

Eastern Brook Trout Joint Venture Completed Project Report Form

Project Title: Restoring habitat connectivity in Machias and Saint Croix River tributary streams, ME: EBTJV&NFHAP; F11AC00322

- **Sponsor:** Downeast Lakes Land Trust
- **Partners involved:** Natural Resources Conservation Service, US Fish and Wildlife Service Maine Fisheries Resources Office and Gulf of Maine Coastal Program, Project SHARE.
- **Project costs:**
 1. Total cost: \$130,955.87
 2. Non federal amount: \$13,900
 3. Federal amount: \$117,055.87
- **Funding Sources:**

Natural Resources Conservation Service, US Fish and Wildlife Service Maine Fisheries Resources Office and Gulf of Maine Coastal Program, Project SHARE, Grand Lake Stream Plantation.

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

This project addresses Regional Habitat Objectives: 1 – Maintain the status of 477 Northern subwatersheds classified as Healthy; 2 – Strengthen brook trout populations in 20 Northern subwatersheds classified as Healthy.

This project addresses Maine State Habitat Objectives: 2.1.2 – Identify degraded stream habitats and prioritize for restoration efforts – Identify barriers to fish passage and re-establish habitat connectivity where possible; 2.4.1 – Restore degraded habitats, establish collaborative partnerships with State, Federal, Tribal, and private entities to implement stream restoration projects. 2.4.2 Restore degraded habitats, monitor efficacy of implemented projects for ecological responses and indicators of success.

- **Priority score of the sub-watershed where the project took place.**

Protection of a 1.63 “best of the best” subwatershed (230467).
- **Describe any additional species of greatest concern or the state wildlife action plan listed habitat conservation goal (s) supported by the project.**

American eel has been petitioned to be listed under the Endangered Species Act and is found within the project area.
- **Description: project objective(s):**

Through this project, Downeast Lakes Land Trust (DLLT) continued its work with partners to restore brook trout habitat on priority streams within its 33,708-acre Farm Cove Community Forest by removing passage barriers. Three project sites were located on tributaries to West Grand Lake, and one on a tributary to Fourth Machias Lake. DLLT hired a local contractor and coordinated a partnership between the Natural Resources Conservation Service and U.S Fish and Wildlife Service Maine Fisheries Resource Office. With surplus funding available after the completion of the four original sites, two additional sites were restored on a tributary of Grand Lake Stream.

- **Methods used:**

DLLT and partners removed six culverts that were acting as fish passage barriers and replaced them with fish-friendly bottomless arch culverts that allow a natural stream channel. NRCS will provided match funding, engineering design and oversight, and the Maine Fisheries Resource Office surveyed for fish and installed block nets during construction.

- **Project outcomes: Describe outcomes and whether or not the objectives were met. If not why? What lessons were learned?**

Project was successfully implemented and habitat restoration goals as originally proposed were met.

NRCS funding received after the EBTJV grant award was sufficient to fully fund restoration at the three sites with bottomless arch culverts installed. Project costs were dramatically reduced at the Lower Mud Turtle site by the decision to do a restoration project without installation of a road-stream crossing (Downeast Lakes Land Trust will later incur additional expenses to reroute a road around this crossing, but these costs will not be billed to this grant). EBTJV funds were used to cover the direct habitat restoration expenses of \$1,223.10. No direct NRCS funding was available at this site, but NRCS provided technical assistance.

As of December, 2012, as a result of the successful NRCS funding at three sites and the reduced expenses at the fourth; 31,776.90 in EBTJV funds remained in the award amount. Downeast Lakes Land Trust utilized this funding to restore habitat at two additional sites on Billy Brown Brook, a brook trout stream tributary to Grand Lake Stream.

