



PENNSYLVANIA

"It is really quite interesting to note and observe how wildlife seem to migrate to the wetland. Once water is in place an impressive chain of life begins ... I have gotten, as have my family and friends, a new impression of the interrelatedness of life forms. Stop by."

Mike Cavanaugh

Introduction and General Description

Through its innovative Partners for Fish and Wildlife Program, the U.S. Fish and Wildlife Service provides technical advice and funding to help landowners realize their goals of making their land a better place for wildlife and people. The Partners for Fish and Wildlife Program in Pennsylvania began in 1989 and has been growing at a steady pace ever since. In Pennsylvania the program has focused on restoring several types of habitats. Most recently, the Partners Program has become the lead agency in restoring in-stream habitats. Fish and wildlife habitats that were once degraded are now providing important cover, food, water and breeding areas for many species.

Pennsylvania Activities

- Wetland restoration
- Grassland restoration
- Riparian fencing
- Bioengineering
- Restoration of threatened and endangered species habitat
- In-stream restoration

Habitats of Special Concern

Lost Habitats

Since European settlement in the 1600s, Pennsylvania's vast forests, wetlands, streams, and grasslands have fueled the State's growth and development. Many of the State's natural resources were greatly diminished or degraded as the landscape was changed to make room for agricultural and urban development. More than half of the wetlands were drained or filled, 99 percent the native grasslands were converted to other uses, more than 5,000 dams were constructed that blocked fish movement, and miles of stream were channelized. In addition, the extensive hemlock-white pine and hardwood forests were cut and cleared.

As these habitats changed, so did the fish and wildlife populations that relied on them, leading to declines in waterfowl, grassland nesting birds, anadromous fish, and many forest dependent species.

Positive Change

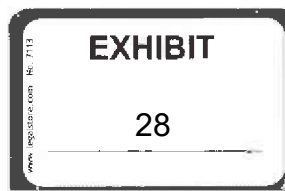
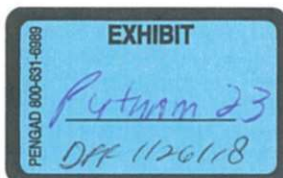
The outlook began to change in 1987 when the Service launched



Green-backed heron hunting in a restored wetland.

Photo: T. Wingert

its Partners for Fish and Wildlife Program. Recognizing that nearly 80 percent of Pennsylvania's lands are privately owned, the Partners Program began to forge partnerships with private landowners to improve fish and wildlife habitats. Working together, the Partners Program and private landowners, sometimes with the help of other agencies and organizations, are able to design and implement habitat restoration projects to improve conditions for wildlife and meet the goals of the landowner.



Conservation Strategies

Wetland Restoration

The Partners Program in Pennsylvania focuses on wetland restoration because of their importance to migratory birds. Wetland restoration techniques focus on returning hydrology to formerly drained wetlands by removing or disabling field drainage tiles and plugging drainage ditches. Restoration projects are carefully crafted to blend into the surrounding landscape and involve a variety of activities such as: creating micro-topography; establishing complexes of small seasonal wetlands; and, restoring larger permanent wetlands.

Wetland restoration projects have focused in the Lake Erie coastal plain, the glaciated areas of northwestern Pennsylvania, and the lower Susquehanna River Basin. These areas contain the densest breeding populations of water birds in Pennsylvania.

The total costs for a wetland restoration project is \$750 per acre.

Grassland Improvements

Grasslands are an essential component of nesting habitat for many species of neotropical migratory birds. The decline of grassland bird species such as the bobolink and eastern meadowlark, is directly correlated to the decline of grasslands in the Northeast. The Partners Program has cooperated with the Pennsylvania Game Commission, Pheasants Forever, Ducks Unlimited and California University of Pennsylvania to promote the use of

native grasses in agricultural programs, including rotational grazing systems. Other grassland management techniques include mowing, burning, planting both warm-season and cool-season grasses, and removing invasive plant species.

The focus area for grassland habitat is in the southern half of the State. These region supports some of the largest populations of birds that use grasslands and early succession scrub/shrub habitat for nesting cover. Grassland restoration costs \$200 to \$250 per acre.

Stream and Riparian Area Rejuvenation

Streams and riparian (streamside) areas support fish, mussels, amphibians and serve as corridors that connect diverse fish and wildlife communities. Many Pennsylvania streams have been straightened, channelized and/or eroded and "armored" with stone or other man-made materials. Pennsylvania also suffers more flood damage than any other State in the nation and the after-effects of flooding often involve stream channel clearing and dredging. Many of our streams are sensitive to disturbance and are showing the



Before streambank fencing.



One year after fence installation.

ill effects of a century of manipulation. In our agricultural regions, we have hundreds of miles of streams and streamside habitat that have been degraded from over a hundred years of intensive livestock grazing. Many of these streams flow through limestone buffered soils and once had very good water quality, yet now they resemble linear mud holes.

One restoration technique that is cost-effective and valued by landowners is streambank fencing. The Partners Program provides the equipment and labor to manage livestock access to streams and streamside habitat. Working with the California University and Pennsylvania Game Commission we are providing assistance to a greater number of private landowners. Fencing costs \$0.75 per linear foot to install.

