Appendix 1 – Gulf of Alaska and Bering Sea/Aleutian Islands SAFE Reports

Assessment of the Grenadier Stock Complex in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands

by
David M. Clausen and Cara J. Rodgveller
November 2011

EXECUTIVE SUMMARY

Introduction

Grenadiers are presently considered "nonspecified" by the NPFMC, which means they are technically not part of the NPFMC management process and are not assigned values for overfishing levels (OFL), acceptable biological catch (ABC), or total allowable catch (TAC). In 2010, they were dropped from NPFMC Management Plan amendments that moved a number of species to a new management category, "in the fishery". Had grenadiers remained in these amendments, they could have become "specified" by the NPFMC, in which case recommended values of ABC and OFL would be required. Despite their removal from the amendments, future amendments are expected to address the issue of grenadier management, and grenadiers may eventually be categorized as "in the fishery". In response to this possible change in the management status of grenadiers, full assessment reports were prepared for this group in 2006, 2008, and 2010 Because grenadiers are "nonspecified", all these reports are considered unofficial, and they have been included as appendices in the standard SAFE reports. In 2011, it was decided to present only a short "Executive Summary" for grenadiers. An updated full assessment is planned for 2012.

Of the seven species of grenadiers known to occur in Alaska, giant grenadier (*Albatrossia pectoralis*) appears to be most abundant and also has the shallowest depth distribution on the continental slope. As a result, it is by far the most common grenadier caught in the commercial fishery and in fish surveys. Therefore, the grenadier assessments have focused on giant grenadier.

For a copy of the last full assessment of Alaska grenadiers in 2010, see: http://www.afsc.noaa.gov/REFM/docs/2010/GOAgrenadier.pdf.

New Survey Information

New survey data available this year for giant grenadier include results of the 2011 NMFS longline survey in the Gulf of Alaska (GOA) and eastern Bering Sea (EBS) and the 2011 Gulf of Alaska trawl survey. In the 2011 longline survey, the relative population weight (RPW; an index of relative biomass) for giant grenadier in the GOA was 953,916, a decrease of 32% compared to the 2010 RPW. The RPW for giant grenadier in the EBS in 2011 was 643,107, 19% less than the last year this area was surveyed in 2009. The 2011 GOA trawl survey presents a problem for assessment of giant grenadier because it did not cover all the depth strata to 1,000 m that have been used in the previous assessments for grenadiers. The survey did not sample the deepest stratum, 700-1,000 m, where past surveys have found as much as >50% of the biomass.

Updated Catch

Catch estimates (mt) for grenadiers, nearly all of which are thought to be giant grenadier, are listed below for the most recent four years (updated as of Nov. 17, 2011):

	Eastern Bering Sea	Aleutian Islands	Gulf of Alaska	Total
2008	2,670	2,490	11,508	16,668
2009	2,902	3,743	6,427	13,072
2010	2,795	3,553	5,419	11,766
2011	n.a.	n.a.	8,191	14,552

n.a. = not available at the time this report was prepared. Total eastern Bering Sea and Aleutian Islands combined catch was 6,360 mt.

Summary of Results

The previous (2006, 2008, and 2010) SAFE reports for grenadiers have all recommended a tier 5 approach for determining OFL and ABC. The tier 5 computations have been based on giant grenadier only and have excluded the other grenadier species because virtually none of the other species are caught in the commercial fishery and relatively few are taken in fish surveys. Therefore, in the tier 5 determinations, giant grenadier is serving as a proxy for the entire grenadier group.

Gulf of Alaska Grenadiers

Quantity	As estimated or *specified last* year for: 2011	2012	As estimated or *recommended this* year for: 2012	2013
M (natural mortality rate)	0.078	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	597,884	597,884	597,884	597,884
F_{OFL}	F=M=0.078	F=M=0.078	F=M=0.078	F=M=0.078
$maxF_{ABC}$	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585
F_{ABC}	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585
OFL (t)	46,635	46,635	46,635	46,635
maxABC (t)	34,976	34,976	34,976	34,976
ABC (t)	34,976	34,976	34,976	34,976
Status	As determined *last* year for: 2009	2010	As determined *this* year for: 2010	2011
Overfishing	No	n/a	No	n/a

Bering Sea and Aleutian Islands Grenadiers

Quantity	As estimated or *specified last* year for: 2011	2012	As estimated or *recommended this* year for: 2012	2013
M (natural mortality rate)	0.078	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	1,733,797	1,733,797	1,733,797	1,733,797
F_{OFL}	F=M=0.078	F=M=0.078	F=M=0.078	F=M=0.078
$maxF_{ABC}$	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585
F_{ABC}	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585	0.75M=0.0585
OFL (t)	135,236	135,236	135,236	135,236
maxABC (t)	101,427	101,427	101,427	101,427
ABC (t)	101,427	101,427	101,427	101,427
Status	As determined *last* year for: 2009	2010	As determined *this* year for: 2010	2011
Overfishing	No	n/a	No	n/a

Response to SSC Comments Regarding the Grenadier Assessment

The SSC made the following comment in their Dec. 2010 minutes to assessment authors of the grenadier report:

The authors provided information for estimation of biological reference points for the BSAI and GOA if the NPFMC elects to manage this complex in the fishery. The SSC agrees with the proposed methods for estimation of reference points in the GOA and BS. However, the estimation method proposed for the AI requires further work. The SSC requests that the author considers the uncertainty associated with the proposed Tier 5 expansion method for the AI.

Response:

We are currently working on different approaches for estimating biomass of giant grenadier in the Aleutian Islands, where the grenadier population is incompletely sampled by both the NMFS longline survey and the NMFS bottom trawl survey. An improved extrapolation procedure has been developed to estimate the longline relative population weight (RPW) of giant grenadier in the western half of the Aleutian Islands, which has not been sampled since the Japan/U.S. Cooperative Longline Survey ended. In combination with this, we are working on a new computational method for estimating biomass of giant grenadier in the Aleutian Islands that makes use of biomass of this species from the Aleutian Islands trawl surveys. In the previous method used to estimate giant grenadier biomass in the Aleutian Islands, the Aleutian Islands trawl surveys were not used because the surveys only extend to a maximum depth of 500 m and therefore only sample a portion of the giant grenadier population. When the new method is finalized, variance of the new biomass estimate will also be computed. We plan to present the new method at the September 2012 Plan Team meetings. Based on Plan Team approval and recommendations, we hope to use the new method when the next full assessment of grenadiers is prepared for November 2012 SAFE report.

(This page intentionally left blank)