SSC Reports June 2021 SAFMC Meeting

SSC_May2021_Report_FINAL.pdf

Report of SSC Meeting April 27-29, May 3, 2021

SSC Report To The Snapper Grouper Committee June 2021 SAFMC Meeting

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Report of SSC Meeting April 27-29, May 3, 2021

SSC agrees that the assessment:

- appropriately addresses ToRs
- is BSIA
- is an adequate basis for determining stock status and supporting fishing level recommendations, and
- used methods of addressing uncertainty that are consistent with expectations and available information



Factors affecting reliability of stock status estimates and fishing level recommendations:

- Stock status robust to natural mortality and other assumptions, despite some counterintuitive responses to re-estimating steepness
- Recruitment low and may have been overestimated
- Sharp drop in private rec discards
- Difficult to model protogynous life history





GR HB CH

Has there been a change in stock status?

 Stock condition has worsened - continued low recruitment, declines in abundance and biomass



Should fishing level recommendations and management be based on the recent low recruitment?

- Yes
- Consistent low recruitment estimates have been observed for the last 10 consecutive years
- This period of low recruitment is lowest in the time series. There is no indication high recruitment pulses have occurred.



Year

Recommend OFL based on F=F_{MSY}

ABC Control Rule applied:

- <u>Tier I</u>: 1 (0%) because steepness was estimated
- <u>Tier II</u>: 2 (2.5%) because uncertainty was carried forward in the projections, but environmental conditions were not explicitly included
- <u>Tier III</u>: 4 (7.5%) because the stock is both overfished and overfishing
- <u>Tier IV</u>: 3 (10%) because the stock has low productivity, high vulnerability, and high susceptibility
- Recommended total adjustment to the OFL of 20% = P* of 30%
- Recommended $P_{rebuild} = 70\%$

SSC Catch Level Recommendations for Gag Grouper

Criteria		Deterministic		Probabilistic			
Overfished evaluation (SSB/SSB _{MSY})		0.15		0.14			
Overfishing evaluation		2.15		2.27			
MFMT (F _{MSY})		0.37		0.35			
SSB _{MSY} (mt whole wt)		1563.9		1659.4			
MSST (mt whole wt)		1172.9		1244.5			
MSY (1000 lbs. gw)		1455.1		1453.5			
Y at 75% F _{MSY} (1000 lbs.)							
ABC Control Rule Adjustment		20%					
P-Star		30%					
P rebuild		70%					
М		0.15					
OFL RECOMMENDATIONS							
Year	Landed LBS (GW, 1,000 <u>lb</u>)	Discard LBS	Landed Numb (1,000)	er Discard Number			
2023	367		36				
2024	494		45				
2025	605		53				
2026	706		60				
2027	808		68				

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Catch level recommendations (cont'd):

- Catch level recommendation associated with P_{Rebuild} will be provided once a rebuilding scheduled is selected by the Council
- Consider both average recruitment and low recruitment scenarios in rebuilding projections

SSC requests Working Group to develop best practices for making recruitment assumptions in projections

Indicators or metrics to monitor:

- Regularly examine updated landings, discards, indices of abundance (SERFS video and headboat), length and age composition for evidence of good recruitment
- Discard mortality and the use of descending devices



Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment:

- Increased age sampling
- Non-traditional recruitment monitoring (e.g., bridge net, channel net sampling)
- Length info from SERFS video index
- Better characterize protogynous life history (e.g., age at sexual transition, maturity, batch fecundity, spawning, potential for sperm limitation, etc.)

Additional research recommendations to improve future assessments:

- Incorporate time-varying maturity/protogyny, if necessary
- Characterize discard mortality, use of descending devices and compliance rates
- Explore drop in MRIP discard estimates
- Examine coastal and estuarine data sources for indicators of recruitment
- Consider Chevron trap catches of ages 1-3 as indicator of recruitment
- Gut content analysis (genetic) of gag and its predators
- Characterize egg viability with age

Next assessment – operational in 5 years



SSC agrees that the assessment:

- appropriately addresses ToRs
- is BSIA
- is an adequate basis for determining stock status and supporting fishing level recommendations, and
- used methods of addressing uncertainty that are consistent with expectations and available information



Factors affecting reliability of stock status estimates and fishing level recommendations:

