

GROUND FISH MANAGEMENT TEAM REPORT ON 2011-2012 MANAGEMENT MEASURES CONSIDERATION FOR OVERFISHED SPECIES ANNUAL CATCH LIMITS

Each biennial management cycle, the Council reviews existing rebuilding plans for their performance in times to rebuild, the performance of our management measures at keeping total mortality within the annual rebuilding limits, and the impact of management measures on the sectors managed under and affected by the groundfish FMP.

This management cycle, the Council faces a few required revisions to rebuilding plans based on our understanding of times to rebuild and a new rebuilding plan for petrale. The Council may wish to revise other rebuilding plans based on new understanding of the tradeoff in times to rebuild and the impact to fishing communities.

In addition, the Council is looking at a significant change to the management system in 2011-12 with the pending implementation of the trawl rationalization program. The Amendment 20 analysis details the importance of improved bycatch performance to the three trawl catch share programs, although the analysis admitted considerable uncertainty in the bycatch encounter rates we will see after the transition. Individual accountability creates an incentive to reduce bycatch, yet learning and change within the fleets should be expected in the early years of the program. The Council will gain much better certainty about bycatch on account of the program's improved at sea and shoreside monitoring.

With this brief overview, we provide stock by stock discussion on the rebuilding species and discussion of the draft rebuilding alternatives proposed by Council staff (Agenda Item I.4.a, Attachment 1). We have opportunity at this meeting, albeit limited opportunity, to provide the Council with additional information on rebuilding considerations during Agenda Item I.6.

New Rebuilding Plans

Petrale Sole

The GMT offers the following summary of the rebuilding analysis for the petrale, including both "year-round fishery" and "no winter fishery" scenarios.¹ As with the other rebuilding stocks, the Council will consider the contrast between rebuilding times and the needs of the fishing communities when choosing a rebuilding plan for petrale. As the Council is aware, the petrale rebuilding plan must attempt to rebuild the stock within the ten year period allowed by the Magnuson-Stevens Act (MSA).²

¹ Catch projections for alternatives 1, 2, and 4 are from the petrale sole rebuilding analysis (PFMC Briefing Book, November 2009). Catch projections for alternative 3 were updated by the rebuilding analysis author at the request of Council staff and received by the GMT on April 12. to reflect the Council's 25-5 control rule instead of the (25-6.25 control rule).

² Section 304(e)(4) requires the Council to rebuild stocks in "'as short [a time] as possible' and, if biologically possible, in less than 10 years.'" NRDC vs. NMFS, 421 F.3d 872 (2005).

As a reminder, the four alternatives in both the “year-round” and “no winter” scenarios represent the following harvest strategies:

- **Alt1:** F=0 (“no fishing”);
- **Alt2:** Harvesting at SPR harvest rate = 0.500;
- **Alt3:** Harvesting at the proxy F_{MSY} proxy harvest rate with 25:5 precautionary adjustment;
- **Alt4:** Harvesting at the OFL (F_{MSY} proxy harvest rate (SPR= 0.300)).

The projections for alternatives 3 and 4 will potentially be altered by the Council’s ABC control rule decision and the method for applying the 25:5 control rule for petrale.

To compare the four alternatives and two scenarios, the GMT summed projected rebuilding yields over the rebuilding period to contrast how alternatives might meet the short- and long-term needs of fishing communities. The rebuilding projections—reflecting the status and biology of the stock—do not show a tradeoff between expected yield in the short-term yield and yield over the long-term. In fact, the rebuilding analysis projects that the alternative that would be expected to produce the most yield over the rebuilding period is also the alternative that causes the most delay in rebuilding under both scenarios. However, the rebuilding analysis does show some contrast between the alternatives in terms in their probabilities of recovery.

The following tables and figures help illustrate these points.

Table 1. Comparison of “Year Round Fishery” and “No Winter Fishery Scenarios” for all four rebuilding alternatives

| | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | <i>Alt 4</i> |
|--|--------------|--------------|--------------|--------------|
| "Year Round" Total Yield (mt), 2011-2021 | 14,000 | 16,819 | 19,020 | 19,224 |
| "No Winter" Total Yield (mt), 2011-2021 | 16,000 | 18,183 | 18,929 | 19,147 |
| "Year Round" Ttarget | 2014 | 2014 | 2015 | 2017 |
| "No Winter" Ttarget | 2013 | 2013 | 2016 | 2017 |
| "Year Round" P(recovery) >= 75% | 2014 | 2015 | 2019 | 2021 |
| "No Winter" P(recovery) >= 75% | 2014 | 2014 | 2020 | 2021 |

Table 2. "Year-Round Fishery" – Differences (column to row) in Expected Yield (mt) over 10-year Rebuilding Period

| | Alt 1 | Alt 2 | Alt 3 | Alt 4 |
|-------|-------|-------|-------|-------|
| Alt 1 | -- | 2,819 | 5,020 | 5,224 |
| Alt 2 | -- | -- | 2,201 | 2,405 |
| Alt 3 | -- | -- | -- | 204 |
| Alt 4 | -- | -- | -- | -- |

