



U.S. Fish & Wildlife Service

Partners for Fish and Wildlife 2021 Annual Report



PARTNERS FOR FISH AND WILDLIFE 2021 ANNUAL REPORT



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Migrating sandhill cranes on a Partners for Fish and Wildlife restoration site along the Central Platte River in Nebraska. ©Joe Milmo/USFWS.

MESSAGE FROM THE CHIEF

In 2021, 240 Partners for Fish and Wildlife program biologists completed 1,983 wildlife habitat projects across all states and U.S. territories. Together with nearly 2,000 landowners and 800 conservation organizations, the program restored and enhanced 241,753 acres of upland habitat, 16,879 acres of wetlands and 242 miles of rivers and streams for fish, wildlife and plant species.

Those numbers represent voluntary conservation endeavors that connect, enlarge and buffer national wildlife refuges and other lands and waters to create a conservation landscape that will help people and wildlife thrive for generations.

Thank you to all involved – partners and U.S. Fish and Wildlife Service employees alike – for making 2021 another successful year for the Partners for Fish and Wildlife program. It will be remembered as a year of challenges. A year of a continually mutating coronavirus, rising costs of doing business, and supply chain constraints. A year made more difficult in many cases by the need to meet remotely rather than in person. However, we all adapted and innovated to ensure we delivered conservation together. I am grateful for your efforts and proud to share your accomplishments.

Partners for Fish and Wildlife biologists are connected and resourceful members of communities across America. They fill a critical niche in conservation by offering technical and



financial assistance to design, plan and implement customized projects that meet community and landowner needs – benefitting people, landscapes and wildlife.

If you have not yet experienced the power of conservation partnerships or visited a Partners for Fish and Wildlife project, I encourage you to contact your local biologist. All it takes is a phone call or an email to get started to visit a project or to set up a virtual site visit.

Thank you for all you do on behalf of wildlife conservation. I look forward to continued success working together with all of you in 2022 and beyond to build landscapes where people and wildlife thrive.

Cynthia Martinez, Chief
National Wildlife Refuge System,
U.S. Fish & Wildlife Service



USFWS National Wildlife Refuge System Chief Cynthia Martinez. ©USFWS?

1,983

PROJECTS

\$9.36M

PFW PROJECT
INVESTMENT

\$42.8M

PARTNER
CONTRIBUTION

\$52.1M

TOTAL
PROJECT
INVESTMENT

\$1:4.8

LEVERAGE

242

STREAM
AND RIVER
MILES

241,753

UPLAND
ACRES

16,879

WETLAND
ACRES

57

FISH
PASSAGE
STRUCTURES

NATIONWIDE ACCOMPLISHMENTS



WORKING TOGETHER

With nearly 2,000 landowners and 800 partnering organizations, we completed 1,983 collaborative restoration and enhancement projects in 2021.

Biologist Kurt Waterstradt Meets with Swamp Lovers Inc. Landowners to Conduct a Site Visit at the SwampLovers Foundation Property in Cross Plains, Wisconsin. ©Joe Milmo/USFWS.



Wetland restoration project in Illinois. ©Mike BuddUSFWS.

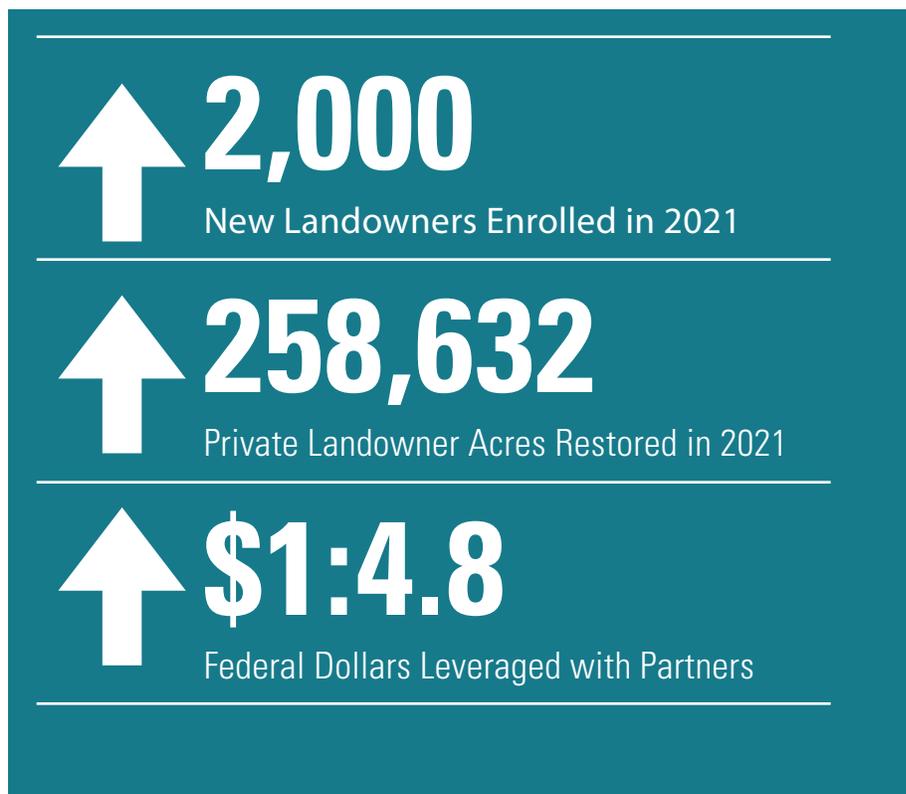
The Partners for Fish and Wildlife program provides technical and financial assistance to landowners interested in restoring and enhancing wildlife habitat on their land. Projects are custom-designed to meet landowners' needs.

Since the program's start in 1987, more than 50,000 landowners have worked with Partners for Fish and Wildlife biologists to complete 60,000 habitat restoration projects across 6 million acres.

Partners for Fish and Wildlife projects are voluntary. Participating landowners continue to own and manage their land to serve their needs while they improve conditions for fish, wildlife and plants.

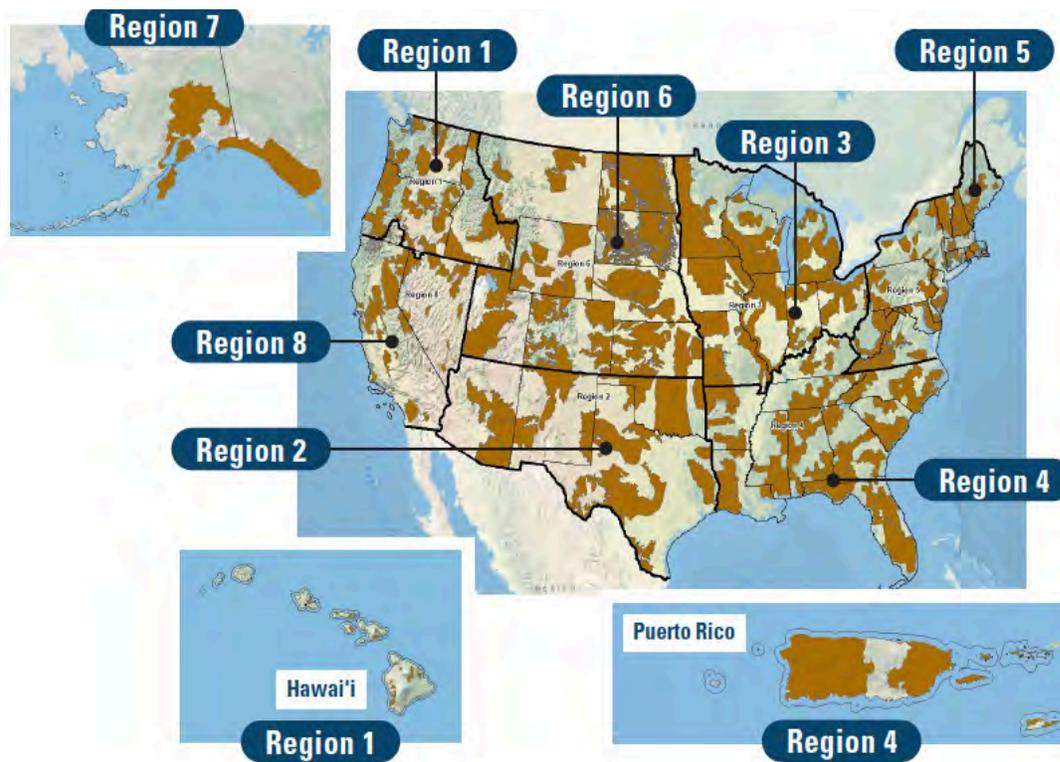
The health of the country's fish and wildlife populations depends on private landowners, who manage more than two-thirds of the country's land. Many Partners for Fish and Wildlife projects take place on working landscapes such as forests,

farms and ranches. Our goal is to keep lands working: increasing sustainability and yield while improving habitat for wildlife. We focus our efforts on areas of conservation concern, such as upland prairies, wetlands, rivers and streams. Projects range in size and scope to benefit federal trust species including migratory birds, endangered, threatened and at-risk species.



STRATEGIC CONSERVATION

NATIONAL GEOGRAPHIC FOCUS AREAS



2022-2026 STRATEGIC PLANS

A Comprehensive Approach to Conservation Planning and Delivery

Our conservation efforts are guided by a three-part National Strategic Plan, which we update every five years. This revision is our fourth generation plan that will cover fiscal years 2022–2026. Collectively, the components of the plan identify conservation goals, priorities, and objectives that were developed collaboratively among Headquarters, regional and field staff, in collaboration with conservation partners and stakeholders. The national strategic plan ensures that we continually allocate our resources toward habitats and priorities with the greatest need. The National Strategy presents the vision, goals, and national priorities. The Regional Implementation Plans present each Region’s geographic focus areas (i.e., priorities), focal species, and conservation objectives. The Strategic Plan Review reports on the Regions’ previous five-year accomplishments and summarizes the Regions’ conservation objectives.

NATIONAL INITIATIVES

Conservation Equity, Inclusion and Diversity

Diversity, inclusion, racial justice and equity are complex, societal challenges that require thoughtful and ambitious solutions. The PFW Program is committed to providing benefits to the American people as we carry out our mission. As part of the Justice 40 initiative, the PFW Program is reviewing how our habitat conservation projects can provide additional benefits and better support these initiatives. Fundamental to our conservation approach is building a diverse coalition of stakeholders, including underrepresented and underserved people, such as Tribes and minority communities and delivering projects that in addition to wildlife conservation, benefit people and communities.

Urban Conservation

According to the U.S. Census Bureau, more than 80% of Americans live in urban areas. The Service recognizes the future success of conservation lies ultimately in our ability to inspire Americans to connect with the outdoors and nature, and to become stewards of the environment which support their communities and the fish and wildlife resources which they depend on.

Youth and Nature

The PFW Program works to foster a connection with nature in communities, especially among youth – the next generation of environmental stewards. The Service is committed to working with local and national non-profit youth organizations by providing internships and other employment opportunities. By partnering with these organizations, upon completion of their commitment, these youth are eligible for a variety of jobs under Special Hiring Authorities in the Service. We can do this by working with local schools, youth job corps and others to create, we help create employment opportunities and restore natural spaces that educate and engage young people.

STRATEGIC PRIORITIES

Species Conservation

Implement habitat projects within priority areas that prevents decline or supports recovery of species of greatest conservation concern, including federal listed species, Birds of Conservation Concern, pollinators and interjurisdictional fish. This priority supports the Service's conservation mission and our role as stewards of federal trust species with intent to make improvements in select species status.

Habitat Connectivity

Integrate projects at a landscape level to improve habitat connectivity and functionality. This priority recognizes that interconnected habitats and migration corridors are vital to fish and wildlife conservation and the work of these programs can support and leverage other ongoing conservation efforts including on National Wildlife Refuges and other protected lands.

Resilient Ecosystems

Advance ecosystem health and resilience to climate change related impacts to benefit communities of fish, wildlife, plants and people. This priority acknowledges that climate change affects all parts of the ecosystem, including those in which humans depend, and the PFW Program can work with diverse partners to support conservation actions to help them respond to climate change stressors.

FARM CONSERVATION

Keeping Working Lands Working



Rural landowners are some of our most important partners in conservation. By working in the right areas and applying best available science, wildlife conservation and sustainable agriculture can fit together like hand in glove.

©USFWS

The Farm Conservation program serves as a liaison to the U.S. Department of Agriculture (USDA), providing technical assistance in the development, implementation and evaluation of Farm Bill conservation programs to ensure shared conservation goals are met, maximizing the benefit to Federal Trust species. By working with our nation's farmers, ranchers and forest landowners, we can implement conservation practices that will contribute to the long-term sustainability of both their agricultural operations and the wildlife populations that depend on the lands under their stewardship.



Ranchers working on a project in California. ©Conservation Media

IN 2021, THE FARM CONSERVATION PROGRAM:

- Provided technical assistance at the national, state and local levels in support of efforts by USDA's Natural Resources Conservation Service and Farm Service Agency to target Farm Bill resources to conserve high priority wildlife and their habitats, such as grassland birds, aquatic species, and pollinators, while also increasing habitat connectivity and ecosystem resilience to climate change.
- Continued to track implementation of the Farm Bill and provided Service-wide information updates on conservation program funding, rules, policies and practices.
- Coordinated with State Fish and Wildlife agencies and other partners to leverage resources and maximize conservation opportunities offered by the Farm Bill.
- Worked in partnership with the Natural Resources Conservation Service, as directed by Congress in the 2018 Farm Bill, to support implementation of the Working Lands for Wildlife model of conservation that offers regulatory predictability to agricultural producers who take actions to conserve declining species on their lands.
- Facilitated engagement by the agricultural community in monarch conservation through participation in Farmers for Monarchs and highlighting monarch and other pollinator conservation efforts.
- Coordinated Service implementation of the National Seed Strategy for Rehabilitation and Restoration to ensure the availability of regionally appropriate native seeds and plant material for restoration projects.



©USFWS



©USFWS

A man with a grey beard and glasses, wearing a dark cap and a white t-shirt, is smiling and holding a large blue crab. The background shows a clear blue sky with some clouds and a green landscape with a road.

1,835
JOBS CREATED

\$6.15
PER \$1 INVESTED IN
ECONOMIC RETURNS

\$149M
TOTAL ECONOMIC
STIMULUS

RESTORATION RETURNS

Creating Jobs and Stimulating
Local Economies

Blue crabs at Mattamuskeet National Wildlife Refuge stimulate the economy through fishing and recreational investments. ©Joe Milmoel USFWS

WHAT WE DELIVER

High Return on Investment of Taxpayer Dollars

A 2018 supplement to U.S. Fish and Wildlife Service national economic analysis titled "Restoration Returns: The Contribution of Partners for Fish and Wildlife Program and Coastal Program Projects to Local U.S. Economies", found that the Partners for Fish and Wildlife program is an extraordinary economic engine, creating local jobs and generating dollars for the U.S. economy.

Numbers at a glance FY2017



This reflects spending for on-the-ground restoration projects completed in FY2017. Program spending for protection activities and staff time to support technical assistance is not included.

Leveraging

For every appropriated dollar invested in Partners for Fish and Wildlife habitat projects on privately owned land, Partners for Fish and Wildlife leveraged an additional \$3.40 in non-federal funds with other partners. Local businesses then hire and pay employees, workers and businesses spend money in the local economy and ultimately the investment is multiplied throughout local communities.

In total, Partners for Fish and Wildlife projects deliver an impactful \$1:6.15 return on investment. Most importantly, our work created 1,835 local jobs, ranging from heavy equipment operators, project supervisors, surveyors, and staff at nurseries, quarries, farm suppliers and more. Additionally, habitats that we have restored have been found to increase property values which greatly benefit the American people.

ECONOMIC RETURNS



Every **\$1** the Partners for Fish and Wildlife Program invested in a project leveraged **\$3.40** in total project funding, which created **\$6.15** in economic returns.



Restoration Returns report, available at <https://www.fws.gov/home/pdfs/restoration-returns.pdf>

\$166,213

**PFW PROJECT
INVESTMENT**

\$227,856

**PARTNER
CONTRIBUTION**

\$394,069

**TOTAL
PROJECT
INVESTMENT**

\$1:2.8

LEVERAGE

4.47

**WETLAND
ACRES**

181

**UPLAND
ACRES**

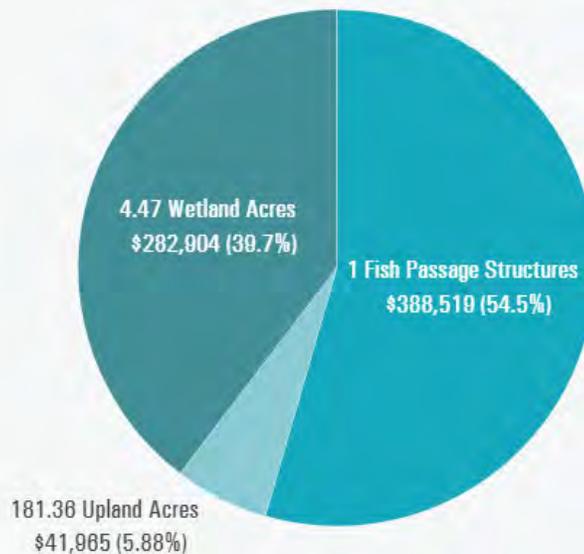
1

**FISH
PASSAGE
STRUCTURE**

ALABAMA



Investments by Habitat Type





SRI training day. ©USFWS

PROJECT HIGHLIGHT:

Urban Darter Project

The unique geological, hydrological, and biological characteristics of central Alabama have interacted over evolutionary time to produce some of the highest levels of biodiversity and endemism in the United States. Despite being the most populated city in Alabama, the Birmingham Metropolitan area is no exception, and is home to three endangered darter fish. Effective conservation of these species will continue to be contingent on community involvement, willing landowners and diverse partnerships. The cultural and economic diversity associated with the distribution of habitat throughout the Birmingham area offers endless opportunities to maximize inclusion, exposing members of underserved communities to species conservation, environmental education, and potential ecological services career opportunities.



Watercress darter. ©USFWS

The project's three primary objectives were to (1) enhance and preserve habitat for trust species in the Birmingham Metropolitan area through partnership-driven community engagement, (2) expose diverse communities to principles of conservation, ecological restoration methodologies, and ecological services career opportunities, and (3) provide training opportunities for habitat assessment methodologies to a broad coalition of conservation specialists to better recognize and implement meaningful restoration and recovery opportunities for at-risk species.

In FY2021, we coordinated an inclusive resource meeting that included partners representing over 20 different organization, as well as students and community members. The meeting topics included habitat needs, restoration completed and planned, internships, and outreach and education opportunities. Since that time, we have developed working groups associated with each component of the project. Two community workdays have been completed at Roebuck Springs and Glenn Springs where local environmental partners, companies, and community members improved habitat for watercress darters, an endangered fish. Three interns were funded during this first year of the project. An intern from Samford University coordinated community workdays, performed habitat improvement tasks, and helped a local non-government organization with their conservation and stewardship work. A second intern from the University of Alabama at Birmingham who had film experience began composing short informational videos of USFWS and partners which will be curated and available to college students as they look for future opportunities. A third intern, also from the University of Alabama at Birmingham is working to improve habitat for endangered species in the project's focus area. In the week after the conclusion of FY2021, we worked with Geological Survey of Alabama, Alabama Department of Environmental Management, Cawaco Resource and Development Council, and The Nature Conservancy to offer a day-long training to environmental professionals and students on bank erosion hazard index, index of biological Integrity, sediment risk index, and rapid habitat assessments.

While there is much more to come from this project in FY2022, benefits to the species and local communities have already begun to accumulate. Several articles on the success of this project have been published by USFWS and other partners. We hope that the Urban Darter Project will serve as a case study on the advantages of a collaborative, community-involved approach to trust resource conservation in an urban setting.

\$235,466

**PFW PROJECT
INVESTMENT**

\$394,837

**PARTNER
CONTRIBUTION**

\$630,303

**TOTAL
PROJECT
INVESTMENT**

\$1:1.68

LEVERAGE

1

**STREAM
AND RIVER
MILES**

3.94

**UPLAND
ACRES**

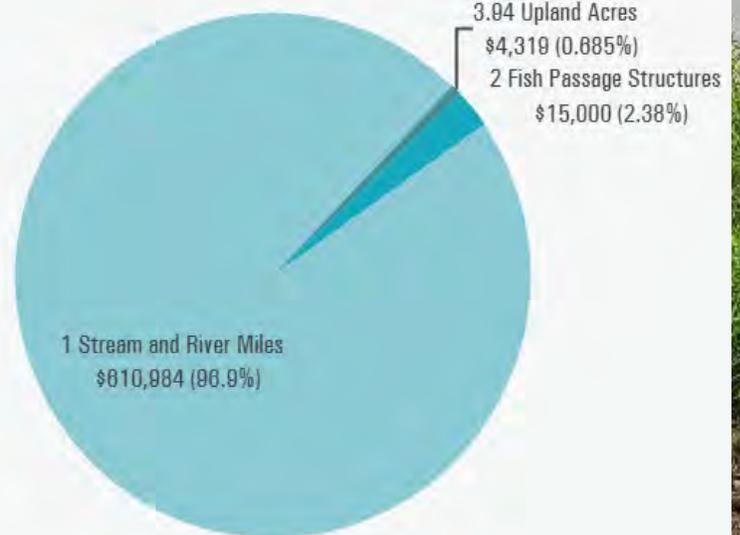
2

**FISH
PASSAGE
STRUCTURES**

ALASKA



Investments by Habitat Type





Youth for Habitat participants prepare topsoil for trenched willow and planting of native vegetation. ©USFWS

PROJECT HIGHLIGHT:

Partnering with Native Corporations

The Fairbanks Soil and Water Conservation District and USFWS established a partnership with Doyon Limited, a Native Corporation primarily composed of people of Northern Athabaskan descent.

The partnership collaborated on streambank restoration work on Doyon lands. The project demonstrates to the Fairbanks community and Native shareholders how riverbanks can be restored to increase high-valued habitat and habitat connectivity for salmon and other wildlife of ecological and cultural significance.

The Fairbanks Youth for Habitat Corps has been improving local habitat and providing a unique experience for local youth since 2009. The Fairbanks Youth for

Habitat seeks to improve local wildlife habitats and provide local area youth with the skills and knowledge for continued land stewardship through the following goals: 1. Provide youth with useful skills, work ethic, character development, and a sense of stewardship towards natural resources through local habitat improvement projects. 2. Improve the community through habitat restoration and education projects that enhance local public spaces that support human and wildlife exchanges. 3. Create a meaningful “first job” experience and career pathway for local youth to work in the outdoors and natural resources fields. 4. Create partnerships with local agencies and organizations that emphasize youth as stewards and active community members. 5. Connect youth with nature as a valuable resource that supports healthy lifestyles and livelihoods.

In the first season of work on Doyon lands, 18 youth working with the Fairbanks Youth for Habitat program began planting native species, including willow, red osier dogwood, and silverberry, along the upper reaches of the riverbank. These species were planted to establish deep roots that will support bank stability, prevent erosion, and provide shade and habitat for aquatic and terrestrial wildlife.

As this project progresses, USFWS and FSWCD want to develop a long-term, meaningful partnership with Doyon Limited and its shareholders. We will continue working with the corporation to improve streambank habitat on its lands, increase education, and provide funding to rural communities looking to undertake riparian restoration projects. We look forward to growing this partnership in the coming years and to fulfilling our agency and organizational commitments to improving habitat for humans and wildlife and to increasing community stewardship of the lands and resources whose value we share.

\$337,219

**PFW PROJECT
INVESTMENT**

\$63,840

**PARTNER
CONTRIBUTION**

\$401,059

**TOTAL
PROJECT
INVESTMENT**

\$1:0.19

LEVERAGE

ARIZONA



2,520

**UPLAND
ACRES**

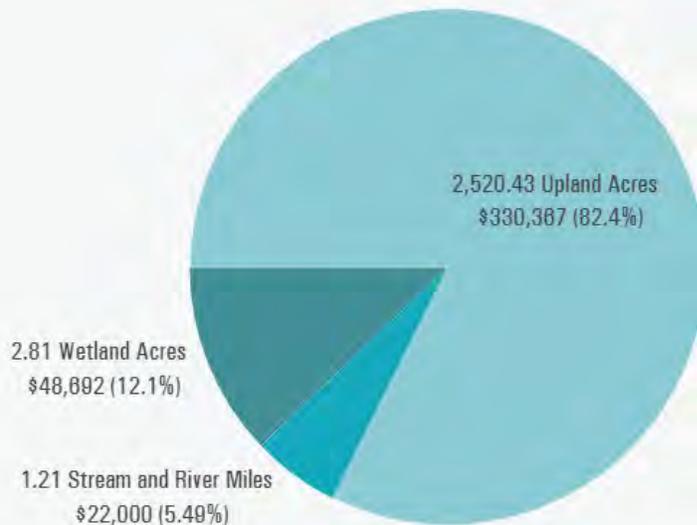
2.81

**WETLAND
ACRES**

1.21

**STREAM
AND
RIVER
MILES**

Investments by Habitat Type



**Before Restoration****After Restoration**

Before and after grassland restoration at the project site. ©USFWS

PROJECT HIGHLIGHT:

Northern Arizona Grassland Enhancement Supporting Secretarial Order 3362

Collaborating with the Arizona Game and Fish Department and a private landowner to enhance grasslands for migratory birds and pronghorn

The Northern Arizona Grassland Enhancement project was a partnership between Arizona Game and Fish Department (AGFD), a private landowner, and the Partners for Fish and Wildlife Program to improve 2,485 acres in support of Secretarial Order 3362. Secretarial Order 3362 focuses on conserving, enhancing, restoring, and improving ungulate big game winter range and migration corridor habitat. AGFD's State Action Plan (Plan) identified Northern Arizona's Grand Canyon to Prescott Corridor Complex (Complex) as a high priority, based upon

the best available science. This project addressed a specific plan need to mechanically reduce juniper (*Juniperus* sp.) tree distribution and abundance across the Complex's grasslands.

Decades of fire suppression and historic livestock grazing facilitated juniper tree expansion across Northern Arizona's grasslands and savannahs. Juniper expansion has fragmented grasslands and reduced grass, forb, and shrub diversity and production. These habitat changes have adversely affected open grassland ungulate species, such as pronghorn (*Antilocapra americana*). Other big game species such as Rocky Mountain elk (*Cervus elaphus nelsoni*) and mule deer (*Odocoileus hemionus*) can also benefit the improved grasses, forbs, and shrubs.

