essentially provides the same harvest level outcome as Alternative 2. However, the GMT discussed that by selecting Alternative 2, the outcome could potentially be constraining to the fishery in future years in the absence of a new assessment. Application of the time-varying sigmas over the 10-year projection period will result in low ACLs falling below the proposed ACT values. Alternative 1 in combination with a lower ACT value could provide long-term stability, while continuing to be precautionary and flexible for multiple regulatory cycles until such time another stock assessment can be conducted.

### ***Oregon Black Rockfish (in complex with Oregon Blue/Deacon Rockfish)***

**The GMT recommends the Council select Alternative 1 (“Case-by-case ABC”) for Oregon black rockfish as its FPA.** As described below, this is not expected to negatively impact the stock and has benefits that outweigh the costs.

Although Alternative 1 results in 2021-2022 ACL contributions that are 35.5 mt higher per year, on average, than under No Action, the short- and long-term biological impacts are nearly identical to those of No Action. Most importantly, the stock is projected to stay well above the management target long-term (> 54 percent relative stock status) under both alternatives.

The main benefit of Alternative 1 is that it would stabilize Oregon fisheries while reducing the likelihood of needing to take inseason actions while the Oregon Department of Fish and Wildlife works to complete their new hydroacoustic survey to potentially better inform a 2023 assessment.

The downside to Alternative 1 is that catching 35.5 mt more on average in 2021 and 2022 would reduce 2023 and 2024 ACLs by ~5 mt per year compared to No Action. Recall that the Alternative 1 uses the case-by-case ACL from 2020, and then reverts back to using  $ACL=ABC$  and  $P^*=0.45$  thereafter. The ACLs in 2023 and 2024 could remain at stable levels if another case-by-case ABC is requested, however the Scientific and Statistical Committee expressed concerns about doing case-by-case two cycles in a row, and this is not a decision point for this time.

Neither alternative is expected to result in exceeding the ACL for the complex (570 mt in 2021 and 562 mt in 2022) that also includes blue/deacon rockfish. There is a combined ACL contribution for blue and deacon rockfishes, since they were assessed together as a complex. Higher black rockfish ACLs could increase mortality of co-occurring blue and deacon rockfishes, but additional catch would be unlikely to exceed the ACL since total mortality of blue and deacon rockfishes has been, and is expected to remain, less than 40 percent of their component ACL contribution. Additionally, the state of Oregon manages black rockfish and blue/deacon rockfish to their species-specific ACL contributions within the complex ACL.

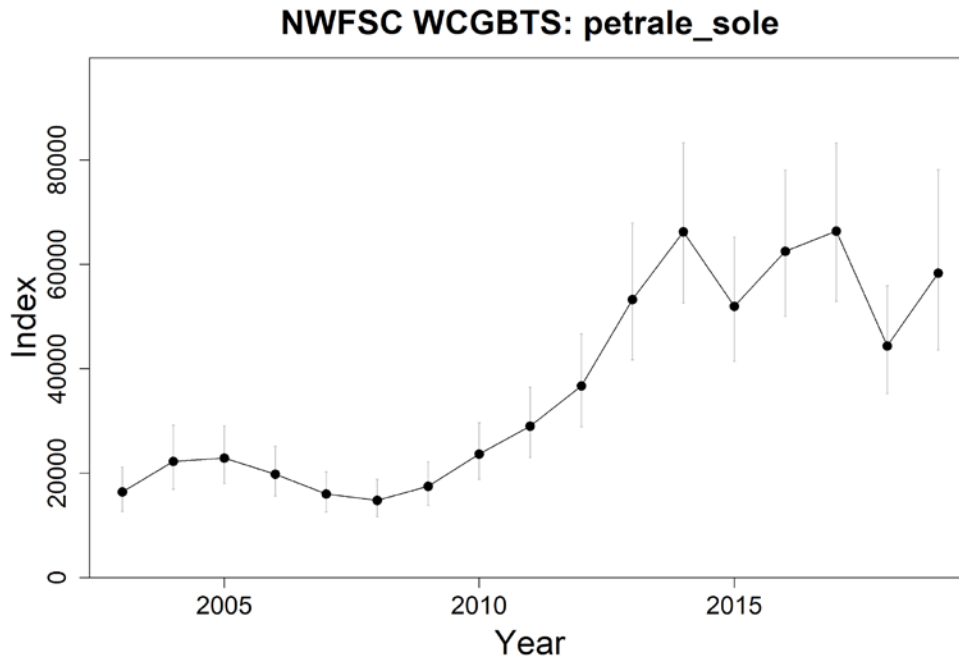
## ***Petrale Sole***

The GMT previously supported Alternative 1 (ACL = ABC; P\*=0.40), but is now supporting No Action (ACL = ABC; P\*=0.45).

In November 2019, both the GMT and Council recommended using a precautionary approach to reflect concerns about the 2019 update stock assessment, including that the model was above the 2018 bottom trawl survey estimate and that a sensitivity with new fecundity data led to a slightly more depleted status. Both Alternatives 1 and 2 provide the similar long-term (through 2030) precaution to the stock and economic benefits, but Alternative 1 provides more economic benefits in 2021-2022 whereas Alternative 2 distributes them more evenly across future biennium. The GMT had supported Alternative 1 in recognition of industry's previous indications that economic benefits in the short-term will have greater impact than distributing those benefits over the uncertain future.

