

CHAPTER 14: ASSESSMENT OF THE DEMERSAL SHELF ROCKFISH STOCK IN THE SOUTHEAST OUTSIDE DISTRICT OF THE GULF OF ALASKA

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EXECUTIVE SUMMARY

This year we present an executive summary for the Demersal Shelf Rockfish (DSR) stock assessment with updated catches and average weights only. This report is submitted to the North Pacific Fishery Management Council annually as part of the stock assessment and fishery evaluation review for the federally managed groundfish species of the Gulf of Alaska (GOA). Relative to the December 2010 Stock Assessment and Fishery Evaluation report (SAFE) (Brylinsky et al. 2010) (<http://www.afsc.noaa.gov/refm/docs/2009/GOAdsr.pdf>), the following changes have been made:

Changes in the Input Data

The only new information available for this report is updated catch information for Southeast Outside Subdistrict (SEO) and average weights for yelloweye rockfish catch from all four management areas in SEO. We conducted a habitat mapping survey in Southern Southeast Outside (SSEO) in August 2010, however these data are currently being processed and will not be available until the next stock assessment period.

Changes in the Assessment Results

The changes in average weights (from 3.99 to 4.23 kg in East Yakutat (EYKT), from 3.57 to 3.50 kg in Central Southeast Outside (CSEO), from 3.35 to 3.73 kg in Northern Southeast Outside (NSEO) and from 3.53 to 3.31 kg in SSEO) resulted in small changes to the biomass point estimate for each management area (from 4,358 to 4,625 mt in EYKT, from 4,339 to 4,254 mt in CSEO, from 1,352 to 1,503 mt in NSEO and from 4,272 to 4,013 mt in SSEO). The overall biomass estimate for 2011 was 14,395 mt; a slight increase from 14,321 mt in 2010.

Scientific and Statistical Committee Comments Specific to Demersal Shelf Rockfishes:

- ***The SSC urges the assessment authors to consider an age-structured model in the future, from which to conduct a comparison of biomass estimation methods.***

An age-structured assessment model for yelloweye rockfish is currently being developed and evaluated. A progress report will be given during the November 2010 plan team meeting to get plan team feedback and guidance on further development and evaluation of the model.

- ***A study of survey timing would also help to determine if density surveys conducted early in the summer are representative of those conducted later in the year.***

We are constrained to conducting biennial, or less frequent, density surveys due to limited funding and, recently, unavailability of the submersible used to conduct the surveys. Currently, surveys are planned for the spring or summer due to weather conditions as well as submersible and vessel availability. Depending on the year, surveys have been conducted in May, June, July, or August. While it could be useful to evaluate intra-annual variability in density, at present there is no evidence to suggest that density estimates may be inherently higher or lower during certain months. However, to reduce the chance that

possible inherent intra-annual differences in density may confound interpretation of inter-annual differences, in planning future surveys we will try to reduce the range of allowable months (e.g. July-August) during which surveys are conducted and consistently conduct surveys only during those months.

- *The SSC also looks forward to seeing confidence intervals for recreational removals, which the authors expect to provide next year.*

Although confidence intervals are not explicitly provided, this assessment does provide standard errors on final estimates of harvest and release mortality. The variances of average weight estimates by species were estimated using bootstrapping so the estimates are probably not distributed normally.

INTRODUCTION

The DSR assemblage includes yelloweye, quillback, copper, rosethorn, canary, China, and tiger rockfish. We continue to use a habitat-based stock assessment to calculate total DSR biomass. Total yelloweye rockfish biomass is estimated for each management area in the SEO as the product of density, mean fish weight, and area estimates of DSR habitat. Yelloweye rockfish density is derived using line transects conducted from an occupied submersible. Average weights from yelloweye caught in the directed DSR commercial fishery were available for SSEO, but since a directed fishery was not opened in EYKT, CSEO, or NSEO, we used the mean weights from yelloweye landed as incidental catch in the halibut fishery in these areas. Area estimates of DSR habitat are a combination of National Oceanic Survey (NOS) data, sidescan and multibeam data and fishermen logbook data. A harvest rate of $F=M$ (0.02) is used to set the ABC. The recommended ABC for yelloweye rockfish is increased by 4 % to account for other species in the DSR assemblage. The data used to calculate the yelloweye biomass in each of the four management areas in SEO, and the total ABC for 2011 are described below.

