

## GROUND FISH MANAGEMENT TEAM REPORT ON BIENNIAL HARVEST SPECIFICATIONS FOR 2019-2020

### Annual Catch Limit Alternatives

At our October meeting, the Groundfish Management Team (GMT) reviewed the range of annual catch limit (ACL) alternatives adopted by the Pacific Fishery Management Council (Council) in September for lingcod and California scorpionfish ([Agenda Item E.9. Supplemental REVISED Attachment 1, September 2017](#)). The GMT also discussed the proposed harvest specifications from the Scientific and Statistical Committee (SSC) Groundfish Subcommittee's September 28 webinar under the default harvest control rules (HCR). **The GMT agrees with the range adopted by the Council and did not identify a need to analyze additional ACL alternatives.** Below, we provide rationale for analyzing only the default HCR for yelloweye rockfish and Pacific ocean perch (POP). In addition, the GMT provides information on the Oregon nearshore groundfish complexes, based on the Council's September motion ([September 2017 Draft Council Motions on Agenda Item E.9.](#)).

### Yelloweye Rockfish

After further review of the yelloweye rockfish stock assessment ([Agenda Item E.8, Attachment 5, September 2017](#)) and the rebuilding analysis (Agenda Item F.4, Attachment 2, November 2017), **the GMT does not recommend additional alternatives for analysis, or changes from the default HCR of a spawning potential ratio (SPR) of 76 percent for 2019-2020.** While the GMT recognizes that the assessment is sensitive to steepness and other factors, the GMT believes that uncertainty can be accounted for in management (described below).

In the rebuilding analysis, Gertseva and Cope produced sensitivity runs based on both a GMT request of a catch stream of 65 percent removals of the proposed ACL (i.e., the recent average removals), and a request to look at sensitivity to steepness ([Agenda Item E.8.a. WDFW Report 1, September 2017](#)). The authors assessed the impact to rebuilding around steepness values of 0.718, 0.509, and 0.4. The steepness of 0.718 is based on the meta-analysis for rockfish species, and was used in the base case endorsed by the SSC, and adopted by the Council in September. As shown in Table 13 of the rebuilding analysis (provided in the Appendix), the probability of rebuilding under the base model ( $h = 0.718$ ) is 100 percent by 2027 under full ACL removals, or by 2026 under 65 percent removals.

Under a steepness of 0.509, the likelihood of rebuilding exceeds 50 percent after 2054, assuming current removals (less than 100 percent), and exceeds 50 percent after 2061 assuming the ACLs are fully harvested. A steepness of 0.509 is the 12.5th percentile of the prior distribution, which is typically associated with the low state of nature in a decision table.

The steepness value of 0.4 was estimated in the last full yelloweye assessment (2009) and used in the 2011 update. The 2017 assessment was unable to estimate steepness, as likelihood profiles were trending towards a value of 0.9. This value was deemed implausible and resulted in the use of the prior from the meta-analysis. Under a steepness of 0.4, there is zero probability of rebuilding by the current  $T_{\text{target}}$  of 2074, and only a 0.8 percent chance assuming current removals (Table 13 from rebuilding analysis). Note that estimating steepness for yelloweye rockfish, or any rockfish,

is difficult. To reliably estimate it, the stock would need to be fished intensely, and allowed to rebuild. Currently, there is only data available for the downward trajectory for yelloweye rockfish. As such, there is considerable uncertainty with any of the steepness values that have been used in any of the past assessments.

The current  $T_{\text{target}}$  of 2074 is greater than the new  $T_{\text{max}}$  of 2071, and therefore must be changed. The base case model, assuming full ACL removals, predicts rebuilding by 2027. However, given the significant changes in rebuilding from the previous assessment, the GMT cautions against setting a  $T_{\text{target}}$  of 2027. The assessment estimates of productivity (steepness discussion above), recruitment strength, and the associated biomass estimates directly translates to uncertainty in the projected rebuilding dates in the rebuilding analysis. Furthermore, as shown in Table 13, the GMT is suspicious of the unusual knife-edge change in probability under full removals that goes from zero percent in 2026 to 100 percent in 2027. More often, rebuilding analyses demonstrate increasing probabilities through time. If the Council selects a  $T_{\text{target}}$  of 2027 and the next assessment indicates a weaker rebuilding signal and a longer time to rebuild, another regulatory and Fishery Management Plan amendment would be needed. While the GMT acknowledges the base model is the best available science, **the GMT recommends taking into account the uncertainty inherent in the assessment and rebuilding projections by setting the new  $T_{\text{target}}$  at 2061**, which is based on a steepness of 0.509 and full ACL removals. The GMT's proposed  $T_{\text{target}}$  meets the requirement to be less than the new  $T_{\text{max}}$ , is derived from the default HCR under an alternative steepness, and increases the likelihood of rebuilding by that time, specifically in regard to assessment uncertainty such as steepness.