Table 3. “Year Round Fishery” – Difference in Years to Rebuild to T_{Target} (column to row)

| | Alt 1 | Alt 2 | Alt 3 | Alt 4 |
|-------|-------|-------|-------|-------|
| Alt 1 | -- | 0 | 1 | 3 |
| Alt 2 | -- | -- | 1 | 2 |
| Alt 3 | -- | -- | -- | 2 |
| Alt 4 | -- | -- | -- | -- |

Table 4. "No Winter Fishery" Scenario – Differences (column to row) in Expected Yield (mt) over 10-year Rebuilding Period

| | Alt 1 | Alt 2 | Alt 3 | Alt 4 |
|-------|-------|-------|-------|-------|
| Alt 1 | -- | 2,183 | 2,929 | 3,147 |
| Alt 2 | -- | -- | 746 | 964 |
| Alt 3 | -- | -- | -- | 219 |
| Alt 4 | -- | -- | -- | -- |

Table 5. "No Winter Fishery" Scenario – Difference in Years to Rebuild to T_{Target} (column to row)

| | Alt 1 | Alt 2 | Alt 3 | Alt 4 |
|-------|-------|-------|-------|-------|
| Alt 1 | -- | 0 | 3 | 4 |
| Alt 2 | -- | -- | 3 | 4 |
| Alt 3 | -- | -- | -- | 1 |
| Alt 4 | -- | -- | -- | -- |

Table 6. Projected probabilities of recovery for petrale rebuilding alternatives in the “no winter fishery” and “year round fishery” scenarios.