**However, the GMT is now recommending the Council select No Action for petrale sole (ACL = ABC, P\* = 0.45)**, based on the data released on April 1, 2020 by the Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Bottom Trawl Survey (WCGBTS) (data available at the [NWFSC/FRAM data warehouse](#)). The 2019 petrale sole update stock assessment ([Agenda Item H.5, Attachment 13, September 2019](#)) noted that the 2018 data point from the NWFSC WCGBTS was lower than those of 2016 and 2017, and was not fit by the model. Concern regarding a potential downward turn in the stock trajectory incited discussion among advisory bodies and the Council in the November 2019 and March 2020 meetings, which explored alternative management actions that would provide flexibility in decision making to incorporate precautionary measures for petrale sole. However, the survey biomass estimate, based on 2019 NWFSC WCGBTS data, has increased from the low value of 2018 and is better in line with the average trend between 2014 - 2017 (Figure 1). The 2019 update stock assessment for petrale sole identified new fecundity data as an additional item of concern, which would likely be incorporated in future assessments, and would result in a slightly less optimistic estimate of stock status. However, the GMT considers the standard level of precaution incorporated in the P\* = 0.45 approach, combined with time-varying sigma values, will result in sufficiently conservative ACLs. Additionally, the No Action alternative is expected to increase ex-vessel revenue by up to \$378,502 per year on average compared to Alternative 1. Setting sustainable ACLs for petrale sole will provide additional opportunities to access other co-occurring groundfish species and reduce the likelihood of petrale sole limits constricting their harvest, which could occur under Alternative 1 or Alternative 2.

Given this new information and other fishery considerations, the GMT supports No Action for petrale sole for the 2021-2022 harvest specifications.



**Figure 1** Estimated index of abundance for petrale sole from 2003-2019 NWFSC WCGBTS data.

### *Sablefish*

Sablefish was subject to the most extensive analysis of this cycle, reflecting its economic importance and the Council’s previously precautionary approach given the stock has been subject to overfishing and was in the precautionary zone. The 2019 full assessment projects that the stock is above the management target, and the Council is considering higher ACLs that could benefit fisheries without resulting in a conservation concern.

### Coastwide Acceptable Biological Catch

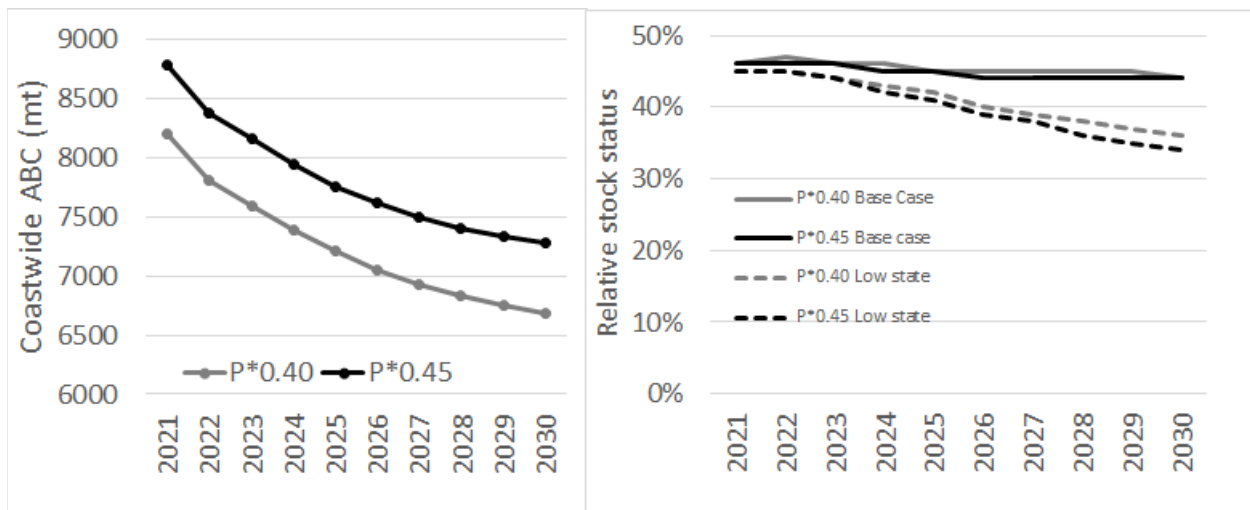
**The GMT recommends the Council select Alternative 1 (P\* of 0.45) as the new default HCR.**

The GMT and the Statistical Analysis Team (STAT) evaluated whether catching 550-600 mt per year under Alternative 1 would negatively impact the stock compared to the more precautionary No Action alternative (Figure 2). As the GMT discussed in March, the short- and long-term biological impacts are similar for both Alternatives under the base state of nature that is most probable. Additionally, the stock is projected to remain above the management target (B<sub>40%</sub>) in the long-term (through 2030) for both Alternatives under the base state of nature.

The GMT and STAT evaluated the long-term biological impacts of higher Alternative 1 ABCs given assessment uncertainty. As is the case in many stock assessments, the size (scale) of spawning biomass was the main source of uncertainty. Stock assessment forecasts project that the long-term biological impacts to sablefish would be similar for both alternatives under the low state of nature (Figure 2), and most importantly, the stock is projected to remain above management target through 2025 and close to the management target thereafter for both as well. This assumes that the full ACLs would be taken each year, and “reduced/realistic” catch scenarios forecast that the stock would remain at or above the management target long-term for both Alternatives even

under the low state of nature (not shown in Figure 1; see [Agenda Item H.6.a GMT Report 2 November 2019](#)).

