



New England Fishery Management Council

50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116

Eric Reid, *Chair* | Thomas A. Nies, *Executive Director*

COUNCIL SOLICITING CONTRACT WORK **Prototype Management Strategy Evaluation for** **Georges Bank Ecosystem-Based Fishery Management** May 2022

Project Description

The New England Fishery Management Council (NEFMC) requires the services of an independent contractor to develop and conduct a Prototype Management Strategy Evaluation (MSE) for Georges Bank, based on the EBFM strategy in the Council's [example Fishery Ecosystem Plan \(eFEP\)](#). The purpose of the Prototype MSE is to showcase a simplified MSE framework for EBFM, to identify data sources, models, and analyses that will support a full public MSE that the Council could pursue in the future.

Working with Council staff, the Council's EBFM Plan Development Team, and a limited number of 'stakeholders' that are appointed by the Council¹, the contractor will develop new or expand existing operating models that represent the productivity of and trophic relationships among managed stocks on Georges Bank, identify and apply existing estimation (assessment) models, identify management objectives and candidate management procedures (e.g., harvest control rules) based on the Council's ecosystem cap and ceilings and floors approach for stock complexes, and provide concise and approachable summaries that show the trade-offs between alternative management procedures to meet multiple objectives.

This is a short-term, temporary contractor role, commencing on or about August 1, 2022 and ending in January 2023. **Note: The scheduling and execution of in-person meetings will be contingent on the CDC COVID-19 level of community transmission assessment. This may cause delays in the execution of this work or a transition to remote stakeholder meetings.** The intended completion date of January 2023 will depend on the scope and complexity of work and the MSE proposed by the applicant. Applications should include a proposed work plan, number of stakeholder meetings, and a draft timeline.

Project Background

The Council has been working on the EBFM conceptual approach for several years, and it developed an [example Fishery Ecosystem Plan \(eFEP\)](#) that discusses how EBFM management measures could be applied to management of Georges Bank fish stocks.

Using the general management concept and strategies in the eFEP, the Council would like to

¹ The 'stakeholders' for the prototype will be EBFM Committee members, the chairs of the Council's advisory panels, and a few selected NGO representatives or others chosen by the Committee.

develop and conduct a Prototype Management Strategy Evaluation (pMSE). This pMSE would build on the worked examples that the Council has already developed and precede a full MSE that the Council could pursue in the future. The pMSE would involve a limited number of stakeholders, focusing on a limited number of operating models and management procedures.

This RFP supports the Council's effort to develop a Fishery Ecosystem Plan for Georges Bank, which includes stocks managed by the NEFMC and other entities. The purpose of the Prototype MSE is to

- **To showcase a simplified prototype MSE framework and demonstrate how MSE will be used to evaluate EBFM management strategies for a Georges Bank Ecosystem Production Unit, using what we learn to communicate with the public about MSE for EBFM. This product will:**
 - Act as an educational dry run from both a development and an operational perspective.
 - Provide an opportunity for the Council to gain experience with the MSE process
 - Identify and work through the types of decisions to be made during an MSE
- **To identify data sources and develop the models and analyses that will support a full EBFM MSE with broad stakeholder participation in the next phase of the Council's EBFM development strategy.**

While intended to be realistic, the prototype MSE results are not intended to be actionable in a fishery ecosystem plan, but the results should be used as the basis for a full MSE, which would be the next step. As such, a prototype MSE is also NOT intended to determine the definitive management procedure or determine how much total yield will change compared to current conditions.

The objectives of the Prototype MSE are to:

- Increase understanding of the eFEP and use the Prototype MSE process and results to demonstrate how MSE can be applied to evaluate EBFM strategies with broader stakeholder engagement;
- Identify management decision points, trade-offs, and potential sequences of decisions within the eFEP to compare the performance of EBFM and existing (primarily single species) management strategies;
- Identify data and analytical gaps through the prototype MSE which could be addressed later in a full MSE process;
- Investigate how human behavior (e.g. targeting vulnerable stocks within a stock complex due to its relatively low fishing costs and/or high value) can impact the ability of EBFM strategies to meet objectives (i.e. preventing overfishing and overfished conditions);
- Identify associated ecosystem management objectives (biological, economic, and social) and associated performance metrics;
- Identify and develop a reasonable set of operating models that account for trophic relationships among stocks and reflect a plausible range of 'states of nature';
- Identify a limited set of realistic management procedures (harvest control rules) to be evaluated.