- Stock status sensitive to uncertainty in natural mortality
- Terminal year of assessment is 2018, so uncertainty in current (2021) stock status is already higher than characterized in the assessment
- Available indices are patchy in spatial coverage and demonstrate high variability with little trend
- Steepness could not be estimated and model sensitive to specified value

Factors affecting reliability of stock status estimates and fishing level recommendations (cont'd):

- Truncation of commercial longline index of abundance in 2006 leaves assessment with little information on recruitment at end of time series
- Recruitment uncertainty accounted for in projections via MCBE
- SSC requests Working Group to develop best practices for making recruitment assumptions in projections



Recommend OFL based on $F=F_{MSY}$

ABC Control Rule applied:

- <u>Tier I</u>: 2 (2.5%) because steepness was specified
- <u>Tier II</u>: 2 (2.5%) because uncertainty was carried forward in the projections, but environmental conditions were not explicitly included
- <u>Tier III</u>: 2 (2.5%) because the stock is in close proximity to benchmark values
- <u>Tier IV</u>: 3 (10%) because the stock has low productivity, high vulnerability, and high susceptibility
- Recommended total adjustment to the OFL of 17.5% = P* of 32.5%

SSC Catch Level Recommendations for Golden Tilefish

Criteria		Deterministic		Probabilistic				
Overfished evaluation (SSB/SSB _{MSY})		0.927		0.803				
Overfishing evaluation		0.947		1.122				
MFMT (F _{MSY})		0.282		0.249				
SSB _{MSY} (gonad wt metric		19.9		22.4				
tons)								
MSST (gonad wt metric		14.9		16.8				
tons)								
MSY (1000 lbs., gutted wt)		541.6		531.6				
Y at 75% F _{MSY} (1000 lbs.)		534		522.7				
ABC Control Rule		17.5						
Adjustment		17.5						
P-Star		32.5						
M		0.1038						
OFL RECOMMENDATIONS								
Year	Landed LBS (GW 1 000 lb)	Discard LBS	Landed Numb (1 000s)	er Discard Number				
2022	573		70					
2023	562		69					
2024	552		68					
2025	543		67					
2026	535		66					
ABC RECOMMENDATIONS								
Year	Landed LBS (GW, 1,000 lb)	Discard LBS	Landed Numb (1,000s)	er Discard Number				
2022	418		51					
2023	435		53					
2024	448		54					
2025	458		55					
2026	466		56					

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Was past management successful at ending overfishing?

- Stock no longer experiencing overfishing
- High uncertainty in stock status (expected at/near MSY)



Uncertainty in stock and fishery status

Is buffer between OFL and ABC appropriate?

- High uncertainty in recruitment (no info in last 7 years, index of abundance truncated)
- This assessment includes narrower range of natural mortality in uncertainty estimation procedures than previous assessments, which contributes to a smaller buffer



Indicators or metrics to monitor:

- Given uncertainty in stock status, SSC recommends a midterm review of:
 - Landings
 - MARMAP/SEAMAP index of abundance
 - Length and age composition from longline, handline, and general recreational fisheries as well as MARMAP/SEAMAP
- SSC encourages monitoring and data collection for tilefish with the new fishery independent South Atlantic Deepwater Longline Survey

Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment:

- "(2a) Explore alternative distributional assumptions for natural mortality for MCBE uncertainty analysis". This would help to reduce uncertainty and could reduce buffer between the OFL and ABC
- "(2b) Consider incorporation of new fishery independent abundance data and/or life history data from: CRP Coop Bottom longline survey data, deepwater survey data, SCDNR vertical longline survey, SA Deepwater Longline Survey". Could inform estimation of recent recruitment and/or adult abundance trends.
- "(2d) Increase age sampling to improve composition data". Increasing available age data is a high priority for this stock.

Additional high priority research recommendations to improve future assessments:

- Investigating the relationship between recruitment and environmental variability to predict/project recruitment
- Collect information on pre-recruit (<age7) abundance, acknowledging this information may be difficult to collect
- Identify any current, ongoing, or recent studies regarding stock structure along the east coast of the US. If none exist, collect genetic data on golden tilefish related to the Cape Hatteras stock boundary.

Next assessment should be operational in 3-5 years and should include pilot survey data with the thought that 3-5 years of data might provide a new index of abundance.



SSC agrees that the assessment:

- appropriately addresses ToRs
- is BSIA



- used methods of addressing uncertainty that are consistent with expectations and available information, and
- is an adequate basis for determining stock status and supporting fishing level recommendations.

