PROJECT TITLE

Enhancing Connectivity in the Ash-Black Rock Subbasin of the WB Narraguagus River, ME. EBTJV-NFHAP

Project Location: Maine, Hancock County

Congressional District of Project: District 2

Congressional District of Applicant: District 1

EBTJV / NFHAP Funding Requested: $47,224

Total Project Cost: $98,994

Total Federal Matching: $9,100

Total Non-Federal Matching: $42,670

APPLICANT

Organization:	The Nature Conservancy
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U.S. Fish and Wildlife Service Sponsoring Office

Fish and Wildlife Service Office:	Maine Fisheries Resources Office
Project Officer:	Scott Craig
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USFWS FONS Database Project Number:
53371-2010-358

Coordination Completed with US Fish and Wildlife Service Fisheries Office (Check One):

___X____Yes, June 2010 _Date Coordination Began

_____No

I. PROJECT DESCRIPTION, SCOPE OF WORK, AND PARTNER INFORMATION

A. Project Description and Scope of Work: This proposed project is for restoration of road/stream crossings within the Ash Bog Stream and Black Rock Brook sub-basin of HUC 230635 on The Nature Conservancy's Spring River Preserve in T10, Hancock County, Maine. We are seeking funding to replace two poorly functioning culverts with open bottom arch culverts to allow unhindered fish passage and restore overall ecological stream connectivity. The Conservancy will be working with an experienced contractor that is knowledgeable in the installation of arch culverts for fish and wildlife passage.

B. Proposed Methods: Funds will be used for engineering of two arch culverts, and material and installation costs of the new culverts. Other costs include outreach materials and monitoring of the effectiveness of the project. Together, these culvert replacements will restore 4.3 miles of stream connectivity.

C. Project Timeline: This will be a 1.5 year project with three years of post-restoration fish monitoring.

Timeline	Project Task
Spring 2011	Complete engineering designs of two culverts
Spring 2011	Install temperature and pH data loggers at culverts
July to November 2011	Replacement of two existing corrugated pipe culverts with bottomless arch culverts
Annually 2012-2015	Post-restoration e-fish surveys
Summer 2012	Analysis of temperature and pH data
Summer 2012	Installation of educational signage
Summer 2012	Assessment of wetland condition at Unnamed Tributary to determine need for tree planting to head-start overhead stream cover

D. Proposed Accomplishment Summary: This project will correct habitat degradation resulting from improperly installed culverts on historic logging roads and will allow for fish and wildlife passage while reducing sedimentation that occurs during spring runoff and extreme storm events. This work builds on road retirement (culvert removal and stream restoration) already completed in 2007 and 2008 on 13.5 miles of roads within Spring River Preserve (Sferra 2007). This project is in alignment with the NFHAP and will restore a watershed with a high priority score under the EBTJV.

E. State the Importance of the project to the Resource: This project will connect 4.3 miles of habitat from Ash Bog Stream to Black Rock Brook which flows to the West Branch of the Narraguagus River. Brook trout are currently abundant downstream in Black Rock Brook and prior inventories suggest that some trout will overwinter in Myrick Pond. It's likely that fish will utilize Ash Bog Stream upstream from Myrick Pond if the stream reach is accessible.

