



# NE Data-Poor Stocks (12/08 Meeting): Summary

Feb. 2009

# NE Data Poor Stocks Peer Review Meeting

Stephen H. Clark Conference Room – Northeast Fisheries Science Center  
Woods Hole, Massachusetts

12/8 – 12/12, 2008

## Chairman:

**Dr. Tom Miller**  
(Univ. Maryland)

## Review Panel:

**Dr. Robert Muller**  
(Florida Fish and Wildlife  
Commission )

**Dr. Andy Rosenberg**  
(Univ. New Hampshire)

**Mr. Robert O'Boyle**  
(Beta Scientific Consulting)

## Stocks:

- **Skate spp. Complex**
- **Deep-sea red crab**
- **Atl. Wolffish**
- **Scup**
- **Black sea bass**
- **(Weakfish)**

# NE Data Poor Stocks 2008: Process

1. NRCC chose the stocks and set TORs.
2. Assessment Team: ~20 members (NEFSC, NERO, MAFMC, NEFMC, ASMFC, SEFSC, SWFSC).
3. Interactive Peer Review: Expert Reviewers chosen primarily by Councils from SSCs.
4. “Provide advice to SSC” was a TOR and is reported.
5. Products: (Reviewer’s Report) + (Science Report NEFSC CRD09-02)

Reports at: <http://www.nefsc.noaa.gov/nefsc/saw/>

## **Working Group TORs:**

- 1a. Recommend biological reference points (BRPs) and measurable BRP proxies for: Black sea bass; Red crab; Scup; Skates; Wolffish.**
- 1b. Provide advice about scientific uncertainty and risk for Scientific and Statistical Committees (SSCs) to consider.**
- 1c. Consider developing BRPs for species groups for situations where the catch or landings can not be identified to species.**
- 1d. Recommend ways to improve the information, proxies or assessments.**
- 2. For weakfish, provide guidance for scientists to use in future assessments.**

# **1. NE Skate Complex (7 species)**

## Skates – Main focus:

- Can commercial catch data on the spp. complex be allocated to species level?
- Progress was made using several analytic approaches, BUT Review Panel had insufficient time to review these in detail
- In future, use several approaches, and they will require additional peer review.
- Skate catch data NOT ready to use in analytical SINGLE SPECIES assessment models.

## **Skates – Biological Reference Points (BRPs):**

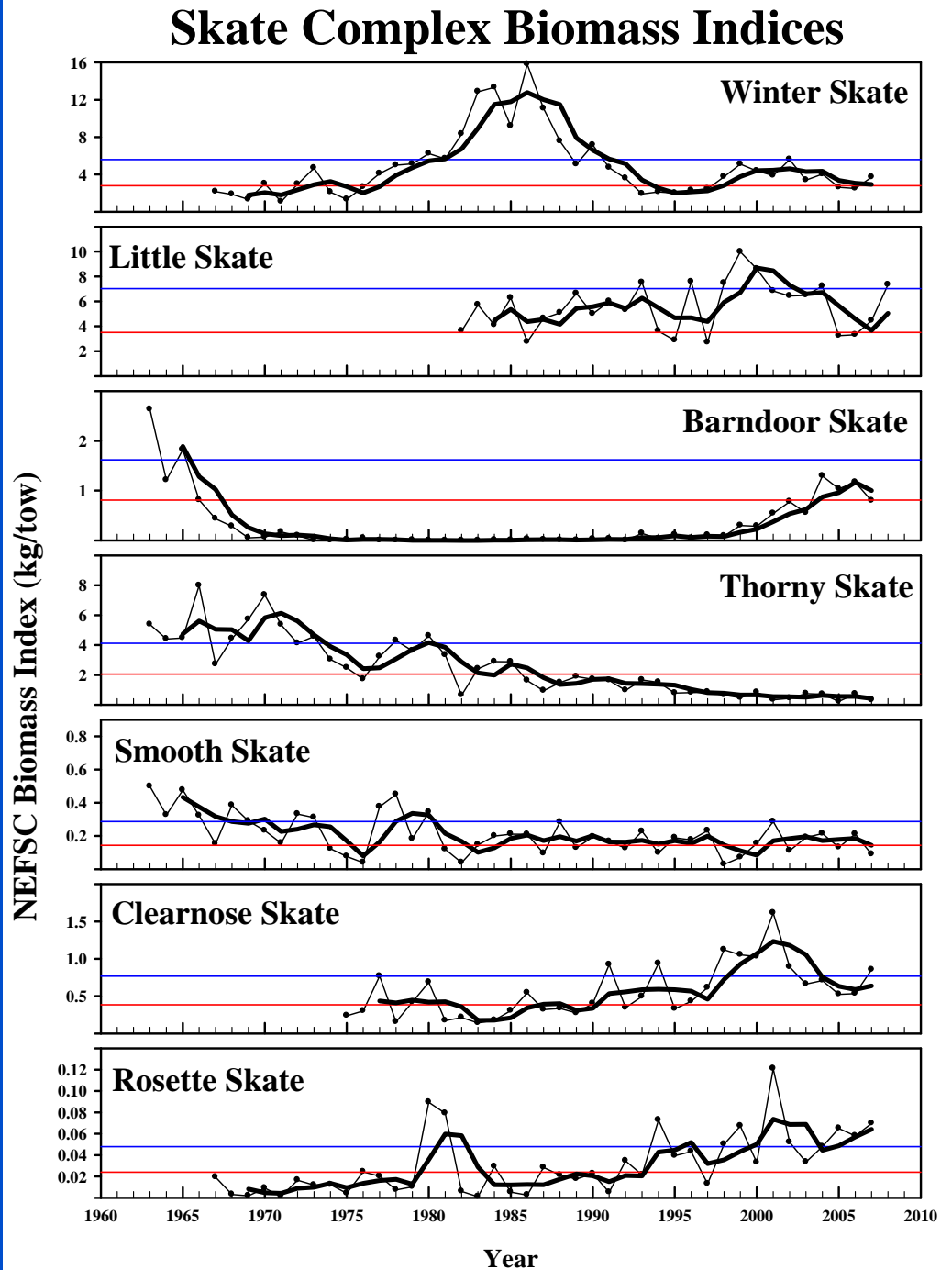
- **BRPs are currently based on NEFSC Survey Indices**
- **New BRP approaches were reviewed, but none of these were recommended at this time. (BRPs must be “measurable”.)**
- **Therefore, NO new measurable stock status definitions were identified or recommended.**
- **Panel recommended updating BRP biomass estimates with recent data (except for Barndoor).**
- **Note: This BRP update implies one change in stock status: Smooth skate not overfished.**

