11. RED SNAPPER ASSESSMENT REVIEW

11.1. Documents

Attachment 13a. SEDAR 41 SAR, Red Snapper
Attachment 13b. SEDAR 41 Supplemental Projections

11.2. Presentation

Assessment Overview: Dr. Kate Siegfried, SEFSC

11.3. Overview

The Committee is asked to review the Red Snapper Benchmark assessment prepared through SEDAR 41 and provide fishing level recommendations.

Red Snapper was assessed in SEDAR 15, and was determined to be overfished and experiencing overfishing. This led to the Council developing a rebuilding plan in Amendment 17A. Rebuilding began in 2010 and ends in 2044. Amendment 17A implemented a closure of the Red Snapper fishery and proposed a large closed area off the South Atlantic to reduce discard mortality of Red Snapper. A subsequent good year class was identified in SEDAR 24 that eliminated the need for the large closure, but left the fishery closure in place.

During initial reviews of assessed stocks, the SSC calculated a P* of 30% for Red Snapper, and a probability of rebuild of 70%. However, since rebuilding of Red Snapper began prior to the existence of the P* approach, the rebuilding plan is based on a 50% chance of reaching SSB_{MSY} by the end of the rebuilding period. This is the first assessment of Red Snapper under the P* methodology, thus the Council may consider revising the rebuilding approach but is not obligated to do so.

11.4. Action

- Review assessment
  - Does the assessment address the ToRs to the SSCs satisfaction?
  - Does the assessment represent Best Scientific Information Available?
  - Does the assessment provide an adequate basis for determining stock status and supporting fishing level recommendations?
- Identify and discuss assessment uncertainties
  - Are key uncertainties identified, and if not, indicate additional uncertainties.
  - Are risks and consequences of uncertainties identified and evaluated?
  - Are methods of addressing uncertainty consistent with SSC expectations?
  - List and comment on the effects of those uncertainties that most contribute to risk and impact status determinations and future yield predictions.

- Provide fishing level recommendations
  - Apply the ABC control rule and complete the fishing level recommendations table.
- Provide advice on monitoring the stock until the next assessment
  - What indicators/metrics should the council monitor/SSC evaluate to keep tabs on the stock until the next assessment?
  - Is there a recommended trigger level for these metrics?
- Provide research recommendations and guidance on the next assessment
  - Review the included research recommendations, and indicate those which are most likely to reduce risk and uncertainty in the next assessment.
  - Provide any additional research recommendations the SSC believes will improve future stock assessments.
  - Provide guidance on the next assessment, addressing its timing and type.

SSC RECOMMENDATIONS:

- Review assessment
  - Does the assessment address the ToRs to the SSCs satisfaction?

The SSC received a presentation on the SEDAR 41 Red Snapper stock assessment. After much discussion the Committee concluded that the assessment properly addressed all the review ToRs. Further, the SSC recognized that many of the assessment limitations and uncertainties were caused by data issues and limitations.

  - Does the assessment represent Best Scientific Information Available?

The SSC concluded that the Red Snapper assessment represents BSIA.

  - Does the assessment provide an adequate basis for determining stock status and supporting fishing level recommendations?

The stock assessment is adequate to determine stock status and support fishing level recommendations. However, there was considerable discussion by the SSC of various sources (and causes) of assessment uncertainty. A summary of the Committee's main concerns, discussion points, and recommendations is provided below:

- *Although the assessment indicates that the stock is undergoing overfishing, the SSC noted there is a high uncertainty in exploitation status and thus the degree of overfishing (i.e., the actual numerical value of the current F estimate) is highly uncertain. Therefore, the SSC conclusions were limited to determining that $F_{12\text{-}14}$ exceeded 0.15, and that it is necessary to have F reduced to the level of $F_{REBUILD}$ (0.14).*

- *The biomass status of the stock was less uncertain given information on the highly truncated current age composition, dominated by fish ages 10 and younger. The SSC concurs with the Review Panel's conclusion that the stock is overfished. The current level of spawning stock biomass (SSB_{2014}) is estimated to be about 22% of MSST ($SSB_{2014}/MSST= 0.22$).*
  - *One caveat to be mentioned here is that the model expects to see an extended age structure based on the age specific estimates of M, but this age structure has never been observed in the fishery. The large biomass of the 1950's and 1960's present in the assessment is based on assumptions rather than observations. A differently shaped curve for the natural mortality at age may lead to a different conclusion about the expected age structure and the unfished biomass level. This remains a significant source of uncertainty in this assessment until such time that it can be demonstrated that the stock can indeed attain the extended age structure expected in the model under low fishing mortality.*

- Identify and discuss assessment uncertainties

The SSC had an extensive discussion of the uncertainties, most of which are identified and well documented in the SEDAR 41 Review Workshop report.

