16. Assessment of Other rockfish in the Bering Sea and Aleutian Islands

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Introduction

The Bering Sea/Aleutian Islands (BSAI) Other rockfish complex includes all species of *Sebastes* and *Sebastolobus*, except for Pacific ocean perch (POP, *Sebastes alutus*), northern rockfish (*Sebastes polyspinis)*, dark rockfish (*Sebastes ciliatus*), rougheye rockfish (*Sebastes aleutianus*), blackspotted rockfish (*Sebastes melanostictus*) and shortraker rockfish (*Sebastes borealis*). In 2013, species caught in the BSAI in the "other species" complex included black rockfish (*Sebastes melanops*), redbanded rockfish (*Sebastes babcocki)*, darkblotched rockfish (*Sebastes crameri*), yelloweye rockfish (*Sebastes ruberrimus*), harlequin rockfish (*Sebastes variegatus)*, redstripe rockfish (*Sebastes proriger*), dusky rockfish (*Sebastes variabilis*; formerly light dusky), thornyhead (*Sebastolobus alascanus*), and longspine thornyhead (*Sebastolobus altivelis*). Many of the species in the genus *Sebastes* are relatively uncommon; and different species may be represented in different years. Between 2004-2013, this category has consisted primarily of dusky rockfish and shortspine thornyhead.

Because the Other Rockfish complex is defined by what it excludes rather than by what it includes, an analysis was conducted in the 2001 Other Rockfish SAFE report to distinguish species expected to occur in the BSAI from rarely observed and potentially misidentified species. The criteria used for the analysis was occurrence in at least one haul of the BSAI surveys and/or occurrence in at least 1% of observed fishery hauls. Using data from 1999-2001, 7 species (shortspine thornyhead; *Sebastolobus alascanus*, dusky rockfish; *Sebastes variabilis*, redbanded rockfish; *Sebastes babcocki*, redstriped rockfish; *Sebastes proriger*, yelloweye rockfish; *Sebastes ruberrimus*, harlequin rockfish; *Sebastes variegatus*, and sharpchin rockfish; *Sebastes zacentrus*) were identified as meeting these criteria (Table 1). Dark rockfish also met the criteria, but have since been removed from the Other Rockfish complex and is now managed by the State of Alaska.

In 2005, Bering Sea/Aleutian Islands (BSAI) the other rockfish complex was moved to a biennial assessment schedule to coincide with the frequency of trawl surveys in the Aleutian Islands (AI) and the eastern Bering Sea (EBS) slope. These surveys occur in even years, and for these years a full assessment of other rockfish in the BSAI area will be conducted. The 2012 full assessment can be found at http://www.afsc.noaa.gov/REFM/docs/2012/BSAIorock.pdf. The other rockfish assessment is conducted with Tier 5 methods, and an exploitation rate is then applied to the estimated current biomass to obtain the ABC and OFL.

A small error was identified in the 2012 assessment; unidentified rockfish were not incorporated into the assessed biomass. The current assessment ameliorates the problem, but the change is very small. All rockfish are identified to species in the Aleutian Islands survey; therefore, changes were limited to Bering Sea estimates.

Summary of Results; Updated ABC, OFL, and Catch

The BSAI catch of other rockfish in 2012 was 814 t, with 656 t in the AI and 157 t in the EBS. The 2013 catch of other rockfish, through November 12, was 575 t, with 450 t in the AI and 125 t in the EBS. Because neither the time series of survey biomass estimates nor the proxy values for F_{abc} and F_{ofl} have changed since 2012, the estimated ABC and OFL values for 2013 and 2014 in this update are identical to the values for 2012 and 2013 produced in the 2012 assessment. The estimated biomass was based upon a (4, 6, 9) weighted average of the three most recent survey biomass estimates. The estimate of biomass includes data from the NMFS eastern Bering Sea shelf survey, the NMFS Bering Sea slope survey, and the NMFS Aleutian Islands (AI) survey, split into the AI and southern Bering Sea (RACE summary area 799).

Summary of Changes in Assessment Inputs

There have been no changes to the input data, and no changes in the assessment methodology.
Catch data has been updated for 2010 and 2011.

Stock size, harvest, and fishing rate reference values for the portion of other rockfish complex composed of shortspine thornyheads (SST) are shown in the following table.