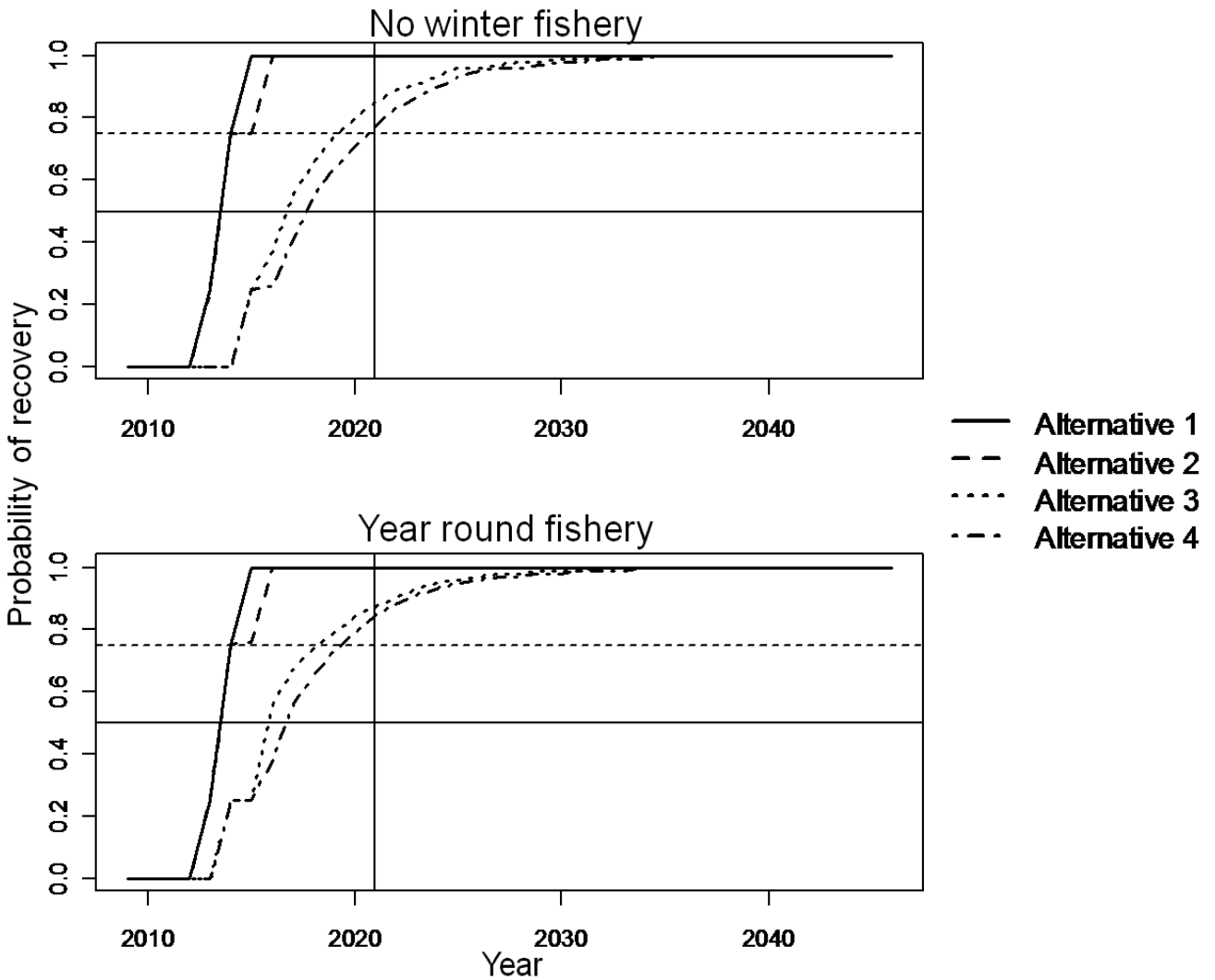


Table 7. Projected Catch Streams for Petrale Rebuilding Alternatives, cumulative probability of recovery “P(recovery)” and ex-vessel value (based on \$1.14 coastwide average \$ per lb, 2006-09). Ex-vessel value is not discounted. Approximate equilibrium yield held constant in year after stock hits T_{Target}.

"Year-Round" Fishery

| <u>Alternative 1</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| ACL | 0 | 0 | 0 | 0 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 14,000 |
| P(recovery) | 0% | 0% | 25% | 75% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | -- |
| Ex-vessel \$(thous.) | \$0 | \$0 | \$0 | \$0 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$15,960 |
| <u>Alternative 2</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
| ACL | 459 | 624 | 791 | 945 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 16,819 |
| P(recovery) | 0% | 0% | 25% | 75% | 76% | 100% | 100% | 100% | 100% | 100% | 100% | -- |
| Ex-vessel \$(thous.) | \$523 | \$711 | \$902 | \$1,077 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$19,174 |
| <u>Alternative 3</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
| ACL | 776 | 1,160 | 1,481 | 1,720 | 1,883 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 19,020 |
| P(recovery) | 0% | 0% | 0% | 25% | 25% | 56% | 67% | 74% | 79% | 84% | 87% | -- |
| Ex-vessel \$(thous.) | \$885 | \$1,323 | \$1,689 | \$1,960 | \$2,146 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$21,683 |
| <u>Alternative 4</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
| ACL | 1,021 | 1,279 | 1,507 | 1,690 | 1,824 | 1,919 | 1,984 | 2,000 | 2,000 | 2,000 | 2,000 | 19,224 |
| P(recovery) | 0% | 0% | 0% | 25% | 25% | 38% | 56% | 65% | 73% | 79% | 84% | -- |
| Ex-vessel \$(thous.) | \$1,164 | \$1,458 | \$1,718 | \$1,927 | \$2,079 | \$2,188 | \$2,262 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$21,915 |

"No Winter" Fishery

| <u>Alternative 1</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| ACL | 0 | 0 | 0 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 16,000 |
| P(recovery) | 0% | 0% | 25% | 75% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | -- |
| Ex-vessel \$(thous.) | \$0 | \$0 | \$0 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$18,240 |
| <u>Alternative 2</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
| ACL | 586 | 732 | 866 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 18,183 |
| P(recovery) | 0% | 0% | 25% | 75% | 75% | 100% | 100% | 100% | 100% | 100% | 100% | -- |
| Ex-vessel \$(thous.) | \$667 | \$834 | \$987 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$20,729 |
| <u>Alternative 3</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
| ACL | 900 | 1,232 | 1,482 | 1,662 | 1,784 | 1,869 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 18,929 |
| P(recovery) | 0% | 0% | 0% | 0% | 25% | 37% | 55% | 66% | 74% | 80% | 85% | -- |
| Ex-vessel \$(thous.) | \$1,026 | \$1,404 | \$1,689 | \$1,895 | \$2,034 | \$2,131 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$21,579 |
| <u>Alternative 4</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> | <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> | <u>Total</u> |
| ACL | 1,170 | 1,369 | 1,528 | 1,653 | 1,744 | 1,816 | 1,868 | 2,000 | 2,000 | 2,000 | 2,000 | 19,147 |
| P(recovery) | 0% | 0% | 0% | 0% | 25% | 26% | 41% | 55% | 64% | 71% | 77% | -- |
| Ex-vessel \$(thous.) | \$1,334 | \$1,560 | \$1,742 | \$1,884 | \$1,988 | \$2,070 | \$2,130 | \$2,280 | \$2,280 | \$2,280 | \$2,280 | \$21,828 |

The GMT recommends narrowing the range of petrale rebuilding alternatives for analysis. We expect our analysis for petrale to be more straightforward than for the rebuilding rockfish stocks because petrale is a fishery target and predominantly taken by trawl gear. As the Council well knows, petrale sole is one of the most economically important target stocks in the non-whiting trawl fishery.

