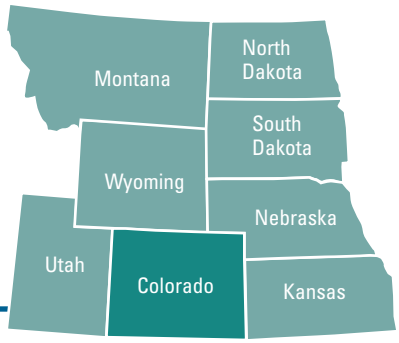
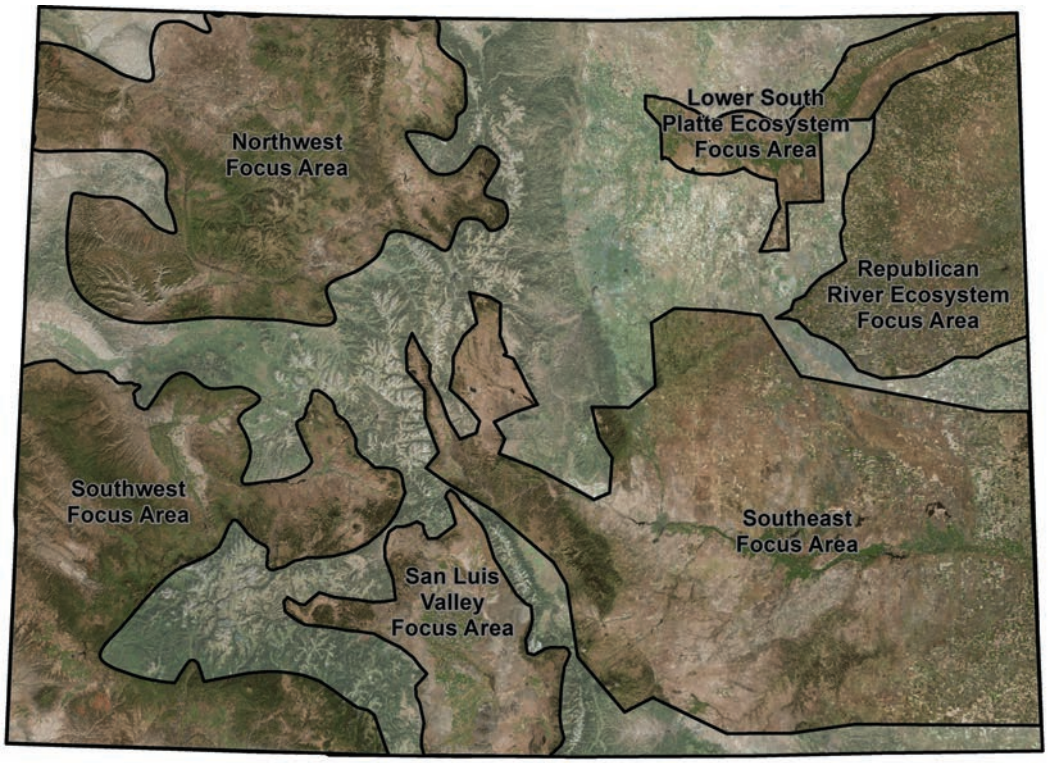
Colorado





Colorado PFW program Focus Areas. USFWS map.

