# CHAPTER 13

## Assessment of the Northern Rockfish Stock in the Eastern Bering Sea and Aleutian Islands

by

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### Introduction

In 2005, 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 northern rockfish in the BSAI area will be conducted. The 2010 full assessment can be found at http://www.afsc.noaa.gov/REFM/docs/2010/BSAInorthern.pdf. In years without a scheduled Aleutian Islands survey, an "update" is produced by revising the recent catch data and re-running the projection model using the results from the previous full assessment as a starting point. Therefore, this update was produced by running the projection model with a revised catch estimate for 2010 and a new catch estimate for 2011.

### Updated ABC, OFL, Catch and Projection

The new information for this update is the final estimate of 2010 catch and a revised estimate of the 2011 catch. The 2010 catch was 4,332 t, 3.7% smaller than the estimate of 4,500 t was used in the 2010 projection. The 2011 catch through October 8$^{th}$ was 2,587 t, with catches still occurring in the fall of 2011. The estimated 2011 catch of 3,446 t is obtained by summing the total 2011 through September (2,545 t) and the average catch from Oct-Dec from 2007 – 2010 (901 t). The 2012 and 2013 catches were set to the average annual catch from 2007-2010 (3687 t). A summary of the updated projection model results is shown below.

| **Quantity** | As estimated or *specified last* year for: 2011 | 2012 | As estimated or *recommended this* year for: 2012 | 2013 |
|---|---|---|---|---|
| *M* (natural mortality rate) | 0.0427 | 0.0427 | 0.0427 | 0.0427 |
| Tier | 3a | 3a | 3a | 3a |
| Projected total (age 3+) biomass | 201,429 | 196,815 | 202,173 | 202,623 |
| Female spawning biomass (t) | | | | |
| Projected | 71,516 | 69,319 | 72,211 | 71,764 |
| $B_{100\%}$ | 126,528 | 126,528 | 126,528 | 126,528 |
| $B_{40\%}$ | 50,611 | 50,611 | 50,611 | 50,611 |
| $B_{35\%}$ | 44,285 | 44,285 | 44,285 | 44,285 |
| $F_{OFL}$ | 0.071 | 0.071 | 0.071 | 0.071 |
| $maxF_{ABC}$ | 0.058 | 0.058 | 0.058 | 0.058 |
| $F_{ABC}$ | 0.058 | 0.058 | 0.058 | 0.058 |
| OFL (t) | 10,600 | 10,400 | 10,500 | 10,354 |
| maxABC (t) | 8,670 | 8,330 | 8,608 | 8,489 |
| ABC (t) | 8,670 | 8,330 | 8,608 | 8,489 |
| **Status** | As determined *last* year 2009 | 2010 | As determined *this* year 2010 | 2011 |
| Overfishing | No | n/a | No | n/a |
| Overfished | n/a | No | n/a | No |
| Approaching overfished | n/a | No | n/a | No |

BSAI northern rockfish was not subjected to overfishing in 2010, and is not overfished or approaching an overfished condition.

**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.*

The request for a table summarizing multiple model runs will be addressed in the 2012 full assessment. A slightly altered methodology was used in this update to improve estimates of terminal year catch.

SSC comments for BSAI northern rockfish from the December, 2010, meeting

*SSC recommendations to the author:*

*1) The model consistently underestimates the early fishery age composition and overestimates the recent fishery age compositions. This should be evaluated and model improvements should be explored to resolve this pattern and/or attempt to better fit age composition data.*
*2) Consider alternative selectivity patterns for the fishery.*
*3) Consider alternate selectivity time periods and state the rationale.*
*4) Explore increasing the number of age bins and evaluate model fit to the data.*

These issues will be addressed in the 2012 full assessment for BSAI POP. With regard to item 1 above, the issue is the underestimation of the older age compositions (i.e. ages 20 and above) in the earlier portion of the data and the overestimation of the recent older age compositions.

**Data Gaps and Research Priorities**

Little information is known regarding most aspects of the biology of northern rockfish, particularly in the Aleutian Islands. Recent genetic data suggests that the spatial movement of northern rockfish, per generation, may be much smaller than the current BSAI management area. The evaluation of spatial management units will be conducted for the 2012 assessment with a template developed by the Plan Team-SSC working group on stock structure. More generally, little is known regarding the distribution, duration, and habitat requirements of the various life-history stages of northern rockfish. Such information would improve the quality of the northern rockfish assessment.

**Summary table for the Plan Team**

| Year | Biomass[1] | OFL | ABC | TAC | Catch[2] |
|---|---|---|---|---|---|
| 2010 | 202,267 | 8,642 | 7,242 | 7,240 | 4,332 |
| 2011 | 201,429 | 10,600 | 8,670 | 4,000 | 2,587 |
| 2012 | 202,173 | 10,500 | 8,608 | | |
| 2013 | 202,623 | 10,354 | 8,488 | | |

[1] Total biomass from age-structured projection model.
[2] Catch as of October 8, 2011.

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