

# Monkfish FMP Review of Biological and Management Reference Points

*PDT Report to the  
Scientific and Statistical  
Committee*

August 24, 2010

# Discussion Outline

- Terms of Reference
- SARC 50 Monkfish Stock Status and BRP recommendations
- PDT calculation of updated OFL and discussion of sources of uncertainty
- Interim ABC control rule and updated calculation of ABC
- 2011-2016 projections under various catch scenarios

# Terms of Reference

- Review SARC 50 Report, Monkfish (Goosefish) Assessment for 2010, including recommendations for updating biomass reference points, and the approach to estimating the MSY proxy, for purposes of developing an ABC recommendation for the monkfish resource;
- Review the PDT's updated calculation of OFL using SARC 50 results;
- Develop a recommendation to the Council for an updated ABC that accounts for uncertainty in the estimate of OFL, including assessment model uncertainties and projection uncertainties.

# Stock Status – SARC 50

- Both stock components not overfished and overfishing not occurring relative to current and newly recommended BRPs
- Total biomass in 2009: 66,062 mt (N) and 131,218 (S)
- Fishing mortality rate in 2009: 0.10 (N) and 0.07 (S)
- *High degree of uncertainty remains in estimates from the SCALE model due to data limitations, poorly understood monkfish biology, and the strong retrospective pattern in the northern area*

## SARC 50 calculation of MSY

- $F_{\text{threshold}} = F_{\text{max}}$ , proxy for  $F_{\text{msy}}$
- $B_{\text{target}}$ : SARC 50 recommends long term projected biomass at  $F_{\text{msy}}$  proxy ( $B_{\text{max}}$ )
- MSY: catch produced from  $B_{\text{target}}$  when fishing at  $F_{\text{msy}}$  proxy
  - **$MSY = F/Z * (1 - e^{-z}) * B$**

From SARC 50 Report:

**MSY = 10,745 mt (N) and 15,279 mt (S)**

# OFL

- OFL: annual catch based on  $F_{\text{threshold}} \times B_{\text{current}}$  (exploitable B)
- May fluctuate above/below MSY depending on stock size
- $B_{\text{current}}$  (2009) above  $B_{\text{target}}$  (both DPWG 2007 and SARC 50 recommended)
- **$OFL = F/Z \cdot (1 - e^{-z}) \cdot B_{\text{current}}$**   
**OFL = 14,084 mt (N) and 35,036 mt (S)**

# ABC

- Accounts for scientific uncertainty in estimate of OFL and other scientific uncertainty
- Scientific uncertainty includes historical catch, growth, longevity, M, and other information; new assessment model; survey variability; and more.
- Models exhibit retrospective patterns, especially in the North; strongest for 2002-2006, weaker for 2007-2008

# Interim ABC Control Rule

- 2009 SSC recommendation adopted in Amendment 5 (in NMFS review)
- *“ product of the average exploitation rate during the recent period of stable or increasing trend in biomass for each management unit and the most recent estimate of exploitable biomass”*
- *should be considered an interim proxy until Overfishing Level of Catch and its uncertainty can be projected*

# North ABC Comparison

	<b>DPWG 2007</b>	<b>SARC 50</b>
<b>Period of stable/increasing biomass</b>	1999-2006	2006-2009
<b>Exploitable B</b>	97,940 mt	46,150 mt
<b>Ave. Exploitation Rate</b>	0.18	0.16
<b>ABC</b>	17,485 mt (Amendment 5)	7,592 mt

North ACT in Amendment 5 = 10,750 mt

# South ABC Comparison

South	<b>DPWG 2007</b>	<b>SARC 50</b>
<b>Period of stable/increasing biomass</b>	2000-2006	2002-2009
<b>Exploitable B</b>	98,250 mt	108,740 mt
<b>Ave. Exploitation Rate</b>	0.14	0.11
<b>ABC</b>	13,326 mt (Amendment 5)	12,316 mt

South ACT in Amendment 5 = 11,469 mt

# SARC 50 Projections

- SCALE model results & AGEPRO stock trends 2011-2016 using catch at Fthreshold, proposed ACTs and Amendment 5 ABC values (based on DPWG 2007); Tables 3 and 5 in the PDT memo
- Low or no probability that biomass falls below SARC 50 recommended Bthreshold ( $1/2 B_{max}$ ) under any scenario
- No probability that overfishing will occur under any scenario, except  $P > 50\%$  that overfishing will occur in the North by 2012 under ABC level of catch (17,485 mt)

# Additional PDT Projections

- North only, runs at proposed ACT (10,750 mt) and 13,988 mt (80% of current ABC value); Table 3 in PDT memo
- Probabilities of exceeding current and updated Biomass threshold values under Amendment 5 BRPs (lowest observed in the time series, Bloss)
- Under higher catch,  $P > 50\%$  that by 2015 overfishing will occur, and biomass will fall below the 2007, but not the 2009 Bthreshold value