"This project was a great example of a partnership built between our State wildlife agency, the USFWS, and a private landowner as a result of the Partners for Fish and Wildlife Program. Grassland restoration has long been a high priority for the Department and the ability to implement projects on private lands is critical to achieve the goals outlined in our SO 3362 State Action Plan."

—Kyle Dutro, AGFD

\$117,874

**PFW PROJECT
INVESTMENT**

\$216,141

**PARTNER
CONTRIBUTION**

\$334,015

**TOTAL
PROJECT
INVESTMENT**

\$1:1.83

LEVERAGE

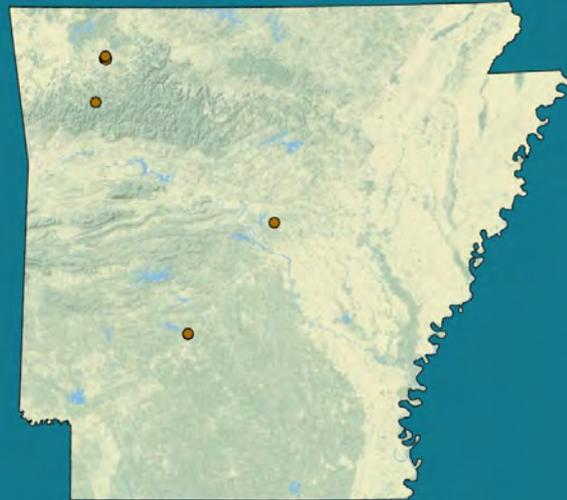
0.12

**STREAM
AND RIVER
MILES**

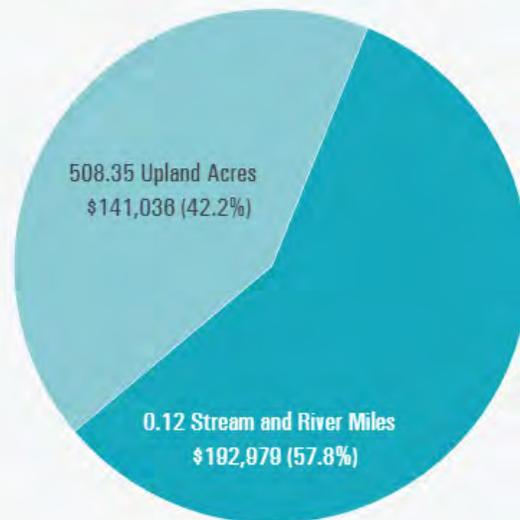
508

**UPLAND
ACRES**

ARKANSAS



Investments by Habitat Type





AWF volunteers hand carry a piece of steel to the cave entrance to be welded into place. ©Teresa Taylor/Arkansas Wildlife Federation

PROJECT HIGHLIGHT:

Lee Creek Res Gate Project: Saving the Ozark Big Eared Bat

This project focused on priority karst habitat in northwest Arkansas. Specialty, multiple designed zero reduction airflow gates were constructed to protect known Ozark Big-eared Bat hibernacula. The gates are specifically designed to not interfere with echolocation, air flow, or restrict the flight abilities of the bats that inhabit the caves. The threats of white-nose syndrome, loss of summer habitat, and human disturbance are known to affect this federally endangered bat, particularly, human presence in caves when pups (only one young per female) are present and during periods of hibernation. This disturbance can cause bats within range of any light or sound to, at least partially, arouse from

hibernation, which can deplete energy reserves meant to sustain the bat through winter or until food sources are available. With the abundance of hiking/ mountain biking trails in the area, these caves receive periods of increased disturbance. With an estimated 2,000 individual Ozark Big-eared Bats remaining throughout its range, these gates will help protect the remaining populations in these caves. The Partners for Fish and Wildlife Program, Arkansas Wildlife Federation, city of Fort Smith, Arkansas Game and Fish Commission, and many volunteers worked together to accomplish this project. Other species that will benefit include, but are not limited to, Northern Long-eared Bat (T), and the federally designated at-risk Tricolored Bat.

For more on the project, see the below news article: <https://www.efortsmith.com/editor-picks/saving-the-ozark-big-eared-bat>



Kristen Bobo welding the gate together inside the entrance of the cave. ©Jim Honaker

\$915,874

PFW PROJECT
INVESTMENT

\$2.16M

PARTNER
CONTRIBUTION

\$3.07M

TOTAL
PROJECT
INVESTMENT

\$1:2.38

LEVERAGE

7.92

STREAM
AND RIVER
MILES

1,614

UPLAND
ACRES

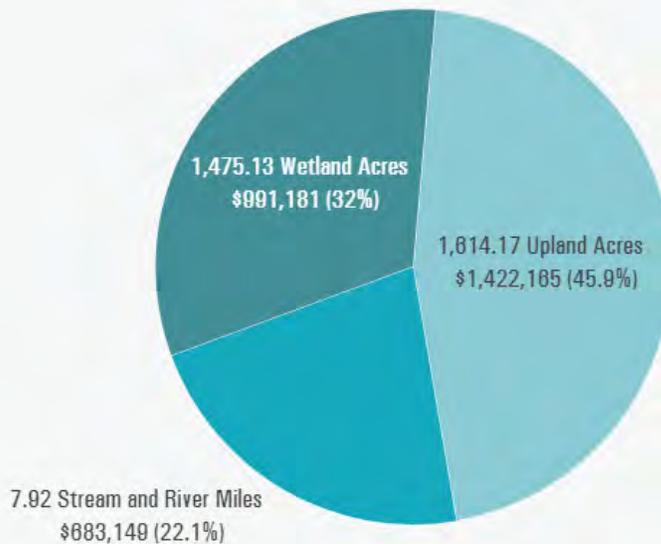
1,475

WETLAND
ACRES

CALIFORNIA



Investments by Habitat Type





Construction crew loading wood at Patterson Creek. ©USFWS

PROJECT HIGHLIGHT:

Patterson Creek Wood Loading Project

Patterson Creek is a cold-water westside tributary to the Scott River. The Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionary Significant Unit of Coho Salmon listed Patterson Creek as one of the Scott River tributaries with high intrinsic potential for coho. However, distinct reaches of the creek have become confined and channelized, resulting in increased stream velocities. The confinement and increased velocities reduced slow water rearing habitat and gravel sorting and disconnected the creek from its floodplain. Additionally, historic management practices and high severity wildfire have reduced the potential for large wood to recruit into the system.

To address these resource concerns, the Partners for Fish and Wildlife Program, along with the landowner and partners implemented this project in three phases. Work completed during the three phases restored degraded habitat for coho and steelhead throughout a 1.25 mile section of Patterson Creek and a 500 foot side channel by directionally felling conifers and hardwoods 6 to 30 inches in diameter into the creek and side channel. . . . Where necessary, California Conservation Corps crews then used grip hoists and block and tackle to move and interlock the trees and/or soft anchor the felled trees against creek side vegetation and boulders to reduce mobilization of the wood and to maximize restoration objectives. By strategically selecting and directionally felling trees into the creek, the loading of the wood partitioned flow, created slow water refugia and overhead cover, sorted gravel and enhanced spawning habitat and increased floodplain and side channel connectivity. Tree tags were applied to selected felled trees to monitor and document their movement within the system for up to five years post project implementation. Information collected from this monitoring effort will be used to inform design of future wood loading projects.

By restoring habitat in Patterson Creek it is expected that this project will increase survival and reproduction of coho salmon and steelhead in the Scott River Valley. Finally, this project has helped Patterson Creek attain NOAA Fisheries Large Woody Debris criteria of more than 20 pieces of large wood per stream mile for properly functioning forest streams in the region.

\$41,619
PFW PROJECT
INVESTMENT

\$245,074
PARTNER
CONTRIBUTION

\$286,693
TOTAL
PROJECT
INVESTMENT

\$1:5.9
LEVERAGE

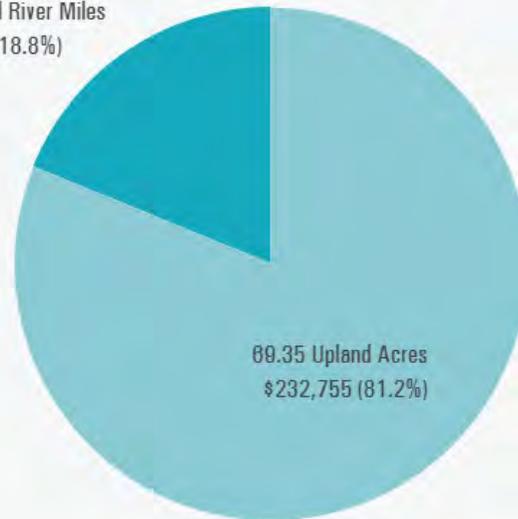
69.35
UPLAND
ACRES
1.13
STREAM
AND RIVER
MILES

CARIBBEAN



Investments by Habitat Type

1.13 Stream and River Miles
\$53,938 (18.8%)



89.35 Upland Acres
\$232,755 (81.2%)



Staff from the Service and Protectores de Cuencas, Inc. with landowners during the certification of the project. ©Protectores de Cuencas, Inc

PROJECT HIGHLIGHT:

Federal Trust Species Habitat Restoration Initiative in Private Lands of the Guajataca River Watershed in Puerto Rico

The Partners for Fish and Wildlife Program in the Caribbean collaborated with local NGOs, Iniciativa Herpetológica Inc. and Protectores de Cuencas, Inc., to restore wildlife habitat for the benefit of threatened and endangered species in private lands adjacent to the Guajataca River Watershed. This project complemented other on-going landscape-level initiatives within same geographic region.

Three Landowner Agreements were developed as part of this project to restore, enhance, and establish new essential habitat for the targeted Harlequin butterfly (*Atlantea tulita*) by planting

native trees/shrubs in order to create biological corridors and increase food availability for this candidate species. Other focal species identified included Matabuey, Palma manaca, Puerto Rican crested toad, and the Puerto Rican boa. The implementation of specific conservation practices within this portion of the island also benefit other State and Federal trust species and other endangered plants species occurring within private lands in the Guajataca River Watershed.

A total of 2,000 native tree/shrub species typically found in this area were planted within three selected private properties located in the municipality of Isabela, Puerto Rico. The properties are of high ecological value because they lie within the Subtropical Wet Forest Life Zone/Northern Karst region adjacent to the Guajataca State Forest.

The Service was substantially involved in the restoration actions performed in each property and collaborated with partners during the planning phase and very actively during the implementation and monitoring activities. The technical assistance provided to the landowners was critical to ensure the successful implementation of the restoration practices.



Staff from Protectores de Cuencas, Inc. planting native trees in a private property as part of the restoration efforts. ©Protectores de Cuencas, Inc.

\$245,623
PFW PROJECT
INVESTMENT

\$713,245
PARTNER
CONTRIBUTION

\$958,868
TOTAL
PROJECT
INVESTMENT

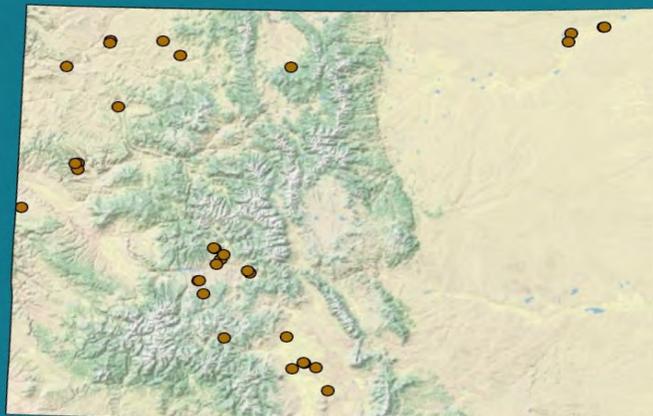
\$1:2.97
LEVERAGE

8.60
STREAM
AND RIVER
MILES

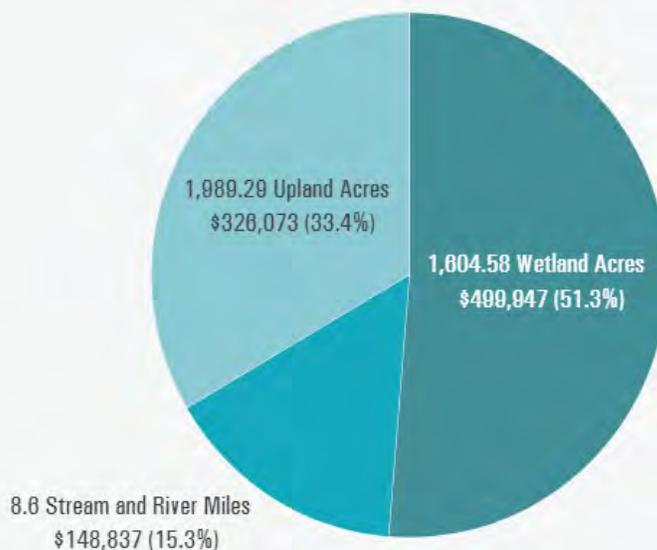
1,989
UPLAND
ACRES

1,605
WETLAND
ACRES

COLORADO



Investments by Habitat Type





Crew installing log structures. ©USFWS

PROJECT HIGHLIGHT:

Planting Cottonwoods to Promote Riverscape Health

This project is located along the Little Dolores River approximately nine miles upstream of the Colorado-Utah border, west-southwest of Grand Junction. The purpose was to improve riverscape health by increasing channel-floodplain connectivity, increasing water storage, extending stream flow, and creating conditions that promote the recruitment of cottonwood. This project used low-tech processes-based restoration techniques (LTPBR) to mimic, promote, and sustain the processes of wood accumulation and beaver activity within identified stream reaches. Installation of LTPBRs included installing approximately 150 post-assisted log structures (PALS) or beaver dam analogues (BDAs) using hand crews.

PALS are used to mimic and promote the process of wood accumulation in the stream. PALS utilize woody material pinned together with untreated posts that are driven into the stream substrate. BDAs are used to mimic and promote the process of beaver dam activity. BDAs are permeable, channel-spanning structures constructed with a mixture of woody debris and fill material (e.g., cobble, mud). Both types of structures were installed throughout stream reaches. Expected outcomes include reduced stream velocity, increased sediment deposition, pool formation, streambed aggradation, increased channel-floodplain connectivity, colonization and expansion of emergent wetland and riparian vegetation, and increased habitat diversity. Federal Trust Species benefiting from this project include Western Yellow-Billed Cuckoo, Lewis's Woodpecker, other migratory birds and resident wildlife.



Beaver dam analog under construction. ©USFWS

2017-2021
PROJECTS

\$48,000
PFW PROJECT
INVESTMENT

\$5,000
PARTNER
CONTRIBUTION

\$53,000
TOTAL
PROJECT
INVESTMENT

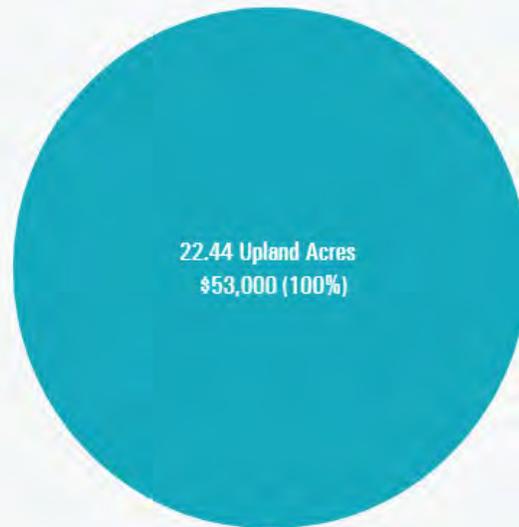
\$1:0.1
LEVERAGE

22.44
UPLAND
ACRES

CONNECTICUT



Investments by Habitat Type





New England Cottontail. Creative commons ©Brandon Keim

PROJECT HIGHLIGHT:

Wewaka Brook

USFWS partnered with The Nature Conservancy to design a New England Cottontail (NEC) habitat restoration project at the Wewaka Brook Farm in Bridgewater, CT. Wewaka Brook Farm & Natural Area is a 325-acre parcel in Bridgewater, CT owned and managed by The Nature Conservancy (TNC). Approximately 100 acres of Wewaka Brook Farm are in field, of which nearly 40 acres is managed for grassland-nesting birds; the rest is forested. Since 2006, New England cottontails (NECs) have been documented in the extensive hedgerows at the north end, and in thickets at the southern end of the property. CT DEEP biologists have studied the effects of eastern cottontail (EC) removal and obtained NECs for the captive breeding

program from the NEC population at the north end. Both north and south populations are now part of the Regional Monitoring Program.

This project promotes the USFWS Northeast Region priority of Conserving At-Risk Species. PFW was substantially involved in the project, through restoration site designs and implementation, review of construction operations during restoration, assistance with permitting, monitoring habitat restoration construction actions, and providing general guidance and technical assistance.



Forest management at Wewaka Brook restoration site. ©USFWS

\$7,698

**PFW PROJECT
INVESTMENT**

\$155,301

**PARTNER
CONTRIBUTION**

\$162,999

**TOTAL
PROJECT
INVESTMENT**

\$1:20

LEVERAGE

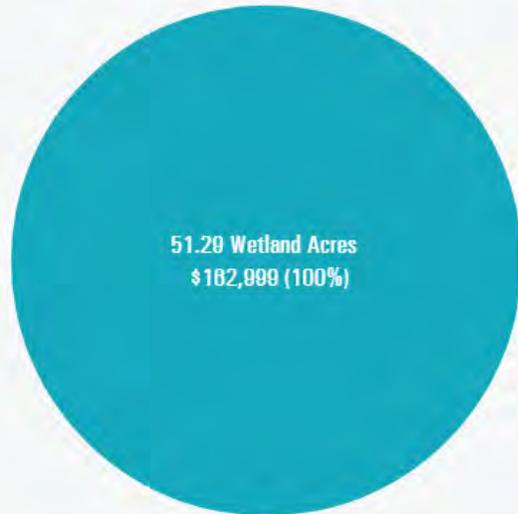
51.29

**WETLAND
ACRES**

DELAWARE



Investments by Habitat Type





Improving breeding habitat in depressions and backwater sloughs in Sussex County. ©USFWS

PROJECT HIGHLIGHT:

Resilient Ecosystems

Restoration and rehabilitation of the degraded wetlands is being accomplished by partial removal of the side cast berms that were generated when the stream was channelized as part of a Tax Ditch system. Allowing more frequent out of bank flows to interface with the floodplains will restore riverine functions such as carbon sequestration and sediment deposition which ultimately will improve downstream water quality. Representative species such as prothonotary warblers will benefit from improved breeding habitat conditions (i.e. longer hydroperiods in depressions and back water sloughs).



Completed wetland restoration. ©USFWS

\$128,206

PFW PROJECT
INVESTMENT

\$579,447

PARTNER
CONTRIBUTION

\$707,653

TOTAL
PROJECT
INVESTMENT

\$1:4.5

LEVERAGE

1.06

STREAM
AND RIVER
MILES

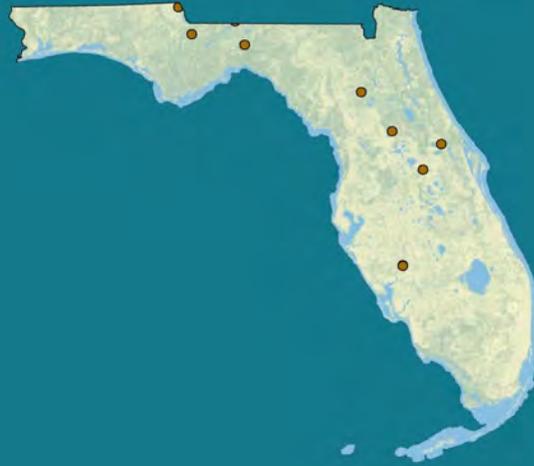
444

UPLAND
ACRES

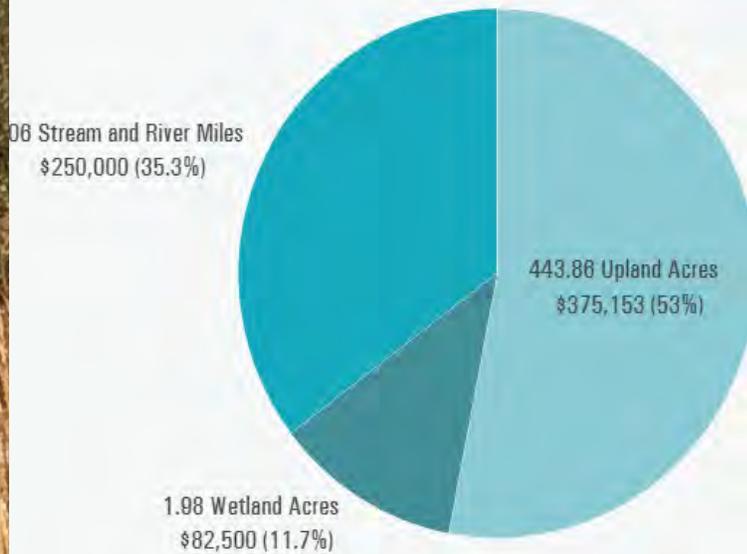
1.98

WETLAND
ACRES

FLORIDA



Investments by Habitat Type





Before and after at 24 acre longleaf pine habitat restoration site at Sweetwater Preserve. ©USFWS

PROJECT HIGHLIGHT:

Sweetwater Preserve Sandhill Restoration (Alachua County, Florida)

Partners for Fish and Wildlife in Florida partnered with the Alachua County Environmental Protection Department to expand longleaf pine habitat by restoring approximately 24 acres of disturbed sandhill on the 125-acre Sweetwater Preserve located in Southeast Gainesville. This restoration project, along with its proximity to other protected lands, provides valuable habitat for the gopher tortoise and Eastern indigo snake. The Preserve is part of the Kincaide Loop Longleaf Restoration Partnership which includes a city park, state park, and private conservation area.

Due to significant topographic changes across the site, the Preserve contains a diverse assemblage of

plant communities ranging from baygall and floodplain forest transitioning to seepage slope forest and arriving at several upland communities including the targeted sandhill. Prior to county acquisition in the mid-2000s the site was used for agriculture and ranching with some indication that it may have been part of Rancho de la Chua, the oldest known cattle ranch in Florida. This land use was not conducive to native sandhill, thus specific restoration efforts targeting the degraded plant community were a priority from the beginning.

While the county had initiated some restoration on its own, they decided to team up with the Partners for Fish and Wildlife Program to chemically treat hardwoods, vines and other invasive exotics, apply prescribed fire with a preference for growing season, install wiregrass plugs, and seed open areas free from invasive species. Based on the hurdles the projects had to cross, it offers a compelling lesson in employing systematic chemical treatment to achieve specific outcomes. Stewardship of the Sweetwater Preserve will continue to improve the sandhill components of this habitat for the gopher tortoise and Eastern indigo snake.

Despite challenges related to site prep, prescribed fire, staff turnover, covid restrictions, etc. the project eventually wrapped up in 2021. Items completed include the chemical treatment of invasive exotics, pasture grasses, and off-site hardwoods; 2 prescribed fires (June 2018 and June 2020); installation of wiregrass plugs; and the seeding of diverse native groundcover species and planting of site-specific hardwoods collected from local conservation areas.

Restoration efforts have resulted in reduced midstory, improved ground cover, and notable longleaf pine recruitment and retention.

\$324,913

**PFW PROJECT
INVESTMENT**

\$289,914

**PARTNER
CONTRIBUTION**

\$614,827

**TOTAL
PROJECT
INVESTMENT**

\$1:0.89

LEVERAGE

2,815

**UPLAND
ACRES**

0.14

**WETLAND
ACRES**

0.74

**RIVER
AND STREAM
MILES**

GEORGIA



Investments by Habitat Type

0.74 Stream and River Miles

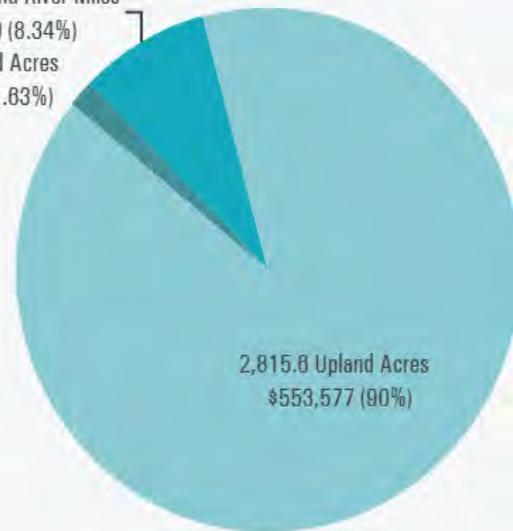
\$51,250 (8.34%)

0.14 Wetland Acres

\$10,000 (1.63%)

2,815.8 Upland Acres

\$553,577 (90%)





Gopher tortoise at American Forest Foundation project site. ©USFWS

PROJECT HIGHLIGHT:

Longleaf Pine Habitat Enhancement

Through a continued cooperative effort with the American Forest Foundation, Partners for Fish and Wildlife assisted several private landowners to complete restoration / enhancement projects across the range of the longleaf pine ecosystem in Georgia. These projects provided habitat improvements for gopher tortoise, a candidate species for federal listing, and other listed, and at-risk species including, eastern indigo snake, eastern diamondback rattlesnake and Bachman's sparrow. In addition, valuable information about density and the extent of gopher tortoise populations was gathered from species surveys conducted by the Georgia Department of Natural Resources (GDNR). Another partner,

the Georgia Forestry Commission, provided technical assistance for prescribed burning and other associated restoration / enhancement forestry practices.

One specific project focused on 1,296 acres of longleaf pine enhancement within a landowner's property in Calhoun County, Georgia. Within the acreage footprint, practices included: prescribed burning, herbaceous weed control to release recently planted longleaf pine seedlings, forestry mowing, and hack and squirt herbicide application to remove undesirable hardwood and exotic species within the mid-story forest canopy. Prior to project implementation, a gopher tortoise survey conducted by GDNR discovered 338 gopher tortoise burrows and an estimate of 150 gopher tortoises on the property. The habitat enhancement practices provided by this project will benefit the existing individuals and provide opportunities for population expansion.

