IRA Initiative 3: *Ecosystem Component Species Evaluation Update*

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CESC Meeting

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For Today

- Ensure understanding of project work vs. future Council actions
- Review evaluation framework
- Seek feedback on elements included and data & information being used for scoring
- Opportunity for feedback on combining / weighing different factor scores and considering other types of tradeoffs when identifying ecosystem component species

Goals and Objectives of the IRA Project

- **Objective of the evaluation:** Analyze factors in MSA and NS Guidelines, as well as changes in environmental drivers and fishery data, to develop criteria and thresholds for designating Ecosystem Component Species (EC Species) within the NEFMC fishery management system.
- **Goal of the evaluation:** A robust screening framework that can be applied across species (now and later).
- **Deliverable of the pilot evaluation:** A white paper containing quantitative and qualitative results for each of the case study species/stocks.

Project timeline

- March 2026 – Seek feedback from CESC
- April 2026 – Brief Council update as part of CESC report under Council Planning agenda item
- June 2026 – Council receives a completed draft of evaluation framework and a report out of the species evaluation.
  - Decision: to adopt framework as-is or makes suggestions for adjustments.
  - No decisions on next steps for pilot species needed in June (see post-IRA project slide)
- Summer 2026 – Finalize revised framework as needed and archive methods / code

Post-IRA actions

- December 2026 – Council recommends 2027 work priorities
  - Decision: Considering results of pilot evaluation, Council could recommend developing an FMP amendment to consider designating one or more pilot species as an ecosystem component.
- 2027 (or later)
  - Council amendment(s) to consider ECS designation for one of the pilot species, and/or
  - Technical exercise to apply the evaluation framework to additional species/stocks to determine if an amendment should be developed

Case Study Species

- Southern windowpane flounder
- Atlantic wolffish
- SNE/MA yellowtail flounder
- Thorny skate
- Rosette skate
- Red hake
- Offshore hake
- Sand lance
- Cusk
- Witch flounder

Source: NOAA Fisheries (for all species except sand lance) and https://allfishes.org/fishes/marine/sand-lance

Evaluation Framework

I. Evaluate the need for conservation and management
II. Evaluate the ten National Standard Guideline factors
III. Consider additional information as necessary

Evaluation Framework: Steps I and II

I. Conservation and Management Determinations	ECS Designation?
1. Is the stock/species overfished or likely to become overfished?	☒
2. Is the stock/species subject to overfishing or likely to become subject to overfishing?	☒
3. Is the stock/species predominately caught in federal waters?	☒
II. National Standard Guideline Factors (§ 600.305(c))	
4. Is the stock an important component of the marine environment?	☑
5. Is the stock caught by the fishery?	⇆
6. Will an FMP improve or maintain the condition of the stock/species?	☑
7. Is the stock/species a target of the fishery?	☒
8. Is the stock important to commercial, recreational and subsistence users?	⇆
9. Is the fishery important to the Nation or regional economy?	⇆
10. Is there a need to resolve competing interests and conflicts among user groups and would an FMP further that resolution?	⇆
11. What is the economic condition of the fishery and would an FMP produce more efficient utilization?	⇆
12. Are there needs of a developing fishery, and would an FMP can foster orderly growth?	☑
13. What is the extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law?	⇆

Legend ☑ *Supports an ECS Designation* ⇆ *Designation depends on the answer* ☒ *Does not support an ECS Designation*

Conservation and Management Definition

16 U.S.C. 1802(5)

" 'Conservation and Management' refers to all of the rules, regulations, conditions, methods, and other measures (A) which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining, any fishery resource and the marine environment; and (B) which are designed to assure that—

(i) a supply of food and other products may be taken, and that recreational benefits may be obtained, on a continuing basis;

(ii) irreversible or long-term adverse effects on fishery resources and the marine environment are avoided; and

(iii) there will be a multiplicity of options available with respect to future uses of these resources."

Conservation and Management Determinations

Questions:

1. Is the stock/species overfished or likely to become overfished?
2. Is the stock/species subject to overfishing or likely to become subject to overfishing?
3. Is the stock/species predominately caught in federal waters?

Data and References:

- Most recent stock assessments
- Fishing activity maps using VTR data in 10-minute squares

Challenges / Gaps:

- 4 out of 10 pilot species require conservation and management based on stock status.
- 4 out of 10 pilot species do not have a stock status or formal assessment.

Relationship to ECS: ☒

- If yes, stock requires conservation and management.
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some degree of oversight .

