

GROUND FISH MANAGEMENT TEAM REPORT ON BIENNIAL HARVEST
 SPECIFICATIONS FOR 2023-24 INCLUDING OVERFISHING LIMITS AND
 ACCEPTABLE BIOLOGICAL CATCHES

Contents

Comparing benefits and risks of different harvest strategies 1

Default Harvest Control Rules..... 2

Annual Catch Limit Alternatives 2

 1. *Sablefish* 3

 2. *Lingcod North of 40° 10' N. lat.* 5

 3. *Lingcod South of 40° 10' N. lat.* 6

 4. *Oregon Black Rockfish* 7

 5. *Pacific Spiny Dogfish*..... 10

 6. *Vermilion/Sunset Rockfish North of 40° 10' N. lat.* 12

 7. *Vermilion/Sunset Rockfish South of 40° 10' N. lat.* 13

 8. *Quillback Rockfish (new in April 2022)*..... 14

GMT Recommendations 18

Comparing benefits and risks of different harvest strategies

The annual catch limit (ACL) is the amount of total mortality (landings + discard mortality) specified for an actively-managed stock or stock complex. The ACL can be set equal to, or less than, the Acceptable Biological Catch (ABC). The ACL accounts for all sources of fishing-related mortality including catches in research activities, exempted fishing permits, and incidental fisheries. The Council can set the ACL or the ACL contribution to a stock complex based on conservation considerations, ecological considerations, and/or the preferred level of risk in harvesting the stock or stock complex.

Higher ACLs can provide greater economic benefits but can also increase conservation risks, especially when a stock assessment’s estimates of spawning biomass and fraction of unfished biomass are uncertain. For this reason, stock assessors provide decision tables that allow the Council to compare how higher and lower harvest strategies (e.g., P* of 0.45 vs. P* of 0.40, respectively) affect spawning biomass annually over the next ten years, taking into consideration uncertainty around stock size and status. Decision tables elucidate the risks and trade-offs from alternative future management actions and should be carefully considered during decision making.

As a reminder, P* (the probability of overfishing) is a value that equates to the risk of exceeding the overfishing limit. The maximum P* value, 0.50, means there is a 50 percent risk of overfishing, and when applied to set the ABC, determines an ABC equal to the overfishing limit (OFL) (which is not allowed for council-managed groundfish). The highest allowed P* under the Groundfish

Fishery Management Plan (FMP) is 0.45. The P* value is a policy determination made by the Council based on their preferred level of overfishing risk tolerance in setting an overall harvest level for a stock or stock complex.

Default Harvest Control Rules

The Groundfish Management Team (GMT) recommends the Council adopt default harvest control rules (HCRs) for all species in the Groundfish FMP, except for the species listed in Table 1 below, as the Final Preferred Alternative (FPA).

Annual Catch Limit Alternatives

Table 1 contains alternative harvest specifications for select stocks that were forwarded for consideration by the Council at the November 2021 meeting, with the preliminary preferred alternatives (PPAs) bolded. The Council did not select a PPA for Pacific spiny dogfish. Each stock is discussed more below, including GMT recommendations, if available.

Table 1. Alternative harvest specifications forwarded by the Council in November 2021 for consideration in the 2023-24 biennium. PPAs identified in November 2021 are bolded.

#	Species/Stocks	Default HCR	Alternative 1	Alternative 2
1	Sablefish	ACL = ABC P* 0.45	ACL = ABC P* 0.40	ACL = ABC P* 0.35
2	Lingcod north of 40° 10' N. lat.	ACL = ABC P* 0.45	ACL = ABC P* 0.40	N/A
3	Lingcod south of 40° 10' N. lat.	ACL < ABC w/ 40-10 adjustment, P* 0.45	ACL < ABC w/ 40-10 adjustment, ABC P* 0.40	N/A
4	Oregon black rockfish	ACL = ABC P* 0.45	“Case-by-case” ABC set = 2020 ABC of 512 mt	N/A
5	Pacific spiny dogfish	ACL = ABC P* 0.40	ACL = 1,075 mt for 2023-2024, then ACL = ABC P* of 0.40 thereafter	N/A
6	Vermilion/sunset rockfish north of 40° 10' N. lat.	ACL = ABC P* 0.45	ACL = ABC P* 0.40	N/A
7	Vermilion/sunset rockfish south of 40° 10' N. lat.	ACL = ABC P* 0.45	ACL = ABC P* 0.40	N/A
8	Quillback rockfish (new in April 2022)	<u>Method 1:</u> ACL < ABC w/ 40-10 adjustment; P* 0.45 <u>Method 2:</u> ACL < ABC w/ 40-10 adjustment off CA only; P* 0.45	WA & OR: ACL = ABC; P*0.45 Off CA only: ABC (P* = 0.45), ACL (SPR = 55%)	WA & OR: ACL = ABC; P*0.45 Off CA only: ABC (P* = 0.45), ACL (SPR = 60%)

N/A = not applicable

1. Sablefish

Since sablefish is the most economically valuable non-whiting stock that has been subject to historical overexploitation, the biological implications of alternative harvest strategies are heavily weighed when determining the P* approach.

Biological implications

The current P* of 0.45 for sablefish was adjusted in 2021 from a P* of 0.40 in response to the 2019 stock assessment for sablefish, which estimated the stock at 39 percent of unfished spawning biomass in 2019, near the management target. The 2019 stock assessment also projected future increases in stock status, largely driven by a strong 2016 year-class, giving the Council reason to consider higher ACLs. The prior P* of 0.40 arose after the 2011 stock assessment that estimated that the stock was in the Council's defined precautionary zone (i.e., between 25 and 40 percent of unfished spawning biomass).

An update assessment for sablefish in 2021 indicated that the stock is at 58 percent of unfished spawning biomass at the start of 2021, well above the 2019 full assessment projection of 46 percent for 2021 under a P* of 0.45, suggesting a more optimistic status than was estimated in 2019. However, given the uncertainty in the scale of the stock estimated by the update assessment, the Council added increasingly more precautionary P* values of 0.40 and 0.35 to the range of alternatives, which are shown in the decision table as alternative harvest strategies (Table 2-4, [Agenda Item F.3, Supplemental REVISED Attachment 1, April 2022](#)). At the November Council meeting, the Council chose Alternative 1 (P* = 0.40) as PPA.

