New England Fishery Management Council's

Risk Policy Statement and Concept

Statement, Concept, and Appendices

Version 2.1

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2.0 RISK POLICY STATEMENT

New England Fishery Management Council (Council) Risk Policy Statement

The goal of the Council's Risk Policy is to implement a process by which the Council, and its subordinate bodies, accounts for the fact that all fishery management is based on uncertain information, fisheries and the surveys used to monitor marine resources are taking place in a changing environment, and that the decisions of the Council have social and economic impacts on fishing communities.

The purpose of the Council's Risk Policy is to:

1. Provide guidance to the Council and its subordinate bodies on taking account of risk and uncertainty in Fishery Management Plans and specification-setting;
2. Clearly communicate the priorities and preferences of the Council regarding risk and uncertainty, including using a common set of terms and definitions so it is accessible to a wide variety of audiences; and
3. Make the discussion of risk tolerance in the Council's decisions a more forward and fundamental aspect of the management process to support its consistent application.

The application of the Council's Risk Policy will be supported by the following strategic initiatives:

1. Clearly identify sources of uncertainty in management decisions. These could include environmental changes, imperfect fishery independent and dependent data, and unknown stock status.
2. Consider risk at all levels of the fishery management process. This Risk Policy provides overarching guidance to the Council's application of Fishery Management Plan (FMP)-specific Acceptable Biological Catch (ABC) control rules and/or harvest control rules.
3. Consider stability in the face of uncertain information and inherent variability in ecosystems. This can be achieved by:
    a. Ensuring all rebuilding plans have at least a 50% probability of success, while also acknowledging socio-economic stability.
    b. Minimizing large swings in annual specifications (both high and low) to the extent practicable, acknowledging the requirements of the Magnuson Stevens Act (MSA) and ongoing challenges with variable stock assessments.
    c. Promoting rebuilding within timeframes that allow functioning fisheries.
4. Provide a direct avenue to discuss the implications of ecosystem changes and socio-economic impacts throughout a Council management decision. This includes:
    a. Identifying topics for the Council and its subordinate bodies to consider for incorporating the risk policy early in the decision-making process.
    b. Outlining a process that works within available resources, including the resources of staff, the Council, and its subordinate bodies.

3.0 RISK POLICY

3.1.1 Need and Benefits of a Revised Risk Policy

The Risk Policy aims to:

1) Better integrate changing environmental conditions into the Council's assessment of risk.
    a. Factors in the revised risk policy allow for consideration of climate change and the dynamic environment in the Council decision process.
2) Develop a clear path to incorporate social and economic considerations.
    a. Factors in the Risk policy allow for consideration of socioeconomic concepts in the Council decision process.
        - Establish a process that integrates the consideration of risk throughout the Council's decision-making process, rather than at the end.
        - A clear policy on risk tolerance can guide the development of catch advice and management measures before final decisions. A scoring and weighting method increases transparency in how the Council assesses risk, increases efficiency, and reduces time delays resulting from remands.
3) Support implementation of a revised Risk Policy (2026) with available Council resources.
        - The 2016 Risk Policy Roadmap relied on management strategy evaluations (MSE) to quantify risk. This approach was not successful due to the limited resources and the time-intensive nature of completing MSEs. The Council believes that the revised Risk Policy is a better match with available resources.
        - The Council remains supportive of the application of MSEs, as resources allow, as a tested method to identify common goals, evaluate performance, and analyze potential results of decision making.

3.1.2 Stability

The Council defines stability in the following way:

Stability can mean several things in fisheries management such as stability of the resource, stability in the management measures, or stability in the economics of the fishery. When assessing stability, baselines matter. Stability can also be considered as an absolute value or as a rate of change.

Given that the ecosystem is inherently dynamic, the Council is focused on considering stability to harvesters primarily by avoiding abrupt shifts in fisheries management. The Council notes that abrupt shifts can happen in both directions, leading to significant increases in harvest limits or very restrictive measures, both of which can have negative impacts on the fishing industry. Accounting for stability in decision making will be done in compliance with applicable laws and the ten National Standards. For example, as outlined in National Standard 1, phased-in changes to ABCs can occur over a time period (not to exceed three years) if overfishing is prevented each year. This strategic approach could provide a level of stability to the industry as they adapt to the short-term effects of large swings in catch advice.

3.1.3 Risk Policy Concept

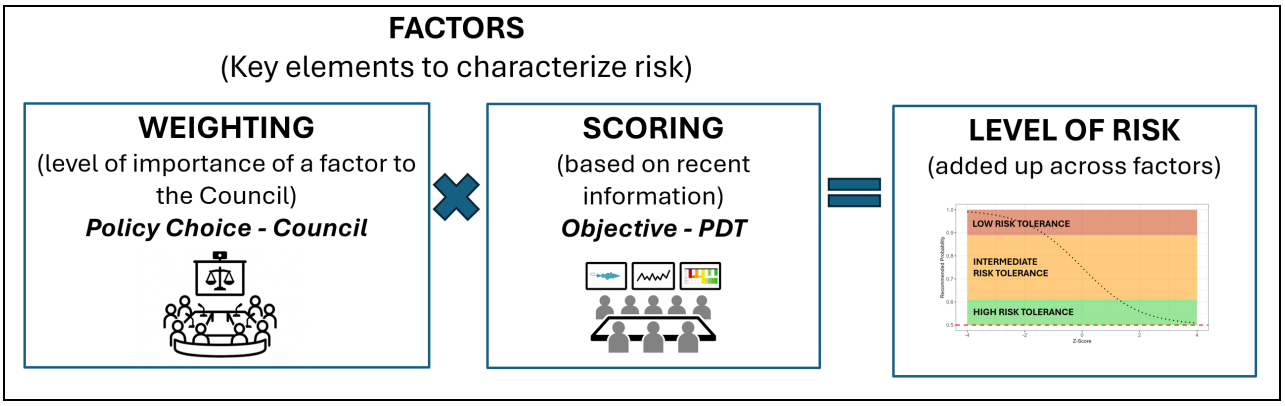
At its core, the Risk Policy aims to systematically account for risk using factors (e.g. climate vulnerability, stock status) that the Council deems important to determine how risk tolerant it wants to be in decision making.

The Council sees value in both a quantitative and qualitative assessment of its risk tolerance. A quantitative assessment of risk may be particularly helpful in discussions surrounding specifications (e.g. appropriate level of risk tolerance for Gulf of Maine haddock ABCs). A qualitative assessment using Risk Tolerance Tiers could be useful when considering out-year specifications, or when considering a range of management measures (e.g. appropriate number of scallop days-at-sea).

3.1.3.1 Factors

The Risk Policy will be implemented by identifying factors, which are inputs the Council believes are important to determine its level of risk aversion in decision making. Each factor is scored according to guidelines (Appendix I) that are applied by Plan Development Teams (PDTs). Factors also undergo a weightings process, which is used to signify the level of importance of a particular factor by the Council. Weightings are a policy choice, while the scoring by the PDTs is an objective assessment of agreed upon data.

Figure 1 – Outline of overarching risk policy concept, where factors are scored by PDTs and weighted by the Council to identify the Council's level of risk.



3.1.3.2 List of Risk Policy Factors

The Council has identified several factors for use in applying the Risk Policy. Five factors are binned into three groupings:

Stock Status and Uncertainty

- Biomass (SSB) / Stock Status
- Recruitment

Climate and Ecosystem Considerations

- Climate vulnerability

Economic and Community Importance

- Commercial fishery characterization
- Recreational fishery characterization

This list can be updated by the Council if the Risk Policy is revisited as an annual work priority.

3.1.3.3 Scoring Factors

Scores for each factor will be determined for a particular stock, species, or species complex (finest resolution of management available). The scoring process is an objective assessment of agreed upon data conducted by the Council's PDTs. The score for each factor reflects the condition of the resource and fishery and is not a policy choice. Scores may range from -4 to 4, though the range and direction is specific to each factor. Positive scores are associated with more risk tolerance, and negative scores confer less risk tolerance.

The range of scores for different factors may vary, and all scores will not necessarily lead to a more risk tolerant outcome. The ranges of scores for a particular factor may be adjusted by the Council as part of an annual work priority.

Complete instructions for scoring factors and data sources for completing the scoring are provided in Appendix I. It is the Council's policy that revisions to data may continue to occur as new information becomes available (e.g. Climate Vulnerability Assessment 2.0). It is anticipated that updated data streams, such as new climate information or refined indicators in the SOE, would be available for scoring without action by the Council. The process for identifying new data should occur early in the calendar year, well before scoring to support actions takes place. The Council envisions utilizing the State of the Ecosystem report and other products from the Northeast Fishery Science Center to support and streamline the application of the Risk Policy.

3.1.3.4 Weighting Factors

Weightings are a policy decision made by the Council that signifies the level of importance of a particular factor by the Council. Weightings are determined by the Council only, and are not developed through the Advisory Panel and Committee structure. It is recommended the weighting process take place at the April Council meeting, if possible. A complete description of the weighting process is described in Appendix II.

The resolution of weightings does not necessarily need to mirror the scale at which factors are scored. Factors are to be scored at the level at which the stock assessment occurs (finest management resolution). An exception to this is skates, which would be best scored at the complex level given a single ABC is set for the multiple skate species. In contrast, weightings occur at a higher order. The Council will weight each factor generally, to be applied across all FMPs ("global" approach). It is the policy of the Council that it may revisit this approach to weighting in the Risk Policy.

Identifying weightings is recommended to occur in conjunction with the April Council meeting. This Council meeting typically has fewer items scheduled for final action, which is important to minimize bias between management decisions and the identification of weightings. Further, the State of the Ecosystem report is typically presented at the April Council meeting and would provide useful context, particularly as it directly supports the scoring of factors.

It is recommended that the Council complete the weightings process every three years. It is not expected that weightings would dramatically change from year to year. Conducting weightings every three years also balances the time the Council spends on the revised risk policy versus other important priorities.

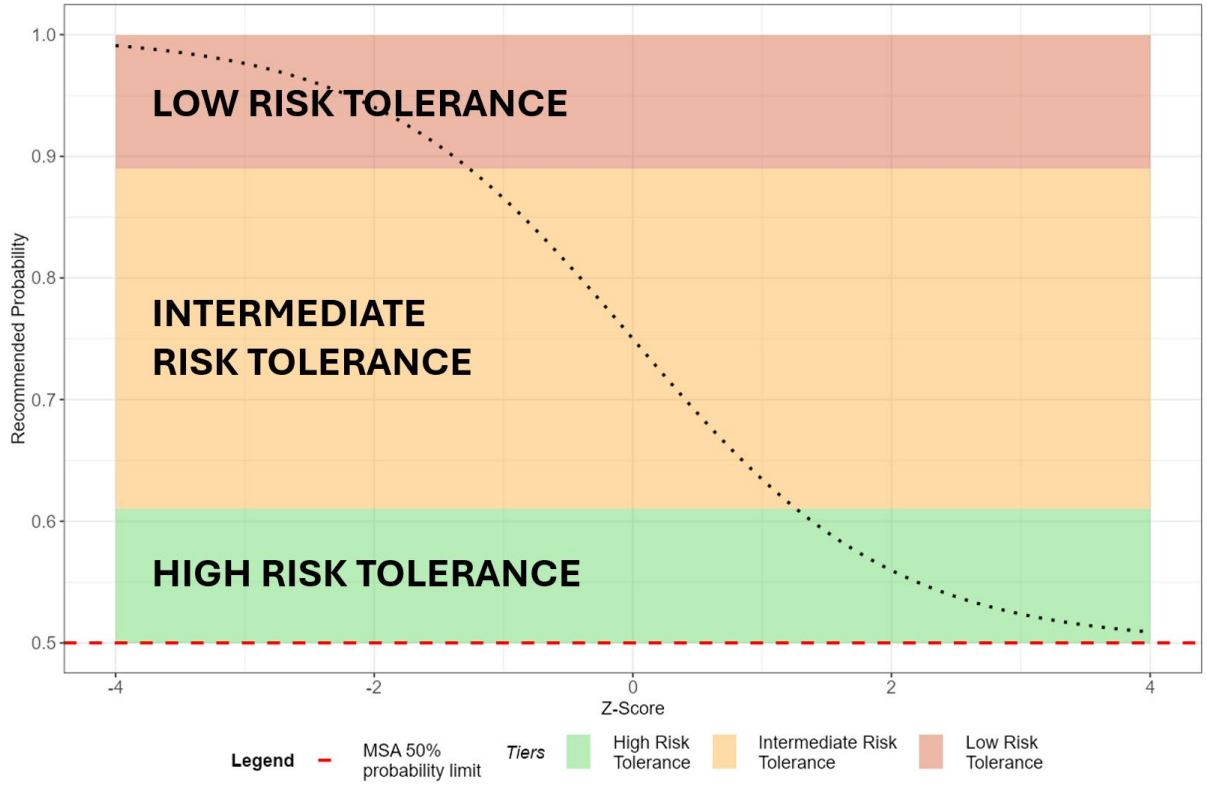
The Council will determine the following details of its weighting process and may adjust the process as it deems necessary. Specifically, the Council will:

- Set guidelines around the participation of Council members in the weightings process. Only voting members are eligible to complete the weightings, and participation is compulsory for eligible Council members.
- Set guidelines on how many times a weight can be assigned to the factors. For example, the Council can determine how many times a Council member can weight factors as "very important."
- Set guidelines on the frequency of the Council setting weights.
- If weightings are not completed by paper ballot, determine appropriate technology/software to support the polling process.