Species/Stock	Stock status
Southern windowpane flounder	Not overfished Overfishing not occurring
Atlantic wolffish	Overfished Overfishing not occurring
SNE/MA yellowtail flounder	Overfished Overfishing not occurring
Witch flounder	Overfished Unknown overfishing status
Thorny skate	Overfished Overfishing not occurring
Rosette skate	Not overfished Overfishing not occurring
Southern red hake	Overfished Unknown overfishing status
Offshore hake	Stock status is unknown
Sand lance	Not assessed or managed
Cusk	Not assessed or managed

Productivity and Susceptibility Analysis (PSA)

- Potential to use as a supplemental analysis when status is unknown or there is no formal assessment
- Developed in 2009 by a NMFS Vulnerability Working Group (Patrick et al. 2009)
- An approach that evaluates a species/stock's level of vulnerability to fishing pressure
  - Defined in MSA, as the combination of its productivity and its susceptibility to the fishery (*§* 600.310(b)(4))
  - Scores are averaged across productivity and susceptibility attributes to derive a vulnerability score.
- Potential ranges / outcomes
  - Low productivity and high susceptibility → most vulnerable to overfishing
  - High productivity and low susceptibility → least vulnerable to overfishing

Productivity and Susceptibility Analysis (PSA)

Productivity Attributes

- Intrinsic Growth Rate (r)
- von Bertalanffy growth coefficient (K)
- Maximum size (Lmax)
- Maximum age (tmax)
- Estimated Natural Mortality Coefficient (M)
- Fecundity
- Age at maturity (tmat)
- Breeding strategy
- Recruitment pattern
- Mean Trophic level (MTL)

Susceptibility Attributes

- Areal overlap (distribution of stock vs. distribution of fishery)
- Geographic overlap (i.e. patchiness)
- Vertical overlap (distribution within the water column)
- Seasonal migration
- Schooling/aggregation and other behavioral responses
- Morphology affecting capture
- Desirability / Value of the fishery
- Management strategy
- Fishing rate relative to natural mortality (F/M)
- Biomass of spawners
- Fishery impact on habitat
- Survival after capture and release

Considerations for PSA

- There would be some overlap in analyses for the main evaluation framework *(see following slides where appropriate)*.
- It would require additional literature review and expert opinion to fill data gaps.
  - There is some existing work by partners that could be leveraged to support data gathering *(i.e., Climate Vulnerability Assessment 2.0 Species Profiles, updated EFH Source Documents, etc.)*.
- It provides a vehicle to incorporate potential drivers in changes to catchability.
- The analysis is one approach being considered for evaluating low/high risk/value under NOAA's Framework to Narrow NFMS Management and Science.

Considerations for the National Standard Guideline Factors

50 CFR 600.305(c)

(2) "**In evaluating factors**. . .Councils should consider the specific circumstances of the fishery, based on best scientific information available. . ."

(3) "**When adding a stock to an FMP**. . .one or more of the above factors, and any additional considerations that may be relevant to the particular stock, may provide the basis for determining that a stock requires conservation and management."

(4) "**When considering removing a stock from, or continuing to include a stock in**, an FMP, Councils should prepare a thorough analysis of factors. . .and any additional considerations that may be relevant to the particular stock. . . Councils should consider weighting the factors *[based on how they address parts A and B in the definition of Conservation and Management]*."

(5) "Councils may choose to identify stocks within their FMPs as ecosystem component (EC) species. . .if a Council determines that the stocks **do not require conservation and management** based on the considerations and factors in paragraph (c)(1)."

50 CFR 600.305(d)(13)

Ecosystem Component Species are stocks that a Council or the Secretary has determined do not require conservation and management, but *desire to list in an FMP in order to achieve ecosystem management objectives.*

Q4. Is the stock an important component of the marine environment?

Data and References:
- Food web and diet information (NMFS)
- EFH Source Document updates (MAFMC) + other literature
- EFH Species Distribution Models (NEFMC/MAFMC contract work presented earlier today)
- FaCeT Species Distribution Maps for sand lance (SBNMS, NASA, WHOI, SDSU)

Analysis:
- Qualitative descriptions of predator-prey interactions

Challenges / Gaps:
- Limited to a food web / trophic interaction context
- As prey, pilot species have low frequency of occurrence in predator stomachs.

Relationship to ECS: ☑
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management.

