February 13, 2013

Eastern Brook Trout Joint Venture
Completed Project Report Form

Project Title: Assessing the Efficacy of Remediating Episodic Low pH (and High Aluminum) Concentrations in Headwater Brook Trout Streams with Clam Shell Additions. USFWS FONs 53371-2009-343 Agreement 53371-A-J0001

Sponsor: Project SHARE, USFWS Maine Fishery Resources Office (MEFRO), and Maine Department of Environmental Protection (MDEP).

- **Partners involved:** Project SHARE, USFWS Maine Fishery Resources Office (MEFRO), and Maine Department of Environmental Protection (MDEP).

- **Project costs:**

1. Total cost: $158,589
2. Non federal amount: $112,504
3. Federal amount: Initial Funding $36,085 through EBTJV. Subsequent In-Kind from Maine Fishery Resources Office $2,000 per year (2009 to 2013)= $10,000

- **Funding Sources:**

USFWS Maine Fishery Resources Office (MEFRO), and Maine Department of Environmental Protection (MDEP).

- **Action strategy implemented in the project (according to EBTJV range wide, regional, or state level habitat strategies).**

From the EBTJV Conservation Strategy (Northern Region):
Conserve, enhance or restore brook trout populations that have been impacted by habitat modification or other population level threats.

From Maine's Plan for the EBTJV:
1.3 Maximize the contribution of wild brook trout stocks to the fishery.
Strategy 5: Prevent, eradicate or control the detrimental effects caused by the intrusion of non-native aquatic species into brook trout habitats.

This project will eliminate non-native smelt that were illegally introduced and known to have adverse impacts on self-sustaining brook trout and charr populations.

3.2 Foster public/private collaborative stewardship of brook trout resources
Strategy 1: Inform the public and encourage interest and participation in addressing environmental issues.
Strategy 2: Continue public education efforts highlighting the permanent ecological repercussions associated with illegal fish stockings.

Visit Maine Public Broadcasting Network for news story on this project.
http://www.mpbn.net/News/MPBNNewsforVillageSoup/tabid/1144/ctl/ViewItem/mid/3695/ItemId/13612/Default.aspx

- **Priority score of the sub-watershed where the project took place.** 230519 – Old Stream. Priority Score = 1.66 Best of the Best.

- **Describe any additional species of greatest concern or the state wildlife action plan listed habitat conservation goal (s) supported by the project.**

  The projects sites were located within proposed critical habitat of Atlantic Salmon (Gulf of Maine) DPS area (National Oceanic and Atmospheric Administration 2008). The Dead Stream and Honeymoon Brook sites were fry stocked annually with Gulf of Maine listed Atlantic salmon. Parr production was excellent at these sites.
  American eel are documented in the project area.

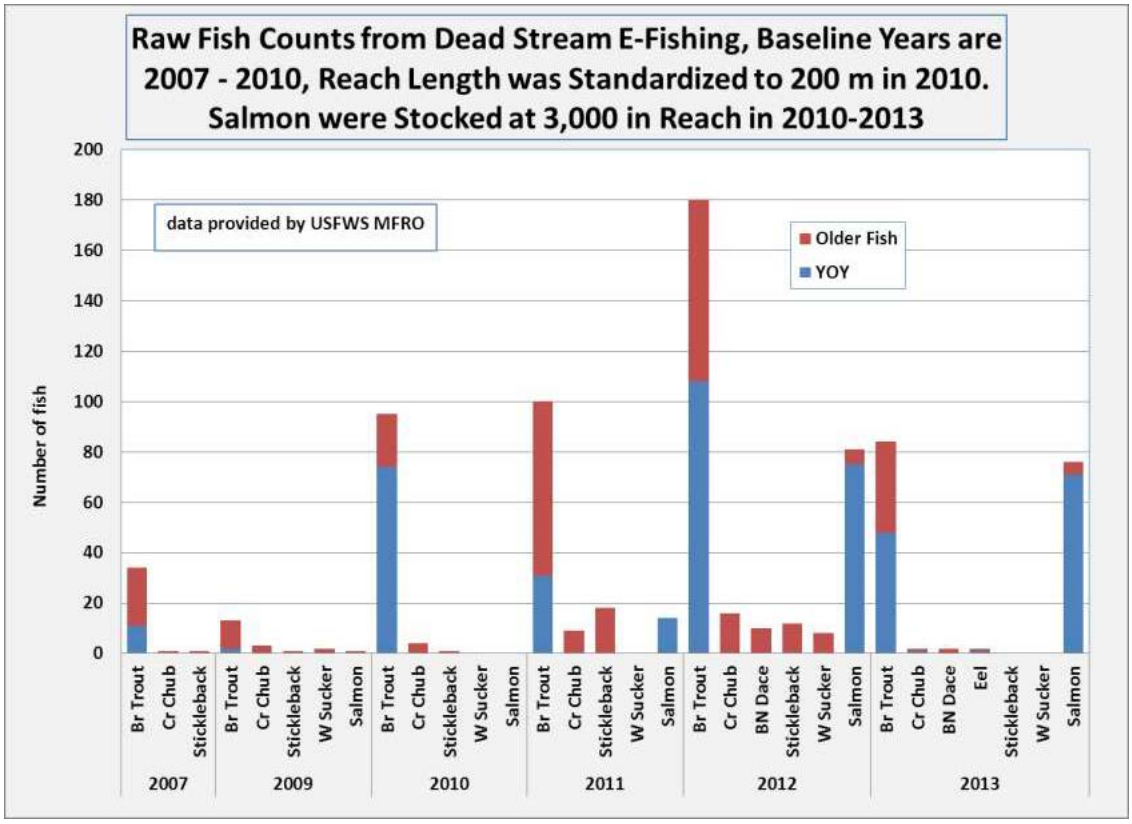
- **Description: project objective(s):**
  The Project evaluated the efficacy of using clam shells as a calcium carbonate supplement to mitigate stream acidity to help restore brook trout and Atlantic salmon.