3.1.3.5 Measure of Risk Tolerance

A combination of the scores and weights for each factor are used to measure risk tolerance (Figure 1). The outputs from the scoring and weighting processes can be interpreted both qualitatively and quantitatively. For qualitative applications of the Risk Policy, the Council has developed tiers to distinguish between levels of high, intermediate, and low risk tolerance. Stability can also be accounted for in this application. Risk Tolerance Tiers are shown in Figure 1. Guidance is provided in Appendix IV.

Figure 2 - Risk Tolerance Tiers



3.1.3.6 Connection to ABC Control Rules

The Council is unique nationally among other fishery management councils in that it has different ABC CRs for each of its fishery management plans. Over time, the Council aims to quantitatively integrate its Risk Policy with ABC CRs.

It is important to note that the Risk Policy will be used as an independent tool that is separate and distinct from ABC CRs. The Risk Policy's quantitative outputs can be directly integrated with ABC CRs, or can be used qualitatively in decision making.

When integrating and updating ABC CRs, the Council aims to assess the use of the Risk Policy to adjust the buffer between the OFL and ABC. The National Standards specifically mention a Council's risk policy when determining a stock or stock complex's ABC. Therefore, there is a clear connection between the Risk Policy and the ABC. An advantage of using the quantitative output of the risk policy to inform the ABC is that it allows for consideration of a more dynamic buffer between the OFL and ABC. This approach could provide clearer and more timely guidance to the SSC on the Council's risk tolerance.

As noted above, having an ABC CR that can receive the quantitative output of the Risk Policy will require modifications to existing control rules. As a result, a phased approach to integrating the quantitative output of the Risk Policy with the Council's various ABC control rules is needed. Because both a qualitative and quantitative assessment of risk is possible under this Risk Policy, qualitative assessments using the Risk Tolerance Tiers (Figure 2) can be more quickly and broadly applied to Council decision-making going forward.

The Council does not currently recommend changes to the herring ABC control rule to integrate quantitative outputs of the Risk Policy into the control rule. The existing herring ABC control rule was developed through an extensive MSE process and is already accounting for many factors that the Council is including in the risk policy.

3.1.3.7 Process, Roles and Responsibilities

This section outlines roles and responsibilities for implementing the Council's Risk Policy.

3.1.3.7.1 Plan Development Teams

PDTs are responsible for the scoring of factors and following guidelines provided in Appendix I. This may include procuring the information needed to complete scoring. PDTs should follow the steps for scoring factors outlined. By scoring the factors, the PDTs are contributing to the goal of integrating discussions of risk throughout the Council's decision-making process.

3.1.3.7.2 Science and Statistical Committee

The SSC is responsible for using the Risk Policy and considering risk tolerance during its deliberations. For qualitative applications of the Risk Policy, this includes the Risk Tolerance Tiers, Z-scores, and the corresponding recommended probability (Y-axis). This is particularly pertinent when considering ABCs and projections for Council managed species.

3.1.3.7.3 Council

Voting Council members are responsible for weighting the importance of factors through polling. In this process, the Council should consider comments from the public and the fishery industry. Council members are also responsible for integrating the consideration of risk throughout the decision-making process.

3.1.3.7.4 Northeast Fisheries Science Center (NEFSC)

The Council anticipates that the NEFSC will continue to provide timely updates to the State of the Ecosystem report and stock assessment products for use by Plan Development Teams in the completion of factor scoring. The Council also encourages increased collaboration with the NEFSC on Risk Policy data needs and the development of data products that can directly assist with the Risk Policy's implementation. This could include clearer identification of factors (i.e., climate change impacts, recruitment assumptions) in stock assessment reports, as well as the procurement of data products from SSB and EDAB.

3.1.3.7.5. Stakeholders

Stakeholders are encouraged to build familiarity with the revised risk policy as it is implemented across the Council's FMPs. Stakeholders are also responsible for providing written or oral comments during the Council weighting process and integrating the discussion of risk into Advisory Panel discussions.

4.0 DEFINITIONS

Acceptable biological catch (ABC) - a level of a stock or stock complex's annual catch, which is based on an ABC control rule that accounts for the scientific uncertainty in the estimate of OFL, any other scientific uncertainty, and the Council's risk policy. [from eCFR]

Factors – Broad categories which are relevant to characterizing risk and uncertainty for a stock or stock complex, such as 'Recruitment' and 'Commercial Fishery Characterization'.

Measure of risk tolerance – The output metric resulting from application of the risk policy, as a product of plotting the Z-score on the Risk Policy curve. This includes the use Risk Tolerance Tiers developed by the Council to signal high, intermediate, and low risk tolerance.

Scores – The stock specific (or stock, complex) answer to factors. Scores are not policy choices but reflect the stock status, assessment, or other pertinent data sources. Scoring is completed by the Council's Plan Development Teams.

Weightings – A measure of how important each factor is to the managers when assessing risk. Weightings are a policy decision and completed by the Council.

5.0 APPENDIX I – SCORING INSTRUCTIONS

New England Fishery Management Council



RISK POLICY

Appendix I

SCORING INSTRUCTIONS

Version 1.1

August 4, 2026

5.1 SCORING INSTRUCTIONS:

Responsibility for Scoring and Guidance
All scoring shall be conducted by the relevant Fishery Management Plan (FMP) Plan Development Team (PDT). Scoring should be objective, evidence-based, and applied at the stock level consistently by PDTs. PDTs are required to follow the procedures, criteria, and guidance outlined in this document when conducting scoring. Plan Coordinators will use an online toolkit and input scores into a scoring form. The toolkit will combine scores with Council weights to generate a Z-score that will be plotted along the Council's Risk Policy curve and assigned a risk tolerance. The output will be delivered to the SSC and other relevant bodies (Table 1 and Figure 1). Plan Coordinators will be able to access these calculations through the NEFMC Risk Policy Application. PDTs should produce only one set of scores that can be combined with weights to generate a Z-score.

Use of Scoring Instructions
Scoring of factors is intended to be replicable and formulaic. PDTs shall begin the scoring process by assembling predefined data and following procedures identified for scoring each factor consistent with the scoring matrix shown in Table 2. Scores should only reflect the possible choices outlined in color in the matrix. Scoring also includes using the best available information such as the latest stock assessment, State of the Ecosystem report, and information from the most recent fishing year.

As part of the scoring process, PDTs will assess if factors are already accounted for and/or how uncertainty is quantified in related processes, such as the underlying stock assessment. This diagnostic is intended to address double counting when applying the Risk Policy. For example, a stock assessment may include environmental covariates that are consistent with a factor. In this case, the PDT should use expert judgement to recommend if it is appropriate to score an overlapping factor. Similarly, diagnostics will apply to stock assessments, which account for scientific uncertainty in their estimates.

When prescribed data is not available for scoring stocks, the PDT may use expert opinion to deviate from the guidelines but within the bounds of the possible choices outlined in color in the matrix. If the PDT recommends that a factor/uncertainty is already accounted for in the stock assessment process, and the PDT should score that factor as 0.

Documentation of Deviations in PDT Scoring
The PDT is required to follow the procedures, criteria, and guidance outlined in this document when conducting scoring to promote replicable and consistent outputs. If during the scoring process a PDT determines that deviation from the scoring guidelines is necessary (e.g. lack of information, a data point falls between two scores, or available information is at the species level and not the stock level), the PDT should use what it deems to be the best available information to complete the Risk Policy scoring for that factor. In such cases, PDTs must clearly document any deviation from the scoring procedures. PDTs should consider recent peer-reviewed literature in this process.

As previously noted, the Risk Policy aims to be formulaic and replicable, and the advent of new methods or data are not grounds for substituting new methods, processes, or data for current guidance. Expert guidance will be in addition to the results of following scoring procedures.

Documentation shall be provided in a standardized Risk Policy Report to the appropriate Council body (e.g., the Scientific and Statistical Committee (SSC)).When scoring deviates from the guidance, PDTs should include a justification for the deviation, an explanation of its potential implications, and any references to the resources used to support the deviation.

Table 1. Example scores for Gulf of Maine (GOM) haddock for demonstration purposes. Average weights were calculated based on the global weights assigned during the April 2025 Council Weighting mock exercise.

Report Year	Stock	Factor	Score	Average Weight
2026	GOM Haddock	Biomass	4	3.29
2026	GOM Haddock	Recruitment	4	3.00
2026	GOM Haddock	Climate	-1	2.95
2026	GOM Haddock	Commercial	2	3.24
2026	GOM Haddock	Recreational	2	1.90

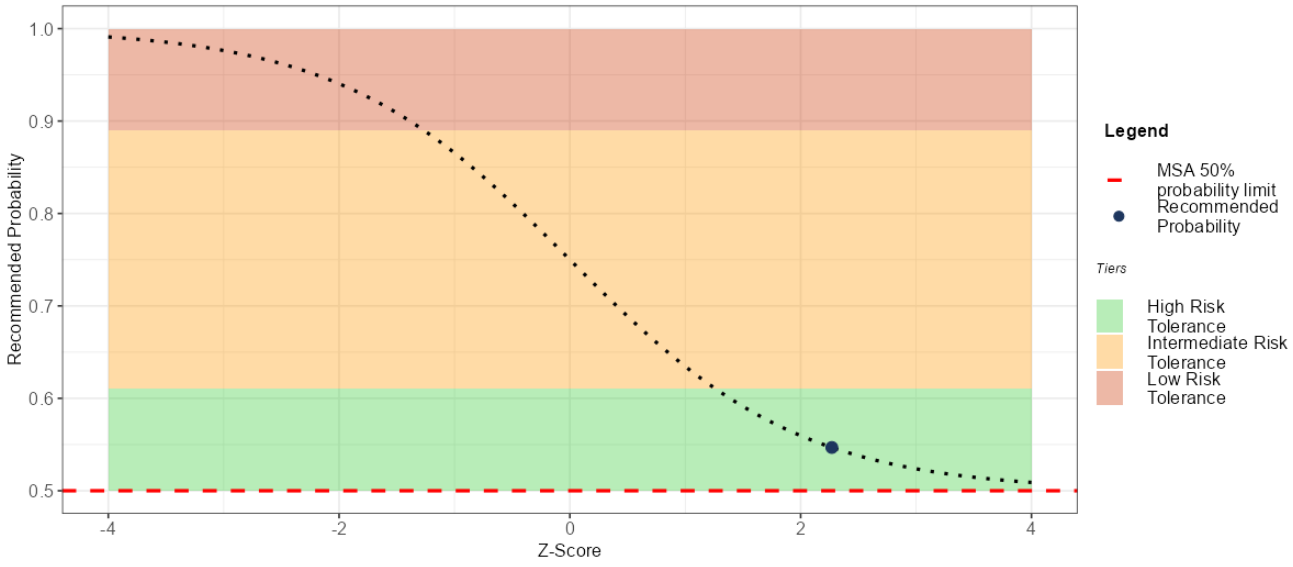


Figure 3. The recommended probability for Gulf of Maine (GOM) haddock based on a Z-score of 2.27 calculated from the example scores and average Council weights displayed in Table 1.