**SKATES. Recommended updated (through 2007/2008) biomass-based reference points for skates. Estimates for Barndoor are an average of 1963-1966 biomass estimates.**

	<b>B<sub>MSY</sub></b>	<b>B<sub>THRESHOLD</sub></b>
<b>Winter</b>	<b>5.60</b>	<b>2.80</b>
<b>Little</b>	<b>7.03</b>	<b>3.51</b>
<b>Barndoor</b>	<b>1.62</b>	<b>0.81</b>
<b>Thorny</b>	<b>4.12</b>	<b>2.06</b>
<b>Smooth</b>	<b>0.29</b>	<b>0.14</b>
<b>Clearnose</b>	<b>0.77</b>	<b>0.38</b>
<b>Rosette</b>	<b>0.048</b>	<b>0.024</b>

Updated NEFSC  
survey indices  
(annual, 3-year  
averages).

Updated B target and  
threshold.



## **Skates: Advice to SSC on Scientific Uncertainty**

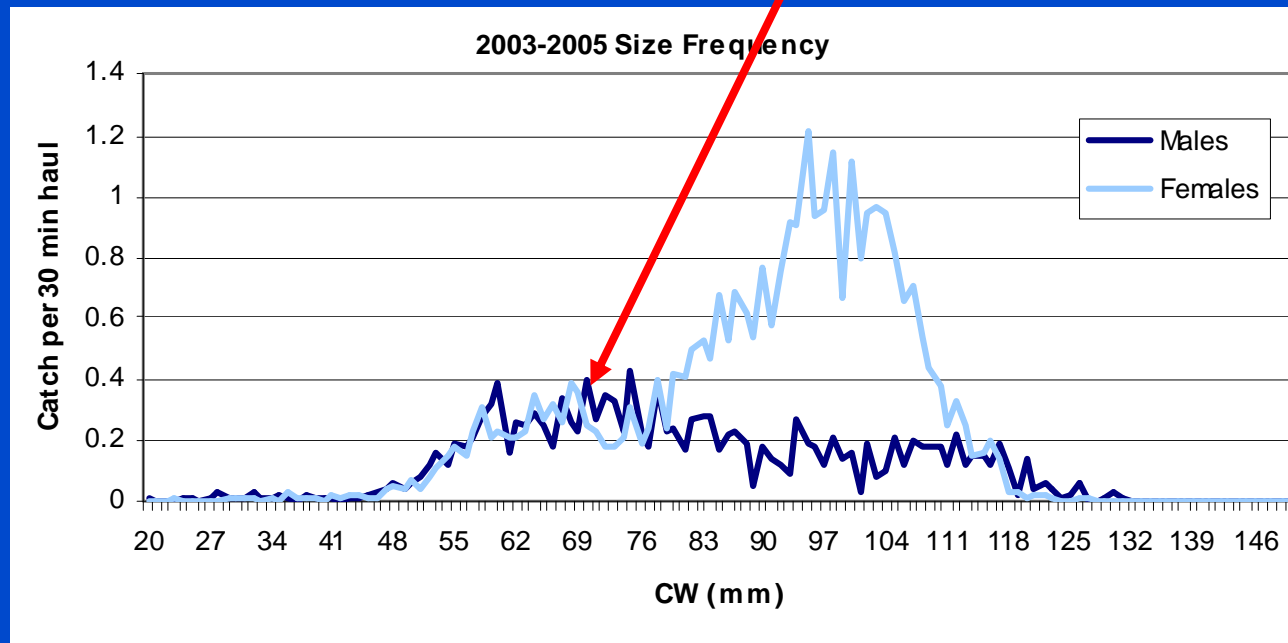
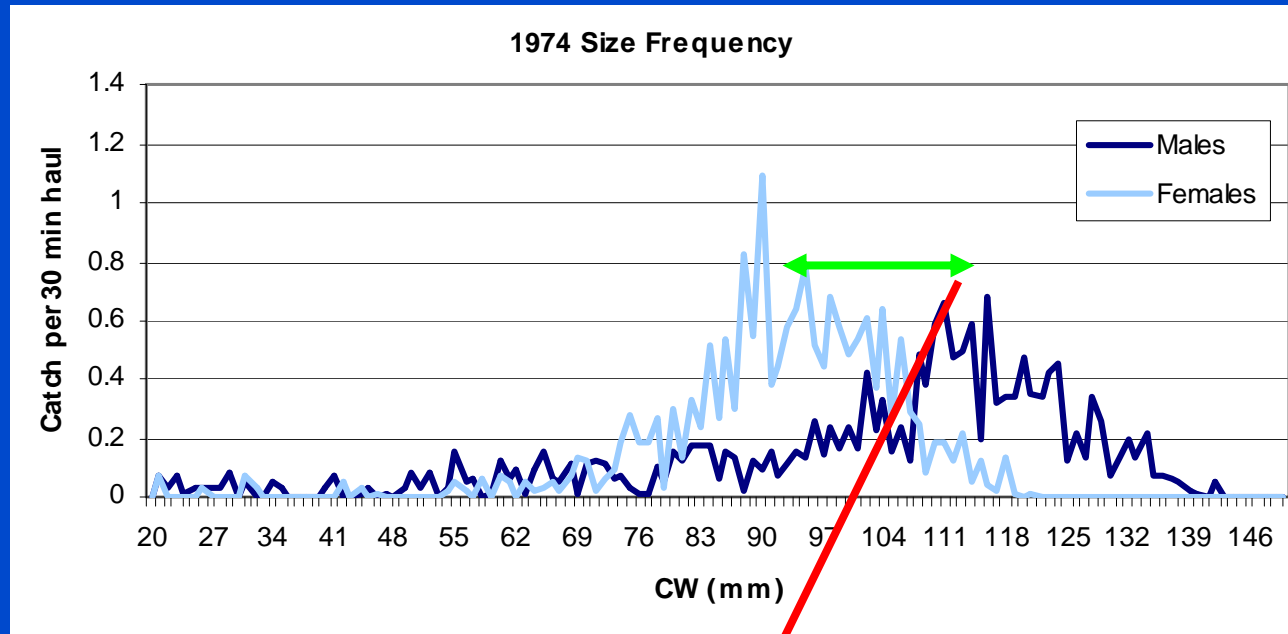
- **Individual assessments not yet feasible. In the current situation, aggregated data on the spp. complex may provide some information.**
- **Sources of Uncertainty: life history; M; species ID of the catch; discard estimates; models didn't fit well.**
- **Advice: For the time being, maintain existing BRPs (with some data updates).**