- **Methods used:**
  Beginning in 2010, 2 metric tons of shells were placed in Dead Stream, a tributary to Old Stream and the Machias River, located in T 37 MD BPP and Day Block Township. The following year (2011), the treatment was expanded into the southern part of the watershed (known as Bowles Brook) and treatment was increased to 10 tons of shells. In the third year (2012), the project was expanded to other tributaries of the Machias River: an unnamed tributary to Honeymoon Brook, Canaan Brook, and First Lake Stream. In 2013, the project was expanded to the main stem of Honeymoon Brook and to Beaverdam Stream (East Machias River). Overall, the original proposal had three treatment sites, the end result had 9 sites with a treatment length of 2,562 meters.

- **Project outcomes: Describe outcomes and whether or not the objectives were met. If not why? What lessons were learned?**
  This project demonstrated that clam shells could be utilized to increase pH and decrease detrimental inorganic aluminum concentrations. In Dead Stream, water chemistry has improved by approximately 1.0 pH unit, and total fish densities increased two-fold. In Canaan Brook water chemistry has improved by 1.0 pH unit and First Lake Stream improved by 0.7 pH unit, while fish densities have increased 2- and 6- times, respectively. Macroinvertebrate communities have improved somewhat, especially among mayflies and stoneflies, while amphipods and snails have appeared for the first time. However, even at treated sites, macroinvertebrate communities continue to have low diversity and may not achieve Class A water quality. Overall, by adding buffering capacity, there has

been a boost to the bottom of the food chain which has contributed to improved fish abundance and diversity. In the fourth year, biological communities are still adapting to the new conditions.

- **What is the Brook trout population response to the project outcome?**
  For a project that was largely designed to determine if adding clam shells to increase pH was feasible, the biotic results are very encouraging. Overall brook trout abundance and species diversity has increased in the study area. See Figure below.



- **If applicable, what is the number of stream miles and or acres of brook trout habitat?:**

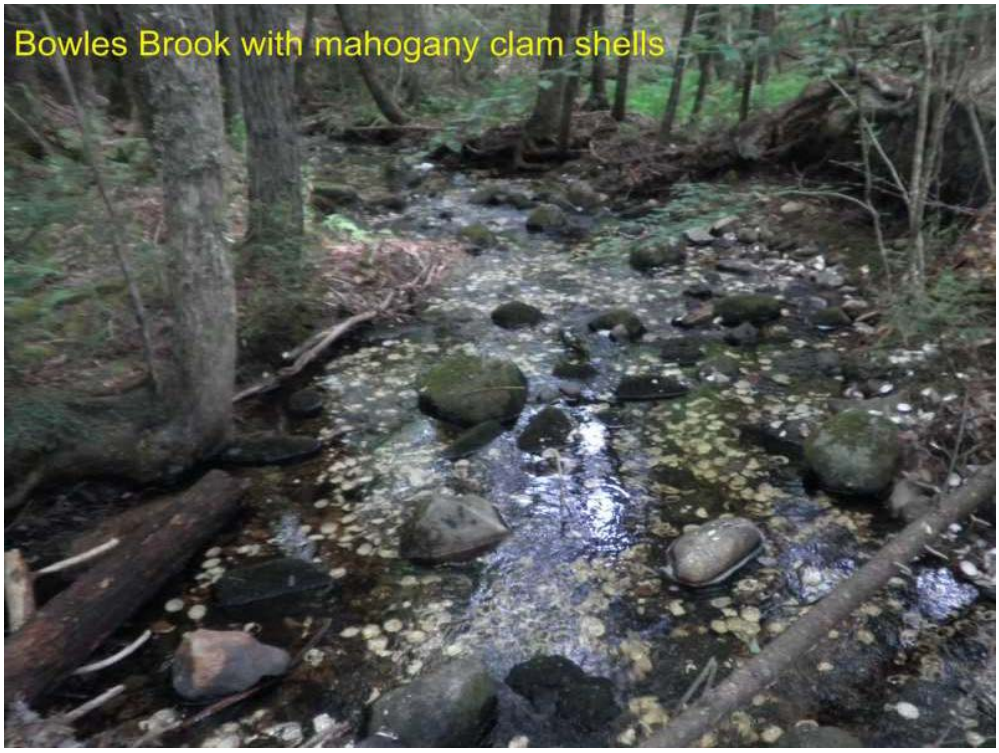
A Protected:
B.Restored/Enhanced: *Added calcium via clam shells to 9 sites with a treatment length of 2,562 meters.*

- **If applicable what is the number of stream miles and or lake/pond acres of brook trout habitat gained access to as a result of removing a fish barrier. Include the # of fish barriers removed?** N/A

- **If applicable, what is the number of stream miles and or lake or pond acres of brook trout habitat with sediment, phosphorous, or nitrogen inputs that were rehabilitated to within 25% of natural or other desired levels such as numeric state water quality criteria?** N/A

For more information contact Steve Koenig (stevenkoenig0@gmail.com) of Project SHARE or Mark Whiting (mark.c.whiting@maine.gov) of Maine DEP.
Click for News story on Project, Reports and other information

*******Please include before and after photos of the project.*********



Brook Trout from Dead Stream

Dead Stream Treatment Site Summer 2011 (last year mesh bags were used).