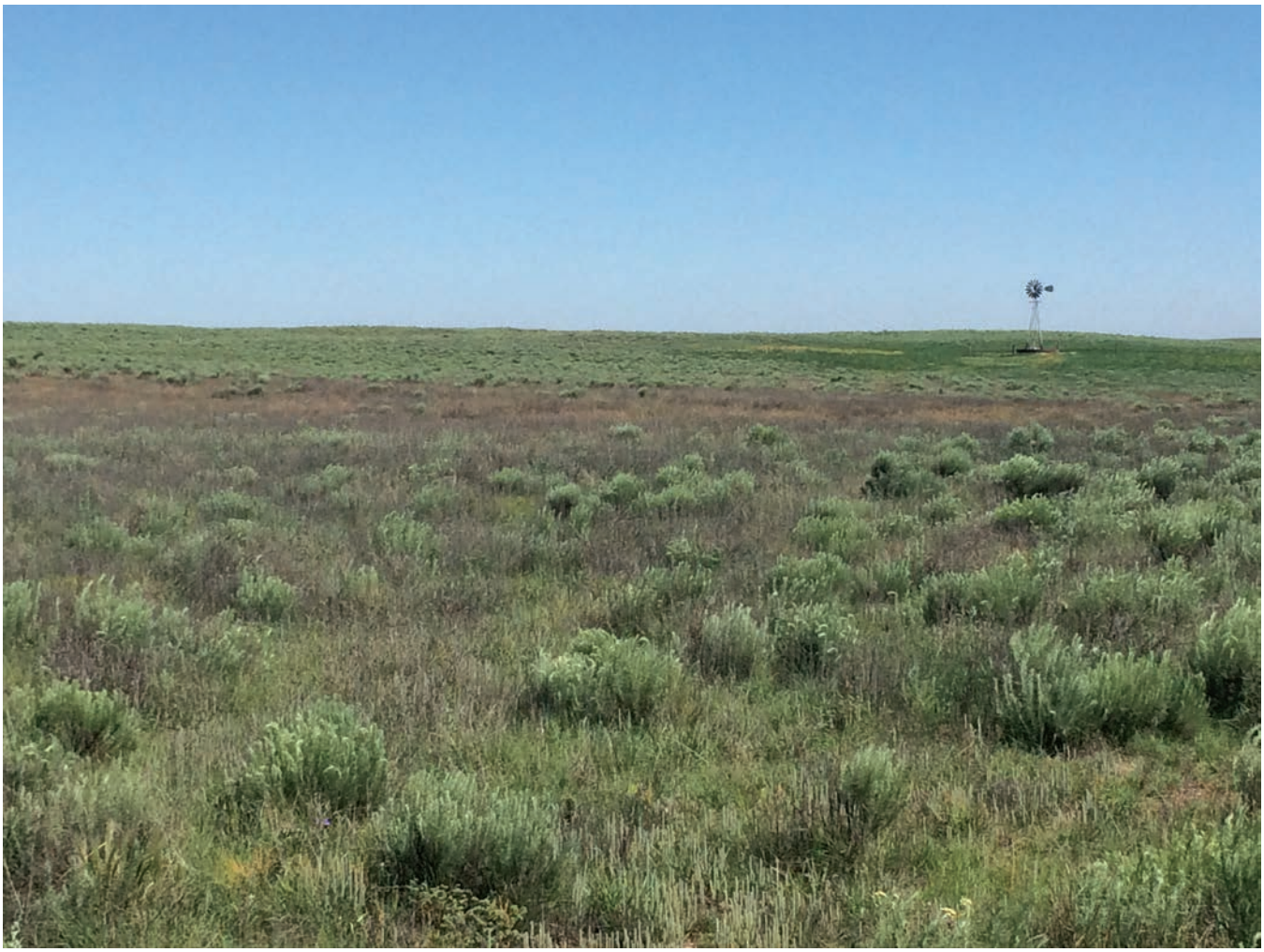
Introduction and Overview

The 2017–2021 Colorado PFW (CO PFW) Strategic Plan is built upon the solid foundation established by the two previous strategic plans. Those plans developed CO PFW's initial focus areas, evaluated critical resource needs and threats in conjunction with opportunities to prevent or reverse habitat fragmentation, identified existing or potential partners, and support for National Wildlife Refuge system lands in relationship to Colorado's private lands. This plan continues those efforts with the incorporation of current Service priorities, new scientific information, the revised 2015 Colorado State Wildlife Action Plan (CPW SWAP 2015), and input from our partners.

Plan development guidance was provided by National and Regional Service priorities. Current information relating to species and habitat occurrences, priority areas for conservation, and presence of potential partnerships were obtained from the Colorado parks and Wildlife (CPW), Colorado Natural Heritage Program (CNHP), TNC, DU, and statewide and local land trusts. The State of Colorado's 2015 Wildlife Action Plan, in particular, was used to help guide the planning process. The plan identifies 210 species as meeting the criteria for inclusion as Species of Greatest Conservation Need. Of those 210 species 55 are on the State's Tier 1 list. Additionally, CO PFW field biologists solicited and met with local partners for focus area specific input. Information from these more localized sources was integrated into the National, Regional, and Statewide information for each Colorado focus area.

Colorado is home to 18 animal species and 18 plants listed as Threatened or Endangered under the Endangered Species Act. The Colorado Natural Heritage Program lists 132 species and natural communities as Globally Critically Imperiled (G1) or Imperiled (G2), and 681 species and natural communities as State Critically Imperiled (S1) or Imperiled (S2). Colorado lies within the Central and Pacific flyways and the Playa Lakes and Intermountain West Joint Ventures. The state provides important nesting and stopover habitat for many migratory birds and for resident sage steppe and grassland species.

Although often perceived of as a federal ownership state, nearly two-thirds or 38,679,947 acres

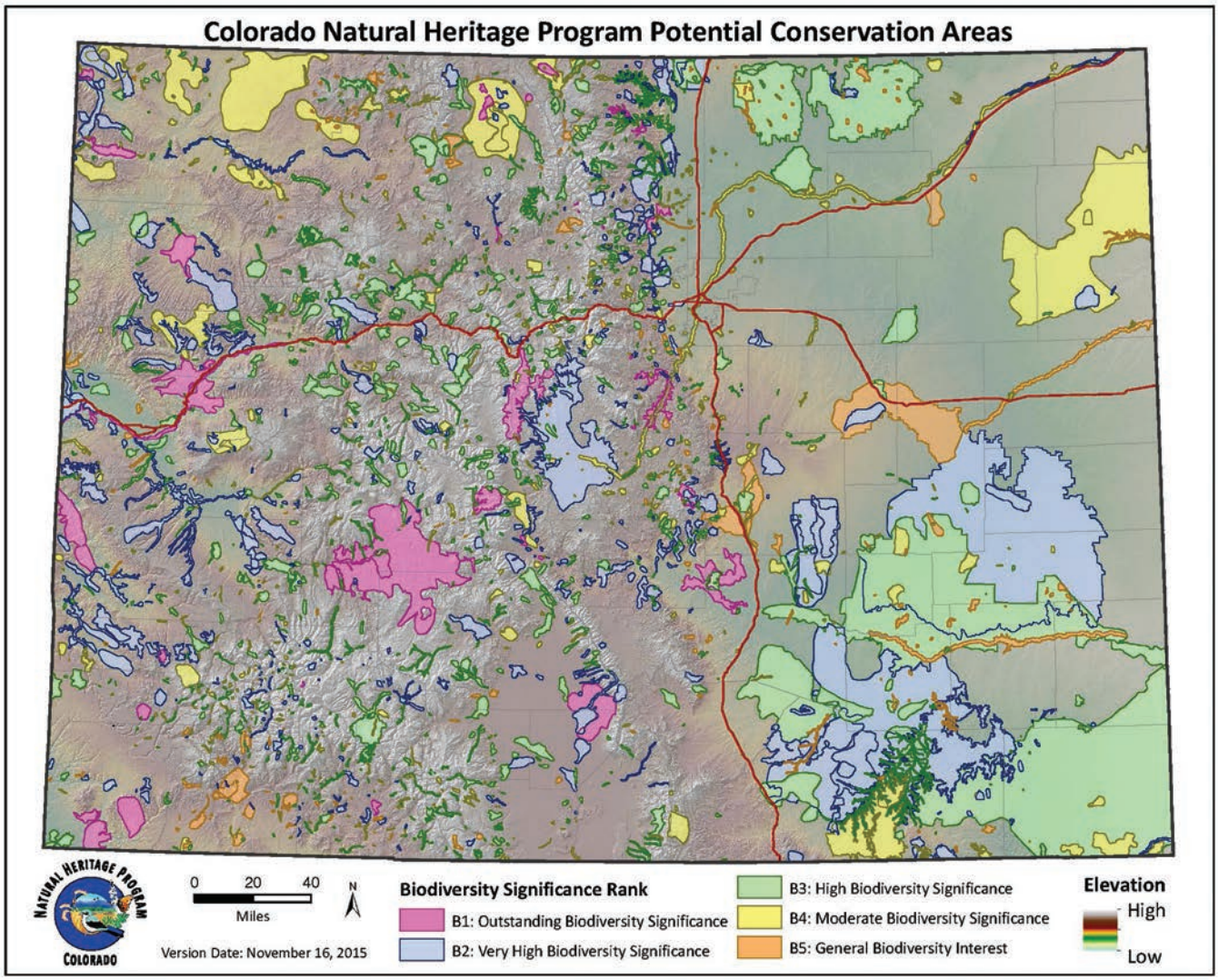


Native prairie, Cheyenne County, Colorado. USFWS photo.