## **2. Deep Sea Red crab**

## **Red crab – Main focus:**

- **Limited data available (2 research surveys; minimal commercial data).**
- **Current BRPs assumed min harvest size 114 mm CW, males only. Smaller crabs are now harvested (90-100 mm CW) and abundance of large males in population declined over time.**
- **Discussion of potential impact of change in male size-structure on mating success.**

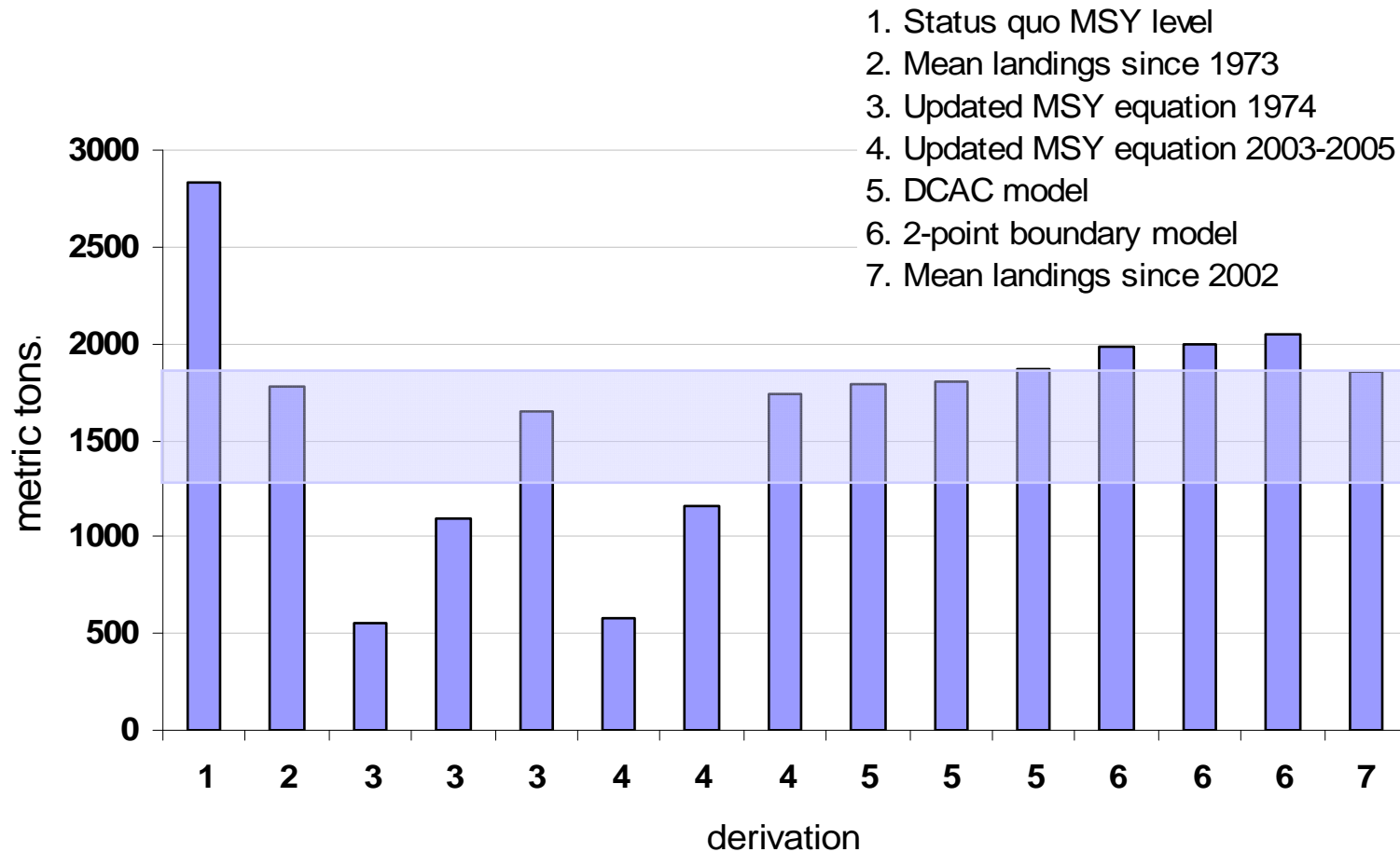
Red crab size structure, by sex, in two surveys (1974 top, 2003-2005 bottom).



## Red crab – BRPs:

- Retain current definition of overfishing (catch > MSY).
- Retain current definition and estimate of  $B_{MSY}$ .
- Current estimate of MSY (2830 mt) was deemed too high; replaced with a new recommendation (1,700-1,900 mt of males).
- New MSY recommendation is based on multiple lines of evidence (biology, theoretical models, catch history).

Red crab. Estimates of sustainable yield from various methods.  
(Upper boundary = mean annual landings since 2002;  
Lower boundary = landings during 2007.)



