

# **New England Fishery Management Council**



## **RISK POLICY**

### **Appendix I**

## **DRAFT SCORING INSTRUCTIONS**

**Date/Version**

*Risk Policy Working Group Version*

*June 3, 2026*

## Scoring Instructions:

### **Responsibility for Scoring and Guidance**

All scoring shall be conducted by the relevant 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 input scores decided by the PDT into a scoring form that will combine scores with Council weights to generate a Z-score that will be plotted along the Council's Risk Policy curve and delivered to the SSC and other relevant bodies (Table 1 and Figure 1). Plan Coordinators will be able to access this calculation through the NEFMC Risk Policy Application.

### **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 the scoring each factor. This 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.

### **Documentation of Deviations in PDT Scoring**

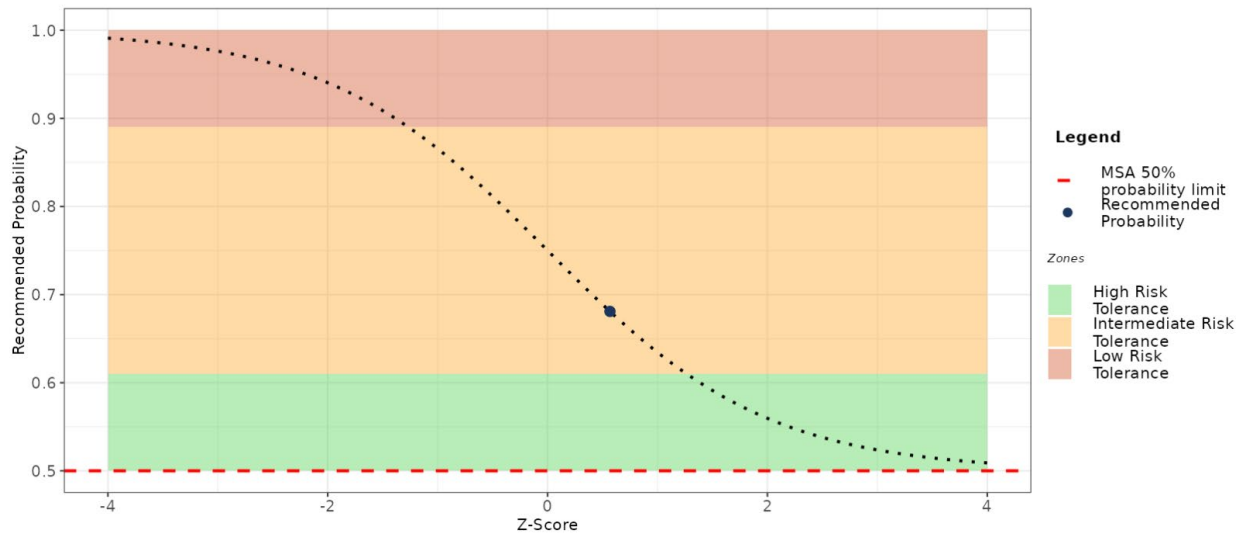
The PDT is required to follow the procedures, criteria, and guidance outlined in this document when conducting scoring. If during the scoring process a PDT determines that deviation from the scoring guidelines is necessary (e.g. lack of information, a data point falls between two scores, or available 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. PDT's 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 guidance.

Documentation shall be provided in a memorandum to the appropriate Council body (e.g., the Scientific and Statistical Committee (SSC)), including 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 1. The recommended probability for Gulf of Maine (GOM) haddock based on a Z-score of 0.57 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

## 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. 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 SSB relative to the SSB reference point. When stock status is unknown and there is a lack of reference points, base the factor score using the quantile approach outlined below (uses 5-years of abundance indices relative to baseline time series).

### SSB / Stock Status Scoring Rubric (Table 3):

*Analytical assessments / Empirical assessments with reference points (score 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 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. Compute the **lower quantile (e.g., 0.25 or 25<sup>th</sup> percentile)** and **upper quantile (e.g., 0.75 or 75<sup>th</sup> percentile)** based on the baseline time series. The quantiles serve as thresholds to define recent stock condition:
  - i. **Below-average abundance:** abundance < 25<sup>th</sup> percentile
  - ii. **Average abundance:** abundance between 25<sup>th</sup> and 75<sup>th</sup> percentiles
  - iii. **Above-average abundance:** abundance > 75<sup>th</sup> 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 stock status is unknown and three years are within the “Average abundance regime” or “above average abundance regime” or if quantiles are variable among years. If there is no abundance information, score as a neutral state.
  - **Less than 75% but above threshold. (-2)** The stock status is unknown and three years are within the “Below-average abundance regime”.
  - **Below threshold. (-4)** The stock status is unknown and four or more years are within the “Below-average 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.

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 <u>and</u> four or more years are within the “Below-average abundance regime”.		Stock status is unknown <u>and</u> three years are within the “Below-average abundance regime”.		Stock status is unknown and three years are within the “Average abundance regime”, “above average abundance regime” or if quantiles are variable among years. If there is no abundance information, score as a neutral state.				

