AFSC Groundfish Stock Assessment Guidelines

Alaska Fisheries Science Center

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Disclaimer

Internal to AFSC document

Informational share with the NPFMC advisory bodies

Living document that will be updated as needed

AFSC Groundfish Stock Assessment Guidelines

2023

Updated to reflect assessment prioritization schedule and products definitions

2024

Provide guidance for September - November products

Clarify what goes into operational full and operational update stock assessments

Revise model results section with emphasis on model diagnostics and convergence criteria

Revise and clarify projections and harvest recommendations section

Revise risk table section to reflect SSC requests

Revise ecosystem sections

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AFSC Groundfish Stock Assessment Guidelines

	Assessment Type			
Section	**Operational Full**	**Operational Update**	**Harvest Projection**	**Catch Report**
Title Page/Authorship	Yes	Yes	Yes	No
Executive Summary				
Summary of Changes to Assessment Inputs	Yes	Yes	Yes	No
Summary of Results	Yes	Yes	Yes	No
Responses to SSC/Plan Team Comments in general	Yes	Abbreviated	No	No
Responses to SSC/Plan Team Specific to assessment	Yes	Abbreviated	No	No
Introduction	Yes	Abbreviated	No	No
Fishery and Management History	Yes	Abbreviated	No	No
Data	Yes	Yes	No	No
Fishery	Yes	Abbreviated	No	No
Survey	Yes	Abbreviated	No	No
Other	As Needed	As Needed	No	No
Analytic Approach				
Description of alternative models	Yes	No	No	No

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Section	Assessment Type			
	Operational Full	Operational Update	Harvest Projection	Catch Report
Results				
Tables	**Yes**	**Yes**	**No**	**No**
Figures	**Yes**	**Yes**	**No**	**No**
Evaluation of Model(s) and Associated Uncertainty	**Yes (Tier 1-3)**	**Yes (Tier 1-3)**	**No**	**No**
Sensitivity to Model Specification	**Yes (Tier 1-3)**	**Yes (Tier 1-3)**	**No**	**No**
Convergence Status and Criteria	**Yes (Tier 1-3)**	**Yes (Tier 1-3)**	**No**	**No**
Likelihood Profiles on Key Parameters	**Yes (Tier 1-3)**	**Yes (Tier 1-3)**	**No**	**No**
Retrospective Analysis	Yes (Tier 1-3)	Yes (Tier 1-3)	No	No
Historic Retrospectives	**Yes (Tier 1-3)**	**Yes (Tier 1-3)**	**No**	**No**
Projections and Harvest Recommendations				
Amendment 56 reference points	Yes	Yes	No	No
Specification of OFL and ABC	Yes (Tiers 1-5)	Yes (Tiers 1-5)	Yes	No
Standard Harvest Scenarios	**Yes (Tiers 1-3)**	**Yes (Tier 1-3)**	**No**	**No**

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AFSC Groundfish Stock Assessment Guidelines RESULTS

Tier 1-3 Models Only		**Full**	**Update (Nov. PT only)**
Model Results	Time series of derived quantities, with uncertainty intervals, for recommended and base models	Sept & Nov	✓
	Fits to all data sources	Sept & Nov	✓
	Parameter estimates, with uncertainty	Sept & Nov	✓
Model Evaluation	Sensitivity to model specification (e.g., dropping datasets, LOO, Steepness, M). Can be hosted as an external file.	Sept	
	Convergence status and criteria, including jitter analysis or evidence that posterior sampling is adequate if Bayesian methods are used.	Sept & Nov	✓
	Likelihood profile(s) on key parameters	Sept	
	10-year retrospective analysis (biomass), with uncertainty intervals if feasible	Sept & Nov	
	Comparison of past assessment estimates	Sept & Nov	

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AFSC Groundfish Stock Assessment Guidelines
Standard Harvest Scenarios and Projection Methodology: Tiers 1-3

Standard set of projections

- 7 Scenarios

Standardized software and settings for projections

- spmR
- Stock Synthesis 3

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AFSC Groundfish Stock Assessment Guidelines

	Assessment Type			
Section	**Operational Full**	**Operational Update**	**Harvest Projection**	**Catch Report**
Risk table and ABC recommendation	**Yes**	**Yes**	**No**	**No**
Area allocation of ABC	Yes	Yes	Abbreviated	No
Status determination	Yes	Yes	No	No
F limit	Yes (Tiers 1-3)	Yes (Tiers 1-3)	No	No
Ecosystem Considerations				
Ecosystem effects on the stock	Yes	Abbreviated	No	No
Fishery effects on the stock	Yes	Abbreviated	No	No
Data Gaps and research priorities	Yes	Yes	No	No

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Risk Table Levels of Concern

Team Effort

Sandra Lowe, Cole Monnahan, Maia Kapur, Kalei Shotwell, Stephani Zador, Ebett Siddon, Bridget Ferriss, Ivonne Ortiz, and others

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Background

- In the report of the 2021 Risk Table Workshop (pages 33-34 of June 2021 SSC report), SSC recommended risk table category levels be revised from the existing 4 categories to 3 categories (normal, increased, extreme)
- The 2023 stock assessment risk tables used 3 categories dropping level 2 (substantially increased concerns), but did not change the category descriptions
- The SSC requested the risk tables use 3 categories of concern (normal, increased, extreme), and revise the category descriptions to cover the range in the original table

The SSC requests that the general risk table *with definitions* be placed in the introductory SAFE material, and that authors include the species specific implementation of the risk table in the stock assessment for operational full and operational update assessments.

