

**United States Department of Agriculture**



**NRCS**

Natural  
Resources  
Conservation  
Service

# Restoring America's Wetlands



**The Wetlands Reserve Program**

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## The Wetlands Reserve Program

The conversion of native habitats to cropland led to the drainage and alteration of almost 54 percent of the wetlands in this country with some states losing as much as 90 percent, from the 1780s to the 1980s. In recent years, increasing knowledge about the importance of wetland functions has led to policy changes, including the creation of the Wetlands Reserve Program (WRP), that have significantly decreased the loss of wetland acreage and moved the national focus toward restoring wetlands. The WRP is a major contributor for achieving the nation's goal of "no net loss" of wetlands.

The Department of Agriculture's Natural Resources Conservation Service (NRCS), with voluntary participation by landowners and the cooperation of many partners, has restored and protected more than one million acres of wetlands and associated uplands through the WRP. Lands enrolled in the WRP provide habitat for wildlife, decrease flood damages, improve water quality, enhance cultural opportunities for American Indians, create opportunities to generate alternative income, help the recovery of threatened and endangered species, and allow farmers and others to maintain ownership of lands suited for wetland restoration.

## Program Accomplishments

WRP restoration planners are designing new and innovative techniques to restore wetlands to maximize wildlife benefits and ensure the aesthetic quality of the landscape. Historically, wetland restoration consisted primarily of straight dikes and levees and flat wetland basins created by years of agricultural use. NRCS now emphasizes micro and macro-topographic features that create a diversity of water depths and habitats, which enhance biological diversity. In addition, levees and dikes are being constructed in serpentine patterns and lower heights so that they blend into the landscape and create small pockets of sheltered wetlands. For the past several years, NRCS has conducted many workshops on restoring hydrological diversity on wetlands that have been leveled due to past agricultural practices. Now NRCS is incorporating innovative topographic features into restorations that provide a diversity of habitat for amphibians, reptiles, and birds.

## Wildlife and Fish

Biological diversity that depends upon wetlands declined with the loss of wetlands during the last century. By restoring wetlands and associated uplands, WRP provides habitat for a large array of plants and animals that depend upon wetlands, wetland forests, and grasslands. One-third of all bird species in North America depends upon wetlands during some part of the year. Habitat loss and fragmentation are the most important factors causing the decline of many species. Only through habitat restoration and protection can many of these species be restored to viable populations.

WRP provides benefits on a continental scale to migratory birds; many birds nesting in Canada or on restored WRP sites in North Dakota, New York, and Washington are also wintering on restored WRP sites in Louisiana, Florida, and California. Many species, especially songbirds, spend their winters in Mexico and Central and South America.

### Red Slough, OK

■ In southeast Oklahoma a group of landowners restored a 7,500-acre wetland site in Red Slough. Today, the area provides habitat for 256 species of birds. Some of these species include first-time or unusual nesters for Oklahoma, such as wood storks, white ibis, willow flycatchers, roseate spoonbills, and black neck stilts.



Roseate spoonbill.

White ibis at Red Slough, Oklahoma.



### Kootenai River, ID

■ A 1,200-acre restoration project along the Kootenai River in northern Idaho is providing wetlands and uplands habitat for not only wetland dependent species such as shorebirds and waterfowl, but is also providing habitat for elk, deer, grizzly bears, and nesting bald eagles.

Elk.