(60,437 square miles) of Colorado are in private or local government ownership. The intersection of private land and target habitats provide the foundation and the primary filter for PFW restoration efforts in Colorado. The Executive Summary of Colorado's State Wildlife Action Plan (CPW 2015) states that almost all habitat types are impacted by "residential/ commercial development and natural systems modifications (including alteration of hydrological and fire regimes)". Additionally, conversion or degradation from incompatible agricultural activities, climate change, and invasive species are affecting more than two-thirds of Colorado's habitat types. The current Colorado SWAP further identifies several priority habitat types for the Service as having moderate to high vulnerability to modeled climate change. These include playas, shortgrass prairie, sand sage prairie, riparian and slope wetlands, and foothills and mountain grasslands. Several of the CO PFW focus areas reflect agreement with the state's conclusion.

This 2017–2021 update of the CO PFW program Strategic Plan retains many of the principal habitat targets of the first two previous plans. However, the Service priorities as articulated at the national, regional and state levels have set up a more refined approach to plan development. Additionally, a notable increase in the science available for landscape planning has occurred and will greatly assist project planning and implementation. In particular, the massive sagebrush habitat conservation effort by the States and Federal government has resulted in improved habitat evaluation, restoration approaches, and monitoring. Project site selection guided by newer information and models such as Core Area Mapping and Habitat Resilience and Resistance, generated by sagebrush research will improve restoration success. Statewide efforts such as CNHP's Potential Conservation Area mapping were also used in planning.

The process as it is now being implemented in Colorado is the essence of the Strategic Habitat Conservation model with an active feedback loop between research developments and implementation efforts. The need for increased applied research and effective lines of communication with implementers is critical. The work in sagebrush ecosystem is an excellent foundation, one that will need to be implemented and



expanded upon in the grasslands of the Great Plains where a similar multi-state landscape conservation effort will likely need to occur.

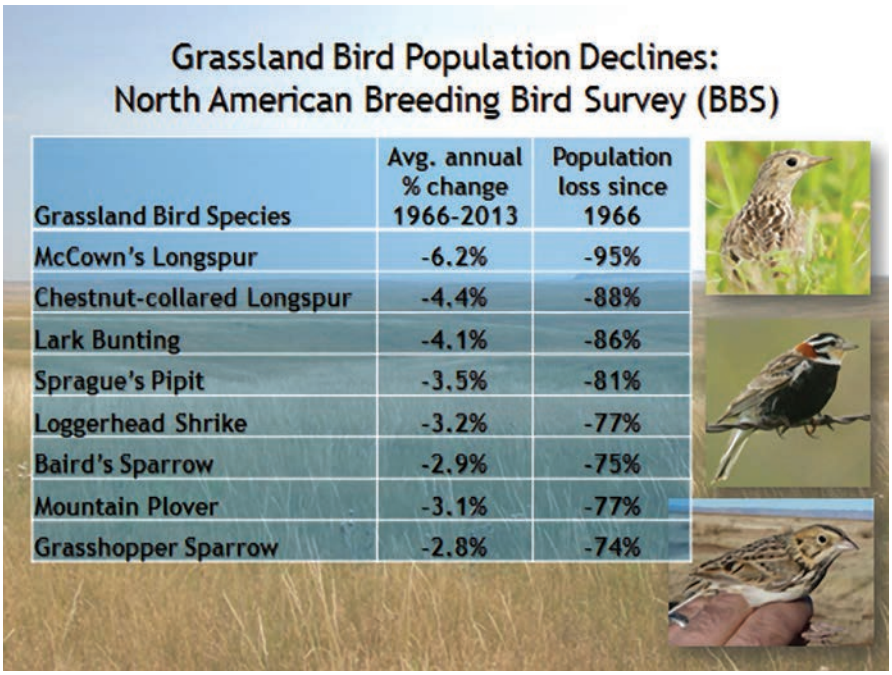
According to the State of the Birds 2016 report: "One-third of all grassland bird species are on the Watch List due to steeply declining populations and threats to habitat. Birds that breed in the Great Plains of Canada and the U.S., and winter in Mexico's Chihuahuan grasslands, are experiencing exceptionally steep declines, nearly a 70% loss since 1970. Other temperate grassland birds have declined by 33% in that time." Seventeen of the 48 Tier II bird species listed in the CPW SWAP 2015 are grassland dependent. The graphic above, courtesy of the Bird Conservancy of the Rockies (BCR), presents the recorded declines of several key Great Plains grassland species.

While much additional research is needed to clearly identify the causes of these declines, and to guide conservation responses, the need to retain as much existing grassland as possible is evident. The CO PFW program will use the intervening five years of this Strategic Plan to better develop and then refine our approaches to grassland conservation on the eastern plains of Colorado. Increased coordination and cooperation with individual ranchers, NRCS range conservationists, Colorado Cattlemen's Association, Federal, State, University and NGO research will be required. CRP acres are a key for grassland conservation in the Great Plains and declining acreage and management issues have reduced the programs value for birds in many areas. The CO PFW program currently has staff assets in place in Eastern Colorado to position us to lead the way for an expected future increase of grassland conservation efforts.

Just as the 2012–2016 Strategic Plan was a refinement of the previous plan, this version is built upon a mix of new information, lessons learned, and changes in the social, political and economic landscape. Climate change, and how best to address it, is a major factor which will influence CO PFW efforts under this and future PFW Strategic Plans. The overall goal is to recognize the importance of larger contiguous natural communities, maintain and improve the biodiversity and integrity of existing habitats, and recognize and influence pressures on these systems. This approach will afford resiliency in ecological systems and

processes, and to allow common species and species of concern the ability to adapt to changing environmental factors the PFW program cannot directly impact.

The CO PFW program will continue to work as closely as possible with the NRCS sage-grouse Initiative (SGI) on project selection and delivery. The Service assists in the support of a SGI biologist in Colorado assigned to Gunnison sage-grouse. Conservation of sagebrush for this species is a high National and Regional priority. The program will also continue to work with the NRCS Lesser Prairie Chicken Initiatives (LPCI), although with reduced emphasis. CO PFW will coordinate with other conservation partners and participate in appropriate projects when requested.



