15. Assessment of the Thornyhead stock in the Gulf of Alaska

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November 2013

Executive Summary

Gulf of Alaska (GOA) thornyheads are assessed on a biennial stock assessment schedule to coincide with the availability of new survey data. For GOA thornyheads in on-cycle (odd) years, we present a full stock assessment document with updated assessment results to recommend harvest levels for the next two years. However, due to the 2013 government shutdown, we present an executive summary with updated survey biomass estimates and recommended harvest levels. Please refer to the last full stock assessment report presented in 2011 for further information regarding the assessment calculations (Murphy and Ianelli 2011, available online at http://www.afsc.noaa.gov/refm/docs/2011/GOAthorny.pdf). A full stock assessment document with updated assessment results will be presented in next year's SAFE report.

We use the exploitable biomass from the most recent trawl survey to determine the recommended ABC for thornyhead rockfish, which qualifies as a Tier 5 stock. For this update year, we use the same extrapolation method (Alternative 2) from the 2011 assessment applied to the 2013 survey biomass estimate to provide estimates for the next two years.

Summary of changes in Assessment Inputs

Changes in the input data: New data added for this assessment are biomass estimates from the 2013 trawl survey for shortspine thornyheads. The 2013 biomass estimate of 69,878 t is an 11% increase from the 2011 estimate and similar to the 2009 estimate for the 1-700 m strata. The increase occurred in both the Central and Western GOA, by 14% and 58%, respectively, from the 2011 estimates. The 2013 Eastern GOA biomass was similar to the 2011 estimate. As with the 2011 survey, the 700 to 1000 m stratum was not sampled; therefore, the 2013 biomass estimate was also inflated to account for the lack of sampling in the deep strata. We used the same methods described in the 2011 assessment where area-specific mean percentages of biomass in the 701-1000 m stratum relative to the other depth strata for the Western, Central, and Eastern GOA from the 2005, 2007, and 2009 trawl surveys were calculated and the 2013 area-specific biomass estimates were increased by these percentages. The modification results in a total estimated biomass of 81,816 t, which is a 17% increase in the observed biomass estimate of 2013.

There was a small increase in the coefficient of variation (CV) on the 2013 survey biomass estimate for shortspine thornyheads (7% in 2013, 6% in 2011, and 5% in 2009). This may have resulted from the further reduction in survey effort this year. Similar to 2011, only 2 boats were chartered for the survey (usually 3 boats are used). This resulted in even fewer stations sampled compared to previous surveys: 550 stations in 2013 compared to 670 in 2011 and 823 in 2009. The 2013 sampling level (based on number of stations) is 30% lower than the long-term mean for this survey. The implication of the reduced sampling effort for shortspine thornyhead is relatively minor since the uncertainty due to sampling remains quite small. This precision supports the practice (for this stock) to use the most recent trawl survey estimate for Tier 5 ABC calculations and area apportionments.

Changes in assessment methodology: There were no changes in assessment methodology.

Summary of Results

For the 2014 fishery, we recommend the maximum allowable ABC of 1,841 t for thornyhead rockfish. Reference values for thornyhead rockfish are summarized in the following table, with the recommended ABC and OFL values in bold. The stock was not being subjected to overfishing last year.

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2013	2014	2014	2015
M (natural mortality rate)	0.03	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)				
Upper 95% confidence interval	N/A	N/A	91,599	91,599
Point estimate	73,990	73,990	81,816	81,816
Lower 95% confidence interval	N/A	N/A	72,032	72,032
F_{OFL}	0.03	0.03	0.03	0.03
$maxF_{ABC}$	0.0225	0.0225	0.0225	0.0225
F_{ABC}	0.0225	0.0225	0.0225	0.0225
OFL (t)	2,220	2,220	**2,454**	2,454
maxABC (t)	1,665	1,665	1,841	1,841
ABC (t)	1,665	1,665	**1,841**	1,841
Status	As determined *last* year for:		As determined *this* year for:	
	2011	2012	2012	2013
Overfishing	No	n/a	No	n/a

Updated catch data (t) for thornyhead rockfish in the Gulf of Alaska as of October 5, 2013 (NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database, http://www.akfin.org) are summarized in the following table. The 2012 and 2013 catch in the western GOA exceeded the 2012 and 2013 ABC in that area, respectively.

Year	Western	Central	Eastern	Gulfwide Total	Gulfwide ABC	Gulfwide TAC
2011	159	301	163	623	1,770	1,770
2012	186	343	217	746	1,665	1,665
2013	283	488	286	1,057	1,665	1,665

Gulfwide catch of thornyhead rockfish for 2013 (as of Oct 5) was up 49% from 2012. The majority of this increase occurred in the Central and Western GOA, resulting in a 133 t overage (as of October 5, 2013) of the Western GOA ABC of 150 t. The 2013 estimated thornyhead catch in the gulfwide rockfish fishery decreased by 30% compared to 2012. This decrease is likely due to the fact that the Western GOA remained closed to directed Pacific ocean perch fishing this year. The 2013 thornyhead rockfish catch increased by 58% in the sablefish fishery compared to 2012. In 2013 the observer program restructuring began and the extent that this program affected perceived catches of thornyhead rockfish in the sablefish fishery (due to improved coverage) is uncertain. Understanding the potential for catch accounting biases due to shifts in observer coverage will require further study.