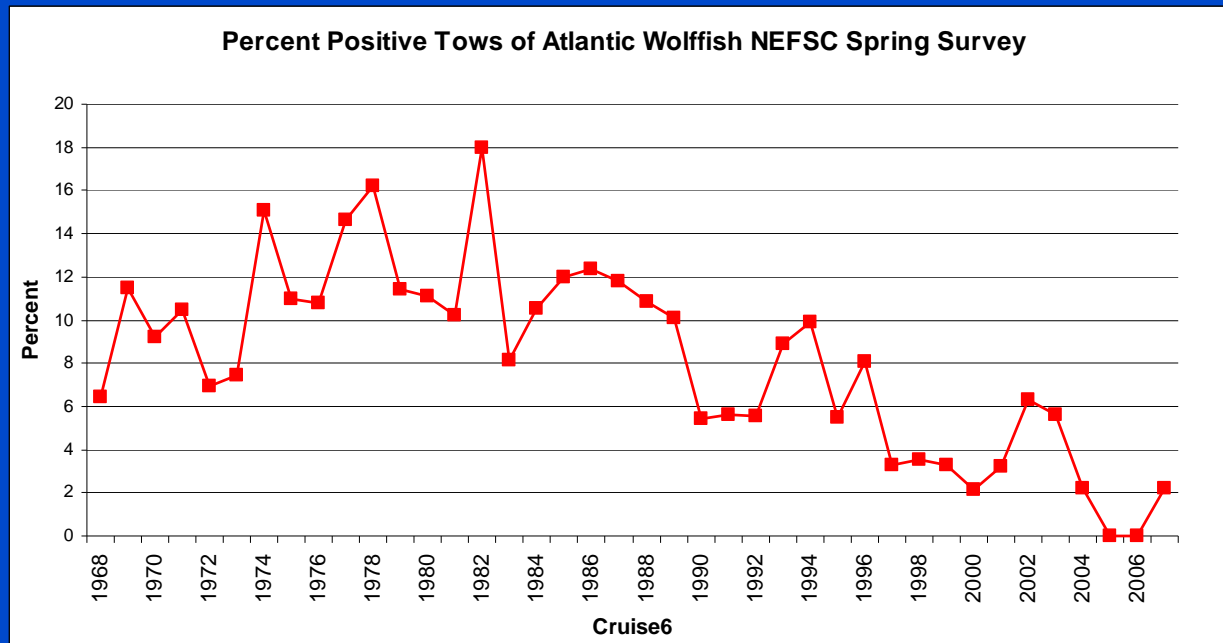
## Red Crab – Advice to SSC on Scientific Uncertainty

- **Advice:** The current MSY was probably too high; a lower value (range) has been recommended.
- **All of the BRPs are UNCERTAIN.**
- **Sources of Uncertainty:** There are many, including life history; population distribution in time/space; what to infer from only 2 surveys; Does the reduction in large males reduce mating success?

## **3. Atlantic wolffish**

## Atlantic wolffish – Main focus:

- Largely starting from scratch (no recent stock assessment; no FMP; no BRPs).
- Survey catchability is uncertain (habitat, nesting behavior)
- Surveys show a declining trend in abundance



## Wolffish – BRPs:

• New Model was recommended as a basis for BRPs:  
“SCALE”

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•  $B_{\text{TARGET}} = \text{SSB}_{\text{MSY}} = (794 - 1,011 \text{ mt})$

•  $B_{\text{THRESHOLD}} = \frac{1}{2} B_{\text{TARGET}}$

•  $(\text{SSB}_{07} / B_{\text{TARGET}})$  ranges from 23% to 45%, which indicates stock is “Overfished”.

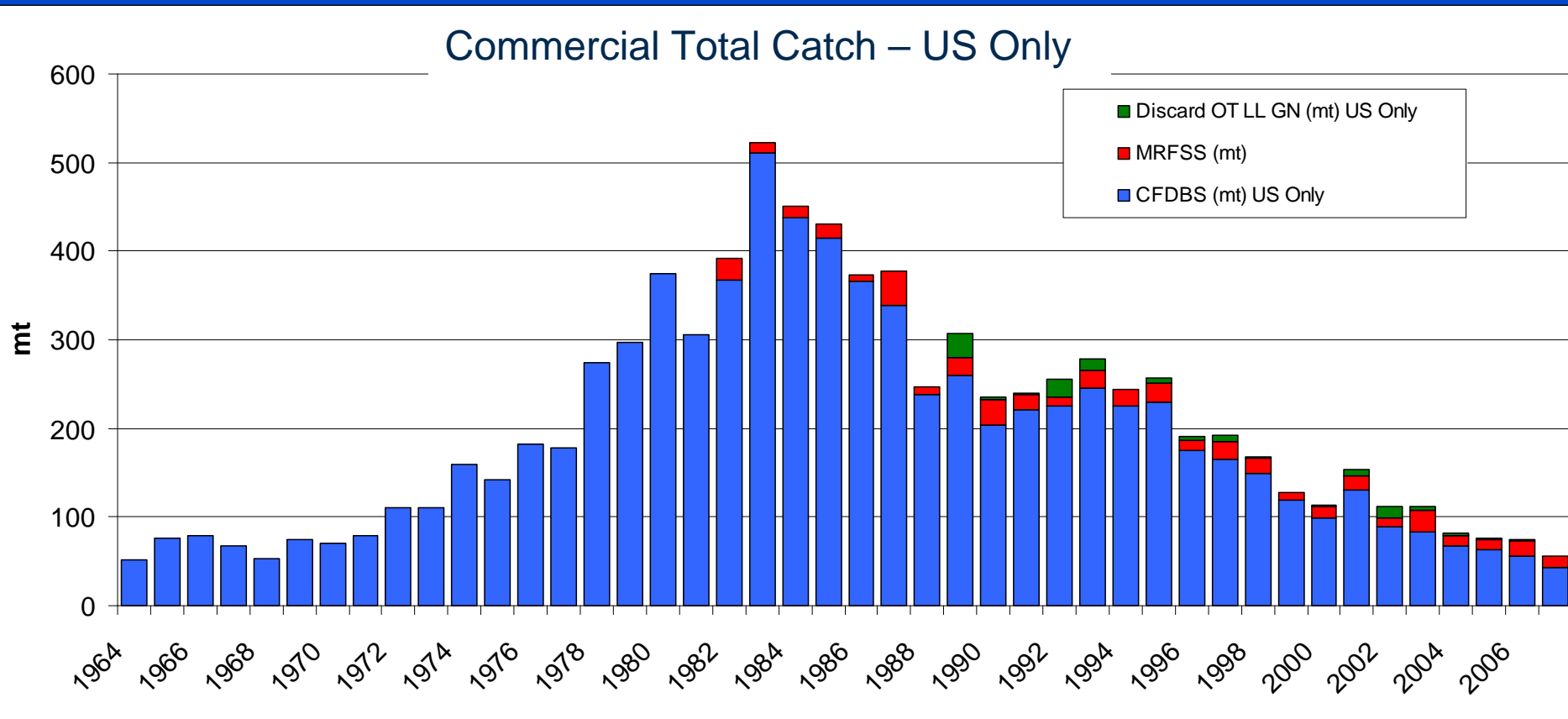
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•  $F_{\text{THRESHOLD}} = F_{\text{MSY PROXY}} = F_{40\%}$  , estimated to be  $<0.35$

•  $(F_{07} / F_{\text{THRESHOLD}})$  ranges from 56% to 158%. Therefore, current overfishing status is too uncertain to determine.