Grassland Bird Species	Avg. annual % change 1966-2013	Population loss since 1966
McCown's Longspur	-6.2%	-95%
Chestnut-collared Longspur	-4.4%	-88%
Lark Bunting	-4.1%	-86%
Sprague's Pipit	-3.5%	-81%
Loggerhead Shrike	-3.2%	-77%
Baird's Sparrow	-2.9%	-75%
Mountain Plover	-3.1%	-77%
Grasshopper Sparrow	-2.8%	-74%

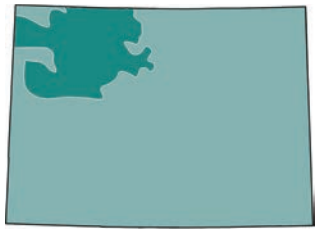
Breeding Bird Survey data compiled by the Bird Conservancy of the Rockies.

Plan Development

1. Input on general PFW program direction and future activities was solicited from key partners in a comprehensive stakeholder meeting on March 15-16, 2016, and through requests for written comments from our major partners.

2. Focus Area Biologists requested input from local partners on additions, edits, and other suggestions for each focus area. This resulted in the addition of a new Focus Area (Republican River watershed) and the expansion of the Southeast Focus area to include the Upper Arkansas River Headwater and South Park. Slight changes to the boundaries of the other focus areas were also made in response to knowledge gained over the past five years.

Northwest Focus Area



Colorado has the highest average elevation of any U.S. State at 6,811 feet, and the Northwest Focus Area exemplifies this with its diversity of habitats and species. Several major rivers have their origins in the Northwest Focus Area including the Colorado, North Platte and the Yampa River. Focal species include native cutthroat trouts, northern leopard frog, a host of neotropical migrants, and greater sage-grouse. This Focus Area provides vital habitats for many wildlife species, important to the state and local conservation organizations and watershed groups.

The majority of the Focus Area is west of the Continental Divide. The notable exception to that is at the far north-east boundary, in a high elevation valley known as North Park. This area contains State renowned populations of both greater sage-grouse and nesting waterfowl. However, the State's largest population of greater sage-grouse occurs west of the Divide, in Moffat County In addition, many smaller populations of this important species are located throughout the Focus Area near places such as Kremmling, Meeker, Toponas, and elsewhere.

Sagebrush is a high priority landscape for the Service at all organizational levels and the CO PFW program has been working with landowners on conservation for 20 years. Within sagebrush rangelands throughout northwest Colorado, greater sage-grouse are often considered the marquee species. Research has shown that both the distribution and abundance of sage-grouse has markedly decreased over time. Sage-grouse populations have exhibited long-term declines in many areas of its overall range, declining by 33% over the past 30 to 40 years (Braun 1998). The sagebrush ecosystem is occupied by many important sagebrush obligate species, including the sage thrasher, Brewer's sparrow, and sagebrush sparrow. The 2015 Colorado SWAP lists 22 Tier 1 plants and animals and 43 Tier 2 species as occurring in sage steppe. Of these 65 species, CPW has identified sagebrush as the

The Secretary of the Interior, Director of the Service, visit a PFW program-Sage Grouse Initiative project on a private ranch in northwest Colorado. Although not pictured, the Governor of Colorado and the Director of Colorado Parks and Wildlife were also present. Photo by Brandon Miller, NRCS.

primary habitat for 39 species. In addition, our habitat projects that specifically benefit these obligate species will benefit a wider suite of Federal Trust Species and state species of concern, including northern harrier and vesper sparrow. Other species, typically noted with a more moderate association with sagebrush, will benefit as well, including green-tailed towhee, lark sparrow, and Preble's shrew (SWAP 2015).

The removal of invasive overstory in the form of pinyon-juniper, implementing livestock grazing plans, vegetative plantings, and the enhancement of wet meadows, are the current main emphasis of program efforts to benefit sage-grouse. Some greater sage-grouse research points to the majority of nesting (70-80%) and early brood-rearing occurring within three miles of lek sites (Bradbury et al. 1989). The PFW program works to concentrate efforts within this "circle of maximum influence." Nesting cover objectives include stands of sage with a grass/forb understory, generally averaging greater than 20 inches in height (Peterson 1980) and canopy cover of sagebrush around nests ranging from 15 to 38% (Colorado Division of Wildlife 2005). These areas are important nesting and brood habitat for greater sage-grouse, while providing a variety of lifecycle benefits for a multitude of neotropical migrants.

Multi-tasking: As a veterinarian checks cattle, a cooperating landowner reviews Service paperwork for an invasive juniper removal project in association with NRCS SGI efforts. Photo by Bob Timberman, USFWS.

Within Red Canyon (above and below), this irrigated meadow at 8,200 ft illustrates its multiple uses. Waterbirds nest there in the early spring, soon after it can become brood habitat for greater sage-grouse. These mesic areas within sagebrush habitat are important for wildlife and working landscapes. Photo by Bob Timberman, USFWS.

Ancillary benefits promoting sagebrush health and its restoration include those for big game. This can be helpful for a landowner to make their decision regarding participation in habitat projects to benefit the greater sage-grouse. Photo by Bob Timberman, USFWS.

Ensuring the complete removal of young trees is critical to the longevity of pinyon-juniper removal projects. Photos by Bob Timberman, USFWS.

In-stream restorations to specifically benefit native cutthroat trout populations will continue to be worked on whenever possible. In addition to native cutthroat trout being a Regional priority, riparian and wetland resources are of particular importance to much of this otherwise arid landscape. Several streams have relatively unaltered hydrographs which have maintained significant native fish, riparian and wetland communities. TNC, Yampa Valley Land Trust, and others have been targeting riparian areas for conservation easements to protect these habitats. In addition, both the Arapaho and Browns Park National Wildlife Refuges are located within the Focus Area, and provide valuable fish and wildlife habitats.

Colorado Parks and Wildlife and Trout Unlimited fish biologists gather low flow population data for a PFW native cutthroat project that included funding from them, NRCS, and others. Photos by Colorado Parks and Wildlife.