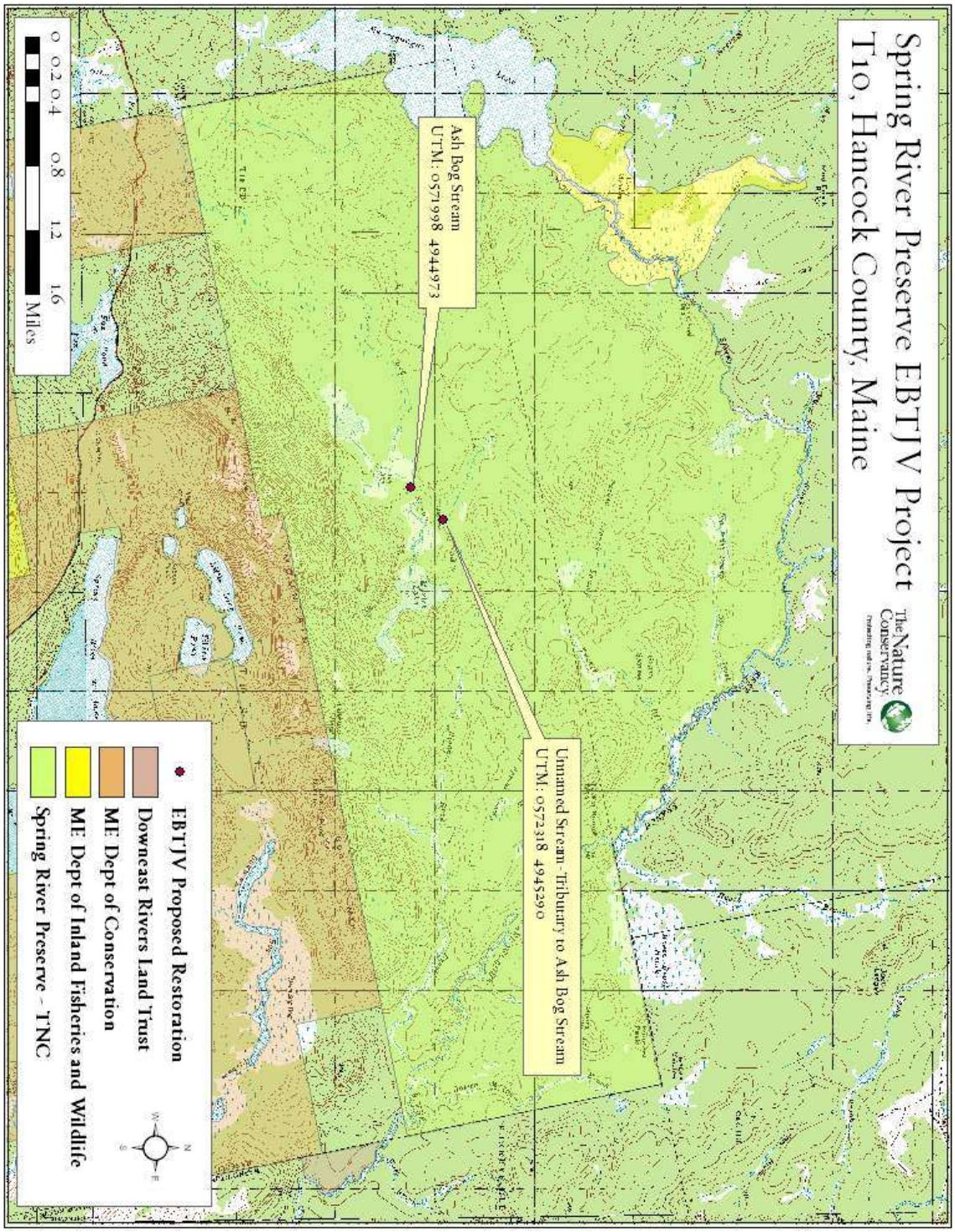
F. Problem and Specific Cause of the Problem: The Ash Bog Stream culvert is a fish passage barrier for most small bodied fish due to a perched outlet and a velocity barrier (Scott Craig- USFWS). During spring runoff and periods of extreme precipitation, sediment washes over the road and into the stream. The Unnamed Tributary culvert is also a fish passage barrier for small bodied fish due to a perched outlet, an inlet set too high, and an undersized culvert.

G. Objective of the Project with Reference to the Problem: The primary objectives of this proposal is to remove two barriers to fish passage, restore ecological stream connectivity and remove a source of fine sediment input into the streams.