The GMT request guidance on how to analyze allocations between sectors (i.e., trawl, and non-trawl). In addition to guidance on whether to have a winter only, or year round fishery, the GMT would like preliminary guidance on allocations among sectors. The GMT understands that Amendment 21 allocations are suspended under rebuilding, as such any guidance on how to allocate between trawl and non-trawl would be appreciated. The GMT notes that the relative proportion of take for the non-trawl sectors prior to rebuilding has been less than 1% (Table 8). We can provide more information to help the Council develop these allocations under I.6 as needed.

Table 8. 1995-2005 average percentage of annual non-treaty landed catch in directed groundfish fisheries.

| Percent petrale | Whiting | | Non-whiting | | Total trawl | Total non-trawl |
|--------------------|---------|------|-------------|-------|----------------|--------------------|
| | CP | MS | SS | trawl | | |
| | 0.0% | 0.0% | 0.0% | 99.0% | 99.0% | 1.0% |

Revised Rebuilding Plans

In November 2009, the Scientific and Statistical Committee (SSC) recommended that the Council revise the rebuilding plans (target rebuilding years and harvest rates) for canary and Pacific Ocean perch because the best scientific information available resulted in “fundamental revisions to our understanding of the biology” of these stocks. These revisions to the best estimates of “as quick as possible” rebuilding times are substantially different than those used to set 2009-2010 harvest specifications and the Amendment 16-4 rebuilding plans.

Canary rockfish

The 2009-10 canary OY was based on a SPR harvest rate of F92.2%, which is lower than the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. The Council decided to specify a target rebuilding year of 2021, which is one year longer than the median rebuilding time and two years longer than TF=0. The 2007 assessment and rebuilding analysis provided a different picture of the status and biology of the canary stock than the previous assessment and analyses that were used to develop the Amendment 16-4 canary rockfish rebuilding plan.

The updated (2009) canary rockfish assessment indicated a more depleted stock status than the previous assessment. As a result, none of the ACL alternatives will meet the current T_{target} (2021) in the rebuilding plan. As a reminder, this change in stock perception is attributable to the inclusion of a revised historical catch time series in California. The current rebuilding plan for canary rockfish specifies a T_{target} of 2021, with a status quo SPR harvest rate of 88.7% ($F_{88.7\% SPR}$). The revised rebuilding analysis suggests that the no fishing alternative ($F_{100\%SPR}$) results in a minimum time to recovery of 2024 (T_{min}), thereby requiring a revision to the rebuilding plan.

In its November 2009 report to the Council, the SSC stated that the canary rockfish cumulative OY was exceeded by 14% over the period 2000-2007 which was due primarily to an excess harvest of 40 mt in 2001, when constraints on the groundfish fishery were first being imposed (Agenda Item G.2.b, Supplemental SSC Report, November 2009). Management of this stock has tended to constrain more west coast fisheries than any other groundfish stock since canary rockfish are distributed coastwide, are found in a variety of habitats, and are caught by a variety of different fishing gears.

Canary rockfish will be an extremely important species under the trawl rationalization program. Since trawl rationalization has yet to be implemented, the exact needs of the fishery are unknown. It is anticipated that the needs may be greater than in previous years as the fleet adjusts to the new program. Likewise, canary rockfish are an extremely important species for the fixed gear and recreational fisheries. Despite more restrictive management measures, canary bycatch has been increasing in recent years, possibly due in part to rebuilding of the stock.

In its choice of a 2011-12 ACL, the Council could choose to deviate from the rationale used in 2009-10 and maintain the status quo SPR harvest rate. Although the new assessment indicated a change overall stock depletion level, the productivity of the stock remained unchanged. The Council's preliminary range of canary ACL alternatives includes 0 mt, 49 mt, 69 mt, 102 mt (the ACL under the status quo harvest rate), 129 mt, and 155 mt. These alternatives predict a range of rebuilding periods from 2024 under a zero harvest strategy to 2028 under the 155 mt alternative. The GMT analysis in the 2008-2009 Harvest Specifications and Management Measures Environmental Impact Statement (EIS) showed substantial adverse socioeconomic impacts associated with OYs less than or equal to 44 mt. Since it is anticipated that there will be increased need for canary (especially as we transition into trawl rationalization and as canary interactions increase due to rebuilding) some of the low ACL alternatives (49 mt and 69 mt) may require more drastic management measures to stay within the ACL. Also, for the same level of harvest in 2009, you are going to have greater canary interactions than you would have in previous years based solely on rebuilding (i.e., the rebuilding paradox).

Pacific ocean perch

The 2007-2008 OY of 150 mt, the 2009 OY of 189 mt and the 2010 OY of 200 mt for Pacific ocean perch (POP) are based on a rebuilding plan with a target year to rebuild of 2017 and an SPR harvest rate of 86.4 percent. The 2009-2010 OYs for POP are consistent with the existing rebuilding plan, last revised in 2007. The Council initially selected a preliminary preferred OY of 100 mt for 2007-2008 based on status quo catches in the commercial slope fisheries. The Council also considered that POP and darkblotched co-occur, and then increased the POP OY to accommodate increasing bycatch rates that were presumed to be due to rebuilding and to allow additional slope opportunities that would take both POP and darkblotched. This in turn would take some fishing pressure off of sensitive shelf species. The hope was to increase fishery stability during the season and decrease the need for inseason management actions without a significant increase in rebuilding times (increase the POP rebuilding time by about 1 year from the F=0 alternative).