Relationship to PSA:
- Mean trophic level

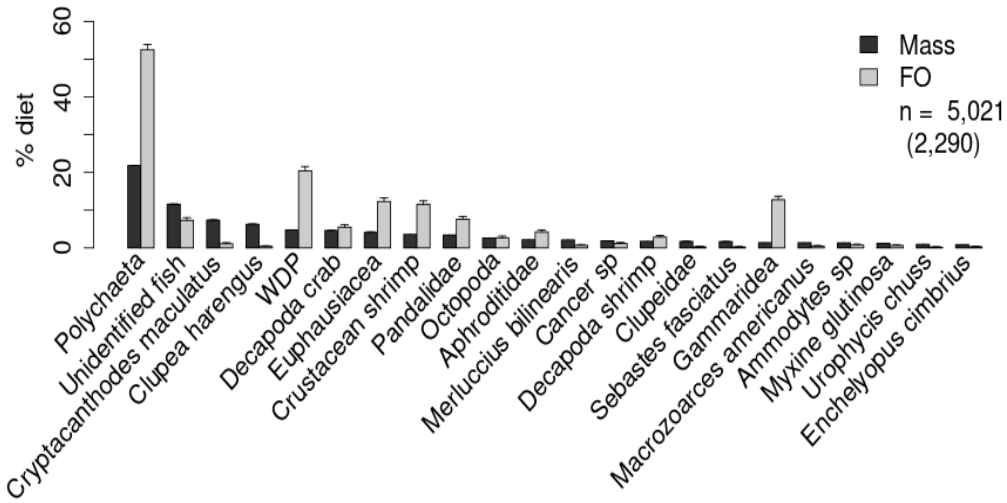

Figure: Prey proportions of Thorny skate diet by mass and frequency of occurrence

Source: Fish Trophic Ecology of the Northeast U.S. Continental Shelf Shiny App (NEFSC Food Web Dynamics Program)

Q5. Is the stock caught by the fishery?

Data and References:
- Commercial catch
- Recreational catch
- Species Distribution Modeling (NEFMC/MAFMC contract work presented earlier today)

Analysis:
- Annual summaries of commercial and recreational catch over the most recent 5 years.

Challenges / Gaps:
- Analysis would need to differentiate between targeted catch and bycatch.
- Results would need some qualifying threshold to signal a species as a potential ecosystem component.
- Recreational data from MRIP may be limited or highly uncertain for pilot species.

Relationship to ECS: ⇆
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some degree of oversight.

Relationship to PSA:
- Fishing mortality rate relative to natural mortality, Desirability / Value of the fishery, Areal overlap, Vertical overlap, Seasonal migrations, Morphology affecting capture, Survival after capture release

Q6. Will an FMP improve or maintain the condition of the stock/species?

** niche = which environmental conditions provide the most suitable habitat conditions*

Data and References:
- Species distribution modeling
- Most recent stock assessments, where applicable
- Expert opinion from Plan Coordinators and PDTs

Analysis:
- Differences between time trends in abundance estimated with and without niche* responses.
- Changes in conditions within a species footprint / suitable habitat related to estimated niche responses.
- Trends in age composition, recruitment, spawning stock biomass, survey indices
- Anecdotal information regarding on the water observations
    - If currently managed, has abundance increased or been maintained over the history of the FMP?
    - Are catch limits, gear restrictions, spatial management important to the condition of the resource?

Challenges / Gaps:
- Many of the pilot species are included in an FMP. Analysis will need to signal condition as a result of changes in productivity rather than a response to management measures.

Relationship to ECS: ☑
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some degree of oversight.

Relationship to PSA:
- Management strategy, Fishery impact on habitat, Biomass of spawners, Survival after capture release

Q7. Is the stock/species a target of the fishery?

Data and References:
- Commercial landings and discards
- Recreational landings, discards, and effort
- Observer data for sand lance and cusk

Analysis:
- A comparison between annual landings and annual discards over the most recent 5 years.
- The proportion of species landed over the total number of trips.

Challenges / Gaps:
- Recreational data from MRIP may be limited or highly uncertain for pilot species.

Relationship to ECS: ☒
- If yes, suggests stock needs conservation and management under an FMP.
- If no, suggests stock does not need conservation and management in an FMP but could be added as an ECS for some degree of oversight.

Relationship to PSA:
- Fishing mortality rate relative to natural mortality, Desirability / Value of the fishery, Areal overlap, Vertical overlap, Geographic overlap, Biomass of spawners, Survival after capture release, Seasonal migrations

Q8. Is the stock/species important to commercial, recreational, and subsistence users?

Data and References:
- Commercial landings
- Recreational landings and effort
- Fishing community information
- Port landings and revenue
- Quota lease prices
- Ex-vessel prices

Analysis:
- Annual summaries of commercial and recreational catch over the most recent 5 years.
- Annual revenues by port over the most recent 5 years.
- Trends in quota lease prices and ex-vessel prices over the most recent 5 years.

Challenges / Gaps:
- Recreational data from MRIP may be limited or highly uncertain for pilot species.

Relationship to ECS: ⇆
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some degree of oversight.

Relationship to PSA:
- Desirability / Value of the fishery

Q9. Is the fishery important to the Nation or regional economy?

