

## 12: Assessment of Pelagic Shelf Rockfish in the Gulf of Alaska (Executive Summary)

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### Introduction

Rockfish are assessed on a biennial stock assessment schedule to coincide with new survey data. The pelagic shelf rockfish complex consists of two Tier 5 species, widow and yellowtail rockfish, and one Tier 3a species, dusky rockfish. For the Tier 5 species we use survey biomass estimates to determine exploitable biomass. For dusky rockfish we use a separable age-structured model as the primary assessment tool. This consists of an assessment model which uses survey and fishery data to generate a historical time series of population estimates and a projection model which uses results from the assessment model to predict future population estimates and recommended harvest levels. For Gulf of Alaska rockfish in alternate (even) years we present an executive summary to recommend harvest levels for the next (odd) year. For this off-cycle year, there is no new survey information for widow and yellowtail rockfish; therefore, the recommended ABC and OFL are identical to those presented in the 2009 assessment. For dusky rockfish, we only updated the 2009 projection model estimates with revised catch data from 2009 and a new catch estimate for 2010. For further information regarding pelagic shelf rockfish assessment, please refer to last year's full stock assessment, which is available online, (Lunsford et al. 2009, <http://www.afsc.noaa.gov/REFM/docs/2009/GOApelshelf.pdf>). A full stock assessment document with new survey biomass estimates for widow and yellowtail rockfish, and updated results for the dusky rockfish assessment and projection model will be presented in next year's SAFE report.

### Updated ABC, OFL, Catch and Projection

For widow and yellowtail rockfish, the recommended 2009 stock assessment estimates are rolled over for this year, resulting in an ABC of 91 t. For dusky rockfish, new information for this year's projection is updated 2009 catch of 3,052 t and the 2010 catch as of October 2, 2010 of 2,855 t. Catch estimates used in last year's model were 2,935 t for 2009 and 3,408 t for 2010. This year's projection model for dusky rockfish results in a recommended ABC of 4,663 t which is similar to last year's dusky ABC of 4,957 t.

For the pelagic shelf rockfish complex, ABC and OFL for widow and yellowtail rockfish are combined with the ABC and OFL for dusky rockfish. For the 2011 fishery, we recommend the maximum allowable ABC of 4,754 t. This ABC is similar to last year's ABC of 5,059 t. The corresponding reference values for pelagic shelf rockfish are summarized in the following table, with the recommended ABC and OFL values in bold. The stock is not overfished, nor is it approaching overfishing status.

Quantity/Status for Widow/Yellowtail Rockfish	Last Year (2009)		This Year (roll-over) <sup>1</sup>	
	2010	2011	2011	2012
<i>M</i> (natural mortality)	0.07	0.07	0.07	0.07
Specified/recommended Tier	5	5	5	5
Biomass	1,947	1,947	1,724	1,724
$F_{OFL}$ ( $F=M$ )	0.07	0.07	0.07	0.07
$maxF_{ABC}$ (maximum allowable = $0.75 \times F_{OFL}$ )	0.0525	0.0525	0.0525	0.0525
Specified/recommended $F_{ABC}$	0.0525	0.0525	0.0525	0.0525
Specified/recommended OFL (t)	136	136	<b>121</b>	121
Specified/recommended ABC (t)	102	102	<b>91</b>	91
Is the stock being subjected to overfishing? <sup>2</sup>	No	No	No	No

Quantity/Status for Dusky Rockfish	Last Year (2009)		This Year	
	2010	2011	2011	2012 <sup>3</sup>
<i>M</i> (natural mortality)	0.07	0.07	0.07	0.07
Specified/recommended Tier	3a	3a	3a	3a
Projected biomass (ages 4+)	67,685	64,242	64,774	62,584
Female spawning biomass (t)				
Projected	25,800	24,861	25,099	23,964
<i>B</i> <sub>100%</sub>	47,898	47,898	47,898	47,898
<i>B</i> <sub>40%</sub>	19,159	19,159	19,159	19,159
<i>B</i> <sub>35%</sub>	16,764	16,764	16,764	16,764
<i>F</i> <sub>OFL</sub>	0.106	0.106	0.106	0.106
<i>maxF</i> <sub>ABC</sub> (maximum allowable = <i>F</i> <sub>40%</sub> )	0.087	0.087	0.087	0.087
Specified/recommended <i>F</i> <sub>ABC</sub>	0.087	0.087	0.087	0.087
Specified/recommended OFL (t)	6,006	5,603	<b>5,649</b>	5,266
Specified/recommended ABC (t)	4,957	4,625	<b>4,663</b>	4,347
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
Quantity for Pelagic Shelf Rockfish Complex	Last Year (2009)		This Year	
	2010	2011	2011	2012
Biomass	69,632	66,189	66,498	64,308
Specified/recommended OFL (t)	6,142	5,739	<b>5,770</b>	5,387
Specified/recommended ABC (t)	5,059	4,727	<b>4,754</b>	4,438