The 2009 stock assessment for POP incorporates a lower estimate of biomass from the NWFSC trawl survey in 2007 and a correction to a small data error in the 2007 assessment update. The current rebuilding plan for (POP) specifies a T_{target} of 2017, with a status quo SPR harvest rate of 86.4% ($F_{86.4\% SPR}$). The revised rebuilding analysis suggests that the no fishing alternative ($F_{100\%SPR}$) results in a minimum time to recovery of 2018 (T_{min}), thereby requiring a revision to the rebuilding plan.

POP is predominantly caught in the trawl fishery, and is subject to the allocations adopted under Amendment 21. POP and darkblotched rockfish should be considered together, as they co-occur on the slope. It is also still likely that canary rockfish will be constraining for shelf opportunities in the northern trawl fisheries, so providing slope opportunities with a relatively higher impact on POP and darkblotched would provide the fishing opportunities needed to sustain the fishing community. If the Council chooses a preliminary preferred ACL alternative for darkblotched consistent with the current SPR harvest rate (332 mt) then the Council may want to consider maintaining the 2011-2012 POP ACL at a level similar to status quo (e.g. 204 and 208 mt for 2011 and 2012 respectively based on the current harvest rate), to allow for slope opportunities that would take both POP and darkblotched.

In 2007, the OY of 150 mt was exceeded by 4% (157 mt). It is likely that the severe nearshore restrictions in the northern trawl fishery to protect canary rockfish contributed to exceeding the 2007 OY. Also, higher bycatch rates than anticipated may have contributed to underestimating projected impacts in 2007. The current 2010 scorecard estimates that 120 mt of POP will be caught out of the 200 mt OY.

Considerations for revisions to other rebuilding plans

Yelloweye rockfish

The 2009 yelloweye assessment contains many changes to the 2007 assessment (e.g. sex-specific modeling, estimation of natural mortality, growth, and steepness parameters, area-specific treatments of population dynamics, and a new specified fecundity function). The current rebuilding plan for yelloweye rockfish specifies a T_{target} of 2084, with a status quo SPR harvest rate of 71.9% ($F_{71.9\% SPR}$). The revised rebuilding analysis suggests that the no fishing alternative ($F_{100\%SPR}$) results in a minimum time to recovery of 2047 (T_{min}). The status quo SPR harvest rate results in a median time to rebuild of 2087, 3 years after the current T_{target} . To rebuild with 50% probability by the current T_{target} , harvest rates could be reduced to a SPR harvest rate of 72.8%. The 2009-10 OY of 17 mt corresponds to a SPR harvest rate of 86% ($F_{86\% SPR}$) under the revised rebuilding analysis.

As the Council is well aware, yelloweye affects many fisheries, mainly recreational and fixed gear fisheries but also the non-whiting trawl fishery as well. This current year, 2010, is the final year of the ramp-down strategy. The Council's intention for 2011-12 is to pick a constant SPR harvest rate.

The Council's preliminary range of yelloweye ACL alternatives includes 0 mt, 9 mt, 13 mt, 17 mt (the ACL under the status quo harvest rate), 20 mt, and 21 mt.

Bocaccio

The 2007-2008 OY of 218 and the 2009-2010 OY of 288 is based on a rebuilding plan with a target year to rebuild of 2026 and a SPR harvest rate of 77.7 percent. The 2009 and 2010 OYs for bocaccio are consistent with the existing rebuilding plan, last revised in 2007. The Council considered setting the 2007-2008 bocaccio OY at 190 mt, but decided to recommend a higher OY of 218 mt because bocaccio recruitment is highly variable and there was evidence in the stock assessment of a strong 2003 year class, as well as anecdotal information of a strong year class entering the fishery. A 218 mt OY increased the bocaccio rebuilding time by 5 years from the F=0 alternative.

The current rebuilding plan for bocaccio specifies a T_{target} of 2026, with a status quo SPR harvest rate of 77.7% ($F_{77.7\% SPR}$). The revised rebuilding analysis suggests that maintaining the status quo SPR harvest rate of 77.7% ($F_{77.7\% SPR}$) results in a new T_{target} of 2022, which is four years ahead of schedule.

Total mortality reports for bocaccio indicate that the OY has not been exceeded since 2001. In 2007, 31% of the OY was taken. The GMT notes that the 2008 year-end scorecard (November 2008) estimated that 40% of the bocaccio OY would be taken through the end of 2008, but in 2008, only 21% of the OY was taken (2008 Total Mortality Report). The current 2010 scorecard estimates that 104 mt of bocaccio will be caught out of the 288 mt OY.