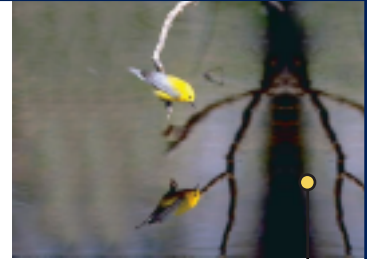
# Wildlife and Fish



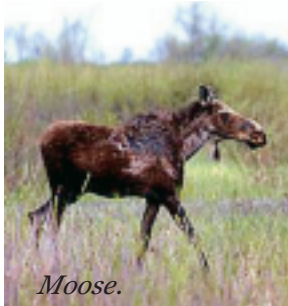
*Sandhill cranes.*



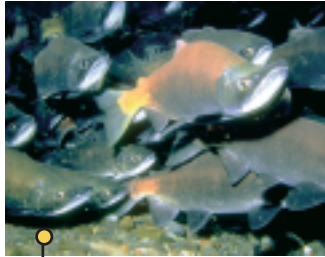
*Lesser yellowlegs.*



*Prothonotary warbler.*



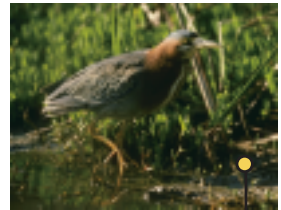
*Moose.*



*Salmon.*



*Bald eagles.*



*Green-backed heron.*

## Glacial Ridge, MN

## Consumnes River, CA

## Raft Creek Bottoms, AR

## Lower Mississippi Valley

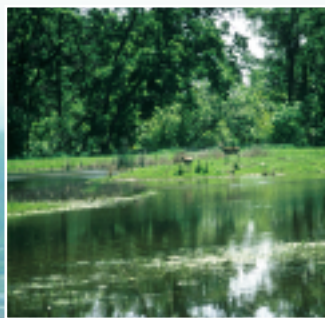
■ The Glacial Ridge project in Minnesota has placed 10,700 acres under easement to provide nesting habitat for shorebirds and waterfowl and even habitat for moose. This large prairie pothole restoration project supports the largest population of the Western prairie fringe orchid in North America. It also supports habitat along the migratory path of sandhill cranes.

*Glacial Ridge pothole restoration.*



■ Wetlands are important spawning areas for many species of fish. Wetlands restored in the Pacific Northwest are improving water quality for steelhead and salmon. Levees were breached along the Consumnes River in central California to provide rearing areas for salmon.

*California riparian area restoration.*



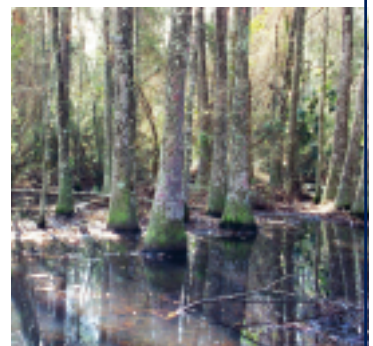
■ Over a half million waterfowl visited a 7,000-acre restoration site in Raft Creek Bottoms along the White River in Arkansas immediately following restoration. The following spring, 20,000 shorebirds foraged in the mudflats and bald eagles nested in the trees.

*Marbled godwit.*



■ Over 80 percent, 6.8 million acres, of the bottomland hardwood forests of the lower Mississippi Valley have been cleared. These wetland forests provide critical habitat to many species of wildlife including songbirds that have declined due to habitat loss and fragmentation. WRP is restoring approximately 500,000 acres of bottomland hardwoods that will eventually provide important nesting habitat to species dependent upon mature forests. However, during the interim, species depending upon open areas and shrub lands will benefit.

*Bottomland hardwood forest.*



*Arkansas WRP is using microtopography restoration techniques to provide habitat for a variety of species.*



## Threatened and Endangered Species

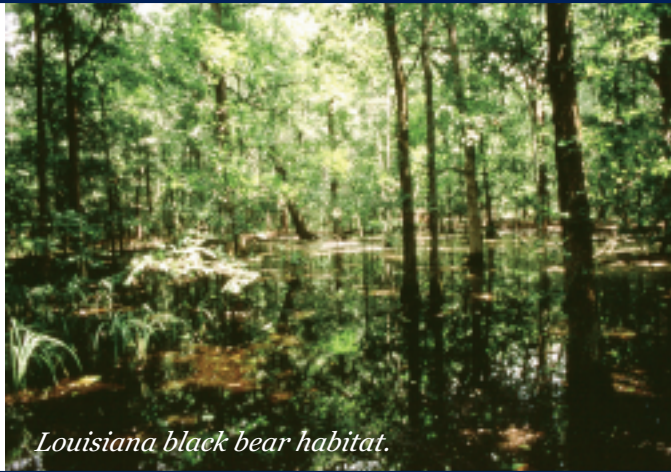
By restoring and protecting wetlands and associated uplands, WRP is an important tool for the recovery of threatened and endangered species.

*Bog turtle.*



**North Carolina**

■ The bog turtle, the second smallest turtle in the world, was listed as a threatened species in 1997 because of habitat loss and fragmentation. A landowner in North Carolina is using WRP to restore and protect habitat for this species.



*Louisiana black bear habitat.*

**Arkansas**

■ In Phillips County, Arkansas, landowners have enrolled 3,500 acres into WRP that provide or will provide habitat for the Louisiana Black Bear. These acres are filling in fragmented areas next to the White River National Wildlife Refuge in the east central part of the state. Louisiana, Mississippi, and Texas are also restoring and protecting habitat for this threatened species.