# Wolffish – BRPs (cont):

**MSY = 138-149 mt (estimate from SCALE)**



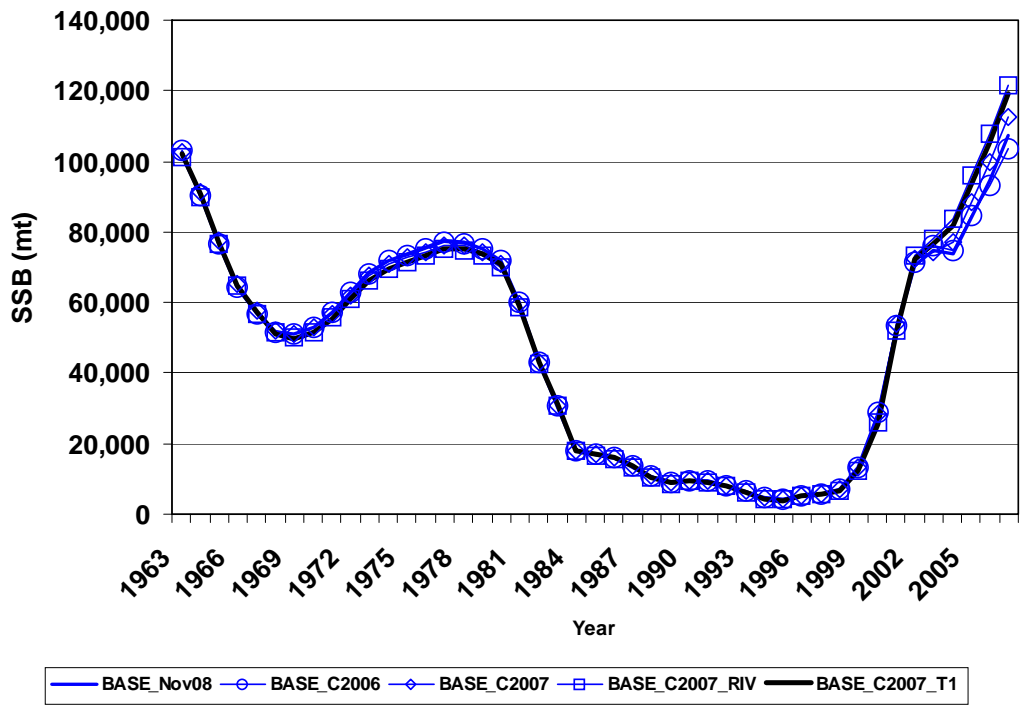
## Wolffish – Advice to SSC on Scientific Uncertainty

- Sources of Uncertainty:** life history; stock structure and migration; survey catchability; commercial catch estimates; anomalous size structure; BRPs are sensitive to life history assumptions and fishery selectivity.
- BRPs:** A model was adopted and used to estimate BRPs, for the first time.
- Advice:** Stock appears “overfished” and future catches may have to be set low until recruitment is better known.

## 4. Scup

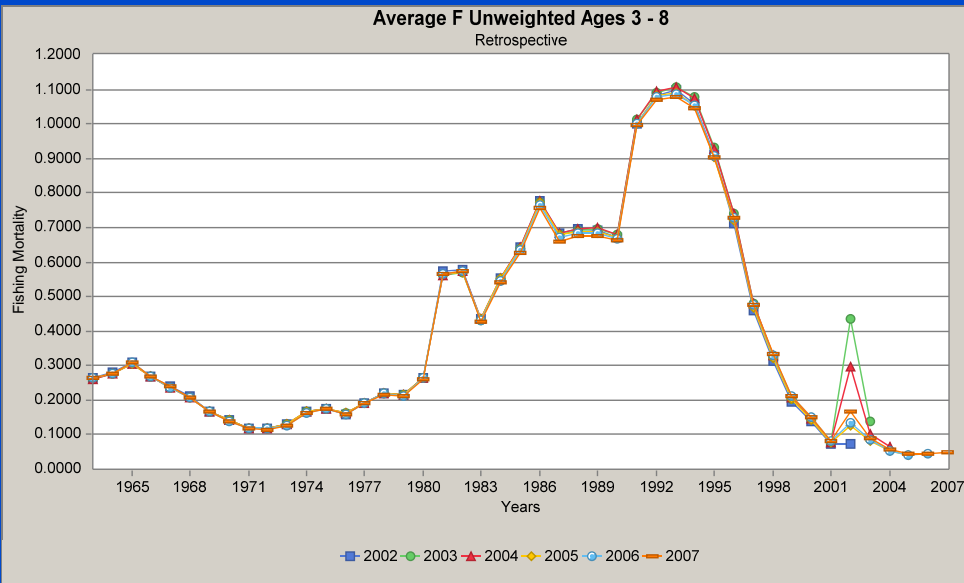
## **Scup – Main focus:**

- **New stock assessment, based on an analytical model (ASAP) was presented, accepted, recommended.**
- **New approach uses more sources of data (fishery and multiple surveys); should represent more stable basis for assessment and status determination.**
- **The scup stock has improved recently due to recruitment and rebuilding of population age structure. Compared to the new model, the previous index approach to determining stock status was less sensitive to these variables.**
- **New results are a major change from last update conducted in July 2008 (which had indicated stock was “overfished”).**



Scup

Spawning Stock Biomass (SSB).