The GMT supports Alternative 1, because the biological impacts to the sablefish stock and habitat would be similar to the No Action alternative. Alternative 1 could also provide \$2-3 million in additional ex-vessel revenue per year that wouldn't be available under the No Action alternative. In addition, the GMT does not have any concerns with negative impacts to other species or habitats associated with higher sablefish ABCs. Although additional effort may occur in the north, all effort would be in areas that fishing already occurs and this action does not open any new areas to fishing. The Council expressed in November 2019 that conservative management of the sablefish stock is a top priority. The GMT believes that conducting more frequent updates and/or full stock assessments of sablefish would help ensure the long-term sustainability of this economic linchpin, because management would be better able to respond and adapt early to variability in recruitment and trends in indices. The GMT notes that an update assessment is being considered in 2021, and the SSC suggested benefits of potential new full assessment in 2023.

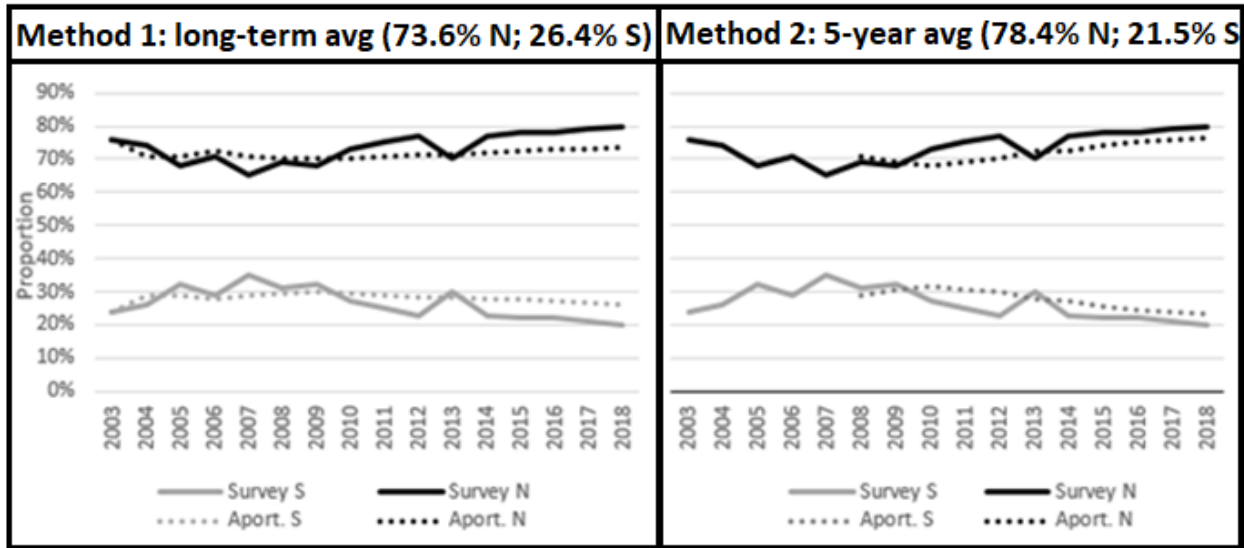


**Figure 2. Annual ABCs (mt) and relative stock status (“depletion”) projections for No Action and Alternative 1 coastwide ABC alternatives.** The stock is projected to remain at or above the management target under “reduced catch” scenarios even under the low state of nature (results not graphed but discussed above).

#### Apportionment Method North and South of 36° N. lat.

The GMT also recommends that the Council select ACL apportionment Method 2 for sablefish for 2021-2022 (Figure 3). Recent genetic analyses suggest a coastwide population ([Jasonowicz, et al. 2017](#)). As noted by the Scientific and Statistical Committee (SSC), sablefish apportionment is a policy call best addressed by the Council and could be revisited each biennium. The GMT concurs that sablefish apportionment should be revisited each biennium in order to ensure that the ACLs reflect current biomass distributions while minimizing constraints on fisheries. While the GMT and SSC both agreed that Method 2 is a better approach for 2021-2022, more sophisticated methods may be developed to better inform biomass distributions in both management areas.

In general, the GMT supports apportionment Method 2 because it would better reflect the more northerly recent distribution of the stock, be more responsive to future changes in distribution, and would increase economic impacts without negatively impacting southern sablefish participants, the sablefish stock, co-occurring stocks, and habitats. More detail on these impacts are provided below.



**Figure 3. The two proposed methods for apportioning the sablefish coastwide ABC to ACLs for the management areas north and south of 36° N. lat.**

Method 2 would increase the sablefish ACLs to the north of 36° N. lat. and the GMT evaluated if there would be any negative impacts to the sablefish stock, co-occurring stocks, or to habitats associated with higher effort. The SSC reviewed both apportionment methods in November 2019 and determined that neither method would negatively impact the sablefish stock. In light of the recently revised configuration of essential fish habitat (EFH) area protections under Amendment 28, any proportional shift or increase in bottom trawl effort to the north of 36° N. lat. are not anticipated to adversely impact seafloor habitat as fishing effort will be in areas previously fished. Amendment 28 also developed Block Area Closures off Oregon and California from the shore to 250 fathoms, which could be utilized to mitigate against conservation concerns, including those to Endangered Species Act (ESA) listed salmon stocks. At the November 2019 meeting, the Council took final action on mitigation measures for ESA salmon, including the option to extend bottom trawl block area closures, originally adopted as part of the Amendment 28 action, to 700 fathoms (the EFH Conservation Area boundary). These mitigation measures for salmon, which are currently under rulemaking, are expected to minimize any potential negative impacts to listed salmon species from shifts in effort, however the GMT does not anticipate salmon impacts from sablefish to increase the risk of reaching or exceeding the 5,500 guideline.