Bocaccio is rebuilding ahead of the current T_{target} of 2026. However, bocaccio still show strong variability in recruitment increasing the amount of uncertainty in rebuilding trajectories. In 2007 and 2008, mortality of bocaccio was well below the OYs for those years. The GMT notes that as bocaccio rebuilds, bycatch rates may increase.

The Council may want to consider using similar rationale to set the 2011-2012 rebuilding ACLs as was used in 2007 through 2010, where the projected impacts for this year (2010) are used as a basis, and then increased to provide enough buffer to prevent exceeding the 2011-2012 ACL due to recruitment variability. The 2011 ACL under a status quo SPR harvest rate of 77.7% ($F_{77.7\% SPR}$) is 263 mt and the rebuilding analysis indicates that, with this harvest rate, the stock is projected to be rebuilt ahead of schedule.

Cowcod

The 2009 rebuilding analysis indicates the shortest possible time to rebuild under a zero harvest strategy is 2060. The status quo 2009-10 OY of 4 mt corresponds to the SPR harvest rate of F79% in the current rebuilding plan (Table 9). Maintaining the status quo OY of 4 mt, which corresponding to an SPR of 79% will prolong rebuilding until 2071, or 11 years longer than the shortest possible rebuilding time under the zero harvest option. A lower OY for cowcod such as the 2 mt OY (SPR = F90%) under Amendment 16-4 could adversely impact recreational and trawl fisheries off California. An ACL of 9 mt is the highest harvest that meets legal requirement for 50% probability of rebuilding by the T_{max} of 2097, though harvesting at this level will prolong rebuilding until 2097, 37 years after the zero harvest option, contradictory to the priority of rebuilding in the quickest time possible taking into account the needs of fishing communities.

Table 9. Cowcod Rockfish Alternatives under Revised Rebuilding Plans (summarized from Agenda Item I.2.a Attachment 2).

| Cowcod | Alt 1 | Alt 2 | Alt 3 | Alt 4 | Alt 5 |
|----------------------|--------------|--------------|--------------|--------------|--------------|
| 2011 ACL (mt) | 0 | 2 | 3 | 4 | 9 |
| Ttarget | 2060 | 2064 | 2068 | 2071 | 2097 |
| SPR | F100% | F90% | F82.7% | F79% | F59.7% |
| Tmax | 2097 | 2097 | 2097 | 2097 | 2097 |
| Pmax | 78.4% | 72.4% | 66.2% | 66.2% | 50% |

Darkblotched Rockfish

The latest assessment update for darkblotched shows that darkblotched rockfish biomass is increasing, providing more optimistic perception of the stock than in the 2007 assessment. The 2010 OY was set at 291 mt and the current T_{target} in the rebuilding plan is 2028. The status quo SPR harvest rate would result in an ACL of 332 mt.

Annual Catch Limits (ACLs) for darkblotched rockfish in the integrated alternatives presented under this Agenda Item range from 130 to 461 mt (Tables 2-3, Agenda Item I.4.a, Attachment 1). The total mortality for darkblotched rockfish in the bottom trawl fleet exceeded 220 mt during 2008 (Bellman et al., 2009). As such alternatives less than 240 mt would likely require more conservative management measures (e.g. lower cumulative limits, deeper RCA boundaries). The current 2010 scorecard shows projected impacts of 287.6 mt. Hence, only alternative 4 (461 mt), 5 (332 mt), or 6 (461 mt) would not further constrain fisheries in the north. The high slope-low shelf (alternatives 4 and 5) or high slope-high shelf (alternative 6) from Tables 2 and 3, Agenda Item I.4.a, Attachment 1 are the two alternatives with an ACL larger than current projected impacts.

There are tradeoffs to consider as the ACL for darkblotched is increased or decreased. For example, because trawl fishery opportunities are heavily influenced by the darkblotched ACL, it may constrain the most valuable target species caught with trawl gear including sablefish, Dover sole, and thornyheads (DTS). Other overfished species (i.e. petrale sole and POP) will constrain catches of this slope complex as well. Previous GMT reports have noted that a reduction in the darkblotched OY results in less trawl activity seaward of the RCA in the north. More restrictive RCA boundaries may have a distinct geographic effect by limiting opportunities for vessels off central and northern Oregon and Washington because target species are less available at deeper depths as one moves north. A reduction in the darkblotched ACL can result in a fairly dramatic shift in trawl opportunity for DTS species from north to south.

