

Technical Evaluation Report

of the
Northeast Consortium collaborative research project,

*“Ecological role of adult and juvenile anadromous forage fish in
downeast Maine estuaries: Sea-run alewife and groundfish prey”*

Anonymously reviewed

August 1, 2011

1. Introduction

This report documents an independent peer evaluation of the project, *“Ecological role of adult and juvenile anadromous forage fish in downeast Maine estuaries: Sea-run alewife and groundfish prey.”* This collaborative research project received funding from the Northeast Consortium in FY2005 and was led by Dr. Karen Wilson of the University of Southern Maine (USM) in partnership with Dr. Theo Willis and Dr. Larry Waxler of USM, Chris Bartlett of Maine Sea Grant, and several fishermen. This mail review serves as a formal assessment of the completed project and focused on certification of results, i.e. whether the experimental design was appropriate and if the conclusions are well supported by the data.

2. Reviewer

The following information about the reviewer is provided as evidence of the authority and expertise of the individual and to help authenticate the independent nature of the review process. The reviewer has signed the Northeast Consortium’s “Conflict of Interest and Confidentiality Policies for the Technical Evaluation of Projects” agreement. The views expressed do not necessarily represent those of the Northeast Consortium.

The reviewer has a Ph.D. and is an expert in the ecology of river herring. The reviewer has extensive fisheries expertise including groundfish and herring fisheries resources in the Gulf of Maine and Georges Bank. The reviewer is a marine spatial ecologist working in conservation science and fisheries management.

3. Documentation

In advance of the evaluation, the reviewer was provided with the project’s final report entitled, *“Final Report: Ecological Role of Adult and Juvenile Anadromous Forage Fish in Maine Estuaries: Sea-Run Alewife and Groundfish Predators.”* It was submitted to the Northeast Consortium on September 30, 2009. Along with

the final report, the reviewer received the project's funding proposal dated July 2005 and annual report dated June 2008.

4. Comments and Recommendations of the Reviewer

The reviewer was asked by the Northeast Consortium to address the criteria developed for the evaluation of Northeast Consortium-funded projects that are complete, noting specific strengths and weaknesses of the project. All criteria were considered, but evaluation was focused on the second, "Certification of results."

- 1) **Project success:** Did the project accomplish its stated goals and objectives?

The project was successful at meeting its stated goals but not at all of its objectives. The first objective, to compare the diets of predators in high and low alewife estuaries, was accomplished after changes to the project design in the first year. However, the second objective was not met due to several significant constraints identified by the investigators. This objective was to quantify the distribution of river herring in estuaries before, during, and after spawning runs. After more consideration and discussions with fishermen, it became clear that fishing in some estuaries was problematic due to by environmental obstructions, fixed lobster gear, and logistical constraints due to the inability to predict river herring out-migrations in advance.

- 2) **Certification of results:** Is there adequate description of the experimental design, methods, and data analysis? Were these approaches appropriate? Are the data accurate, precise, and believable? Are the results and conclusions well supported by the data, statistically valid, and contribute to a sound basis for management decisions and policies? If not, can anything be done to allow this?

There is adequate description of the experimental design, methods, and data analysis. The approaches used were appropriate. The data are accurate, precise, and believable.

One concern about interpretation of the statistical analysis is the role that unequal sampling and associated stratification plays in the results. The project team did address this concern by taking necessary steps to transform and standardize data.

Additionally in the first phase of the project, the fishing (sampling) was targeted, gear switching occurred (i.e. hook-and-line, baited traps, seines), and effort varied (i.e. number of hooks, number of fishers, size of hooks). Thus, sampling was not done at random using the same gear with the same catchability. The authors ultimately decided to use a single gear type (hook-and-line). The project team should comment on whether the statistical techniques used allow for non-random (targeting) sampling.

At this stage, the results could also be used to demonstrate how the differences in predatory fish diets vary between estuaries based on food availability and preference. These results could be used to inform management decisions on steps needed to recover alewife in estuaries and possible pelagic and demersal predatory fish scenarios that may reemerge following alewife recovery.

- 3) **Dissemination of results:** Are the project deliverables (publications, reports, and communications materials) of high quality and understandable to end-users?

The project deliverables are of high quality and understandable to end-users. The final report is written using clear concise language. The videos are well-done and help illustrate the findings noted in the report.

- 4) **Project partnerships:** As best can be discerned, was the project of mutual interest to participants and were all partners engaged throughout the course of the project, including project design, data collection and analysis, and application of the results or products? What were the most and least successful aspects of the partnership?

As best can be discerned, the project was of mutual interest to participants and all partners engaged throughout the course of the project. For example, fishermen suggested changing the type of gears used and where to fish and this was supported by video work by the researchers. The initial project design as detailed in the proposal could have been strengthened by discussing its implementation with fishermen. Such a situation may have prevented some trial and error during the first phase of the project. One significant result of the project was that it fostered a growing partnership between the project team and alewife harvesters.

- 5) **Project impacts:** What impacts has the project had or could it have? What are the potential effects on fishing practices; socio-economics; and fisheries, coastal, and ocean management?

Use conflicts are a common challenge in fisheries management and in ocean zoning. In the initial phase of the project, valuable lessons were learned on the appropriate gear to use to target fish in the estuaries, when limited by lobster gear and other obstructions. For the for-hire sector, supporting livelihoods, when relying on sport fishing for large predatory fish like cod, might be challenging as they seemed difficult to catch (often absent) in the sampling locations. Alewife harvesters may benefit from understanding the migratory patterns of alewife and dietary requirements of predatory fish with respect to their municipally managed fisheries.

- 6) **End-Users:** Who specifically could benefit from knowing about the research (i.e. fishing sector, management organization, working group, or plan development team)?

With ASMFC's moratorium on river herring landings effective in 2012, many stakeholder groups are facing a common challenge- conserve river herring and preserve a fishing tradition. Many harvesters in Maine are interested in preserving an alewife fishery by demonstrating sustainability to receive an exemption from the moratorium and have successfully done so through increased monitoring efforts related to this study. In addition, watershed groups in Maine would be interested in the results as they pertain to dam removal projects.

Management teams in addition to Maine DMR that might benefit from knowing these results include: NOAA Protected Species, ASMFC Shad and River Herring Technical Team, NEFMC Atlantic Herring PDT, MAFMC Squid, Mackerel, and Butterfish FMAT, and NEFSC Stock Assessment and Food Habits Groups.

- 7) **Overall rating.** Rate the overall project according to the criteria listed above as excellent, very good, good, fair, or poor. Explain the reasoning behind the rating.

I rate the overall project as very good to excellent. The project provided a baseline look at the role of alewife as a prey item for predatory fish in estuaries. The team seemed to work well with partners, altering the study to still achieve multiple objectives despite facing many early challenges.

- 8) **Future research.** Is additional research needed to answer the original questions posed by the project? Are there obvious avenues of further research that should be pursued?

Further analysis should focus on the new run data available and how this relates to the findings of this project. In addition, the project team might want to explore whether only fall spawning cod (as opposed to spring spawning cod) are returning to estuaries and the role of alewife in that migratory timing.

- 9) **Additional remarks.** Provide any further comments not covered in a prior section.