\$25,000
PFW PROJECT
INVESTMENT

\$25,000
PARTNER
CONTRIBUTION

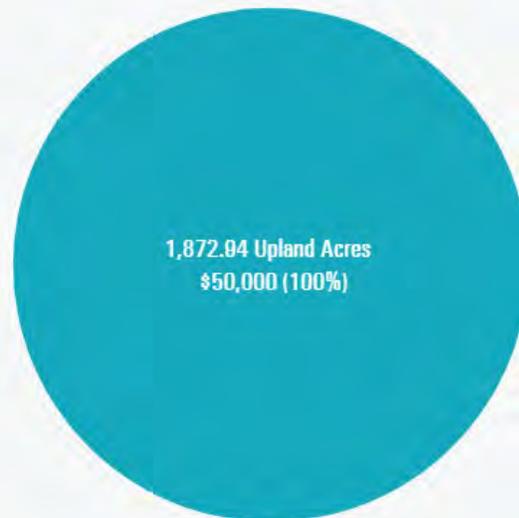
\$50,000
TOTAL
PROJECT
INVESTMENT

\$1:1
LEVERAGE

HAWAII



Investments by Habitat Type



1,873
UPLAND
ACRES



Before and after gorse control at Haleakala Ranch. ©USFWS

PROJECT HIGHLIGHT:

Priority Weed Management at Puu Pahu

This project was with a private landowner of a working cattle ranch that protected an important ecosystem in the subalpine forests of Haleakala through weed control, fence maintenance, and animal control. Gorse (*Ulex europaeus*) is a significant invasive species found on Haleakala, and this project included significant mechanical and chemical control. Fence maintenance and animal control were also essential for protecting existing native forest found at the ranch. The ranch worked with contractors and conservation partners (Department of Land and Natural Resources and others) to remove the last remaining ungulates from Puu Pahu preserve. Once feral animals were removed and priority invasive plants were effectively

controlled, the area has begun to recover and have little need for extensive out planting or other intensive management.

At this elevation, native forest birds can escape mosquitoes which carry avian malaria. Protecting this area is a form of climate change adaptation with which will strengthen resilience of the forest as higher temperatures slowly increase to higher elevations over time which allows the mosquitos to move into previously safe habitat for native forest birds. This project will also benefit rare and endangered species within the Maui Island focus area. Rare species benefiting from this project include: Nohoanu, Hawaiian goose, Hawaiian hoary bat, and Hawaiian petrel.



Early Koa tree outplanting with PFW biologist Malia Nanbara. ©USFWS

\$184,403

**PFW PROJECT
INVESTMENT**

\$779,434

**PARTNER
CONTRIBUTION**

\$963,837

**TOTAL
PROJECT
INVESTMENT**

\$1:4.2

LEVERAGE

2.16

**STREAM
AND RIVER
MILES**

1,242

**UPLAND
ACRES**

63.52

**WETLAND
ACRES**

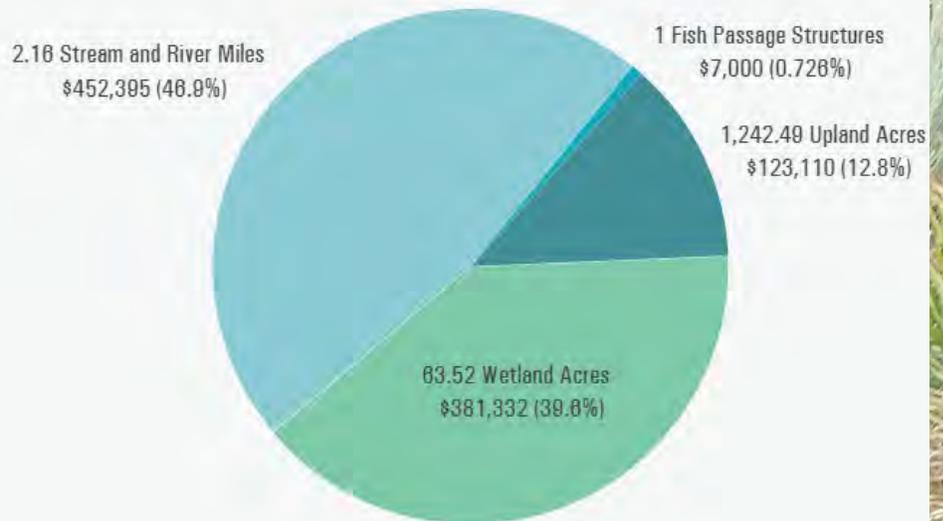
1

**FISH
PASSAGE
STRUCTURES**

IDAHO



Investments by Habitat Type





Fence rolling at project site. ©USFWS

PROJECT HIGHLIGHT:

Promoting Wildlife Corridors: Rock Creek Fence Removal

This project is part of a larger, western United States wide effort to improve habitat quality in big game winter range and reduce threats across important migration corridors. The University of Idaho's Rinker Rock Creek Ranch, near Hailey, Idaho, is a working ranch that also serves as an education, research, and outreach facility. The 10,400-acre ranch has a diverse assemblage of habitats that support a variety of wildlife species from greater sage-grouse to big game.

This project focused on relocating and building approximately 8.5 miles of wildlife friendly fence to more appropriate areas. The previous fence was mostly sited along the road, and would at times be located on steep topography, or be redundant

to another nearby fence. The new fence was aligned with more smooth topography, and long straight lines. It was constructed as a 3 strand, high-tensile electric laydown fence. The fence would only be up during the livestock grazing season and would only be electrified when livestock were present. Because of the temperate climate, this meant that most wildlife interactions (fall and spring) would occur outside of livestock presence, which would mean no or minimal fence obstructions.

Species benefitted include Greater sage-grouse, moose, mule deer, pronghorn, and wapiti.



PFW biologist Jason Pyron with landowner/producer Wyatt Prescott at a ranch. ©USFWS

\$69,320

**PFW PROJECT
INVESTMENT**

\$286,433

**PARTNER
CONTRIBUTION**

\$355,753

**TOTAL
PROJECT
INVESTMENT**

\$1:4.1

LEVERAGE

305

**UPLAND
ACRES**

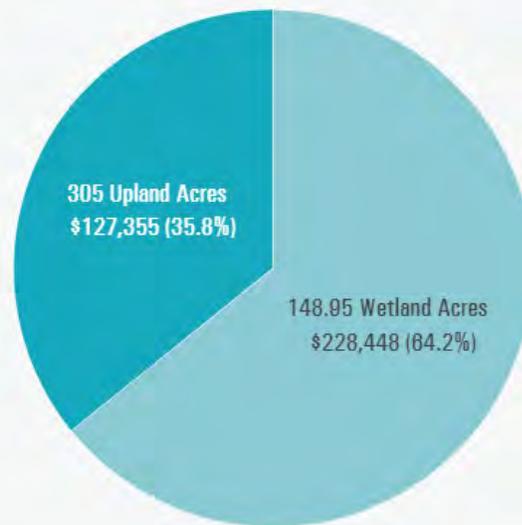
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**WETLAND
ACRES**

ILLINOIS



Investments by Habitat Type





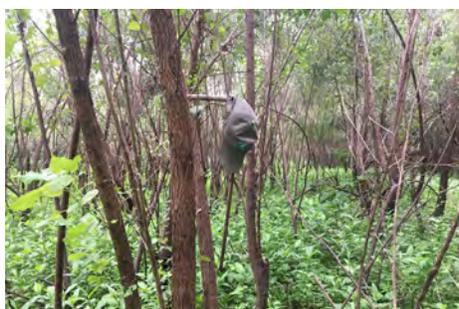
After restoration. ©Jason BleichUSFWS

PROJECT HIGHLIGHT:

Spunky Bottoms Wetland Ecosystem Restoration

This PFW project enhanced 25 acres of wetland habitat in Brown county Illinois. The project involved grinding and cutting encroaching woody and herbaceous vegetation to allow sunlight to reach to soil surface and promote annual moist-soil vegetation beneficial to migratory waterfowl and other waterbirds. A heavy offset disk was used to destroy the woody vegetation root structure and stimulate annual seed production. The Service is assisting with the removal of woody vegetation with the primary goal of re-establishing the Federally threatened decurrent false aster (*Boltonia decurrens*). Funding for this project came from the Illinois Habitat Stamp funds awarded to Ducks Unlimited. The Service was a matching partner on

the grant and wrote the proposal as part of a larger effort along the Illinois River to recover this species while providing quality waterfowl habitat.



Before Restoration



During Restoration



After Restoration



Before, during and after restoration phases at the Spunky Bottoms restoration site. ©Jason BleichUSFWS

\$107,383

**PFW PROJECT
INVESTMENT**

\$416,313

**PARTNER
CONTRIBUTION**

\$523,696

**TOTAL
PROJECT
INVESTMENT**

\$1:4.2

LEVERAGE

315

**UPLAND
ACRES**

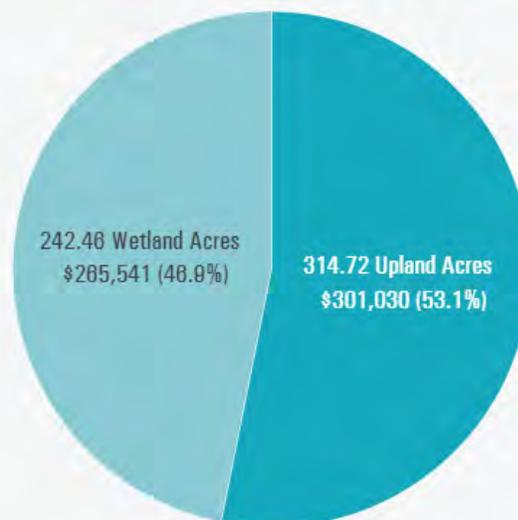
242

**WETLAND
ACRES**

INDIANA



Investments by Habitat Type





Restoration site at the NICHES Land Trust. ©USFWS

PROJECT HIGHLIGHT:

Whistler-Hare Woods

The 100-acre Whistler-Hare Woods property was recently purchased by NICHES Land Trust and is now under permanent protection. The unique property features sandstone rock exposures, white oak and pine woodlands, and diverse native plant communities that border Big Shawnee Creek, which drains to the Wabash River. A portion of this property contained degraded woodlands and a failed Christmas tree farm, which led NICHES to partner with USFWS to restore 38 acres of oak and white pine woodland. The site is in Indiana's Southwest River Corridors Focus Area, and is a mile from Shawnee Bottoms, a 518-acre preserve where previous fecon work in partnership with USFWS has been completed. This property lies within a forested

corridor that connects to Snyder-Marshall Woods, another 41-acre NICHES property, with six private properties in between. NICHES has long been known for their community involvement and outreach, and this corridor restoration project brought the opportunity to get the private landowners involved. NICHES held several site visits for landowners to learn about invasive species threats and the habitat restoration process. That dedicated engagement led to all six landowners in the corridor partnering with PFW to allow access for invasive species removal and selective tree thinning, for a total of 81 acres of habitat enhancement. On the 38 acres of Whistler-Hare Woods, restoration began by cutting the Amur honeysuckle using a fecon machine, followed by foliar spraying limit resprouts of honeysuckle. Once the invasive shrubs were controlled, oak woodland thinning of Osage orange, black locust, and white mulberry occurred to further open the canopy and encourage growth of the oak community. Tree removal occurred outside the Indiana bat reproductive season of April 1 – September 30 to avoid impacts to the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*). The goal of the project was restore the open oak woodland community beneficial to a host of priority forest-dependent migratory birds including red-headed woodpecker, Acadian flycatcher, Eastern wood-peewee, wood thrush, Kentucky warbler, and great-crested flycatcher. Improved habitat is also provided for the Northern bobwhite as well as the federally endangered Indiana bat, which has records in the area. The PFW biologist conducted a site visit, assisted the landowner in the development of a restoration and management plan for the site, worked with the landowner to ensure that the restoration activities met habitat objectives, and coordinated with the contractor.

\$67,008
PFW PROJECT
INVESTMENT

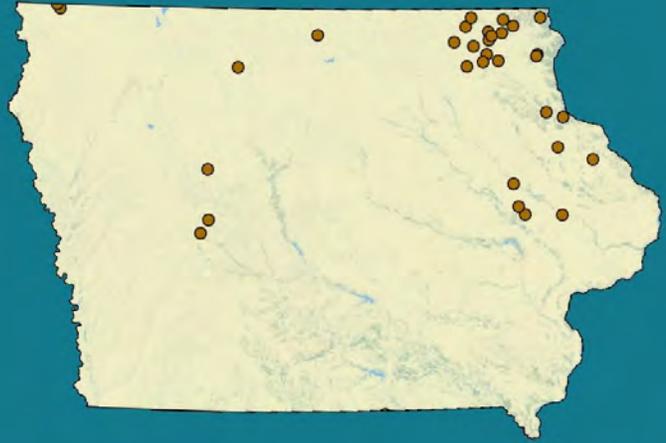
\$286,487
PARTNER
CONTRIBUTION

\$353,495
TOTAL
PROJECT
INVESTMENT

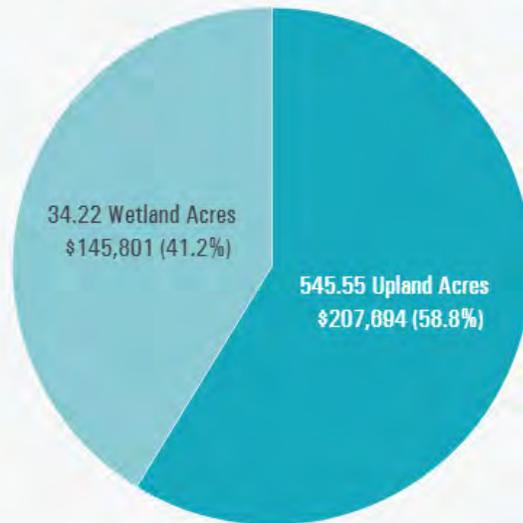
\$1:4.3
LEVERAGE

546
UPLAND
ACRES
34
WETLAND
ACRES

IOWA



Investments by Habitat Type





Restored floodplain habitat. ©USFWS

PROJECT HIGHLIGHT:

This project restored floodplain habitat for at-risk mussel species (plain pocketbook, pink papershell, and mapleleaf) and to reestablish native prairie on disturbed areas. Floodplain habitat restoration will include tree removal, in-stream boulder placement, floodplain benching to reduce erosion and enhance off-channel wetland (oxbow) habitat. Native prairie reestablishment will be accomplished by seeding a diverse native seed mix in disturbed areas to stabilize soil and diversify habitat for pollinators and migratory birds. The Horseshoe Bend Wildlife Area is owned and managed by the Dickinson County Conservation Board and is in the Service's Iowa Wetland Management District and PFW's Prairie Pothole Focus Area. The Service provided technical assistance including survey, design

(including estimates for PSA removal quantity and costs, seed mix, etc.), permitting/compliance (e.g., floodplain, ESA, cultural) and assisted with bidding and construction oversight assistance. The Conservation Board provided in-kind labor for tree removal and native prairie seed, and the Iowa DNR provided boulders, benching, and native prairie seed funding.



Before and during restoration. ©USFWS

\$113,460

PFW PROJECT
INVESTMENT

\$745,162

PARTNER
CONTRIBUTION

\$858,622

TOTAL
PROJECT
INVESTMENT

\$1:6.6

LEVERAGE

36.34

STREAM
AND RIVER
MILES

7,882

UPLAND
ACRES

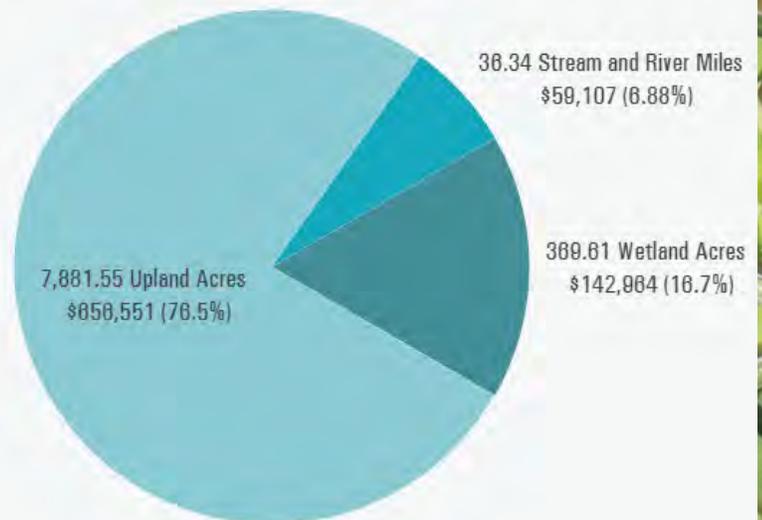
370

WETLAND
ACRES

KANSAS



Investments by Habitat Type





Before and after restoration. ©Aron Flanders\USFWS.

PROJECT HIGHLIGHT:

Invasive Tree Removal and Prescribed Fire

This project enhanced 1,610 acres of habitat for grassland-dependent wildlife species while benefiting working agricultural lands and surrounding communities through increased livestock forage, soil health, water quantity, economic growth, wildlife and plant diversity and reduced risk of wildfire. This project restored and or enhanced upland and wetland habitat within the Red Hills of South-Central Kansas and the Kansas Partners for Fish & Wildlife Program's Southwest Prairies and Playas Focus Area.

Several lesser prairie-chicken leks are documented within 10 miles of the project site. The combined annual ranges of all lesser prairie-chickens attending one lek has been estimated to be 6,000-12,000

acres. In order to provide these large contiguous grasslands required by prairie-chickens, this restoration area strategically builds upon over 30 restoration projects completed by Kansas PFW working with the ranching community. These diverse prairie habitats support priority grassland birds and the area is within a high production region for Monarch butterfly, providing breeding and migrating habitat.

This project addressed the invasion of eastern redcedar and other tree species, historically controlled by periodic fire, within the native grasslands. Left untreated, the woody encroachment fragments and eventually replaces the grassland, impacting wildlife, livestock producers and ecosystem functions. Practices implemented on this project included mechanical invasive tree control, firebreak establishment, prescribed burning and prescribed grazing. As a result of the conservation practices, sunlight stimulated broadleaf flowering plant (i.e. forbs) production throughout the accomplishment area, supporting wildlife and cattle. Increased forb cover and milkweed production benefitted monarch production and migration. Large-scale grassland enhancement supports monarch migration by improving habitat connectivity.

This project improves habitat resiliency and promotes native plant community establishment, diversity during a changing climate with potential for reduced rainfall and other abnormal weather patterns by maintaining beneficial habitat management practices such as grazing, prescribed fire and invasive species control. Healthy native prairies are an important component in carbon sequestration and restoration helps meet the needs of Kansas ranchers and wildlife that depend on these systems.

\$14,983
PFW PROJECT
INVESTMENT

\$13,300
PARTNER
CONTRIBUTION

\$28,283
TOTAL
PROJECT
INVESTMENT

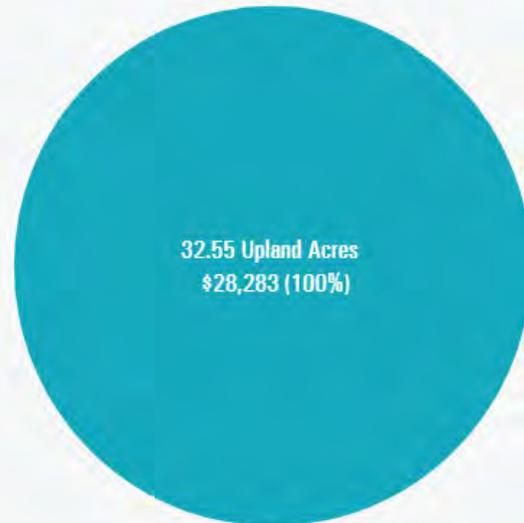
\$1:0.89
LEVERAGE

33
UPLAND
ACRES

KENTUCKY



Investments by Habitat Type





Monarch butterfly and pollinator habitat sign. ©USFWS

PROJECT HIGHLIGHT:

Restoring Kentucky's Cedar Barrens with Prescribed Fire

PFW in Kentucky facilitated the completion of a prescribed fire essential in restoring a native cedar barren known as Rose Barrens.

Located in the central part of Kentucky, Rose Barrens is part of the Big Barrens Region of Kentucky, an area known for prairie and barren remnants and other rare plant communities. Big Barrens Region is a Strategic Habitat Conservation focus area for the Service and other conservation partners.

Owned by the Southern Conservation Corp (SCC), Rose Barrens is highly diverse and is home to a broad host of native prairie-barren species naturally present, which includes but not limited to little blue stem, big blue stem, prairie drop seed, side oats gamma, rattlesnake master,

Bergamot, and butterfly milkweed. SCC is managing Rose Barrens for the monarch butterfly, a candidate species for protection under the Endangered Species and the federally endangered Indiana bat. Kentucky is very important for the monarch's conservation as it is in the southern portion of the monarch's breeding habitat and it is also in its migration corridor. There are also plans to increase rattlesnake master plants on the site to benefit the rare rattlesnake master moth, which also occurs in the county. This site also provides habitat for several neotropical birds species such as prairie warblers, whip-por-wills and the American woodcock. Less than 1.0% of native barren and prairie habitats remains on earth making them one of the earth's most endangered ecosystems.

Unfortunately, eastern red cedar and invasive species such as autumn olive and *Sericea lespedeza* have suppressed the native barren remnant for many years. Therefore, restoration of the site required opening the canopy and allowing suppressed native forbs and grasses to release and grow. To assist in meeting this objective, SCC and KFO-PFW conducted an eastern red cedar harvest to reduce the encroachment of cedar trees. However, the cedar harvest left cedar tops and woody material, but also opened the canopy and released other woody plants, including the invasive species. To address this, a prescribed fire was planned to reduce the fuel load of cedar tops. This initial burn would then set the stage for more normal prescribed burns that would be used to kill or set back other woody succession and invasive species.

Working closely with the Kentucky Department of Forestry and SCC, we burned burned approximately 55 acres of native barren remnant during the spring growing season. This prescribed burn successfully reduced fuel loads and woody plant competition. This is part of a larger effort by the KFO-PFW, SCC, and other conservation partners to restore barren and prairie habitats.

\$25,293
PFW PROJECT
INVESTMENT

\$86,550
PARTNER
CONTRIBUTION

\$111,843
TOTAL
PROJECT
INVESTMENT

\$1:4.4
LEVERAGE

0.83
STREAM
AND RIVER
MILES

78
UPLAND
ACRES

89
WETLAND
ACRES

KLAMATH BASIN



Aerial photo of Lakeside Farms Wetland Restoration site. ©USFWS



Habitat restoration in action at Lakeside Farms. ©USFWS

PROJECT HIGHLIGHT:

Lakeside Farms Wetland Restoration and Flooded Cropland Enhancement

This project is a collaborative effort between the landowners, Klamath Watershed Partnership, the Klamath Basin NWR Complex, and the Klamath Falls Ecological Services office. With foresight, adaptability, and a conservation ethic, the landowners have been an engaged partner in a holistic effort to achieve multiple ecological outcomes: contributing to the recovery goals for shortnose and Lost River suckers by reducing phosphorus inputs into Upper Klamath Lake that are directly linked to toxic cyanobacteria blooms; preserving and enhancing critical Pacific Flyway waterbird habitat; and providing rearing habitat for older age class endangered suckers.

For this project to be sustainable for the landowners and of greatest ecosystem benefit, the following goals were addressed: preserve agricultural production and revenue, reduce pumping of phosphorus-laden agricultural water into Upper Klamath Lake, develop functional semi-permanent wetland habitat, and preserve important flood irrigated cropland around Upper Klamath Lake. Waterfowl populations in the Klamath Basin have substantially declined over the last 20 years, reaching an all-time low in fall 2021. Much of this decline is associated with climate change, over-allocation of water, and conversion to more efficient irrigation systems. Over the last several years, many farms in the Upper Klamath Basin have begun shifting toward irrigation efficiency (e.g. center pivots, wheel-line irrigation, etc.), compromising the limited remaining agricultural production lands that support fall and wintering waterbird habitat.

This project resulted in the development of a 70 acre semi-permanent wetland, a 10-acre pond for rearing endangered suckers, and the preservation of > 270 acres of flooded grain. Because of this project, this property was able to provide fall-flooded cropland for the first time in several years, and has consistently supported > 20,000 ducks this October and November.



Flooded cropland enhancement at Lakeside Farms. ©USFWS

\$130,000
PFW PROJECT
INVESTMENT

\$188,000
PARTNER
CONTRIBUTION

\$318,000
TOTAL
PROJECT
INVESTMENT

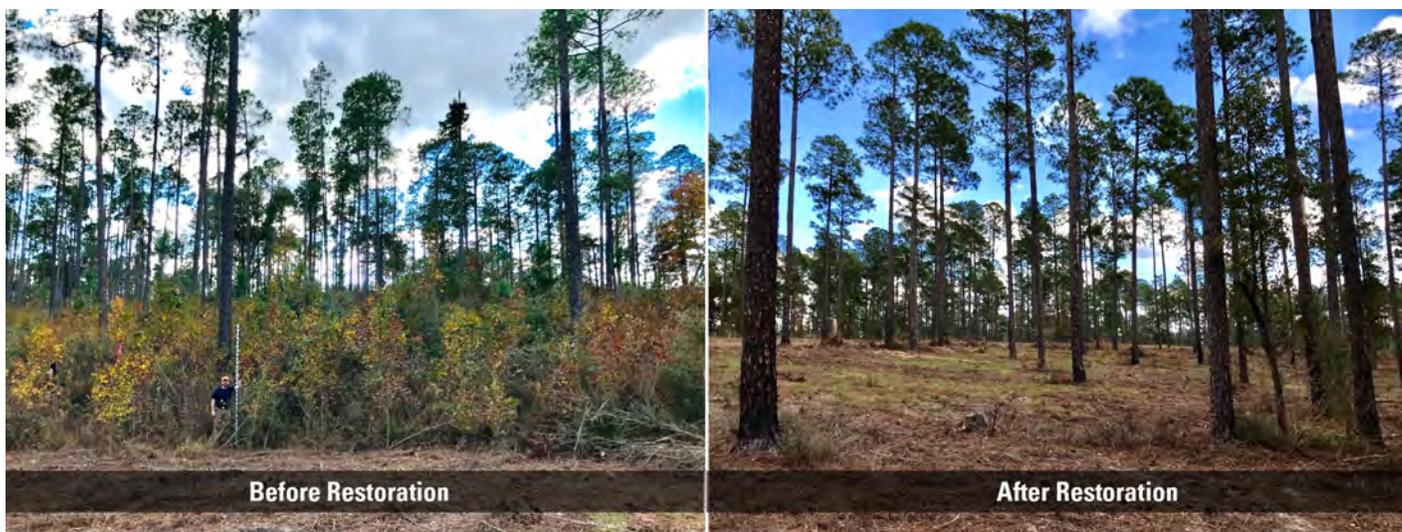
\$1:1.44
LEVERAGE

1,565
UPLAND
ACRES

LOUISIANA



Red cockaded woodpecker habitat. ©USFWS



Before and after mechanical clearing at project site. ©USFWS

PROJECT HIGHLIGHT:

Proactive Conservation of At-Risk Species and Pollinator Conservation

This is a longstanding habitat improvement project in Sabine Parish, Louisiana, that is benefiting from the collaboration of numerous partners including The Nature Conservancy, National Wild Turkey Federation, the Longleaf Alliance, and the Natural Resources Conservation Service. The 4,300-acre project site is known as the Louisiana Ecological Forestry Center, or LEAF Center, and is operated to provide opportunities for education, research, and community outreach. With financial and technical help from the PFW Program and other partners, the LEAF Center is being managed to transform the 4,300-acre property from a commercial pine operation to an open longleaf

pine forest with a diverse herbaceous understory that will benefit listed and at-risk species, including the threatened Louisiana pinesnake and endangered red-cockaded woodpecker. Partners for Fish and Wildlife has specific interest in this project site because it contains suitable soils for Louisiana pinesnakes and their primary food source, the pocket gopher.