In 2013, DLLT and partners completed installation of a pre-cast concrete arch culvert on the 4th Lake Road crossing of Billy Brown Brook, a tributary to Grand Lake Stream. Billy Brown Brook has historically provided a cold water refugia for brook trout when Grand Lake Stream warms in mid to late summer. Due to uncertainty around project expenses with the first test of this new structure design, only the single site was completed in 2013. The pre-cast arch proved to be very cost-effective by comparison with corrugated metal arches, and the installation went smoothly. As a result, after drawing \$14,073.95 in EBTJV grant funds in 2013, a balance of \$17,702.95 remained for 2014. Of these funds, \$17,702.95

was used to install a pre-cast concrete arch culvert on the Shaw Street crossing of Billy Brown Brook in the village of Grand Lake Stream in 2014. As a result, 6 sites were restored using this EBTJV grant rather than the 4 originally anticipated.

- **What is the Brook trout population response to the project outcome?**
Population response has not been measured and likely will develop over a period of years.
- **If applicable, what is the number of stream miles and or acres of brook trout habitat?:**
A. Protected: N/A
B. Restored/Enhanced: Approximately 3 miles of stream habitat from the initial 4 sites. Approximately 0.6 miles on Billy Brown Brook.

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?

Approximately 3 miles of stream habitat from the initial 4 sites. Approximately 0.6 miles from the 2 sites on Billy Brown Brook.

- **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?**
Unknown or not applicable.

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



Billy Brown Brook at Shaw Street crossing prior to arch culvert installation in 2014.



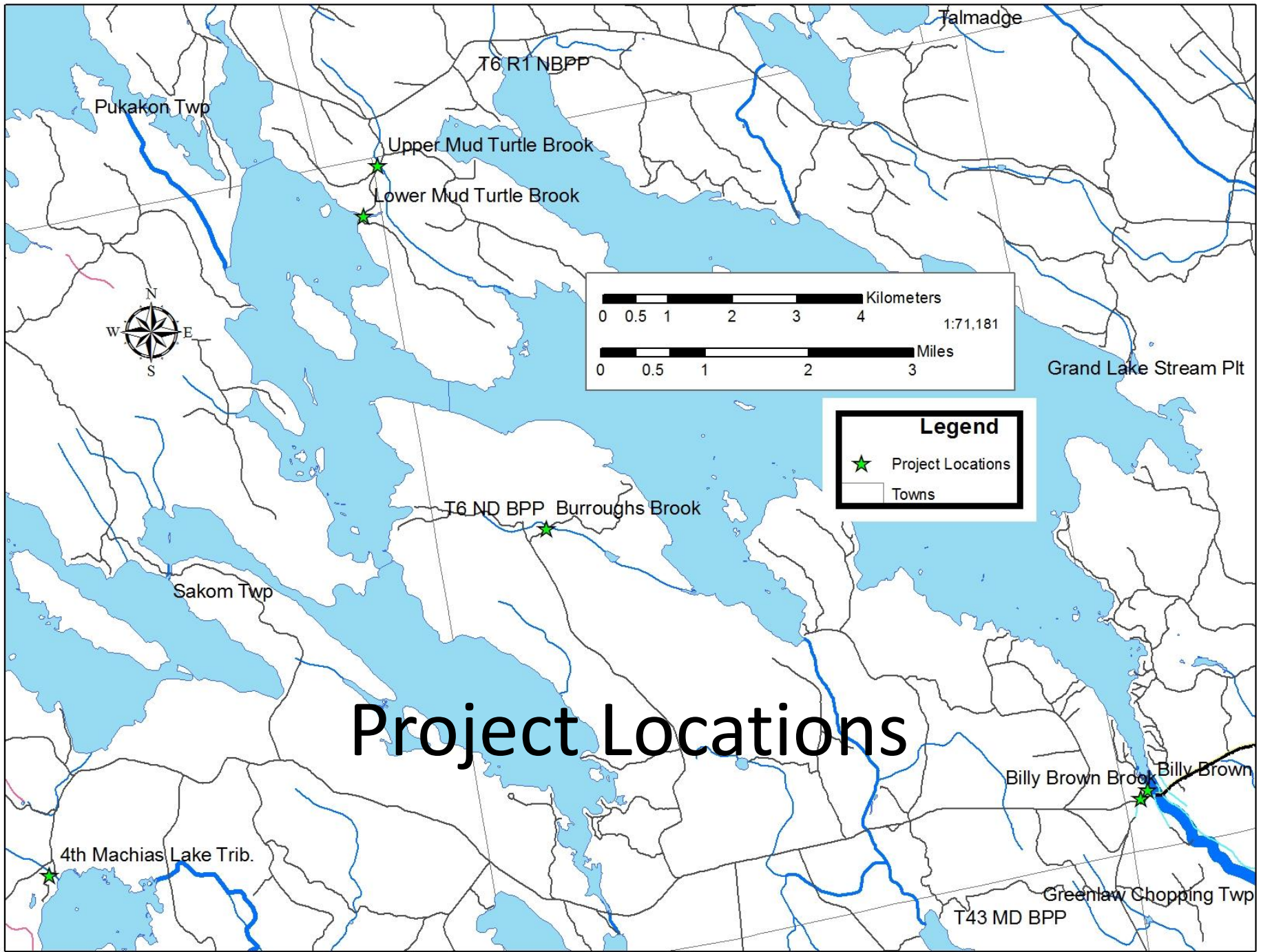
Billy Brown Brook at Shaw Street crossing after arch culvert installation in 2014.

