



SEDA

SouthEast Data, Assessment, and Review

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BENCHMARK ASSESSMENT: Gulf of Mexico Spanish Mackerel

Terms of Reference

I. Data Workshop

1. Characterize stock structure and develop an appropriate stock definition. Provide maps of species and stock distribution.
2. Review, discuss and tabulate available life history information.
 - Provide appropriate models to describe growth, maturation, and fecundity by age, sex, or length as applicable
 - Evaluate the adequacy of available life-history information for conducting stock assessments and recommend life history information for use in population modeling
3. Provide measures of population abundance that are appropriate for stock assessment.
 - Consider and discuss all available and relevant fishery dependent and independent data sources
 - Document all programs evaluated, addressing program objectives, methods, coverage (provide maps), sampling intensity, and other relevant characteristics
 - Develop CPUE and index values by appropriate strata (e.g., age, size, area, and fishery) and provide measures of precision and accuracy
 - Evaluate the degree to which available indices adequately represent fishery and population conditions
 - Recommend which data sources are considered adequate for use in assessment modeling
4. Characterize commercial and recreational catch.
 - Include both landings and discards, in pounds and number of fish
 - Provide estimates of discard mortality rates by fishery and other strata as feasible
 - Evaluate and discuss the adequacy of available data for accurately characterizing harvest and discard by species and fishery sector
 - Provide length and age distributions if feasible, and maps of fishery effort and harvest
5. Determine appropriate stock assessment models and/or other methods of evaluating stock status, determining yields, estimating appropriate population benchmarks, and making future projections that are suitable for making management decisions.
6. Describe any environmental covariates or episodic events that would be reasonably expected to affect population abundance.



7. Provide any information available about demographics and socioeconomics of fishermen, especially as they may relate to fishing effort.
8. Provide recommendations for future research, including guidance on sampling design, intensity, and appropriate strata and coverage.
9. Develop a spreadsheet of assessment model input data that reflects the decisions and recommendations of the Data Workshop. Review and approve the contents of the input spreadsheet.
10. Prepare the Data Workshop report providing complete documentation of workshop actions and decisions (Section II of the SEDAR assessment report).
 - Develop a list of tasks to be completed following the workshop
 - Review and describe any ecosystem consideration(s) that should be included in the stock assessment report

II. Assessment Process

1. Review and provide justification for any changes in data following the data workshop and any analyses suggested by the data workshop. Summarize data as used in each assessment model.
2. Recommend a model configuration which is deemed most reliable for providing management advice using available compatible data. Document all input data, assumptions, and equations.
3. Incorporate known applicable environmental covariates into the selected model, and provide justification for why any of those covariates cannot be included at the time of the assessment.
4. Provide estimates of stock population parameters.
 - Include fishing mortality, abundance, biomass, selectivity, stock-recruitment relationship, and other parameters as appropriate given data availability and modeling approaches
 - Include appropriate and representative measures of precision for parameter estimates
5. Characterize uncertainty in the assessment and estimated values.
 - Considering components such as input data, modeling approach, and model configuration
 - Provide appropriate measures of model performance, reliability, and ‘goodness of fit’
6. Provide yield-per-recruit, spawner-per-recruit, and stock-recruitment evaluations.
7. Provide estimates of stock status relative to management criteria consistent with applicable FMPs, proposed FMPs and Amendments, other ongoing or proposed management programs, and National Standards for each model run presented for review.
8. Project future stock conditions and develop rebuilding schedules if warranted, including estimated generation time. Develop stock yield projections in both biomass and numbers of fish in accordance with the following:
 - A) If stock is overfished:
 $F=0, F_{\text{Current}}, F_{\text{MSY}}, F_{\text{OY}}$
 $F=F_{\text{Rebuild}}$ (max that permits rebuild in allowed time)
 - B) If stock is undergoing overfishing:
 $F= F_{\text{Current}}, F_{\text{MSY}}, F_{\text{OY}}$
 - C) If stock is neither overfished nor undergoing overfishing:
 $F= F_{\text{Current}}, F_{\text{MSY}}, F_{\text{OY}}$
 - D) If data limitations preclude classic projections (i.e. A, B, C above), explore alternate models to provide management advice
9. Provide a probability distribution function for the base model, or a combination of models that represent alternate states of nature, presented for review.
 - Determine the yield associated with a probability of exceeding OFL at P* values of 30% to 50% in single percentage increments for use with the Tier 1 ABC control rule
 - Provide justification for the weightings used in producing combinations of models
10. Provide recommendations for future research and data collection. Be as specific as possible in describing sampling design and intensity, and emphasize items which will improve assessment capabilities and reliability. Recommend the interval and type for the next assessment.
11. Prepare a spreadsheet containing all model parameter estimates and all relevant population information resulting from model estimates and projection and simulation exercises. Include all data included in assessment report tables and all data that support assessment workshop figures.
12. Complete the Assessment Workshop Report (Section III: SEDAR Stock Assessment Report).