Habitat treatments completed during 2021 totaled 1,565 acres of upland restoration efforts, including 15 acres of midstory tree/shrub removal via mechanical clearing, 53 acres of herbicide treatment, 1,087 acres of prescribed burning, and 410 acres of overstory harvest/thinning to create a low basal area and allow more sunlight to reach the forest floor. Invasive species control (both mechanical and chemical) was completed to treat recent incursions by Chinese tallow-tree and Chinese privet. Maintenance activities planned include the upkeep of fire lanes, prescribed burns on a two to three year timeframe, and raking around red-cockaded woodpecker nest trees where cavity inserts were installed.

While habitat improvement activities are ongoing at the LEAF Center, the restoration and enhancement work accomplished in 2021 resulted in the emergence of pocket gopher mounds in many locations following treatment. This offers a promising outlook for the future return of the Louisiana pinesnake to this once occupied area. The project site is now even being considered as a potential reintroduction site for the species.

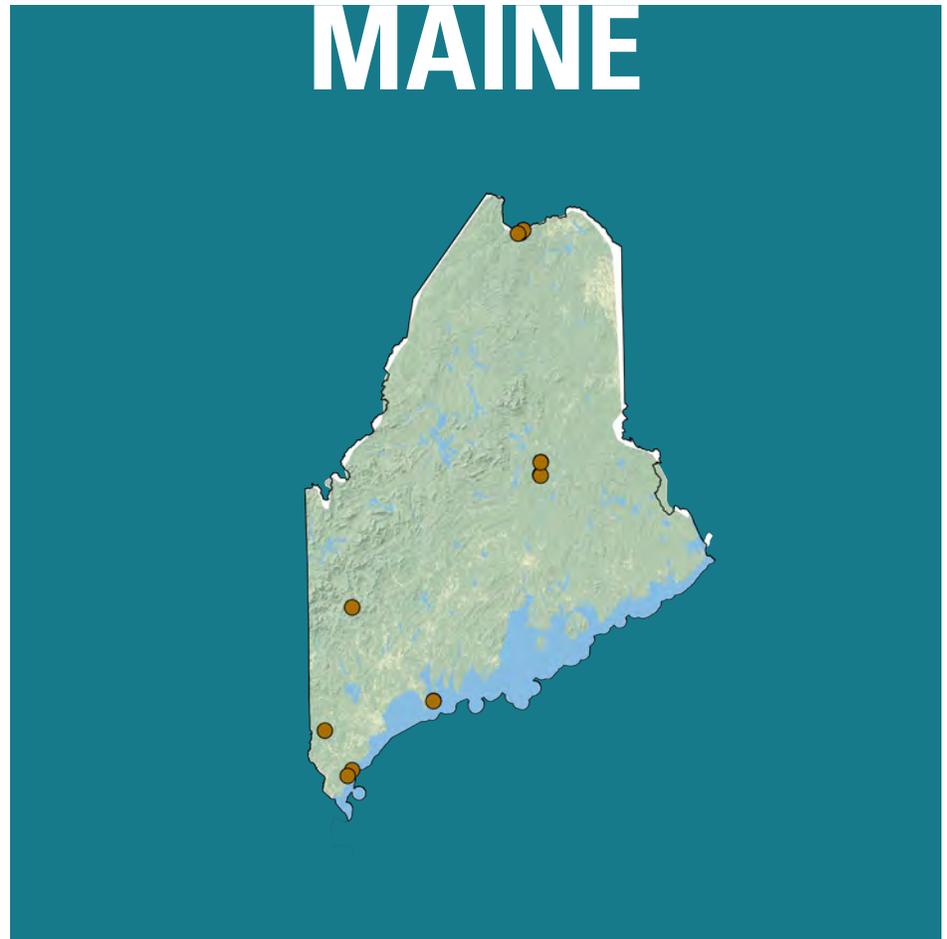
\$289,525
TOTAL
PROJECT
INVESTMENT

5.61
STREAM
AND RIVER
MILES

8.71
UPLAND
ACRES

12
WETLAND
ACRES

7
FISH
PASSAGE
STRUCTURES



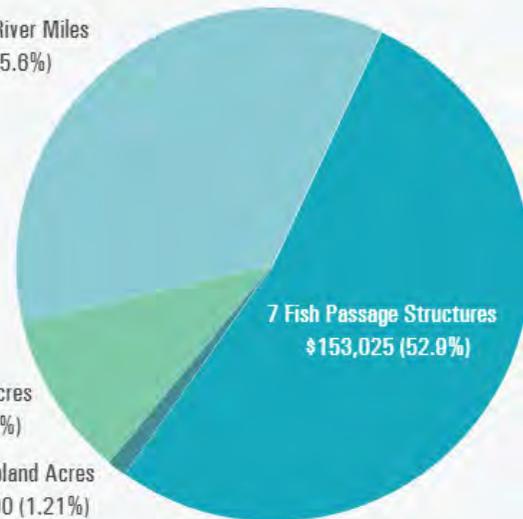
Investments by Habitat Type

5.61 Stream and River Miles
\$103,000 (35.8%)

12.11 Wetland Acres
\$30,000 (10.4%)

8.71 Upland Acres
\$3,500 (1.21%)

7 Fish Passage Structures
\$153,025 (52.0%)





PFW biologist Hannah Mullally installing flowage device. ©USFWS

PROJECT HIGHLIGHT:

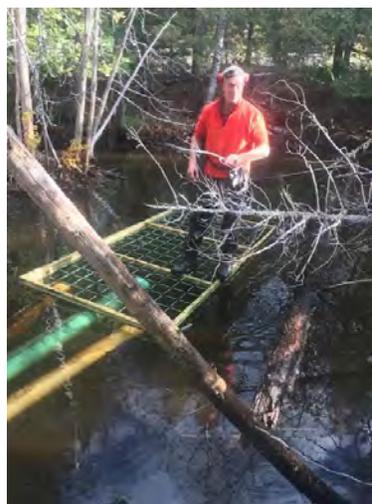
Eastern Prairie Fringed Orchid Habitat Restoration

The US Fish and Wildlife Service (Service) Maine Field Office (MEFO) Partners for Fish and Wildlife Program (PFW) continued to work with The Nature Conservancy (TNC) to restore habitat for the federally listed Eastern Prairie Fringed Orchid (EPFO). This partnership takes place on TNC's Crystal Bog. Crystal Bog includes unique circumneutral fen communities which support the only known population of the EPFO in the Northeast.

Factors which appear to be limiting to the orchid include shading by shrubs or forest canopy as well as invasive species pressure. Fires during the dormant season and early growing season have been found to be beneficial for the species. The EPFO's habitat was maintained by

fire in the past when the bog was unintentionally burned by sparks from steam locomotives traveling along the adjacent railroad tracks. This disturbance was eliminated with the advent of diesel locomotives and as allowed encroachment of trees and shrubs into prime EPFO habitat.

The overarching goal of this partnership is recovery of this species by restoring hydrology and periodic fire disturbance regimes to the area. This year, beavers dammed the fen outlet stream, leading to flooding of this threatened plant's habitat. The Service contracted Skip Lisle, president and founder of Beaver Deceivers International in Vermont to design and build flowage devices to resolve this flooding. Service staff worked on site with Skip to build these devices which will discourage beaver damming in the future. Future work on Crystal Bog will utilize PFW technical assistance and species recovery funding to complete monitoring, prescribed burn plans, invasive species control, and cedar removal. There will also be opportunities for planting Eastern Prairie Fringed Orchid seeds in the future.



Skip Lisle installing flowage device at project site. ©USFWS

\$54,800

**PFW PROJECT
INVESTMENT**

\$547,908

**PARTNER
CONTRIBUTION**

\$602,708

**TOTAL
PROJECT
INVESTMENT**

\$1:10

LEVERAGE

74

**WETLAND
ACRES**

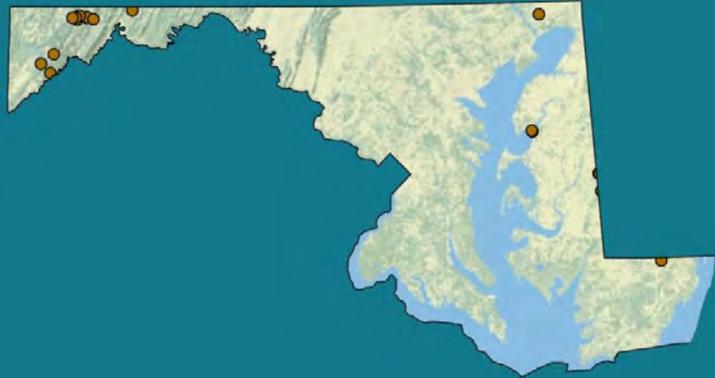
164

**WETLAND
ACRES**

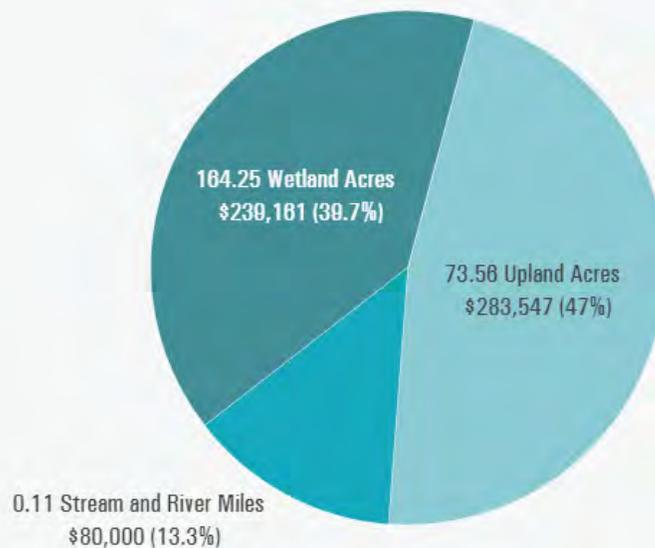
0.11

**STREAM
AND RIVER
MILES**

MARYLAND



Investments by Habitat Type



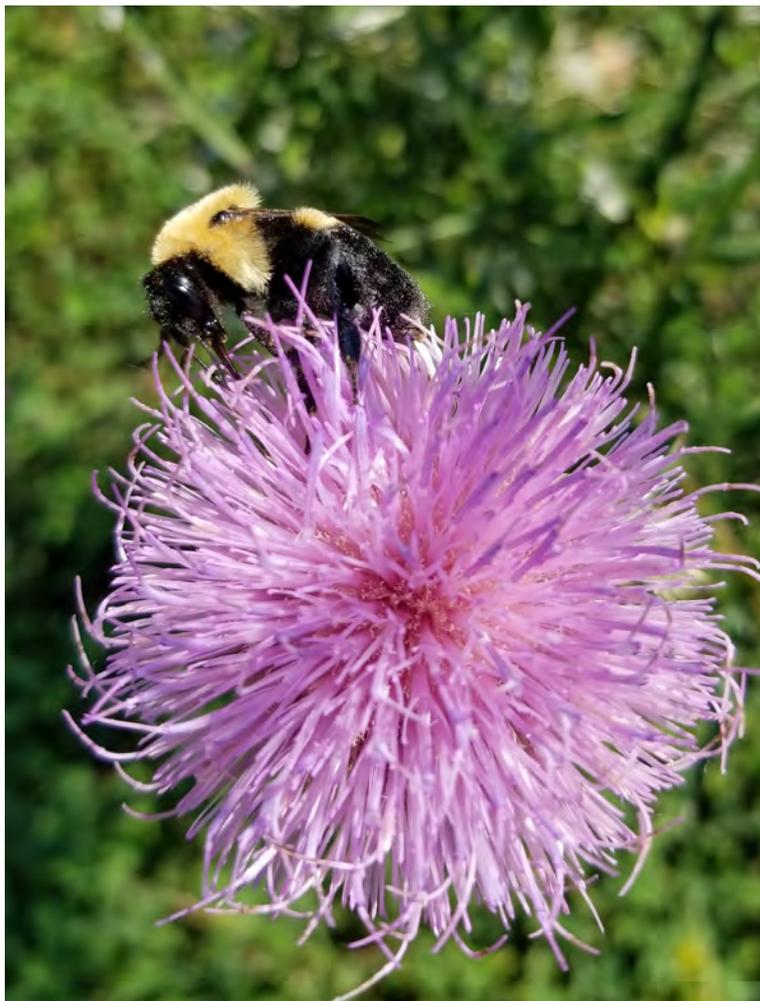


Restored wetland photo. ©Leah Franzluebbbers\USFWS

PROJECT HIGHLIGHT:

This is a cooperative project between Queen Anne's County Parks, The Natural Lands Project, and USFWS. The site is a county park (744 acres) and is permanently protected. Restoration activities include the construction of five berms to restore 33 acres of shallow emergent wetlands, the construction of five ditch plugs to restore forested wetland hydrology, planting 15 acres of open fields to trees, and establishing 125 acres of grassland. The site will be a complex of seasonal wetlands, upland meadows, and forests, providing habitat for migratory birds, amphibians, and other species. The project is located on a peninsula between the Chester and Corsica Rivers and lies six miles from Eastern Neck National Wildlife Refuge. The restored habitat will provide habitat for a wide range of wetland

dependent birds, songbirds, and raptors. The park has walking paths and is open to the public for a variety of activities. It is particularly well-liked for birding.



©Leah Franzluebbbers\USFWS

\$101,050
PFW PROJECT
INVESTMENT

\$90,600
PARTNER
CONTRIBUTION

\$191,650
TOTAL
PROJECT
INVESTMENT

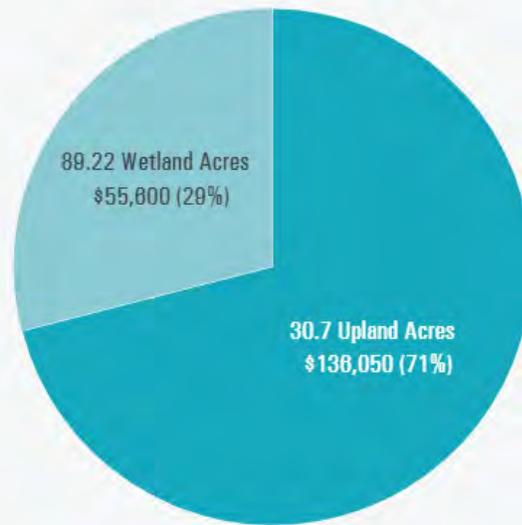
\$1:0.9
LEVERAGE

30.7
WETLAND
ACRES
89.2
WETLAND
ACRES

MASSACHUSETTS



Investments by Habitat Type





Prescribed fire application, in partnership with Colrain Fire Department. ©USFWS

PROJECT HIGHLIGHT:

Chapman Pasture Pollinator Restoration

Chapman Pasture is an 8-acre old field parcel which was pastured for sheep for the past 25+ years. The property is part of a contiguous 95-acre conservation corridor in the Silver Hill Bog area of Lincoln. Silver Hill Bog is a high biodiversity site identified by MassWildlife’s Natural Heritage and Endangered Species Program (NHESP). Chapman Pasture was selected by the LLCT as one of three conservation properties in Lincoln to be studied and developed over a three-year period as part of the Lincoln Pollinator Action Plan: Planting for Biodiversity and Climate Resilience. In partnership with a professor of biology at UMass-Dartmouth and director of the New England Beecology Project, and a consultant, the LLCT will rebuild

functionally diverse native ecosystems through the restoration of native plant communities to support at-risk bee and lepidoptera species specifically, using site-specific management techniques and developing planting palettes and pollinator habitat designs that are based in scientific study. LLCT proposes a 10-year long-term management plan for the Chapman Pasture. Year 1 (2020) involves inventory of current species (completed). Year 2 (spring 2021) involves extensive field restoration work. Specifically, the LLCT proposes a prescribed burn to clear the existing non-native grasses which dominate the site; to push back the cold season grasses and encourage native warm season grasses and forbs. Fall of Year 2 (fall 2021), the site will be seeded with native forbs, grasses and sedges, and planted with native woody shrubs and trees in the wet swale running through the center of the site, all of which will specifically target at-risk pollinator species (preferred pollen and nectar plants, and host plants). Years 3-10, the site will be brush hogged and managed to continue to encourage native pollinator and plant species. Additional burning/management will be considered as is necessary. Priority will be given to plants that support the pollen, nectar, and nesting needs of at-risk bee, butterfly and moth species, and especially to plants that support the widest possible range of such species per plant.



40+ inch grasses, post-restoration. ©USFWS

\$194,889

PFW PROJECT
INVESTMENT

\$415,873

PARTNER
CONTRIBUTION

\$610,762

TOTAL
PROJECT
INVESTMENT

\$1:3.53

LEVERAGE

902

UPLAND
ACRES

256

WETLAND
ACRES

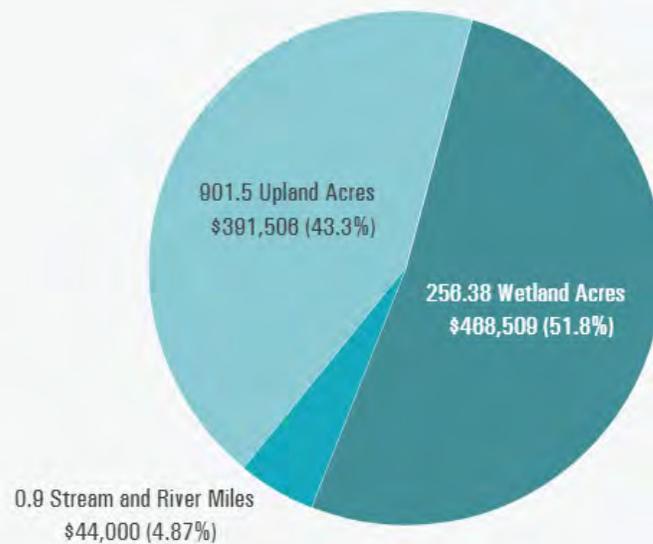
0.9

STREAM
AND RIVER
MILES

MICHIGAN



Investments by Habitat Type





Urban-focused work at a community church, near Detroit. Parishoners volunteered to plant and maintain the pollinator planting at their school USFWS photo. ©USFWS

PROJECT HIGHLIGHT:

Wayne County Pollinator Garden

This project represents some of PFW's urban-focused work, connecting a community church near Detroit to nature through a small pollinator plot. The Service provided native grass and wildflower plants and technical assistance to design and install a 0.05 acre Schoolyard Pollinator Garden on St. Philip Lutheran Church/School property. The Church worked with the parishioners, students and local volunteers to plant and will maintain the site. The PFW Biologist provided technical assistance, native grass & wildflower plants or plugs (both quart and gallon size containers) in May 2021, and assisted in planning and planting the project site that will benefit Monarch butterflies, native bees, other native pollinators and wildlife. The Church worked with

the biologist to complete all site preparation activities, engage parishioners, students and local volunteers to plant and maintain the pollinator planting for the agreement period. Site preparation activities included removing existing vegetation in the project area, adding topsoil to the planting area, installing mulch and designing a seating area. Other recommended materials for the project site beneficial to pollinators included flat rocks for basking sites, bee nesting boxes, water sources, and areas of bare soil/rock for nesting. The project will improve the quality and function of the Church property by converting existing lawn and un-utilized areas of the property to provide habitat for Monarch butterflies, native bees, and other pollinators, and for the benefit of the church and community of Wayne County.



Schoolyard pollinator garden. ©USFWS

\$508,858

PFW PROJECT
INVESTMENT

\$3.22M

PARTNER
CONTRIBUTION

\$3.73M

TOTAL
PROJECT
INVESTMENT

\$1:6.4

LEVERAGE

0.85

STREAM
AND RIVER
MILES

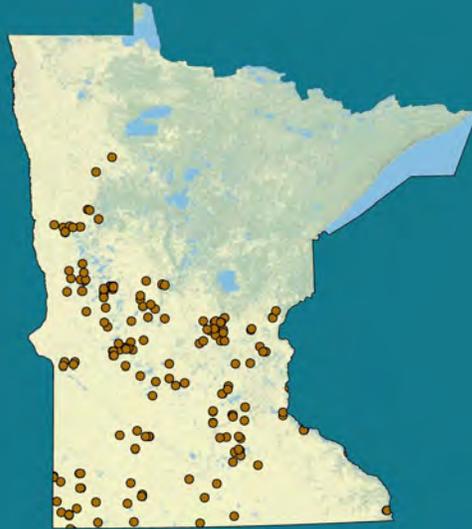
4,612

UPLAND
ACRES

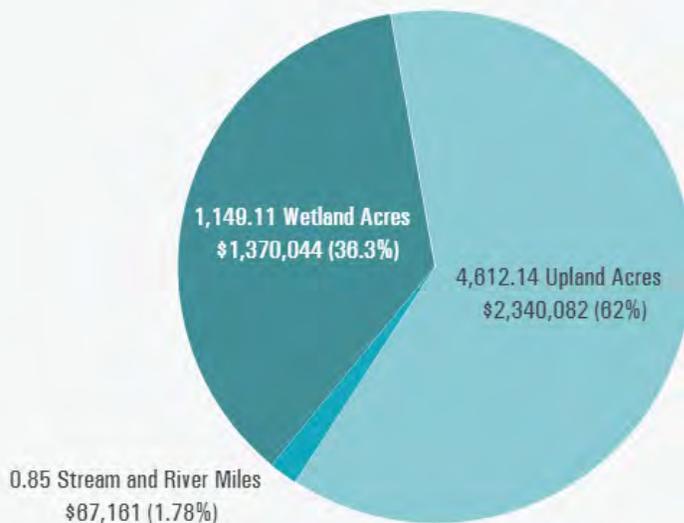
1,149

WETLAND
ACRES

MINNESOTA



Investments by Habitat Type





Before and after restoration. ©USFWS

PROJECT HIGHLIGHT:

Isanti County Wetland Restoration

This project consisted of restoring three wetland basins and one prairie, totaling 31 acres, in Isanti County, MN. The Partners biologist worked collaboratively with the landowner to mutually benefit from the restoration of these habitats. The PFW biologist supported Service priorities by working collaboratively with the landowner and The Nature Conservancy for the benefit of federal trust species. This restoration provides breeding, nesting, rearing, foraging and resting habitat for a variety of both migratory birds and resident wildlife species. In addition to restored habitat, this project also improves water quality through increased water storage and filtration capabilities while lessening the effects of erosion

and sedimentation on downstream waterbodies. Combined, the wetland and grassland habitat will provide habitat for blue-winged teal, bobolinks, dickcissels, eastern meadowlarks, mallards, monarchs, and other pollinators.



PFW biologist conducting site preparation. ©USFWS

\$99,772

**PFW PROJECT
INVESTMENT**

\$149,180

**PARTNER
CONTRIBUTION**

\$248,952

**TOTAL
PROJECT
INVESTMENT**

\$1:1.5

LEVERAGE

491

**UPLAND
ACRES**

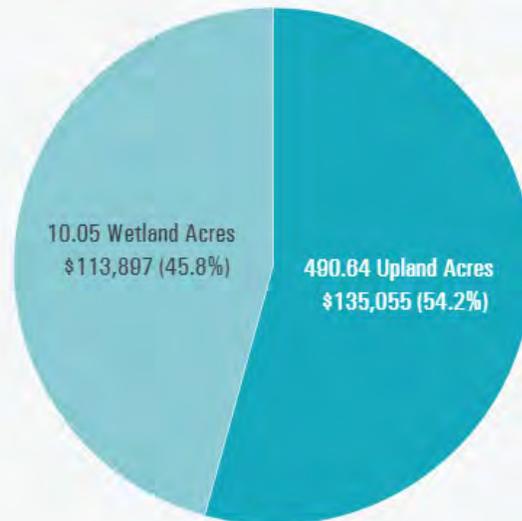
10

**WETLAND
ACRES**

MISSISSIPPI



Investments by Habitat Type





Before and after streambank stabilization treatment along the Buttahatchie River. ©USFWS

PROJECT HIGHLIGHT:

Streambank Stabilization

The Mississippi portion of the Buttahatchie River has been a focus of the U.S. Fish and Wildlife Service for over 25 years. The Buttahatchie River is listed as an Important Site for Conservation of Freshwater Biodiversity in North America by the World Wildlife Fund United States. It has also been classified as a Freshwater Conservation Area by the Nature Conservancy.

There are eight Federally listed species and nine at-risk species found within the Buttahatchie River watershed. This project required a bank stabilization project to keep the Buttahatchie River from eroding through the northern bank and into a silt filled and abandoned gravel mine. The bank was reshaped and over 500 tons of riprap were applied to help stabilize the bank. Anchor

keys were established in eleven strategic locations along the bank and rip-rap weirs were constructed to reduce energy at high flow periods. Root wads and tree structures were also established within the channel to reduce erosion. The impacted area was planted in herbaceous vegetation and trees. The Partners Program, the Landowner, the Nature Conservancy, and the Private John Allen Fish Hatchery were partners on this project. Species that benefitted from this project are: Orange-nacre Mucket (*threatened*), Southern Clubshell (*endangered*), and Southern Combshell (*endangered*); Tombigbee Riverlet crayfish (*at-risk*), Frecklebelly Madtom (*at-risk*), and Alabama hickorynut (*at-risk*).

This project is part of a larger watershed initiative in the Buttahatchie River to restore water quality, improve riparian zones and support priority species. Habitat improvement completed by the PFW Program compliments ongoing efforts along the river to provide permanent protection of lands through conservation easements with private landowners. The PFW Program aims to focus on the most problematic areas of the Buttahatchie where historical gravel mines have made the river susceptible to sedimentation and further degradation.