Table 2. Risk Policy Scoring Matrix.

FACTOR	-4	-3	-2	-1	0	1	2	3	4
SSB / Stock Status	Below Threshold		<75% but Above Threshold		Neutral		Rebuilt		Well Above Target
Recruitment	Persistent Low Recruitment		Recent Low Recruitment		Average, No Trend		Recent Large Year Classes		Multiple Large Year Classes
Climate Vulnerability	High Negative Direction	High	Moderate, Negative Direction	Moderate	Low				
Commercial Fishery Characterization					Minimal stress	Low stress	Moderate stress	Elevated stress	High stress
Recreational Fishery Characterization					Minimal stress	Low stress	Moderate stress	Elevated stress	High stress

5.1.1 Biomass (SSB) / Stock Status

Goal: To determine the acceptable level of risk based on the current productivity of a stock.

Relationship to risk tolerance: As stock size increases relative to reference points (i.e. SSB/SSB_{MSY}), risk tolerance increases. Lower stock levels correspond to reduced risk tolerance, indicating a need for more cautious management.

How to score: Use the most recent stock assessment and the scoring criteria (Table 3) provided below. If the stock was last assessed using an analytical assessment, the PDT should use the recent estimates from this analytical assessment, even if a data update has been completed for the stock. When scoring stocks with an analytical assessment or where there is an empirical assessment that estimates reference points, base the factor score on the terminal year. PDTs will calculate the score using the units in which the reference points are calculated for the stocks official status determination, such as Biomass (B) or spawning stock biomass (SSB) relative to the reference point. The rubric below is described using SSB. When there is a lack of reference points, base the factor score using the quantile approach outlined below, which uses the most recent 5-years of abundance or biomass indices relative to a baseline time series. The PDT should determine and utilize the survey index/indices that it feels are most representative of stock productivity. In some cases, this will be just one survey index, such as the Northeast Fishery Science Center (NEFSC) fall index. In other cases, both the spring and fall indices may be appropriate. If there is missing data in the survey index, the PDT will document how it handled missing years, such as averaging available years, extending the years used in a quantile analysis, using alternative indices, or applying another method. If three or more years of survey data are missing, then the score for this factor will be 0 (neutral).

SSB / Stock Status Scoring Rubric (Table 3):

Analytical assessments / Empirical assessments with reference points (score in bold in parenthesis).

- **Well above target. (4)** The terminal year SSB is greater than 150% of the SSB target (SSB_{MSY}).
- **Rebuilt. (2)** The terminal year SSB is greater than the SSB target but not more than 150% of the SSB target.
- **Neutral. (0)** The analytical assessment estimated a terminal year SSB that is greater than or equal to 75% but less than 100% of the SSB target
- **Less than 75% but above threshold. (-2)** The analytical assessment estimated a terminal year SSB that is less than 75% of the SSB target.

- **Below threshold. (-4)** The analytical assessment estimated a terminal year SSB below the SSB threshold (0.5*SSB_{MSY}).

Empirical assessments without reference points (not to exceed a score of 0)

1. **Quantile Method:** Compute the **lower quantile (e.g., 0.25 or 25th percentile)** and **upper quantile (e.g., 0.75 or 75th percentile)** based on the baseline time series. The quantiles serve as thresholds to define recent stock condition:
    i. **Lower abundance**: abundance < 25th percentile
    ii. **Average abundance**: abundance between 25th and 75th percentiles
    iii. **Higher abundance**: abundance > 75th percentile
2. Translate each of the last 5 years of the survey index time series to quantile ranks based on the definitions above.
3. Summarize the 5-year period as a stock condition "state" based on the scoring rubric in Figure 3.
    - **Neutral**. **(0)** The three years are within the "Average abundance regime" or "higher abundance regime" or if quantiles are variable among years and criteria for a score of -2 or -4 are not met. If there is no abundance or biomass information, or if the PDT analyzes multiple survey indices that do not agree (e.g. fall survey is below threshold, and spring survey is neutral), score as a neutral state.
    - **Less than 75% but above threshold. (-2)** The stock status is unknown and three years are within the "Lower abundance regime".
    - **Below threshold. (-4)** The stock status is unknown and four or more years are within the "Lower abundance regime".

*Table 3. The scoring rubric for the **SSB / Stock Status Factor**. Gray boxes within a numerical score column are unavailable to use when scoring SSB / Stock Status. For stocks that do not use SSB for reference point calculation, scoring should be done making comparisons in the units used for official status determination.*

Numerical Score	**-4**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**
Categorical Score	**Below threshold**		**<75% but above Threshold**		**Neutral**		**Rebuilt**		**Well Above Target**
Analytical or Empirical assessments with ref pts	Below SSB threshold		< 75% SSB target		≥75% SSB target but < 100% SSB target		≥ SSB target but < 150% SSB target		≥ 150% SSB target
Empirical assessments without ref pts	Stock status is unknown and four or more years are within the "Lower abundance regime".		Stock status is unknown and three years are within the "Lower abundance regime".		Stock status is unknown and three years are within the "Average abundance regime", "Higher abundance regime" or if quantiles are variable among years. If there is no survey information, score as a neutral state.				

5.1.2 Recruitment

Goal: To identify the risk to the population associated with uncertainty in future recruitment and how that interacts with the fishery.

Relationship to risk tolerance: As recruitment increases, risk tolerance increases. Lower recruitment corresponds to reduced risk tolerance, indicating a need for more cautious management.

How to score: The baseline for recruitment will be defined by either the estimated recruitment time series from the most recent analytical stock assessment or the survey time series of abundance indices from age-1 fish from the most recent empirical stock assessment or data update. If the stock was last assessed using an analytical assessment, the PDT should use the recruitment time series from this analytical assessment, even if a data update has been completed for the stock.

If an empirical assessment is applied, the PDT may consider an alternative to an age-1 index, such as a length-based index that represents recruitment, or an alternative age index such as age-0. If there is missing data in the survey index, the PDT will document how it handled missing years, such as averaging available years, extending the years using in a quantile analysis, using alternative indices, or appyling another method. A neutral score of 0 may be applied by the PDT when data from an assessment product (e.g. data update) is not available to complete scoring.

1. **Quantile method:** Compute the **lower quantile (e.g., 0.25 or 25th percentile)** and **upper quantile (e.g., 0.75 or 75th percentile)** based on the baseline time series. The quantiles serve as thresholds to define recruitment regimes:
    i. **Lower recruitment**: recruitment < 25th percentile
    ii. **Average recruitment**: between 25th and 75th percentiles
    iii. **Higher recruitment**: recruitment > 75th percentile
2. Translate each of the last 5 years of the recruitment or survey index time series to quantile ranks based on the definitions above.
3. Summarize the 5-year period as a recruitment "state" based on the scoring rubric in Figure 3.

Recruitment Scoring Rubric (Table 4):

- **Multiple large year classes. (4)** Four years or more that are > 75th percentile, “higher recruitment”.
- **Recent large year classes. (2)** Three years are > 75th percentile, “higher recruitment”.
- **Average**. **(0)** Three years are between the 25th and 75th percentile, and within the “Average recruitment regime” or if quantile scores are variable among years and no other scoring criteria are met. If there is no recruitment information, score as a neutral state.
- **Recent low recruitment. (-2)** Three years are < 25th percentilewithin the “Lower recruitment regime”.
- **Persistent low recruitment. (-4)** Four years or more years are < 25th percentile, within the “Lower recruitment regime”.

*Table 4. The scoring rubric for the **Recruitment** Factor. Gray boxes within a numerical score column are unavailable to use when scoring Recruitment.*

Numerical score	**-4**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**
Categorical score	**Persistent Low Recruitment**		**Recent Low Recruitment**		**Average, No Trend**		**Recent Large Year Classes**		**Multiple Large Year Classes**
Analytical Assessments and Empirical Assessments	Four years or more are within the "Lower recruitment regime".		Three years are within the "Lower recruitment regime".		Three years are within the "Average recruitment regime" or if quantiles are variable among years and no other criteria are met. If there is not enough information available to complete recruitment scoring, score as a neutral state.		Three years are within the "Higher recruitment regime".		Four years or more years are within the "Higher recruitment regime".

5.1.3 Climate Vulnerability

Goal: To assess the risk associated with climate change.

Relationship to risk tolerance: As climate vulnerability increases, risk tolerance decreases, indicating a need for more precautionary management for stocks that are more sensitive to climate-driven changes.

How to score at the species level: The PDT should first assess if climate vulnerability is directly accounted for in the most recent analytical stock assessment and determine if scoring would result in double counting the influence of this factor. If the factor will be scored, use the results presented in Figure 3 and Figure 5 from Hare et al. 2016 to bin species. This has been done in Table 6. For each species:

1. Assign the vulnerability criteria based on the Biological Sensitivity and Climate Exposure classifications.
    - **Low vulnerability:** When Climate Exposure is Low, moderate, or high, and the biological sensitivity column is Low.
    - **Moderate vulnerability:** When Climate Exposure is very high and biological sensitivity is low, or if biological sensitivity is moderate and climate exposure is high.
    - **High vulnerability:** When Climate Exposure is very high and biological sensitivity is moderate, or if climate exposure is high and biological sensitivity is high.
    - **Very High vulnerability:** When Climate Exposure is very high and biological sensitivity is high or very high, or if climate exposure is high and biological sensitivity is very high.
2. Identify the directional effect.
3. Apply the scoring rubric in Table 5.

How to score at the stock level (interim approach): PDTs should use expert opinion and recent bodies of literature to score at the stock level. In providing guidance at the stock level, the PDTs may choose to develop new scores using the same criteria evaluated in Hare et al. 2016 or may draw on other information to develop a score. PDTs should also use the Climate and Ecosystem Consideration indicators identified and produced by the Ecosystem Dynamics and Assessment Branch (EDAB)[1,2] or the regional State of the

[1] NEFSC EDAB Indicators to Support Risk Policy Presentation | August 2025 RPWG Meeting

[2] NEFSC EDAB Risk Policy Technical Brief | August 2025 RPWG Meeting

Ecosystem reports to assist with scoring at the stock level where appropriate. In either case, strong rationale and justification should be provided alongside the stock-level score.

Climate Vulnerability Scoring Rubric (Table 5):

- **Low Vulnerability. (0)** Climate vulnerability is low, ignoring the directional effect column.
- **Moderate Vulnerability. (-1)** Climate vulnerability is moderate, ignoring the directional effect column; OR Climate vulnerability is low and the directional effect is negative.
- **Moderate Vulnerability, Negative Direction. (-2)** Climate vulnerability is moderate and the directional effect is negative.
- **High Vulnerability. (-3)** Climate vulnerability is high or very high, ignoring the directional effect column.
- **High Vulnerability, Negative Direction. (-4)** Climate vulnerability is high or very high, and directional effect is negative.