**Louisiana**

■ Louisiana enrolled more than 232 contracts on 81,674 acres within the Louisiana black bear habitat. Approximately 57,800 acres have been planted to bottomland hardwood tree species.



*Ocelot.*

**Texas**

■ When large wetland-upland complexes are restored, many species benefit, including nonwetland species. For example, uplands that provide important buffers for wetlands in south Texas are protecting scrub thorn forests important to ocelots.



*Nene geese.*



*Pacific Megalagrion Damselfly.*

**Hawaii**

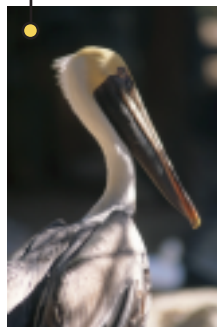
■ In Hawaii, wetland restoration projects have targeted endangered species such as the Nene Goose and Koloa Duck, as well as the Hawaiian damselfly.



*Koloa duck.*

**Puerto Rico**

■ Puerto Rico's Cabo Rojo salt flats that are being protected through WRP are critical to many species of wildlife in the Caribbean. This area provides habitat for piping plovers, peregrine falcons, brown pelicans, manatees, and several species of sea turtles.



*Brown pelican.*

**California**

■ Upland areas adjacent to wetland projects in southern California are being restored to provide habitat for the endangered San Joaquin kit fox, Tipton kangaroo rat, and blunt-nosed leopard lizard.

■ Vernal pools in California, which have rapidly disappeared due to urban growth, are being restored and protected to provide habitat for endangered tadpole shrimp and fairy shrimp.



*California vernal pool.*

**Oregon**

■ In Oregon, deep pools were included on a restoration site to ensure the survival of the endangered Oregon chub. On the same site, logs were placed to provide basking sites for the Pacific pond turtle, which has experienced a significant decline in population.



*Pacific pond turtle.*

Photo courtesy of The Nature Conservancy.

## Flood Protection

Wetlands are critical components of the landscape's hydrology since they serve as detention areas for flood waters. As wetlands were drained, downstream flooding increased. Restoring wetlands allows these areas once again to store water and decrease or slow flood flows.

■ Catastrophic flooding along the Missouri River during the mid 1990s increased interest in expanding floodwater storage. WRP in Missouri has been used to breach levees on 16,000 acres, which has reduced flood heights and decreased downstream flooding. These areas also provide spawning habitat for fish and foraging areas for migratory birds.

■ A 1,200 acre WRP easement in Neosho County, Kansas, provides shallow water wetland habitat and aids in flood protection for the Neosho River Basin. Sixteen wetland cells were constructed that provide 325 acre feet of flood storage capacity and create 370 surface acres of shallow water wetland habitat.

■ In east-central Iowa a number of groups and agencies organized after the floods of 1993 to make better use of flood-prone land along the Iowa River. The Iowa River Corridor contains about 50,000 acres, stretching 45 miles. Nearly 100 conservation easements, including WRP and other program easements, are in place on over 12,000 acres. Estimated flood damage savings over the past 10 years is \$7.6 million.

## Recreation and Education

Wetlands provide more than ecological functions and benefits to fish and wildlife. A growing human population has a greater need for recreation and opportunities to enjoy natural settings. Wetlands also serve as outdoor classrooms where ecological principles can be taught and knowledge gained. Restored wetlands provide recreational hunting opportunities for landowners and many offer fee access hunting on their land. Bird watching and nature viewing are two of the most rapidly growing outdoor activities. Many state agencies have realized the potential for developing non-consumptive recreational values of WRP restorations and are working with NRCS to develop observation towers and parking lots near restored areas.

■ A WRP project in Lyon County, Kansas, contains a large single tract of prairie cordgrass. It is a prime example of native grass lowlands. Emporia State University has used this for student and faculty studies.

■ The Sacramento, California, chapter of the Audubon Society uses the Consumnes River restoration project every other Saturday for bird watching tours.

■ Restoration projects throughout the country are being used as outdoor classrooms to teach biology and conservation. For example, 700 acres in Lee County, South Carolina were enrolled in WRP for environmental education.

■ Another site was donated to Arkansas State University for teaching a wetland restoration class. Not far away along the White River, the University of Arkansas at Pine Bluff is developing graduate school projects to conduct fish, reptile, and amphibian studies.

■ In northern California, fifth and sixth graders are monitoring wood duck nesting success on a WRP site.



## Project Size

WRP projects range in size from two acres to several thousand acres. NRCS recognizes the important ecological benefits of both large and small projects. Therefore, NRCS enrolls a mixture of large restoration projects, projects that adjoin other protected areas, individual projects of varying sizes, and clusters of smaller projects.

