

Flood Summit 2012

Hurricane Relief Meets Fish Passage



August 28, 2011 -
Tropical Storm Irene
dropped eight inches of
rain in 24 hours resulting
in a 500-year flood in
Vermont's upper White
River basin



**963 culverts and 277 bridges
damaged or destroyed – isolating
13 towns & impacting 225
municipalities in Vermont**



Credit: White River Partnership

The 3 ft Johnson Brook culvert wash out caused the road to fail leaving a 30 ft gap, and damaged a local home. Estimated damages \$250,000.

Broad Brook Road, Royalton, VT



The 10 ft Marsh Brook culvert was positioned at an angle to the river. The force of the angled high stream flow caused the culvert to buckle and fail. USFWS Engineers designed the fix. Replacing this with a 22 ft culvert cost \$111,000. FEMA will cover the entire cost.

Marsh Brook Road, Rochester, VT



Credit: White River Partnership



Credit: USFWS

Credit: White River Partnership

The 11 ft Nason Brook culvert plugged with debris and flood waters washed around it dislodged 50 grave sites. Bridge installation cost \$45,750. FEMA covers \$19,000 (price of old culvert). Placement is temporary until Spring 2013. Estimated damages (total cemetery) \$1,000,000.

Woodlawn Cemetery in Rochester, VT



Credit: White River Partnership

The North Hollow Road 2.5 ft perched double-culverts blew out and were replaced during the emergency with two more undersized and poorly placed culverts. These will be replaced with a 15'4" open arch culvert at a cost of \$71,000. FEMA will cover \$11,000.

Hayford Rd, Trout Brook, Ticonderoga, NY



Field assessments demonstrated that fish-friendly culverts installed with NFPP funds survived the storm in NY



Credit: USFS

Before

Open Arch
Replacement 2010

Green Mountain National Forest
FR17A/Jenny Coolidge Brook
Bottomless Arch Inlet



Post-Irene Survivor
2011



Green Mountain National Forest FR54/ Sparks Brook Bottomless Arch Step Structures



Pre-Irene



Post-Irene Survivor

Great Brook culvert retrofit, Plainfield, VT



And instream work to retrofit perched culverts survived the storm in VT

- USFWS-WO - Fisheries & Habitat Conservation provides \$100,000 to the White River Partnership for projects in VT
- USFWS-R5-Fisheries provided Ausable River Association with \$15,000 for ongoing projects in NY
- Supporting field office: Lake Champlain Fisheries and Wildlife Resource Office



But for those cases where undersized and poorly positioned culverts failed, the USFWS Responded with on-the-ground project funding



USFWS – Cross Program Effort

Fisheries

- National Fish Passage Program
- Regional Fish Passage Engineers

Ecological Services

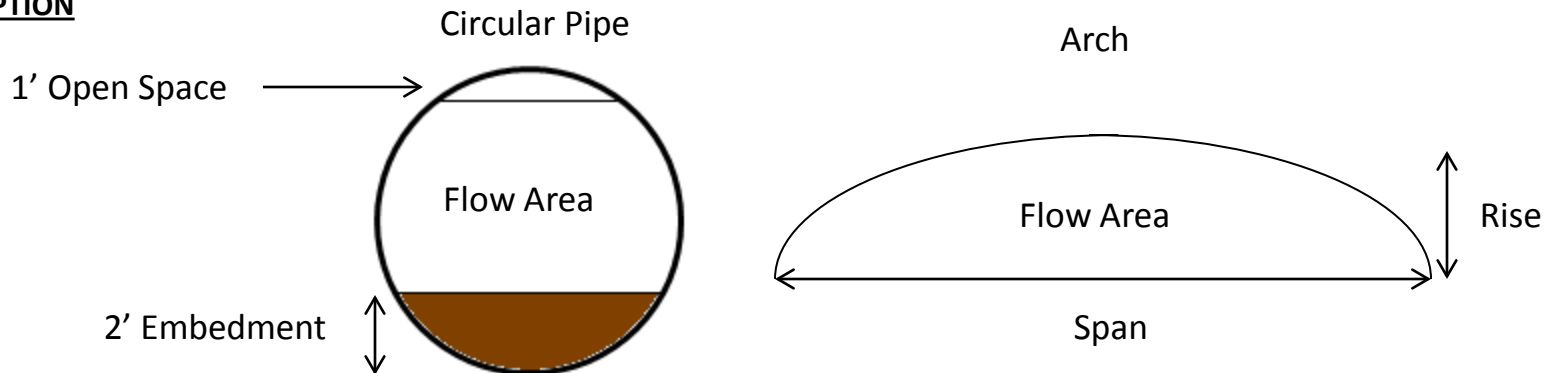
- Partners for Fish and Wildlife
- Coastal Program