H. Partner Information

Partner Name	Contribution In-Kind	Contribution Cash	Federal or Non-Federal	Partner Category	Role of Partner
The Nature Conservancy	$3,500	$37,670	Non-federal	Conservation Group (National)	Cash for project implementation and in-kind staff time for project administration
Maine Department of Inland Fisheries and Wildlife	$1,000		Non-federal	State Agency	3 years of e-fishing/1 day per year
Project SHARE	$500		Non-federal	Local Conservation Group	Site engineering of bottomless arch culvert
US Fish and Wildlife Service	$9,100		Federal	Federal Agency	Stream and culvert assessments; Section 10 ESA oversight

II. MAP OF PROJECT AREA



III. PHOTOGRAPH(S) OF PROJECT AREA (no more than 2, please provide credits and attach photo release forms)

Photo 1: Outlet of culverts at Ash Bog Stream. Outlets are perched during most of summer and undersized culvert leads to overwash and sedimentation into the stream. (Photographer: Nancy Sferra, The Nature Conservancy).

Photo 2: Outlet of culvert on Unnamed Tributary showing perched outlet. (Photographer: Scott Craig, US Fish and Wildlife Service).

IV. PROJECT BUDGET

A. General Requirements

B. Budget Table

Partner Name	Partner Category *	Activity of Partner **	Budget Category***	EBTJV NFHAP Request	Non-Federal Contribution		Federal Contribution		Total Contribution	Acres/Miles Affected
					In-Kind	Cash	In-Kind	Cash		
The Nature Conservancy	Conservation Group (National)	Restoration Monitoring	Personnel		$3,095				$3,095	0
		Restoration Monitoring	Travel		$405				$405	0
		Restoration	Contractual	$46,174		$37,670			$83,844	4.3 miles of connectivity
		Monitoring	Supplies	$1,050					$1050	0
Maine Department of Inland Fisheries and Wildlife	State Agency	Monitoring	Personnel		$900				$900	0
		Monitoring	Travel		$100				$100	0
Project SHARE	Conservation Group (Local)	Restoration	Personnel		$500				$500	0
		Restoration	Travel							0
US Fish and Wildlife Service	Federal Agency	Monitoring	Personnel				$9,100		$9,100	0
Total Contribution				$47,224	$5,000	$37,670	$9,100		$98,994	4.3 miles of connectivity

V. EVALUATION QUESTIONS

1. **Please provide the GPS Coordinates for the project in UTM NAD 83.**
   Ash Bog Stream culvert – 0571998 4944973; Unnamed Tributary culvert – 0572318 4945290

2. **Please list the type of project. Examples include: in-stream habitat, riparian planting, fencing, AMD, fish passage, reintroduction, assessment, etc.**
   Fish passage

3. **Does the project include a protection component? If so, explain how the project sufficiently protects brook trout habitat. Does the project include fee simple land purchase or easements?** No

4. **What percentage of the watershed above the proposed project is protected in perpetuity?**
   >75%. Almost all of the upstream portion of the watershed is protected by either the State of Maine or The Nature Conservancy.

5. **List the specific regional EBTJV habitat objectives addressed by the project and describe how the project will contribute towards them.** This project will strengthen brook trout populations by restoring connectivity between the lower watershed where brook trout are abundant and the upper watershed where brook trout are limited due to poorly placed culverts.

6. **List the specific state-level EBTJV habitat objectives addressed by the project and describe how the project will contribute towards them.** This project will restore and maintain natural hydrologic regimes by re-establishing fish passage through barrier removal.

7. **Please state whether the project is an enhancement, restoration or protection project.** This project will restore brook trout habitat through the removal of improperly placed culverts. The EBTJV score for this watershed (230635) is 1.66 "Best of the Best". Therefore this is a Protection type project.

8. **State which, if any, EBTJV priority the project addresses:** The project improves and reconnects habitats adjacent to the best of the best that also have a high likelihood of supporting stable brook trout populations.