- Are key uncertainties identified, and if not, indicate additional uncertainties.
- Are risks and consequences of uncertainties identified and evaluated?
- Are methods of addressing uncertainty consistent with SSC expectations?
- List and comment on the effects of those uncertainties that most contribute to risk and impact status determinations and future yield predictions.

Although the SSC concluded that the assessment represents the best available science, significant areas of uncertainty are evident in both the data and in components to the model. The most significant sources of this uncertainty include: the stock-recruitment relationship, natural mortality at age, the age structure of the unfished population, the composition and magnitude of recreational discards, potential changes in CPUE catchability, and the selectivities for the different fishery fleets.

- Provide fishing level recommendations
  - Apply the ABC control rule and complete the fishing level recommendations table.

The SSC's fishing level recommendations for Red Snapper are based on yield at $F_{REBUILD}$ provided by the probabilistic projections Yield streams for both OFL and ABC (for landings and discards in both pounds and in numbers) that assume management starting in either 2016 or 2017 are listed in Table 2 below.

- Provide advice on monitoring the stock until the next assessment

- What indicators/metrics should the council monitor/SSC evaluate to keep tabs on the stock until the next assessment?
- Is there a recommended trigger level for these metrics?

The SSC indicated that sufficient funding should be made available to monitor and evaluate the size of the harvest and investigate its effect on the stock, especially if future mini seasons are considered as a management option. Further, the SSC recommends that efforts be developed (or continued) to properly characterize the size and age composition of the catch, discards, and population. Although the South Atlantic Red Snapper stock has had recent strong recruitment pulses and shown significant increases in abundance, rebuilding of the age structure is still a concern and is a critical factor in documenting the rebuilding of spawning stock biomass.

- Provide research recommendations and guidance on the next assessment
  - Review the included research recommendations, and indicate those which are most likely to reduce risk and uncertainty in the next assessment.
  - Provide any additional research recommendations the SSC believes will improve future stock assessments.

Given the importance of the SERFS video index in providing fishery-independent information, the SSC recommends that techniques be developed to determine the length composition in the video survey. Currently, length and age composition data (and resulting selectivity for the combined video and trap index) are based only on the trap survey data.

- Provide guidance on the next assessment, addressing its timing and type.

Given the indications of a strong year class in the terminal year (2014) of the assessment (as indicated by both the assessment model and preliminary 2015 fishery independent age composition data), the SSC recommends an update assessment no later than 2019 (with 2018 as the terminal year of data). This should provide sufficient information for evaluating progress in rebuilding the stock unless there are changes in the selectivity (i.e. size limits). If other sources of data become available (i.e., new data series) another benchmark may be appropriate to assess the rebuilding of the stock.

Table 2. Red Snapper recommendations

Criteria		**Deterministic**		**Probabilistic**
Overfished evaluation ($SSB_{2014}/SSB_{30\%}$)		0.18		0.2
Overfishing evaluation		$F_{12-14}/F_{30\%} > 1$		$F_{12-14}/ F_{30\%}>1$
MFMT ($F_{30\%}$)		0.15		0.15
$SSB_{30\%}$ (Eggs 1E8)		329,948		299,651
MSST (Eggs 1E8)		247,461		224,739
MSY (1000 lb)		459		450
Y at 75% $F_{30\%}$ (1000 lb)		425		417
ABC Control Rule Adjustment		Under Rebuilding		
P-Star		Under Rebuilding		
M		0.134		
Management starting in 2016 (probabilistic projection results)				
OFL RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2016	144,000	187,000	16,000	38,000
2017	205,000	222,000	21,000	40,000
2018	241,000	242,000	23,000	41,000
2019	267,000	254,000	24,000	41,000
ABC RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2016	138,000	180,000	16,000	36,000
2017	196,000	213,000	20,000	38,000
2018	233,000	233,000	22,000	39,000
2019	258,000	246,000	23,000	39,000
Management starting in 2017 (probabilistic projection results)				
OFL RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2017	174,000	189,000	18,000	35,000
2018	204,000	210,000	19,000	37,000
2019	230,000	227,000	21,000	39,000
ABC RECOMMENDATIONS				
Year	Landed LBS	Discard LBS	Landed Number	Discard Number
2017	165,000	179,000	17,000	33,000
2018	195,000	200,000	18,000	35,000
2019	220,000	218,000	20,000	37,000