Assessment information used to set the ABC and overfishing levels for 2011.

	EYKT	CSEO	NSEO	SSEO	Total
Survey year	2009	2007	2001	2005	
Density yelloweye/km ²	1930	1068	1420	2196	
CV(D)	0.1660	0.1271	0.3144	0.1716	
Avg wt (kg)	4.23	3.50	3.73	3.31	
Habitat km ²	744	1404	472	732	3352
Biomass point estimate (mt)	6083	5249	2502	5317	19151
Biomass lower 90% CI (mt)	4625	4254	1503	4013	14395
Yelloweye ABC ($F=0.02$) (mt)	93	85	30	80	288
DSR ABC (yelloweye ABC/0.96)	97	89	31	83	300
Overfishing ($F=0.032$) adjusted for other species					479

We recommend a 2011 ABC of 300 mt, a slight increase from the 2010 ABC of 295 mt. The corresponding reference values for DSR are summarized below. The stock is not overfished, nor is it approaching overfishing status although total catch (including recreational harvest and unreported discards) may have approached the overfishing level in past years. In 2006 the Board of Fisheries (BOF) allocated the SEO DSR Total Allowable Catch (TAC) in the following manner: 84% to the commercial fishery and 16% to the sport fishery. We deducted 6 mt for DSR caught in the subsistence fisheries from the total ABC of 300 mt. This equates to a total TAC of 294 mt, and thus 47 mt is allocated to sport fisheries and 247 mt is allocated to commercial fisheries for 2011.

FISHERY

Full Retention of Incidental DSR Catch in Commercial Fishery

Since the implementation of the state and federal full retention regulations for DSR, over 90% of the landed overages of DSR in the state and federal waters are now retained for personal use rather than being donated or sold. To date in 2010, 83% (54,972 lbs) of the DSR overages (66,331 lbs by total weight) were reported from federal waters. There appears to be increasing compliance with the full retention regulations and there continues to be an outreach campaign by Alaska Longline Fishermen's Association, Fishing Vessel Owner's Association, and Petersburg Vessel Owner's Association to their members to comply with full retention regulations.

Disposition of DSR incidental catch (round pounds) landed in the SEO commercial halibut fishery, by year.

<i>Overage Description</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010¹</i>
Confiscated	328	0	0	0	0
Fed. Retained, not sold	50,996	53,435	44,803	43,509	54,972
Fed. Forfeiture	858	0	244	2,749	0
State Forfeiture	9,254	7,825	3,310	943	237
State Retained, not sold	18,061	18,523	17,576	14,116	11,121
Total	79,497	79,782	65,933	61,317	66,331

¹ Numbers through October 21, 2010.

DSR incidental catch (mt) landed in the SEO commercial halibut fishery by year.

<i>SEO</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010¹</i>
landed within incidental catch limits	161	154	114	135	117
landed overage (>10%)	36	36	30	28	30
Total	197	190	144	163	147

¹ Numbers through October 21, 2010.

Summary of 2010 Commercial Directed DSR Fishery

Before the decision is made to open a directed DSR commercial fishery in January, ADF&G estimates the amount of yelloweye bycatch from the commercial halibut fishery, and deducts this from the commercial portion of the TAC (For a description of the methodology used to calculate the yelloweye bycatch, refer to pg. 5 of last year's 2010 stock assessment (Brylinsky et al. 2010). (The "weight-ratio" method that ADF&G uses to estimate yelloweye rockfish bycatch in the halibut fishery was compared to other methods for estimating bycatch as part of the November 2010 Plan Team Working Group "Methods for the estimation of non-target species catch in the unobserved halibut IFQ fleet" headed by Cindy Tribuzio). In 2010 the portion of the TAC available for release to the commercial directed DSR fishery in SEO was 100.1 mt. However, only the SSEO management area was opened to a directed fishery, as the TAC apportioned to other management areas was insufficient to conduct and adequately manage a directed fishery. In SSEO, a total of 30.3 mt was available to the directed commercial DSR fishery, 29.5 mt of were harvested. In past years the directed fishery opened on January 1 and closed when the quota was reached well in advance of the closure date in regulation (which is the day before the opening day of IFQ season). For SEO in 2011, the yelloweye rockfish bycatch landings will be calculated in December 2010, and these data will be evaluated prior to opening a directed DSR commercial fishery in January 2011.