9. **What is the EBTJV priority ranking for the proposed project watershed for the type of project (protection) being proposed?**
   Watershed # = 230635
   Priority Score = 1.66
   Map =

10. **Will the completed project benefit any federally listed threatened or endangered species?**
    The projects are located within Designated Critical Habitat for Atlantic salmon. Atlantic salmon spawning and rearing habitat has been documented in the West Branch of the Narraguagus River on the east end of the preserve between the confluence of Heath Brook and Dog Brook Swamp. Spawning and rearing habitat has also been documented in Spring River along the northern boundary of the preserve just downstream from Spring River Dam.

Restoration of fish passage on these smaller tributary streams will benefit the overall health of the watershed. American eel (Petioned for Listing) are found at both locations.

11. **Will the completed project benefit any state listed threatened or endangered species?** No state threatened or endangered species have been documented within the Ash Bog Stream sub-basin.

12. **Does the project demonstrate watershed scale planning? Yes. The project will increase habitat connectivity in a predicted intact sub-watershed (230635).** This project builds upon work already completed in this watershed, including the retirement of former logging roads that included several stream crossings. The work in 2007 and 2008 were self funded by The Nature Conservancy in the amount of $47,000. This was a significant outlay of resources and this project allows us to build on that investment by helping us fund the more expensive culvert replacement work. It allows us to maintain gravel roads on the preserve that allow for public access while improving the connectivity for aquatic species. Without the additional EBTJV and HFHAP funding, the connectivity of the biotic community would remain compromised.

13. **Please describe how the project will provide for the expansion or improvement of existing habitat?** Fish surveys on the lower portion of the watershed indicate good brook trout populations in Black Rock Brook. Myrick Pond, located upstream of Black Rock Brook, is a relatively warm water pond which is used seasonally by brook trout. When water temperatures are high, brook trout seek cooler refugia in adjacent streams. The two culverts that this project will replace currently restrict brook trout from reaching those refugia upstream from Myrick Pond. Removal of these stream barriers will open 4.3 miles of habitat for brook trout.

14. **What are the root causes of the watershed degradation and which of these are addressed by the project?** Much of the degradation within this system results from the extensive network of former logging roads with improperly placed or undersized culverts. The roads that are no longer needed for management purposes have already been retired and all culverts at stream crossings have been pulled. However, there are a number of roads that cannot be retired due to existing rights-of-ways. A total of seven stream crossings with poorly functioning culverts that restrict fish passage have been identified and prioritized for action. This project focuses on two of the highest priority culverts that have the best opportunity for brook trout habitat.

15. **Describe the plans for post project monitoring and evaluation.** Fish passage capacity will be evaluated visually (effectiveness of culvert installation) and through electrofishing. Fisheries biologists from Maine Department of Inland Fisheries and Wildlife will conduct e-fishing annually for three years following installation of bottomless arch culverts. In addition, continuous read temperature and pH data loggers will be installed at each site to document any changes following restoration. Lastly, the upstream portions of the wetland at the Unnamed Tributary culvert will be evaluated post-restoration to determine if tree planting is warranted to head-start the development of overhead stream cover.

16. **Describe the expected effect on the brook trout population. To what degree will the project strengthen the brook trout population status?** The project will likely increase abundance and natural productivity by increasing the amount of habitat available for

brook trout throughout the year. An additional 4.3 stream miles will be opened to brook trout.

17. **Please describe the long term benefit of the project and provide an estimate of the length of time the project is expected to be effective. If a plan for long term maintenance is necessary, please describe it.** It is expected that the bottomless arch culvert, if properly sized and installed, has a life expectancy of over 20 years. In addition, the culverts will be better able to withstand extreme storm events, thus reducing the potential for sediment input from the adjacent road system and the potential for the culvert to wash out. We anticipate that the road above the culvert will need periodic maintenance. However, these roads are no longer used for timber operations and the amount of traffic should be relatively low impact.

18. **What size stream does the project benefit - tributary stream or mainstem habitats?** Both streams within this project are tributary streams to Black Rock Brook which flows into the West Branch of the Narraguagus River. Ash Bog Stream has a bank-full width of 12 to 14 feet and the Unnamed Tributary has an estimated bank-full width of six to seven feet.