However, the SSC tabled ABC-setting pending additional review of new forecasting methodology.

Factors affecting reliability of stock status estimates and fishing level recommendations:

- Results are sensitive to natural mortality, including stock status
- Natural mortality may be density-dependent
- Fits to the catch-at-age for older fish appeared to be either over- or under-estimated, which may impact accuracy of the model
- The model assumes an average discard mortality rate that is not age- or size-dependent, which may impact accuracy of overall fishing mortality estimates



Factors affecting reliability of stock status estimates and fishing level recommendations (cont'd):

- Proportion of mature females is estimated to be relatively high at young ages for a long-lived fish (and compared to Gulf of Mexico). This may be a density-dependent response to previously low stock size.
- Although current recruitment is estimated to be at an alltime high, environmental conditions may be influencing recruitment success.
- High productivity may not be sustained if the age structure is not allowed to expand further.



Factors affecting reliability of stock status estimates and fishing level recommendations (cont'd):

- Separation of SERFS trap and video indices and revised MRIP estimates
- Stock characterization prior to 1990 differs across assessments, but recent stock status and trends are similar qualitatively across assessments



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Stock status and rebuilding:

- Stock status has not changed. Stock is still overfished and overfishing is still occurring.
- Stock may be responding to rebuilding plan:
 - Highest recruitment and abundance in recent years
 - Biomass increasing and age structure expanding
- However, stock still composed primarily of young fish (ages 1-4)

BAM base run – abundance



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Stock status and rebuilding:

- Rebuilding of spawning stock biomass to rebuilding target of SSB/SSBF30% has not yet occurred; therefore, the stock is not yet rebuilt.
- Although total fishing mortality declined after 2010, losses due to discarding are hindering rebuilding.
- The major source of mortality is dead discards.



Recruitment scenarios for ABC-setting:

 Retrospective analysis conducted for this stock indicated recruitment estimates in two of the peels were lower than the lower bound of the MCBE uncertainty band suggesting recruitment may not be estimated with the reported level of certainty



Recruitment scenarios for ABCsetting:

- Stock has demonstrated exceptionally strong year class strength in recent years
- However, there is no guarantee that recent high recruitment will continue to occur in future years
- Environmental conditions may be influencing recruitment success
- High productivity may not be sustained if the age structure is not allowed to expand further



Recruitment scenarios for ABC-setting:

 Previously, the SSC has recommended alternatives to assuming average recruitment in projections if recruitment in long-term decline or extended time period below R_{MSY}



Recruitment scenarios for ABC-setting:

- SSC had extensive discussion of appropriate approach for projecting recruitment if recent trends are increasing
- Given red snapper stock status and the fact that the stock has not yet rebuilt, the SSC recommends average recruitment be used in projections to set fishing level recommendations
- SSC requests Working Group to develop best practices for making recruitment assumptions in projections

Fishing level recommendations:

- Final recommendations tabled pending additional review of
 - New two-step forecasting methods
 - Data on descender device usage
 - Information used to characterize discard mortality and uncertainty
- Preliminary decisions made:
 - Average recruitment be used in projections
 - OFL be set using projections at proxy F_{MSY} ($F_{30\%}$)
 - Recommend ABCs be based on $P_{Rebuild} = 67.5\%$

Indicators or metrics to monitor:

- Recruitment signal in the SERFS trap and video data
- Change in age composition of catches
- Continued and improved monitoring of recreational landings and discards
- Increased sampling with stereo video cameras
- Results of the Great Red Snapper Count in the US South Atlantic

Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment:

- Obtain empirical estimates of natural mortality in region, especially fish ≤ age 7
- Monitor usage of descending devices, venting, circle hooks, and depths fished over time to reduce uncertainty in discard mortality assumptions used in the assessment and projections
- Account for non-independence (autocorrelated error) of the SERFS trap and video indices in the likelihood function

Additional high priority research recommendations to improve future assessments:

- Retrospective review of projections
- Explore alternative start years in future assessments.
- Study timing of peak spawning with climate change
- Quantify egg size and quality as well as batch size by age, especially for young females
- Investigate size dependence of discard mortality using descending devices
- Investigate impact of climate warming on red snapper distribution

Timing of the next assessment should align with incorporation of new data and estimates obtained from the Great Red Snapper Count in the US South Atlantic scheduled for completion in 2023.