Under all three alternative harvest strategies, the stock is projected to remain above the 40 percent management target under the most probable (i.e., "base") state of nature. Assuming the base state of nature, each harvest strategy results in similar annual spawning biomass and fraction of unfished estimates in 2023-24, with each harvest strategy resulting in long-term fraction of unfished estimates above the management target by 2032 (i.e., 49 percent P* of 0.45, 51 percent P* of 0.40, and 53 percent P* of 0.35).

The risk to the stock is similar across alternative harvest strategies under the low state of nature, which assumes a reduced stock size and a more depleted stock relative to the base state of nature. Under the low state of nature, the stock is expected to fall below the management target by 2030 under No Action, by 2029 under Alternative 1, and by 2028 under Alternative 2. Given the economic importance of sablefish, the stock is assessed frequently and will most likely be re-assessed before 2028. This gives stock assessors time to further refine the assessment, explore a possible transboundary assessment, and identify any emerging strong year-classes before the stock approaches the management target, if the low state of nature is in fact more reflective of the stock.

In recent years, removals of sablefish have been below the ACLs due to multiple fishery and economic factors. Assuming that future removals continue to be lower than the ACL, at least in the short-term, the sablefish decision table may overestimate the risk associated with alternative future catches because it assumes full ACL (i.e., coastwide ABC) removals for 2021 and beyond. Actual removals in 2023 and 2024 are even more likely to be lower than the full ACLs, because the ACLs under all three alternatives are higher than those of 2021 and 2022. Ultimately, the risk

of approaching the higher ACLs projected under any of the alternatives, particularly No Action or Alternative 1, in the next two years is low given that there are still limitations to sablefish allocation attainments (e.g., gas prices, markets, competing fisheries, and low price per pound). However, it is worth noting that the Council is considering action in 2023 and beyond to extend the primary sablefish season and to remove the Open Access sector's sablefish daily trip limit north of 36° N. lat., both of which could increase overall sablefish attainment. It is difficult to accurately predict future impacts to sablefish removals from these actions.

Tribal Implications/Concerns

The GMT was briefed on [Agenda Item F.3.a, Tribal Report 1](#) and the tribal recommendation for the No Action alternative. Within the FMP, the treaty allocation for sablefish north of 36° N. lat. is 10 percent of the ACL. As opposed to other species where the tribes request harvest guidelines and set-asides, Council decision on this agenda item directly impacts the allocation for the tribes. Treaty case law through *U.S. v. Washington* and further sub-proceedings require treaty allocations to be set in accordance with the conservation necessity principle which mandates that reductions in treaty allocations must be based on biological need of the resource. The GMT agrees with the tribal report that there is little risk to the stock if the Council chooses the No Action alternative but notes that there was some uncertainty in the 2021 update assessment regarding the true scale of the stock.

The GMT discussed the impacts to the tribes under the three alternatives. The tribal sablefish allocation is managed with a complex catch sharing plan, and, within that framework, some tribes are fully utilizing their full allocation. Under the No Action alternative, the tribes have indicated that tribal fisheries will continue to be constrained, and thus, other more conservative alternatives could cause additional impacts on treaty fisheries.

Economic implications

The P* choice has the potential for significant economic impact during the 2023-24 cycle. Sablefish is an economically important stock to the open access, non-whiting limited entry, and tribal fisheries. Sablefish is a high value target species and is also caught as part of a complex with co-occurring species in the bottom trawl fishery such as Dover sole and thornyheads. The GMT analyzed potential economic losses associated with the more precautionary alternative harvest strategies, compared to No Action, in November 2021 ([Agenda Item E.3.a, GMT Report 1, November 2021](#)). Following a Council request in November, the GMT also analyzed potential economic losses compared to the Baseline in the Shorebased Individual Fishing Quota (IFQ) and Non-Nearshore No Action sections (2.5.2 and 2.7.3, respectively) of the Attachment 2 management measure analysis ([Agenda Item F.4, Attachment 2, April 2022](#)).

Alternative 2 will likely result in the greatest loss in economic opportunity, particularly for the IFQ fishery and the primary sablefish fishery north of 36° N. lat. Additionally, IFQ sector participants have indicated in the past that the amount of sablefish allocated can limit their ability to attain other co-occurring and economically important stocks like Dover sole. Given that the stock is expected to remain healthy under all three alternatives, Alternative 2 may set unnecessary limitations on IFQ sablefish allocations, thereby potentially impacting vessels targeting non-sablefish stocks.

Recommendations:

The GMT recommends selecting No Action (P* 0.45) as FPA, because there is little risk to the biology of the stock under any of the three alternatives, there is already a level of precaution built into both the sigma and the default P* approach, and No Action provides the most opportunity for growth for all sectors while minimizing constraints to tribal fisheries. As stated above, actual catches are likely to be well below the No Action ACLs in 2023 and 2024. The GMT also notes that the P* of 0.35 (Alternative 2) may be overly constraining in 2025 and beyond if catches in 2023 and 2024 fall well below the ACL, since the projections assume full ACL removal in 2023 and 2024. Additionally, given the economic importance of sablefish, the Council is likely to re-assess the species within the next several years, potentially giving the Council a better understanding of the stock's scale.

2. *Lingcod North of 40° 10' N. lat.*

Alternatives under consideration:

No Action: Default HCR ACL = ABC P* of 0.45 (Council PPA)

Alternative 1: ACL = ABC P* of 0.40

Biological implications

The No Action or default HCR for lingcod north of 40° 10' N. lat. is to apply a P* of 0.45 and set the ACL equal to the ABC. The 2021 stock assessment for lingcod north of 40° 10' N. lat. was highly uncertain around the estimates spawning biomass and fraction unfished and was designated as a Category 2 assessment with a sigma value of 1.0 by the Scientific and Statistical Committee (SSC), whereas the previous assessment in 2017 was designated as a Category 1 assessment with a sigma value of 0.50. During the stock assessment review (STAR) panel, a P* of 0.40 catch projection was conducted as a possible management option to account for the large uncertainty in the assessment. Therefore, the P* of 0.40 is included as Alternative 1, should the Council wish to be more precautionary.