19. **What competitive non-native or invasive fish are in the watershed with access (no barrier) to the proposed project?** Based on results of e-fishing in July 2010, no non-native fish are known to be present in the two streams within this project (Scott Craig- USFWS).

20. **Are other strains of brook trout or other salmonids or other exotics stocked within the proposed project watershed? Where (e.g. upstream, downstream, and distance from project site) does the stocking take place with respect to the project site?** No

21. **Please describe the current status of the project. Is it planned, permitted and ready to begin? Please identify the targeted month and year for project completion.** This project is in the planning stage, but is funding dependent. Some money is currently in-hand for the culvert replacement, but is currently not enough to fund the full project. If funding comes through, we hope to complete the culvert replacement in the summer of 2011. Since TNC has already completed several in-water (stream-road) projects on the property, permitting will not be a limiting factor. USFWS (Maine Fishery Resources Office) has agreed to assist TNC with Endangered Species Permitting issues associated with Designated Critical habitat for Atlantic salmon (Scott Craig- USFWS).

22. **Will public access be allowed at the project site? If so, what kinds of recreational activities are allowed - public fishing, nature trails, etc?** The project area is on lands owned and managed by The Nature Conservancy. The property is open to public access at no cost and uses include hiking, fishing, hunting, skiing, and ATV use on one designated trail. The majority of the property is managed consistent with ecological reserve guidelines (low impact recreational use). A small parcel adjacent along our northern boundary is owned and managed by Maine Department of Inland Fisheries and Wildlife. The Maine Department of Conservation owns and manages land directly to the south along Tunk Mountain. The publically owned lands adjacent to Spring River Preserve are also open for recreational activities. In addition, there are eleven camp leases on the Spring River Preserve which are used primarily for hunting and fishing.

23. **What is the recreational quality of the potential fishery?** The majority of the fishing occurs on Myrick Pond, Narraguagus Lake, Spring River, and the West Branch of the Narraguagus River.

24. **Describe any outreach or educational components of the project and how many individuals / students will be served.** There is limited opportunity to educational components primarily due to the distance from area schools. However, the Conservancy is committed to educating the public about the impacts of poorly installed culverts on streams and fish connectivity. This project will be used to promote the restoration of fish passage through our website, newsletters, press releases and on-site educational signage.

25. **If applicable, please briefly describe how this project will promote adaptation to climate change.** The frequency of high precipitation storms has increased over the past ten years. Much of this watershed lies at the foot of Tunk Mountain resulting in large amounts of runoff from steeps slopes. Stream and cross drain culverts on a major haul road along the lower slope of Tunk Mountain were removed in 2007 to reduce sedimentation in the Ash Bog watershed and to remove a major fragmenting feature from the preserve. The replacement of remaining corrugated pipe culverts with bottomless arch culverts will facilitate the flow of water in the system from these extreme storm events.

26. **Please explain how this project is a good investment of funds, using a quantitative approach where possible and the recreational and / or economic value of the project.** This project builds upon work already completed in this watershed, including the retirement of former logging roads that included several stream crossings. The work in 2007 and 2008 were self funded by The Nature Conservancy in the amount of $47,000. This was a significant outlay of resources and this project allows us to build on that investment by helping us fund the more expensive culvert replacement work. It allows us to maintain gravel roads on the preserve that allow for public access while improving the connectivity for aquatic species. Without the additional EBTJV and NFHAP funding, the connectivity of the biotic community would remain compromised.

27. **Specify the NFHAP tasks upon which you will work. A list of tasks to choose from can be found in the instruction document.** Number P-7.7; Strategy 3 – Reconnect fragmented river, stream reservoir, coastal and lake habitat to allow access to historic spawning, nursery, and rearing grounds; Strategy 4 – Reduce and maintain sedimentation, phosphorus and nitrogen runoff to river, stream, reservoir, coastal and lake habitats.