\$112,013

PFW PROJECT
INVESTMENT

\$256,213

PARTNER
CONTRIBUTION

\$368,226

TOTAL
PROJECT
INVESTMENT

\$1:2.3

LEVERAGE

3.16

STREAM
AND RIVER
MILES

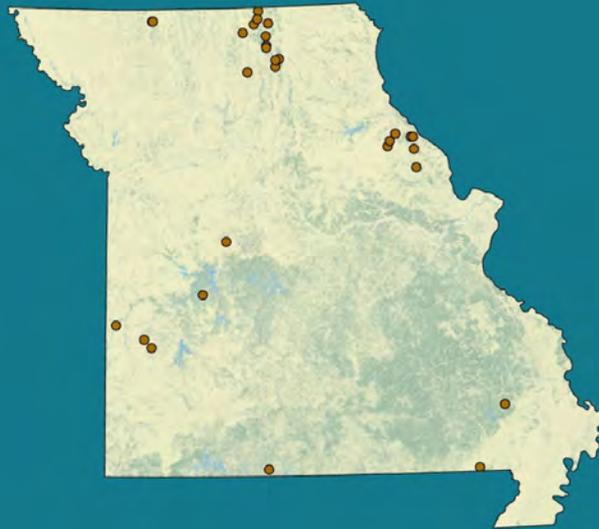
882

UPLAND
ACRES

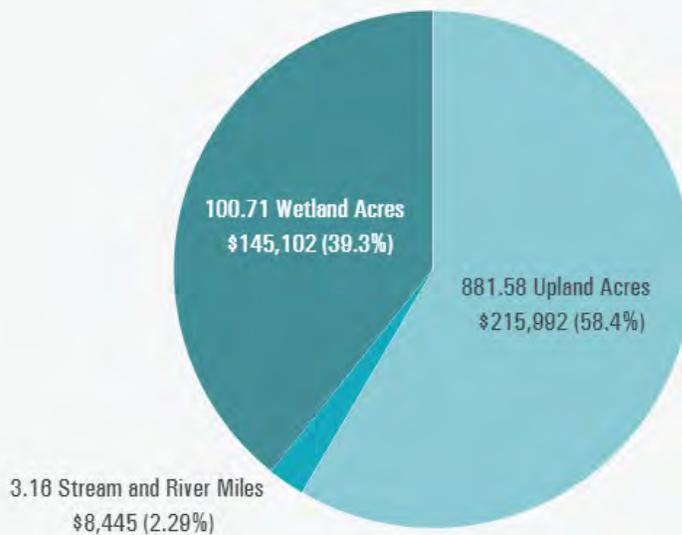
101

WETLAND
ACRES

MISSOURI



Investments by Habitat Type





Missouri Agricultural Wetland Initiative partners. ©USFWS

PROJECT HIGHLIGHT:

Missouri Agricultural Wetland Initiative (MAWI)

The Missouri Agricultural Wetland Initiative (MAWI) is a partnership between producers, landowners, and federal, state and local conservation organizations to demonstrate the compatibility of wetlands and production agriculture. This initiative brings together a variety of conservation organizations that work together to provide financial and technical assistance to landowners. This 42-acre wetland enhancement and restoration in the floodplain of the Mississippi River is an agreement between the landowner, PFW Program, Ducks Unlimited, and the Missouri Department of Conservation. It is directly adjacent to Big Cane Conservation Area, which is 2,154 acres of mature bottomland forests,

sloughs and swamps managed by the Missouri Department of Conservation. The landowner's property has been farmed historically. Restoration work involved installing berms and three water control structures to manage and distribute water effectively. The structures will allow independent flooding and draining of native wetland plant sites on the property. Native wetland herbaceous plants will provide essential food for satisfying the nutritional requirements and habitat needs of waterfowl and waterbirds during spring and fall migration. This restoration project supports conservation plans and efforts, including the North America Waterfowl Management Plan, Partners in Flight, Upper Mississippi Valley/Great Lakes Waterbird Conservation Plan, The Nature Conservancy Ecoregional Planning for the Upper Mississippi River, Missouri Bird Conservation Initiative and Ducks Unlimited Big Rivers Initiative. The Service worked in partnership with DU, MDC, and the Landowner(s) to assist in surveying, design of project restoration components, developing the management plan and overseeing completion of the project. Upon completion of the project, the Service and partners conducted a final inspection with the contractor reviewed maintenance and management requirements with the landowners.



©USFWS

\$477,080

PFW PROJECT
INVESTMENT

\$2.63M

PARTNER
CONTRIBUTION

\$3.11M

TOTAL
PROJECT
INVESTMENT

\$1:6.5

LEVERAGE

90.64

STREAM
AND RIVER
MILES

49,012

UPLAND
ACRES

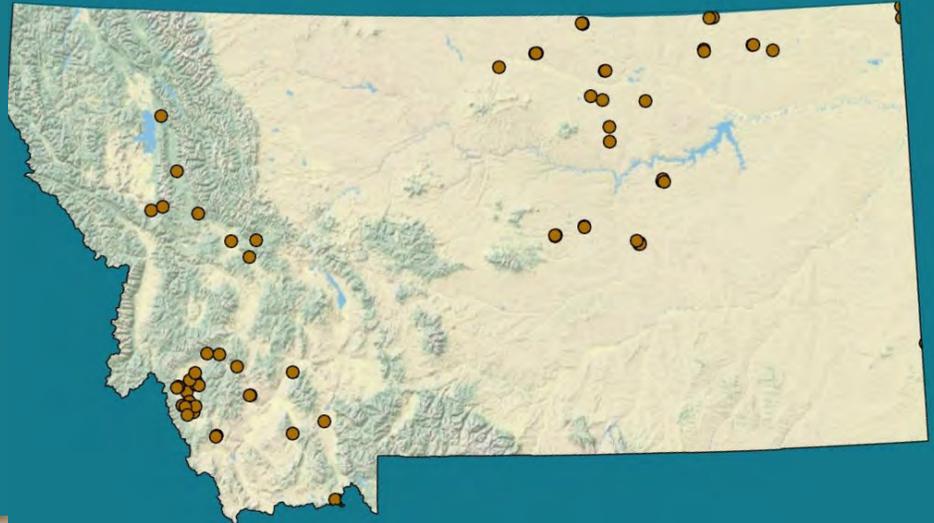
580

WETLAND
ACRES

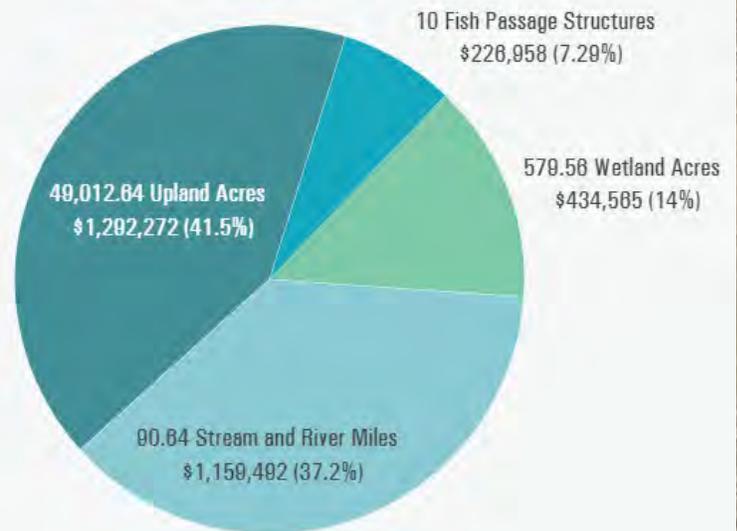
10

FISH
PASSAGE
STRUCTURES

MONTANA



Investments by Habitat Type





Before and after restoration, June 2020 and September 2021. ©USFWS

PROJECT HIGHLIGHT:

East Fork Grassland Restoration

Partners for Fish and Wildlife in Montana is working in the intact grassland landscape of northeast Montana to restore marginal cropland back to native perennial grass cover across thousands of acres each year. One example from 2021 is the East Fork restoration, which supplied a diverse, native mix of nine grass species and five wildflowers to 633 acres in a critical area for priority grassland songbirds like Sprague's pipit (figure 1). Along with the seeding, PFW and partner organizations helped provide boundary fence, cross fence, a livestock well and tank to fully convert this former cropland to a wildlife-compatible grazing system. In the challenging drought conditions of 2021, this seeding established incredibly well and the native

wheatgrasses are flourishing. Across the PFW grassland restoration projects in the region, we are measuring a strong positive response in Sprague's pipit numbers, with birds recolonizing restoration sites on average about four to five years after seeding.



Spragues pipit. ©John Carlson 2016.

\$298,140

PFW PROJECT
INVESTMENT

\$2.38M

PARTNER
CONTRIBUTION

\$2.67M

TOTAL
PROJECT
INVESTMENT

\$1:9.2

LEVERAGE

8.44

STREAM
AND RIVER
MILES

26,210

UPLAND
ACRES

2,118

WETLAND
ACRES

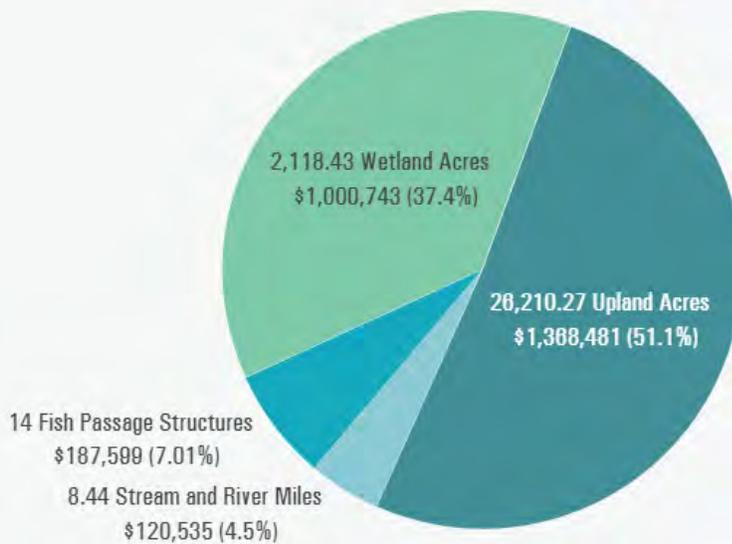
14

FISH
PASSAGE
STRUCTURES

NEBRASKA



Investments by Habitat Type





Aerial drone photos of Nebraska PFW Sandhills Prairie Restoration project located in Wheeler County, NE. During restoration. Photo provided by FWS contractors. ©USFWS

PROJECT HIGHLIGHT:

Central Platte River Habitat Restoration Project

The migration was in full swing this past fall and a record number of whooping cranes roosted within the central Platte River and foraged along its associated wetland and wet meadow habitats. A total of 97 whooping cranes (~ 20 percent of the Aransas/Wood Buffalo population) were confirmed in the central Platte River Valley this fall. A goal of the Nebraska PFW Program is to restore important in-channel and riverine floodplain habitats along biologically important riverine systems in Nebraska. The Nebraska PFW program worked in collaboration with numerous partners including private landowners, Ducks Unlimited, Nebraska Game and Parks Commission, Platte River Whooping Crane Trust, Audubon's Rowe Sanctuary, and Prairie Plains

Resource Institute to restore and enhance habitat throughout the central Platte River Valley. This past fiscal year over 9,000 linear feet of riverine and riparian habitats; 13,516 linear feet of riverine sloughs and backwater habitat; 594 acres of wetland habitat; and 200 acres of upland habitat were restored throughout this focus area. In addition, fish and aquatic passage was provided at six locations by removing barriers.

These central Platte River habitat restoration accomplishments are associated with six Landowner Agreements completed this past fiscal year. The six projects are located along the central Platte River and are great examples of the type of habitat projects being conducted throughout the central Platte River valley and the diverse group of partners that work together to accomplish habitat projects in Nebraska. The overall goal of these projects is to restore riverine floodplain habitat for numerous federal trust species including: migratory waterfowl (mallards, blue-winged teal, Canada geese, and Northern pintail), sandhill cranes, other migratory waterbirds, grassland nesting birds, monarch butterflies and other pollinators, bald eagles, whooping cranes and other native fish and wildlife species. Restoration practices conducted included: (a) excavating silt and other material from historic wetland features, (b) removing undesirable trees from the project areas, (c) removing barriers and providing fish and other aquatic passage; (d) seeding disturbed areas to a diverse mixture of native grasses and forbs; and (e) maintaining/managing the entire sites through the use of prescribed management. These projects were made possible due to funding support from a large number of partners and funding sources. The projects contributed significantly towards meeting established habitat restoration targets for the NE PFW Program's Central Platte River Focus Area as identified in the Service's PFW Strategic Plan 2017-2021.

\$285,528
PFW PROJECT
INVESTMENT

\$387,982
PARTNER
CONTRIBUTION

\$673,510
TOTAL
PROJECT
INVESTMENT

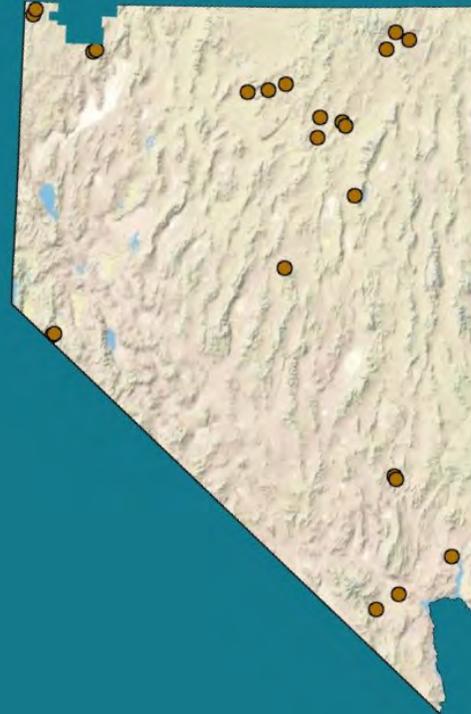
\$1:1.4
LEVERAGE

6.46
STREAM
AND RIVER
MILES

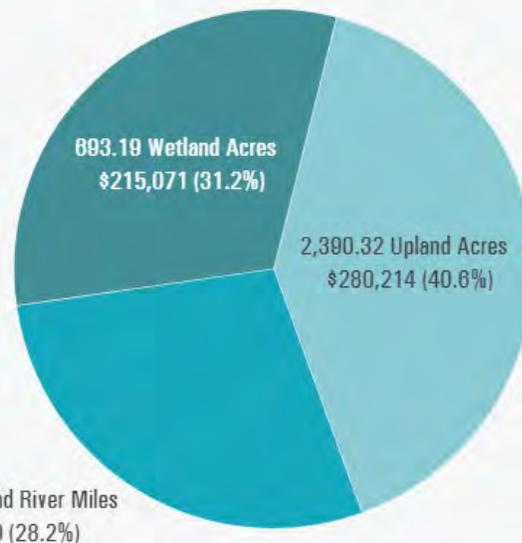
2,390
UPLAND
ACRES

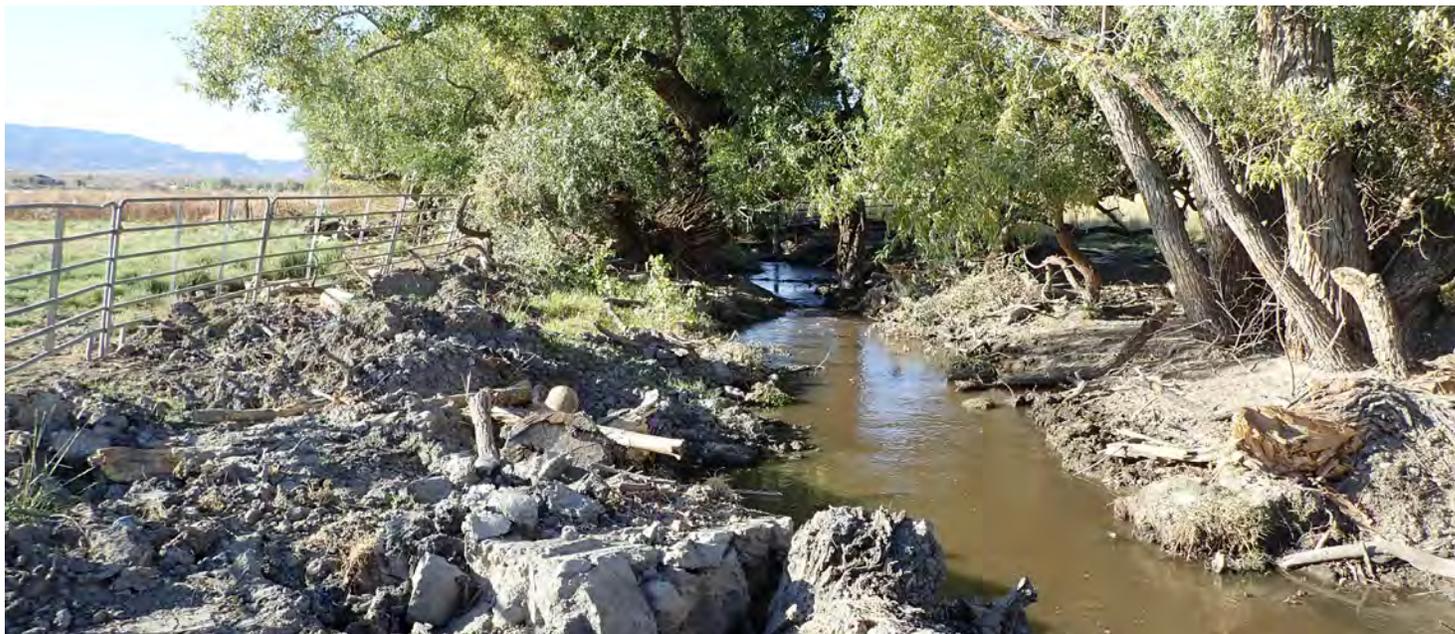
693
WETLAND
ACRES

NEVADA



Investments by Habitat Type





Debris and silt removed from the drain. ©USFWS

PROJECT HIGHLIGHT:

Pahranagat Drain Enhancements

The main water source for Pahranagat National Wildlife Refuge (Refuge), an oasis for fish and wildlife in southern Nevada, is the Pahranagat Drain. Since the Refuge is at the southern end of the valley, it receives water after it has passed through the private lands above.

Decreasing the sediment entering the drain and increasing the capacity of the drain will benefit the Refuge, specifically habitat that supports the endangered southwestern willow flycatcher (*Empidonax traillii* extimus) and the refugium for the endangered Pahranagat roundtail chub (*Gila robusta jordani*). Both the flycatcher and chub are listed in Nevada's Wildlife Action Plan as Species of Conservation Priority. The project is listed in the Recovery Plan for Aquatic and Riparian Species of

Pahranagat Valley.

This project improved water management in Pahranagat Valley which benefited ranchers, other landowners, and native fish. Conservation practices included the removal of live and dead woody material from the channel that obstructs flows, removal of trash, and removal of dead woody materials from the banks. All non-native Russian olives in the project area were removed which totaled over 100 trees along over 4 miles of the drain. The Lincoln County Conservation District worked with private landowners along the drain to complete this project. This segment of the drain passes through private land with over 30 different private landowners.

Special thanks to volunteer Steve Meldrum, who managed the project and did most of the work!



LCCD Vvolunteer Steve Meldrum. ©?

NEW HAMPSHIRE

\$0

PFW PROJECT
INVESTMENT

\$16,475

PARTNER
CONTRIBUTION

\$16,475

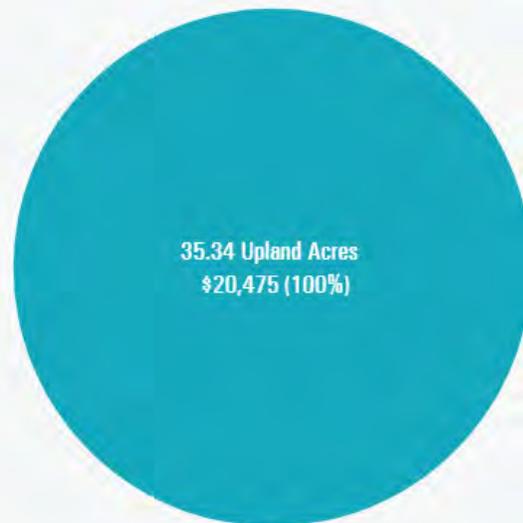
TOTAL
PROJECT
INVESTMENT

N/A

LEVERAGE



Investments by Habitat Type



35.34

UPLAND
ACRES

3

FISH
PASSAGE
STRUCTURES



Restoration in progress. ©USFWS

PROJECT HIGHLIGHT:

Species Conservation Targeting At-Risk Pollinator Species

The U.S. Fish and Wildlife Service (Service) New England Field Office (NEFO) Partners for Fish and Wildlife Program (PFW) and the New Hampshire Fish and Game Department (NHFG) are proposing to create Frosted elfin (*Callophrys irus*) habitat on approximately 19 acres of land owned by the City of Concord, NH. The Concord Municipal Airport Development and Conservation Management Agreement dated November 9, 2000 gives permission to the Service and NHFG to conduct habitat management under Section 5 on page 10 of the attached document. The proposed work is depicted in the map below. Work will be completed by Land and Mowing Solutions, LLC (contractor) for a total of \$35,000. The Service allocated

funding to the contractor via an existing cooperative agreement between the Service and the Wildlife Management Institute, Inc. (WMI). A variety and machinery will be utilized to achieve the goals set by NHFG staff. To achieve open habitat suitable for Frosted elfin a Cat 315 excavator with 175hp auxiliary motor powering Fecon BH80 tree mulcher, and a John Deere 7290R tractor with Agriworld FPR230.15 Stone Crusher was utilized. Approximately 13 acres will have the trees removed to less than 6" of the ground without ground scarification labeled as "Bronto" on the attached map. An additional 6 acres will have canopy trees thinned to retain approximately 20%-40% canopy closure as depicted on the map as "select trees removal/Understory bronto". Two acres will be tilled to create a scarified soil conditions to promote additional recruitment of Wild lupine (*Lupinus perennis*). All work was completed under the supervision of either Service or NHFG staff.



Restoring habitat for the Frosted elfin in the City of Concord. ©USFWS

\$216,475

PFW PROJECT
INVESTMENT

\$488,324

PARTNER
CONTRIBUTION

\$704,799

TOTAL
PROJECT
INVESTMENT

\$1:2.3

LEVERAGE

0.57

STREAM
AND RIVER
MILES

73.7

UPLAND
ACRES

132

WETLAND
ACRES

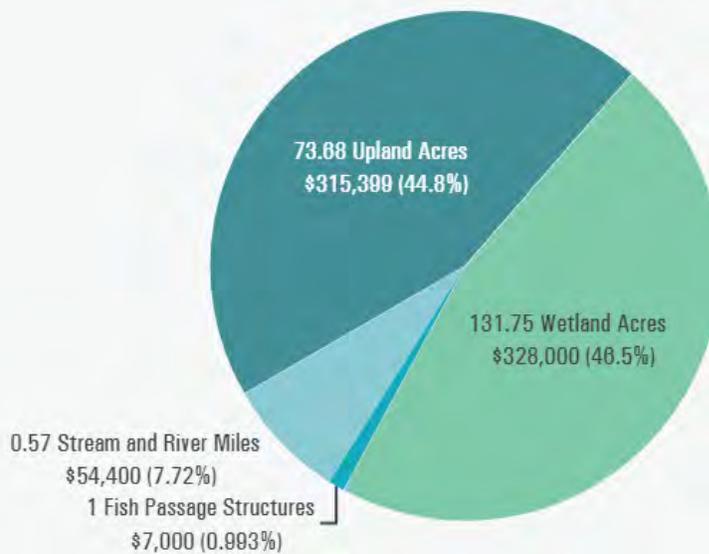
1

FISH
PASSAGE
STRUCTURE

NEW JERSEY



Investments by Habitat Type



The Wichechoke Preserve, where the mussels are documented, is a tributary of the Delaware River very close to the confluence. The Service considers eradication a priority and partnered with the landowner to eradicate the mussel from the property. USDA-NRCS, NJDEP Pesticide Program as well as Division of Fish and Wildlife collaborated on the project. To control Chinese pond mussel, the ponds were drained, and nonnative fish were removed because fish are a required part of the mussel's life cycle. The ponds were also treated with a molluscicide. Treatments appear to have been successful; after extensive searching, including digging in the ponds with an excavator, no living Chinese pond mussels were found. To ensure that eradication was successful, eDNA technology is being used to monitor the ponds and surrounding landscape. The project is in the Highlands/Middle Delaware River focus area. The Service provided technical assistance, permitting support, and financial assistance for molluscicide application (by a contractor) and eDNA surveillance.

PROJECT HIGHLIGHT:

USFWS is working with the landowner to prevent colonization of the Chinese pond mussel (*Sinanodonta woodiana*). The Service has been working with the landowner since 2016 after learning that New Jersey has the only known occurrence of Chinese pond mussel in North America. This species has invaded Asia, Europe, Central America, and the Caribbean with significant impacts to those aquatic systems and in-stream fauna. The Service conducted an analysis of the likelihood of escape and the model identified a high probability for escape and ecological damage. <https://www.fws.gov/fisheries/ans/erss/highrisk/Sinanodonta-woodiana-ERSS-revision-July2015.pdf> This mussel can become the size of a dinner plate when full grown and can reproduce the first year of life with a shell size of only 3 mm.