This high elevation stream is restored to address the low flow/high temperature issue identified as the limiting factor for native trout. Livestock are excluded for a few years to allow the planted woody vegetation to establish and provide shading. Photo by Bob Timberman, USFWS.

This stream restoration on Milk Creek shows a log vane that's directing the high flow velocities from the near bank, as it maintains pool habitat. Erosion control fabric holds the bank profile of this construction until the vegetation matures. Photo by Bob Timberman, USFWS.

A head cut such as this is common in many areas, and can be repaired with various techniques. Erosion control structures can prevent additional erosion, as well as set the stage to aggrade soils to recover some of what was previously lost. Photo by Bob Timberman, USFWS.

Increased resilience of wet meadows within the sagebrush ecosystem by restoring their hydrologic functions may very well prove to be critical for greater sage-grouse populations. Wet meadows provide brood rearing habitat for the grouse in otherwise arid upland locations. They also provide important habitats for numerous other wildlife species, including a host of neotropical migrants and northern leopard frog. In many core habitat locations, the meadows are compromised with head cuts leading to expansive erosion and reduced water tables. Over time as the soil moisture declines, grasses and forbs are replaced as sagebrush moves into these zones that were previously too wet to allow for their growth. This condition also leads to reduced insect production that's so important to the first few weeks of the greater sage-grouse life cycle. Left unchecked, these head cuts continue to move upslope with subsequent runoff events, and therefore increase damage to the landscape. The techniques shown here have been implemented on CO PFW projects in our Southeast Focus Area and in Gunnison sage-grouse habitat in pursuit of the same habitat goals. This project type is now part of our strategic planning for future efforts that will benefit greater sage-grouse habitat, as well as addressing the general health of the sagebrush landscape for all sagebrush obligate species.

The PFW program conservation targets for this Focus Area include the restoration and enhancement of native riparian and wetland plant communities for the primary benefit of migratory bird and amphibian species. It operates with maximized investment of shared conservation efforts on private lands, and a strong emphasis on strategic habitat conservation for priority resources to guide the goal of self-sustaining populations such as those for sagebrush dependent populations of birds, specifically the greater sage-grouse. Riparian protection, wetland restoration, grazing management, pinyon-juniper removal, and restoration of hydrologic functions, constitute the majority of PFW program efforts. Whenever possible on private lands, projects to restore or protect habitat for native cutthroat trouts will be pursued and accomplished.

Restoration of head cuts are effective but labor intensive. This may prove to be the largest challenge for widespread implementation efforts. Photos by Bob Timberman, USFWS.

Northwest Focus Area Focal Species

- Greater sage-grouse
- Colorado River cutthroat trout
- Boreal toad
- Sage thrasher
- Green-tailed towhee
- Brewer's sparrow
- Vesper sparrow
- Lark sparrow
- Sage sparrow
- Greater sandhill crane

Northwest Focus Area Habitat Targets

- Upland Restoration/Enhancement: 20,000 acres
- Riparian Restoration/Enhancement: 10 miles
- Wetland Restoration/Enhancement 500 acres
- In-stream Structures: 10

Northwest Focus Area Partnership Targets

- Private Landowner Agreements: 40
- Partnerships: 324
- Technical Assistance: 250 staff days
- Percentage of Leveraging (Ratio Service to Partner): 1:3

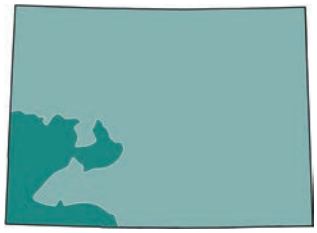
Northwest Focus Area Related Plans

- North American Waterfowl Management Plan
- United States Shorebird Conservation Plan
- North American Waterbird Conservation Plan
- North American Bird Conservation Initiative
- State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado (Colorado Parks and Wildlife 2015)
- Partners in Flight (Rich et al. 2004)
- Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint, September 2001 (Neely et al. 2001)
- A Conservation Assessment of the Colorado Plateau Ecoregion
- Colorado Important Bird Areas Program
- Greater Sage-grouse Statewide Conservation Plan (in progress)
- WAFWA MOU National Sage-grouse Habitat Conservation Strategy
- Intermountain West Joint Venture Coordinated Bird Conservation Plan
- Northern Eagle and Southern Routt Greater Sage-grouse Conservation Plan
- Northwest Colorado Greater Sage-grouse Conservation Plan
- Conservation Agreement and Strategy for Colorado River Cutthroat Trout *(Oncorhynchus clarki pleuriticus)* in the States of Colorado, Utah, and Wyoming

Riparian fence in South Park, Colorado. Photo by Katy Fitzgerald, USFWS.

Restored wet meadow continues to provide critical brood-rearing habitat for Gunnison sage-grouse. PFW program projects are intended to create resiliency and provide long-term benefits at a landscape scale. Photo by Corey Kanuckel, USFWS.

Southwestern Focus Area



This conservation focus area targets habitat on all private and tribal lands in an area extending south from the Colorado River to New Mexico, and west of the Continental Divide to Utah. It encompasses the major river basins of the Gunnison, Dolores, and San Juan and includes watersheds of the Animas, Mancos, San Miguel, Uncompaghre, Tomichi, and North Fork of the Gunnison. The PFW program conservation objectives for this focus area include the restoration and enhancement of native riparian and wetland plant communities, sagebrush habitats, and native aquatic resources. The selection of focal species for this focus area is not intended to be comprehensive or exclusive, but rather representative of specific habitat types and ecosystems prioritized by the program.

The sagebrush ecosystem, while naturally dynamic and spatially diverse, is one of the most imperiled ecosystems in the United States, with continued threats from increasing fragmentation, habitat loss, and invasive weeds like cheatgrass (Braun 1998; Davies et al. 2011; Dobkin and Sauder 2004; Miller and Eddleman 2001). In southwest Colorado, Gunnison sage-grouse are considered the marquee species for this habitat type. As with greater sage-grouse, the restoration of diverse age classes of sagebrush with a healthy understory of native grasses and forbs is the objective for sagebrush habitat enhancements. The PFW program seeks to address the limiting factors within the complexity of habitat types required by the sage-grouse as well as a suite of other sagebrush dependent species such as the Brewer's sparrow, sagebrush sparrow, sage thrasher, and green-tailed towhee. Habitat improvement practices can include the removal of encroaching pinyon-juniper trees, native grass/forb/shrub seeding, and grazing system improvements as well as the development and enhancement of critical wet meadow and shallow wetland areas. The program will continue to assist the NRCS with the delivery of EQIP, SGI, and other Farm Bill funded projects which target sagebrush habitat improvements.