28. **Please describe the expected Performance Metrics. A list of Service performance measures to select from can be found in the instruction document.** 5.1.12 Number of miles re-opened to fish passage = 4.3

VI. SUPPORTING DOCUMENTATION:

1. Literature Cited

Sferra, N.J. 2007. Management plan for Spring River Preserve. Unpublished Report, The Nature Conservancy, Brunswick, ME.

2. References to published interagency fishery or aquatic resource management plans.

Abbott, A. 2006. Maine Atlantic salmon habitat atlas. USFWS, Falmouth, ME.

National Oceanic and Atmospheric Administration (2009). "Endangered and Threatened Species; Designation of Critical Habitat for Atlantic Salmon (Salmo salar) Gulf of Maine Distinct Population Segment; Final Rule." Federal Regester 74(117): 29300-29341.

3. USFWS Site visit report (below)

June 24, 2010

Subject: Field Visit with *The Nature Conservancy* (Tunk Mountain: Ash Stream-Black Rock Stream Subbasin)
From: Scott Craig. Project Leader. USFWS Maine Fishery Resources Office. 207 469-6701 x226

Scott Craig and Joseph McKerley (USFWS Maine Fishery Resources Office) meet with Nancy Sferra and Daniel Grenier (The Nature Conservancy) to discuss possible National Fish Habitat Action Plan (Eastern Brook Trout and/or Atlantic Coastal Partnerships) projects on their property near Tunk Mountain in Hancock County (T10 SD).
We visited seven potential locations (sites 127-133) that I determined to be potential candidates for the Eastern Brook Trout Joint Venture (EBTJV) Partnership. See Figure 1. The EBTJV grant opportunity will be soliciting Requests for Proposals this summer.
Both Joe and I thought all of the sites we visited have constituent elements that would sustain native brook trout, although site 132 and possibly 131, may be too small for sustaining year-long fish presence? The larger site (129) may only have brook trout when daily mean stream temperatures are below 24C. Sites 127, 133 and 130 appear to be impacted by elevated round culvert inlets (set to high), resulting in unnatural wetland-ponds above the road. Sites 128 and 131 appear to be the best locations for observing trout at this time of the year. Four sites had pH water values at or below 5.0. Locations 132& 133 were ~5.5 pH. See Table 1.
After checking with the Maine Department of Inland Fish and Wildlife (to see if the locations have been previously surveyed), I have offered to try and coordinate a single pass electrofishing survey on the mentioned sites so that we can determine the presence/absence and relative abundance of fish. Nancy agreed this was a good course of action; I will notify her of my interactions with the State, and if necessary, a date of conducting the proposed survey.
If we (USFWS and TNC) conduct the electrofishing surveys, it would also be an opportune time to conduct a Fish Crossing Assessment with the USFS FishXing (Software) methodology.

We also visited a decommissioned road that crosses the outlet of Myrick Lake (not marked). This decommissioned crossing was providing excellent stream connectivity for fish and it was restored ecological stream function of Black Rock Stream.

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132
131
128
130
129
127
133
182
8504 ft
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Table 1. Location information on the sites visited (Coordinates UTM 19N WGS 84)

Site_ID	**127**	**128**	**129**	**130**	**131**	**132**	**133**
UTM X	569,249	570,925	571,998	572,318	571,416	571,419	569,318
UTM Y	4,943,238	4,945,324	4,944,973	4,945,290	4,945,829	4,945,923	4,943,098
Est. Drainage Area (sq mi)	0.25	0.30	2.85	0.55	0.16	0.18	0.15
Calc Bankful (ft) (Craig& Koenig 2010)	5.4	5.8	12.5	7.1	4.6	4.8	4.5
Field Est. Bankfull			12-14	6-7	4-5	4-5	6-10
Est. Structure Width Calc bankfull * 1.2 (ft)	6.5	6.9	15.0	8.5	5.6	5.8	5.5
Est. Cost of Project (USFWS Est.)[1]	$18,843	$20,456	$56,370	$26,874	$15,413	$16,252	$14,971
Temp (C)		12.5	18	18.3	14.4	14.1	21.9
pH		5.0	5.0	4.9	5.0	5.4	5.6
Photo of Inlet		IMG_3056	IMG_3058	IMG_3063	IMG_3066		IMG_3070
Photo of Outlet		IMG_3057	IMG_3059	IMG_3061	IMG_3065	IMG_3067	IMG_3068
Photo Other			IMG_3060	IMG_3062			IMG_3069
Date Time	24-JUN-10 9:22AM	24-JUN-10 9:48AM	24-JUN-10 9:59AM	24-JUN-10 10:20AM	24-JUN-10 11:21AM	24-JUN-10 11:22AM	24-JUN-10 11:48AM
Other Information	Difficult area calculation (DAC)				DAC	DAC	Temp 21.9 Up, 18.5 down (DAC)