4th Lake Road crossing of Billy Brown Brook before and after (2013).





Belden Brook arch culvert (2012)



Project Locations

Eastern Brook Trout Joint Venture Annual Project Report Form

Project Title: Restoring habitat connectivity in Machias and Saint Croix River tributary streams, ME: EBTJV&NFHAP; F11AC00322

- **Location:** Washington County, Maine
- **Sponsor:** Downeast Lakes Land Trust
- **Annual Report Date:** December 16, 2013
- **Partners involved:** Natural Resources Conservation Service, US Fish and Wildlife Service Maine Fisheries Resources Office and Gulf of Maine Coastal Program, Project SHARE.
- **Project costs:**
Pending
- **Final Funding:**
Pending
- **Project Description and Scope of Work**
Downeast Lakes Land Trust (DLLT) will continue its work with partners to restore brook trout habitat on priority streams within its 33,708-acre Farm Cove Community Forest by removing passage barriers. Three project sites are located on tributaries to West Grand Lake, and one on a tributary to Fourth Machias Lake. DLLT will hire a local contractor and coordinate a partnership between the Natural Resources Conservation Service and U.S Fish and Wildlife Service Maine Fisheries Resource Office.
- **Proposed Methods**
We will remove four culverts that currently are acting as fish passage barriers and replace them with fish-friendly bottomless arch culverts that allow a natural stream channel. NRCS will provide match funding, engineering design and oversight, and the Maine Fisheries Resource Office will survey for fish and install block nets during construction.
- **Project Timeline**
Engineering and design work began in spring 2011. Two sites were proposed for construction in 2011 and the final 2 for 2012. Post construction monitoring will be conducted by DLLT and USFWS, Maine Fisheries Resource Office. Sites planned for 2011 construction were not completed due to unanticipated delays in funding availability from the NRCS. Engineering work was completed for one site and survey work was completed at a second site.

Habitat restoration was completed at all four sites during August and September of 2012. At three of the sites, bottomless arch culverts were installed as originally proposed. At the Lower Mud Turtle Brook site, Downeast Lakes Land Trust determined it was possible to remove the road crossing completely. At this site, aquatic habitat restoration was completed without installation of a new road stream crossing structure.

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

This project will accomplish NFHAP priorities by restoring habitat connectivity on three brook trout habitat streams and eliminate ongoing risks of sedimentation during culvert failure, in watersheds identified as brook trout habitat protection priorities by the EBTJV on lands managed by DLLT for wildlife habitat, public recreation, and a sustainable supply of forest products.

- **Priority score of the sub-watershed where the project took place.**

Protection of a 1.63 “best of the best” subwatershed (230467).