<sup>1</sup>The 2010 ABC and OFL values recommended by the author for widow and yellowtail were 91 t and 121 t respectively (please see <http://www.afsc.noaa.gov/REFM/docs/2009/GOApelshelf.pdf>) but for an unknown reason these values were not transferred to the GOA status and catch specifications. The specified values of 102 t and 136 t came from a preliminary version of the Pelagic Shelf Rockfish SAFE. For 2011 we continue to recommend an ABC and OFL of 91 t and 121t respectively.

<sup>2</sup>The official catch estimate for the most recent complete year (2009) for widow and yellowtail is 5.4 t. This estimate is generated by applying the percentage of widow and yellowtail rockfish in the observed catch to the official catch estimate for pelagic shelf rockfish. This estimate is substantially less than the 2009 widow/yellowtail OFL of 77 t. Therefore, the stock is not being subjected to overfishing.

<sup>3</sup>Projected dusky rockfish ABCs and OFLs for 2012 are derived using an expected catch value of 2,826 t for 2011 based on recent ratios of dusky catch to ABC. This calculation is in response to management requests to obtain a more accurate one-year projection.

## Area Apportionment

The apportionment percentages are identical to last year, because there is no new survey information. The following table shows the recommended apportionment for 2011. Please refer to last year's SAFE report for information regarding the apportionment rationale for pelagic shelf rockfish.

	Western	Central	Eastern	Total
Area Apportionment	12.9%	64.2%	22.9%	100%
Area ABC (t)	<b>611</b>	<b>3,052</b>	<b>1,091</b>	<b>4,754</b>
OFL (t)				<b>5,770</b>

Amendment 41 prohibited trawling in the Eastern area east of 140° W longitude. The ratio of biomass still obtainable in the W. Yakutat area (between 147° W and 140° W) is the same as last year at 0.373. This results in the following apportionment to the W. Yakutat area:

	W. Yakutat	E. Yakutat/Southeast
Area ABC (t)	408	683

## Responses to Council, SSC, and Plan Team Comments

The GOA Plan Team 2009 minutes included the following comments concerning all stock assessments:

*“That the AFSC coordinate with the Regional Office a source for catch data to ensure that authors use the same set of reports for recent years (e.g., for the current and previous year). This also applies for prohibited species catch (PSC) tables as well as non-target species catch.”*

A coordinated effort between Fisheries Monitoring and Assessment (FMA) division, the Alaska Regional Office (AKRO) and the Pacific States Marine Fisheries Commission (PSMFC) was initiated in 2009 to utilize the Alaska Fisheries Information Network (AKFIN) as a data warehouse for Alaska Fisheries Science Center (AFSC) economists and stock assessment scientists. A workshop was held in February 2010 at the Auke Bay Laboratories (ABL) where FMA, AKRO, AKFIN, and ABL staff discussed the types of fishery data required each year for the stock assessments and SAFE reports. Included in this workshop was an introduction to the new AKFIN Answers Dashboard site and newly added North Pacific Observer (NORPAC) database tables. The AKFIN site is a coordinated effort between AKRO, FMA, and AKFIN to house and distribute fishery data. The new NORPAC tables maintain continuity of observer data across the entire historical time series. Following this workshop a reports committee consisting of AFSC and AKFIN staff was developed to produce standardized catch reports available through the AKFIN Answers site. These reports are in the testing phase and will be available for assessments in 2011.

*“For fisheries where bycatch in halibut fisheries apply, authors are requested to coordinate with the Regional Office or other appropriate agency to account for these removals.”*

The issues of unobserved incidental catch in the IFQ halibut fishery is of increasing concern in the management of many GOA species, and the SSC has specifically requested catch estimates for roughey rockfish, sharks and skates. A working group was formed in 2010 to examine quantitative methods to estimate the incidental catch of non-target species. The working group presented multiple approaches to the Joint Groundfish Plan Team at the September 2010 meeting and will present catch estimates of four example species for review at the November 2010 Plan Team meeting. After the SSC reviews the methods and determines the most appropriate, the working group will prepare time series estimates of catch for all non-target species. This data will be available to assessment authors for the 2011 stock assessment cycle. However, it is unlikely the unobserved incidental catch of pelagic shelf rockfish species is significant.