The GMT discussed potential economic tradeoffs in November:

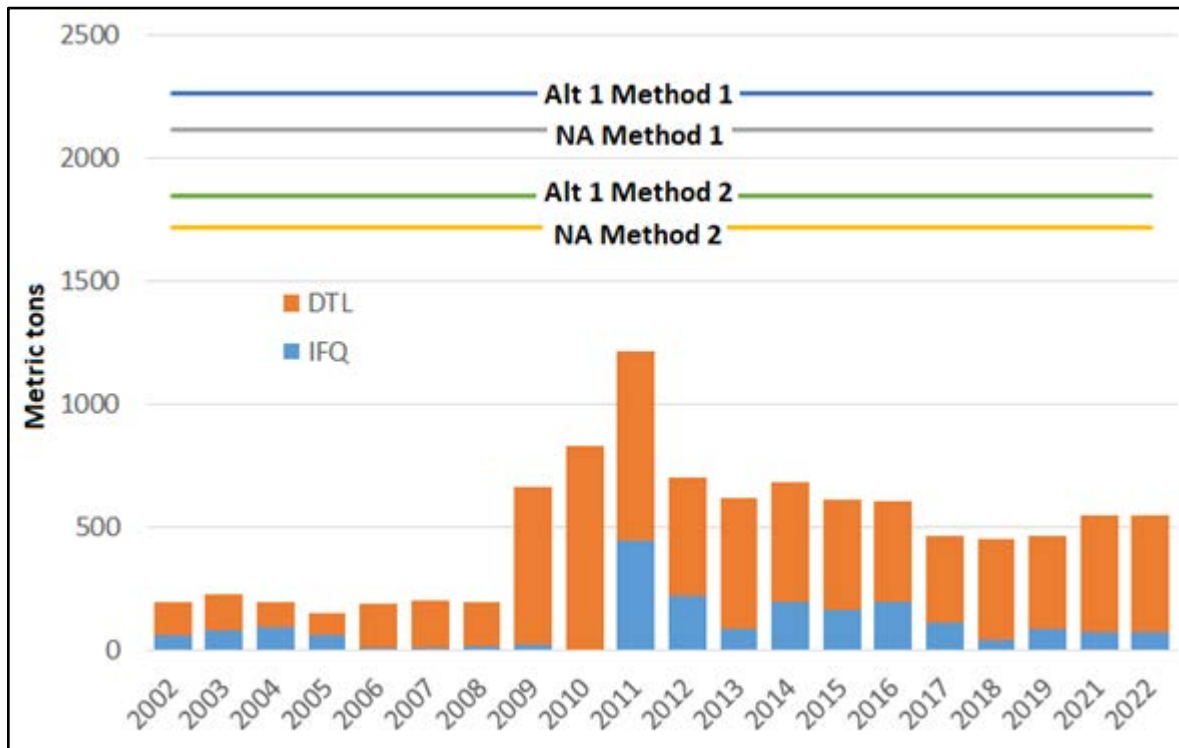
The northern management area typically catches their full ACL, and there would likely be economic benefits associated with Method 2 (the 5-year average), as it



would increase the northern ACL by ~400 mt per year ([Agenda Item H.6.a Supplemental GMT Report 3 November 2019](#)).

In addition to the economic gains from increased sablefish targeting, further benefits may come from the potential to increase the catch of fish caught by trawl gear in a complex (dover sole and thornyheads) that is constrained by sablefish quota ([Catch Share Five Year Review, 2017 pg. 162](#)).

This gain to the north would come from a reduction to the south. Based on historic catch rates, the reduction is not expected to negatively impact the south, since the annual mortality estimates, typically less than 800 mt per year during the past decade with a 1,221 mt high, would still be ~500-1,000 mt below the Method 2 ACLs (Figure 4). However, potential reopening of the cowcod conservation areas (CCAs) in the south is expected to increase southern attainment of sablefish. At the same time, limited processing infrastructure in the south was identified during the 5-Year Catch Share Review and Sablefish Management and Trawl Allocation Attainment Committee (SaMTAAC) process as a major factor limiting southern attainment. Recently industry has signaled a commitment to build the necessary infrastructure, so reducing the southern allocation may stymie this growth and hinder the potential of the southern fishery to reach full attainment ([Agenda Item H.6.a Supplemental GMT Report 3 November 2019](#)).



**Figure 4. Historic and projected (2021-2022) sablefish mortality for the groundfish fisheries south of 36° N. lat. in relation to the four different ACL options for 2021-2022.**



In the IFQ sector, a shift of quota from the south to north would benefit quota share owners of sablefish north of 36° N. lat., where attainment was 99 percent of allocation in 2019. These owners would likely profit from either sales to other vessels or increased access to additional quota pounds for this highly-attained stock. Because attainment of sablefish south of 36° N. lat. quota is typically low (10 percent in 2019), the shift is not expected to adversely affect catch in the south for the 2021-2022 biennium under Method 2 or negatively impact these quota share owners. As shown in Figure 4, all of the potential method and alternative combinations are expected to accommodate projected sablefish south catches in the upcoming biennium.