Recreational Fishery Removals

The 2009 harvest biomass was estimated using a combination of SWHS, creel survey, and charter logbook data (Table 4). The total removals were estimated as the sum of the mass of the harvest (retained catch) and release mortality (see Brylinksky 2010). This year, harvest biomass estimates were additionally stratified by user group (charter, non-charter) to reduce potential bias caused by non-proportional sampling. Harvest from the EYKT (East Yakutat) portion of the Southeast Outside (SEO) area was also included for the first time in the harvest estimation, although the harvest was less than 0.1 mt. Estimating the proportion of non-charter harvest that came from the SEO waters of each SWHS area was still problematic due to the lack of data from a comprehensive set of landing sites for non-charter harvest. Therefore, the outside proportion calculated for the charter fleet from logbook data was substituted for the non-charter harvest as well. Non-charter removals accounted for about 25% of the sport removals in 2009.

The 2009 release mortality biomass was also estimated using the same method as last year. The release proportions from logbook data were applied specifically for yelloweye rockfish, and the release proportion for all other non-pelagics was applied to the remaining DSR species.

Revised (final) estimates of 2009 recreational DSR removals (Retained and discards (assumed 100% mortality)) in the SEO portion of Southeast Alaska. Estimates were stratified user group (charter, non-charter) but combined for this table.

Retained Biomass (mt)

<i>Species</i>	<i>POW Island</i>	<i>Sitka</i>	<i>Glacier Bay</i>	<i>Yakutat</i>	<i>Total</i>
Yelloweye	7.0	16.9	2.1	0.0	26.0
Quillback	2.2	2.2	0.3	0.0	4.7
Copper	0.6	0.5	0.1	0.0	1.2
Canary	0.2	0.6	0.0	0.0	0.8
Tiger	0.0	0.1	0.0	0.0	0.2
China	0.1	0.1	0.0	0.0	0.2
Rosethorn	0.0	0.0	0.0	0.0	0.0
Total	10.2	20.3	2.6	0.0	33.1
StdErr	0.9	1.4	0.4	0.0	1.7

Discard Mortality (mt)

<i>Species</i>	<i>POW Island</i>	<i>Sitka</i>	<i>Glacier Bay</i>	<i>Yakutat</i>	<i>Total</i>
Yelloweye	0.4	1.0	0.1	0.0	1.4
Quillback	0.7	0.1	0.0	0.0	0.8
Copper	0.2	0.0	0.0	0.0	0.2
Canary	0.0	0.0	0.0	0.0	0.1
Tiger	0.0	0.0	0.0	0.0	0.0
China	0.0	0.0	0.0	0.0	0.0
Rosethorn	0.0	0.0	0.0	0.0	0.0
Total	1.3	1.1	0.1	0.0	2.5
StdErr	0.1	0.1	0.0	0.0	0.1

Total Sport Removals (Retained and discard mortality combined) (mt)

<i>Species</i>	<i>POW Island</i>	<i>Sitka</i>	<i>Glacier Bay</i>	<i>Yakutat</i>	<i>Total</i>
All DSR	11.5	21.4	2.7	0.0	35.6
StdErr	1.0	1.5	0.4	0.0	1.8

Because SWHS estimates are only available through 2009, preliminary estimates were provided for 2010. Five methods of projecting the harvest (in numbers of fish) were evaluated retrospectively based on absolute deviations and mean squared deviations. The best method for projecting charter harvest was to expand the 2010 creel survey estimates by the previous 5-year average ratio between the creel survey and SWHS. Because the relationships between creel survey and SWHS estimates were very weak for the private sector, double exponential time series forecasts were chosen to projecting these harvests. Efforts to improve harvest projections are ongoing, including possible incorporation of logbook data in the charter projections. These efforts will also include methods to describe the uncertainty in the projections, which we cannot calculate for the methods used this year. The retrospective projections indicated quite large errors in some years, due to high year-to-year variability in the harvest estimates.

Preliminary estimates of 2010 recreational DSR removals (retained and discard mortality) in the SEO portion of Southeast Alaska. Estimates were stratified user group (charter, non-charter) but combined for this table.