Cinnamon teal courtship displays in Archuleta County, Colorado. Photo by Corey Kanuckel, USFWS.

While the annual rate of wetland loss in the U.S has significantly declined over the past 30 years, thanks in large part to a national focus and prioritization of wetland conservation and restoration, the threats to freshwater emergent wetlands remain (Dahl 2006). Wetlands are some of the most productive and diverse communities within the arid landscapes of southwestern Colorado and thereby warrant significant investment. These wetland complexes, often associated with adjacent riparian corridors, vary greatly throughout this Focus Area. The PFW program recognizes this complexity from hemi-marsh wetlands, to seasonal shallow water wetlands, to wet meadows associated with flood irrigation practices. The restoration, enhancement, and establishment of wetland habitat remains a high priority for migratory waterbirds and amphibians such as the northern leopard frog.

The decline of native riparian communities and their critical importance to a myriad of wildlife species have been well documented throughout the west (Busch and Smith 1995; Chaney et al. 1990; National Research Council 1992; Johnson et al. 1977; Kauffman et al. 1997; Knopf et al. 1988; Sanders and Edge 1998). The PFW program will continue to focus on the restoration and enhancement of important riparian corridors and engage willing landowners who share a vested interest in providing connected habitat along southwest Colorado waterways. The goal of riparian enhancement projects is to provide habitat connectivity with the delivery of a robust and structurally diverse native plant community. These enhancement activities can include: grazing management to allow natural regeneration of the native cottonwood/willow community; riparian planting to provide a more diverse community; instream structure to provide grade control and improve hydrologic function; bioengineering techniques to curb accelerated erosion and sedimentation; and removal and treatment of woody invasive species such as tamarisk and Russian olive.

In addition to the terrestrial benefits provided by a healthy riparian corridor, the instream benefits are also numerous and invaluable to the function of the aquatic ecosystem. Riparian buffers offer shade (temperature control) that is critical to trout; filtering of sediment and other pollutants to improve water quality; and the contribution of leaf litter and woody debris that is the base of the aquatic food chain (Broadmeadow et al. 2010, Henley et al. 2000, Jensen and Platts 1989, Karr et al. 1986). Native fish projects look to connect the link between the terrestrial and aquatic system by targeting species such as bluehead sucker, flannelmouth sucker, and roundtail chub. This could include floodplain connection and enhancement, side channel

Before and after tamarisk removal and follow-up treatments along the Dolores River, Gateway, Colorado. Photo by Corey Kanuckel, USFWS.

development, or the placement of log and root wad structures to increase instream habitat complexity. These projects may also involve obstruction removal or even the installation of barriers to prevent hybridization with non-native suckers. The installation of fish barriers on select private lands has been successful in protecting existing populations of Colorado River cutthroat trout from competition and hybridization with non-native trout. The program will continue to work closely with Colorado Parks and Wildlife aquatic biologists to identify habitat needs and support the conservation and recovery of Colorado River cutthroat trout.

Southwest Focus Area Focal Species

- Gunnison sage-grouse (Threatened)
- Southwestern willow flycatcher (Endangered)
- Western yellow-billed cuckoo (Threatened)
- Colorado River cutthroat trout
- Mallard
- Cinnamon teal
- Green-winged teal
- Greater sandhill crane
- Wilson's phalarope
- American bittern
- Sage thrasher
- Green-tailed towhee
- New Mexico meadow jumping mouse (Endangered)

Southwest Focus Area Habitat Targets

- Upland Restoration / Enhancement: 3,500 acres
- Wetland Restoration / Enhancement: 1,200 acres
- Riparian / Stream Restoration / Enhancement: 15 miles

Southwest Focus Area Partnership Target

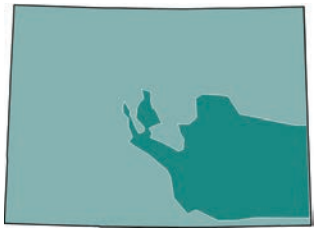
- Private Landowner Partners: 45
- Partnerships: 364
- Technical Assistance: 300 staff days
- Percentage Leveraging (Ratio Service to Partner): 1:3

Focus Area Linkage to Existing Conservation Plans

- North American Waterfowl Management Plan
- United States Shorebird Conservation Plan
- North American Waterbird Conservation Plan
- North American Bird Conservation Initiative
- State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado (Colorado Parks and Wildlife 2015)
- Colorado Wildlife Action Plan Enhancement: Climate Change Vulnerability Assessment (Colorado Natural Heritage Program 2014)
- Statewide Strategies for Riparian and Wetland Conservation: Strategic Plan for the Wetland Wildlife Conservation Program (Colorado Parks and Wildlife 2011)
- Strategic Plan for the Southwest Wetlands Focus Area Committee
- Partners in Flight Strategic Action Plan
- Intermountain West Joint Venture Coordinated Bird Conservation Plan
- Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint, (Neely et al. 2001)
- Colorado Important Bird Areas Program
- Gunnison Sage-grouse Rangewide Conservation Plan (Colorado Division of Wildlife 2005)
- Southwestern Willow Flycatcher Recovery Plan
- Conservation plan and agreement for the management and recovery of the southern Rocky Mountain population of the boreal toad *(Bufo boreas boreas)*
- Conservation Agreement and Strategy for Colorado River Cutthroat Trout *(Oncorhynchus clarki pleuriticus)* in the States of Colorado, Utah, and Wyoming
- Range-wide Conservation Agreement and Strategy for Roundtail Chub (Gila robusta), Bluehead Sucker (Catostomas discobolus), and Flannelmouth Sucker (Catostomas latipinnis). Utah Department of Natural Resources, Division of Wildlife Resources

Elk herd utilizing Purgatoire River riparian area after removal of invasive trees. Photo by Katy Fitzgerald, USFWS.

Southeast Colorado Focus Area



The Southeastern Colorado Focus Area encompasses a large geographical area and several ecological communities. Ecologically it includes sand sage, shortgrass prairie, wet meadow/slope wetlands, streams and playas. Projects are targeted to address building resiliency and connectivity in these ecological systems and addressing limiting factors for species of concern. This approach allows species to respond to environmental and anthropologic stressors including land use changes, and habitat quality shifts. It is applied at both the localized project site and within the landscape context.