Area Apportionment

The following table shows the recommended apportionment for 2014 based on the 2013 expanded survey biomass distribution. The thornyhead apportionment of ABC increased in the Western GOA and decreased in the Eastern GOA from the 2011 estimates. Please refer to the 2011 full stock assessment report for information regarding the apportionment rationale for thornyhead rockfish.

	Western	Central	Eastern	Total
2013 Biomass (t)	10,459	38,895	32,462	81,816
Area Apportionment	13%	47%	40%	100%
Area ABC (t)	**235**	**875**	**731**	**1,841**
OFL (t)				**2,454**

The recommended Western GOA ABC of 235 t is an 89% increase from the 2012 ABC of 150 t, which decreases the potential for the Western GOA ABC to be reached or exceeded next year.

Summaries for Plan Team

Species	Year	Biomass[1]	OFL	ABC	TAC	Catch[2]
Thornyhead rockfish	2012	73,990	2,220	1,665	1,665	746
	2013	73,990	2,220	1,665	1,665	1,057
	2014	81,816	2,454	1,841		
	2015	81,816	2,454	1,841		

Stock/		2013				2014		2015	
Assemblage	Area	OFL	ABC	TAC	Catch[2]	OFL	ABC	OFL	ABC
Thornyhead rockfish	W		150	150	283		235		235
	C		766	766	488		875		875
	E		749	749	286		731		731
	Total	2,220	1,665	1,665	1,057	2,454	1,841	2,454	1,841

[1]Total biomass from trawl survey estimates and includes expansion to 701-1000 m.

[2]Current as of October 5, 2013. Source: NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database (http://www.akfin.org).

SSC and Plan Team Comments on Assessments in General

"The SSC concurs with the Plan Teams' recommendation that the authors consider issues for sablefish where there may be overlap between the catch-in-areas and halibut fishery incidental catch estimation (HFICE) estimates. In general, for all species, it would be good to understand the unaccounted for catches and the degree of overlap between the CAS and HFICE estimates, and to discuss these at the Plan Team meetings next September." (SSC, December 2011)

"The Teams recommend that authors continue to include other removals in an appendix for 2013. Authors may apply those removals in estimating ABC and OFL; however, if this is done, results based on the approach used in the previous assessment must also be presented. The Teams recommend that the "other" removals data set continue to be compiled, and expanded to include all sources of removal." (Plan Team, September 2012)

"The Plan Teams recommend that assessment authors retain status quo assessment approaches for the November 2012 SAFE report but also apply the Kalman filter or random effects survey averaging methods for Tier 5 stocks and summarize the analytical results for comparison purposes only. ADMB code for implementing the random effects method will be made available." (Plan Team, September 2012)

"The Teams recommend that the whole time series of each category of 'other' catches be made available on the NMFS "dashboard," so that they may be listed in all SAFE chapters." (Plan Team, November 2012)

"The SSC encourages assessment authors of stocks managed in Tier 5 to consider the recommendations found in the draft survey averaging workgroup report." (SSC, December 2012)

SSC and Plan Team Comments Specific to this Assessment

"The Team made an additional request to Paul and Jon (for September discussion of consistency or lack thereof between assessment treatment of biomass and other issues) to also look at how individual assessments expand biomass to account for unsurveyed areas and depths." (Plan Team, November 2011)

"The Plan Team recommends that in addition to the current assessment methodology, authors use the Kalman filter method to estimate survey biomass and summarize the results for comparison at the September 2013 meeting." (Plan Team, November 2012)

"The SSC agrees with the Plan Team recommendation that trawl surveys extend to 500 m in order to more completely cover available thornyhead habitat and that a Kalman filter approach to estimating biomass be used in the next assessment." (SSC, December 2012)

Responses to Comments and Research Priorities for Full Assessment

Due to time constraints resulting from the government shutdown, responses to the previously listed SSC and Plan Team comments will be presented in next year's full stock assessment report. To address several of these comments, we plan to follow the recommendations listed in the various working group reports (e.g. the methods for averaging surveys report) submitted to the Plan Team in September 2012. In addition, we anticipate that many of the comments specific to the thornyhead rockfish assessment during the 2013 Center for Independent Experts (CIE) Alaska rockfish scientific peer review will be incorporated. Please refer to the Summary and response to the 2013 CIE review of AFSC rockfish document presented to the September 2013 Plan Team for further details.