*Wisconsin WRP project.*



## Economics

WRP focuses on enrolling marginal lands having a history of crop failure or low yields. These areas are then targeted for the restoration and protection of wetland functions and values, especially for migratory birds and other wildlife.

■ In 1996, approximately \$15 billion was spent on activities related to wildlife viewing. Restoring wetland habitat continues to bolster this segment of the economy.

■ WRP is putting money back into local economies by providing jobs to restore wetlands. In addition, many nurseries have focused on growing trees for use in wetland restoration.

■ Recreational hunting is being expanded through WRP and landowners are generating income by selling hunting rights.

■ WRP provides an opportunity for landowners with financial difficulties to remain on the land by using the easement payment to acquire land better suited for agricultural production or to reduce debt and develop alternative sources of income.

## Cultural Values

■ In Oregon, the Confederated Tribes of the Umatilla are working with NRCS and others to restore wetland plants that have traditional cultural value. In addition, the United Indian Health Service in northern California is using a restored site to grow wetland plants for their medicinal value to American Indians.



*Bulrushes are culturally important to several American Indian tribes in Washington.*

## Water and Air Quality

■ Restored wetlands, particularly those along river flood plains, filter out sediments, chemicals, and nutrients. In addition, the restoration of wetlands on former agricultural fields decreases erosion and the use of pesticides and fertilizers. Research has shown that wetlands trap 50 percent of dissolved phosphate, 70 percent of dissolved nitrates, and 30-40 percent of dissolved organic nitrogen, phosphorus and carbon from farm field runoff each year. The economic value of wetlands along streams and rivers for pollution control is estimated to be \$95 per acre per year.

■ Local water quality is also improved by the restoration of riparian cover that can shade streams and, thus, reduce thermal pollution. This improves habitat for many species of fish, such as salmon.

■ Placing land in permanent cover also reduces air pollution by decreasing wind erosion.

■ In addition, approximately 600,000 acres of WRP lands support growing trees, which sequester atmospheric carbon. Each acre of growing bottomland hardwood forests will sequester 2,566 pounds of carbon each year, according to R. A. Birdsey in 1996 for American Forests.



*New York WRP project.*

## Wetlands Reserve Program History

In 1985, the Food Security Act provided significant protection for wetlands by coupling USDA economic benefits to wetland stewardship. Although successful, this protection was achieved by providing a disincentive for draining wetlands without any incentive to restore wetlands. The Food, Agriculture, Conservation, and Trade Act of 1990 created an incentive by establishing the WRP to restore and protect degraded wetlands through the acquisition of permanent and 30-year easements.

WRP began as a pilot program in nine states in 1992. The pilot was expanded to 20 states in 1994, and then made available as a nationwide program in 1995. The program was quickly accepted by landowners and there are now restoration projects in 49 states and Puerto Rico. The Federal Agriculture Improvement and Reform Act of 1996 expanded the

program by adding restoration cost-share agreements and placing a statutory priority on maximizing benefits to migratory birds and other wildlife.

During the first years of the program, a minimalist approach was taken on restoration efforts. Many of these early projects were referred to as "walkaways" since it was hoped that simple ditch plugs and natural vegetative regeneration would return the lost wetland functions and values. However, this approach did not achieve the full potential of wildlife benefits targeted by the program. After 1996, greater emphasis was placed on restoring wetland hydrology and topographic features, as well as ensuring that the sites maximized wildlife benefits, particularly for migratory birds. Many of the sites enrolled in the program during the first few years are now being revisited so wetland hydrology restoration can be accomplished.

## Enrolling Land into WRP

Landowners wanting to participate in the WRP should contact the local NRCS office. The land is likely eligible if it is agricultural land that contains degraded or converted wetlands that have a high probability for successful restoration. If the site is selected for enrollment, then NRCS develops a restoration plan and makes an offer to the landowner. Existing natural wetlands or adjacent uplands can also be enrolled if they are ecologically important to the restoration of the site. Landowners can choose between a permanent easement, a 30-year easement, or a restoration cost-share agreement to protect the area. If an easement is selected, NRCS pays the landowner an amount based on the agricultural value of the land and the length of the easement. NRCS will pay up to 100 percent of the restoration costs for permanent easements and up to 75 percent for 30-year easements. If a landowner does not wish to sell an easement and chooses a restoration cost-share agreement, NRCS will pay up to 75 percent of the restoration costs. Landowners have predominantly opted to enroll their land through the permanent easement option.