The SSC December 2009 minutes included the following comments concerning all stock assessments:

*“The SSC suggests that description of the apportionment rationale in each SAFE chapter of area-apportioned species would be helpful to the reader.”*

The apportionment rationale for pelagic shelf rockfish is explained in the *Area Allocation of Harvests* section of the 2009 full SAFE report under *Projections and Harvest Alternatives*. Apportionment is determined based on the geographic distribution of pelagic shelf rockfish biomass in the trawl surveys. This distribution has been computed as a weighted average of the percent biomass distribution for each

area in the three most recent trawl surveys. Each successive survey is given a progressively heavier weighting using factors of 4, 6, and 9, respectively.

The GOA Plan Team 2009 minutes included the following comments concerning all rockfish:

*“Some rockfish assessments may have revised maturity estimates and the Team would like to review comparisons of these studies in September 2010. In particular, locations and timing of samples, and recommendations from assessment authors for approaches to modifying assessments.”*

A report on estimating rockfish maturity in the Gulf of Alaska was prepared and presented by ABL rockfish staff for the September 2010 Plan Team meeting. The GOA rockfish assessment authors will investigate methods for incorporating new maturity information into the assessment for 2011. Allowing for uncertainty of maturity estimates within the assessment is a possibility, but further exploration of such methods is needed.

The GOA Plan Team 2009 minutes included the following comments concerning pelagic shelf rockfish:

*“The Team recommends reorganizing PSR assessment and management such that separate specifications would be established for dusky and consideration given to best groupings of complexes for the remaining species.”*

GOA rockfish authors will present alternative rockfish complex grouping considerations at the 2011 September Plan Team meetings for consideration by the Plan Teams and SSC. An alternative to the current pelagic shelf rockfish assemblage will likely be presented.

The SSC December 2009 minutes included the following comments concerning pelagic shelf rockfish:

*“The SSC notes that the MCMC estimate of trawl survey  $q$  for the rougheye complex (0.381) is considerably different from the  $q$  for dusky rockfish (0.911). It would be useful to compare the model estimates of  $q$  for different species of rockfish and consider whether the estimates are reasonable.”*

The estimate of  $q$  for dusky rockfish will be compared to estimates of  $q$  from other GOA rockfish species and results will be presented in the next full assessment in 2011.

*“The SSC agreed that reorganization of the complex should be considered and noted that the option to manage widow and yellowtail rockfish as part of the other slope complex should be considered. The SSC notes that these changes could be assessed as part of consideration of assemblage membership that will occur in FMP amendments to implement the ACL requirements.”*

GOA rockfish authors will present alternative rockfish complex grouping considerations at the 2011 September Plan Team meetings for consideration by the Plan Teams and SSC. An alternative to the current pelagic shelf rockfish assemblage will likely be presented.

*“The authors continue to use the 1996 length weight data in the dusky rockfish assessment. The SSC requests that the authors examine length weight from more recent surveys to determine whether additional information could be added to the assessment.”*

For the next full assessment in 2011 the authors will compare available data from all of the surveys and determine the best most up-to-date data to use in the dusky rockfish model.

## Research Priorities

It is critically important to rockfish stock assessments that the GOA trawl surveys continue and that they extend into deeper waters (>300m) to cover the range of primary habitat for rockfish. There is little information on larval, post-larval, or early juvenile stages of rockfish. Habitat requirements for these stages are mostly unknown. Research on early life history parameters and essential habitat for these early life stages is vital to effective management of rockfish.

## Summaries for Plan Team

Species	Year	Biomass	OFL	ABC	TAC	Catch
Pelagic Shelf Rockfish	2009	66,603 <sup>1</sup>	5,803	4,781	4,781	3,057
	2010	69,632 <sup>2</sup>	6,142	5,059	5,059	2,865
	2011	66,498 <sup>2</sup>	5,770	4,754		
	2012	64,308 <sup>2</sup>	5,387	4,438		

<sup>1</sup>Total biomass estimates for pelagic shelf rockfish, including: widow, yellowtail rockfish (not dark) from 2009 trawl survey and age-structured model for dusky rockfish. Average exploitable biomass is not used.

<sup>2</sup>Total biomass estimates for pelagic shelf rockfish, including: widow, yellowtail rockfish (not dark) from 2009 trawl survey and age-structured model for dusky rockfish. Average exploitable biomass is not used.

Stock/ Assemblage	Area	2010				2011		2012	
		OFL	ABC	TAC	Catch <sup>2</sup>	OFL	ABC	OFL	ABC
Pelagic Shelf Rockfish	W		650	650	528		611		570
	C		3,249	3,249	2,251		3,052		2,850
	WYAK		434	434	75		408		380
	EYAK/SEO		726	726	11		683		638
	Total	6,142	5,059	5,059	2,865	5,770	4,754	5,387	4,438

<sup>2</sup>Current as of October 2, 2010 (<http://www.fakr.noaa.gov/2010/2010.htm>)

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