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

American eel has been petitioned to be listed under the Endangered Species Act and are found within the project area.

- **Project outcomes: Describe outcomes and whether or not the objectives were met. If not why? What lessons were learned?**

Project was successfully implemented and habitat restoration goals as originally proposed were met.

NRCS funding received after the EBTJV grant award was sufficient to fully fund restoration at the three sites with bottomless arch culverts installed. Project costs were dramatically reduced at the Lower Mud Turtle site by the decision to do a restoration project without installation of a road-stream crossing (Downeast Lakes Land Trust will later incur additional expenses to reroute a road around this crossing, but these costs will not be billed to this grant). EBTJV funds were used to cover the direct habitat restoration expenses of \$1,223.10. No direct NRCS funding was available at this site, but NRCS provided technical assistance.

As of December, 2012, as a result of the successful NRCS funding at three sites and the reduced expenses at the fourth; 31,776.90 in EBTJV funds remained in the award amount. Downeast Lakes Land Trust planned to utilize this funding to restore habitat at additional sites in 2013 or 2014. Two crossings on Billy Brown Brook, a brook trout stream tributary to Grand Lake Stream are the current restoration targets.

In 2013, DLLT and partners completed installation of a pre-cast concrete arch culvert on the 4th Lake Road crossing of Billy Brown Brook, a tributary to Grand Lake Stream. Billy Brown Brook has historically provided a cold water refugia for brook trout when Grand Lake Stream warms in mid to late summer. Due to uncertainty around project

expenses with the first test of this new structure design, only the single site was completed in 2013. The pre-cast arch proved to be very cost-effective by comparison with corrugated metal arches, and the installation went smoothly. As a result, after drawing \$14,073.95 in EBTJV grant funds in 2013, a balance of \$17,702.95 remains. These funds should be adequate to complete one more site in 2014, completing this EBTJV grant with 6 sites restored rather than the 4 originally anticipated.

DLT has submitted a new proposal to EBTJV to continue aquatic habitat restoration at four additional priority sites in 2014-2015.

- **What is the Brook trout population response to the project outcome?**
Population response has not been measured and likely will develop over a period of years.
- **If applicable, what is the number of stream miles and or acres of brook trout habitat?:**
Approximately 3 miles of stream habitat from the initial 4 sites. Approximately 0.5 mile is upstream of the site restored on Billy Brown Brook, but a downstream road crossing requires restoration to completely provide access to this area.
- **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?**
Approximately 3 miles of stream habitat; four fish barriers removed. Approximately 0.5 mile is upstream of the 5th site, on Billy Brown Brook, but a downstream road crossing requires restoration to completely provide access to this area.
- **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?**
Unknown or not applicable.

Eastern Brook Trout Joint Venture Annual Project Report Supplement

Project Title: Restoring habitat connectivity in Machias and Saint Croix River tributary streams,
ME: EBTJV&NFHAP; F11AC00322

- **Location:** Washington County, Maine
- **Sponsor:** Downeast Lakes Land Trust
- **Annual Report Date:** December 16, 2013



Billy Brown Brook at 4th Lake Rd, flooded, July 2013



USFWS personnel electrofishing Billy Brown Brook prior to construction 2013



Brook trout, Billy Brown Brook, July 2013, below installation at 4th Lake Rd



Assembling concrete arch culvert, July 30, 2013



Inlet of concrete arch, Billy Brown Brook at 4th Lake Rd, Sept. 15, 2013



Downeast Lakes Land Trust touts new culvert design aimed at restoring trout habitats

By Jen Lynds, Bangor Daily News Staff

Posted Sept. 22, 2013

[Link to Video](#)

Courtesy of Downeast Lakes Land Trust

Officials with Downeast Lakes Land Trust have completed a new project with several partners and support from the U.S. Fish and Wildlife Service that they say has the potential to be a model for cost-effective restoration of aquatic habitats. It involves installing a concrete arch structure (pictured here) on Billy Brown Brook, a small tributary to Grand Lake Stream.

