Eastern Brook Trout Joint Venture

Final Project Report

Cooperative Agreement Number: 50181J305A

Cost Code: NFHAP/EBTJV$FT/1334-5HAB

Rehabilitation of an Unnamed sea-run brook trout stream, Belfast, Maine

Project Sponsor: Maine Department of Inland Fisheries and Wildlife

Partners Involved: Maine Department of Inland Fisheries and Wildlife
Maine Department of Transportation
Colonial Gables Resort, LLC

Project Costs:

Project Costs: Relocation of an unnamed sea-run brook trout stream, Belfast, Maine.				
Partner	Job	Federal Amount	Non-federal amount	Total for Job
Maine Dept. Inland Fisheries and Wildlife	Project and design coordination	$0.00	$1500.00	$1500.00
	Monitoring	2500.00	2500.00	5000.00
Maine Dept. of Transportation (all state force account funds)	Project Design	$0.00	$1000.00	$1000.00
	Equipment mobilization	0.00	1000.00	1000.00
	Materials	0.00	1800.00	1800.00
	Construction	0.00	1900.00	1900.00
Totals		$2500.00	$9700.00	$12200.00

Funding Sources: US Fish and Wildlife Service NFHAP\EBTJV
Maine Department of Inland Fisheries and Wildlife
Maine Department of Transportation

Action Strategy Implemented: Restoration of fish and wildlife habitats: Restoration of aquatic habitat connectivity for native sea-run brook trout.

Project description:

The project seeks to remove obstructions to fish passage and rehabilitate 110m of associated riparian area.

The original scope of the project was to relocate 110m of stream channel to its historic location. Since the inception of the project, one of the formerly cooperating landowners has decided against excavation of his property. Since the proposed relocation would have followed a property line on which he is an abutter, the project partners re-evaluated rehabilitating the stream channel in place.

The new scope will remove a 4' high headwall and two adjacent culverts, and calls for the construction of 6 drop pools to correct the vertical alignment of the stream over 40m of stream length. Additionally, an access roadway will be abandoned, resulting in a single access to two shore-side rental units. The replacement access will terminate in a constructed cul-de-sac. The stream channel will be stabilized vegetation prescribed by the property owner.

Methods used: Please see attached project plan. Construction work was completed in the dry channel by sandbagging the brook at approximate Sta. 0+45 and pumping discharge below the existing roadway to the intertidal zone. The 4' high headwall at Sta. 0+5 was removed. Wing walls from Sta. 0+0 to 0+5 were removed and replaced. The headwall and two existing 18" RCMP at Sta. 0+0 were retained at the property owner's request. Both culverts are in fair condition, are 100% inundated at mean high tide and are not barriers to fish passage. By retaining the culverts and headwall, the existing road downstream of the project was kept in place.

The drop structures used to correct the vertical alignment after removal are located at Sta. 0+7, 0+15, 0+24, and 0+32. With the exception of the structure at Sta. 0+7, which used native cobble and boulder, the drop structures were built utilizing cut granite blocks roughly measuring 8" X 12" X 36". The structures were constructed as shown on the attached cross-sectional view on the attached plan.

Project outcomes and Lessons Learned: Construction of the instream portion of the project was completed in 2009. The project successfully corrected vertical alignment of the unnamed stream to accommodate historic aquatic connectivity with the marine environment.

The plan for construction was developed by the Maine DOT and coordinated with Maine DIFW. On review, Maine DIFW's project officer brought up concerns about the size of the granite blocks proposed for the drop structures. While MDIFW felt that the blocks were somewhat small, hydrological evaluation of the watershed indicated that using blocks of the proposed size would withstand discharge volumes and flow velocities resulting from a 50 year precipitation event.

In spring 2010, large discharge volumes generated by snowmelt exceeded bankfull of the stream and eroded portions of the structures located at 0+15, 0+24 and 0+32. Some of the embedded blocks were exposed to varying depths. All structures remained where they were built. In short, the stream adjusted its horizontal channel position in response to the changes in vertical corrections put in place by the project. Subsequent large discharge volumes resulting from either snowmelt or precipitation have not caused additional rearrangement of the structures. Ultimately, the project has resulted in a situation where natural processes are again controlling channel development and connectivity for fish movements have been restored.

Brook trout response to project outcomes: In 2006, Maine DIFW biologists located a native population of brook trout upstream of the US Route 1 crossing in this small unnamed coastal stream while gathering data for an environmental review for the Maine Department of Transportation. Electrofishing downstream of the crossing resulted in no trout captured. In coordination meetings with Maine DOT, Maine IFW requested that the proposed retrofit at the crossing correct vertical channel alignment to allow fish access to the lower portions of the stream. On additional review, Maine DIFW found that structures on the property of Colonial Gables, LLC, a local lodging business, prevented free movement from the stream to the marine