Under a P* of 0.40, the ACLs in 2023 and 2024 would be 561 mt and 436 mt lower, respectively, than those under a P* of 0.45 (Table 2). Recent estimated total mortality of lingcod north of 40° 10' N. lat. from all sources of mortality combined has been around 1,000 mt in the last three years (Table 3). Therefore, with suggested ACLs greater than 3,418 mt, neither alternative would be restrictive to fisheries under the current management structure and regulations.

Table 2. The 2023-24 ACLs (mt) resulting from a P* of 0.45 and a P* of 0.40.

Year	ACL with P* 0.45 (No Action)	ACL with P*0.40 (Alt. 1)
2023	4,378	3,817
2024	3,854	3,418

Table 3. Recent estimated total mortality. Data source: Groundfish Expanded Mortality Multiyear (GEMM).

Year	Estimated Total Mortality (mt)
2018	1,021
2019	1,004
2020	815

Economic implications

Given that recent estimated total mortality has been approximately 1,000 mt, much less than the No Action ACL and the Alternative 1 ACL, the GMT does not foresee any notable economic implications under either of these alternatives.

Recommendations

The GMT recommends that the Council adopt the PPA of using the P* of 0.45 to the FPA. Given the low mortality of lingcod is predominantly due to yelloweye rockfish constraints, if yelloweye rockfish rebuilds in the future, the P* can be re-evaluated without a new assessment as part of another harvest specifications cycle, should concerns arise.

3. *Lingcod South of 40° 10' N. lat.*

Alternatives under consideration:

No Action: Default HCR ACL < ABC w/ 40-10 adjustment, P* of 0.45 (Council PPA)

Alternative 1: ACL < ABC w/ 40-10 adjustment, P* of 0.40

Biological implications

Similar to lingcod north of 40° 10' N. lat., lingcod south of 40° 10' N. lat. was designated a Category 2 stock accounting for the uncertainty around the estimated spawning biomass and fraction unfished. Also similar to lingcod north of 40° 10' N. lat., the STAR Panel applied a P* of 0.40 as a means to address the uncertainty in the assessment.

Historically, the Council has chosen to remain with the default HCR with the 40-10 adjustment and a P* of 0.45 (No Action); however, in light of the new stock category designation and the greater uncertainty in the assessment, the Council may prefer to consider a more precautionary approach to managing lingcod south of 40° 10' N. lat. for the 2023-24 biennium by selecting a P* of 0.40.

Under the default HCR (40-10 adjustment and P* of 0.45), the resulting ACL for 2023 and 2024 would be 726 mt and 722 mt, respectively. Applying the alternative HCR, 40-10 adjustment and a P* of 0.40, would result in ACLs of 633 mt for 2023 and 634 mt for 2024 (Table 4). The GMT notes that under a P* of 0.40, future ACLs are less than 700 mt, which was the GMT projection for 2021 and 2022. The 700 mt projection was based on previous years of much higher mortality and increased access of the trawl sector to areas where lingcod could be caught. However, recent estimated total mortality of lingcod south of 40° 10' N. lat. has been declining (Table 5). Additionally, preliminary mortality estimates for 2021 are approximately 320 mt or 29 percent of the 2021 ACL (1,106 mt; [PacFIN APEX Report GMT-007](#)). The decline in mortality may be

due to poor market conditions and more recently the effects of COVID-19 on the industry. Given the decline in mortality, the GMT does not foresee fisheries under the current management structure would be restricted at either P* level.

Table 4. The 2023-24 ACLs (mt) resulting from a P* of 0.45 and a P* 0.40.

Year	ACL with P* 0.45 (No Action)	ACL with P* 0.40 (Alt. 1)
2023	726	633
2024	722	634

Table 5. Recent estimated total mortality. Data source: GEMM.

Year	Estimated Total Mortality (mt)
2018	457
2019	397
2020	290

Economic implications

Given that recent estimated total mortality has been declining and is much less than the No Action ACL and the Alternative 1 ACL, the GMT does not foresee any notable economic implications to lingcod south of 40° 10' N. lat. under these alternatives.

Recommendations

The GMT recommends that the Council adopt the PPA of using the P* of 0.45 to the FPA. The P* can be re-evaluated without a new assessment as part of another harvest specifications cycle, should catches increase and conservation concerns arise.

4. Oregon Black Rockfish

Alternatives being considered:

No Action: Default HCR ACL = ABC with P* of 0.45,

Alternative 1: “Case-by-case” ABC for 2023-24 equal to the 2021-22 ABC of 512 mt (Council PPA)

Biological Implications

Prior to 2015, black rockfish were managed in Oregon and California under a constant catch of 1,000 mt (58:42 split OR:CA). Black rockfish in Oregon was assessed as a separate stock for the first time in 2015. The Oregon black rockfish stock assessment was approved for management, but there were some issues identified by reviewers. “All STAT and STAR Panel participants recognized a broad suite of unique challenges in the data and models developed for Oregon black rockfish, which was best described as a ‘data rich, but information poor’ stock” ([Agenda Item I.3 Attachment 3 November 2015](#)).

The SSC designated the 2015 assessment as a Category 2 assessment due to the large overall level of uncertainty around stock size and status ([Agenda Item I.3.a, Supplemental SSC Report, November 2015](#)). The stock was estimated to be at 60 percent of unfished spawning biomass at the beginning of 2015, well above the management target of 40 percent. However, the estimated scale of the stock from the 2015 Oregon specific model was lower than previous estimates (e.g., the 2007 assessment was an Oregon and California combined model) resulting in lower harvest levels. Table 6 shows the total mortality of black rockfish off Oregon since 2015. The Oregon Department of Fish and Wildlife (ODFW) also expressed concerns about the 2015 assessment ([Agenda Item I.3.a, Supplemental ODFW Report 1, November 2015](#)). These concerns resulted in using the 2020 ABC of 512 mt to set a “case-by-case” ABC in the 2021-22 cycle. The Oregon Department of Fish and Wildlife (ODFW) has renewed those concerns and again requests a “case-by-case” ABC for 2023-24 ([Agenda Item C.8.a, ODFW Report 1, September 2021](#)).