*Table 5. The scoring rubric for the **Climate Vulnerability** factor. Gray boxes within a numerical score column are unavailable to use when scoring Climate Vulnerability.*

Numerical score	**-4**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**
Categorical score	**High Negative Direction**	**High**	**Moderate, Negative Direction**	**Moderate**	**Low**				
Description	Climate vulnerability is high or very high, and the directional effect is negative.	Climate vulnerability is high or very high, ignoring the directional effect column.	Climate vulnerability is moderate and the directional effect is negative.	Climate vulnerability is moderate and ignoring the directional effect column; OR Climate vulnerability is low and the directional effect is negative	Climate vulnerability is low and ignoring the directional effect				

Table 6 - Climate Vulnerability scores by species.

FMP	Fish Stock	Biological Sensitivity	Climate Exposure	Climate Vulnerability	Directional Effect	Score	Score Cat
Scallops	Atlantic Sea Scallop	High	High	High	Negative	-4	High Vulnerability, Negative Direction
Groundfish	Atlantic Halibut	High	High	High	Negative	-4	High Vulnerability, Negative Direction
Groundfish	Ocean Pout	High	High	High	Negative	-4	High Vulnerability, Negative Direction
Groundfish	Atlantic Wolffish	High	High	High	Negative	-4	High Vulnerability, Negative Direction
Groundfish	Witch Flounder	High	High	High	Negative	-4	High Vulnerability, Negative Direction
Groundfish	Winter Flounder	High	Very High	Very High	Negative	-4	High Vulnerability, Negative Direction
Groundfish	Acadian Redfish	Moderate	High	Moderate	Negative	-2	Moderate Vulnerability, Negative Direction
Groundfish	Atlantic Cod	Moderate	High	Moderate	Negative	-2	Moderate Vulnerability, Negative Direction
Groundfish	White Hake	Moderate	High	Moderate	Negative	-2	Moderate Vulnerability, Negative Direction
Groundfish	Pollock	Moderate	High	Moderate	Negative	-2	Moderate Vulnerability, Negative Direction
Groundfish	Haddock	Low	High	Low	Negative	-1	Moderate Vulnerability
Groundfish	Yellowtail Flounder	Low	High	Low	Negative	-1	Moderate Vulnerability
Groundfish	American Plaice	Low	High	Low	Negative	-1	Moderate Vulnerability
Groundfish	Windowpane	Low	High	Low	Neutral	0	Low Vulnerability
Herring	Atlantic Herring	Low	High	Low	Negative	-1	Moderate Vulnerability
Monkfish	Monkfish	Low	High	Low	Neutral	0	Low Vulnerability
Skates	Thorny Skate	High	High	High	Negative	-4	High Vulnerability, Negative Direction
Skates	Barndoor Skate	Moderate	High	Moderate	Negative	-2	Moderate Vulnerability, Negative Direction
Skates	Smooth Skate	Moderate	High	Moderate	Negative	-2	Moderate Vulnerability, Negative Direction
Skates	Rosette Skate	Moderate	High	Moderate	Neutral	-1	Moderate Vulnerability
Skates	Winter Skate	Low	High	Low	Negative	-1	Moderate Vulnerability
Skates	Little Skate	Low	High	Low	Negative	-1	Moderate Vulnerability
Skates	Clearnose Skate	Low	High	Low	Neutral	0	Low Vulnerability
Small Mesh	Silver Hake	Low	High	Low	Negative	-1	Moderate Vulnerability
Small Mesh	Offshore Hake	Low	High	Low	Negative	-1	Moderate Vulnerability
Small Mesh	Red Hake	Low	High	Low	Neutral	0	Low Vulnerability
Red Crab	Deep-sea Red Crab	Low	High	Low	Neutral	0	Low Vulnerability
Salmon	Atlantic Salmon	Very High	Very High	Very High	Negative	-4	High Vulnerability, Negative Direction
Dogfish	Spiny Dogfish	Low	High	Low	Neutral	0	Low Vulnerability

5.1.4 Commercial Fishery Characterization

Goal: To identify the socioeconomic risks to the commercial fishery.

Relationship to risk tolerance: As socioeconomic stress increases, risk tolerance increases.

How to score: The Commercial Fishery Characterization factor will be scored using responses to a series of questions that aim to assess stress and vulnerability for the Commercial fishery.

1. **Utilization –** Has greater than 80% of the allowable limit been harvested in at least two of the last three years? If the answer is yes, score as 1. If the answer is no, score as 0. For this question, assess the 80% against the stock- or complex- specific target listed in Table 7 below. For stocks that are zero-possession (e.g. ocean pout), this assessment should focus on utilization relative to a catch limit (instead of landing limit).
    a. Assess completed fishing years (do not assess current fishing year with in-season data).
    b. Data sources can include final year end reports from NMFS, full year data from NMFS quota monitoring, or a mix of the two.

Table 7 -Fishery Targets for use in Scoring

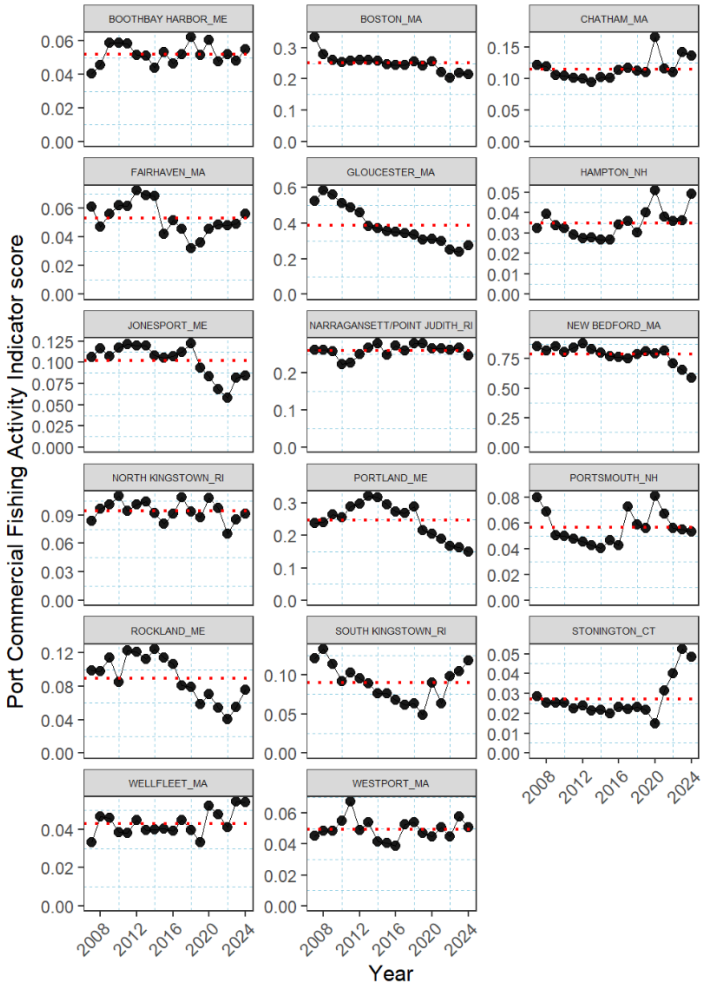
Species, Complex	Fishery Target used for Scoring
Atlantic Herring	Annual Catch Limit (ACL)
Atlantic Sea Scallops	Annual Projected Landings (APL)
Small Mesh Whiting	
Northern Red Hake	Total Allowable Landings (TAL)
Southern Red Hake	Total Allowable Landings (TAL)
Northern Whiting	Total Allowable Landings (TAL)
Southern Whiting	Total Allowable Landings (TAL)
Skate Complex (combined wing/bait)	Total Allowable Landings (TAL)
Monkfish	
Northern Monkfish	Total Allowable Landings (TAL)
Southern Monkfish	Total Allowable Landings (TAL)
Northeast Multispecies	
All stocks	Commercial Annual Catch Limit (Commercial Catch / Commercial ACL)

2. **Fishing Communities** – Of New England ports identified in the PCFA analysis, are the port-level scores for a majority (mode) of ports above, neutral, or below the time-series average? (Below=1, Neutral=0, Above=-1)

Use Port Commercial Fishing Activity (PCFA) Indicator which uses NOAA data on dealers, landings, revenue, and active commercial permits to explore trends in commercial fishing activity over time. A New-England-specific PCFA was prepared for use in the 2026 Risk Policy by the NEFSC Social Sciences Brance (SSB) and selects for New England ports where lobster landings constitute <50% of total landings, with selected ports to ensure geographic representation from all New England states.
To determine a score for this question (-1, 0, +1), PCFA scores from the terminal year of the analysis (2024) were compared with the mean of the time series (2007-2024) at the port/fishing community level.

Seven ports scored below the mean in the terminal year, while 5 were neutral (difference of less than .01), and 5 were above the mean. Since the mode of the number of ports was 7, this factor question will be scored as a 1 for all stocks scored and to which the Risk Policy is applied in 2026. PDTs should not deviate from this at this time.

Figure 4 - PCFA Indicator Scores for 2026 Risk Policy. Red dashed line in time-series mean (2007-2024).



3. **Revenue -** Has revenue in the fishery (FMP level) been in a lower, higher, or average state over the last five years? For Northeast multispecies stocks, assess if stock revenue contributes to 10% or more of overall groundfish fishery revenue in three of the last five year (+1). Stocks that are zero possession will receive a score of 0.

   For scoring the "state", apply the quantile method. Quantile Method: Compute the **lower quantile (e.g., 0.25 or 25th percentile)** and **upper quantile (e.g., 0.75 or 75th percentile)** based on the baseline time series. PDTs should focus on determining a base year (first year) that is representative of current fishery management practices, such as after the most recent reauthorization of the Magnuson-Stevens Act (MSA). Since the Council took actions to update FMPs with Overfishing Limits (OFLs), Acceptable Biological Catch (ABCs), ACLs, and Accountability Measures (AMs) at different points, PDTs should use their expert

judgement in defining the base year. PDTs should adjust the dollar values for inflation to allow for comparison between years. The quantiles serve as thresholds to define revenue states:

i. **Lower revenue**: data that is < 25th percentile

ii. **Average revenue**: data that is between 25th and 75th percentiles

iii. **Higher revenue**: data that is > 75th percentile

Translate each of the last 5 years of the time series to quantile ranks based on the definitions above.

Summarize and score the 5-year period as a "state" based on the scoring rubric.

- **Lower revenue. (1)** Revenue in the fishery has been "lower" in 3 of the last 5 years.
- **Average revenue**. **(0)** The conditions for "lower" and "higher" have not been met, suggesting mostly average revenues over the last 5 years.
- **Higher revenue. (-1)** Revenue in the fishery has been "higher" in 3 of the last 5 years.

4. **Fisheries Interactions –** Is quota for this species limiting the execution/prosecution of other fisheries? Is there a sub-ACL, accountability measure, or inter-FMP interaction associated with this stock that limits the execution of another fishery? If the answer is yes, +1.

   This question looks at constraining species / choke stocks as well as allocations / AMs that impact other FMPs. PDTs should focus on recent and current situations, not predictions of future conditions (this is reflected on by the AP in question 5). Score as a +1 if the stock could impact other fisheries. The PDT should develop a list of all fishery interactions that it believes are relevant and may provide a brief explanation as justification. In building this list, the PDT may consider fishery performance reports.

