



# U.S. Fish & Wildlife Service Riparian Habitat Restoration



## Vermont Partners for Fish & Wildlife Program

The Partners for Fish and Wildlife Program restores, enhances and protects important fish and wildlife habitat on private lands through partnerships. We focus our efforts in priority landscapes to achieve the greatest conservation benefit for federally listed species, candidate and at-risk species, migratory birds and interjurisdictional fish.

Priority species such as the golden winged warbler, monarch butterfly, wood turtle and brook trout benefit from riparian habitat restoration projects.



Figure 1. Priority species from top left: golden winged warbler, monarch butterfly, wood turtle, brook trout. Photo credit: USFWS

## Habitat Restoration

The Partners for Fish and Wildlife Program provides financial and technical assistance to design and implement riparian habitat restoration projects in Vermont. U.S. Fish and Wildlife Service staff work with local partners to conduct site assessments and design restoration plans.



Figure 2. Before restoration project implementation on left and after restoration on the right. Photo credit: USFWS

## Working with Landowners and Partners

- Projects occur on private land in partnership with willing landowners
- Many projects occur on agricultural land in conjunction with USDA Farm Bill programs such as the Conservation Reserve Program (CRP)
- The Partners Program regularly works with over 30 Federal, State and NGO partners to implement habitat restoration projects



Figure 3. A landowner and his children plant a riparian buffer. Photo credit: USFWS

## Conservation Success

- 660 projects have been completed with voluntary landowners in Vermont
- Restoration and enhancement of over 2,200 acres of riparian habitat
- Over 515 miles of streambank habitat to benefit Federal Trust Resources and water quality



Figure 4. Restoration project before (left) planting and exclusion and 8 years after project completion (right). Photo credit: Vermont Agency of Agriculture

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# Restoring Aquatic Connectivity

## Identifying and Addressing the Problem

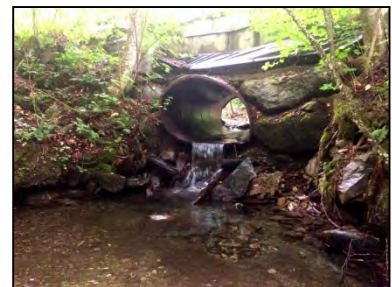
- Stream habitat fragmentation by dams and road crossings has altered stream habitat across the northeast, impacting native fish at-risk species, and other aquatic organisms.
- Lake Champlain Fish and Wildlife Conservation Office (FWCO) is restoring aquatic connectivity and fish passage in Vermont, the Connecticut River Watershed and the entire Lake Champlain Basin by assessing, prioritizing and removing barriers



*Priority species such as brook trout and landlocked Atlantic salmon benefit from aquatic connectivity projects.*

## Barrier Removal

- In partnership with the VT Fish and Wildlife Department, NY State Department of Environmental Conservation, the Lake Champlain Basin Program and numerous other conservation organizations, the Lake Champlain FWCO has leveraged technical and financial resources to open hundreds of miles of rivers and streams by removing barriers.
- Barrier removal, combined with in-stream habitat restoration, restores access to historical spawning areas and allows for seasonal migration of salmon, brook trout and other aquatic species.
- In addition, properly designed road crossings greatly increase flood resiliency, lower nutrient loading, restore stream morphology and reduce maintenance costs.



*Restoring natural stream flow and fish passage under a road*



*Boquet River before and after removal of Willsboro Dam in Willsboro, NY*

## Conservation Success

In the last two years, the Service and our partners have removed **23 barriers**. Efforts have resulted in **230 miles of stream habitat re-opened** to aquatic species.

[https://www.fws.gov/lcfwro/habitat/aquatic\\_connectivity.htm](https://www.fws.gov/lcfwro/habitat/aquatic_connectivity.htm)  
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*Atlantic salmon migrating up the Boquet River in Willsboro*



# U.S. Fish & Wildlife Service Wetland Habitat Restoration



## Vermont Partners for Fish & Wildlife Program

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Priority species such as the American black duck, monarch butterfly, blue spotted salamander and Virginia rail benefit from wetland habitat restoration projects.



Figure 1. Priority species from top left: willow flycatcher, spotted turtle, black duck, black-crowned night-heron. Photo credit: USFWS

## Wetland Habitat Restoration

The Partners for Fish and Wildlife Program provides financial and technical assistance to design and implement wetland habitat restoration projects in Vermont. Restoration techniques include ditch plugs, shallow depressions, berm removal, wood replacement, hummock/hollow creation, and tree/shrub plantings.



Figure 2. Conducting cultural resource review at a restoration project. Photo credit: USFWS

## Vermont Wetland Partnership

Initiated in 2008, a partnership between the U.S. Fish & Wildlife Service, the USDA – Natural Resources Conservation Service, and the Vermont Agency of Natural Resources was formed to restore degraded wetlands in Vermont.



Figure 3. USFWS Biologist explaining wetland restoration project to visiting professionals. Photo credit: USFWS

## Conservation Success

- Since 2008, over **65 projects** have been completed as part of the wetland partnership in Vermont.
- Over **5,300 acres** of wetland habitat have been restored or enhanced.



Figure 4. Restoration project before (left) and 4 years after project completion (right). Photo credit: USFWS

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