Table 6. Recent years mortality (mt) from the Oregon recreational and commercial nearshore fisheries and total mortality from all sectors (IOA, EFP, Trawl, etc.). Data for 2015 through 2020 come from the GEMM ([Agenda Item C.1.b, NMFS Report 2, September 2021; Table 3](#)).

Year	Recreational Mortality	Comm. Nearshore Mortality	Total Mortality	OR ACL or HG
2015	479	121	601	580
2016	423	106	530	580
2017	417 a/	123	543	527
2018	295 b/	123	419	520
2019	319	120	440	513
2020	334	102	437	512
2021	340 c/	112 d/	452	512

a/ recreational fishery closed in mid-September, reduced bag limit from 7 to 5 fish through state regulations at the beginning of the year

b/ 5-fish daily bag limit for most of the season, 4-fish daily bag limit during the summer

c/ year-end projection based on ODFW data through December 5-fish daily bag limit

d/ year-end projection based on preliminary ODFW data through Aug

The 2021-22 harvest specification cycle FPA was a 512 mt ABC based on the 2020 ABC. If the case-by-case ABC is selected for 2023-24, depending on the realized removals, future ABCs and ACLs could be reduced to account for the higher removals between 2021 and 2024. If the No Action alternative is chosen then the constraints on the fishery will likely be higher than they were before the 2021-22 cycle because of the change in ABC that would happen once the time-varying buffer is applied. The additional 35 mt of ABC will provide much needed stability and is projected to have a minimal impact on the long-term spawning output or fraction of unfished biomass (2032 percent unfished spawning output of 54.4 percent under No Action, Table 7, and 54.1 percent under Alternative 1, Table 8).

Table 7. Long-term projections for Oregon black rockfish under the No Action alternative (ACL = ABC P* of 0.45).

Year	Predicted OFL (mt)	ABC (mt)	Spawning Output (Billion eggs)	Depletion
2023	578	477	726	0.551
2024	576	471	722	0.548
2025	576	466	719	0.546
2026	575	462	717	0.544
2027	576	458	716	0.543
2028	576	454	715	0.542
2029	577	450	715	0.542
2030	578	447	715	0.543
2031	579	443	716	0.543
2032	580	439	718	0.544

Table 8. Long-term projections for Oregon black rockfish under Alternative 1 (i.e., case-by-case ABC that will be a constant 512 mt in 2023-2024 but will revert to the sigma/P* framework thereafter).

Year	Predicted OFL (mt)	ABC (mt)	Spawning Output (Billion eggs)	Depletion
2023	578	512	726	0.551
2024	573	512	720	0.546
2025	569	461	713	0.541
2026	570	458	710	0.539
2027	572	454	709	0.537
2028	573	452	708	0.537
2029	574	448	709	0.538
2030	576	445	710	0.539
2031	577	442	712	0.540
2032	578	438	714	0.541

Economic Implications

Black rockfish remain vitally important to Oregon’s recreational and commercial nearshore fisheries. This fishery provides the backbone of the fishing opportunities due to its consistency and helps insulate many coastal communities against the boom-and-bust nature of other fisheries such as salmon and albacore tuna. The reduced stock size estimate from the 2015 stock assessment of black rockfish compared to previous assessments meant that, beginning in 2017, black rockfish became just as limiting for the Oregon recreational fishery as yelloweye rockfish. Since black rockfish normally account for 65-80 percent of the Oregon recreational catch, adjusting bag limits

is the main tool available to control catches. The daily bag limit has continued to be reduced through state regulations from 2018 to 2021 in order to maintain removals at or below the black rockfish ACL contribution. ODFW also sets bi-monthly trip limits for the commercial nearshore fishery, and minor adjustments were made inseason, often to increase trip limits, to come closer to the state-specified commercial harvest guideline. Even though the total mortality has been below the 512 mt level for the last four years (Table 6), this higher ACL allows for more stability within the recreational and commercial fisheries in Oregon and allows for flexibility in the state management of both sectors while awaiting the next stock assessment (tentatively scheduled for 2023).

Recommendations

The GMT recommends the Council select their PPA, Alternative 1, as the FPA for Oregon black rockfish. This will provide increased fishery stability for an important stock to the Oregon recreational bottomfish and commercial nearshore fisheries as ODFW works to incorporate their new hydroacoustic/visual survey results into a new full assessment, tentatively scheduled for 2023.

5. *Pacific Spiny Dogfish*

Alternatives under consideration:

No Action: Default HCR ACL = ABC P* of 0.40

Alternative 1: ACL = 1,075 mt for 2023-24, then ACL = ABC P* of 0.40 thereafter

In November, the Council did not choose a PPA for Pacific spiny dogfish but did adopt the middle state of nature model with the West Coast Groundfish Bottom Trawl Survey (WCGBTS) catchability coefficient of 0.43 at that time. This model projects a more optimistic status compared to the “old base model” (catchability = 0.59) that was used until the September 2021 Mop-up Review Panel when the SSC determined that a catchability value of 0.43 is the most reasonable assumption of Pacific spiny dogfish catchability in the WCGBTS. Using the catchability value of 0.43, the 2021 stock assessment of Pacific spiny dogfish estimates that the stock is at 42 percent of unfished spawning biomass in 2021, above the management target of 40 percent. Any reference to a depletion value that is not 42 percent in the analytical document ([Agenda Item F.4, Attachment 2, April 2022](#)) is incorrect and will be corrected for the June 2022 Council meeting.