   The following list provides examples for PDTs to consider as it answers this question. This list is not exhaustive, and these relationships can change over time.

   a. GB haddock → Atlantic Herring
   b. GB yellowtail flounder → Sea Scallop, Small Mesh Fisheries
   c. SNE/MA yellowtail flounder → Sea Scallop
   d. N windowpane flounder →Sea Scallop

e. S windowpane flounder → Sea Scallop
f. Allocations/AMs that could impact within FMP with gear/area Ams
    i. N windowpane flounder → Groundfish
    ii. S Windowpane Flounder → Groundfish
    iii. Atlantic Halibut → Groundfish
    iv. Ocean Pout → Groundfish
    v. Wolffish → Groundfish
g. Fishery Allocations that have direct effect on effort measures
    i. GOM haddock & GOM cod → recreational fishery
h. Fishery Interactions recommended by Industry
    i. Skates limiting Southern monkfish

5. **Advisory Panel (AP) input – PDTs will need to work with respective APs to answer this question:** Focusing on the current fishing year and the current outlook, do the answers to the Commercial Fishery Characterization (questions 1-4) continue to be correct?
   If they "still hold" and are correct, score this question as a 0. If there are recent changes to the socio-economic status of the fishery, then score in the following ways: If the AP reports that the socio-economic health of the fishery has improved, score this question as a -1. If the AP reports that the socio-economic health of the fishery has declined further and is not captured in the answers to questions 1-4, score as a 1. When scoring, the AP may consider fishery performance reports.

Commercial Fishery Characterization Scoring Rubric: Sum the scores of questions 1-5:

- **High Stress (4)** Responses to questions result in a score of 4 or more.
- **Elevated Stress (3).** Responses to questions result in a score of 3.
- **Moderate Stress (2)**. Responses to questions result in a score of 2.
- **Low Stress (1)**. Responses to questions result in a score of 1.
- **Minimal Stress (0).** Responses to questions result in a score of 0 or less.

5.1.5 Recreational Fishery Characterization

Goal: To identify the socioeconomic risks to the recreational fishery.

Relationship to risk tolerance: As socioeconomic stress increases, risk tolerance increases.

How to score: The Recreational Fishery Characterization factor will be scored using responses to a series of questions that aim to assess stress and vulnerability for the recreational fishery. There are a limited number of recreational fisheries that the Council directly manages, and scoring will focus on stocks with specific allocations (current sub-ACLs). For all other stocks without sub-ACLs, a score of 0 should be applied for the recreational component given that the Council does not set possession, size, or gear restrictions for a number of stocks; in some cases, possession of a stock (e.g. Atlantic sea scallops) is prohibited without a commercial license. Catches of many managed species in federal waters is accounted for in total catch accounting, which comes through in other parts of the Risk Policy.

1. **Quota Utilization (stocks with sub-ACL)**
    a. Utilization – Has greater than 80% of the allowable limit (sub-ACL) been harvested in at least two of the last three years?
    If the answer is yes, score as 1. If the answer is no, score as 0. For this question, assess the 80% against the sub-ACL for a fishing year. Assess completed fishing years (do not assess current fishing year with in-season data). Utilize final year end reports from NMFS.

2. **Fleet Diversity**
    a. Has recreational fleet diversity been in a lower, higher, or average state over the last five years?

    For scoring the "state", apply the quantile method. Quantile Method: Compute the **lower quantile (e.g., 0.25 or 25th percentile)** and **upper quantile (e.g., 0.75 or 75th percentile)** based on the baseline time series from this indicator in the NEFSC's SOE. The quantiles serve as thresholds to define diversity states:
        i. **Lower**: data that is < 25th percentile
        ii. **Average**: data that is between 25th and 75th percentiles
        iii. **Higher**: data that is > 75th percentile

Translate each of the last 5 years of the time series to quantile ranks based on the definitions above.

Summarize and score the 5-year period as a "state" based on the scoring rubric.

- **Lower diversity. (1)** Recreational fleet diversity has been "lower" in 3 of the last 5 years.
- **Average diversity. (0)** The conditions for "lower" and "higher" have not been met, suggesting mostly average fleet diversity over the last 5 years.
- **Higher diversity. (-1)** Recreational fleet diversity has been "higher" in 3 of the last 5 years.

3. **Angler Trips**
    a. Have angler trips been in a lower, higher, or average state over the last five years?

    For scoring the "state", apply the quantile method. Quantile Method: Compute the **lower quantile (e.g., 0.25 or 25th percentile)** and **upper quantile (e.g., 0.75 or 75th percentile)** based on the baseline time series from this indicator in the NEFSC's SOE. The quantiles serve as thresholds to define angler activity states:

    i. **Lower**: data that is < 25th percentile

    ii. **Average**: data that is between 25th and 75th percentiles

    iii. **Higher**: data that is > 75th percentile

Translate each of the last 5 years of the time series to quantile ranks based on the definitions above.

Summarize and score the 5-year period as a "state" based on the scoring rubric.

- **Lower activity. (1)** Angler trips have been "lower" in 3 of the last 5 years.
- **Average activity. (0)** The conditions for "lower" and "higher" average have not been met, suggesting mostly average number of angler trips over the last 5 years.
- **Higher activity. (-1)** Angler trips have been "higher" in 3 of the last 5 years.

4. **Data Quality (PSE)**
    a. Is the PSE for total catch of a stock consistently below 30 in the last three years of available data?

       MRIP time series should be prepared by staff at NOAA Fisheries.

5. **Advisory Panel input – PDTs will need to work with Groundfish Recreational AP to answer this question:** Focusing on the current fishing year and the current outlook, do the answers to the Recreational Fishery Characterization continue to be correct?

   If they "still hold" and are correct, score this question as a 0. If there are recent changes to the socio-economic status of the fishery, then score in the following ways: If the AP reports that the socio-economic health of the fishery has improved, score this question as a -1. If the Groundfish RAP reports that the socio-economic health of the fishery has declined further and is not captured in the answers to questions 1-4, score as a 1. When scoring, the AP may consider fishery performance reports.

Recreational Fishery Characterization Scoring Rubric: Sum the scores of questions 1-5:

- **High Stress (4)** Responses to questions result in a score of 4 or more.
- **Elevated Stress (3).** Responses to questions result in a score of 3.
- **Moderate Stress (2)**. Responses to questions result in a score of 2.
- **Low Stress (1)**. Responses to questions result in a score of 1.
- **Minimal Stress (0).** Responses to questions result in a score of 0 or less.

6.0 APPENDIX II - COUNCIL WEIGHTING

New England Fishery Management Council

RISK POLICY

Appendix II – Council Weighting

Version 1

June 12, 2026

Weightings are a policy decision made by the Council that signifies the level of importance of a particular factor. It is the Council's policy to utilize the following guidance to conduct weightings for the Risk Policy, unless otherwise specified.

1. Eligibility to participate in weightings

It is the Council's policy that only voting Council members (members) will be eligible to participate in the Risk Policy weighting process, and participation is compulsory.

2. Process for weighting

A polling process at a meeting of the Council will be used to identify the importance of factors. At the Council meeting, identification of the individual factor weights by each Council member would occur during a dedicated agenda item. The Council will be supplied with links to materials to support the weightings process, such as the most recent State of the Ecosystem report, or National Standards. In addition, a template of the weightings poll will be provided to Council members in materials to encourage consideration of the weights prior to the meeting

Each voting member will weight all factors on a scale of 0-4.

- A weight of "0" indicates the factor is not important at all, while a weight of "4" indicates the factor is very important.
- The weights provided by each Council member will be counted equally.
- Individual responses will be anonymous.
- Responses from Council members will be averaged for each factor, and then divided by the sum of the averages to calculate the weighting for each factor. This ensures that the final weights of all factors add up to 1.
- A full description of how weights are combined with factor scores to determine a Z-score can be found in Appendix III.

Like other agenda items, written comments from the public will be accepted and provided to the Council as part of meeting materials. Weightings may be done in a closed session. After staff have calculated the weights for each factor, weights will be presented to the Council and public during the Council meeting. The Council will approve weights through motion before the full Council. This will be the opportunity for public comment and discussion between Council members about the weights. To be used as part of the Risk Policy, weights must be accepted by the Council by a simple majority vote or through consensus.

3. Frequency of Weightings

It is recommended that the Council complete the weightings process every three years. It is not expected that weightings would dramatically change from year to year.

4. Scale of Weights

The scale of weightings does not necessarily need to mirror the scale at which factors are scored. Factors are to be scored at the level at which the stock assessment occurs (finest management resolution). An exception to this is skates, which would be best scored at the complex level given a single ABC is set for the multiple skate species. In contrast, weightings can occur at a higher order. The Council will weight each factor generally, to be applied across all FMPs ("global" approach). It is the policy of the Council that it may revisit this approach to weighting in the Risk Policy.

Global Weightings Exercise for Voting Council Members:

The New England Fishery Management Council's Risk Policy utilizes data and Council member input to characterize the Council's risk tolerance for its managed resources.

As a voting Council member, you will be assigning *weights* to each factors. Unlike the scoring of factors, which is conducted by the PDT and based on objective data, weightings are a policy choice. Weightings signify the level of importance of a factor in the Council's assessment of risk. For example, for the factor "Climate Vulnerability", the weighting process is not asking whether a species is vulnerable to climate change impacts; this is the purpose of scoring. Instead, the weighting process is asking how important the topic of 'climate change impacts' is to the Council's risk tolerance for that species or stock.

The table below lists the factors you will weight. It also outlines the goal of each factor, and differences between what is evaluated during the objective PDT scoring process and what you should consider as a Council member when weighting each factor, which is a policy choice.

Factor / Goal	**Scoring – Objective** *Completed by the PDT*	**Weighting – Policy Choice** *Completed by Voting Council Members*
Biomass/Stock Status: acceptable level of risk based on the current biomass (or abundance) of a stock	Considers SSB relative to SSB targets, and recent stock size when stock status is unknown.	Consider how important the level of spawning stock biomass (SSB) and stock abundance are to your risk tolerance for a managed resource.
Recruitment: the risk to the population associated with uncertainty in future recruitment-related productivity	Considers recruitment over the last five years.	Consider how important recent recruitment is to your risk tolerance for a managed resource.
Climate Vulnerability: to assess the risk associated with climate change	Considers climate vulnerability of the stock/species and expected directional effect of climate change from Hare et al (2016).	Consider how important climate change impacts are to your risk tolerance for a managed resource.
Recreational Fishery Characterization: to assess the socioeconomic health of the recreational fishery	Considers sub-ACL utilization, recreational fleet diversity from SOE report, trends in angler trips, level of percent standard error (PSE) in total catch estimates, and AP input.	Consider how important recreational fishing considerations are to your risk tolerance for a managed resource.
Commercial Fishery Characterization: to assess the socioeconomic health of the commercial fishery	Considers catch target utilization, fishing communities, revenue trends, operational constraints, and AP input.	Consider how important commercial fishing considerations are to your risk tolerance for a managed resource.

When assessing weights for the factors, it may be helpful for you to think about the relative importance of the factors compared to one another. Some questions to help you think about weighting are:

- Is there a factor that you feel should have the most influence on the Council's decision making? Is there a factor that you feel is least important?
- When you have made past decisions at the Council, what has been the primary driver of whether you were willing to accept an option of higher or lower risk? And what had little influence on your decision?

Following the weighting exercise, the average of the Council members' weightings for each factor are combined with each factor's score. This is a global weighting exercise, meaning that the Council will use one set of weights for its Risk Policy. Scores and weights from all factors as used to calculate a Z-score to determine a level of risk tolerance.

Weighting Exercise – Global

Complete the grid below by assigning a weight to each factor using a whole number between 0 and 4. A weighting of 0 indicates the factor holds the lowest relative importance in determining the Council's risk tolerance for that managed resource, while a 4 indicates it is critically important. You may only designate a maximum of two factors as "Critically Important (4)."

Factor	***Least Important*** **0**	***Slightly Important*** **1**	***Important*** **2**	***Highly Important*** **3**	***Critically Important*** **4**
Biomass/Stock					
Recruitment					
Climate Vulnerability					
Recreational Fishery Characterization					
Commercial Fishery Characterization					

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Appendix III

RISK POLICY MECHANICS

Version 1

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Each factor within the Council's Risk Policy receives a weight and a score, which is used to calculate a Z-score that is translated through a logistic function to derive a recommended probability of management success. The mechanics for each step are described in detail below.