III. Review Workshop

1. Evaluate the quality and applicability of data used in the assessment.
2. Evaluate the quality and applicability of methods used to assess the stock.
3. Recommend appropriate estimates of stock abundance, biomass, and exploitation.
4. Evaluate the methods used to estimate population benchmarks and management parameters. Recommend and provide estimated values for appropriate management benchmarks and declarations of stock status for each model run presented for review.
5. Evaluate the quality and applicability of the methods used to project future population status. Recommend appropriate estimates of future stock condition.
6. Evaluate the quality and applicability of methods used to characterize uncertainty in estimated parameters.
 - Provide measures of uncertainty for estimated parameters
 - Ensure that the implications of uncertainty in technical conclusions are clearly stated
 - If there are significant changes to the base model, or to the choice of alternate states of nature, then provide a probability distribution function for the base model, or a combination of models that represent alternate states of nature, presented for review.
 - Determine the yield associated with a probability of exceeding OFL at P* values of 30% to 50% in single percentage increments
 - Provide justification for the weightings used in producing the combinations of models
7. If available, ensure that stock assessment results are accurately presented in the Stock Assessment Report and that stated results are consistent with Review Panel recommendations.
8. Evaluate the quality and applicability of the SEDAR Process as applied to the reviewed assessment and identify the degree to which Terms of Reference were addressed during the assessment process.
9. Make any additional recommendations or prioritizations warranted.
 - Clearly denote research and monitoring needs that could improve the reliability of future assessments
10. Prepare a Review Summary Report summarizing the Panel's evaluation of the stock assessment and addressing each Term of Reference. Develop a list of tasks to be completed following the workshop. Complete and submit the Review Summary Report no later than the date set by the Review Panel Chair at the conclusion of the workshop.

The review panel may request additional sensitivity analyses, evaluation of alternative assumptions, and correction of errors identified in the assessments provided by the assessment workshop panel; the review panel may not request a new assessment. Additional details regarding the latitude given the review panel to deviate from assessments provided by the assessment workshop panel are provided in the SEDAR Guidelines and the SEDAR Review Panel Overview and Instructions.

** The panel shall ensure that corrected estimates are provided by addenda to the assessment report in the event corrections are made, alternate model configurations are recommended, or additional analyses are prepared as a result of review panel findings regarding the TORs above.**

Table 1. Required MSRA Evaluations:

Note: te = trillion eggs

Criteria	Definition* (as of 2002/2003)	Current Value* (2002/03)
Mortality Rate Criteria		
F_{MSY}	$F_{30\%SPR}$	
MFMT	$F_{30\%SPR}$	
F_{OY}	75% of $F_{30\%SPR}$	0.40
$F_{CURRENT}$	$F_{2002/03}$	
$F_{CURRENT}/MFMT$		0.53
Base M		0.30
Biomass Criteria		
SSB_{MSY}	Equilibrium SSB_{MSY} @ $F_{30\%SPR}$	19.10 te
MSST	$(1-M)*SSB_{MSY}$: $M=0.30$	13.40 te
$SSB_{CURRENT}$	SSB_{2003}	17.96 te
$SSB_{CURRENT}/MSST$		1.34
Equilibrium MSY	Equilibrium Yield @ $F_{30\%SPR}$	8.7 mp
Equilibrium OY	Equil. Yield @ 75% of $F_{30\%SPR}$	8.3 mp
OFL	Annual Yield @ MFMT	
	2013	
	2014	
	2015	
	2016	
	2017	
	2018	
Annual OY**	Annual Yield @ F_{OY}	
	2013	
	2014	
	2015	
	2016	
	2017	
	2018	

*Definitions and values are subject to change as per guidance from this assessment.

**Based upon current definitions of OY, where $OY = 75\%$ of F_{MSY}

Table 2. Projection Scenario Details

2.1 Initial Assumptions:

OPTION	Value
2012 base TAC	TBD
2012 Recruits	TBD by Panel
2012 Selectivity	TBD by Panel
Projection Period	6 yrs (2013-2018)
1 st year of change F, Yield	2013

2.2 Scenarios to Evaluate (preliminary, to be modified as appropriate)

1. Landings fixed at 2013 target
2. $F_{OY} = 65\%, 75\%, 85\% F_{MSY}$ (project when OY will be achieved)
3. F_{MSY}
4. $F_{REBUILD}$ (if necessary)
5. $F=0$ (if necessary)

2.3 Output values

1. Landings
2. Discards (including dead discards)
3. Exploitation
4. F/F_{MSY}
5. B/B_{MSY}