Fishing Mortality

(F) Retrospective

analysis.

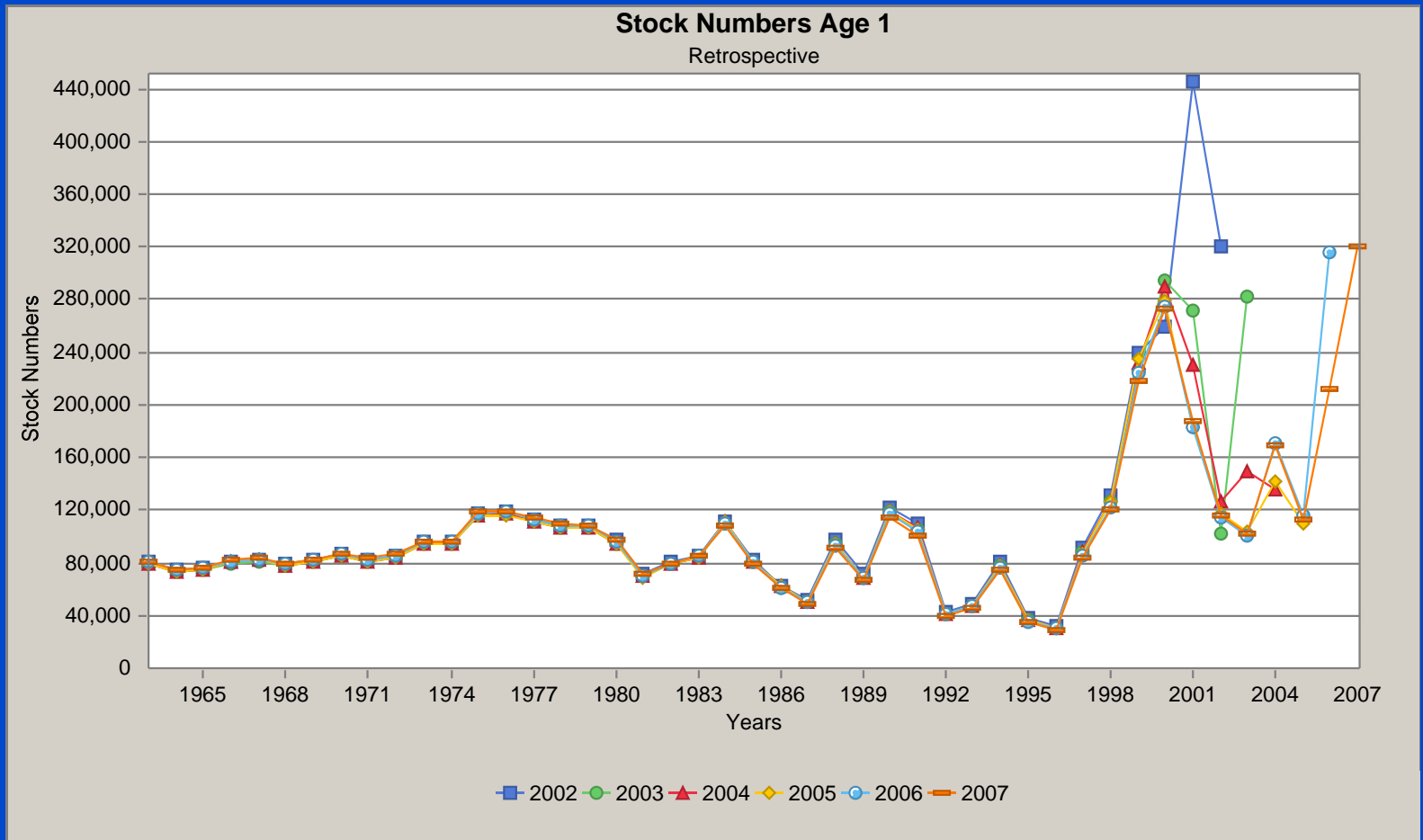
Note that model coded

ages 3-8 are true ages

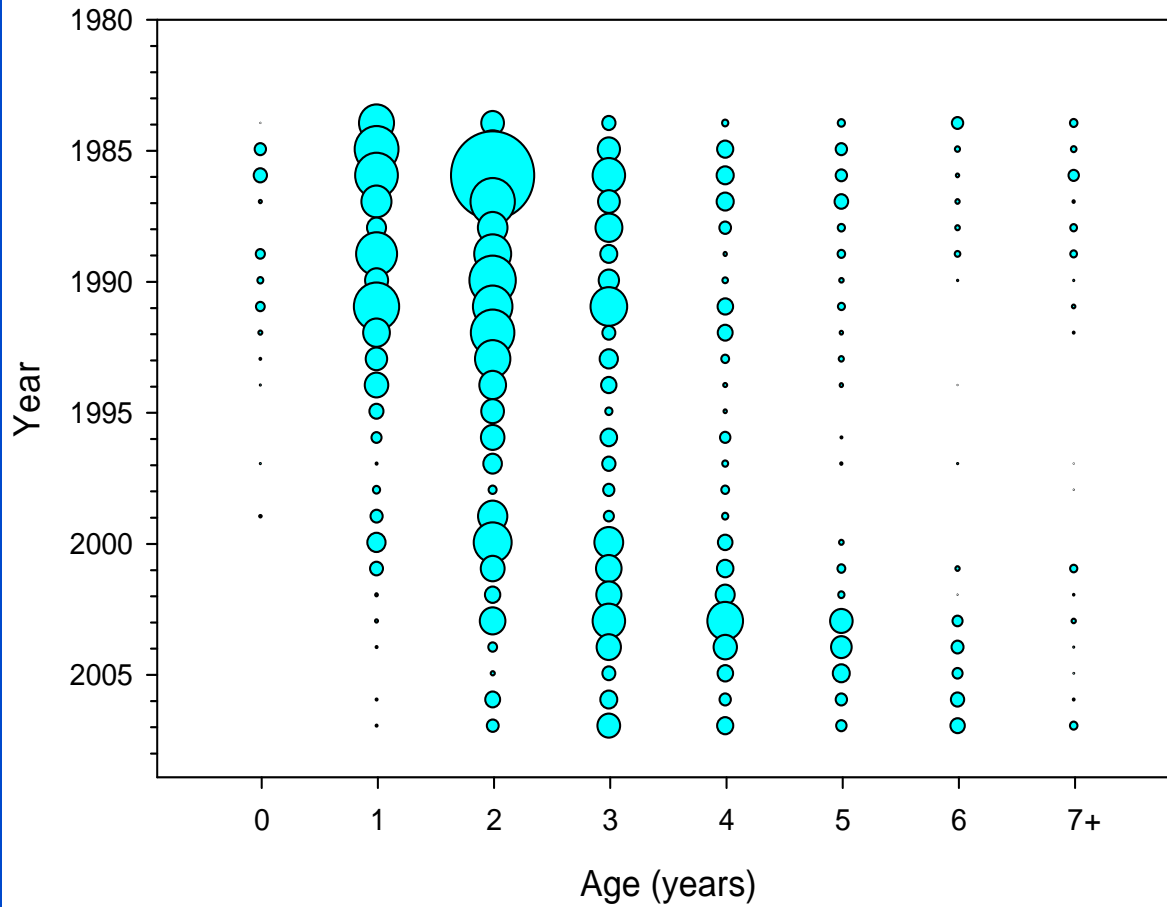
2-7+.

