N.H. Sea Grant Research Project Progress Report
For time period 2/1/13 – 1/31/14

Today's date: March 17, 2014

Project number: R/SSS-1

Project title: Alewife Population Assessment and Aquaculture

Project initiation date: 2/1/2012

Project completion date:

Principal investigator: David Berlinsky

Affiliation: UNH, Department of Biological Sciences

Associate investigator(s) and affiliation(s):
Michael Bailey, U.S. Fish and Wildlife Service
Erik Chapman, N.H. Sea Grant
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Technician(s) and affiliation(s):
Mathew DiMaggio – Post Doctoral Researcher

Partner(s) and affiliation(s) with SCALE (local, state, regional, national, international) and TYPE (gov't, NGO, industry/business, academic institution, other) (List any collaborators, sponsors, industry partners, municipalities, etc., associated with this project):
John Whalen, Harmon Brook Farm

Brief project overview/Abstract:
Together with smelt, river herring (alewives and blueback herring) comprise the most dominant anadromous species in the Great Bay estuary system and support limited fisheries. Due to coast-wide declines in river herring populations, the Atlantic states Marine Fisheries Commission’s (ASMFC) Amendment 2 to the Interstate Fisheries Management Plan for shad and river herring calls for states to close recreational and commercial river herring fisheries, with an exception for those that can demonstrate sustainable fisheries. Currently, river herring populations in New Hampshire are monitored by spawning stock returns in fish ladders on four of the seven major rivers in the estuary. Many questions regarding the efficacy of this evaluation method must be addressed, however, to determine its value in estimating annual recruitment to the fishery. In this proposal, we outline a project for collaborative research with 2 goals aimed at alewife conservation. We will: 1) examine the accuracy of river herring population assessment methods currently used in the Great Bay Estuary and 2) develop methods for alewife aquaculture for both stock enhancement and as a marine baitfish

Objectives:
1) Determine the extent of juvenile descent from migrating and translocated alewives.
2) Determine the fish ladder efficiency for spawning river herring in the Great Bay Estuary.
3) Generate a fish ladder-independent productivity index for river herring spawning in the Great Bay Estuary.
4) Develop practical spawning methods for alewife broodstock
5) Develop effective methods for adhesiveness removal and disinfection of alewife eggs
6) Determine practical methods for alewife larviculture
7) Raise juvenile alewives in intensive production systems

**Research findings/progress during 2/1/13 – 1/31/14:**
During this reporting period, alewife spawning and larviculture procedures were optimized and egg disinfection experiments were conducted. Salinity tolerance experiments were conducted on embryos, larvae, and juveniles. Upstream passage into fish ladders was monitored in tagged fish.

**Accomplishments during 2/1/13 – 1/31/14** (Accomplishments are the key actions, activities or products resulting from Sea Grant research projects. They are distinct from impacts in that they reflect ongoing activities or key results that may not yet have had a significant economic, societal and/or environmental benefit but lay the foundation for such a benefit. Accomplishments may evolve into impacts in the future.):
Working protocols for alewife aquaculture were established and several thousands of juveniles were produced.

**Impacts during 2/1/13 – 1/31/14** (Impacts are significant economic, societal and/or environmental benefits of research.):
**NOTE: Include quantitative data to validate the impact, if possible.**
We developed protocols for large-scale alewife culture to sub-adult stages. Methods for commercial-scale baitfish production were developed.

**Economic benefits realized during 2/1/13 – 1/31/14** (businesses retained or created, jobs retained or created, market and non-market economic benefits):
**NOTE: Please quantify and provide supporting data if possible.**
None to date

**Tools, technologies or information services resulting from this project that were developed or used during 2/1/13 – 1/31/14 to improve ecosystem-based management** (e.g., that reduce contaminants that harm coastal ecosystems and seafood consumers; that track changes in ecosystem processes, biological responses and conditions):
None to date

**Patents:**
None to date

**Technology transfer** (Has a private company utilized this research successfully?):
Harmon Brook Farm, Caanan ME

**Related grants and contracts** (Other grants and contracts that funded this research or that were obtained as a result of this research.):
None to date
**Leveraged funding** (leveraged funding comes from outside sources and is used to accomplish the goals and objectives of your project. Match associated with your project is not leveraged funding). Provide amount, source, purpose, and start and end date.
None to date

**Problems encountered:**
None

**Publications to date** (please cite and attach PDF or send a hardcopy, or provide status if not yet published):

**Peer reviewed publications:**
Practical Culture Methods for River Herring, In preparation.

The effects of elevated salinity of river herring survival during their early life stages, In preparation.

**Theses/Dissertations:**
None to date

**Other communications products (non peer-reviewed pubs, manuals, tech reports, videos, etc.):**
"NHSG alewife research." YouTube.
UNHMP-V-SG-13-51

**Presentations to date, with published abstract citation if applicable:**
NOTE: For presentations to civic groups, etc. (i.e., to the public rather than a scientific conference), please include number of attendees.

**Awards:**
None to date