- Show whether and how the proposed EBFM strategy (i.e. ceilings and floors approach) would have biological outcomes consistent with Magnuson Stevens Act National Standard 1 criteria.
- Develop scientific support for EBFM MSE; e.g. “rapid-prototyping” process with the Committee, PDT, and participating stakeholders.
- Apply a multispecies operating model that includes trophic and technical interactions and the potential effects of climate change along with estimation, management, and implementation models in closed loop simulations to address the identified set of critical decision points and data gaps
- Identify and develop summary products for effective communication and discussion of MSE results (key communication tools and visuals)

Statement of Work

The Prototype MSE will have three overlapping phases:

1. Development of software and data to create appropriate operating models, an estimation or assessment model, and a closed-loop simulation analysis to evaluate candidate or example management procedures.
2. Stakeholder interaction and facilitation
3. Identify and develop summary products for effective communication and discussion of MSE results (key communication tools and visuals)

The contractor will be responsible at the direction of Council staff for developing stakeholder ² meeting agendas, for stakeholder meeting planning and facilitation for implementing the pMSE analyses, and for conducting and summarizing the results of the pMSE (including stakeholder participation, model results, and management procedure performance). Software and programs developed by the contractor should be open-source and clearly licensed with Massachusetts Institute of Technology (<https://opensource.org/licenses/MIT>) or other permissive licensing. Programming in R and shared via Github is preferred.

The Council will be responsible for the organization, and logistics of meetings with the EBFM Committee, the EBFM PDT, and selected Advisory Panel members. Where possible, these meetings will be in-person, but some may be conducted via webinar when warranted.

The Council will contract directly with the venues for all meetings associated with this effort.

The successful candidate for this contract will work with the Council to:

Phase 1 Technical tasks

1. Develop and conduct a management strategy evaluation for primary Georges Bank fish stocks managed by the Council or other agencies. While applying a variety of management procedures that are based on the Council’s proposed stock complex ceilings and stock floors approach, the MSE should account for trophic interactions and economic incentives to target vulnerable stocks and.

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2. The prototype MSE should include the following components. Further details are provided in background document titled, [“Draft Prototype Management Strategy Evaluation for EBFM planning outline and timeline”](#)
- Operating model(s) having multiple scenarios that represent different states of nature considering:
 - Georges Bank stocks in ecosystem management
 - Representations of past, present, and potential future conditions
 - Food habits data and other information, trophic relationships among stocks including consumption of juvenile fish
 - Different levels of primary productivity
 - Assessment (aka estimation) models and performance monitoring indicators
 - Management procedures based on the eFEP ceilings and floors concept applied to stock complexes
 - At a minimum, operating models will include the 10 stocks that are analyzed by the [Hydra worked example](#), organized into stock complexes based on their trophic, biological, and fishery characteristics. Sea scallops and lobster management goals will not be included in the operating model, but the effects of fishing for sea scallops, surf clams, red crab, and lobster on finfish stock complexes should be taken into account by the pMSE.

Piscivore	Atlantic cod Monkfish	Silver hake Winter skate	Spiny dogfish
Planktivore	Atlantic herring	Atlantic mackerel	
Benthivore	Haddock	Winter flounder	Yellowtail flounder

- Other stocks that may be included in the operating model as managed stocks or as predators and/or prey are as follows:

Apex predators	Bluefin tuna Seabirds	Gray seal Swordfish	Large pelagic sharks Yellowfin tuna
Piscivore	Bluefish Summer flounder Little skate Smooth skate John Dory Black sea bass	Shortfin squid Redfish Thorny skate White hake Windowpane fl. Golden tilefish	Longfin squid Atlantic halibut Winter skate Sea raven Striped bass Red hake
Planktivore	Butterfish	Northern searobin	Sand lance (prey)
Benthivore	Hagfish American plaice	Barndoor skate Pollock	Scup
Prey	Juvenile fish		

Phase 2 Facilitation and Coordination with stakeholders appointed by the Council (primarily EBFM Committee members and chairs of the Council’s Advisory Panels)

3. Develop an overall strategy for stakeholder input and participation, work plan for conducting the Prototype MSE, and calendar. Early in the MSE development, the contractor should work with stakeholders to frame the problem being addressed by Georges Bank EBFM and identify appropriate decision points.
4. Conduct stakeholder meetings to develop desirable management objectives and at least six plausible ecosystem management procedures built on strategies outlined in the

Council's eFEP, considering:

- Management procedures that have added protection for vulnerable stocks and biomass rebuilding if their biomass sinks below acceptable floors
 - Management procedures with process lags (differences between information and implementation, often 1-2 years)
 - Desired management stability (e.g. multi-year specifications)
 - Transitions between management procedures, for example shifting between one that performs well under a depleted/low productivity regime to one that performs better under a rebuilt/high productivity regime.
5. Work with stakeholders to identify performance metrics that are related to management objectives, distilled down to an acceptable level of dimensions
 6. Evaluate the performance of the management procedures that are recommended by stakeholders, using measurable metrics such as
 - Variation of biomass by stock complex and individual stocks
 - Mean catch level and revenue compared to single-stock management
 - Variation of catch limits (i.e. management stability)
 - Fishery participation and diversity