# Recruitment at age 0. Scup accepted model. Retrospective analysis.

Note that model coded age 1 is true age 0. (Fig. 58)



# Recreational Fishery Landings by Age



## Scup – BRPs:

• New Model was recommended as a basis for BRPs:  
“ASAP”

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•  $B_{\text{TARGET}} = \text{SSB}_{\text{MSY}} = 92,044 \text{ mt}$

•  $B_{\text{THRESHOLD}} = \frac{1}{2} B_{\text{TARGET}}$

•  $(\text{SSB}_{07} / B_{\text{TARGET}}) = 130\%$ ,  
which indicates stock is “Not Overfished”.

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•  $F_{\text{THRESHOLD}} = F_{\text{MSY PROXY}} = F_{40\%}$ , estimated to be 0.177

•  $(F_{07} / F_{\text{THRESHOLD}}) = 0.31$ , which indicates “Overfishing is NOT occurring”.

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$\text{MSY} = 16,161 \text{ mt}$

## **Scup – Advice to SSC on Scientific Uncertainty**

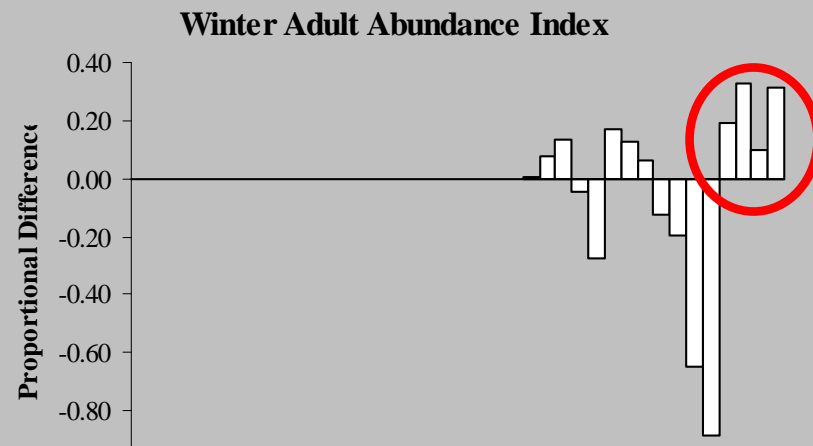
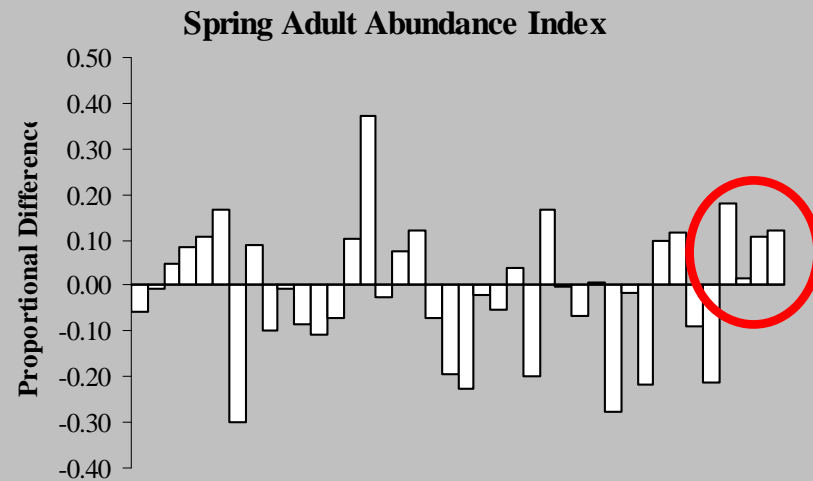
- Panel recommends that scup should no longer be considered “data poor”. Adopt the new model.**
- Sources of Uncertainty: recruitment; max age; survey variability and absence of older fish in surveys; discard estimates; M.**
- BRPs: New ones have been recommended.**
- Advice: a.) Perceived stock status is markedly better. The Panel felt that there was ample justification for accepting revised conclusions.**
- More advice: b.) However, rapid increases in the quota would be unwarranted given uncertainties in (new) model estimates and stock status. A gradual increase in quotas would be appropriate.**