Craig, S. and S. Koenig (2010). Stream Relationship Curves from Restoration Sites- Mean Bankfull Width to Catchment Area within Northern Coastal Maine Watersheds. Appendix R. Regional Stream Relationship Curves: Restoring Salmonid Aquatic/Riparian Habitat- A Project SHARE Restoration Strategy for the Downeast Maine DPS Rivers (Update to 2009 Document). East Orland, ME: 6 p.

[1] Cost estimates were derived from 47 culvert replacements (Open Arch) from 2007-2009 in Downeast Maine. Culvert width to cost regression. Scott Craig Personal Information.

July 29, 2010

Electrofishing Survey

Scott Craig and Joe McKerley- USFWS Maine Fishery Resources Office.

We efished three locations- Site 130, 132 and 128. Site 131 was almost completely dewatered, so we did not survey (efish) this location. We found 9 Spine Stickleback at all three sample locations, and 1 sunfish at site 130. An American eel was also observed above the road at site 130.

Site	Time	pH	Temp (C)	Cond (µs)
130	10:10	4.6	21.4	16.5
129	11:22	5.0	17.9	19.5
128	12:54	4.5	19.5	22.1

Sites 127 and 133 had water temperatures of 30°C, so we did not efish. Fish were observed downstream of the road at site 133.

Above the road at site 130. Joe observed an American Eel at this location.

Two fish observed at site 130. Pumkinseed Sunfish (76 mm) and Nine Spine Stickleback (35 mm)

Recommendations:
Water quality is compromised by low pH at all the sites we visited. Low pH, coupled with high water temperatures undoubtedly hinders brook trout persistence in the areas we surveyed.

Although brook trout were not observed at any of the sample location, MEFRO staff would endorse culvert replacements or road decommissions at the following locations:

Priority #1 Site 129 is a fish passage barrier for most small bodied fish (outlet perched and velocity barrier) located low in the watershed. Sediment inputs from the road are entering stream. Diadromous fish are present (they were found upstream at site 130).

Outlet Site 129

Road crossing at Site 129

Priority #2 Site 130 is a fish passage barrier for most small bodied fish (outlet perched), the inlet is set too high, and the culvert is too small. American eel are present at the site. If a open arch culvert was installed (correctly) at this location, the stream would be much more conducive for brook trout.

Priority #3 Site 133 is a fish passage barrier for most small bodied fish (outlet perched), the inlet is set too high, and the culvert is too small. Water temperature is elevated because of the crossing! The road is compromised by the small round culvert and ongoing beaver issues.

Priority #4 Site 127 is a fish passage barrier for most small bodied fish (outlet perched), the inlet is set too high, and the culvert is too small. Water temperature is elevated because of the crossing! The road is compromised by the small round culvert and ongoing beaver issues.

Priority #5 Site 132 is a fish passage barrier for most small bodied fish (outlet perched) and the culvert is too small.

Priority #6 Site 128 is a fish passage barrier for most small bodied fish (water velocity barrier) and the culvert is too small. The existing culvert does not appear to pose immediate threat to the road- it appears adequate (large enough) to pass water through the road.