Biological Implications

The Pacific spiny dogfish decision table presents alternative states of nature based on a range of catchability values in order to capture the uncertainty around Pacific spiny dogfish catchability (Table 2-5, [Agenda Item F.3, Supplemental REVISED Attachment 1, April 2022](#)). Given the uncertainty around the catchability value and the notably low value of steepness for Pacific spiny dogfish (0.283), the Council may wish to be more precautionary than status quo. The SSC has also decided to hold a workshop to review the current $SPR_{50\%}$ proxy harvest rate in light of the extremely low productivity and fecundity of Pacific spiny dogfish. If the workshop finds that the proxy harvest rate is too aggressive, a new elasmobranch specific harvest strategy could be explored in the 2025-26 harvest specifications process. Given this possibility, the GMT recognizes that the Council may want to take first steps to lowering the ACLs, which could be done by adopting Alternative 1.

However, the difference of 400 mt between the alternatives does not appear to greatly influence the long-term depletion levels and could be constraining to the at-sea and shoreside Pacific whiting fleets where the majority of the bycatch occurs ([Table 14, Agenda Item E.3.a, GMT Report 1, November 2021](#)). The fraction unfished is projected to decline by less than 1 percent by 2032 when comparing catch levels of 655 mt and 635 mt in 2023 and 2024, respectively, with those of 1,456 mt and 1,407 mt (Table 11, [Agenda Item E.2, Attachment 6, November 2021](#)). Under the No Action default HCR, the stock is projected to remain above the management target of 40 percent by 2032. Therefore, the Council could choose to adopt the default harvest control rule (i.e., No Action) and allow for increased flexibility in the Pacific whiting fleets while having a low impact on the stock depletion within the next two years.

Economic Implications

Pacific spiny dogfish is primarily caught as bycatch in all sectors. Given that Pacific spiny dogfish is not targeted by any groundfish sectors and approximately 60 percent is discarded, the GMT does not anticipate any direct economic impacts from reduced ACLs. However, the majority of Pacific spiny dogfish bycatch is caught in the Pacific whiting at-sea and shoreside sectors. If Alternative 1 is selected as FPA, the lower ACLs are more likely to trigger spatial closures in areas with productive Pacific whiting, given that the two stocks tend to be caught in similar depths and latitudes, thereby potentially impacting the Pacific whiting fleet's ability to catch their target stock. This effect may be more pronounced for Mothership and shoreside catcher vessels than for Catcher Processors because of differences in horsepower capacity. Additionally, the entire Pacific whiting season could be effectively closed if spatial closures coincide with where the majority of the Pacific whiting is. Such closures are likely to also impact groundfish vessels using bottom trawl gear, given that it would be difficult to discern impacts from midwater trawl gear and bottom trawl gear inseason due to data insufficiencies. The GMT notes that such closures are generally imperfect and less nimble than industry efforts to avoid or respond to high bycatch of stocks of concern.

Recommendations

The GMT recommends the No Action alternative (ACL = ABC, P* of 0.40) for Pacific spiny dogfish. In addition to there being little biological difference between the two alternatives, the Council is working on having additional management tools (i.e., BACs) to aid in controlling catch starting in 2023. To assist in tracking inseason impacts, the GMT can provide a catch update on Pacific spiny dogfish in our inseason report at each Council meeting. The GMT does continue to encourage the Council to further refine our understanding of the proxy harvest rate and to consider a transboundary stock assessment with Canada as soon as feasible.

Further, the GMT understands that Alternative 1 was added to the range of alternatives in November 2021 as a more precautionary option given the concerns around the catchability coefficient in the 2021 stock assessment. The GMT provides those reasons in the list below for the Council's consideration, along with those in support of No Action, but ultimately believes that precaution in the next biennium is not necessary to protect the long-term conservation of the stock, and the inseason management tools available to the Council are sufficient to avoid exceeding the No Action ACL and minimizing bycatch of Pacific spiny dogfish.

Reasons to select No Action (P* 0.40):

- There is little difference in either short-term or long-term depletion levels under either alternative.
- No Action would be less constraining on all groundfish fisheries, and Alternative 1 could economically impact the trawl sectors if the ACL is exceeded or projected to be exceeded.
- The ACLs in 2023 and 2024 would be at a lower risk of being exceeded under No Action.
- The Council will have Block Area Closures for groundfish mitigation coastwide by all trawl gear types available for use inseason in 2023 and beyond, and the GMT will closely track Pacific spiny dogfish catches inseason.

Reasons to select Alternative 1 (1,075 mt in 2023 & 2024, then P* 0.40 thereafter):

- Given the uncertainty around q and the likelihood that the current proxy harvest rate of Spawning Potential Ratio ($SPR_{50\%}$) is too aggressive, the Council may wish to take precaution in 2023 and 2024.
- The lower ACLs under Alternative 1 could incentivize fishery participants to further minimize catches in 2023 and 2024 so as not to induce a fishery closure. The GMT notes that, depending on the results of the upcoming SSC workshop to re-evaluate the proxy harvest rate, industry could see even lower harvest limits in 2025 and beyond.

6. *Vermilion/Sunset Rockfish North of 40° 10' N. lat.*

Alternatives under consideration:

No Action: Default HCR ACL = ABC P* of 0.45 (Council PPA)

Alternative 1: ACL = ABC P* of 0.40

The default HCR for vermilion/sunset rockfish north of 40° 10' N. lat. is to apply a P* of 0.45 with the ACL set equal to the ABC. Alternative 1 is to apply a P* of 0.40 with the ACL set equal to the ABC. With the recent overages of the species-specific OFL contribution to the Minor Shelf complex north of 40° 10' N. lat., the Council may want to consider being more precautionary and apply a P* of 0.40 (Alternative 1). Even under the default HCR of P* 0.45, management actions may be necessary to keep the total mortality (Table 9) below the ACL contribution (Table 10) for vermilion rockfish off Washington and Oregon. Additional management measures would also likely be necessary under a P* of 0.40, as it would reduce the ACL contribution. This may prove to be difficult, as vermilion rockfish are not a targeted species in the recreational fisheries off of Washington and Oregon, nor are they targeted by commercial nearshore and non-nearshore fisheries. Vermilion rockfish are mostly a bycatch species while targeting other more plentiful co-occurring species. Therefore, designing management measures to reduce impacts will be challenging. The Washington Department of Fish and Wildlife (WDFW) outlines potential management measures for the Washington recreational fishery in [Agenda Item F.4.a, WDFW Report 1, April 2022](#).