Shortspine thornyhead (SST)	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity/Status	2013	2014	2014	2015
M (natural mortality)	0.03	0.03	0.03	0.03
Specified/recommended Tier	5	5	5	5
Biomass	45,820	45,820	45,820	45,820
F_{OFL} (F=M)	0.03	0.03	0.03	0.03
$maxF_{ABC}$ (maximum allowable = $0.75x\ F_{OFL}$)	0.0225	0.0225	0.0225	0.0225
F_{ABC}	0.0225	0.0225	0.0225	0.0225
OFL (t)	1,375	1,375	1,375	1,375
AI ABC (t)	367	367	367	367
EBS ABC (t)	664	664	664	664
Status	As determined *this* year for:			
	2011	2012	2012	2013
Overfishing	No	No	No	n/a
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)				

Stock size, harvest, and fishing rate reference values for the portion of other rockfish complex other than shortspine thornyheads (SST) are shown in the following table.

non-SST other rockfish	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity/Status	2013	2014	2014	2015
M (natural mortality)	0.09	0.09	0.09	0.09
Specified/recommended Tier	5	5	5	5
Biomass	1,885	1,885	1,947	1,947
F_{OFL} (F=M)	0.09	0.09	0.09	0.09
$maxF_{ABC}$ (maximum allowable = 0.75x F_{OFL})	0.0675	0.0675	0.0675	0.0675
F_{ABC}	0.0675	0.0675	0.0675	0.0675
OFL (t)	170	170	175	175
AI ABC (t)	106	106	106	106
EBS ABC (t)	22	22	26	26
Status	As determined *this* year for:			
	2011	2012	2012	2013
Overfishing	No	N/a	Yes	Yes
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)				

The total estimated biomass and recommended ABC and OFL for the other rockfish complex is as follows (the sum of the SST and non-SST values):

All other rockfish	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity/Status	2013	2014	2014	2015
M (natural mortality) Specified/recommended Tier	5	5	5	5
Biomass	47,705	47,705	47,767	47,767
F_{OFL} (F=M)				
$maxF_{ABC}$ (maximum allowable = 0.75*x* F_{OFL})				
F_{ABC}				
OFL (t)	1,540	1,540	1550	1550
AI ABC (t)	473	473	473	473
EBS ABC (t)	686	686	690	690
BSAI ABC (t)	1,159	1,159	1,160	1,160
Status	As determined *last* year for:		As determined *this* year for:	
	2011	2012	2012	2013
Overfishing	No	No	No	n/a
(for Tier 5 stocks, data are not available to determine whether the stock is in an overfished condition)				

Responses to the comments of the Statistical and Scientific Committee

General SSC comments from the June, 2013 meeting:

A research priority for 2013 is to evaluate the effectiveness of setting ABC and OFL levels for data-poor stocks

Evaluate the effectiveness (e.g., potential for overharvest or unnecessarily limiting other fisheries) of setting ABC and OFL levels for data-poor stocks (Tier 5 and 6 for groundfish and Tiers 4 and 5 for crab, e.g., squid, octopus, shark, sculpins, other flatfish, **other rockfish**, skates, grenadier, and crab). Research is needed to refine the basis for setting gamma for Tier 4 crab stocks.

No other comments refer to the BSAI other rockfish complex.

Data Gaps and Research Priorities

Validating aging techniques of shortspine thornyheads and obtaining ages from archived samples remain research priorities and are required for age-structured population modeling. Little is known regarding most aspects of the biology of the species in the Other Rockfish complex, including the reproductive biology and distribution, duration, and habitat requirements of various life-history stages. Given the relatively unusual reproductive biology of rockfish and its importance in establishing management reference points, data on reproductive capacity should be collected on a periodic basis.

Genetic stock structure has been observed in most rockfish species that have been examined. Many species have yet to be studied, including the majority of species in the Other Rockfish complex. Genetic stock structure studies would provide valuable information on whether area apportionment is appropriate for species in this complex.

Summaries for the Plan Team

Species	Year	Biomass	OFL	ABC	TAC	Catch
Other Rockfish	2012	48,890	1,704	1,278	1,070	814
	2013	47,705	1,540	1,159	873	575[1]
	2014	47,767	1,550	1,160		
	2015	47,767	1,550	1,160		

Summary Table for all Other Rockfish

	BSAI	AI	EBS	Total
OFL (2012)	1,700			1,700
ABC (2012)		570	710	1,280
TAC (2012)		570	500	1,070
Catch (2012)		656	157	814
OFL (2013)	1,540			1,540
ABC (2013)		473	686	1,159
TAC (2013)		473	400	873
Catch (2013)[1]		450	125	575
OFL (2014)	1,550			1,550
ABC (2014)		473	690	1,160
OFL (2015)	1,550			1,550
ABC (2015)		473	690	1,160

[1]Current as of November 12, 2013

Summary Table for non-SST Other Rockfish

	BSAI	AI	EBS	Total
OFL (2012)	356			
ABC (2012)		164	102	
TAC (2012)				
Catch (2012)		541	54	595
OFL (2013)	170			170
ABC (2013)		106	22	128
TAC (2013)				
Catch (2013)[1]		287	32	319
OFL (2014)	175			175
ABC (2014)		106	26	132
OFL (2015)	175			175
ABC (2015)		106	26	132

[1]Current as of November 12, 2013

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