Invasive Chinese pond mussel. ©USFWS

\$172,567

PFW PROJECT
INVESTMENT

\$108,955

PARTNER
CONTRIBUTION

\$281,522

TOTAL
PROJECT
INVESTMENT

\$1:0.63

LEVERAGE

3.88

STREAM
AND RIVER
MILES

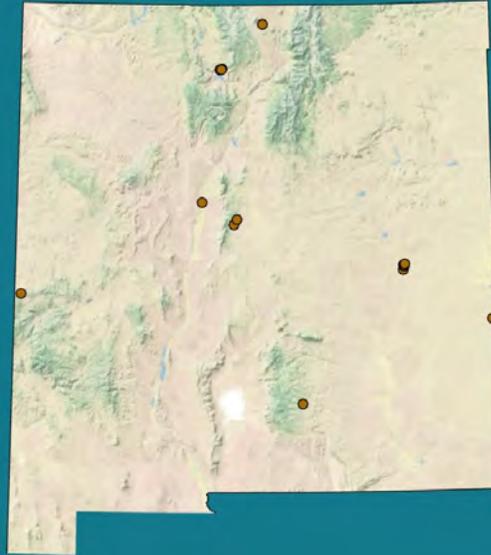
2,594

UPLAND
ACRES

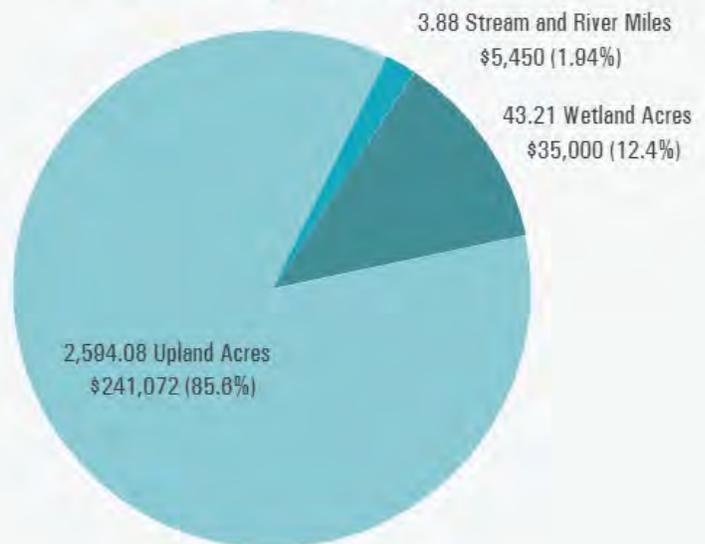
43.2

WETLAND
ACRES

NEW MEXICO



Investments by Habitat Type





Mechanical clearing to benefit the lesser prairie-chicken at the Newberry Tract. ©USFWS

PROJECT HIGHLIGHT:

Newberry Tract Mesquite Grubbing Project

The Landowners purchased lands in eastern New Mexico with the intention of providing high quality habitat for the lesser prairie-chicken (*Tympanuchus pallidicinctus*) (LPC) while maintaining a working ranch operation. The goal of the ranch is to conduct livestock ranching and landscape management operations with a focus on optimizing native wildlife habitat and rangeland vegetative health, particularly to benefit the LPC as an icon species in this area.

In recent years, the Landowners have worked with USFWS, CEHMM, New Mexico Game and Fish Dept., the Natural Resources Conservation Service and other entities to restore and enhance native grasslands and

playas on their property.

The goal for this project is to use brush management as a tool to restore a degraded grassland on the Newberry tract to benefit LPC, migratory birds, and other wildlife such as Northern bobwhite quail, Scaled quail, mule deer and pronghorn antelope.

The 127 acre site has an estimated woody shrub component (honey mesquite) estimated taller than ≥ 1.0 m, which prevents use of the area by LPC. Research has shown that the LPC has adapted to open grasslands with little woody shrub and tree cover. To meet the goals of the project, $\geq 90\%$ woody shrub cover will grubbed and piled for future burning. This practice will also benefit migratory birds and other wildlife that use this tract of land. These objectives may take several years to achieve as effective grubbing is dependent on soil moisture. Direct benefits from these activities will be an increase in native grassland vegetation. Species-specific habitat and indirect benefits will be realized by improving watershed function, increased water table, and diversity and presence of native plants.

The increase in grassland vegetation will provide a direct benefit for game species such as mule deer, Northern bobwhite and Scaled quail. Migratory bird species such as horned larks, lark bunting, chestnut collared longspur, and burrowing owls. Prairie rattle snake, prairie dogs and jack rabbits will also benefit from the enhanced grassland.

This project will benefit the public by assisting in the recovery and enhancement of Federal trust species and their habitats. There will also be an economic benefit to local businesses and contractors through the purchase of supplies and services to complete this project.

\$131,500

PFW PROJECT
INVESTMENT

\$1.14M

PARTNER
CONTRIBUTION

\$1.28M

TOTAL
PROJECT
INVESTMENT

\$1:8.7

LEVERAGE

1.51

STREAM
AND RIVER
MILES

2.46

UPLAND
ACRES

26.6

WETLAND
ACRES

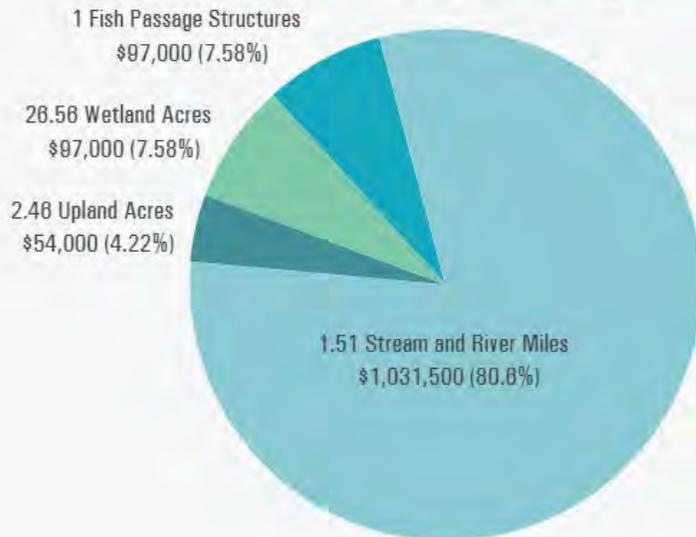
1

FISH
PASSAGE
STRUCTURES

NEW YORK



Investments by Habitat Type





Before and after restoration of eroded streambanks. ©USFWS

PROJECT HIGHLIGHT:

The Service is working with a private landowner and Trout Unlimited (TU) to implement a stream habitat improvement / bank stabilization project on the Little Beaver Kill in Livingston Manor NY. The Little Beaver Kill is a tributary to the Willowemoc in the Upper Delaware River watershed, and is an important trout spawning and rearing stream. The Service worked with TU to survey the site and develop final project designs and oversee project implementation. This project will benefit freshwater fish species, migratory birds and herps, including wood turtle.



Before restoration. ©USFWS

\$162,705

PFW PROJECT
INVESTMENT

\$746,699

PARTNER
CONTRIBUTION

\$909,404

TOTAL
PROJECT
INVESTMENT

\$1:4.6
LEVERAGE

0.3

STREAM
AND RIVER
MILES

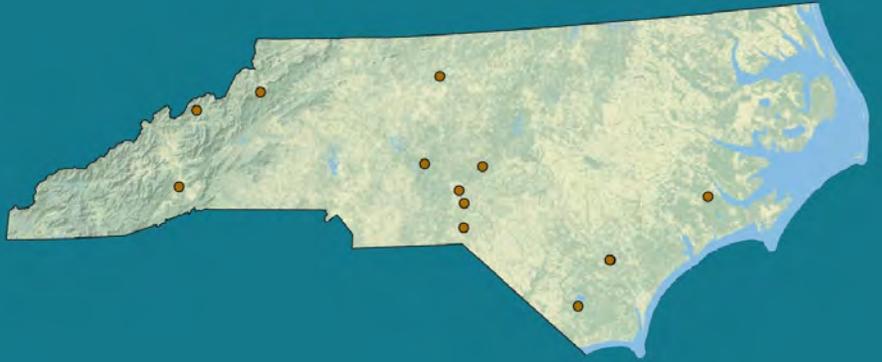
993

UPLAND
ACRES

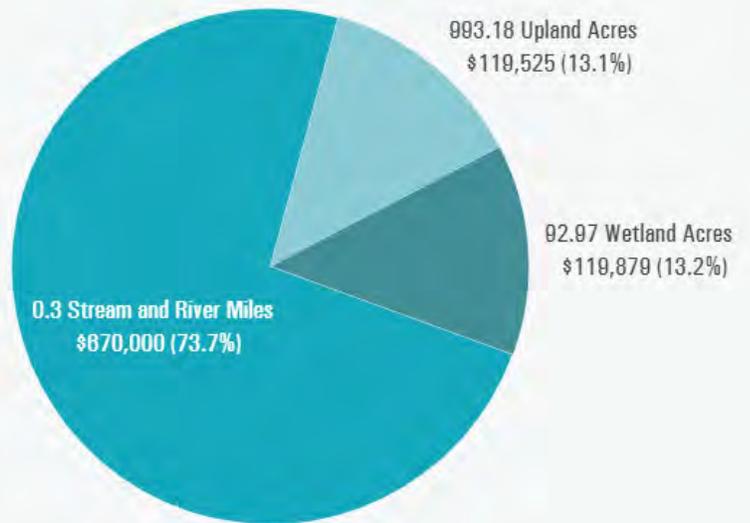
93

WETLAND
ACRES

NORTH CAROLINA



Investments by Habitat Type





The landowner and his forester proudly display PFW habitat signs. ©USFWS

PROJECT HIGHLIGHT:

Huckleberry Farms

The Longleaf Pine Ecosystem once spanned 92 million acres from Virginia to Texas. Now reduced to about 8 million acres, many of the endemic wildlife species are rare and federally threatened or endangered. Landowners care about these species, but they are also connected to longleaf pine because of its rich cultural history and its valuable timber. PFW staff work cooperatively with landowners to restore this iconic ecosystem that is so important environmentally, culturally and economically.

The Huckleberry Farm project is located within the Cape Fear Arch focus area, identified as a priority for longleaf restoration. This project connects habitat to adjacent State Game Lands, State Parks and a State Forest. PFW worked with landowner

and his forester to conduct specific restoration actions on nearly 200 acres of the 900-acre property.

Restoration included harvesting loblolly pine and replacing it with longleaf pine seedlings, thinning older longleaf pine and planting native understory vegetation by opening the forest to increase sunlight and conducting controlled burns. These actions have turned the dial from okay to great in terms of wildlife appeal. Native grasses and wildflowers amidst the longleaf pine. Most importantly, the landowner is thrilled with the results and is committed to the continued management of the property.

Fox squirrels, Bachman's sparrow, brown-headed nuthatches, Northern bobwhite, and wild turkey are benefitting from the restoration. Endangered red-cockaded woodpeckers, active only a mile south, may forage in the restored longleaf pine in the near future and perhaps one day nest there.



A newly planted longleaf seedling with native understory vegetation. ©USFWS

\$356,353

PFW PROJECT
INVESTMENT

\$1.97M

PARTNER
CONTRIBUTION

\$2.32M

TOTAL
PROJECT
INVESTMENT

\$1:7

LEVERAGE

41,489

UPLAND
ACRES

3,075

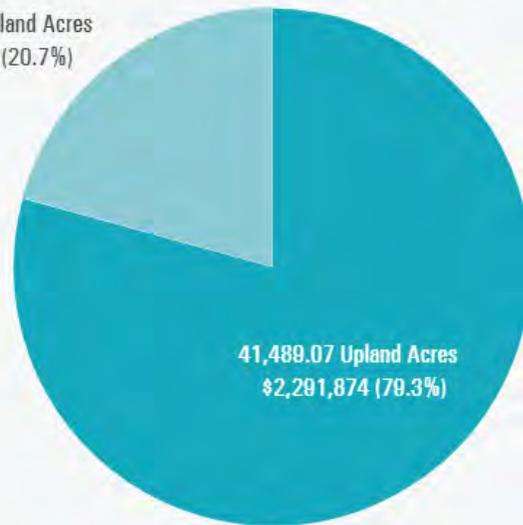
WETLAND
ACRES

NORTH DAKOTA



Investments by Habitat Type

3,075.55 Wetland Acres
\$599,271 (20.7%)





Happy landowner with big bluestem grass. ©USFWS

PROJECT HIGHLIGHT:

Grass Restoration and Enhancement Project

A North Dakota Partners for Fish and Wildlife biologist worked with one landowner family to implement a rotational grazing system on 828 acres of high priority habitat in Northwestern North Dakota. The real success of this project is that over 800 of these acres were being used for row crop and small grain agriculture prior to PFW involvement in 2018 that led to this entire area being restored to native grasses and forbs. The ND PFW program loves these types of projects. Restore marginal cropland to a high diversity native grass and forb planting and then assist the cooperating landowner with the grazing infrastructure they need in order to implement a rotational grazing system that will enhance the value of the grassland habitat that

has just been restored. We also know that by helping to install this grazing infrastructure, this land is more likely to remain as grassland habitat well into the future.



Cattle grazing on grassland restored by the PFW program. ©USFWS

\$81,119

**PFW PROJECT
INVESTMENT**

\$1.3M

**PARTNER
CONTRIBUTION**

\$1.41M

**TOTAL
PROJECT
INVESTMENT**

\$1:17

LEVERAGE

169

**UPLAND
ACRES**

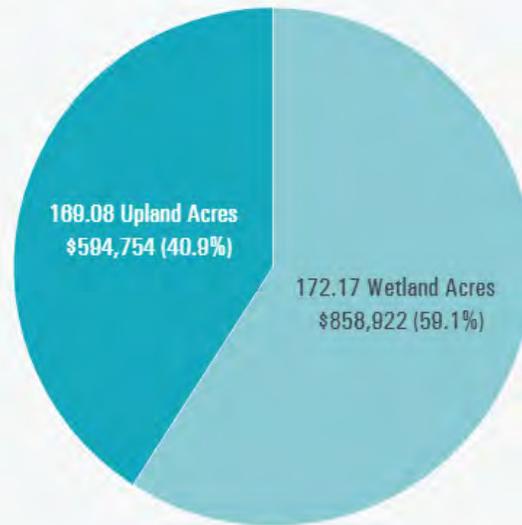
172

**WETLAND
ACRES**

OHIO



Investments by Habitat Type





Students gaining experience in agriculture through immersive learning. ©USFWS

PROJECT HIGHLIGHT:

New Lexington Outdoor Learning Center

This project is part of an overall effort to restore wildlife habitat and agricultural features at the New Lexington Schools Outdoor Learning Center to provide diverse and immersive learning opportunities for students – especially the heavy Future Farmers of America presence – and other community members. Major efforts include the restoration of a historic barn to house livestock and provide unique classroom space, enhancing two small paddocks that will showcase the difference between native warm season grasses and cool season grazing systems, restoring a 28-acre prairie, removing invasive woody vegetation on another 25 acres, and showcasing 15 acres of corn/soybean row crops. There was also heavy equipment

onsite that helped students on their way to various professional certifications. The Service has been heavily involved with the habitat enhancement efforts by designing seed mixes, assisting with planting, facilitating woody vegetation removal, and providing hands-on education for students along the way. In addition to ongoing education, these sites will provide habitat for grassland nesting birds, pollinators, and other local wildlife. More than a dozen NGO and state partners are involved with this unique and creative approach to outdoor learning.



Providing a unique learning experience for students at the New Lexington Outdoor Learning Center. ©USFWS

\$360,109

PFW PROJECT
INVESTMENT

\$358,477

PARTNER
CONTRIBUTION

\$718,586

TOTAL
PROJECT
INVESTMENT

\$1:1

LEVERAGE

3.55

STREAM
AND RIVER
MILES

4,482

UPLAND
ACRES

90

WETLAND
ACRES

OKLAHOMA

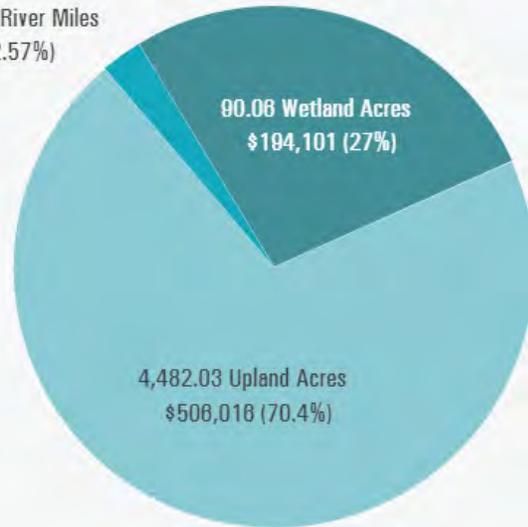


Investments by Habitat Type

3.55 Stream and River Miles
\$18,469 (2.57%)

90.06 Wetland Acres
\$194,101 (27%)

4,482.03 Upland Acres
\$506,016 (70.4%)





Upland habitat restoration project in Woodard, Oklahoma, after restoration. ©USFWS

PROJECT HIGHLIGHT:

Upland Project: Baker Casey Ranch

This project restores important grassland habitat through the mechanical removal of 617 acres of eastern red cedar trees. Prescribed fire will be used as a tool to treat the site three to four years post brush treatment. Livestock grazing will be permitted following treatment, not to exceed taking 25 percent of the annual grass growth that is available for livestock consumption. A four foot by four foot enclosure cage will be constructed of cattle panels and placed in two representative portions of the pasture. Periodic monitoring will be required to determine the estimated grazing percentage. These enclosures should be moved each year prior to the growing season. Within 3-4 years following the mechanical cedar tree control, a prescribed burn is recommended

on the restoration area and any adjacent area of the ranch where cedars are invading. Prescribed fire should kill young remaining cedar trees, remove cedar tree skeletons, and improve grazing distribution. To insure the area has adequate fuel loads for the prescribed fire, grazing may be deferred in areas to be treated with fire prior to the prescribed fire treatment.

\$589,356

PFW PROJECT
INVESTMENT

\$8.28M

PARTNER
CONTRIBUTION

\$8.87M

TOTAL
PROJECT
INVESTMENT

\$1:14.7

LEVERAGE

7.88

STREAM
AND RIVER
MILES

2,874

UPLAND
ACRES

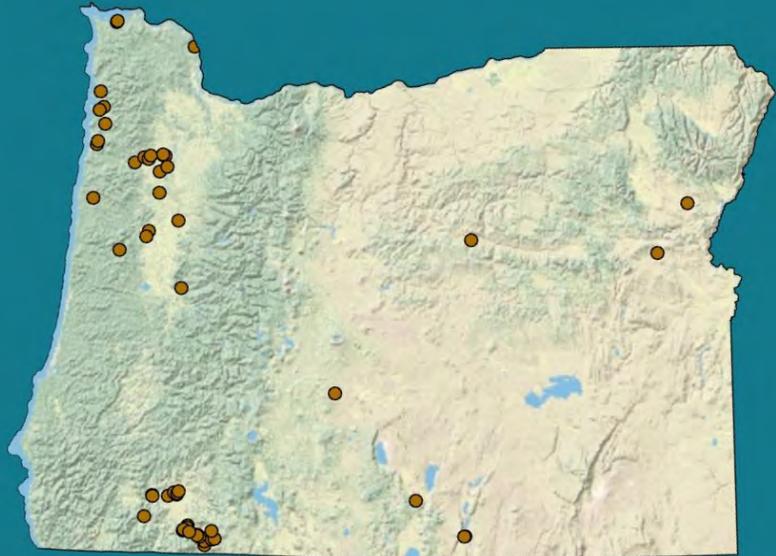
445

WETLAND
ACRES

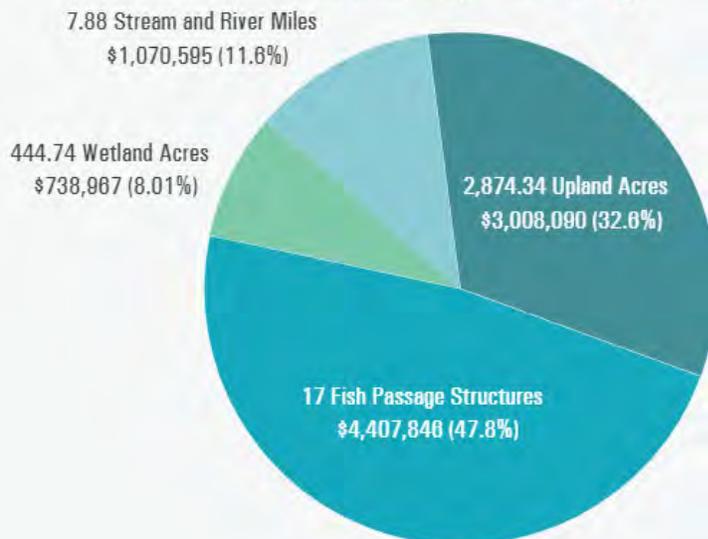
17

FISH
PASSAGE
STRUCTURES

OREGON



Investments by Habitat Type





Bridge with log truck crossing. ©Justin Baile

PROJECT HIGHLIGHT:

Peterson Creek Fish Passage

Access to important stream habitat for fish and other aquatic organisms can be limited by undersized, damaged, or aging culverts. At Peterson Creek, a tributary to the Miami River which is on the coast in Northwest Oregon, Partners for Fish and Wildlife staff worked with partners to improve access to 6.2 miles of upstream habitat for ESA listed coho salmon, as well as chum salmon, coastal cutthroat trout, coastal rainbow trout, king salmon, northern red-legged frog, Pacific lamprey, and western brook lamprey.

Prior to Restoration, an undersized, failing culvert impeded stream flow and distribution of gravel and large wood as well as blocked upstream passage of listed anadromous and other native fish to upstream habitat. The project replaced an undersized,

failing culvert with a bridge that spanned 1.5 x the active channel width to restore normalized stream flow, to restore the downstream distribution of gravel and large wood, to provide free span at 100-year flows, and to restore upstream passage of listed anadromous and other native fish to 6.2 miles of upstream habitat. The bridge also improved public safety on this Priority 1 Lifeline County Road which also serves as an alternate route to a major state highway (Hwy 101) and an emergency evacuation route and is heavily used by local farmers hauling dairy products and local timber producers with their loaded log trucks.

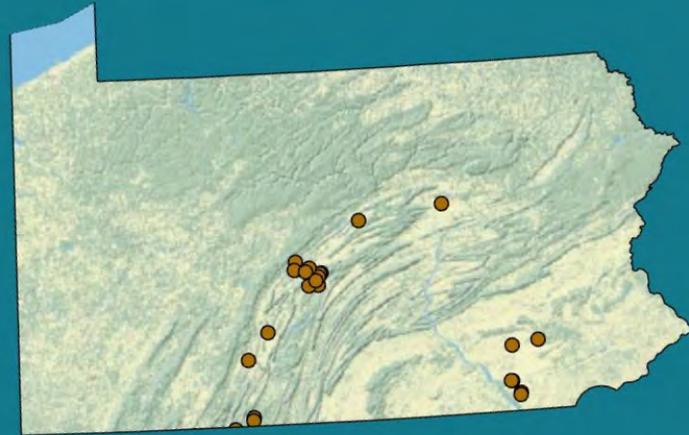
Trout Unlimited, NOAA Fisheries Service, Oregon Watershed Enhancement Board, Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and the U.S. Forest Service have provided funding and in-kind support for this project.

See the video from Tillamook Estuaries Partnership at: <https://www.youtube.com/watch?v=ps0tY805Bzk>.



Before restoration / degraded culvert. ©USFWS

PENNSYLVANIA



\$0
PFW PROJECT
INVESTMENT

\$1.45M
PARTNER
CONTRIBUTION

\$1.45M
TOTAL
PROJECT
INVESTMENT

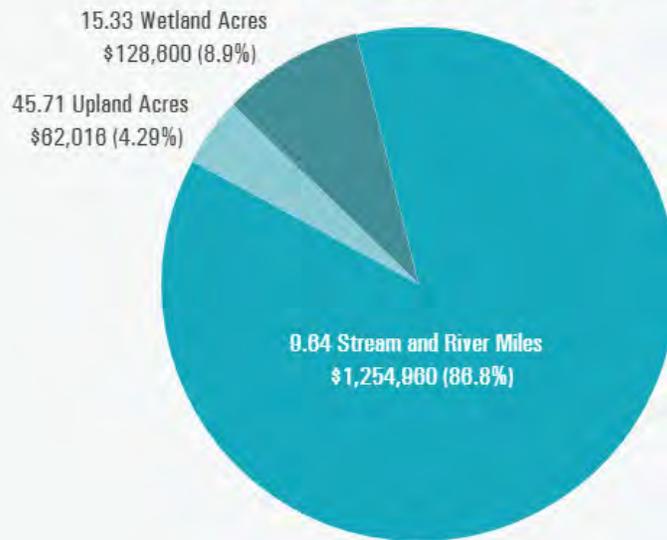
\$NA
LEVERAGE

9.64
STREAM
AND RIVER
MILES

45.7
UPLAND
ACRES

15.33
WETLAND
ACRES

Investments by Habitat Type





Shavers Creek- cattle walkway before

Shavers Creek - cattle walkway after.

Before and after restoration. ©USFWS

PROJECT HIGHLIGHT:

Shaver's Creek Restoration

This project restored a 2,098-foot portion of an unnamed tributary to Shavers Creek located in West Township, Huntingdon County, PA. Pennsylvania Department of Environmental Protection Chapter 93 has designated this stream as a high quality, cold-water fishery (HQ-CWF). The unbuffered stream runs through a pasture resulting in eroding banks, a sediment-laden bottom and a lack of fish habitat. USFWS and the Partners installed fish habitat structures consisting of 14 cross vanes, 445 feet of toe log, 560 feet of mudsill, and one livestock crossing.



Shavers Creek restored stream banks

Restored stream banks at Shavers Creek. ©USFWS

2017-2021
PROJECTS

\$10,000
PFW PROJECT
INVESTMENT

\$5,000
PARTNER
CONTRIBUTION

\$15,000
TOTAL
PROJECT
INVESTMENT

\$1:0.5
LEVERAGE

5.4
UPLAND
ACRES

RHODE ISLAND



Investments by Habitat Type





In 2016 a 20 acre thinning was conducted to prepare for a prescribed burn, the first since 1942. ©?

PROJECT HIGHLIGHT:

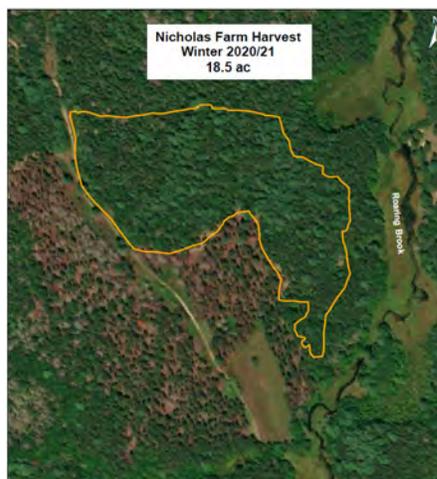
Nicholas Farm Management Area

Partners for Fish and Wildlife (PFW) staff at the New England Field Office has been working collaboratively with our State and conservation partners on development and implementation of a large-scale forest management plan over the past 9 years in Rhode Island, resulting in the largest contiguous patch of habitat for New England cottontail (NEC) and early forest wildlife in New England.

The Nicholas Farm Management Area is comprised of 1,597 acres of mature deciduous and coniferous forest. In 2012, Rhode Island Department of Environmental Management (RIDEM) Division of Fish and Wildlife (DFW) wildlife biologists began to plan a forest cut to benefit early forest species.

In 2013 a 35-acre project was awarded to a logging company and the work was completed in 2014. Based on comments from the community, the State stopped all future cuts at Nicholas Farms until a comprehensive plan was established. Working in collaboration with RIDEM the New England Field Office (NEFO) Partners for Fish and Wildlife (PFW) staff, the Wildlife Management Institute (WMI), and the Ruffed Grouse Society entered into a MOU in November of 2015 to establish a 922-acre Project Area for early successional habitat.