Table 9. Recent estimated total mortality of vermilion rockfish north of 40° 10' N. lat. Data source: GEMM.

Year	Total Mortality (mt)
2018	22.9
2019	25.7
2020	20.2

Table 10. The 2023-24 ACLs (mt) for vermilion rockfish north of 40° 10' N. lat. resulting from a P* of 0.45 and a P* of 0.40.

Year	Area	ACL Contribution with P* 0.45 (No Action)	ACL Contribution with P*0.40 (Alt. 1)
2023	WA	0.72	0.62
	OR	12.60	11.77
	40° 10' to 42° N. lat.	6.54	6.10
	Combined	19.86	18.49
2024	WA	0.70	0.61
	OR	12.45	11.63
	40° 10' to 42° N. lat.	6.62	6.19
	Combined	19.77	18.43

Recommendations

The GMT recommends that the Council move the PPA of using the P* of 0.45 to the FPA.

7. Vermilion/Sunset Rockfish South of 40° 10' N. lat.

Alternatives under consideration:

No Action: Default HCR ACL = ABC P* of 0.45 (Council PPA)

Alternative 1: ACL = ABC P* of 0.40

The default and alternative HCRs are the same as for vermilion/sunset rockfish north of 40° 10' N. lat. and for the same reasons. However, unlike north of 40° 10' N. lat., vermilion/sunset rockfish south of 40° 10' N. lat. is targeted by the non-trawl sector. While the Council has already taken action through the 2021-22 Harvest Specifications and Management Measures item as well as thorough subsequent inseason action to reduce harvest of vermilion/sunset rockfish south of 40° 10' N. lat., additional measures may be needed if a P* of 0.40 (Alternative 1) is selected.

For reference, recent mortality is shown in Table 11 and the ACL contributions for each HCR alternative in Table 12.

Table 11. Recent estimated total mortality of vermilion rockfish south of 40° 10' N. lat. Data source: GEMM.

Year	Total Mortality (mt)
2018	344.5
2019	485.0
2020	259.9

Table 12. The 2023-24 ACLs (mt) for vermilion rockfish south of 40° 10' N. lat. resulting from a P* of 0.45 and a P* of 0.40 with a category 2 sigma value for the portion of the stock south of 34° 27' N. lat. and a category 1 sigma for the portion of the stock off California north of 34° 27' N. lat.

Year	Assessment Area	ACL Contribution with P* 0.45 (No Action)	ACL Contribution with P* 0.40 (Alt. 1)
2023	34°27' to 40°10' N. lat.	142.00	132.59
	South of 34° 27' N. lat.	139.28	121.44
	Total	281.28	254.03
2024	34° 27' to 40°10' N. lat.	143.92	134.09
	South of 34° 27' N. lat.	137.37	119.27
	Total	281.29	253.36

Recommendations

The GMT recommends that the Council move the PPA of using the P* of 0.45 to the FPA. This may be revisited when the Council discusses the stock definitions agenda item and a decision on whether or not to keep vermilion/sunset rockfish in a complex in the future is made.

8. Quillback Rockfish (new in April 2022)

Given that the Council has yet to resolve the stock definition issue, a status determination has not yet been made for quillback rockfish and the stock is still considered coastwide. Therefore, the harvest specifications (OFL, ABC) are on that coastwide basis. However, the Council has indicated their intent to keep quillback rockfish within the minor nearshore rockfish complexes north and south of 40° 10' N. lat., and regardless of how the Council chooses to calculate the quillback rockfish ACL contributions, those ACL contributions will ultimately need to be apportioned into the nearshore rockfish complexes north and south of 40° 10' N. lat., as appropriate.

Based on combining the results of the sub-area assessments conducted in 2021, quillback rockfish coastwide is projected to be at 23.3 percent of unfished biomass at the beginning of 2023 (Table 24). This puts the coastwide stock below the minimum stock size threshold (MSST). However, when looking at the sub-area assessment results, the portion of the coastwide stock off of Washington (39.1 percent) and Oregon (45.1 percent) are above the MSST, while the portion off of California is below (10.5 percent) the MSST (Table 24). The GMT had a robust discussion around what the default harvest control rule would then be on a coastwide basis, particularly in

regard to if/how the 40-10 rule should be applied. Figure 1 represents the two main questions the Council will need to address to determine a quillback rockfish harvest control rule and the alternative pathways resulting from each question.