Since there is a low likelihood that the full ACLs will be harvested in the future, the stock may rebuild faster than 2061 under a steepness of 0.509 (e.g., 2054 if removals continue to average 65 percent of the ACLs). However, the GMT notes that removals may increase in the future due to the potential removal of some trawl gear restrictions, as well as the possible opening of the trawl Rockfish Conservation Area (RCA).

#### Pacific Ocean Perch

**The GMT reviewed the POP assessment document ([Agenda Item E.8. Attachment 3, September 2017](#)) and additional analysis provided on the Groundfish Subcommittee's webinar and does not recommend additional alternatives for analysis or changes from the default HCR (ACL = Annual Biological Catch [ABC],  $P^* 0.45$ ). We recognize that the full SSC has not endorsed this assessment at the time this report was submitted, and if anything were to change in the assessment, the GMT will need to comment in a Supplemental Report.**

The 2011 assessment projected estimated depletion to be at 23 percent at the start of 2017. However, the 2017 full assessment, which the GMT believes to be robust, estimates the stock to currently be rebuilt at 76.6 percent. The SSC's final recommendation of a steepness of 0.5 takes into account the model's inability to estimate steepness, while maintaining a reasonable catchability coefficient ( $q$ ) for the West Coast groundfish bottom trawl survey. The Stock Assessment Team (STAT) team produced a range of spawning biomass estimates based on steepness values from 0.25 to 0.95, and then took the arithmetic mean of those estimates of spawning biomass. The steepness associated with that value for mean spawning biomass is  $h = 0.5$ . Even given this new steepness, the stock still stays above 40 percent depletion for the ten year

projection period under full ACL attainment. The GMT believes that the likelihood of attaining the full ACL is low due to the fact that five percent is allocated to non-trawl sectors, and is rarely caught, therefore maximum attainment would likely not exceed 95 percent. Additionally, the trawl sector has had low attainment in recent years, although changes to management may increase this attainment in coming years.

### Oregon Nearshore Complex Alternatives

The Council is considering two proposals for restructuring stock complexes of nearshore groundfish stocks, based on the September Oregon Department of Fish and Wildlife (ODFW) Report ([Agenda Item E.9.a., Supplemental ODFW Report 1, September 2017](#)) and Council action in September ([Agenda Item E.9, Council Action, September 2017](#)). Since the restructuring of stock complexes is considered a new management measure, the GMT provides greater detail regarding implications in Agenda Item F.9, GMT Report 1, November 2017. However, the stock complex alternatives are briefly described here since they affect ACLs of stock complexes. Note that there are no alternative ACLs proposed for individual stocks; these alternatives only pertain to how the ACL contributions (and overfishing limits (OFLs)/ABCs) are grouped (e.g., to sum the ACLs of multiple individual stocks into a complex or not).

The first proposal (Table 1) pertains to Oregon blue/deacon rockfish (BDR), Oregon black rockfish, and the Nearshore Rockfish complex North of 40°10' N. lat. based on a request from the ODFW ([Agenda Item E.9.a., Supplemental ODFW Report 1, September 2017](#)). In Proposal 1, Oregon BDR continues to be managed within the Nearshore Rockfish North of 40°10' N. lat. complex (No Action), is paired with Oregon black rockfish to form a new Oregon black/BDR Complex (Alternative 1), or is managed on its own as a new Oregon BDR complex (Alternative 2).

Proposal 2 (Table 2) pertains to Oregon cabezon, Oregon kelp greenling, and the Other Fish Complex ([Agenda Item E.9, Council Action, September 2017](#)). In Proposal 2, Oregon kelp greenling continues to be managed within the Other Fish Complex (No Action) or is removed from the Other Fish Complex and paired with Oregon cabezon to form a new Oregon cabezon/kelp greenling Complex (Alternative 1).