## **5. Black sea bass**

## **Black sea bass – Main focus:**

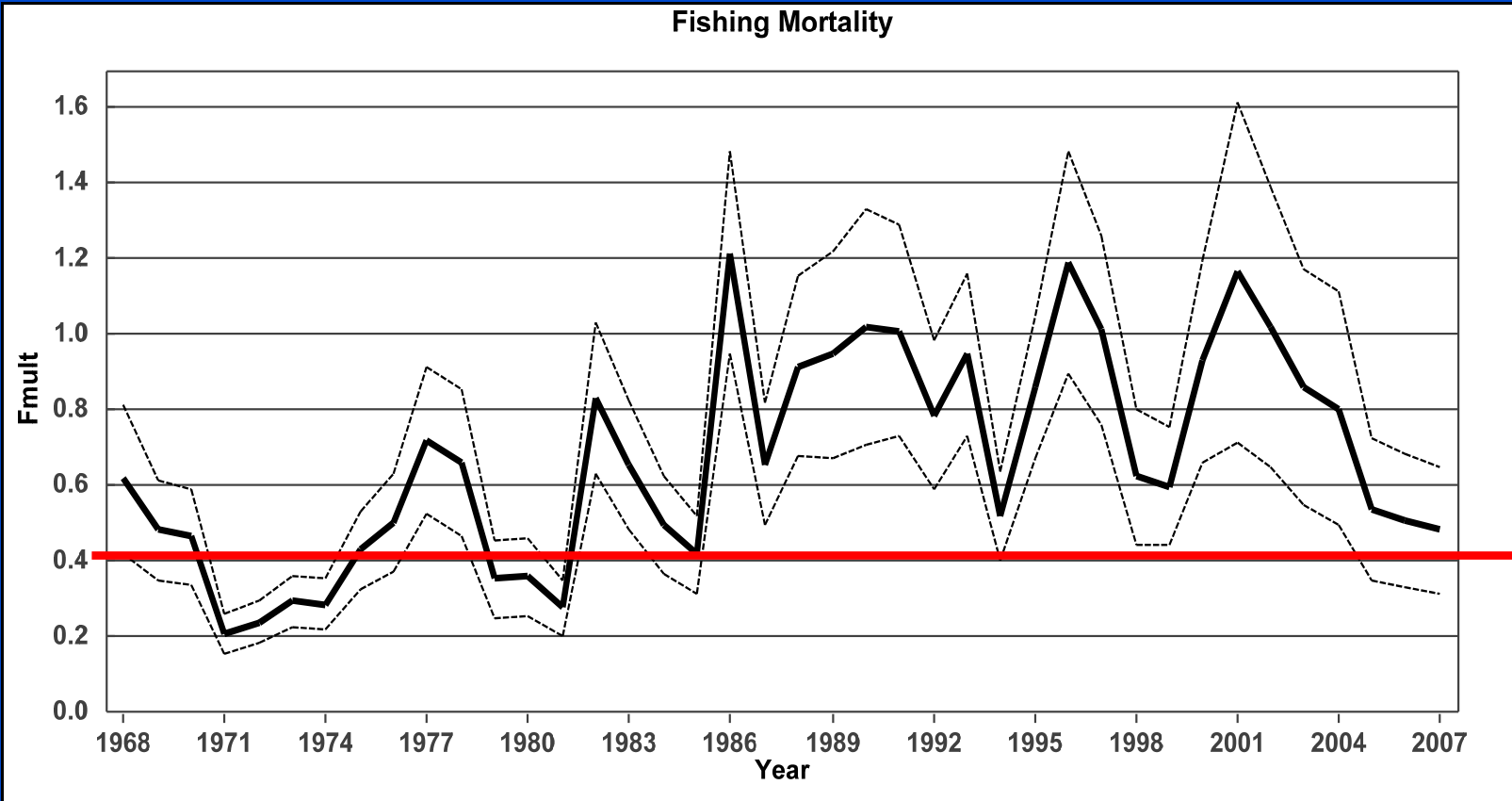
- **Use of tagging data to estimate  $M$ .**
- **How to model a species that changes sex and is territorial. Do standard fishery models apply?**

**Black sea bass:  
“SCALE” Model Fit  
with respect to abundance indices.**



Page 434: **“residuals patterns show predicted indices greater than observed indices for 2004 to 2007”.**  
**“This would suggest that ... the model may overestimate predicted abundance.”**

## Black sea bass – Fishing Mortality Rate



$$F_{2007} = 0.48$$

$$F_{\text{THRESHOLD}} = F_{\text{MSY PROXY}} = 0.42$$

## Black sea bass – BRPs:

- New Model was recommended as a basis for BRPs:  
“SCALE”
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- $B_{\text{TARGET}} = \text{SSB}_{\text{MSY}} = 12,537 \text{ mt}$

- $B_{\text{THRESHOLD}} = \frac{1}{2} B_{\text{TARGET}}$

- $(\text{SSB}_{07} / B_{\text{TARGET}}) = 91.5\%$ ,  
which indicates stock is “Not Overfished”.

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- $F_{\text{THRESHOLD}} = F_{\text{MSY PROXY}} = F_{40\%}$  , estimated to be 0.42 .

- $(F_{07} / F_{\text{THRESHOLD}}) = 1.14$ , which indicates  
“Overfishing IS occurring”.

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$\text{MSY} = 3,903 \text{ mt}$

## **Black sea bass – Advice to SSC on Scientific Uncertainty**

- **New Results and Status are UNCERTAIN.**
- **Sources of Uncertainty:** M; modeling a species that changes sex (Traditional models may not apply!); lack of model fit in recent years (positive residuals); unit or multiple stocks; commercial discards; sensitivity of BRPs to weights of data sources.
- **BRPs:** New ones have been recommended.
- **Advice:** The Panel accepted the model for assessment and BRPs, BUT recommends caution in management due to high uncertainty. Allow for sizable uncertainty in stock status when establishing catch limits.

## **6. Weakfish**

## Weakfish

- In Dec. 2008, the Chair of the ASMFC Tech. Committee presented work in progress on the weakfish assessment to the DP Peer Review Panel and to the DP Working Group. (over a 2 day period)
- Weakfish Models (VPA and Biomass Dynamics) and their input data were presented and discussed.
- The Review Panel provided general comments and guidance (written report is available <http://www.nefsc.noaa.gov/nefsc/saw/>).
- A benchmark weakfish stock assessment will be reviewed in June 2009 at SARC-48.

## Overview of Review Panel Comments on Weakfish

- VPA -- Panel questioned reliability of input catch data, discard estimates, natural mortality rate estimates, catch at age information, spatial and temporal coverage of survey indices, weights at age.
- VPA -- Recommended considering a different model (e.g., statistical catch at age).
- Panel noted that many of its questions had been asked before at another review.
- Biomass Dynamics Model – An interesting exploration of potential ecological mechanisms acting on weakfish, but lacking direct empirical evidence for the mechanisms being hypothesized.

*END*

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