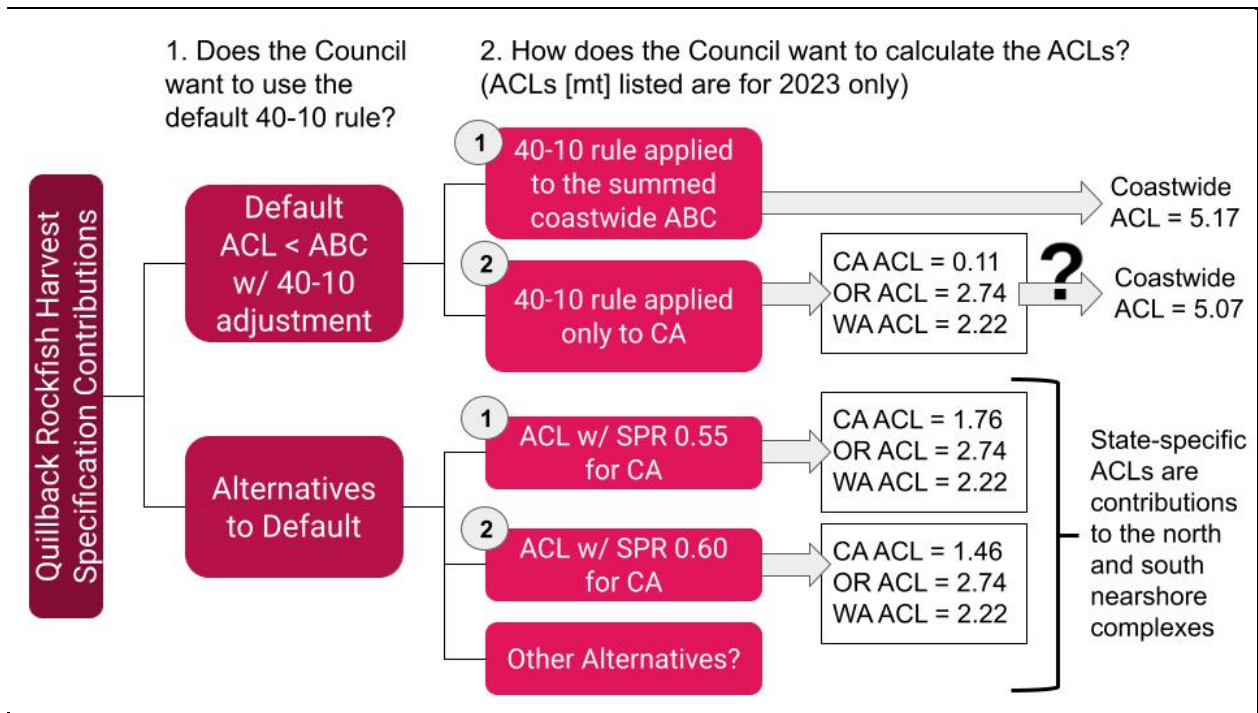


Figure 1. Pathways to selecting a harvest control rule for quillback rockfish and resulting ACL contributions (mt). Numbered items reflect Methods 1 and 2 of applying the 40-10 rule under the default HCR or Alternatives 1 and 2 that diverge from the default HCR. If the Council develops a coastwide ACL contribution under the default HCR, it will need to be reapportioned into the north and south nearshore complexes. The question mark indicates a Council decision point as to whether or not to use the state-specific ACL contributions to determine ACL contributions to the nearshore complexes north and south of 40° 10' N. lat. or to calculate those complex ACL contributions using a summed coastwide ACL.

It is the GMT’s understanding that the “default” HCR for quillback rockfish is to apply the 40-10 rule for a stock that is below its MSST until the Council sets a new rebuilding policy specific to the stock and fishery that differs from the 40-10 rule (Section 4.6.1, [Pacific Coast Groundfish FMP](#)). Thus, the GMT considers any pathways that do not apply the 40-10 rule as “alternatives” to the default HCR. If the default HCR is used, the GMT outlines two potential methods to apply the 40-10 rule (or “adjustment”) to quillback rockfish, both of which are outlined in Figure 1.

Method 1 would apply the 40-10 HCR to the coastwide 6.81 mt ABC resulting in a coastwide ACL contribution of 5.17 mt. However, the FMP specifies that, “only Category 1 and 2 stocks with a quantitative assessment of estimated biomass can be managed in this way [i.e., using the 40-10 adjustment].” Therefore, in the event that it is applied to the coastwide ABC, the 40-10 adjustment cannot be applied to the portion of the stock off Washington. This is because the 2021 stock assessment of the quillback rockfish population off of Washington was designated as a category 3 assessment, while the assessments of populations off Oregon and California were designated as

category 2 assessments. For this reason and given the fact that there are state-specific differences in both the projected fraction unfished and harvest strategies, the Council may want to consider whether applying the 40-10 rule to the coastwide ABC is a reasonable path forward. Additionally, the SSC noted that harvest should be spatially allocated proportional to the relative biomass ([Agenda Item E.3.a Supplemental SSC Report 1, November 2021](#)). Method 2 would apply the 40-10 HCR to the state-specific ABC (1.85 mt) for only the portion of the population off California, which would then be rolled up with Oregon and Washington’s state-specific ACL contributions to establish a coastwide ACL contribution of 5.07 mt. If the Council wanted to use the default 40-10 HCR, the GMT views Method 2 as the most appropriate default method and does not recommend developing a coastwide ACL contribution under Method 2.

It is the GMT’s understanding that, while quillback rockfish is the subject of this discussion and decision-making at this meeting, no additional species, stocks, or sub-stocks, such as copper rockfish or vermilion/sunset rockfish, need to be re-evaluated for this cycle. In subsequent cycles, the methodology used in this cycle for quillback rockfish can be used as a reference, should a similar situation arise. This is likely to happen until the full stock definitions topic has been thoroughly discussed and the FMP has been amended.

Two potential methods of applying the default 40-10 rule:

- Method 1: $ACL < ABC$ w/ 40-10 adjustment; P^* of 0.45
- Method 2: $ACL < ABC$ w/ 40-10 adjustment off CA only; P^* of 0.45

Table 13. Quillback rockfish 2023 ACL contributions calculated using the two different methods of applying the 40-10 rule.

Potential Stock Management Areas	Projected Fraction Unfished (2023)	OFL (mt)	ABC (mt)	Method 1: ACL Calculated Coastwide (mt)	Method 2: Area Based ACL (mt)
CA	10.5%	2.11	1.85	1.40 a/	0.112
OR	45.1%	3.14	2.74	2.09 a/	2.74
WA	39.1%	2.85	2.22	1.69 a/	2.22
Coastwide	23.3%	8.10	6.81	5.17 b/	5.07

a/ these values are the coastwide ACL of 5.17 mt apportioned by state percent of the ABC to calculate the state-specific ACL contributions

b/ The coastwide ACL is calculated based on the coastwide ABC of 6.81 mt multiplied by the 40-10 adjustment of 0.76

Table 14. Quillback rockfish 2024 ACL contributions calculated using Method 1 of applying the 40-10 rule in 2023. (Note these values were provided by the assessors but have not been reviewed by the SSC)

Potential Stock Management Areas	Projected Fraction Unfished (2024)	OFL (mt)	ABC (mt)	Method 1: ACL Calculated Coastwide (mt)
CA	11.5%	2.33	2.01	1.55 a/
OR	45.8%	3.18	2.75	2.21 a/
WA	40.1%	2.56	2.21	1.69 a/
Coastwide	24.2%	8.39	6.97	5.45 b/

a/ these values are the coastwide ACL of 5.45 mt apportioned by state percent of the ABC to calculate the state-specific ACL contributions

b/ The coastwide ACL is calculated based on the coastwide ABC of 6.97 mt multiplied by the 40-10 adjustment of 0.78