In summary, Method 2 reflects a recent northerly shift in sablefish distributions and, as a rolling average, could be more responsive to future distribution changes if this method is used in future bienniums. This method is also expected to increase ex-vessel revenue by ~\$3 million per year across all fisheries north of 36° N. lat. and is not expected to negatively impact the fisheries south of 36° N. lat. in the 2021-2022 biennium. Therefore, **the GMT recommends the Council select apportionment Method 2 for sablefish, to be revisited every biennium.**

### ***Shortbelly Rockfish***

**The GMT recommends the Council select Alternative 1 for shortbelly rockfish.** While the stock meets all the criteria of an Ecosystem Component (EC) Species (Alternative 2), we conclude that Alternative 1 (i.e., 3,000 mt ACL), in combination with the accountability measures identified under Agenda Item G.6, may encourage avoidance by mid-water trawlers and protect the stock better than Alternative 2.

Recall that the Council has used precautionary ACLs set below the ABC for shortbelly rockfish in order to prevent a targeted fishery from developing, to reduce bycatch to help support forage bases for predators, and to accommodate expected bycatch and not constrain fisheries. No market currently exists for shortbelly rockfish, nor are they a commercially valuable stock, and the GMT does not anticipate a surge in demand for fishmeal or other fishmeal product types resulting from the increased ACL under Alternative 1 that would drive prices high enough to encourage targeting in the high cost trawl fishery in the 2021-2022 biennium. The Council may wish to revisit this issue in the future should such a market develop.

Since a targeted fishery is not expected to develop under any of the alternatives, the GMT's main focus was in regard to forage impacts and fishery constraints with higher and lower ACLs. Oceana has recommended a 1,000 mt ACL, because that was the maximum bycatch projection by the GMT and thus would not be expected to constrain fisheries ([Agenda Item G.6.b, Oceana public comment](#)). The GMT confirms that 1,000 mt remains our best projection of maximum bycatch, but we emphasize that any projections are highly uncertain, because the driving forces behind the recent (2017-2019) high shortbelly rockfish catch remain unclear. Therefore, there is a chance that catch could exceed the 1,000 mt projections by the GMT and there could be merit to considering a higher ACL (e.g., 3,000 mt) to reduce fishery constraints given model uncertainty. Shortbelly rockfish are typically located off central California and had not been caught in high amounts prior to 2016 (< 50 mt per year), since they were concentrated south of where the mid-water trawl fisheries occurred. Habitat suitability models indicate ocean conditions changed starting in 2017 to support a northerly range expansion of the shortbelly rockfish stock. The stock

is still found off central California as well, which supports this being a range expansion and not a range shift ([4.1.1.5 Agenda Item G4, Supp REVISED Attachment 1](#)).

The main concern with using an ACL higher than 500 mt (No Action) or 1,000 mt is that it could negatively impact the shortbelly rockfish forage base. Based on analysis, the GMT has concluded that even catching the full ABC (4,184 mt) would not negatively impact forage bases ([Agenda Item H.4.a, Supplemental GMT Report 1, November 2019](#)): “*all indications are that the shortbelly rockfish stock is thriving as are abundances of other important prey species (e.g., anchovy), and even full ABC removals (4,184 mt) would not be expected to negatively impact forage bases*”. The 2019 State of the California Current Report provides the most recent update on the status of forage and predator communities, and indicates that the high abundance of forage species other than shortbelly rockfish may mitigate the impact of shortbelly rockfish bycatch on higher trophic level species in the California Current Ecosystem.

If the Council wants to maintain flexibility to manage and react to catch of shortbelly rockfish year to year, setting an ACL provides greater latitude to do so than making shortbelly rockfish an EC species. The GMT recommends that the Council consider accountability measures for shortbelly rockfish under Agenda Item G.6 to provide further protection against exceeding the ACL in 2021 and 2022.

## **GMT Recommendations**

- **Adopt the default HCRs as FPA for all species except for stocks that have alternative HCRs as shown in Tables 2-2 and 2-3 in [Supplemental REVISED Attachment 1](#)**
- **Adopt Alternative 1 (PPA) as the FPA for stocks with alternative harvest control rules and harvest specifications under consideration, for the below species:**
  - **Cowcod (south of 40°10' N. lat): ACL = ABC, P\*=0.40**
  - **Oregon black rockfish: “Case-by-case” ABC/ACL = 2020 ABC**
  - **Sablefish: Coastwide ABC = P\*=0.45 and use Method 2 (5-year avg. bottom trawl survey distributions) to apportion ACLs north and south of 36° N. lat., can be revisited each biennium**
  - **Shortbelly rockfish: ACL = 3,000 mt; ABC = P\*=0.40**
- **Adopt No Action (ACL = ABC; P\* = 0.45) as FPA for petrale sole**

**Appendix 1. Table with range of 2015-2016 EIS ACLs, recent years approved ACLs, and 2021-2022 default HCR ACLs.**

(Species with 2021-2022 ACLs resulting from default HCRs that are outside the range previously analyzed are **bolded** and **shaded**)