1. Normalize Council weightings

Voting Council members (Members) will complete a weighting form that identifies their individual judgement on the importance of each of the factors to the Council's decision-making. Members will assign a weight to each factor ranging from 0 to 4, where "0" signals that a factor is not important to decision-making and "4" signals that a factor is very important to decision-making.

Once each member has submitted their weightings, the average weight for each factor, $\overline{w_f}$, is calculated given the following:

- $$\overline{w_f} = \frac{1}{n}\sum_{i=1}^{n} w_{i,f}$$ *Equation 1*

where $w_{f,i}$ is the weight of an individual Council member, i, for a given factor, f, and n is the total number of Council members that submitted weights. The average weight for a given factor is then normalized, $\widetilde{W}_f$, so that the data can be assumed as normally distributed and is given by:

- $$\widetilde{W}_f = \frac{\overline{w_f}}{\sum_{f=1}^{5} \overline{w_f}}$$ *Equation 2*

where $\sum_{f=1}^{5} \overline{w_f}$ is the sum of averages across the five factors. The total of the normalized weight across the five factors should equal 1.

2. Assign stock-level factor scores

Plan Development Teams will use the best available information and the Scoring Guidance document to assign a numerical score to each factor for a particular species, stock, or stock complex. The score aims to reflect the condition of the resource and fishery with values ranging from -4 to 4 for the Spawning Stock Biomass (SSB) / Stock Status and Recruitment factors, -4 to 0 for the Climate Vulnerability factor, or 0 to 4 for the Commercial and Recreational Fishery Characterization factors.

3. Calculate the stock-level Z-Score

The z-score (z_j) represents the Council's measure of risk aversion for a given species, stock or stock complex (j). It is the sum product of the normalized weights ($\widetilde{W}_f$) and the PDT scores ($S'_{j,f}$), and is given by:

- $$z_j = \sum_{f=1}^{5} \widetilde{W}_f \times S'_{j,f}$$ *Equation 3*

4. Plot the stock-level Z-Score

To find the recommended probability of management success, $p(Z_j)$, for a given species, stock, or stock complex (j), input the calculated z-score into the logistic function given by:

- $$p(Z_j) = \frac{0.5}{1+e^{Z_j}} + 0.5$$ *Equation 4*

To illustrate the level of risk aversion qualitatively, the z-score value and recommended probability value should be plotted along the logistic curve generated by *Equation 4* and shown in Figure 5.

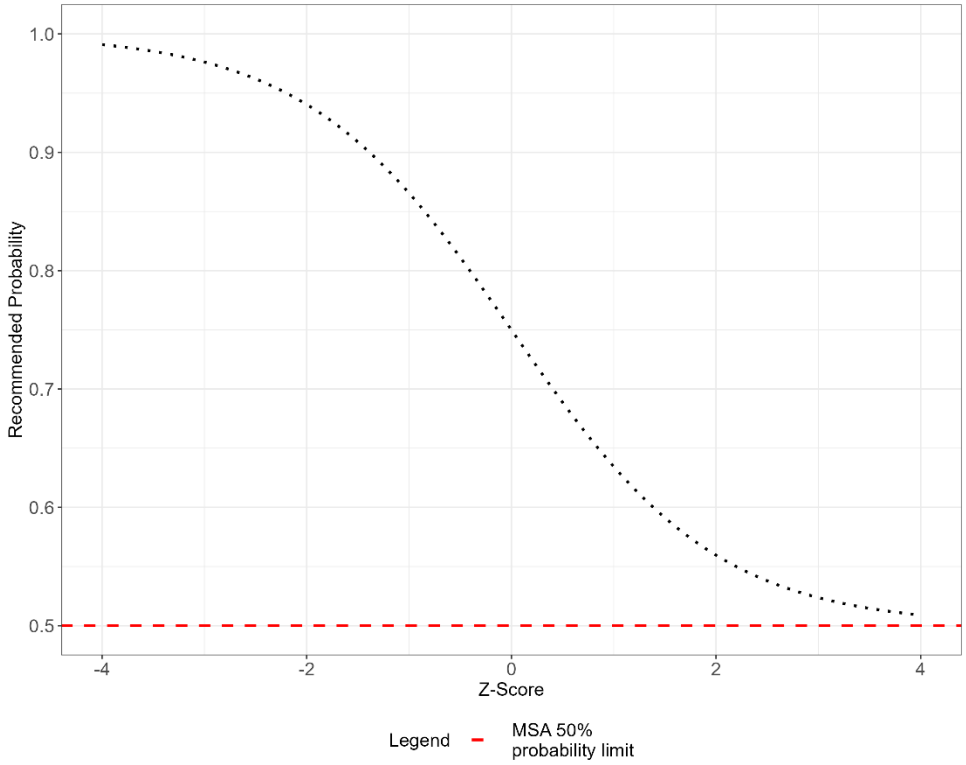
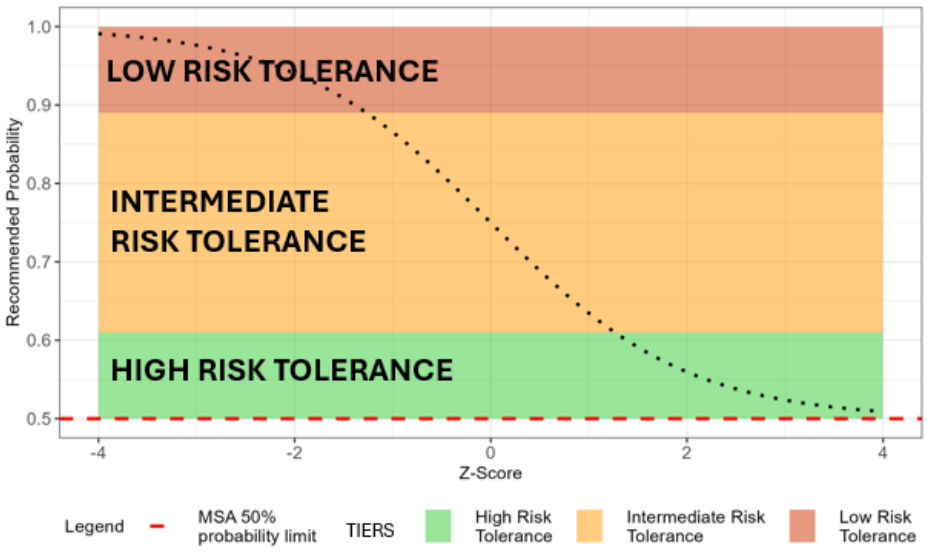


Figure 5. Inverted logistic function

5. Characterize the level of risk tolerance

The qualitative level of risk is based on the stock-level z-score and recommended probability of success, which are associated with defined risk tiers along the inverted logistic curve. Risk tiers were derived by finding the points along the logistic curve where the change in slope is at its steepest. In other words, where $p''(Z) = 0$, and where $p''(Z)$ is the second derivative of $p(Z_j)$ given by:

- $$p''(Z) = \frac{0.5e^{Z}(e^{Z}-1)}{(1+e^{Z})^3}$$ *Equation 5*



- Figure 6. Risk tolerance tiers based upon the inverted logistic function and the points on the curve where the change in its slope is at its steepest.

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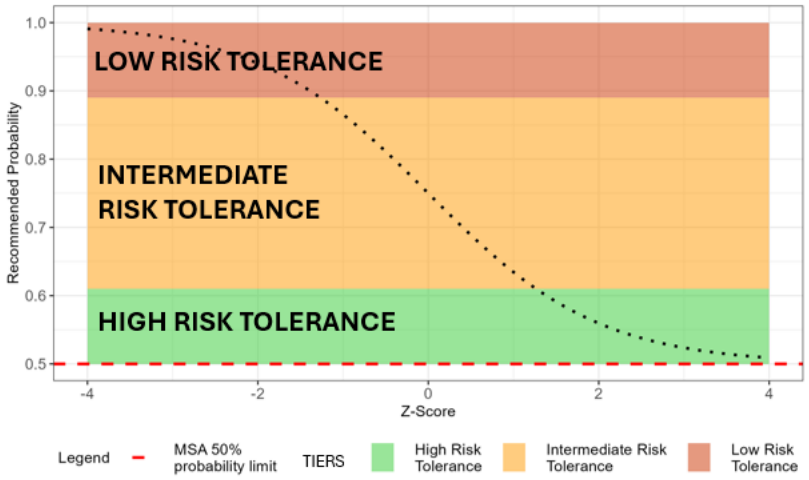
Appendix IV

QUALITATIVE USE GUIDANCE

Version 1

June 12, 2026

When using the Risk Policy Concept qualitatively, the Council may consider Risk Policy outputs (Z-scores) and their corresponding recommended probability (Y-axis) along with the resulting Risk Tolerance tier, shown in the figure below.



Interpreting Risk Policy Outputs

The X-axis represents the calculated Z-score based on the Council's global factor weights and the technical factor scores. Lower Z-scores are associated with lower risk tolerance and require more certainty that actions will achieve objectives through a higher threshold for success (closer to 100% on Y-axis). Higher Z-scores are associated with higher risk tolerance, and the corresponding threshold for success is lower than 100%.

The Z-score is plotted on the Risk Policy curve, which as a logistic curve is naturally partitioned into three zones, with two flat tails and a steep transition. The design of the tiers is based on the points of the logistic curve where there is the greatest change in slope in the curve, signaling a transition from relatively flat and stable "ends" of the curve to an intermediate zone of faster transition. Advice to have "high" or "low" risk tolerance comes when the curve is relatively flat.

The Y-axis is a measure of the Council's "acceptable probability of success" and reflects the level of confidence that a management action will achieve its stated objectives. It represents a decision threshold about the level of uncertainty the Council is willing to accept. Under the Council's Risk Policy Concept, the acceptable probability of success ranges from 50% to 100%. A 50% threshold indicates a high level of risk tolerance. As the threshold increases, the Council is expressing lower risk tolerance in favor of more reliable and predictable outcomes. A 100%

threshold represents the least risk tolerant position, suggesting near certainty that the action will achieve its objectives.

Low Risk Tolerance

This tier is applied when a stock is below its biomass threshold, recruitment has been persistently low, and the stock is highly vulnerable to climate change. A low risk tolerance signals that managers should increase the threshold for success in decision making. In practice, this may result in wider buffers between the Overfishing Limit (OFL) and the Acceptable Biological Catch (ABC). To prioritize stability and sustainability, the Council could implement short-to-medium-term constant catch advice (e.g., 3-5 years). This tier is primarily reserved for depleted stocks with low productivity that are highly vulnerable to environmental conditions.

Intermediate Risk Tolerance

This tier is applied when a stock is above its biomass threshold but not well above its target, recruitment does not deviate substantially from average levels, and the stock has low or moderate vulnerability to climate. An intermediate risk tolerance signals that managers should consider a balanced threshold for success based on economic stability and biological sustainability. In practice, this may result in moderate buffers between the OFL and ABC. Management decisions should aim to avoid abrupt regulatory shocks, and the Council could apply "phase-in" approaches for revising catch advice (e.g., maximum allowable annual increases/decreases). The majority of Council managed stocks likely fall in this tier.

High Risk Tolerance

This tier is applied when a stock is well above its biomass target, recent recruitment indicates multiple large year classes, and the stock has low climate vulnerability. A high risk tolerance signals that managers should accept a lower threshold for success and aim to extract the Optimum Yield (OY) to fully support commercial and recreational fishing opportunities. The uncertainty buffer between the OFL and the ABC is minimized to allow for maximum sustainable harvest. The Council should consider relatively frequent evaluation of stocks to ensure that higher risk tolerance is sustaining acceptable success thresholds. This tier is reserved for highly productive, resilient stocks that are experiencing favorable environmental conditions.

