# Chapter 16

## Assessment of the Other Rockfish Stock Complex in the Bering Sea/Aleutian Islands

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### Introduction

The BSAI other rockfish management group is defined as all *Sebastes* and *Sebastolubus* species except for Pacific ocean perch, northern, shortraker, and rougheye rockfish. In 2005, Bering Sea/Aleutian Islands (BSAI) rockfish were 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 2010 full assessment can be found at http://www.afsc.noaa.gov/REFM/docs/2010/BSAIorock.pdf. The other rockfish assessment is conducted with Tier 5 methods, and an exploitation rate is then applied to estimated current biomass to obtain the ABC and OFL.

### Updated ABC, OFL, and Catch

The BSAI catch of other rockfish in 2010 was 760 t, with 497 t in the AI and 263 t in the EBS. The 2011 catch of other rockfish, through October 8, was 837 t, with 580 t in the AI and 257 t in the EBS. ABC and OFL values for the BSAI other rockfish complex obtained from combing the estimated ABC and OFL values of the shortspine thornyhead (SST; *Sebastolobus alascanus*) and non-shortspine thornyhead portions of the complex, and separate estimates of natural mortality (and thus $F_{abc}$ and $F_{ofl}$) are used for these two components. Biomass estimates for other rockfish are obtained from a weighted average of estimated biomass for other rockfish species captured in the three most recent trawl surveys, which (besides SST) include dark rockfish (*Sebastes ciliatus*), sharpchin rockfish (*Sebastes zacentrus*), harlequin rockfish (*Sebastes variegatus*), and redbanded rockfish (*Sebastes babcocki*). Because neither the time series of survey biomass estimates nor the proxy values for $F_{abc}$ and $F_{ofl}$ have changed since 2010, the estimated ABC and OFL values for 2012 and 2013 in this update are identical to the values for 2011 and 2012 produced in the 2010 assessment. 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. The estimated biomass was based upon a weighted average of the three most recent survey biomass estimates, and was 17,856 t in the AI and 27,083 t in the EBS:

| **Quantity** | As estimated or *specified last* year for: 2011 | 2012 | As estimated or *recommended this* year for: 2012 | 2013 |
|---|---|---|---|---|
| *M* (natural mortality rate) | 0.03 | 0.03 | 0.03 | 0.03 |
| Tier | 5 | 5 | 5 | 5 |
| Biomass (t) | 44,939 | 44,939 | 44,939 | 44,939 |
| $F_{OFL}$ | 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) | 1,348 | 1,348 | 1,348 | 1,348 |
| AI maxABC (t) | 402 | 402 | 402 | 402 |
| EBS maxABC (t) | 609 | 609 | 609 | 609 |
| AI ABC (t) | 402 | 402 | 402 | 402 |
| EBS ABC(t) | 609 | 609 | 609 | 609 |

The summary for the non-SST portion of the complex is shown in the following table. The estimated biomass was based upon a weighted average of the three most recent survey biomass estimates, and was 2,433 t in the AI and 1,518 t in the EBS:

| **Quantity** | As estimated or *specified last* year for: 2011 | 2012 | As estimated or *recommended this* year for: 2012 | 2013 |
|---|---|---|---|---|
| *M* (natural mortality rate) | 0.09 | 0.09 | 0.09 | 0.09 |
| Tier | 5 | 5 | 5 | 5 |
| Biomass (t) | 3,951 | 3,951 | 3,951 | 3,951 |
| $F_{OFL}$ | 0.09 | 0.09 | 0.09 | 0.09 |
| $maxF_{ABC}$ | 0.0675 | 0.0675 | 0.0675 | 0.0675 |
| $F_{ABC}$ | 0.0675 | 0.0675 | 0.0675 | 0.0675 |
| OFL (t) | 356 | 356 | 356 | 356 |
| AI maxABC (t) | 164 | 164 | 164 | 164 |
| EBS maxABC (t) | 102 | 102 | 102 | 102 |
| AI ABC (t) | 164 | 164 | 164 | 164 |
| EBS ABC(t) | 102 | 102 | 102 | 102 |

The BSAI total estimated biomass and OFL, and AI and EBS ABC levels, for the other rockfish complex is obtained by summing the values in the tables above:

| **Quantity** | As estimated or *specified last* year for: 2011 | 2012 | As estimated or *recommended this* year for: 2012 | 2013 |
|---|---|---|---|---|
| *M* (natural mortality rate) | | | | |
| Tier | 5 | 5 | 5 | 5 |
| Biomass (t) | 48,890 | 48,890 | 48,890 | 48,890 |
| $F_{OFL}$ | | | | |
| $maxF_{ABC}$ | | | | |
| $F_{ABC}$ | | | | |
| OFL (t) | 1704 | 1704 | 1704 | 1704 |
| AI maxABC (t) | 566 | 566 | 566 | 566 |
| EBS maxABC (t) | 712 | 712 | 712 | 712 |
| AI ABC (t) | 566 | 566 | 566 | 566 |
| EBS ABC(t) | 712 | 712 | 712 | 712 |
| **Status** | As determined *last* year 2009 | 2010 | As determined *this* year 2010 | 2011 |
| Overfishing | No | n/a | No | n/a |

The BSAI other rockfish complex was not subjected to overfishing in 2010.

**Responses to the comments of the Scientific and Statistical Committee**

General SSC comments from the December, 2010, meeting

*For assessments with multiple models, the SSC requests that status determination criteria (Tier, two-year biomass projections, ABC's, and OFL's) be arrayed by stock assessment authors in a table in the assessment chapter so that the Plan Team and SSC can consider choosing alternative models. If the number of models being presented is very large, the authors may use their discretion to select a subset of desirable models for this summary.*

*For greater consistency in the way the terminal year catch is specified, the SSC requests that authors incorporate their best estimate of total landings that will occur for the entire year. This information will be used to generate projections and should be incorporated into BSAI and GOA specification tables.*

These issues will be addressed in future years if alternative models are considered.

There were no specific SSC comments for the BSAI other rockfish complex.

## Data Gaps and Research Priorities

Validating aging techniques of shortspine thornyheads, and obtaining ages from archived samples, remains 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.

## Summaries for the Plan Team

| Species | Year | Biomass | OFL | ABC | TAC | Catch |
|---|---|---|---|---|---|---|
| Other Rockfish | 2010 | 39,215 | 1,380 | 1,040 | 1,040 | 760 |
| | 2011 | 48,890 | 1,704 | 1,278 | 1,000 | 838[1] |
| | 2012 | 48,890 | 1,704 | 1,278 | | |
| | 2013 | 48,890 | 1,704 | 1,278 | | |

| | BSAI | AI | EBS | Total |
|---|---|---|---|---|
| OFL (2010) | 1380 | | | 1380 |
| ABC (2010) | | 555 | 485 | 1040 |
| TAC (2010) | | 555 | 485 | 1040 |
| Catch (2010) | | 497 | 263 | 760 |
| | | | | |
| OFL (2011) | 1700 | | | 1700 |
| ABC (2011) | | 570 | 710 | 1280 |
| TAC (2011) | | 500 | 500 | 1000 |
| Catch (2011)[1] | | 580 | 257 | 837 |
| | | | | |
| OFL (2012) | 1700 | | | 1700 |
| ABC (2012) | | 570 | 710 | 1280 |
| | | | | |
| OFL (2013) | 1700 | | | 1700 |
| ABC (2013) | | 570 | 710 | 1280 |

[1]Current as of October 8, 2011