The project area is 5 miles from the nearest historic NEC location, and is expected to be a release site for the Captive Propagation program when appropriate habitat is created. Nicholas Farm is contiguous with a 6600-acre parcel of Pachaug State Forest (Connecticut Department of Energy and Environmental Protection) across the Connecticut state border- a historic NEC site where forest management aimed to benefit this species is ongoing.



USFWS map, HabITS database 2022.

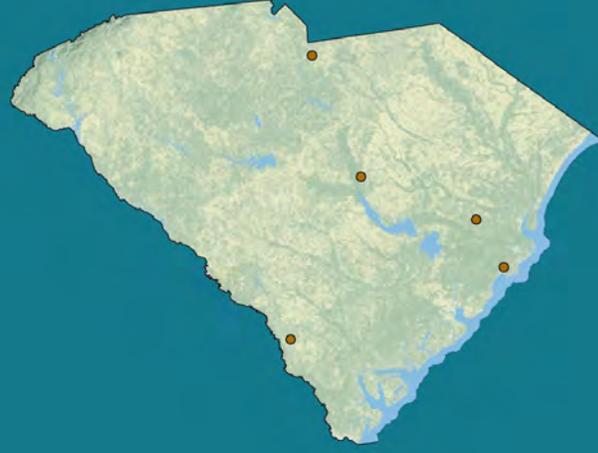
\$20,420
PFW PROJECT
INVESTMENT

\$37,863
PARTNER
CONTRIBUTION

\$58,283
TOTAL
PROJECT
INVESTMENT

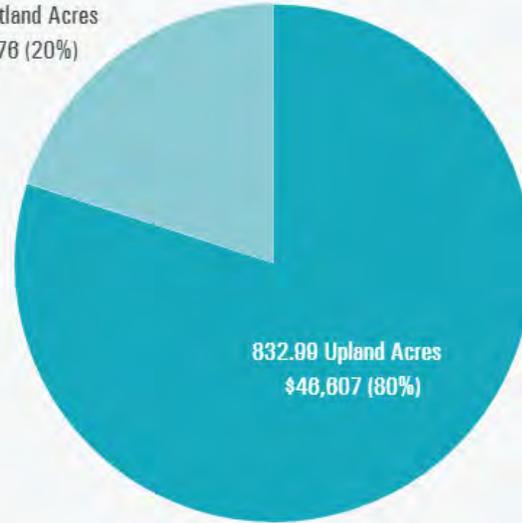
\$1:1.85
LEVERAGE

SOUTH CAROLINA



Investments by Habitat Type

24.88 Wetland Acres
\$11,876 (20%)



832.99 Upland Acres
\$46,607 (80%)

833

UPLAND
ACRES

24.9

WETLAND
ACRES



Red cockaded woodpecker and loblolly patch cut planted with longleaf pine seedlings. ©Bret Beasley/USFWS

PROJECT HIGHLIGHT:

Red-cockaded Woodpecker Habitat Restoration on the Charleston County Parks Two Pines Tract

This project was implemented on a future 813-acre nature public park known as Two Pines, owned, and operated by Charleston County Parks and Recreation Commission (CCPRC) to provide habitat for the Federally Threatened red-cockaded woodpecker. The site was generally composed of mature loblolly pine with isolated wetlands throughout. The tract has a history of being managed by prescribed fire on a 2–4-year rotation for the past 10 years to maintain optimal understory conditions. The site was recently thinned as well as a series of patch cuts were established. The objectives for the site were to strategically transition back to

a native open longleaf pine ecosystem without clear-cutting large areas. Instead, they are patch clearing and planting longleaf seedlings every few years to slowly convert to an uneven age class longleaf pine forest. The South Carolina Partners program provided cost-share funding through our American Forest Foundation Partnership for prescribed burning, invasive plant control, planting longleaf pine seedlings, and a baseline survey needed to enter the South Carolina red-cockaded woodpecker Safe Harbor Program.

This project assists with open-pine habitat connectivity as there are a number of active red-cockaded woodpecker colonies within four miles of the project site on private and the adjacent 259,000-acre Francis Marion National Forest. In the future, as the site becomes more suitable for woodpeckers, CCPRC is installing artificial cavities to promote their establishment onto the property if they don't establish naturally.

This project has the potential to benefit other target species as it is located within two-miles of four other federal species occurrences including Canby's dropwort (endangered), gopher frog (at-risk), spotted turtle (at-risk) and Boykin's lobelia (at-risk) as well as five state species of greatest conservation need identified in the South Carolina Department of Natural Resources State Wildlife Action Plan. In addition to increasing wildlife habitat connectivity and imperiled species recovery and conservation, this project also provides benefits to the surrounding Wildland Urban Interface by decreasing the chance for high intensity wildfire by reducing fuel loading through the use of frequent prescribed fire.

\$248,764

PFW PROJECT
INVESTMENT

\$865,474

PARTNER
CONTRIBUTION

\$1.51M

TOTAL
PROJECT
INVESTMENT

\$1:6.1

LEVERAGE

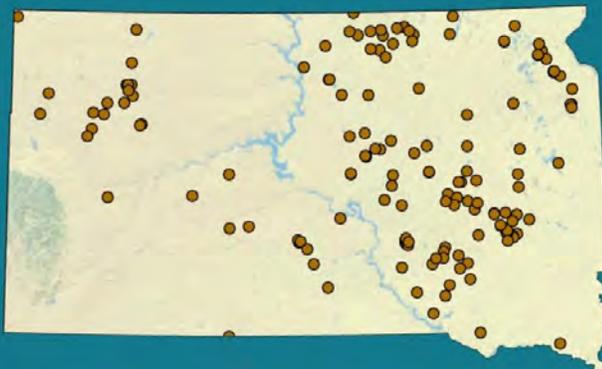
48,980

UPLAND
ACRES

1,804

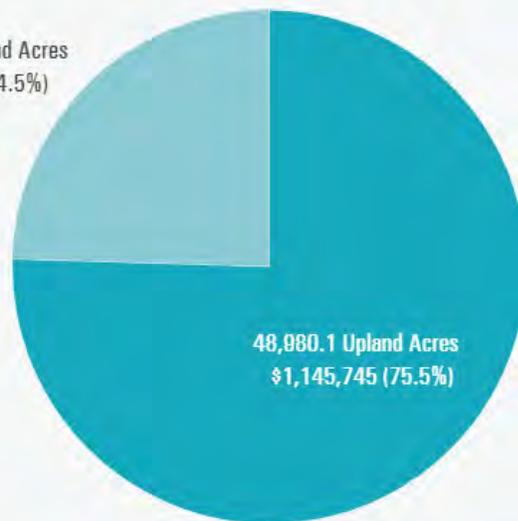
WETLAND
ACRES

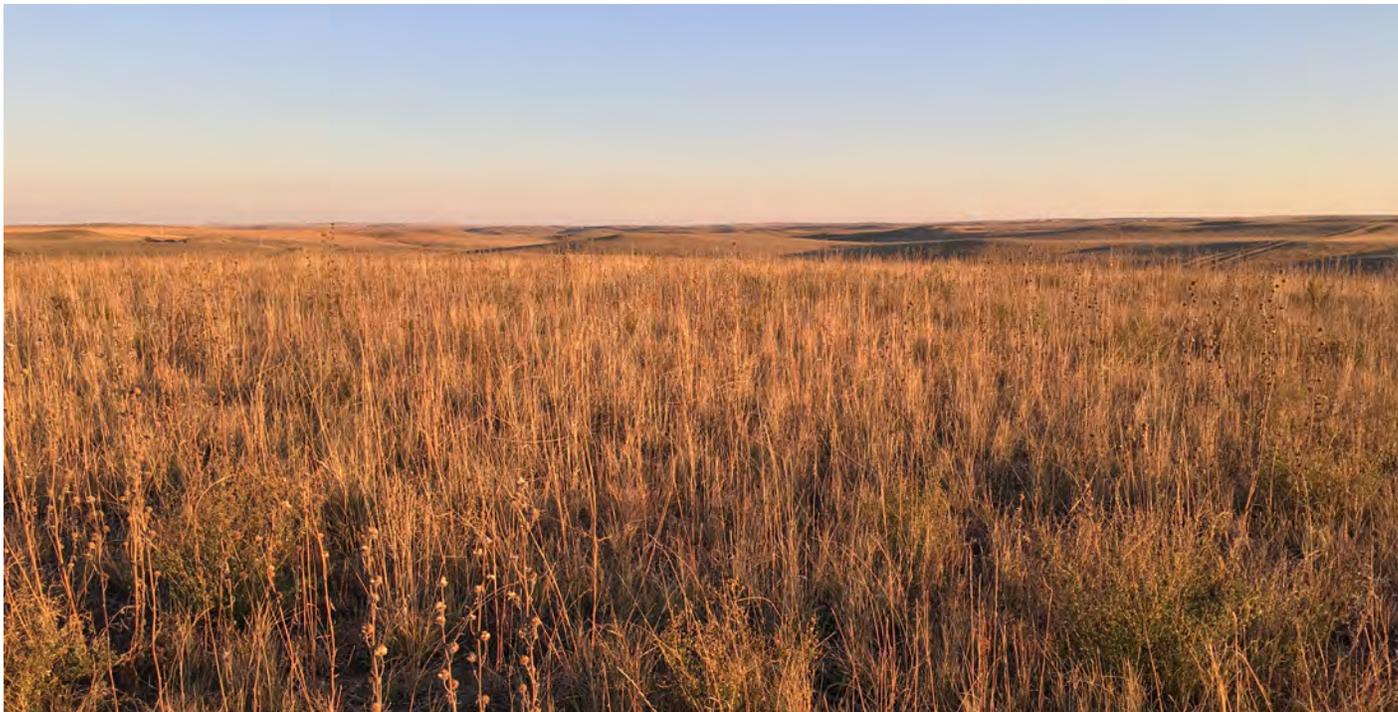
SOUTH DAKOTA



Investments by Habitat Type

1,803.72 Wetland Acres
\$372,321 (24.5%)





PFW native prairie restoration in Western South Dakota, one growing season after seeding. ©Jesse Lisburg/USFWS

PROJECT HIGHLIGHT:

Incorporating Native Prairie Restorations into Larger Working Lands Grazing Operations

PFW staff collaborated with a local landowner to restore native grasses and forbs on 210 acres of marginal cropland with the long-term goal of using the site for managed grazing. The landowner and PFW staff worked closely together to design a species mix tailored to the local site. Native grass species in the mix included, little bluestem, western wheatgrass, side-oats grama and blue grama. Native forbs species in the mix included western yarrow, maximillian sunflower, prairie coneflower and purple prairie clover. PFW provided funding for the seed, and the landowner completed all of the necessary seedbed preparation, seeding and weed control to ensure a successful stand. Upon full establishment of the prairie seeding,

the long-term plan is to incorporate the tract into the adjacent pasture and manage the entire unit as part of the larger ranching operation. An additional PFW Landowner Agreement has been developed and signed on the same tract that will fund the next phase of the larger project. In the second phase, PFW will help install all of the necessary grazing management developments to complete the transition to working rangeland. Specifically, the follow-up Landowner Agreement will fund fence and stock-water facilities to support managed grazing. Collectively, the initial prairie restoration and associated grazing management project provides an example of how the Partners for Fish and Wildlife Program in South Dakota works with landowners to stage and sequence projects to meet their long-term ranch management goals and optimize grassland conservation. Restoring and enhancing working rangelands provides enduring benefits to grassland songbirds, native pollinators and carbon sequestration.

\$154,136
PFW PROJECT
INVESTMENT

\$395,235
PARTNER
CONTRIBUTION

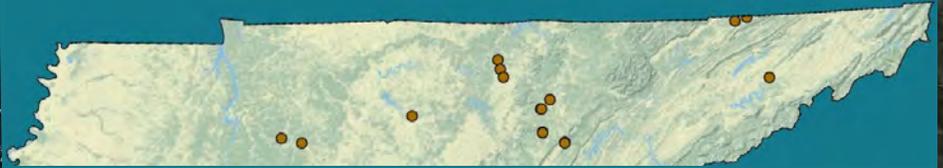
\$549,371
TOTAL
PROJECT
INVESTMENT

\$1:2.6
LEVERAGE

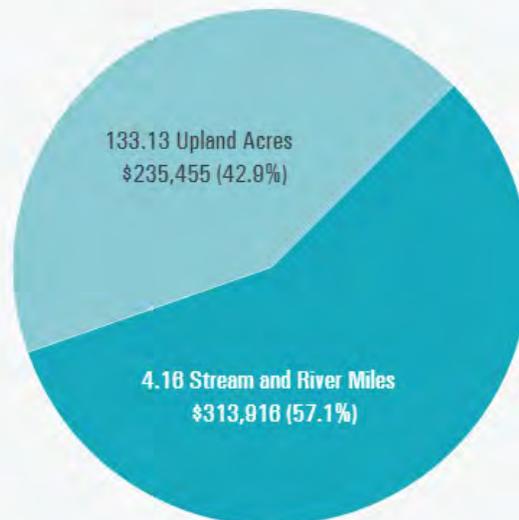
4.16
STREAM
AND RIVER
MILES

133
UPLAND
ACRES

TENNESSEE



Investments by Habitat Type





Eastern red cedar removal. ©USFWS

PROJECT HIGHLIGHT:

Limestone Glade Restoration

Limestone glades of the central basin of Tennessee are an increasingly imperiled ecosystem. These glades are home to numerous federal and state listed species. Due to habitat degradation associated with urban sprawl and the lack of ecological disturbance, limestone glades of middle Tennessee need restoration and protection to improve habitat conditions for these rare species.

Coordinating with several partners, the PFW Program in Tennessee worked with a landowner to restore a limestone glade in middle Tennessee. This specific site is occupied by the federally endangered leafy prairie clover and at-risk streamside salamander. Due to a lack of fire on the landscape and encroaching woody vegetation,

mainly eastern red cedar, the understory had become shaded. Unfortunately this shading limited the growth and reproduction of the leafy prairie clover and other herbaceous ground cover. To restore the site, the PFW Program mechanically removed undesirable woody vegetation and installed fire breaks around the site to facilitate future prescribed burns. In the coming years, the PFW Program will work with the landowner to adaptively manage the site and promote the recovery of the leafy prairie clover, as well as the conservation of streamside salamanders, pollinators, and grassland birds.



Federally endangered leafy prairie clover at the project site. ©USFWS

\$640,745
PFW PROJECT
INVESTMENT

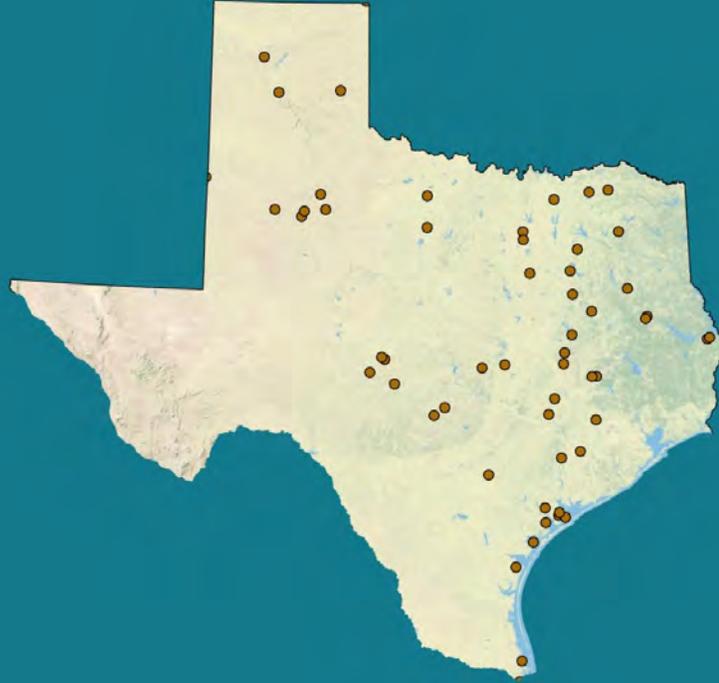
\$594,535
PARTNER
CONTRIBUTION

\$1.24M
TOTAL
PROJECT
INVESTMENT

\$1:0.9
LEVERAGE

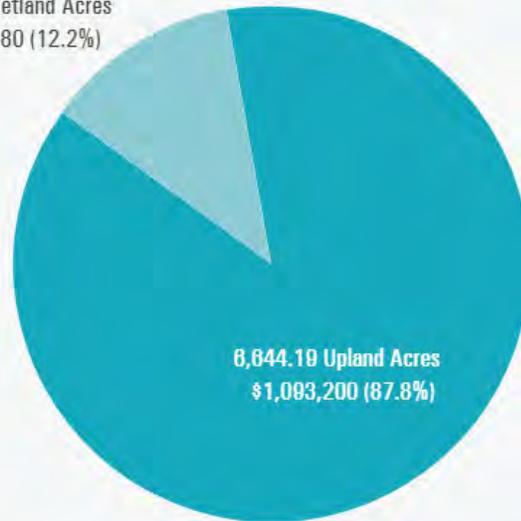
6,644
UPLAND
ACRES
832
WETLAND
ACRES

TEXAS



Investments by Habitat Type

831.99 Wetland Acres
\$152,080 (12.2%)



6,644.19 Upland Acres
\$1,093,200 (87.8%)



Whooping cranes. ©Chad Stinson\USFWS

PROJECT HIGHLIGHT:

Sometimes Recovery Work Can Be Simple and Cheap

In 2015, the City of Rockport constructed a drainage ditch designed to reduce flooding along the western portion of the City. However, this new drainage ditch passed through a natural coastal wetland severing its only water source. This wetland was relatively small, 36 acres, and somewhat remote so the impact this new ditch was having on the wetland went unnoticed for years and the wetland dried up.

In 2019, the International Crane foundation (ICF) did a freshwater wetland survey throughout areas determined to be important to the endangered whooping crane. Whooping cranes inhabit coastal wetlands, however they do need to drink freshwater often. What ICF's

survey discovered was that this 36-acre wetland was no longer functioning as a wildlife freshwater source, because it was being starved of water by the newly constructed ditch. ICF then contacted the Texas Prairie Wetland Program (TPWP); biologists from the TPWP contacted the landowner and City of Rockport and informed all them of the problem. The response was positive, in fact, the landowner and City both offered to fix the problem and fund whatever restoration would be required. After review by TPWP, engineers it was determined the fix would be simple and cheap. All that was needed was to reduce the ditches berm down to grade along two strategic locations. This would allow water to flow along its historical path into the wetland. Within the next six months, a plan was developed to do just that, and the berm was reduced restoring natural flow to the wetland. Restoration of this small wetland has restored a freshwater source for wildlife and the strategic removal of the berm has increased flood control for the City of Rockport. Restoration was a success for all parties and completed for under three thousand dollars.

\$222,271

**PFW PROJECT
INVESTMENT**

\$2.16M

**PARTNER
CONTRIBUTION**

\$2.38M

**TOTAL
PROJECT
INVESTMENT**

\$1:9.71

LEVERAGE

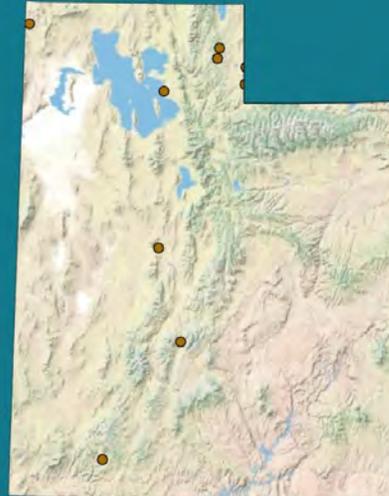
17,650

**UPLAND
ACRES**

113.5

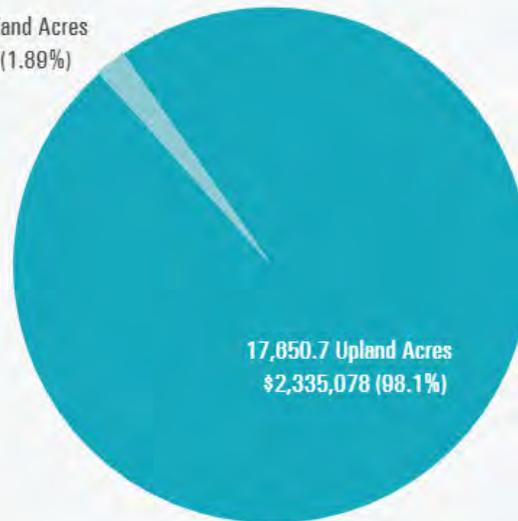
**WETLAND
ACRES**

UTAH



Investments by Habitat Type

113.49 Wetland Acres
\$45,084 (1.89%)



17,850.7 Upland Acres
\$2,335,078 (98.1%)



Aerial view of project site. ©Clint WirickUSFWS.



Before restoration. ©Clint WirickUSFWS.



After restoration. ©Clint WirickUSFWS.

PROJECT HIGHLIGHT:

Miller Creek

The Miller Creek project has truly been a collaborative watershed approach to landscape scale conservation work. The project is in its 4th phase, addressing conservation at a watershed scale, in all habitat types, landownership types, with several agencies, multiple NGO's, corporate partners, and many landowners.

Together, team Miller Creek has seeded, planted, and installed hundreds of artificial beaver dams (some call them BDA's or beaver dam analogues). BDA's can be used for a wide variety of purposes. Miller Creek is a system that had become highly degraded through downcutting after a large high intensity wildfire in 2012. Our purpose for the structures is to add in-stream habitat complexity, trap sediment,

and aggrade the stream bed towards the floodplain once again. Habitat complexity provides places for insects and fish to live, grow, and survive. Stream aggradation puts water back in the soil and provides green stream side vegetation important to... well, just about everything.

During late summer of 2021 some high intensity rainstorms happened in the watershed. Partners were very pleasantly surprised when they went to visit the site afterwards. Big changes took place. Most of the BDA's were gone because of flash flooding - either buried, pushed downstream, or folded over. This was far from a failure though. As you can see in the photos natural morphological stream processes took place like aggradation, deposition, some erosion, channel migration, and what we think is very exciting - valley bottom widening. The BDA's worked, the channel didn't just down cut and erode further into the floodplain throughout the reach. The BDA's, revegetation, and other conservation practices we implemented were the resistance needed to create some of what you see in the 'after' photos - system resilience. Some might call it roughness added to the system. Whatever you call it, enough of it was added to buy time for some positive ecological changes to take place.

Because of the immense partnership built on this watershed project, we have been able to implement conservation practices during difficult times while navigating COVID restrictions. Project partners have been able to lean on one another for support and the USFWS Partners for Fish and Wildlife Program owes a tremendous amount of gratitude to partners in assisting with planning, funding, and implementation during the last couple years. Partnerships get conservation done, especially during challenging times.

\$114,991

**PFW PROJECT
INVESTMENT**

\$1.3M

**PARTNER
CONTRIBUTION**

\$1.41M

**TOTAL
PROJECT
INVESTMENT**

\$1:12.7

LEVERAGE

22.24

**STREAM
AND RIVER
MILES**

132.9

**UPLAND
ACRES**

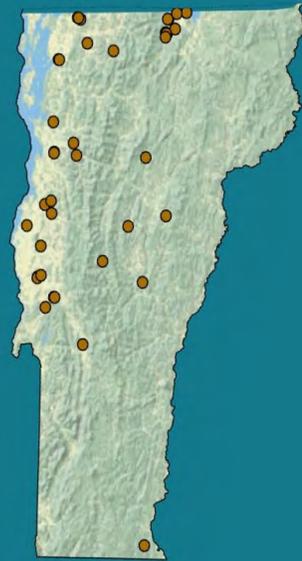
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**WETLAND
ACRES**

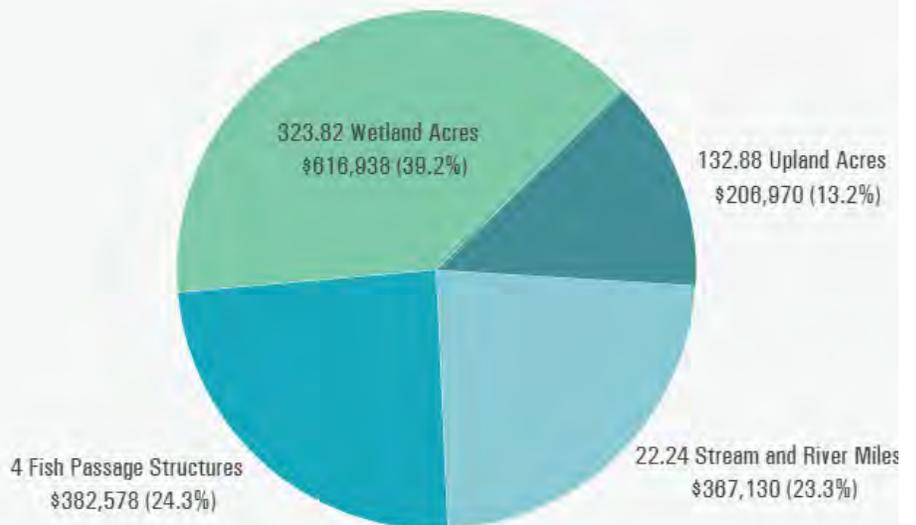
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**FISH
PASSAGE
STRUCTURES**

VERMONT



Investments by Habitat Type





Sudbury wetland restoration in action. ©USFWS

PROJECT HIGHLIGHT:

Sudbury Restoration

This project restores the hydrology, topography, and natural communities of the site by constructing two ditch plugs, excavating depressional wetlands, constructing hummock features, planting trees/shrubs, adding large woody debris and controlling reed canary grass. These actions will restore the preexisting hydrology, enhance wildlife habitat, improve wetland function, and increase overall nutrient cycling of the wetland while reestablishing the topography and natural communities that likely existed prior to agricultural impacts. An osprey nesting platform was installed as well as a duck nesting box as part of this project. Trust species that will benefit from this project include hooded merganser, wood ducks, mallards, blue-winged teal, great blue heron, American

bittern, willow flycatchers, Virginia rails and greater yellowlegs, as well as amphibians, reptiles and wetland mammals. A Partners for Fish and Wildlife Program Biologist had substantial involvement in this project and served the following roles: site identification and assessment, elevational survey, wetland determination, review of historic records, maps and files, restoration design, local, state and federal permitting, project layout, bid process coordination, construction oversight, consultation with NRCS field staff, engineer and archeologist and creation of planting plan as well as directing site preparation contractor and vegetation monitoring. This project is part of a larger effort to restore wetlands along Otter Creek and its tributaries in Addison and Rutland Counties and involves multiple landowners. Otter Creek is Vermont's longest river and its drainage include important habitat for a variety of species. The wetlands associated with Otter Creek provide breeding or migratory habitat for black ducks, blue-winged teals, wood ducks, solitary sandpipers, American woodcock, golden-winged warblers and black-crowned night herons. Though intact wetlands exist, much of the wetlands in the area have been cleared, ditched and drained. Over the last 12 years, the USFWS has worked closely with NRCS to restore wetlands along Otter Creek and its tributaries. This project itself is located near several other completed and still in process projects. Together, along with existing protected and intact wetlands, these projects represent a strategic effort to improve wildlife habitat through partnerships and a holistic approach to conservation.