## 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 the most recent empirical stock assessment or data update.

4. Compute the **lower quantile (e.g., 0.25 or 25<sup>th</sup> percentile)** and **upper quantile (e.g., 0.75 or 75<sup>th</sup> percentile)** based on the baseline time series. The quantiles serve as thresholds to define recruitment regimes:
  - i. **Below-average recruitment:** recruitment < 25<sup>th</sup> percentile
  - ii. **Average recruitment:** between 25<sup>th</sup> and 75<sup>th</sup> percentiles
  - iii. **Above-average recruitment:** recruitment > 75<sup>th</sup> percentile
5. Translate each of the last 5 years of the recruitment or survey index time series to quantile ranks based on the definitions above.
6. 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 are within the “Above-average recruitment regime”.
- **Recent large year classes. (2)** Three years are within the “Above-average recruitment regime”.
- **Average, no trend. (0)** Three years are within the “Average recruitment regime” or if quantiles are variable among years. If there is no recruitment information, score as a neutral state.
- **Recent low recruitment. (-2)** Three years are within the “Below-average recruitment regime”.
- **Persistent low recruitment. (-4)** Four years or more years are within the “Below-average 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	<b>Persistent Low Recruitment</b>		<b>Recent Low Recruitment</b>		<b>Average, No Trend</b>		<b>Recent Large Year Classes</b>		<b>Multiple Large Year Classes</b>
Analytical Assessments and Empirical Assessments	Four years or more are within the “Below-average recruitment regime”.		Three years are within the “Below-average recruitment regime”.		Three years are within the “Average recruitment regime” or if quantiles are variable among years. If there is no recruitment information, score as a neutral state.		Three years are within the “Above-average recruitment regime”.		Four years or more years are within the “Above-average recruitment regime”.

## 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:** 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. PDTs should also use the Climate and Ecosystem Consideration indicators identified and produced by the Ecosystem Dynamics and Assessment Branch (EDAB)<sup>1,2</sup> or the regional State of the 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.

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<sup>1</sup> [NEFSC EDAB Indicators to Support Risk Policy Presentation | August 2025 RPWG Meeting](#)

<sup>2</sup> [NEFSC EDAB Risk Policy Technical Brief | August 2025 RPWG Meeting](#)

- **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; <u>OR</u> 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

## 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.

**Questions: Risk Policy Working Group should be ready to provide final feedback on this section. Guidance will be used in qualitative application of Risk Policy in 2026.**

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 below:

Table 7 -Fishery Targets for use in Scoring

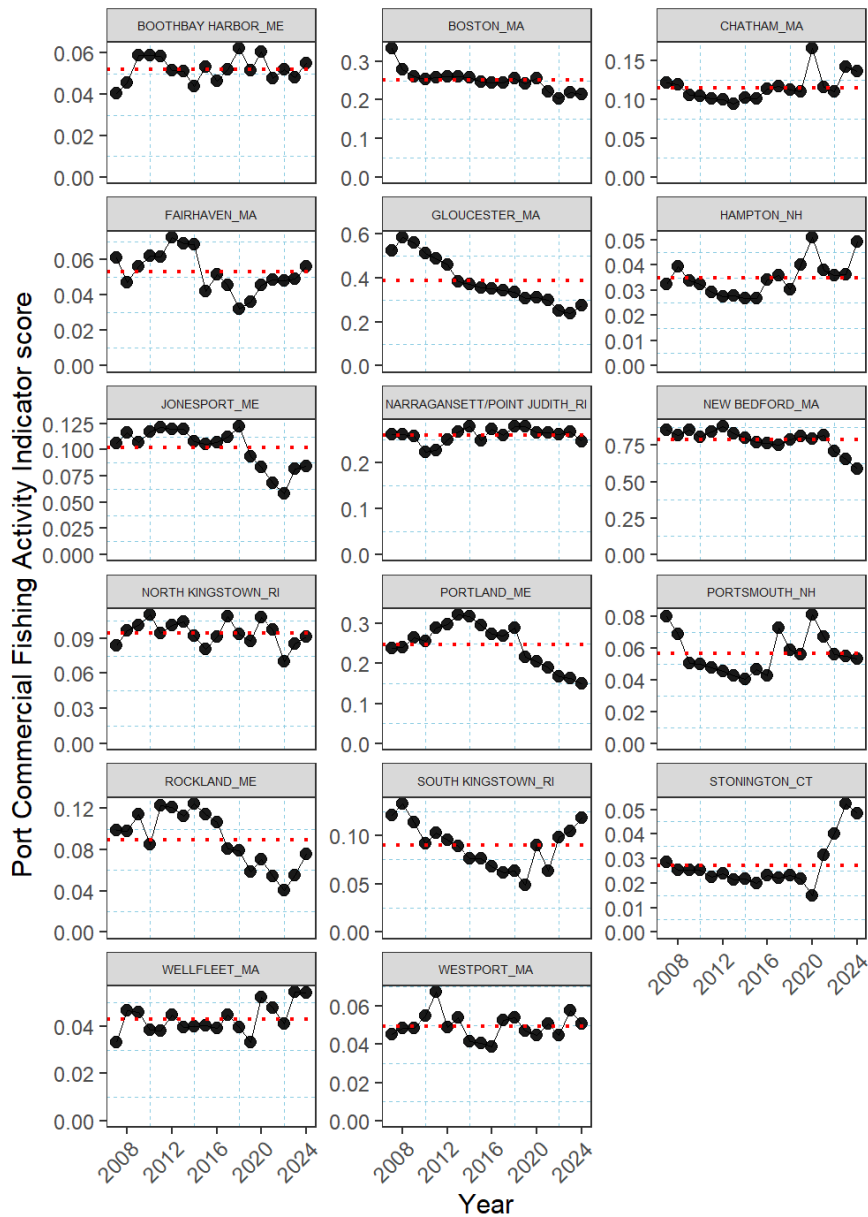
Species, Complex	Fishery Target used for Scoring
<b>Atlantic Herring</b>	Annual Catch Limit (ACL)
<b>Atlantic Sea Scallops</b>	Annual Projected Landings (APL)
<b>Small Mesh Whiting</b>	
Northern Red Hake	Total Allowable Landings (TAL)
Southern Red Hake	Total Allowable Landings (TAL)
Northern Whiting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