And, the USFWS provided engineering, technical assistance, and project oversight to assist the State

And recommendations to the Town DPWs

	South Hollow Rd on Nason Brook		Moose Run Rd on Nason Brook		Marsh Brook Rd on Marsh Brook		Town Line Rd on Howe Brook		North Hollow Rd on Marsh Brook		Oak Lodge Rd on Howe Brook		Fiske Rd on Howe Brook	
General														
Temporary Culvert size, ft	4.5		4		10		4		2.8		4		5	
Drainage Area, mi ²	0.3		0.43		2.18		0.11		0.4		1.1		1.25	
Q25, cfs	46.5		64		244		17.5		59.3		123		129	
Measured Bankfull, ft	9		9		19		N/A		14		11		9	
Bankfull based on VT Regression, ft	7.71		9		18.5		4.96		8.75		13.66		14.45	
Culvert Sizing	Width, ft	Flow Area, ft²	Width, ft	Flow Area, ft²	Width, ft	Flow Area, ft²	Width, ft	Flow Area, ft²	Width, ft	Flow Area, ft²	Width, ft	Flow Area, ft²	Width, ft	Flow Area, ft²
Q25 + 1' Opening + 2' Embedment	4.5	6.41	5	9.55	9.21	51.99	4.39	5.81	4.78	8.12	7.58	32.1	6.68	23
1.2 X Measured Bankfull	10.8		10.8		22.8		N/A		16.8		13.2		10.8	
1.2 X VT Regression Bankfull	9.3		10.8		22.15		5.95		10.5		16.39		17.34	
Recommended Arch (Reference: CONTECH)	Span, ft	10	Span, ft	11	Span, ft	22	Span, ft	6	Span, ft	13	Span, ft	14	Span, ft	14
	Rise, ft	3.50	Rise, ft	3.5	Rise, ft	6.92	Rise, ft	2.33	Rise, ft	6.75	Rise, ft	4.67	Rise, ft	4.67
	Flow Area, ft²	25	Flow Area, ft²	27.8	Flow Area, ft²	109	Flow Area, ft²	10	Flow Area, ft²	70	Flow Area, ft²	47	Flow Area, ft²	47

FLOW AREA DESCRIPTION





Gilead Brook

Outcome: Visible Results

Future

- 2012 construction season
- Post-storm projects in VT, NY, PA and MA



Walker Brook project, Becket, MA



Big Bear Creek project, PA



Bartlet Road culverts replaced on
Lewis Brook, trib to Ausable River, NY

Future

- Responsive
- Flexible
- Cooperative
- Collaborative

National Fish Passage Program

- Each mile of stream access restored has a socioeconomic value estimated at \$542,000
- So every \$1 of federal funding returns \$28 in economic benefit
- Since 1999, the National Fish Passage Program has removed 950 fish passage barriers across the country
- Reopened access to 15,500 stream miles and 82,100 acres of wetlands benefiting 90 species of fish and freshwater mussels important to a healthy aquatic ecosystems
- This \$57M investment created an \$8.3B economic benefit to local communities and supported 186,000 jobs
- Federal dollars were matched 3:1 by non-federal dollars - so the investment of tax dollars is leveraged 3x by the private sector in cooperation with over 700 project partners
- 70% of the funds land on-the-ground
- And the program benefits frequently extend beyond natural resource management, dam removals and culvert replacements can save municipalities maintenance costs, eliminate human health and safety concerns, and often offer important recreational opportunities including improved angling, boating and wildlife viewing
- *What benefits fish, benefits people*

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Fish Passage Flood Summit
Main Interior – Washington, DC
April 24, 2012

Host

U.S. Fish and Wildlife Service - National Fish Passage Program

Attendance

U.S. Fish and Wildlife Service

U.S. Forest Service

Federal Emergency management Agency

Trout Unlimited

Town of Rochester, VT

White River partnership

Natural Resources Conservation Agency

Bureau of Land Management

Federal highway Administration

Environmental protection Agency

American Rivers

Isaac Walton League