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022	
YELLOWEYE ROCKFISH	10	76	18.4	18.7	20	20	48	49	50	51	
Arrowtooth flounder	3,088.0	37,915.0	5,497.0	5,328.0	13,803.9	13,743.2	15,573.8	12,749.9	9,933.0	8,458.0	
<b>Big skate</b>	not provided				493.9	493.9	493.9	493.9	<b>1,477.0</b>	<b>1,389.0</b>	yes, previously an EC species
Black rockfish (WA)	134.0	592.0	402.5	404.4	333.6	331.7	328.9	326.0	293.0	291.0	
Black rockfish (CA)	554.0	2,032.0			526.8	520.4	298.3	297.3	348.0	341.0	
<b>Bocaccio S. of 40°10'</b>	150.0	1,431.0	349.0	362.0	790.0	741.0	2,097.5	2,011.4	<b>1,748.0</b>	<b>1,724.0</b>	yes
<b>Cabezon (CA)</b>			154.0	151.0	150.1	149.1	147.2	146.3	210.0	195.0	yes, none provided in 2015-2016
Cabezon (OR)	24.0	88.0	46.8	46.8	46.8	46.8			-	-	
<b>California scorpionfish</b>	not provided		114.0	111.0	150.0	150.0	312.7	307.5	<b>291.0</b>	<b>275.0</b>	yes, none provided in 2015-2016
<b>Canary rockfish</b>	47.0	1,337.0	122.0	125.0	1,714.1	1,525.8	1,450.3	1,368.0	<b>1,338.0</b>	1,307.0	yes
<b>Chilipepper S. of 40°10'</b>	330.0	2,252.0	1,628.0	1,619.0	2,606.8	2,507.2	2,535.7	2,410.3	<b>2,358.0</b>	<b>2,259.0</b>	yes
<b>Cowcod South of 40°10'</b>			9.5	9.7	10.0	10.0	10.0	10.0	<b>98.0</b>	<b>96.0</b>	yes

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022	
<i>Conception</i>	1.0	93.0							83.0	81.3	
<i>Monterrey</i>									14.7	14.9	yes, none provided in 2015-2016
Darkblotched rockfish	108.0	2,003.0	338.0	346.0	641.0	653.0	764.8	815.5	882.0	831.0	
Dover sole	7,551.0	91,249.0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0	84,192.0	50,000.0	
<b>English sole</b>	207.0	7,461.0	9,853.1	7,203.6	9,964.5	7,536.8	10,090.5	10,135.2	<b>9,175.0</b>	<b>9,101.0</b>	yes
<b>Lingcod N. of 40°10'</b>	893.0	3,696.0	2,830.0	2,719.0	3,332.9	3,110.1	4,870.6	4,540.7	<b>5,369.0</b>	<b>4,958.0</b>	yes
<b>Lingcod S. of 40°10'</b>	175.0	1,624.0	1,004.0	946.5	1,251.4	1,143.5	1,039.0	868.5	<b>1,102.0</b>	<b>1,172.0</b>	yes
Longnose skate	999.0	2,892.0	2,000.0	2,000.0	2,000.0	2,000.0	2,000.0	2,000.0	1,823.0	1,761.0	
Longspine thornyhead N. of 34°27'	942.0	6,620.0	3,169.8	3,015.4	2,893.8	2,746.9	2,603.2	2,469.6	2,634.0	2,452.0	
Longspine thornyhead S. of 34°27'			1,001.0	952.2	913.8	867.5	822.1	779.9	832.0	774.0	
<b>Pacific cod</b>			1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	yes, none provided in 2015-2016
<b>Pacific ocean perch</b>	59.0	1,805.0	158.0	164.0			4,339.8	4,229.2	<b>3,854.0</b>	<b>3,711.0</b>	yes
<b>Petrale sole</b>	939.0	3,170.0	2,816.4	2,910.1	3,135.7	3,013.3	2,908.2	2,845.1	<b>4,115.0</b>	<b>3,660.0</b>	yes
Sablefish N. of 36°	4,086.0	12,335.0	4,792.8	5,241.1	5,251.6	5,475.2	5,605.8	5,723.2	6,049.0	5,757.0	
Sablefish S. of 36°			1,719.2	1,879.9	1,864.4	1,943.8	1,990.2	2,031.8	2,159.0	2,054.0	

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?	
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022		
<b>Shortbelly rockfish</b>			500.0	500.0	500.0	500.0	500.0	500.0	500.0	<b>4,184.0</b>	<b>4,184.0</b>	<b>yes, none provided in 2015-2016</b>
Shortspine Thornyhead N. of 34°27'			1,744.9	1,726.4	1,712.8	1,697.5	1,682.8	1,668.7	1,428.0	1,393.0		
Shortspine Thornyhead S. of 34°27'	754.0	8,011.0	923.2	913.4	906.2	898.1	890.3	882.8	756.0	737.0		
Spiny dogfish	482.0	5,503.0	2,101.4	2,085.2	2,094.2	2,082.5	2,070.8	2,059.2	1,621.0	1,585.0		
Splitnose rockfish S. of 40°10'	70.0	3,036.0	1,715.1	1,745.7	1,760.2	1,760.9	1,750.4	1,730.8	1,666.0	1,630.0		
<b>Starry flounder</b>			1,533.6	1,538.6	1,281.8	1,281.8	452.2	452.2	<b>392.0</b>	<b>392.0</b>	<b>yes, none provided in 2015-2016</b>	
<b>Widow rockfish</b>	247.0	4,648.0	2,000.0	2,000.0	13,508.3	12,654.6	11,830.5	11,198.6	<b>14,725.0</b>	<b>13,788.0</b>	<b>yes</b>	
Yellowtail rockfish N. of 40°10'	1,551.0	9,805.0	6,590.0	6,344.4	6,195.6	6,002.1	6,279.0	5,985.5	6,050.0	5,831.0		
NEARSHORE ROCKFISH NORTH							183.0	180.0	77.0	76.0		
<i>Black and yellow</i>							-	-	0.0	-		
<i>Blue/Deacon (CA)</i>							28.1	29.3	28.6	28.5		
<i>Blue/Deacon (OR)</i>							101.5	98.4	-	-		
<i>Blue/Deacon (WA)</i>							7.3	7.0	6.3	6.1		
<i>Brown</i>	not provided						1.9	1.9	1.7	1.7		
<i>Calico</i>							-	-	-	-		