Table 15. Quillback rockfish 2024 ACL contributions calculated using Method 2 of applying the 40-10 rule in 2023. (Note these values were provided by the assessors but have not been reviewed by the SSC)

Potential Stock Management Areas	Projected Fraction Unfished (2024)	OFL (mt)	ABC (mt)	Method 2: Area Based ACL (mt)
CA	11.7%	2.38	2.06	0.42
OR	45.4%	3.15	2.72	2.72
WA	39.6%	2.86	2.23	2.23
Coastwide	24.2%	8.39	7.01	5.37

To aid in the Council’s decision-making on this issue, the GMT provides alternatives that differ from the default 40-10 adjustment, noting that the FMP requires using the 40-10 rule as an interim rebuilding harvest control policy for a stock below its MSST, “until the Council sets a new rebuilding policy specific to the conditions of the stock and fishery.” The Council adopted a rebuilding analysis for quillback rockfish off California for management in November 2021 that was subsequently revised based on the November inseason action. The inseason action adopted by the Council was informed by [Agenda Item E.7.a, Supplemental GMT Report 2, November 2021](#) which recommended a reduced quillback rockfish retention amounts for the California commercial non-trawl and mandated no retention of the species in the recreational fishery. The updated analysis is available on the Council’s website and was the source of the ACL contribution values for CA shown below under Alternatives 1 and 2 ([Langseth and Wetzel, 2022](#)). The rebuilding analysis was deemed as the best scientific information available by the SSC and analyzed various alternative SPR harvest rates, leading to different long-term results. The GMT considers those to be valid alternatives to the 40-10 HCR in managing quillback rockfish and lists two below for Council consideration.

Alternative harvest control rules that diverge from the default 40-10 harvest control policy for the portion of the quillback rockfish stock off of California, only:

- Alternative 1: SPR 0.55; 2023 ACL contribution = 1.76 mt, 2024 ACL contribution = 1.93 mt; P* 0.45

- Alternative 2: SPR 0.60; 2023 ACL contribution = 1.46 mt, 2024 ACL contribution = 1.61 mt; P* 0.45

The ACL contributions for Oregon and Washington would remain the same as those outlined in the default HCR ([Agenda Item F.3, Supplemental REVISED Attachment 1, April 2022](#)).

Regardless of which route is taken in determining the appropriate harvest specification(s) for quillback rockfish, management measures have already been implemented for 2022 ([86 FR 72863, December 23, 2021](#); [November 2021 Council Decision Document](#); [ODFW News Release, December 17, 2021](#)) and are being proposed for 2023-24 under Agenda Item F.4. ([Agenda Item F.4, Attachment 2, April 2022](#), [Agenda Item F.4, WDFW Report 1, April 2022](#), [Agenda Item F.4, ODFW Report 1, April 2022](#)) to reduce total mortality of quillback rockfish off all three states. These include bag limit reductions, implementing a sub-bag limit, and/or prohibiting retention.

GMT Recommendations

The GMT recommends the Council adopt:

- **default HCRs for all species in the FMP, except for those species/stocks listed in Table 1, as the FPA, and**
 - **sablefish, No Action (P* 0.45) as the FPA,**
 - **lingcod north of 40° 10' N. lat., select the PPA, using P* of 0.45, as the FPA,**
 - **lingcod south of 40° 10' N. lat., select the PPA, applying the 40-10 control rule and using a P* of 0.45, as the FPA,**
 - **Oregon black rockfish, select the PPA Alternative 1 “case-by-case” scenario of a 512 mt ACL as the FPA,**
 - **Pacific spiny dogfish, select No Action using P* of 0.40 as FPA,**
 - **vermillion/sunset rockfish north of 40° 10' N. lat., select the PPA, using a P* of 0.45 as the FPA, and**
 - **vermillion/sunset rockfish south of 40° 10' N. lat., select the PPA, using a P* of 0.45 as the FPA.**

For quillback rockfish, the GMT does not provide a recommendation but presents to the Council the team’s understanding of the default HCR (i.e., the 40-10 rule) as well as two alternatives to the default HCR that the Council may want to consider.

Appendix 1. Copy of Table 1, provided here for easy reference, with GMT recommendations highlighted (Council’s PPAs are bolded).

#	Species/Stock	Default HCR	Alternative 1	Alternative 2
1	Sablefish	ACL = ABC P* 0.45	ACL = ABC P* 0.40	ACL = ABC P* 0.35
2	Lingcod north of 40° 10' N lat.	ACL = ABC P* 0.45	ACL = ABC P* 0.40	N/A
3	Lingcod south of 40° 10' N lat.	ACL < ABC w/ 40-10 adjustment, P* 0.45	ACL < ABC w/ 40-10 adjustment, ABC P* 0.40	N/A
4	Oregon black rockfish	ACL = ABC P* 0.45	“Case-by-case” ABC set = 2020 ABC of 512 mt	N/A
5	Pacific spiny dogfish	ACL = ABC P* 0.40	ACL = 1,075 mt for 2023-2024, then ACL = ABC P* of 0.40 thereafter	N/A
6	Vermilion/sunset rockfish north of 40° 10' N lat.	ACL = ABC P* 0.45	ACL = ABC P* 0.40	N/A
7	Vermilion/sunset rockfish south of 40° 10' N lat.	ACL = ABC P* 0.45	ACL = ABC P* 0.40	N/A
8	Quillback rockfish (new in April 2022)	Method 1: ACL < ABC w/ 40-10 adjustment; P*0.45 Method 2: ACL < ABC w/ 40-10 adjustment off CA only; P*0.45	WA & OR: ACL=ABC; P*0.45 Off CA only: ABC (P*=0.45), ACL (SPR = 55%)	WA & OR: ACL=ABC; P*0.45 Off CA only: ABC (P*=0.45), ACL (SPR = 60%)

N/A = not applicable

PFMC
04/09/22