Fencing out livestock restores excellent habitat for fish and wildlife while reducing erosion and nutrient inputs into the stream. The Partners Program also provides tree seedlings to landowners to establish woody riparian buffers. We are expanding our woody riparian buffer program to concentrate on using locally grown native tree stock. Woody riparian buffers cost \$1.50 per linear foot to plant.

Stream work concentrates on the concept of "natural channel design" that provides sediment transport, improves fish and wildlife habitat and cost-effectively creates a stable stream. This is a state-of-the-art approach that requires special expertise but has outstanding payoffs for Pennsylvania's streams. The Partners Program in

Pennsylvania is cooperating with a number of agencies and groups to construct several large-scale demonstration projects. Stream work projects cost \$50 per linear foot to complete.

Invasive Plant Species Control

Invasive plant species are a major threat to fish and wildlife populations. Invasive, exotic plants reduce native plant diversity and degrade fish and wildlife habitats. The Partners Program assists private landowners to control invasive plant species and restore native species.

One common invasive plant in Pennsylvania is multi-flora rose. This plant is found in old pastures and can expand to dominate an entire field if it is not controlled. The Partners Program has worked to reduce multi-flora rose invasions and improve fields for grassland nesting birds.

We are cooperating with The Nature Conservancy (TNC) to control reed canarygrass, an invasive grass, and multi-flora rose on TNC land which provides important habitat for the bog turtle. Partners Program staff, worked with TNC to erect livestock fences and implement a grazing plan that would restore the original vegetation to the site. The cost for invasive plant control is approximately \$200 per acre.

Development of Outdoor Classrooms and Outreach Programs

The Partners Program works with schools and nature centers throughout Pennsylvania to restore wetlands, grasslands, and wildlife



A student working with a painted turtle in an outdoor classroom.

habitats that are used as living classrooms with environmental educational programs. In addition, Partners Program staff present educational programs about the fish and wildlife to school children and others using these outdoor classrooms.

Partners Program staff provide technical advice about wildlife and fisheries management, wetland design and construction and native grass management to numerous agencies and organizations as well as countless private individuals as part of an outreach program. Several colleges and institutions are using Partners projects in their curricula. Partners Program staff are participating in a 5-year training and watershed monitoring program with the Milton High School in Milton, Pennsylvania. Outdoor classrooms cost \$2,000 per acre to develop.

Improving Habitat for Species of Special Concern

The Partners Program is working to protect bog turtle habitat through our streambank fencing program. We are working to reestablish native grassland areas to provide habitat for the regal fritillary butterfly, a species in serious decline. Within the upper Allegheny watershed we are focusing on streambank fencing efforts to improve water quality for federally listed endangered mussels.

Partners Program projects not only benefit federally listed species, but many State listed species as well. These include sedge wrens, American bitterns, short-eared owls, least bitterns, osprey, and eastern massasauga (rattlesnake). These projects cost between \$200 and \$1,000 per acre to accomplish.

Farming for Wildlife and Profit

The Partners Program recognizes the value of agricultural lands to wildlife and works with agricultural producers to keep farms both economically and biologically productive. The Partners Program also improves the effectiveness of the conservation provisions of the USDA Farm Bill by providing the technical expertise. We evaluate projects for fish and wildlife benefits and demonstrate and recommend management and restoration techniques.

Partners

Natural Resources Conservation Service
Farm Service Agency
U.S. Geological Survey
National Fish and Wildlife Foundation
Environmental Protection Agency
Department of Defense
National Park Service
Pennsylvania Department of Environmental Protection
Pennsylvania Department of Conservation and Natural Resources
Pennsylvania Game Commission
Pennsylvania Fish and Boat Commission
California University of Pennsylvania
Pennsylvania State University
Allegheny College

Edinboro University
University of Pittsburgh
Lycoming College
Bedford County Conservation District
Bradford County CD
Clarion County CD
Washington County CD
Erie County CD
Franklin County CD
Adams County CD
Chester County Parks and Recreation
Montgomery County Parks and Recreation
The Nature Conservancy
Ducks Unlimited
Audubon Society
Trout Unlimited
Pheasants Forever
Ruffed Grouse Society
Kettle Creek Watershed Association
Fishing Creek Watershed Association
Waterfowl U.S.A.
Franklin County Watershed Association
Northwest Pennsylvania Duck Hunters
Accomplishments



Clyde Qualk, a landowner, explaining the benefits of native grasses.

- 975 landowners have had projects completed.
- Over 4,000 acres of wetland habitat have been restored.
- 5,171 acres of grassland habitat have been restored.

- 90 miles of riparian habitat have been restored.
- Five different educational facilities have had wildlife habitat restored on school grounds to be used as outdoor classrooms.

Future Needs

- Restore or enhance 300,000 acres of wetlands, focusing on northwest Pennsylvania and the Susquehanna River Watershed.
- Establish 100,000 acres of grassland, focusing on the southern half of Pennsylvania.
- Restore 5,000 miles of stream habitat.
- Expand habitat available to species of concern, concentrating in the threatened bog turtle in southeastern Pennsylvania and endangered mussels in the Allegheny drainage, the most biologically diverse watershed in the Northeast.
- Work with 300,000 private landowners across Pennsylvania to improve habitat on their property.

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