9.0 APPENDIX V – DECISION CATALOGUE

New England Fishery Management Council



RISK POLICY

Appendix V - DECISION CATALOGUE

Version 1.1

August 11, 2026

9.1.1 Risk Policy Decision Catalog

9.1.1.1 Factors

	Meeting(s)	Decision / Rationale
Assessment and Uncertainty	• January 13, 2026 Stock Assessment Sub-group Meeting • January 23, 2026 RPWG Meeting	Do not use this factor for June 2026 implementation date. Continue to develop this factor for future use. Potential to evaluate based on the last stock assessment but needs to consider changes to stock assessment process and how to handle data updates in Risk Policy.
Fish Condition	• December 17, 2025 Fish Condition and Ecosystem Sub-group Meeting • January 23, 2026 RPWG Meeting	Do not use this factor for June 2026 implementation date. Instead consider a factor for ecosystem characterization (EC). The EC factor should capture risks related to changes in habitat, current habitat conditions, and trophic relationships that are not addressed in other assessment processes (i.e., stock assessments or climate vulnerability assessments).
Biomass (SSB) / Stock Status	March 9, 2026 RPWG Meeting	Maintain factor scoring based on analytical and empirical assessments; consider incorporating information of data updates to modify score based on SSC feedback.
	March 30, 2026 SSC Meeting	Do not use data updates and do not changes in the scoring rubric to revise the factor score for June 2026 implementation date. See *: Biomass (SSB) / Stock Status* below.
Climate Vulnerability	March 9, 2026 RPWG Meeting	Maintain factor for June 2026 implementation date. Continue using Hare et al. 2016 to score at species level; allow PDT expert opinion and bodies of literature to score at stock-level. Future iteration of the factor could consider the updated Climate Vulnerability Assessment tentatively scheduled for release in Fall 2026.
Recruitment	January 23, 2026 RPWG Meeting	Maintain factor for June 2026 implementation date; revise to use a quantile approach to score which uses the recruitment or survey index time series and bins into quantile regimes.
Commercial Fishery Characterization	January 23, 2026 RPWG Meeting	Maintain factor for June 2026 implementation date. Simplify to five inputs; consider definitions of primary and secondary ports and two-way directionality in the score; future iterations should consider leasing.

	Meeting(s)	Decision / Rationale
	March 25, 2026 Risk Policy Factor Discussion	Do not use the Quota Change Model as a data source for June 2026 implementation due to concerns about the model's ability to be a good predictor of future harvest. Consider re-wording the quota question to capture dynamics more broadly. For fishing communities, near term implementation could consider requesting a list from each AP for the important ports for each FMP, and commercial activity could be characterized for that specific port across FMPs. Future development could parse this out by FMP and should derive consistent definitions of ports across FMPs. Future development should also consider how economics relates to risk (e.g. GINI coefficients).
	May 5, 2026 Community Data and Port Identification Discussion (Staff)	Information regarding top ports in New England with at least one port from each NE state was discussed as a potential source of information for scoring the factor in the near term. Ideas will be further discussed and presented at the June RPWG meeting.
Recreational Fishery Characterization	January 23, 2026 RPWG Meeting	Maintain factor for June 2026 implementation date. Add a question for RAP; consider two-way directionality in the score.
	March 9, 2026 RPWG Meeting	Maintain question around PSEs and uncertainty but consider data at the level that is utilized in management decisions; develop questions around quota utilization for June 2026 implementation; future iterations of the factor could include questions around participation, engagement, and choke stocks dynamics.
	March 25, 2026 Risk Policy Factor Discussion	Include if greater than 80% of the quota / catch target has been caught in at least two of the last three years as a question to characterize this factor for June 2026 implementation. Consider a question for stocks without an ACL for future iterations. Clarify the AP question, that information should be unique from information provided in response to other characterizing questions. Consider re-wording questions 3 and 4 to allow bi-directional movement. Movement on the rubric in response to the fleet diversity question should be unidirectional.

	Meeting(s)	Decision / Rationale
	May 5, 2026 Recreational Data Discussion	Future iterations could consider a different source for fleet diversity than the Opportunities (Shannon index) from the State of the Ecosystem Report. This index is based on trip data from MRIP, and using this to score the level of risk for this factor has the potential to suggest more tolerant approaches if the number of trips by mode increases, by the proportion of the fleet by mode decreases. Current application of this data source could allow the PDTs to break down angler trips by mode and include it in the matrix for context to support the Risk Policy score and Shannon index.
	June 24, 2026 Council Meeting Discussion	The Council requested continued work to expand the number of stocks that receive recreational scores. Stocks discussed were pollock, winter flounder, redfish. This list is not exhaustive and could be expanded in the future.

9.1.1.2 Mechanics

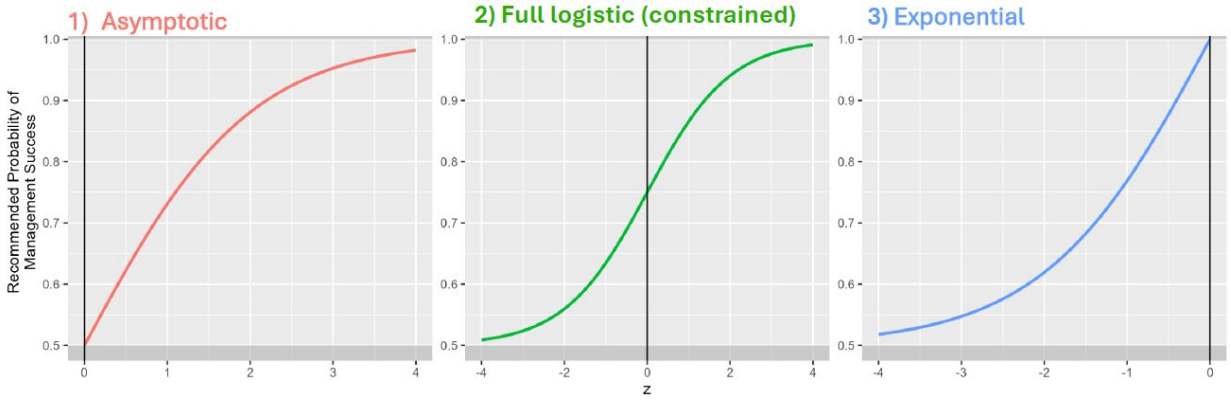
	Meeting(s)	Decision / Rationale
Types of shapes of the logistic curve (Figure 7)	• March 4, 2026 Risk Policy Technical Sub-Group • March 9, 2026 RPWG Meeting	The three curves differ in how quickly the resulting probability of management success changes in areas of high/neutral/low risk tolerance. Do not use asymptotic curve (Figure 7.1) for June 2026 implementation date; replace with full logistic (s-shaped curve, Figure 7.2). Future iterations could consider exponential curve (Figure 7.3) but would need additional development. See *Additional Information: Shape of the Curve* below.
Directionality of scoring rubric	• March 4, 2026 Risk Policy Technical Sub-Group • March 9, 2026 RPWG Meeting	Invert the scoring rubrics so that positive values represent increased risk tolerance; inverted rubric also inverts the full logistic (s-shaped curve) recommended above and removes the need to scale the scores.
Score ranges and increments	March 4, 2026 Risk Policy Technical Sub-Group	Maintain existing ranges and incremental steps between scores for the respective factors. Future iterations could consider changes as needed.
SSC Use and Application	March 9, 2026 RPWG Meeting	Working group considered the following approaches for SSC application: 1) "Adjustments of 'Probability of Success', unconstrained": movement along the curve in terms of the y-axis and probability of success; 2) "Adjustments of 'Probability of Success' within Risk Zones": movement along the curve but constrained to the implicit risk zones or areas of inflection of the S-shaped curve; and 3) "Advisory ABC": Risk Policy and calculated z-score are a starting point for specification deliberations These approaches should be considered as part of FW68 development.
Distribution of Council Weights	June 24, 2026 Council Meeting	The Council requested follow-up on the treatment of recreational weights for stocks that do not receive a score. In the interim, the recreational factor is dropped and normalized weights are calculated using the remaining 4 factors. This allows for Z-scores to access the entire Risk Policy curve. This should be considered in the next update to the Risk Policy and in GF FW68.

9.1.1.3 Additional Information

9.1.1.3.1 Shape of the Curve

Demonstrations of the three curves discussed at the March 9, 2026 RPWG meetings. The full logistic curve was recommended for implementation in June 2026.

Figure 7. Three possible shapes for the Risk Policy curve including 1) an asymptotic curve, 2) a full logistic curve constrained between 0.5 and 1, and 3) an exponential curve.



9.1.1.4 Data Needs and Wants

	Factor	Decision / Rationale
Age-1 indices and length-age keys (LAK)	Recruitment	Indices and LAK could assist in scoring the factor when recruitment estimates are not readily available from assessments or data updates.
Catch (number per tow) at age by year and season (Figure 8)	Biomass (SSB) / Stock Status	This information could provide another source of information when uncertainty around stock assessment estimates is high.
Survey catch (number per tow) by year and age (Figure 9)	Biomass (SSB) / Stock Status	This information could provide another source of information when uncertainty around stock assessment estimates is high.
Age 3+ survey catch by year and season (Figure 10)	Biomass (SSB) / Stock Status	This information could provide another source of information when uncertainty around stock assessment estimates is high.
Advisory Panel weighted community indicators	Commercial Fishery Characterization	The existing community indicators are weighted if the data is more variable which is not a real-world scenario. Allowing the advisory panel to provide feedback, interests, and priorities for improving the fishery could up or down weight certain indicators and the overall level of risk they're willing to accept to achieve those interests.
Angler satisfaction indicator	Recreational Fishery Characterization	NEFSC SSB may be able to assist in defining an indicator based on angler satisfaction of fishing for their target species which could help track the recreational fishery performance and its changes over time.

9.1.1.4.1 Biomass (SSB) / Stock Status

Figure 8. Catch at age (numbers/tow) for the Northern (top row) and Southern (bottom row) stocks of silver hake caught by the NEFSC bottom trawl survey during the Spring (left column) and Fall (right column) surveys. Plots produced by Andy Applegate.

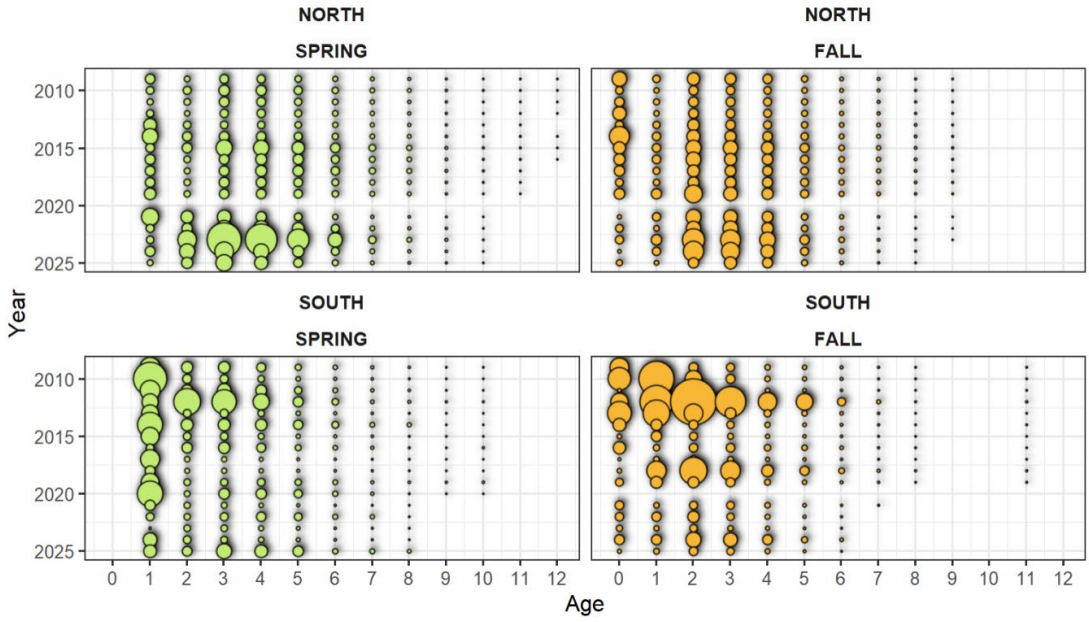


Figure 9. Survey catch (numbers/tow) for ages 0 (red line) and 1(blue line) for the Northern (top row) and Southern (bottom row) stocks of silver hake caught by the NEFSC bottom trawl survey during the Spring (left column) and Fall (right column) surveys. Plots produced by Andy Applegate.