environment. After the completion of Maine DOT's slip ling of and vertical channel corrections downstream to the US Rte. 1 crossing, brook trout were found (via backpack Electrofishing) to have moved into the channel below the crossing and had free access through the structure in both up- and downstream directions (2007). During a follow-up evaluation, brook trout were located above a 4' high headwall on the Colonial Gales property (2007, 2008), but not downstream out the marine outlet of the stream. Coordinating with Maine DOT, MDIFW worked with the property owned to remove the headwall and rehabilitate instream vertical geometry to restore the historic aquatic\marine habitat connection (2009). In a very short time (1 month +\-) after construction, fish were captured below the most downstream structure. The project was monitored via backpack electrofishing again in spring and fall of 2010 and in spring of 2011. On all occasions, brook trout were found in the lower reach of the stream in the vicinity of the project. In the fall of 2010, 3 brook trout showing evidence of recent exposure to marine conditions (silver coloration dorsal\black ventral) were obtained within the project location. However, no brook trout were obtained in the marine portion of the evaluation site. This was due: no fish captured on two sampled efforts, no water on one occasion, water too deep to efficiently sample on two occasions, and unsafe conditions on another.

Photographs of Project Site:

"Before": 2006

Belfast, Maine: Unnamed Stream, existing dam and view of stream channel.
Photograph: W. L. Woodward, Oct, 5, 2006.

Belfast, Maine: Unnamed Stream, existing culverts (upstream of dam).
Photograph: W.L. Woodward, Oct. 5, 2006

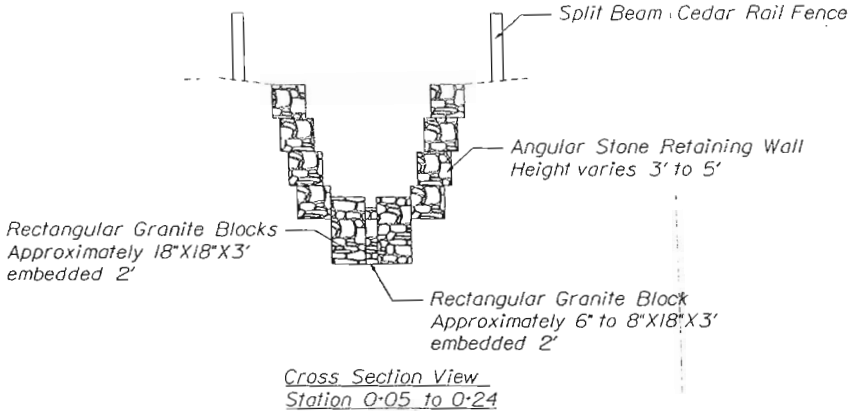
"After": 2011

2011: View is of upstream from the twin 18" culverts, Sta. 0+0.
Photograph: R. Van Riper, July 2011

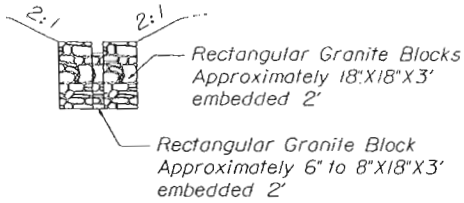
2011: View at Sta. 0 + 20.
Photograph: R. Van Riper, July 2011

2011: View downstream from Sta. 0+10
Photograph: R. Van Riper, July 2011

2011: downstream @ low tide, pipes are 100% submerged @ MHW
Photograph: R. Van Riper, July 2011

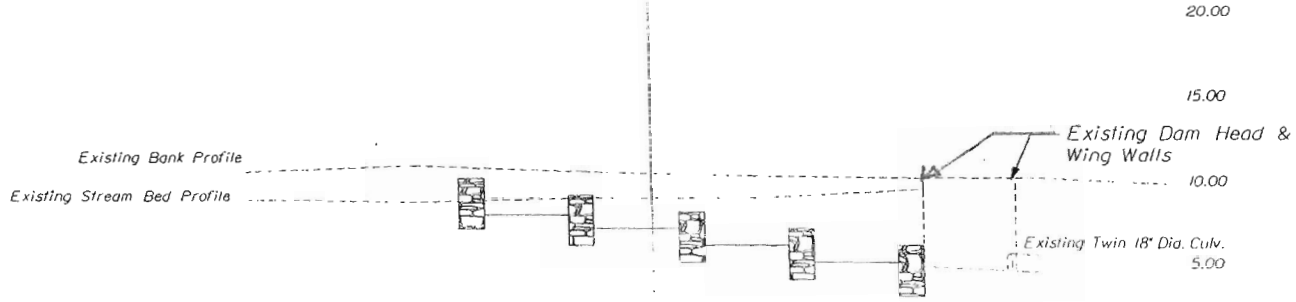


Cross Section View
Station 0+05 to 0+24



Cross Section View
Station 0+24 to 0+32.5

Profile View



Plan Legend

Proposed Stream Level
Existing Ground
Proposed Stream Bed

0+50 0+45 0+40 0+35 0+30 0+25 0+20 0+15 0+10 0+05 0+00

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

NO.	DATE	SUBMITTED
		P.E. NUMBER
		DATE

PROJ. MANAGER
DESIGN DETAILED
CHECKED
QUANTITIES DETAILED
REVISIONS 1
REVISIONS 2
REVISIONS 3
FIELD CHECKED

TYPICAL SECTIONS & PROFILE

COLONIAL GABLES
BELFAST

SHEET NUMBER
1
OF 1