Retained Biomass (mt)

<i>Species</i>	<i>POW Island</i>	<i>Sitka</i>	<i>Glacier Bay</i>	<i>Yakutat</i>	<i>Total</i>
Yelloweye	11.4	28.4	1.5	0.0	41.3
Quillback	3.2	2.9	0.3	0.0	6.4
Copper	0.7	1.0	0.1	0.0	1.8
Canary	0.5	1.3	0.0	0.0	1.8
Tiger	0.1	0.2	0.0	0.0	0.3
China	0.2	0.5	0.1	0.0	0.8
Rosethorn	0.0	0.0	0.0	0.0	0.0
Total	16.0	34.4	2.0	0.1	52.4

Discard Mortality (mt)

<i>Species</i>	<i>POW Island</i>	<i>Sitka</i>	<i>Glacier Bay</i>	<i>Yakutat</i>	<i>Total</i>
Yelloweye	0.6	1.6	0.1	0.0	2.3
Quillback	1.0	0.1	0.0	0.0	1.1
Copper	0.2	0.0	0.0	0.0	0.2
Canary	0.1	0.0	0.0	0.0	0.2
Tiger	0.0	0.0	0.0	0.0	0.0
China	0.1	0.0	0.0	0.0	0.1
Rosethorn	0.0	0.0	0.0	0.0	0.0
Total	2.0	1.8	0.1	0.0	3.9

Total Sport removals (mt) (Retained and discard mortality combined) (mt)

<i>Species</i>	<i>POW Island</i>	<i>Sitka</i>	<i>Glacier Bay</i>	<i>Yakutat</i>	<i>Total</i>
All DSR	18.0	36.2	2.1	0.1	56.4

Total DSR Removal from Sport and Commercial Harvest

The total estimated DSR removal for 2010 is 252 mt (Table 6). This number includes all sport and commercial harvest, as well as estimated unreported discard mortality. Overages refer to DSR landed in excess of the allowed bycatch of DSR in the halibut fishery (equal to 10% of the target species).

Updated Sport and Commercial Catch Table

<i>2010 DSR Catch SEO (mt)</i>	<i>Directed Commercial</i>	<i>Incidental Commercial (to Oct. 21, 2010)</i>	<i>Sport fish Fisheries</i>	<i>Total</i>
Landed	30	120	52	206
Estimated discard	0	12	4	16
Overages >10%	0	30	0	30
Total	30	162	56	252

¹ Commercial landings through October 21, 2010.

² Sport landings are preliminary estimates for 2010. (Summing error corrected 4/4/11).

Research Priorities

We are next scheduled to receive funding for DSR research in FY13, thus the earliest we could conduct a submersible survey and update fish density estimates in any management area would be July 2012.

Implications of this delay include:

- 1) We would have to roll forward our 2009 DSR stock assessment information until 2012, and thus would not have revised biomass estimates for the 2011 assessment cycle.
- 2) There is a good possibility that the Delta submersible will be available for operation in 2011 for work, but the future availability of this submersible is uncertain. At present we have no alternative method for density estimations.

If the Delta submersible is available July 2012, the priority would be to secure sufficient funding to conduct a side-by-side comparison of the Delta submersible and another visual survey tool (e.g. an ROV). The goal of this project would be to determine a calibration factor between the submersible and some other visual survey method which might be used for future surveys.

Also, as indicated above, an age-structured model is being developed for yelloweye which may include yelloweye (bycatch) CPUE from the IPHC longline survey as source of relative abundance information to supplement abundance data from submersible-based surveys.

Summary

DSR biomass, fishing limits and catch in metric tons.

TIER 4

Quantity/Status	Last year		This year	
	2010	2011	2011	2012
<i>M</i> (natural mortality)	0.02	0.02	0.02	0.02
Specified/recommended Tier	4	4	4	4
Projected biomass (ages X+)	14,321		14,395	
Female spawning biomass (t)				
Projected	N/A		N/A	
<i>B</i> _{100%}	N/A		N/A	
<i>B</i> _{40%}	N/A		N/A	
<i>B</i> _{35%}	N/A		N/A	
<i>F</i> _{OFL}	0.032	0.032	0.032	0.032
<i>maxF</i> _{ABC} (maximum allowable = F40%)	0.026	0.026	0.026	0.026
Specified/recommended <i>F</i> _{ABC}	0.020	0.020	0.020	0.020
Specified/recommended OFL (t)	472		479	
Specified/recommended ABC (t)	295		300	
Is the stock being subjected to overfishing?	No	No	No	No
Is the stock currently overfished?	No	No	No	No
Is the stock approaching a condition of being overfished?	No	No	No	No

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