**Table 1: Alternative stock or stock complex harvest specifications for Oregon black rockfish (RF), Oregon BDR, and the Nearshore RF Complex North of 40° 10' N. lat.**

Alternative	Stock or Stock 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
Alternative 1	Black RF/BDR (OR) Complex	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
Alternative 2	BDR (OR) Complex	112.3	101.5	101.5	108.8	98.4	98.4
	Black RF (OR)	565.0	515.8	515.8	561.0	512.2	512.2
	Nearshore RF North Complex	90.9	81.4	81.4	91.6	82.1	82.1

**Table 2: Alternative stock or stock complex harvest specifications for Oregon cabezon, Oregon kelp greenling, and the Other Fish Complex.**

Alternative	Stock or Stock 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 Complex	479.5	420.2	420.2	465.0	406.4	406.4
Alternative 1	Cabezon/Kelp Greenling (OR) Complex	229.9	218.0	218.0	215.5	204.4	204.4
	Other Fish Complex	298.6	249.0	249.0	298.5	248.9	248.9

**The GMT recommends that the Council specify the ACL alternatives for both Oregon nearshore complex proposals** noting that implications of the alternatives are further discussed in Agenda Item F.9., GMT Report 1, November 2017.

### Off the Top Deductions

#### Tribal, Research, Incidental Open Access, and Exempted Fishing Permits

For information on these off-the-top deductions, see Agenda Item F.9.a, Supplemental GMT Report 2, which will be completed after Agenda Item F.8., Preliminary Exempted Fishing Permit Approval.

#### Buffer for Management Uncertainty

In the 2017-2018 harvest specification and management measure cycle, the Council established a new category of off-the-top deductions, known as buffers, for canary rockfish, darkblotched rockfish, and POP. These buffers were created to address “unforeseen catch events.” However, at the time, an “unforeseen catch event” was not defined.

In June 2017, the Council recommended releasing both the darkblotched rockfish and POP buffers equally to the at-sea sectors due to: (1) unexpected high bycatch rates for darkblotched rockfish and POP; (2) the highest whiting allocations in recent history; and (3) the need for vessels to fish further north in order to avoid Chinook salmon bycatch. NMFS implemented this recommendation on July 7, 2017 ([82 FR 31494](#)). While off-the-top deductions are considered management measures (Agenda Item F.9.), the GMT provides some comments and recommendations under this agenda item to assist the Council in selecting their final preferred ACL alternatives.

With regards to POP and canary rockfish, the GMT does not see a need to continue to have buffers for 2019-2020. POP is now rebuilt and has a presumed ACL 16 times larger than the 2017-2018 ACL, which will significantly reduce the potential that POP will constrain access to target species. There was not a need to release the canary rockfish buffer this year, given the size of the ACL and allocations. The GMT does not expect this to change in the near future. Furthermore, canary rockfish harvest is apportioned using a two-year allocation, and can be changed for the next biennium to address any needs or stranded yield.

For darkblotched rockfish, the Council may want to consider maintaining a buffer, depending on whether they decide to change the management of set-asides for the at-sea sector from the sector-specific formula in the proposed Amendment 21-3, or establish a sector level set-aside every biennium (similar to all other set-aside species). The Amendment 21-3 proposed rule includes the potential for an automatic closure of one or more of the mothership and catcher-processor sectors when the set-aside and buffer are reached or are projected to be reached. If this provision remains in 2019-2020, then the Council may want to consider a buffer for darkblotched rockfish in case of at-sea (or other) sectors having higher than projected mortality. The GMT further describes this new management measure in Agenda Item F.9., GMT Report 1, September 2017. Regardless of development of the buffer, **the GMT recommends the Council confirm the default HCR for setting the darkblotched rockfish ACL Final Preferred Alternative.**

The only other species which the GMT has identified that may benefit from the creation of a buffer for the 2019-2020 biennium is yelloweye rockfish. Yelloweye rockfish is caught primarily in the non-trawl sectors and is constraining to many fisheries. In a supplemental report under Agenda Item F.9, the GMT provides some information for the Council when considering a buffer between the proposed 2019-2020 ACLs and a fishery harvest guideline (HG). However, as mentioned above, **the GMT recommends the Council select the default HCR for setting the yelloweye rockfish ACL FPA.** Then, under Agenda Item F.9, the Council can consider setting the fishery HG below the ACL at the desired level, while accounting for any management uncertainty.

