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 ground fish predators"

Anonymously reviewed

April 29, 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 ground fish predators".** This collaborative research project received funding from the Northeast Consortium in FY2005 and was led by Karen Wilson of University of Southern Maine in partnership with Larry Waxler (University of Southern Maine), David Turner (commercial fisherman), Theodore Willis (Maine Rivers), and Christopher Bartlett (Maine Sea Grant). This mail review serves as a formal assessment of the completed project and focused on project objectives, methods, results, and advancing the information fisheries managers have to enhance recovery of commercial finfish in Maine.

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 project reviewer has 25 years professional experience working with a number of marine species throughout the Gulf of Maine. A number of those years are dedicated to assessment and population characteristics of river herring along the East Coast with concentration in the Gulf of Maine.

3. Documentation

In advance of the evaluation, the reviewer was provided with the project's final report entitled, "**Ecological role of adult and juvenile anadromous forage fish in downeast Maine estuaries: sea-run alewife and ground fish 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, and an annual report dated June 30, 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?

Several project objectives changed or were not address during the course of the study. Initial objectives were to 1) assess the ecological role of alewife as a predator and prey in downeast Maine estuarine food webs and 2) to assess the relation ship between spatial distribution, seasonal timing, and densities of alewives in estuaries relative to their movement between freshwater and saltwater habitats (Abstract page 1 of proposal). The project participants did not address either of these objectives in the final report.

There were gear/design/planning issues that precluded some of this work in Passamaquoddy Bay, specifically, reluctance of the participating fisherman to seine or trawl within the study area(s). These situations are often difficult to deal with in the field when sample windows are limited and the project relies heavily on field data.

There appeared to be little attempt to collect juvenile alewife, alewife prey samples, or spatial distribution data by other means. Possible sources of biological samples or data for these analyses include commercial weir fisherman operating at the mouth of Little River, commercial purse seine data from herring fishermen operating in the area, or State of Maine commercial finfish survey databases. In midcoast Maine especially, there are a number of commercial fisherman that target adult and juvenile river herring as bait within the study area.

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 an adequate description of the experimental design, methods, and analysis. The data presented appears to be accurate, precise, and believable. The results are not well supported by the data, mainly because there are not a lot of groundfish-alewife interaction data available. The absence of commercial groundfish in the inner and middle study areas made collecting the food habits work virtually impossible during the study. There appeared to be a lot of effort made to adjust sample areas, fishing techniques, and fishing methods to catch commercial groundfish during the study in an attempt to gather as much relevant data as possible.

The numbers of commercial groundfish caught during the project in the outer study areas increased, especially during the fall. If significant numbers of alewife were present in stomach samples it would be impossible, at this point, to determine if the commercial groundfish caught in these areas were targeting river herring produced in the freshwater habitat from this particular estuary or are targeting migratory alewives from other locations.

What happened to the assessment of spatial distribution, seasonal timing, and densities of alewives in the estuaries relative to their movement between freshwater and saltwater habitats?

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

I did check the NE Consortium website and reviewed all the project materials available. The report by Rachel Feeney was a wonderful article about the project and river herring in general and includes pictures of the project that should have accompanied the final report.

The summary reports provided to the state resources agencies were of poor quality and/or incomplete. This was one of the specific deliverables mentioned in the proposal (page 10, paragraph 1). These documents are not informative or stand alone documents that describe the project goals, objectives, or outcomes.

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?

There appeared to be excellent dialogue between the fishermen and the project leader. This communication made the adapting to more productive fishing areas possible. The project was of mutual interest to all project participants, though there were no participants on the project that represented the municipal alewife fisheries interests, and there appeared to be limited

participation from the Passamaquoddy tribe members operating the Perry fishway. Both groups would have benefit greatly from a successful project.

The most successful aspect of the project was the adaptability and input fisherman and project leaders made to attempt to capture samples for the project. They offered an array of alternatives to place project staff in areas where commercial groundfish were believed to be present throughout the sampling windows.

As helpful as the fisherman were in the western sample areas, it was disappointing to hear that fishermen hired to conduct the purse seine work in eastern Maine failed to follow through with the work plan. These fishermen should have been aware of the tides and tidal currents in the sample area. If certain gear types were not appropriate to sample alewives in the estuary they should have informed the project leader of this problem during the planning phase of the project.

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?

There will be no impact to fisheries management either positive or negative. This project does confirmation that the abundance of adult commercial groundfish species near shore remain severely depressed.

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

Any current information on near shore groundfish stocks is important. This information indicates that near shore, there appeared to be a seasonal variation in groundfish numbers. The variation appears to be unrelated to spawning activity because spawning fish were not available at locations identified as historic spawning habitat. This information is most useful to fisheries managers on the NEFMC.

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 give the outcome of the project a poor rating, though not necessarily the project itself. There were aspects of the project that the project participants could not accomplish and that were out of their control. There appeared to be decisions made during the project that derailed some potentially good outcomes. These include the decision not to investigate alewife diets in the study areas, decisions to not create spatial distribution maps for alewife or blueback herring in the study areas, or obtain adequate adult and juvenile

alewife counts during the project. The result was an inability to link any aspect of the alewife resource of a particular estuary to diets of groundfish.

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?

The question remains – how important are anadromous populations of alewife and blueback herring to the recovery of near shore spawning stocks of groundfish? Are strong populations of forage fish necessary prior to the return of cod to near shore spawning locations? The question is important because it will provide direction for those that manage populations of anadromous fish and groundfish as well. Perhaps lower directed harvest of anadromous fisheries resources, which in Maine appears to be very high, would facilitate the recovery of near shore groundfish populations.

One suggestion is to identify a spawning population of commercially important groundfish in the near shore GOM prior to conducting a similar study based on trawl survey or commercial fishing data. Tag and track the seasonal movement of groundfish, if possible, to determine if the migration is related to spawning, food, or environmental conditions. If migrations appear to correlate with seasonal food sources, anadromous species in particular, conduct an intensive study on that population, or in that specific estuary.

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

The scope of the work was extremely ambitious and, in my opinion, fell into a situation where they attempted to accomplish too much with the limited time and funds available. Any single aspect of the study would have provided valuable data and built upon the limited knowledge we have of seasonal near shore groundfish abundance, current spawning location of commercially important groundfish species near shore, alewife feeding preferences, or spatial distribution of alosines in the Gulf of Maine.

When groundfish were not found in the near shore areas the project seemed to fall apart. The new direction appeared to compare the diets of all species of fish captured verses season and location. I would have liked to see the project retain the alewife distribution and alewife diet aspects for the study period and then compare historic alewife abundance and distribution to fluctuations in the past and present commercial groundfish numbers. There are a number of resources available through the state agencies to use for this type of analysis, including trawl survey data, alewife harvest data, and juvenile count data.