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022	
<i>China (WA)</i>	not provided						26.1	25.5	9.1	8.7	
<i>China (40°10' to 46°16' N. lat.)</i>	not provided								18.1	17.6	
<i>Copper</i>	not provided						10.9	11.2	8.1	8.1	
<i>Gopher</i>							-	-	-	-	
<i>Grass</i>							0.5	0.5	0.5	0.5	
<i>Kelp</i>							-	-	0.0	-	
<i>Olive</i>							0.3	0.3	0.2	0.2	
<i>Quillback</i>							6.2	6.2	5.7	5.7	
<i>Treefish</i>							0.2	0.2	0.2	0.2	
<b>SHELF ROCKFISH NORTH</b>			1,943.7	1,952.4	2,049.0	2,047.0	2,054.0	2,048.0	1,511.0	1,450.0	
<i>Bronzespotted</i>							-	-	-	-	
<i>Bocaccio</i>							236.9	236.9	221.0	221.0	
<i>Chameleon</i>							-	-	-	-	
<i>Chilipepper</i>							190.9	181.4	177.5	170.0	
<i>Cowcod</i>							0.3	0.3	0.4	0.4	
<i>Flag</i>							0.1	0.1	0.1	0.1	
<i>Freckled</i>							-	-	-	-	
<i>Greenblotched</i>							1.1	1.1	1.0	1.0	

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022	
<i>Greenspotted 40°10' to 42° N. lat.</i>	not provided						8.2	8.2	7.3	7.3	
<i>Greenspotted N. of 42 N. lat. (OR &amp; WA)</i>							5.1	5.1	4.7	4.7	
<i>Greenstriped</i>	21.0	10,211.0					1,197.3	1,200.4	712.4	659.3	
<i>Halfbanded</i>							-	-	-	-	
<i>Harlequin</i>							-	-	-	-	
<i>Honeycomb</i>							-	-	-	-	
<i>Mexican</i>							-	-	-	-	
<i>Pink</i>							-	-	-	0.0	
<i>Pinkrose</i>							-	-	-	-	
<i>Puget Sound</i>							-	-	-	-	
<i>Pygmy</i>							-	-	-	-	
<i>Redstripe</i>							225.1	225.1	210.0	210.0	
<i>Rosethorn</i>							10.8	10.8	10.0	10.0	
<i>Rosy</i>							2.5	2.5	2.3	2.4	
<i>Silvergray</i>							133.0	133.0	124.0	124.0	
<i>Speckled</i>							0.1	0.1	0.2	0.1	
<i>Squarespot</i>							0.1	0.1	0.2	0.1	
<i>Starry</i>							-	-	-	0.0	
<i>Stripetail</i>							33.7	33.7	31.4	31.4	
<i>Swordspine</i>							-	-	-	-	



Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?	
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022		
<i>Tiger</i>								0.8	0.8	0.8	0.8	
<i>Vermilion</i>								8.1	8.1	7.5	7.6	
SLOPE ROCKFISH NORTH			1,693.5	1,706.0	1,755.0	1754	1,746.0	1,732.0	1,595.0	1,568.0		
<i>Aurora</i>	34	144					16.7	16.7	15.9	15.7		
<i>Bank</i>							14.4	14.4	13.4	13.4		
<i>Blackgill</i>							3.9	3.9	3.7	3.7		
<i>Redbanded</i>							37.7	37.7	35.2	35.2		
<i>Rougheye/Blackspotted</i>	60	319					198.6	200.4	191.8	190.8		
<i>Sharpchin</i>	7	636					322.1	317.7	241.4	236.3		
<i>Shortraker</i>							15.6	15.6	14.5	14.6		
<i>Splitnose</i>							976.1	965.1	929.3	908.8		
<i>Yellowmouth</i>							160.5	160.5	149.7	149.7		
NEARSHORE ROCKFISH SOUTH			1,113.7	1,005.7	1,329.3	1,163.0	1,142.0	1,163.0	1,016.0	1,016.0		
<i>Shallow Nearshore</i>												
<i>Black and yellow</i>							23.0	23.0	-	-		
<i>China</i>							10.8	11.5	12.2	12.2		
<i>Gopher (N of Pt. Conception)</i>	77	229					84.2	84.2	118.9	118.5		
<i>Gopher (S of Pt. Conception)</i>							21.4	21.4				
<i>Grass</i>							49.7	49.7	46.4	46.4		