For the 2017–2021 Strategic Plan, the Southeastern Colorado Focus Area was modified to include the Arkansas River Headwaters and Upper South Platte drainage. A number of variables have influenced this decision. These include unique ecological habitat occurrences, partnership opportunities, landowner willingness, wetland community integrity, and restoration potential. These areas have unique values and offer opportunity for building ecological resiliency to targeted high value systems of the South Platte and Arkansas drainages as well as the neighboring San Luis Valley.

There are a number of habitat types outlined in both the SWAP and CNHP Wetland Assessment documents. This document will focus on generalized habitat types that provide achievable restoration potential, are significant to species of concern, provide valuable ecosystem function, and meet agency and partner goals.

The Arkansas River Basin is the largest basin in the state of Colorado and drains a quarter of the state's land area. The floodplain of the Arkansas River, its tributaries, and numerous playa lake complexes are important migratory and wintering bird habitat (Service 1995). These areas are utilized by several priority wildlife species, and state species of concern, including plains native fisheries, shorebirds, and migratory waterfowl.

The South Platte Headwaters/South Park area has been identified as a very high biodiversity area

by CNHP. It supports several biologically rich fens, and globally rare plant communities. Research has shown that South Park contains important breeding grounds for mountain plover, supporting 15-20% (>2,000) of the species breeding population (Wunder et al., 2003). Additionally, these grasslands support globally imperiled grasslands and several associated plants. The area is the headwaters of the economically and ecologically important South Platte basin with three primary tributaries contributing to the drainage.

The SWAP identifies the threats to habitat in this Focus Area as residential/commercial development, natural system modifications (hydrological and fire regimes), conversion or degradation from incompatible agricultural activities, climate change, and invasive species. The SWAP goes into detail about habitat specific threats, species impacted, and possible conservation/restoration actions. CNHP noted in their 2012 State of Colorado Biodiversity report, "Of the species that are at risk, fish and amphibians – both aquatic dependent species – have the highest percentage of at-risk taxa. Forty-three percent of all native fish are at risk. Amphibians fared only slightly better with 41% of native species at risk (CPW SWAP 2015).

Restoration potential within this outlined work area is good overall with area specific opportunities and challenges based on partnership goals and opportunities, landowner motivations, socio-economic drivers, and environmental drivers. The restoration goals need to mesh with landowner operational goals as well as habitat improvement, to develop practices that can be sustainable and adaptable.

With such a large geographical coverage, prioritization will be based on working collaboratively to restore valuable ecological systems, to benefit species of concern, and to build on momentum of landowner interest and partnership opportunities.

Wetland habitats: Within the Arkansas River drainage, according to CNHP, only 2% of the total acreage is classified as wetlands. These wetlands include wet meadows, wet seeps, playas, riparian and associated floodplain wetlands. Of these wetland acres, 76% are privately held, and 44% of those are under moderate to severe stress from hydrological, management and physical modifications. The most common observed stressors to wetland biotic and vegetative integrity are typically roads, grazing, invasive species, and hydrological impacts. These impacts can include increased basin sedimentation, late successional wetland plant communities, and artificially fed irrigation wetland systems which are being dried up with water efficiency practices.

Within the South Platte Headwaters/South Park area, 6% of the drainage is comprised of wetlands totaling 60,336 acres. These wetland acres are comprised of globally important fen habitats,

Arkansas River Basin (adapted from CNHP Wetland Inventory):

Wetland Area by Type (acres)

Freshwater Herbaceous	137,652	43%
Freshwater Shrub	58,496	18%
Freshwater Forested	29,474	9%
Ponds	17,948	6%
Lakes	37,332	12%
Rivers	33,147	10%
Other	8,034	2%

South Platte Headwaters (adapted from CNHP Wetland Inventory):

Wetland Area by Type (acres)

Freshwater Herbaceous	35,035	58%
Freshwater Shrub	11,576	19%
Freshwater Forested	389	< 1%
Ponds	2,049	3%
Lakes	9,816	16%
Rivers	433	< 1%
Other	1,038	2%

Playa basin in a wheat field. Photo by Greg Stoebner USFWS.

wet meadows, slope wetlands, riparian and associated floodplain wetlands. Of these wetland acres, 44% are privately held, and 67% are under moderate to severe stressors. The most observed stressors to biotic integrity have been roads, livestock grazing, invasive species, mining operations, and hydrological impacts. PFW is able to work with private landowners, through changes in management and infrastructure, to eliminate or reduce these impacts and to improve wetland condition.

Playa restoration: Playas are a prevalent wetland type in this short grass prairie ecosystem. It is estimated there are 7,500 playa basins in eastern Colorado alone, with basin size varying from 0.25 acre to 65 acres (Hutton 2004). They are shallow, temporary wetlands. They are ephemeral in nature, dependent on precipitation events for hydrology. These prairie-based wetlands support a rich community of birds, mammals, amphibians, invertebrates, and plants. They also provide critical migration habitat for waterfowl and shorebirds. There are a number of Federal Trust Species and/or State species of greatest conservation concern (16 SGCN) that utilize playas including northern pintail, ferruginous hawk, mountain plover, American avocet, long-billed curlew, plains leopard frog, black-tailed prairie dog, and massasauga rattlesnake (CPW SWAP 2015).

Hydrological changes, grazing and conversion to agriculture are the primary threats. Filling of the basins via sedimentation, digging pits to concentrate water, conversion and use for irrigation water collection are some examples. CNHP's recent ecological integrity assessments (EIA) within the lower Arkansas River basin, found that playas represented the least botanical diversity of all wetland types surveyed with typically less than 10 plant species and, depending on the site, could include non-native or noxious weed species. This type of restoration is perhaps one of the most elusive to achieve, as perceived landowner values of these basins are often low. In Southeastern Colorado, there are hydrologically modified basins or intact playas impacted by sedimentation and management. Often times, management to provide plant structure and reduce sedimentation impacts are all that's necessary. Other work can entail providing alternate water sources, and assisting in developing grazing management practices to address wetland function and stressors.