2. **Fishing Communities** – Use Port Commercial Fishing Activity (PCFA) Indications which uses NOAA data on dealers, landings, revenue, and active commercial permits to explore trends in commercial fishing activity over time. PCFA prepared for use in the 2026 Risk Policy 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 “above” the mean in the terminal year, while 5 were neutral (difference of less than .01), and 5 were above the mean.

Figure 2 - PCFA Indicator Scores for 2026 Risk Policy. Red dashed line in time-series mean (2007-2024).



**Risk Policy Working Group: Consider utility of “5-year” trend, time-series may be too short.**

3. Revenue - Has revenue in the fishery (FMP level) had a declining trend over the last five years (+1). For groundfish, instead consider if stock revenue contributes to 10% or more of overall groundfish fishery revenue (+1).
4. Fisheries Interactions – Is quota for this species limiting the execution of other fisheries (+1)? Is there a sub-ACL, accountability measure, or inter-FMP interaction associated with this stock that limits the execution of another fishery?

This question looks at constraining species / choke stocks, Allocations/AMs that could impact other FMPs. Score as a +1 if the stock could impact other fisheries.

The following list provides examples for PDTs to consider.

- a. GB haddock → Atlantic Herring
  - b. GOM haddock → Atlantic Herring
  - c. GB yellowtail flounder → Sea Scallop, Small Mesh Fisheries
  - d. SNE/MA yellowtail flounder → Sea Scallop
  - e. N windowpane flounder → Sea Scallop
  - f. S windowpane flounder → Sea Scallop
  - g. 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
  - h. Fishery Allocations that have direct effect on effort measures
    - i. GOM haddock & GOM cod → recreational fishery
  - i. Fishery Interactions recommended by Industry
    - i. Skates limiting Southern monkfish
5. Advisory Panel input – Focusing on the current fishing year and the current outlook, do the answers to the Commercial 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 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.

**Commercial Fishery Characterization Scoring Rubric:**

- **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.

## 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. For all other stocks, a score of 0 should be applied for the recreational component. **[Risk Policy WG: Consider this point. Including a 0 will pull Z-score toward neutral, dropping will have different effect.]** The rationale for this is that the Council does not set possession, size, or gear restrictions for a number of stocks, and in some cases possession of a stock (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.

**Questions: Risk Policy Working Group should be ready to provide final feedback on this section. Guidance will be used in qualitative application of Risk Policy in 2026.**

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? (+1)
2. Fleet Diversity
  - a. Is recreational fleet diversity from the SOE report decreasing over last five years (+1), increasing over last five years (-1), or no trend? (0)
3. Angler Trips
  - a. Are the number of angler trips in New England which are not targeting striped bass or tuna decreasing (+1), increasing (-1), or no trend? (0)
4. Data Quality (PSE)
  - a. Is the PSE for total catch consistently below 30 in the last three years of available data (+1)?
5. Management Consistency
  - a. Have there been recent changes to recreational bag limits, seasons, minimum fish size? If there has been consistency in recreational regulations (no change within the last 12 months), score as +1.
6. Recreational Advisory Panel input

- a. Do comments from the RAP within the current fishing year suggest the socio-economic stressors in the recreational fishery have increased compared to the previous year (+1), decreased compared to the previous year (-1), or no change? (0)

**Recreational Fishery Characterization Scoring Rubric:**

- **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.