## How Many Acres Are Enrolled?

Year	Acreage Enrolled
1992	43,428
1993	0
1994	75,017
1995	115,071
1996	92,405
1997	127,267
1998	211,917
1999	119,919
2000	149,915
2001*	139,306
<b>Total</b>	<b>1,074,245</b>

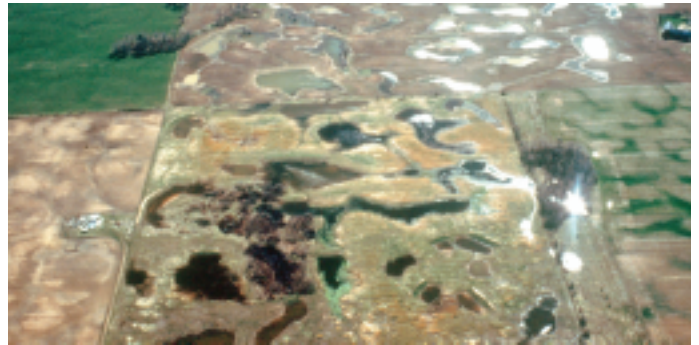
\*At the end of 2001, there were more than 600,000 acres of unfunded applications.

## Costs

As of 2001, there were more than 6,500 restoration projects nationwide that encompass nearly 1,075,000 acres. Project costs vary throughout the country. In 2001, the average cost of purchasing and restoring a permanent easement was approximately \$1,200 per acre. The average cost of purchasing and restoring a 30-year easement was around \$770 per acre. Restoration cost-share agreements, which do not include easement acquisition costs, averaged around \$450 per acre.

## Partnerships

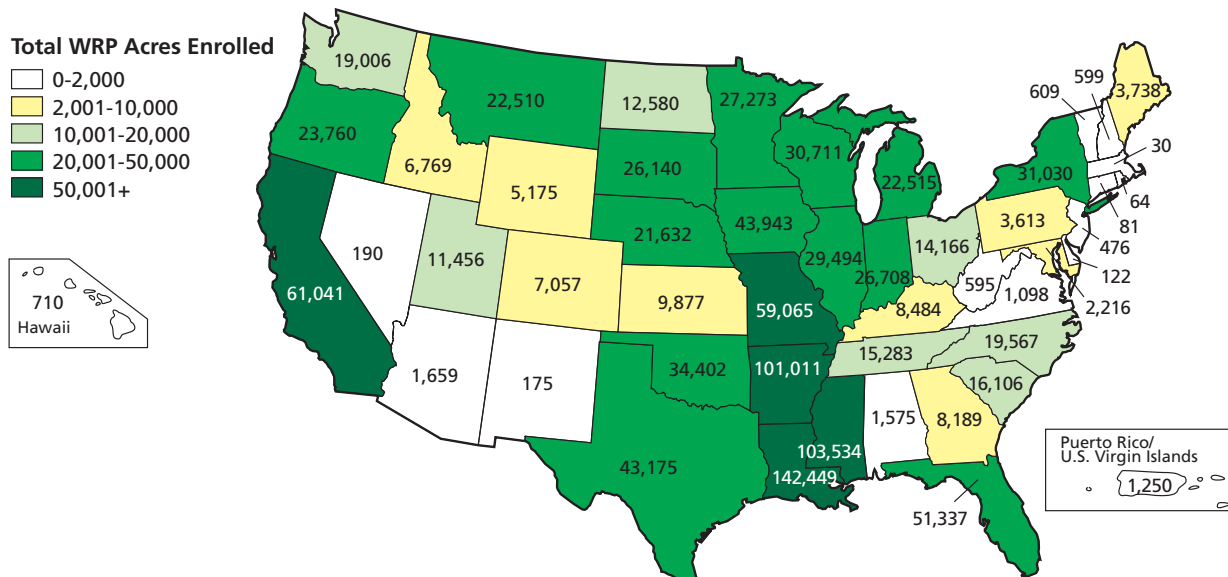
WRP is a voluntary partnership between landowners and the NRCS that provides assistance with the long-term management of restored wetlands. Many state wildlife agencies, the U.S. Fish and Wildlife Service, local conservation districts, and non-governmental organizations have assisted with program implementation by providing additional financial and technical assistance in restoration and wetland protection efforts.



*"Last spring I came out and saw over 5,000 ducks in the wetland. I've never seen such a sight in my life, and it was right here in my backyard."*

— Paul Becker, Wisconsin landowner

## Where Are the Restored Wetlands?







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