Completed wetland restoration. ©USFWS

\$24,740
PFW PROJECT
INVESTMENT

\$285,860
PARTNER
CONTRIBUTION

\$310,600
TOTAL
PROJECT
INVESTMENT

\$1:11.5
LEVERAGE

2

**STREAM
AND RIVER
MILES**

62.3

**UPLAND
ACRES**

8.27

**WETLAND
ACRES**

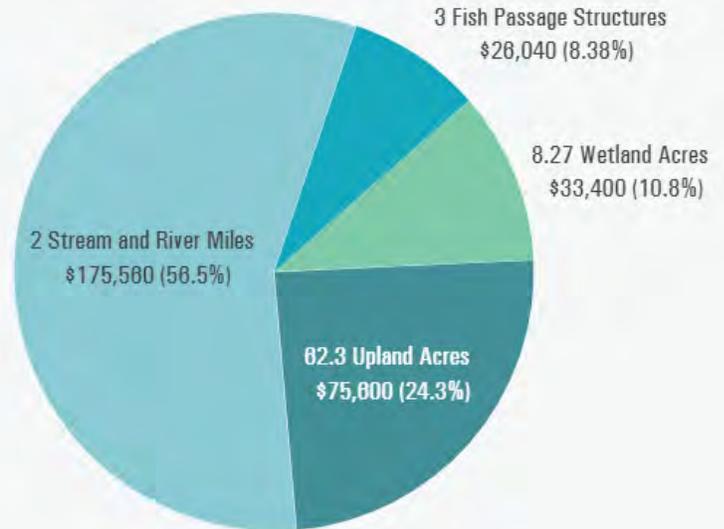
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**FISH
PASSAGE
STRUCTURES**

VIRGINIA



Investments by Habitat Type





Restored streambank habitat. ©USFWS

PROJECT HIGHLIGHT:

This river and riparian restoration project targeted a degraded section of the North Fork Roanoke River (37.2532, -80.3483) located near Blacksburg, Montgomery County, Virginia. The project reach includes a 1,600 foot section of the North Fork Roanoke River (NFRR) along River Mile (RM) 19.6. The project is being implemented along with Canaan Valley Institute (CVI) and includes partner investments from the National Fish & Wildlife Foundation, Skyline Soil & Water Conservation District (SSWCD), Virginia Environmental Endowment, and the Virginia Department of Game & Inland Fisheries. The NFRR at RM 19.6 is experiencing bank failure and extensive erosion along both banks due to historic unrestricted livestock access and a lack of a functioning riparian buffer. These conditions have created an over-widened

channel, leading to an increase in bank toe scour, bank failure, excess fine sediment deposition, and mid-channel bar formation. The restoration project will narrow the bankfull channel as needed, reconstruct and stabilize banks, and restore floodplain connectivity. This will include bank stabilization through bank grading to a 3:1 slope, and/or grading of a bankfull bench. The overall project will include installation of a rotational grazing and watering system (70 acres) and livestock exclusion fence, establishing a riparian buffer (3.5 acres) with a 35' average width, and restoring natural floodplain conditions. A rootwad revetment, soil lift, and soil lift with toe wood will be installed in order to stabilize the toe of the bank, reconstruct degraded banks to bankfull elevation, establish stable channel dimensions, and provide in-stream habitat. A constructed cobble dam will be removed along with numerous mid-channel bars (excess depositional areas) resulting from channel instability that have continued to create instability throughout the reach. In addition, a cross-vane structure will be installed in order to address the longitudinal instability created from the constructed cobble dam which will ensure grade control of a constructed riffle, maintain bankfull channel dimensions, protect streambanks, and improve sediment transport. Federal Trust Species benefiting from this project: Roanoke logperch, federally listed endangered; and numerous riparian obligate species including Louisiana waterthrush, mallard, wood duck, and yellow warbler.



©USFWS

\$172,410

PFW PROJECT
INVESTMENT

\$772,340

PARTNER
CONTRIBUTION

\$944,750

TOTAL
PROJECT
INVESTMENT

\$1:4.5

LEVERAGE

0.62

STREAM
AND RIVER
MILES

103

UPLAND
ACRES

106.6

WETLAND
ACRES

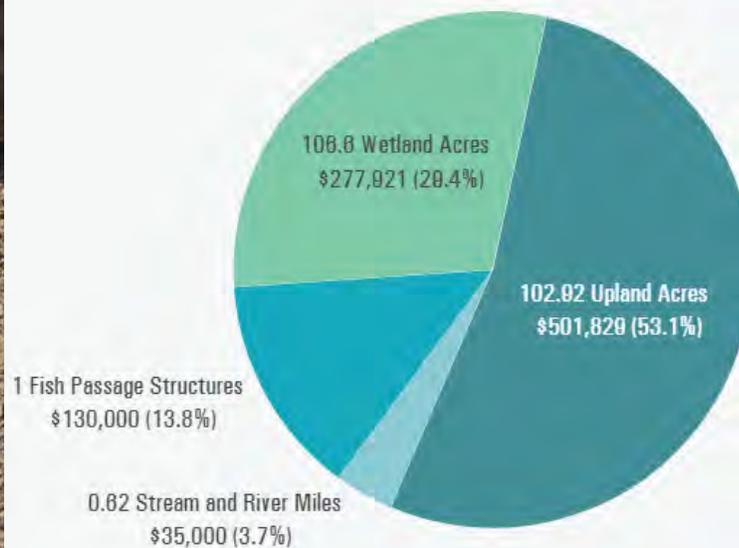
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FISH
PASSAGE
STRUCTURE

WASHINGTON



Investments by Habitat Type





Palisades fencing crew, Site prep for reforestation day and teaching the next generation to care for the land at Palisades. ©Brian Walker\USFWS.

PROJECT HIGHLIGHT:

Palisades Park FWS Initiative: Climate Change, Pollinators

This project restored 58.75 acres of wetlands and uplands across 5 properties in the Channeled Scablands of Eastern Washington overlooking the Spokane River gorge. This habitat was recently purchased by several nearby landowners and a local land trust to remove the potential for residential development on the property and eventually provide a connection between Palisades Park to Riverside State Park. Spokane County Parks Department is working with the group to acquire the entire property through the Conservation Futures Program to permanently protect the site.

The U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program assisted with removal of old infrastructure from a wetland edge and restoring a large, drained wetland that was previously used for hay production. Planting of trees and shrubs around the project site became a community service event, called Reforest Spokane, an annual event hosted by the Inland Northwest Lands Conservancy and The Lands Council. Nearly 300 volunteers showed up on site for five hours to help plant nearly 1,500 native trees and shrubs and erect temporary deer fencing around the newly planted saplings. Along with tree and shrub planting, the volunteers removed nearly 1 ton of debris found on the site, including old t-posts, barbed wire, asphalt shingles, and other old debris.

The project benefited numerous species, reduced dense unburned downed wood to remove the potential for the site to re-burn (previous wildfire in 2015), and protected/enhanced large patches of showy milkweed for monarch butterflies.

Restoration included native grass seed and replanting 500 native trees and shrubs to restore the edge of the wetland basin. The larger wetland basin to the South was excavated to ameliorate a shallow drainage swale that annually drained the wetland basin. The 0.75-acre shallow excavation removed accumulated sediment and hay detritus and placed it on the wetland edges that were damaged by fire in 2015. Spoil areas were contoured to resemble natural topography. Finally, the spoil areas were reseeded with native grasses and had 1000 native trees and shrubs planted in protected exclosures.

\$1,684

PFW PROJECT
INVESTMENT

\$175,949

PARTNER
CONTRIBUTION

\$177,633

TOTAL
PROJECT
INVESTMENT

\$1:104

LEVERAGE

4.25

STREAM
AND RIVER
MILES

129.57

UPLAND
ACRES

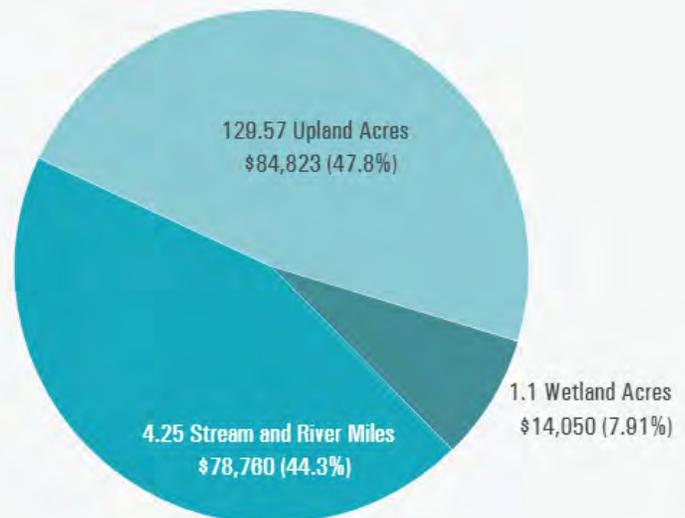
1.10

WETLAND
ACRES

WEST VIRGINIA



Investments by Habitat Type



PROJECT HIGHLIGHT:

Knapps Creek Candy Darter Restoration

Restoration of riparian habitat on Knapps Creek in WV for candy darters and brook trout. Landowner is enrolled in the Conservation Reserve Program (CRP) with the Farm Service Agency (FSA) and has a Conservation Plan developed under the Conservation Reserve Enhancement Program. The landowner asked for assistance completing the fencing portion of the plan. FSA planned for up to 4,500' of 3 strand high tensile electric fence to protect 2,100 feet of stream with a 35' minimum riparian buffer for total riparian acreage of 6 acres. Fence installation will start on East side of boundary fence of tract 946 and end at boundary fence to the west on tract 8276. Both sides of the stream a minimum of 35' from its newly constructed banks will be fenced and excluded from livestock.



©USFWS

\$280,243

PFW PROJECT
INVESTMENT

\$729,343

PARTNER
CONTRIBUTION

\$1M

TOTAL
PROJECT
INVESTMENT

\$1:2.8

LEVERAGE

839

UPLAND
ACRES

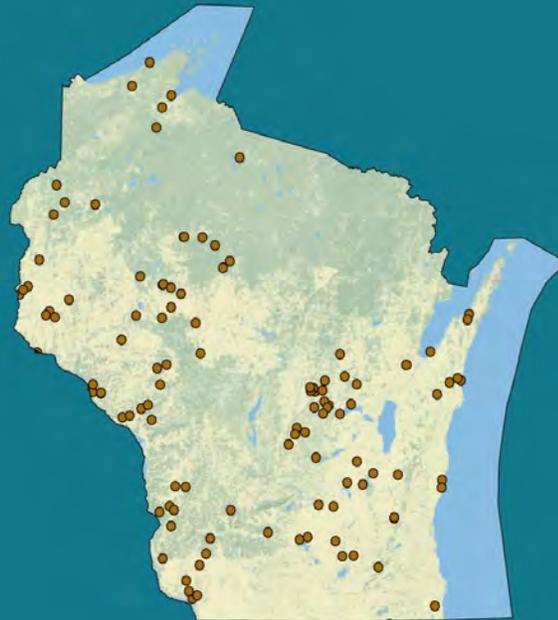
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WETLAND
ACRES

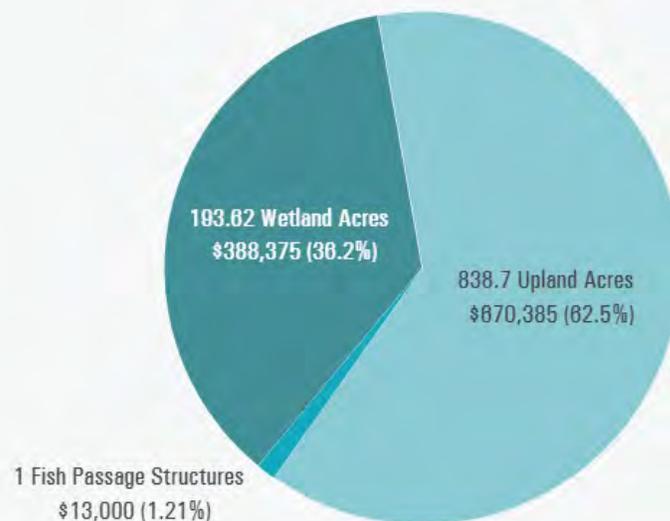
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FISH
PASSAGE
STRUCTURE

WISCONSIN



Investments by Habitat Type





©USFWS

PROJECT HIGHLIGHT:

Our Wisconsin PFW team completed this project in the winter of 2021 to benefit American woodcock and other wildlife species which depend on young forest. The American woodcock is a popular migratory game bird throughout eastern North America. During the past three plus decades the woodcock population across its range in the Northeast and Midwest United States and Canada has shown a steady decline. Habitat improvement projects are taking place throughout the woodcock's range to stop this decline, and this project took place in Price County. The American woodcock and ruffed grouse share the same type of habitat and hunters travel from throughout the United States to hunt Price County, the self-proclaimed "Ruffed Grouse Capital of the World". Abundant forest and public land make this area a

popular destination for hunters and all types of outdoor recreation enthusiasts. The project was done with the help of many partners including the private landowner, Wisconsin Young Forest Partnership, Wisconsin Department of Natural Resources and the Service's Ashland Fish and Wildlife Conservation Office. Using a local private equipment contractor a total of 10 acres were enhanced through alder shearing with heavy duty mowing equipment. The alder is sheared low while the ground is frozen, and in the spring it rejuvenates in dense stands with an open understory which the birds prefer. Project shearing takes place in preplanned and rotating blocks of habitat. Every five to ten years, different locations will be sheared in order to create a mosaic of habitat. The blocks are strategically placed in order to create a rotational system of management to ensure decades of long term benefits.



Mechanical shearing of alder trees at project site. ©USFWS

\$124,818

**PFW PROJECT
INVESTMENT**

\$1.9M

**PARTNER
CONTRIBUTION**

\$2.03M

**TOTAL
PROJECT
INVESTMENT**

\$1:16.3

LEVERAGE

10.9

**STREAM
AND RIVER
MILES**

6,520

**UPLAND
ACRES**

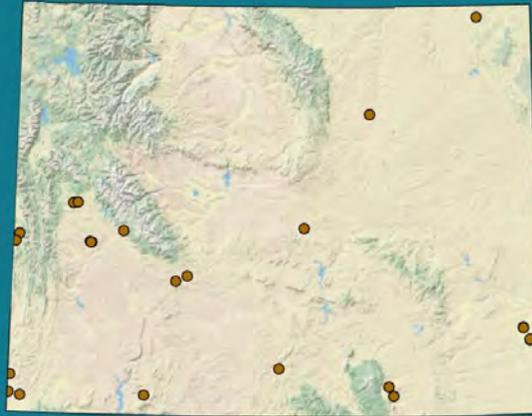
219.4

**WETLAND
ACRES**

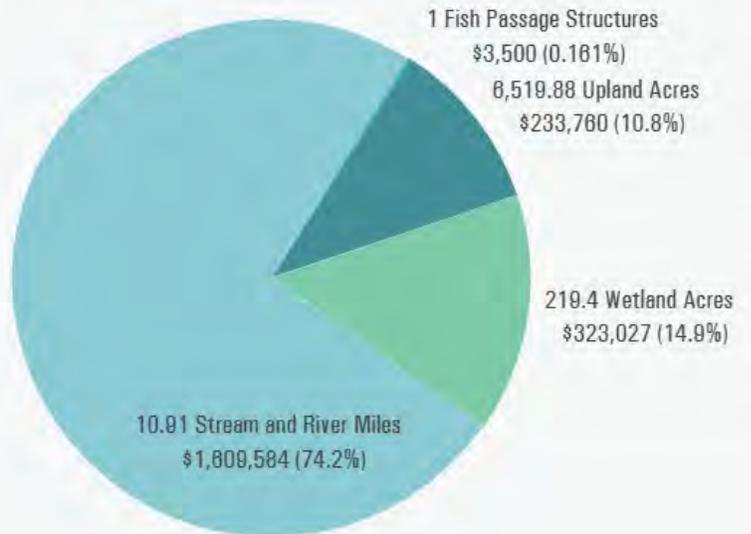
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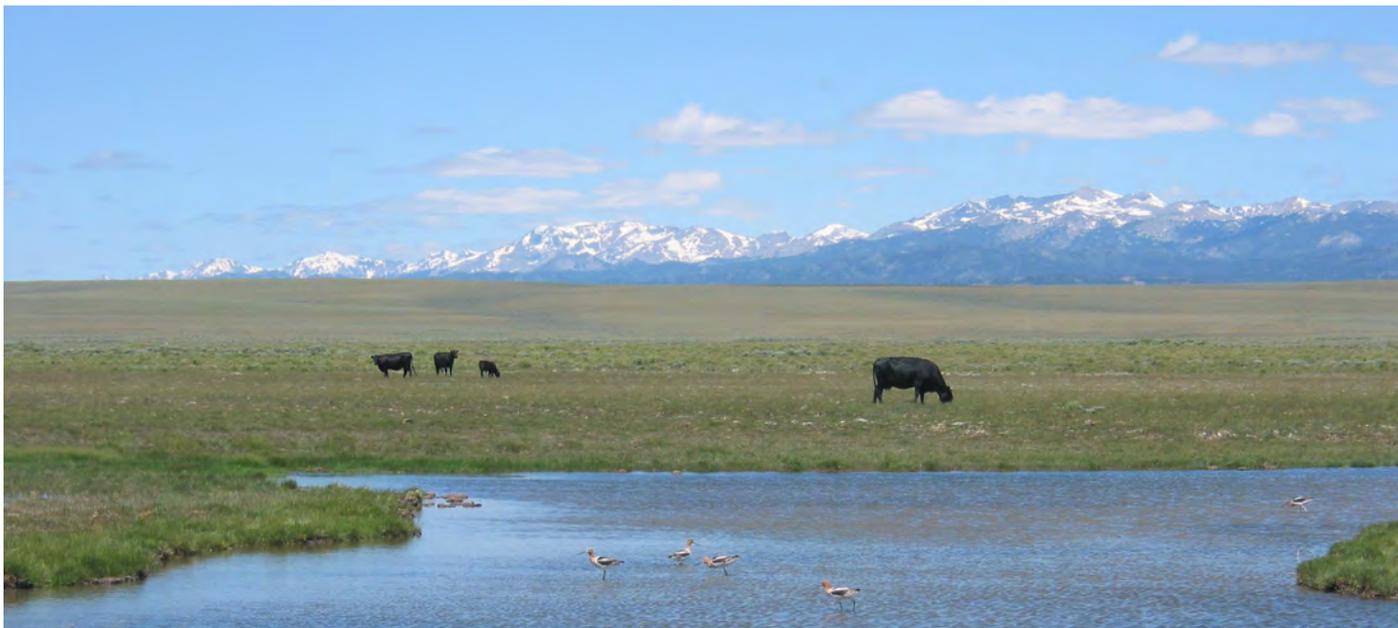
**FISH
PASSAGE
STRUCTURES**

WYOMING



Investments by Habitat Type





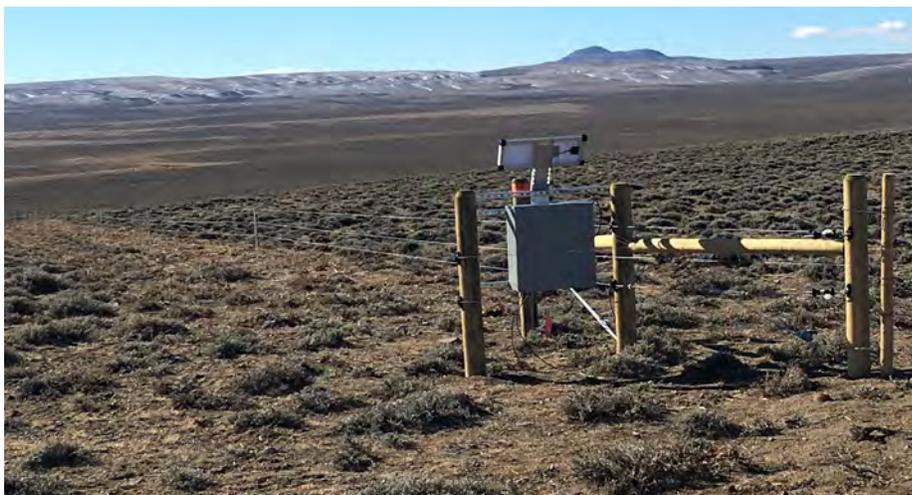
Oregon Slough riparian pasture. ©Mark Hogan\USFWS

PROJECT HIGHLIGHT:

Continental Peak Grazing Management at Dickie Springs

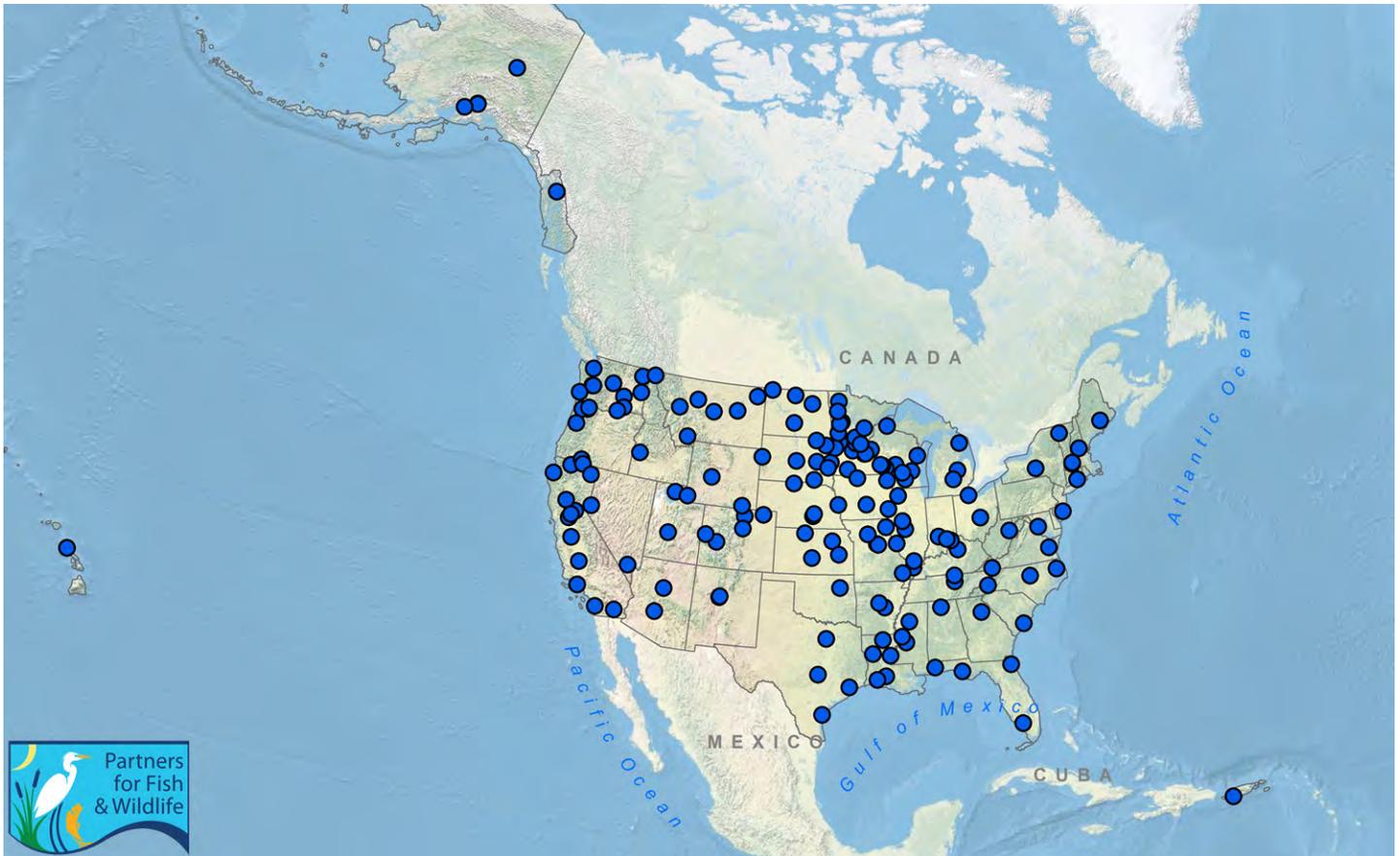
The 93,000 acre Continental Peak Grazing Allotment near South Pass, Wyoming lies within the renowned “golden triangle” for sage grouse and Sublette mule deer herd migration corridor. For sage grouse, the allotment has a Candidate Conservation Agreement (CCA) covering federal lands as well as the landowners are actively participating with the USFWS in the Candidate Conservation Agreement with Assurances (CCAA) Program. A conservation partnership is working with the landowners over the next couple of seasons to complete 14 projects focused on livestock distribution that will enhance sage steppe, wet meadow, riparian and stream habitat.

The first two projects on the list completed this year, Oregon Slough and Dickie Springs Riparian. Identified in the CCAA for improvement, extensive wet meadows of Oregon Slough and surrounding sage steppe habitat will be enhanced by the construction of two segments of 3-strand high tensile electric fence (7,550ft West and 8,945ft East) that tie into a previous PFW project on Oregon slough proper creating this large riparian pasture. High tensile electric fence is durable, handling winter snow drifts greater than 30ft and big game passage friendly. The riparian pasture is approximately 5,250 acres in size allowing the landowner to move away from an unfenced large parcel, season long grazing scenario to a pasture that stocking, timing and duration are now controlled. The landowners enrolled in the Wyoming Game and Fish Departments Walk-in Access Program and have a number of historic Oregon Trail visitors. In these higher traffic areas, four cattle guard crossings were installed to allow for vehicle passage without the need for opening and closing gates benefitting the traveling public.



Three-strand high tensile electric fence. ©Mark Hogan\USFWS

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PFW biologist Jason Bleich surveys a project site to prepare for wetland restoration. ©Mike Budd/USFWS.

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