Phase 3 Presentation and summary of results

7. Identify and develop summary products for effective communication and discussion of MSE results (key communication tools and visuals)
8. Develop graphic and tabular representation of performance of
 - Individual management procedures against all operating models
 - All management procedures against individual operating models
9. Develop a Shiny App to show results (dynamic representation) and post procedures and programming code (via Github or other means)

The contractor will meet with the EBFM Plan Development Team (PDT) and the Committee (independently or jointly) for one or two meetings each to understand the EBFM framework in the eFEP, ask questions, and receive feedback and guidance on the development of operating and assessment models. The contractor will also present to the Council's Scientific and Statistical Committee a detailed plan of the pMSE's operating models, estimation model, and management procedures to be tested for review.

Meetings with the Council's stakeholders will follow to identify and prioritize objectives, identify performance metrics, and management procedures to be evaluated. When MSE results are available, the contractor will present them to stakeholders for feedback and potential adjustments.

Expected Responsibilities and Deliverables

The following list illustrates the activities expected from the contractor. This list is not all-inclusive. A detailed list of deliverables will be negotiated.

Under the supervision of Council staff, the contractor will:

1. Develop an overall work plan and calendar for operating model development, MSE analysis, and stakeholder meetings;

2. Participate and lead discussions at stakeholder meetings.
3. Meet as needed with the EBFM PDT, the EBFM Committee, and selected stakeholders chosen by the Council;
4. On a weekly basis, discuss progress with Council staff to receive interim feedback and guidance.
5. Make programs and software developed for the pMSE available to the Council, including the parameterized operating models, the estimation model, the closed loop simulation programs, and the Shiny App.
6. Prepare a final report that analyzes and summarizes the MSE development, analyses, and results.

Desired Experience and Demonstrated Skills

1. General understanding of fisheries and fishery management in the New England region, including Georges Bank fisheries that are also managed by the Mid-Atlantic Fishery Management Council (MAFMC) and the Atlantic States Marine Fisheries Commission (ASMFC).
2. Familiarity with the use of scientific information in the fishery management process, with particular emphasis on EBFM concepts and potential application as outlined in the Council's example Fishery Ecosystem Plan for Georges Bank (eFEP).
3. Experience interacting with fisheries managers, scientists, and stakeholders to facilitate meetings.
4. Experience developing and conducting management strategy evaluations
5. Demonstrated programming skills in R and/or Python or other languages for programming, analysis, and summary of results.
6. Demonstrated strong writing and presentation skills. Demonstrated ability to summarize complex data and results in clear, easily read documents and through concise verbal presentations.
7. Candidates employed by advocacy organizations or by organizations that are parties in fishery lawsuits related to this issue will not be considered.
8. The successful candidate will not have a conflict of interest, defined as any financial or non-financial interest that conflicts with the actions or judgments of an individual because it could:
 - a. Impair the individual's objectivity;
 - b. Create an unfair competitive advantage for any person or organization; or
 - c. Create the appearance of either item listed above.

Application Submission Contact

Interested professionals and organizations are encouraged to submit a letter of interest, a current resume or CV, examples of similar work completed for other organizations or publications, and a proposed budget aligned with the nine tasks and six deliverables outlined above, including expected expenses. In addition, applicants should describe the approach that would be used to meet the requirements of this project, including deliverables.

Letters of interest and supporting materials should be received **no later than close of business on June 30, 2022** and addressed to Thomas Nies, NEFMC, 50 Water Street, Mill 2, Newburyport, MA 01950 or submitted by e-mail to tnies@nefmc.org. Questions concerning

technical aspects of this proposal should be directed to Andrew Applegate at aapplegate@nefmc.org. Questions concerning the contracting process or Department of Commerce - NOAA grant regulations should be directed to Margaret Bernier at mbernier@nefmc.org.

This work will be funded under New England Fishery Management Council Award #FNA20NMF4410001. Compliance with the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 109-479 as amended) and the Council's standard contract terms and conditions will be required. A copy of these terms and conditions is available on request.

NEFMC takes affirmative action toward ensuring equal opportunities; the Council encourages women-owned businesses, protected veterans, and individuals with disabilities to submit letters of interest and other requested materials for consideration under this announcement.

Disclaimer

1. All costs associated with the preparation and presentation of the proposal will be borne by consultants submitting letters of interest.
2. Necessary office space and equipment will be provided by the contractor; approved travel expenses will be reimbursed by the Council.
3. Materials submitted will not be returned.
4. Respondents must disclose any relevant conflicts of interest and will be expected to comply with all federal grant contracting requirements.
5. The Council reserves the right to: accept or reject any or all letters of interest received; negotiate with all qualified potential candidates; cancel or modify the RFP in part or its entirety; and/or change the application guidelines when it is in its best interests.