The management framework for darkblotched rockfish will likely change considerably under trawl rationalization compared to previous years. Darkblotched is one of the species for which there will be a formal allocation to the trawl sector under Amendment 21. Although the RCAs will remain in effect, fishermen will be operating under TIQs instead of trip limits. Hence, trip limit management, which may result in high levels of discarding, will no longer exist for the bottom trawl fishery. Currently, approximately half of the darkblotched caught by bottom trawl is discarded.³

Other fisheries besides the bottom trawl also encounter darkblotched rockfish. The open access pink shrimp fishery was shown to take 11.3 mt of darkblotched rockfish during 2008.⁴ Most darkblotched rockfish taken by pink shrimp trawls are juveniles and range in lengths of 5 to 30 cm (Data Report and Summary Analyses of the California and Oregon Pink Shrimp Fisheries, WCGOP, Seattle, WA, December 2008). Darkblotched rockfish are also caught by non-nearshore fixed gear fisheries (10.5 mt; Bellman et al., 2009) and whiting fisheries (1.22 mt during 2009; NMFS).

Widow rockfish

The 2009 OY of 522 mt and the 2010 OY of 509 mt was based on a rebuilding plan with a target year to rebuild of 2015 and an SPR harvest rate of 95 percent (a constant harvest rate strategy).

In contrast to darkblotched, the rebuilding analysis projects that this ACL decision will not affect the probability or time to rebuild given that the stock is estimated to be on the verge of rebuilding and all ACLs remain below the F_{MSY} proxy harvest rate for rockfish. Based on the 2009 assessment, the median time to rebuild is constant at 2010 regardless of ACL level, ranging from 0 to 3,000 mt (Agenda Item G.2.a Attachment 6, November 2009). The Council was faced with a similar projection last cycle, where the rebuilding projections were between 0 and 4,000 mt (Agenda Item D.3.a Attachment 11, November 2007).

Like last cycle, the rebuilding year for widow rockfish is less sensitive to changes in harvest level than darkblotched, so the Council may also recommend an increasing the widow rockfish ACL relative to the darkblotched rockfish OY to allow flexibility in whiting targeting while rebuilding darkblotched rockfish faster.

The 2009 widow rockfish assessment estimated the population is at 38.9% depletion and is approaching target spawning output. The 2009 widow rockfish rebuilding plan indicates that the T_{target} is 2010 under the status quo SPR harvest rate of 95% (Agenda Item G.2.b Supplemental SSC Report, November 2009).

The majority of harvest of widow rockfish is in the non-tribal whiting trawl fishery. Widow will have a formal allocation between the trawl and non-trawl sectors under Amendment 21. The

³ Bellman, Marlene A., Eliza Heery, and Janell Majewski 2009. Estimated discard and total catch of selected groundfish species in the 2008 U.S. West Coast Fisheries. West Coast Groundfish Observer Program, National Marine Fisheries Service, Seattle, WA. October.

⁴ (Bellman et al., 2009)

widow rockfish OYs have not been exceeded in recent years as reflected in the total mortality reports from 2007 and 2008. In 2007, 70% of the 368 mt OY was taken and in 2008 65% of the 368 mt OY was taken. The current 2010 scorecard estimates projected impacts to be 375 mt out of the 509 mt 2010 OY. If the Council chooses to maintain the status quo SPR harvest rate of 95%, the resulting harvest specification would be 352 mt, 23 mt lower than the 2010 projected impacts. The GMT notes that the 2010 projected impacts assume that the entire 2010 widow rockfish bycatch limit in the non-tribal whiting trawl fishery is caught.

The Council may choose to increase the 2011 ACL from 352 mt, the tonnage resulting by maintaining the SPR harvest rate of 95%, in order to prevent constraining fisheries that take widow rockfish since the population is anticipated to be rebuilt by 2010 under any harvest level between 0 mt and 3,000 mt. Also setting widow harvest levels higher than recent catch amounts provides flexibility to the whiting fleet to harvest their entire whiting allocation while avoiding more vulnerable overfished species.

Consideration of Fishery Impacts

Washington, Oregon, and California Recreational Fisheries

In all options, yelloweye rockfish is the constraining species for recreational fisheries. Recreational fisheries south of approximately San Francisco may be the exception. Management measures taken to reduce yelloweye rockfish catch in the recreational fisheries include reductions in season length, depth closures, bag limits, and yelloweye rockfish conservation areas (YRCAs). More state specific detail is provided below.

California Recreational Fisheries

The California Department of Fish and Game (CDFG) is proposing a range of management measures for its recreational fisheries in 2011 and 2012 to meet the constraints of the high and low ACL options for constraining species in each management area. The Northern and North Central North of Pt. Arena Management Areas will continue to be constrained by yelloweye rockfish as reflected by the 20 fm depth restriction and 4 and 3 month seasons in these respective areas required to keep yelloweye rockfish impacts within the 2.8 mt statewide HG. In the North-Central South of Point Arena and South-Central Management Areas, blue rockfish and minor Nearshore rockfish are potential constraints on the season length, while yelloweye and canary rockfish have constrained the maximum allowable depth restrictions to 30 and 40 fathoms respectively. The Southern Management Area is constrained by cowcod and bocaccio impacts. Proposed management measures will be designed to remain within the recreational harvest guidelines resulting from the Councils preferred ACLs and biennial catch apportionments for these species.