## Recommendations

The GMT recommends:

- **For yelloweye rockfish analyze only the default HCR of a spawning potential ratio (SPR) of 76 percent for 2019-2020 (i.e., do not analyze departures from the default HCR)**
- **Setting the new  $T_{\text{target}}$  for yelloweye rockfish at 2061**
- **For POP analyzing only the default HCR (ACL = Acceptable Biological Catch [ABC],  $P^* 0.45$ ) for 2019-2020 (i.e., do not analyze departures from the default HCR)**

- **Specifying the ACL alternatives (including preliminary preferred) for both the Oregon nearshore complex proposals**
- **Confirm the default HCR for setting the darkblotched rockfish ACL**

## Appendix

**Table 13. Probability of recovery for rebuilding alternatives under different values of stock-recruit steepness ( $h$ ) for the years 2048-2074, assuming either full or 65% of ACLs removed. Excerpt from Vladlena Gertseva and Jason Cope (2017), Rebuilding analysis for yelloweye rockfish (*Sebastes ruberrimus*) based on the 2017 stock assessment.**

Run	Rebuilding cases under full ACL removals			Rebuilding cases under removals of 65% ACLs		
Year	assessment model, h=0.718	h=0.509	h=0.4	assessment model, h=0.718	h=0.509	h=0.4
2017	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2018	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2019	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2020	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2021	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2022	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2023	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2024	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2025	0.0%	0%	0.0%	0.0%	0.0%	0.0%
2026	0.0%	0%	0.0%	100.0%	0.0%	0.0%
2027	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2028	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2029	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2030	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2031	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2032	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2033	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2034	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2035	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2036	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2037	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2038	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2039	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2040	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2041	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2042	100.0%	0%	0.0%	100.0%	0.0%	0.0%
2043	100.0%	0%	0.0%	100.0%	0.1%	0.0%
2044	100.0%	0%	0.0%	100.0%	0.4%	0.0%
2045	100.0%	0%	0.0%	100.0%	1.1%	0.0%
2046	100.0%	0%	0.0%	100.0%	2.0%	0.0%
2047	100.0%	0%	0.0%	100.0%	5.1%	0.0%

**Table 13 (continued).**

Run	Rebuilding cases under full ACL removals			Rebuilding cases under removals of 65% ACLs		
Year	assessment model, h=0.718	h=0.509	h=0.4	assessment model, h=0.718	h=0.509	h=0.4
2048	100.0%	1%	0%	100.0%	9.4%	0.0%
2049	100.0%	1%	0%	100.0%	13.5%	0.0%
2050	100.0%	2%	0%	100.0%	19.9%	0.0%
2051	100.0%	4%	0%	100.0%	27.1%	0.0%
2052	100.0%	6%	0%	100.0%	34.4%	0.0%
2053	100.0%	9%	0%	100.0%	42.5%	0.0%
2054	100.0%	13%	0%	100.0%	50.5%	0.0%
2055	100.0%	17%	0%	100.0%	57.8%	0.0%
2056	100.0%	22%	0%	100.0%	65.9%	0.0%
2057	100.0%	27%	0%	100.0%	72.1%	0.0%
2058	100.0%	32%	0%	100.0%	77.5%	0.0%
2059	100.0%	39%	0%	100.0%	83.1%	0.0%
2060	100.0%	45%	0%	100.0%	87.4%	0.0%
2061	100.0%	50%	0%	100.0%	90.5%	0.0%
2062	100.0%	55%	0%	100.0%	92.9%	0.0%
2063	100.0%	61%	0%	100.0%	94.7%	0.0%
2064	100.0%	66%	0%	100.0%	96.2%	0.0%
2065	100.0%	71%	0%	100.0%	97.1%	0.0%
2066	100.0%	76%	0%	100.0%	97.9%	0.0%
2067	100.0%	79%	0%	100.0%	98.3%	0.0%
2068	100.0%	82%	0%	100.0%	99.0%	0.0%
2069	100.0%	85%	0%	100.0%	99.4%	0.1%
2070	100.0%	87%	0%	100.0%	99.5%	0.2%
2071	100.0%	89%	0%	100.0%	99.5%	0.4%
2072	100.0%	90%	0%	100.0%	99.6%	0.4%
2073	100.0%	92%	0%	100.0%	99.9%	0.4%
2074	100.0%	94%	0%	100.0%	99.9%	0.8%