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?	
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022		
<i>Kelp</i>								23.1	23.1	21.5	21.5	
<i>Deeper Nearshore</i>												
<i>Blue/Deacon (N. of 34°27' N lat.)</i>								252.6	264.1	257.6	256.7	
<i>Blue/Deacon (S. of 34°27' N lat.)</i>								18.2	18.2	17.0	17.0	
<i>Brown</i>								162.4	166.1	148.4	146.0	
<i>Calico</i>								-	-	-	-	
<i>Copper</i>								294.1	298.8	204.4	202.0	
<i>Olive</i>								187.4	187.4	174.8	174.8	
<i>Quillback</i>								4.5	4.5	4.2	4.2	
<i>Treefish</i>								11.0	11.0	10.3	10.3	
SHELF ROCKFISH SOUTH			1,623.9	1,625.2	1,623.0	1,624.0	1,625.0	1,625.0	1,438.0	1,428.0		
<i>Bronzespotted</i>								3.0	3.0	2.8	2.8	
<i>Chameleon</i>								-	-	-	-	
<i>Flag</i>								19.5	19.5	18.2	18.2	
<i>Freckled</i>								-	-	-	-	
<i>Greenblotched</i>								19.3	19.3	18.0	18.0	
<i>Greenspotted 40°10' to 34°27' N. lat.</i>								70.9	70.7	25.7	25.7	
<i>Greenspotted S. of Point Conception</i>										36.8	6.6	

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?	
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022		
<i>Greenstriped</i>								219.6	220.2	130.7	20.9	
<i>Halfbanded</i>								-	-	-	-	
<i>Harlequin</i>								-	-	-	-	
<i>Honeycomb</i>								8.2	8.2	7.7	7.7	
<i>Mexican</i>								4.2	4.2	4.0	3.9	
<i>Pink</i>								2.1	2.1	1.9	1.9	
<i>Pinkrose</i>								-	-	-	-	
<i>Pygmy</i>								-	-	-	-	
<i>Redstripe</i>								0.4	0.4	0.4	0.4	
<i>Rosethorn</i>								1.8	1.8	1.6	1.7	
<i>Rosy</i>								37.1	37.1	34.6	34.6	
<i>Silvergray</i>								0.4	0.4	0.4	0.4	
<i>Speckled</i>								32.8	32.8	30.7	30.6	
<i>Squarespot</i>								9.2	9.2	8.6	8.6	
<i>Starry</i>								52.2	52.2	48.7	48.7	
<i>Stripetail</i>								19.7	19.7	18.4	18.4	
<i>Swordspine</i>								11.9	11.9	11.0	11.1	
<i>Tiger</i>								-	-	-	0.0	
<i>Vermilion</i>								224.6	224.6	209.5	209.5	
<i>Yellowtail</i>								887.7	887.7	828.1	828.1	

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022	
SLOPE ROCKFISH SOUTH			693.4	694.7	707.0	586.0	744.0	743.0	709.0	705.0	
<i>aurora rockfish</i>	34	144					71.0	71.0	67.7	67.3	
<i>bank rockfish</i>							419.7	419.7	391.5	391.5	
<i>blackgill rockfish</i>							158.9	158.9	176.5	174.0	
<i>blackspotted/rougeye rockfish</i>	60	319					-	-	3.9	3.9	
<i>redbanded rockfish</i>							8.7	8.7	8.1	8.1	
<i>sharpchin rockfish</i>	7	636					4.1	4.1	60.4	59.1	
<i>shortraker rockfish</i>							80.5	79.4	0.1	0.1	
<i>splitnose rockfish</i>							0.1	0.1			
<i>yellowmouth rockfish</i>							0.7	0.7	0.6	0.7	
OTHER FLATFISH			8,749.4	7,243.4	8,510.0	7,281.0	6,498.0	6,041.0	4,802.0	4,838.0	
<i>butter sole</i>							3.2	3.2	2.8	2.8	
<i>curlfin sole</i>							5.7	5.7	5.0	5.0	
<i>flathead sole</i>							24.3	24.3	21.1	21.1	
<i>Pacific sanddab</i>							3,331.9	3,331.9	2,890.2	2,890.2	
<i>rex sole</i>							2,550.0	2,093.0	1,377.4	1,413.8	
<i>rock sole</i>							46.3	46.3	40.2	40.2	
<i>sand sole</i>							536.6	536.6	465.5	465.5	
OTHER FISH							239.0	239.0	223.0	223.0	
<i>Kelp greenling (CA)</i>							99.2	99.2	92.5	92.5	

Stock	2015-16 Range Analyzed (low and high states of nature)		ACLs								Is the proposed 2021/22 ACLs outside the 2015/2016 range?	
	Low	High	2015	2016	2017	2018	2019	2020	2021	2022		
<i>Leopard shark</i>								139.4	139.4	130.0	130.0	
OR BLACK/BLUE/DEACON										570.0	562.0	
<i>Black Rockfish (OR)</i>								515.8	512.2	479.4	474.0	
<i>Blue/Deacon (OR)</i>								101.5	98.4	90.6	87.5	
OR CABEZON/KELP GREENLING								218.0	204.0	198.0	190.0	
<i>Cabezon (OR)</i>								46.8	46.8	54.5	52.2	
<i>Kelp greenling (OR)</i>								171.1	157.5	144.0	138.2	
WA CABEZON/KELP GREENLING								11.0	10.0	20.0	17.1	
<i>Cabezon (WA)</i>								4.6	4.5	14.2	11.6	
<i>Kelp greenling (WA)</i>								5.9	5.9	5.5	5.5	

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