Oregon Recreational Fisheries

The Oregon Department of Fish and Wildlife (ODFW) is proposing a range of management measures for its recreational fisheries in 2011 and 2012 to fall within the constraints of the range of ACL options for limiting species. As in previous biennial management cycles, yelloweye rockfish will be the most constraining species to Oregon recreational fisheries, as evidenced by the current April through September depth restriction. An ACL option lower than status quo (17 mt) will require the examination of further seasonal depth restrictions, reduced bag limits, or other management measures. The Stonewall Bank YRCA will have to remain in place, as will restrictions on retention of groundfish during all-depth halibut fisheries. Proposed management measures will be set up to remain within the recreational harvest guideline for resulting the Council's preferred ACLs and biennial catch apportionments for the overfished species.

Washington Recreational Fisheries

The Washington Department of Fish and Wildlife (WDFW) is proposing a range of management measures for its recreational fisheries in 2011 and 2012. Yelloweye rockfish continues to be the species that is the most constraining to recreational fisheries. It will be necessary to maintain the use of depth restrictions that limit recreational fishing in waters deeper than 20 or 30 fathoms and Yelloweye Rockfish Conservation Areas (YRCAs) in both the northern and central management areas where yelloweye rockfish impacts are the greatest. Proposed management measures will be structured to keep impacts within the recreational harvest guidelines resulting from the Council's preferred ACLs and biennial catch apportionments for overfished species.

Open Access Nearshore Commercial Groundfish Fishery

As in the recreational fisheries, the nearshore commercial fishery is primarily constrained by yelloweye rockfish. West Coast Groundfish Observer Program (WCGOP) data indicate that yelloweye impacts were relatively high in the area between Cape Mendocino (40°10' N. lat.) and Cape Blanco (43° N. lat.), as such a 20 fm depth restriction was implemented in that area in 2009 to restrict yelloweye impacts. Impacts south of 40°10' N lat. are negligible and do not result in any appreciable yelloweye savings, therefore, no changes have been proposed in that area. Further depth restrictions are not viable between 40°10' N. lat. and 43° N. lat. due to vessel safety concerns; therefore, the remaining option for depth restrictions in that area is total fishery closure. Reductions in overall trip limits can reduce fishery activity in the aggregate, while closures of areas with relatively high encounters of yelloweye may maintain the aggregate catch level while adversely impacting select communities adjacent to those closures.

Slope Fixed Gear Commercial Groundfish Fisheries

In all options, yelloweye rockfish is the primary species that constrains opportunities in this fishery. Currently, the seaward boundary of the fixed gear RCA north of 40 10 N. Lat. is 100 fm for all areas except the area between 40°10' to 45°03.83' N lat., where the seaward boundary is 125 fm. Further reductions in catch of yelloweye rockfish could be enabled by moving the seaward boundary for other areas to 125 fm (e.g., if the ACL for yelloweye rockfish was reduced below 17 mt). The first year of the 125 fm RCA line was 2009. The effectiveness of moving this seaward RCA is uncertain until the release of the 2009 Total Mortality Report by the WCGOP.

Non-Whiting Trawl Fisheries

Until recently, darkblotched rockfish had been the principal overfished species encountered by bottom trawlers fishing on the slope. Although POP is also caught on the slope, darkblotched continues to have more of a constraint on harvest opportunities, which was described in the 2009-2010 harvest specifications statement. The addition of petrale sole to the suite of species under rebuilding plans, however, may overshadow the constraints of darkblotched rockfish for the bottom trawl fishery. Nonetheless, all three species will be encountered by trawl fishermen while targeting other slope species (e.g., Dover sole, sablefish, thornyheads, and slope rockfish), and all will constrain fishing opportunities on the slope.

Integrated Alternatives

Based on these considerations for overfished rockfish species the GMT recommends narrowing the suite of integrated alternatives for analysis in the 2011-2012 harvest specifications and management measures EIS. The GMT will come back under Agenda Item I.6 with model results to illustrate the management measures necessary to meet the integrated ACL alternatives. Also under I.6, the GMT will provide further considerations for two-year sector allocations based on preliminary Council guidance.

The GMT and the Council will want to consider which ACL alternatives (and sector allocations under those alternatives), would be necessary to sustain current fishing opportunities (i.e., account for the needs of fishing communities, rebuild in as short a time as possible given, consider stock biology and the ecosystem, etc.).

Recommendations

1. Provide guidance on a narrower range on a petrale rebuilding plan and specify a range of Ttargets. Consider providing guidance on how to treat sectors (e.g., trawl, non-trawl, treaty) under rebuilding or request information to help the Council do so under Agenda Item I.6.
2. Provide guidance on a narrower range of integrated alternatives as well as a preliminary preferred alternative to analyze.
3. Provide preliminary guidance on sector allocations.

PFMC
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