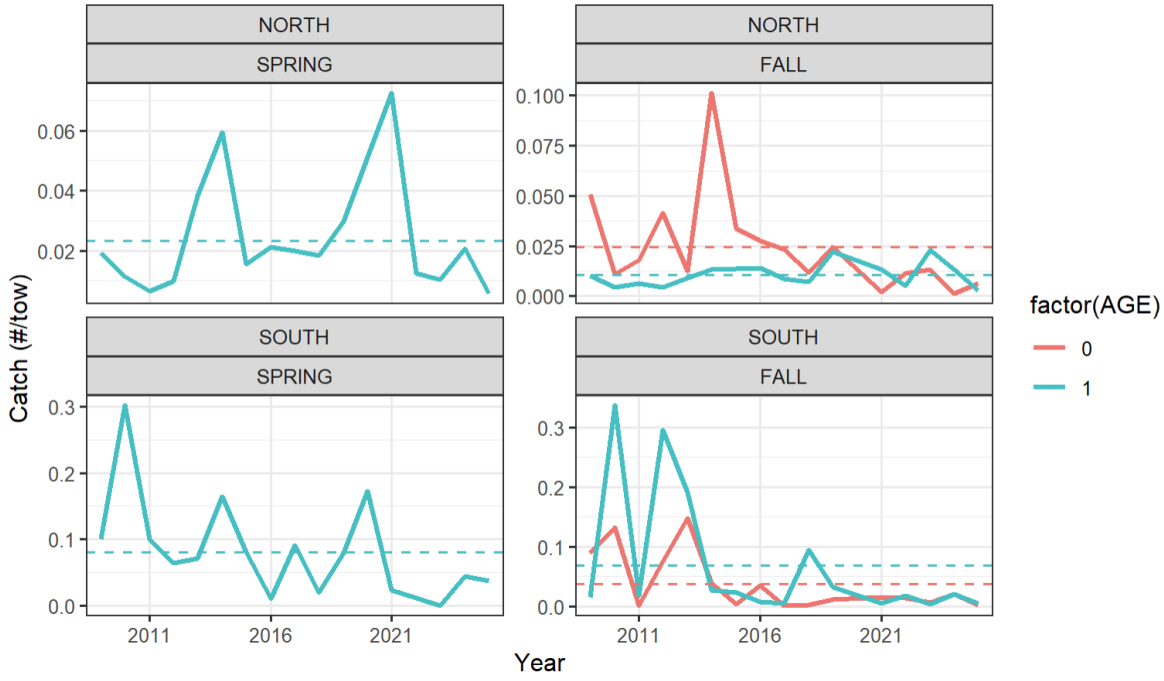
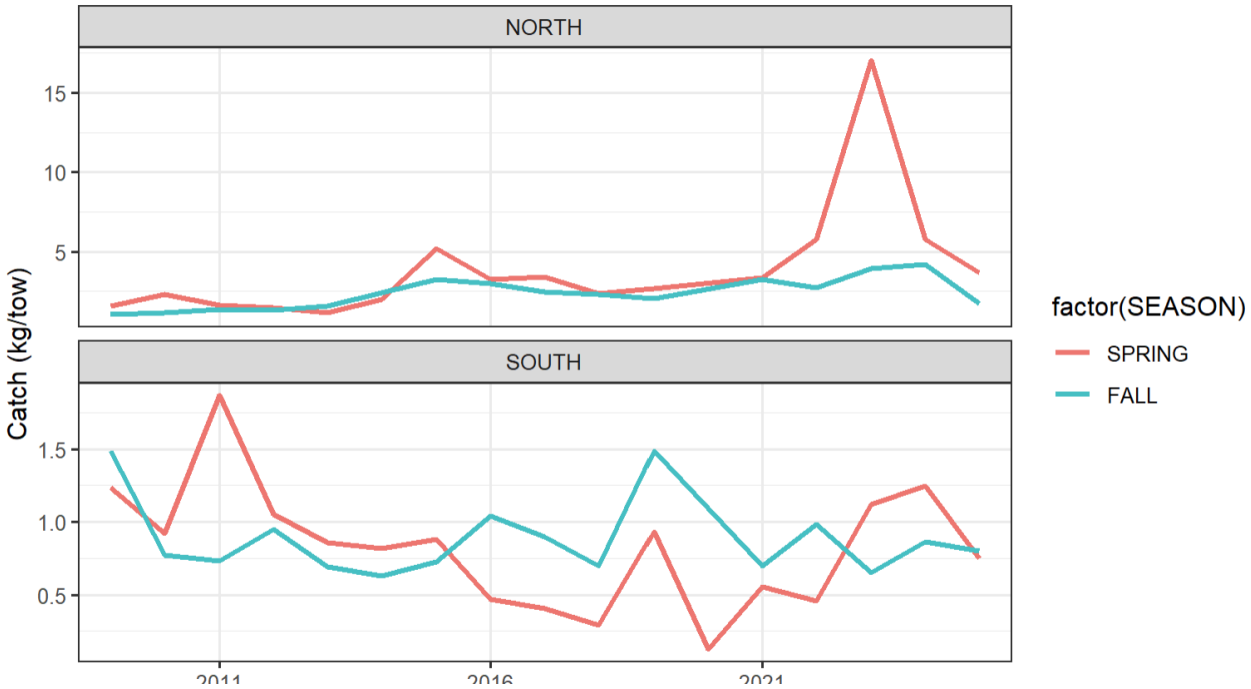


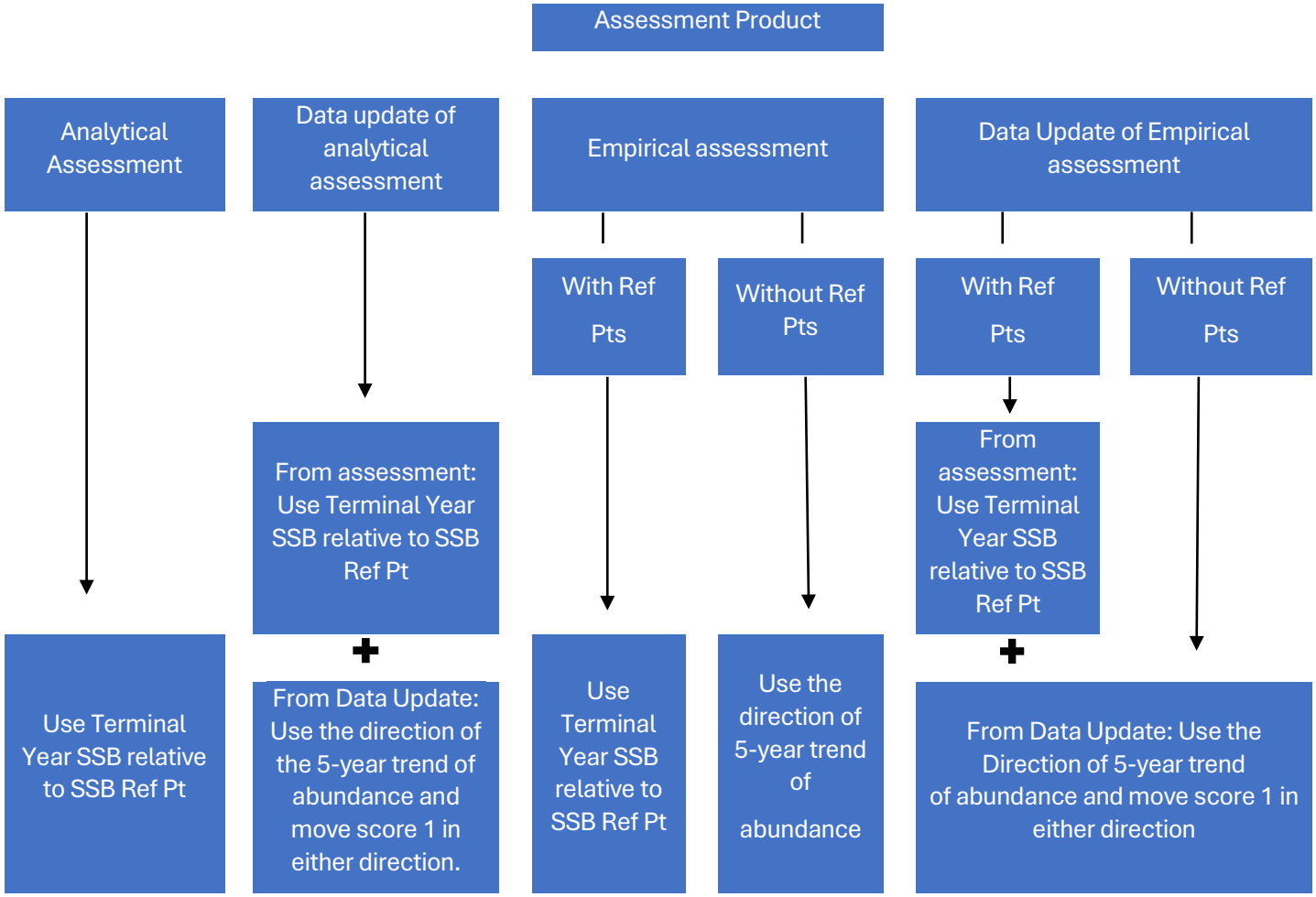
Figure 10. Survey biomass (kg/tow) for ages 3+ for the Northern (top row) and Southern (bottom row) stocks of silver hake caught by the NEFSC bottom trawl survey during the Spring (red line) and Fall (blue line) surveys. Plots produced by Andy Applegate.



9.1.1.4.2 Biomass (SSB) / Stock Status

Demonstrations of how to revise the SSB/Stock status factor using data updates in lieu of updated stock assessments. These were considered by the RPWG on March 9, 2026, and removed from scoring documentation following the March 30, 2026 SSC Meeting.

Figure 11. A flow chart for which data products to use and how when scoring SSB / Stock Status.



Scoring rubric – Data Updates

- **Shift left one score. (-1)** There is a negative trend over the most recent 5 years of abundance indices.
- **Shift right one score. (+1)** There is a positive trend over the most recent 5 years of abundance indices.
- For data updates of empirical assessments, the score range is confined to -4-0, following the scoring rubric available for empirical assessments.

Directionality	Meaning	Data Update Adjustment for Analytical and Empirical Assessments
Increasing	Slope < 0 and meaningful in magnitude	-1
Decreasing	Slope > 0 and meaningful in magnitude	+1
Neutral / No Trend	Slope ≈ 0 or inconsistent direction	No change

Numerical Score	**-4**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**
Categorical Score	**Below threshold**		**<75% but above Threshold**		**Neutral**		**Rebuilt**		**Well Above Target**
Data updates of analytical or empirical assessments with ref pts	Move right one score if there is a positive trend; Move left one score if there is a negative trend; Cannot go above or below the range of -4 to 4								
Data updates of analytical or empirical assessments without ref pts	Move right one score if there is a positive trend; Move left one score if there is a negative trend; Cannot go above or below the range of -4 to 0								