GRAND LAKE STREAM — Officials with Downeast Lakes Land Trust said earlier this week that a new project it completed with several partners and support from the U.S. Fish and Wildlife Service has the potential to be a model for cost-effective restoration of aquatic habitats.

The project is focused on correcting poorly designed culverts that are blocking the natural movement of brook trout and other aquatic wildlife on thousands of streams across Maine.

Mark Berry, executive director of Downeast Lakes Land Trust in Grand Lake Stream, said that restoring free access to habitats is essential to protecting populations of wild brook trout. Maine has more than 80 percent of the remaining U.S. native stocks of brook trout.

Berry said that a concrete arch structure was built by Dirigo Timberlands in North Anson and then installed on Billy Brown Brook, a small tributary to Grand Lake Stream with a history of providing a cold-water summer habitat for brook trout. The road crossing is on property owned by the Lyme Timber Co., and was at risk for washing out when the water level rose. The road provides the only vehicle access between the village of Grand Lake Stream and the trust's Farm Cove Community Forest, along with state conservation lands along the Machias River extending down to Route 9.

"This concrete arch structure is a new product, and it's a lot less expensive for a stream of this size," Berry said. "It opens up the door that we can use this product on more streams in Maine for similar costs."

The project's \$10,000 price tag was financed by the U.S. Fish and Wildlife Service and approximately five workers spent less than a day and a half on the installation.

"This new concrete arch structure holds great promise to provide economic savings and long-term benefits over traditional corrugated metal crossing structures," said Scott Craig, project leader at the Maine Fishery Resource Office for the U.S. Fish and Wildlife Service. "The open arch design has proven to be the best choice to restore ecological stream processes that will greatly benefit our headwater brook trout populations."

Blaine Miller, co-owner of Dirigo Timberlands, said that he was excited about the potential to grow the business through manufacturing arch culvert and bridge products in Maine.

Steven Koenig is the executive director of Project SHARE, a cooperative salmon habitat restoration group and partner on the project. He also was excited about the potential of the new arches.

“These concrete arches could be a game-changer for private commercial forest owners that want to do the right thing for trout habitat on brook trout headwater streams,” he said. “I was happy to help Downeast Lakes Land Trust to test this new approach.”

Downeast Lakes Land Trust manages nearly 34,000 acres as a Community Forest, with priorities of wildlife habitat, public recreation, and a sustainable timber economy. The Community Forest includes a network of private roads maintained by the trust to provide access for public recreation and forest management. These roads cross a number of brooks and streams that provide habitat for native brook trout along with other species of fish and wildlife. In many cases, the culverts installed when the roads were built decades ago were not designed to allow the natural movement of fish and other wildlife. Most culverts were too small or not properly placed to provide fish passage and risked failure during high stream flow. As a result, they have contributed to fragmentation of trout habitat.

Downeast Lakes Land Trust is working to replace these older culverts with bridges or bottomless arches that provide a natural stream channel. Over the last six years, the trust has completed restoration projects at 20 road stream crossings with a variety of partners, including local contractors, neighboring landowners, the Passamaquoddy Tribe, state and federal agencies, and Project SHARE.

Eastern Brook Trout Joint Venture Annual Project Report Supplement

Project Title: Restoring habitat connectivity in Machias and Saint Croix River tributary streams,
ME: EBTJV&NFHAP; F11AC00322

- **Location:** Washington County, Maine
- **Sponsor:** Downeast Lakes Land Trust
- **Annual Report Date:** December 19, 2012



4th Machias tributary culvert outlets, July 2006



4th Machias tributary arch culvert outlet, Sept. 2012, immediately post construction



Burroughs Brook culvert outlet, August 2012



Burroughs Brook arch culvert outlet, August 2012 immediately post construction



Mud Turtle Brook, upper crossing, washed out, August 2012
Post construction photos from Mud Turtle Brook will be provided in 2013.



Mud Turtle Brook, lower crossing, culvert outlet, August 2012