Data and References:

- Commercial revenue for the species (by stock, by fishery, by port)

Analysis:

- Proportion of total revenue for each species/stock to the total revenue of the fishery over the most recent 5 years.
- Proportion of total revenue for each species/stock to the total revenue of a given port over the most recent 5 years.
- Proportion of total revenue for each species/stock to the total revenue of regional fisheries over the most recent 5 years.

Challenges / Gaps:

- The most readily available information is commercial revenue. The analysis could evaluate substantial recreational harvest as a proxy for importance to the economy.

Relationship to ECS: ⇆

- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests species does not need conservation and management but could be added to an FMP as an ECS for some degree of oversight.

Relationship to PSA:

- Desirability / Value of the fishery

Q10. Is there a need to resolve competing interests and conflicts among user groups and would an FMP further that resolution?

Data and References:
- Expert opinion from Plan Coordinators and PDTs

Analysis:
- Anecdotal information regarding on the water experiences

Challenges / Gaps:
- Many of the pilot species are a part of developed fisheries and included in FMPs. Analysis may contain competing interests within FMPs, or shared interests across user groups.

Relationship to ECS: ⇆
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some degree of oversight.

Relationship to PSA:
- Areal overlap, Vertical overlap, Geographic overlap, Fishery impact on habitat

Q11. What is the economic condition of the fishery and would an FMP produce more efficient utilization?

Data and References:
- Lease prices
- Utilization rates
- Quota monitoring reports
- Expert opinion from Plan Coordinators and PDTs

Analysis:
- Percent utilization of annual quotas over the most recent 5 years.
- Changes in utilization over the most recent 5 years.
- Anecdotal information regarding fishery behavior and effort
  - Has the fishery expanded or contracted with regards to targeting the currently managed pilot species?

Challenges / Gaps:
- The most readily available information is commercial revenue. The analysis could evaluate substantial recreational harvest as a proxy for economic condition of the fishery.
- Many of the pilot species are a part of a developed fishery where existing utilization may be inefficient. Analysis will need to signal utilization as a result of changes in catchability rather than a response to management measures.

Relationship to ECS: ⇆
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some initial oversight.

Relationship to PSA:
- Management strategy, Fishing mortality rate relative to natural mortality

Q12. Are there needs of a developing fishery, and would an FMP can foster orderly growth?

Data and References:
- Expert opinion from Plan Coordinators and PDTs
- Commercial landings
- Recreational landings
- Trip information

Analysis:
- Anecdotal information regarding fishery behavior and effort.
  - Is there a desire for or evidence of a developing fishery for sand lance and cusk?
  - Has the fishery expanded or contracted with regards to targeting the currently managed pilot species?
- Percentage of landings that are a given stock/species as a proxy for growth.
- The proportion of species landed over the total number of trips as a proxy for growth.

Challenges / Gaps:
- Many of the pilot species are a part of a developed fishery. The Committee and Council may wish to weigh this differently in varying applications of the framework.

Relationship to ECS: ☑
- If yes, suggests stock needs some level of management or oversight (as an ECS or a stock in need of conservation and management).
- If no, suggests stock does not need conservation and management but could be added to an FMP as an ECS for some initial oversight.

Relationship to PSA:
- Desirability / Value of the fishery

Q13. What is the extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law?

Data and References:
- State catch data
- EFH Review Component 3: Non-MSA Fishing Activities in State Waters

Analysis:
- Annual summaries of state catch over the most recent 5 years
- Qualitative narrative regarding species/stock management by state programs.

Challenges / Gaps:
- Many of the pilot species are included in an FMP. Analysis will need to demonstrate a lack of response to adequate management.

Relationship to ECS: ⇆
- Adequate management of a fishery by states, state/Federal programs, or another Federal FMP could suggest against a Federal FMP action.
- Lack of adequate management suggests stock needs some level of federal management or oversight (as an ECS or a stock in need of conservation and management).

Relationship to PSA:
- Management strategy

Feedback and Discussion

- Should the evaluation assess all 13 factors for each species regardless of the stock status?
  - Should a PSA of all 10 stocks be completed to supplement the evaluation?
- What additional data/information should be considered for each factor/question?
  - For factors using fishery data, what is an appropriate time series length?
- In the context of ecosystem components, how should each factor (questions 4 through 13) be weighted to signal the need for a designation?
  - *E.g., questions 4 through 6 are more important than question 10*
- What type of combined signal would you like to see to be able to recommend a species/stock for designation?
  - *E.g., a ratio of yes to no responses to the 13 questions, a total numerical score based on a score given to each factor, above/below a threshold.*

NMFS Flowchart