Risk Table Levels of Concern (2018-2022 definitions)

	Assessment-related considerations	*Population dynamics considerations*	*Environmental/ecosystem considerations*	*Fishery Performance**
Level 1: Normal	Typical to moderately increased uncertainty/minor unresolved issues in assessment.	Stock trends are typical for the stock; recent recruitment is within normal range.	No apparent environmental/ecosystem concerns	No apparent fishery/resource-use performance and/or behavior concerns
Level 2: Substantially increased concerns	Substantially increased assessment uncertainty/ unresolved issues.	Stock trends are unusual; abundance increasing or decreasing faster than has been seen recently, or recruitment pattern is atypical.	Some indicators showing adverse signals relevant to the stock but the pattern is not consistent across all indicators.	Some indicators showing adverse signals but the pattern is not consistent across all indicators
Level 3: Major Concern	Major problems with the stock assessment; very poor fits to data; high level of uncertainty; strong retrospective bias.	Stock trends are highly unusual; very rapid changes in stock abundance, or highly atypical recruitment patterns.	Multiple indicators showing consistent adverse signals a) across the same trophic level as the stock, and/or b) up or down trophic levels (i.e., predators and prey of the stock)	Multiple indicators showing consistent adverse signals a) across different sectors, and/or b) different gear types
Level 4: Extreme concern	Severe problems with the stock assessment; severe retrospective bias. Assessment considered unreliable.	Stock trends are unprecedented; More rapid changes in stock abundance than have ever been seen previously, or a very long stretch of poor recruitment compared to previous patterns.	Extreme anomalies in multiple ecosystem indicators that are highly likely to impact the stock; Potential for cascading effects on other ecosystem components	Extreme anomalies in multiple performance indicators that are highly likely to impact the stock

**Fishery Performance was added in 2019*

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Risk Table Levels of Concern (2023 definition)

	Assessment-related considerations	*Population dynamics considerations*	*Environmental/ecosystem considerations*	*Fishery Performance*
Level 1: Normal	Typical to moderately increased uncertainty/minor unresolved issues in assessment.	Stock trends are typical for the stock; recent recruitment is within normal range.	No apparent environmental/ecosystem concerns	No apparent fishery/resource-use performance and/or behavior concerns
Level 2: Substantially increased concerns	*Substantially increased assessment uncertainty/ unresolved issues.*	*Stock trends are unusual; abundance increasing or decreasing faster than has been seen recently, or recruitment pattern is atypical.*	*Some indicators showing adverse signals relevant to the stock but the pattern is not consistent across all indicators.*	*Some indicators showing adverse signals but the pattern is not consistent across all indicators*
Level 2: Major Concern	Major problems with the stock assessment; very poor fits to data; high level of uncertainty; strong retrospective bias.	Stock trends are highly unusual; very rapid changes in stock abundance, or highly atypical recruitment patterns.	Multiple indicators showing consistent adverse signals a) across the same trophic level as the stock, and/or b) up or down trophic levels (i.e., predators and prey of the stock)	Multiple indicators showing consistent adverse signals a) across different sectors, and/or b) different gear types
Level 3: Extreme concern	Severe problems with the stock assessment; severe retrospective bias. Assessment considered unreliable.	Stock trends are unprecedented; More rapid changes in stock abundance than have ever been seen previously, or a very long stretch of poor recruitment compared to previous patterns.	Extreme anomalies in multiple ecosystem indicators that are highly likely to impact the stock; Potential for cascading effects on other ecosystem components	Extreme anomalies in multiple performance indicators that are highly likely to impact the stock

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Proposed Risk Table Levels of Concern for 2024

	Assessment-related considerations	*Population dynamics considerations*	*~~Environmental~~/Ecosystem considerations*	*Fishery Performance*
Level 1: Normal	Typical to moderately increased uncertainty/minor unresolved issues in assessment.	Stock population dynamics (e.g., recruitment, growth, natural mortality) are typical for the stock and recent trends are within normal range.	No apparent ecosystem concerns related to biological status (e.g., environment, prey, competition, predation), or minor concerns with uncertain impacts on the stock.	No apparent concerns related to biological status (e.g., stock abundance, distribution, fish condition), or few minor concerns with uncertain impacts on the stock.
Level 2: ~~Major~~ Increased concern	Substantially increased assessment uncertainty/ unresolved issues, such as residual patterns and substantial retrospective patterns, especially positive ones.	Stock population dynamics (e.g., recruitment, growth, natural mortality) are unusual; trends increasing or decreasing faster than has been seen recently, or patterns are atypical.	Indicator(s) with adverse signals related to biological status (e.g., environment, prey, competition, predation).	Several indicators with adverse signals related to biological status (e.g., stock abundance, distribution, fish condition).
Level 3: Extreme concern	Severe assessment problems; very poor fits to important data; high level of uncertainty; very strong retrospective patterns, especially positive ones.	Stock population dynamics (e.g., recruitment, growth, natural mortality) are extremely unusual; very rapid changes in trends, or highly atypical patterns compared to previous patterns.	Indicator(s) showing a combined frequency (low/high) and magnitude(low/high) to cause severe adverse signals a) across the same trophic level as the stock, and/or b) up or down trophic levels (i.e., predators and prey of the stock) that are likely to impact the stock.	Multiple indicators with strong adverse signals related to biological status (e.g., stock abundance, distribution, fish condition), a) across different sectors, and/or b) different gear types.

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Future Topics

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FIMS is coming…