Wet meadow-slope wetlands: According to CPW SWAP, non-riparian wetlands support 53 SGCN species. Wet meadows are typically groundwater fed wetlands with a mix of wetland sedges, grasses, forbs, and shrubs. Recent CNHP EIA work has shown that when hydrology was intact, wet meadows offered high vegetative biodiversity and habitat. The wet meadow habitat is one that is often impacted and

Plains leopard frog. Photo by Greg Stoebner, USFWS.

modified by management practices. These practices and use patterns often lead to erosional processes, lowering of water table, and subsequent drying of this wetland type.

Slope wetlands are a form of wet meadow found throughout mountainous regions. Brinson defines slope wetlands as those that occur "where there is a discharge of groundwater to the land surface." They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes. The level to which headwater slope wetlands are intact, influences the water delivery rate (baseflow) to the downslope environments (Earman et al., 2004). Wetland vegetation also helps dissipate water energy before the water reaches tributaries and therefore has an effect on reducing downstream erosion and channel downcutting (deepening of the stream channel due to erosion). Environmental and management stressors include erosional and vegetative impacts from hydrological manipulation, livestock grazing, logging, and roads.

Restoration potential: There is great potential in restoring these groundwater driven wetland systems through simple structures and management changes with the goal of restoring the hydrological function of the wetland. This is a new programmatic endeavor and there is developing partnership opportunities in the Arkansas and South Platte Headwaters as well as on ephemeral drainages of the southeast. The practices typically include controlling erosional process, encouraging connection to water table, and addressing cattle use patterns and travel in these areas. Exciting efforts using Zeedyk inspired structures is gaining momentum within the state.

Riparian and stream restoration: According to CPW SWAP, riparian woodlands and shrublands support 26 SGCN. The waterways in this area are tributaries of the Arkansas watershed, and are often strongholds of amphibian, migratory birds, and native eastern plains fishes. Hydrologically, they range from dry creeks to intermittent and perennial flowing streams with water levels and flows dependent on rainfall, springs, and run-off events.

Stream corridors play a critical role in the life cycle of grassland dependent species, amphibians, plains native fishes, and neotropical migratory birds. Over 60% of neotropical species use riparian areas in the West as stopover areas during migration or for breeding habitat (Kreuper 1992). There are at least 195 species of birds that are confirmed riparian breeders, according to the Colorado Breeding Bird Atlas (Kingery 2000). Native eastern plains fishes are another group of species linked to these systems. These fishes are believed to be declining because of impacts on eastern plains tributaries. Surface water

Youth Corps members construct a "One Rock Dam" to control erosion on a Colorado PFW program project. Photo by Katy Fitzgerald, USFWS.

diversion and dewatering of the Ogallala Aquifer for irrigation and general development are two such impacts. The Arkansas darter is a native eastern plains fish that has been impacted by these activities– currently a state listed species. A wide variety of native Colorado bats utilize these systems including eastern red bat, hoary bat, and silver-haired bat.

Riparian systems are heavily impacted by overgrazing, development, invasive species, fragmentation, diversion, and farming practices, to name a few. Tamarisk Coalition, has documented that 70% of Colorado's tamarisk is present within the Arkansas River Basin. The PFW program focuses on addressing invasive species has been to work collaboratively with partnering organizations to address it at a landscape scale.

Riparian restoration practices the PFW program utilizes include addressing native plant community vigor and diversity through grazing management, exclusion, invasive species removal and plantings. Other stressors impacting hydrological function and floodplain connectivity can be addressed sometimes on the supporting uplands by reducing erosional impacts or within the channel by addressing stream morphology changes. The desired biological outcome is to reduce erosion, restore hydrology and stream function, and to promote a diversity of plant species and plant structure within the stream, riparian corridor, and associated uplands.

Grassland restoration: The focus area targets short grass prairie, a small area of transitional mixed grass prairie, and sandy soil areas characterized by sand sagebrush habitat. Lesser prairie-chicken, burrowing owl, mountain plovers, shorebirds and other high priority grassland species, have the potential to benefit from grassland management and restoration in this area. CPW SWAP documents, 52 SGCN associated with short grass prairie. Sandsage supports 21 SGCN. Sandsage shrublands dominate sandy areas on Colorado's eastern plains, where they often intermingle with shortgrass prairie to form a locally patchy sandsage-shortgrass matrix.

Riparian fencing project, South Park, Colorado. Photo by Katy Fitzgerald, USFWS.

The majority of the habitat impacts in this focus area, within the grassland mosaic, are a result of fragmentation, habitat composition shifts, and habitat quality degradation. Nearly 50% of the historic short grass prairie has been lost to grassland conversion to agricultural use. Ongoing impacts are present from agriculture, drought, energy production, etc. Recent CNHP work on Pueblo Chemical Depot showed that plants with a grazing history, could take up to 10-12 years after grazing was removed, to match the vegetative trends of non-grazed plant species. Sandsage communities anecdotally are noted to be longer to recover from grazing impacts, and some plant species when grazing and drought conditions are combined can be extirpated from the community.

Grassland habitat restoration is framed around the concepts of restoring/promoting plant diversity and structure to the landscape. This is typically achieved via establishing individualized and adaptive, grazing management goals that allow for utilization while managing for a landscape scale species richness and morphological structure. These types of projects are rare for the PFW program because of increased emphasis and greater funding pools within NRCS programs. The PFW program strives to provide a technical assistance role in these NRCS effort when opportunity arises. Additionally, there is opportunity with FSA CRP projects to promote diversified seed mixtures, either via fiscal or technical assistance.

Southeast Focus Area Focal Species

- Long-billed curlew
- Boreal toad
- Arkansas darter
- Mallard
- Northern pintail
- Mountain plover
- Ferruginous hawk
- American avocet
- Wilson's phalarope
- Grasshopper sparrow

Southeast Focus Area Habitat Targets

- Upland Restoration / Enhancement: 800 acres
- Wetland Restoration / Enhancement: 1,000 acres
- Riparian / Stream Restoration / Enhancement: 18 miles

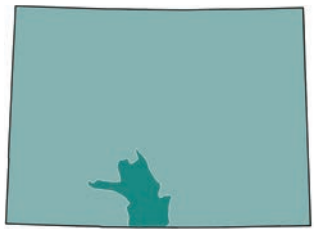
Southeast Focus Area Partnership Target

- Private Landowner Partners: 35
- Partnerships: 283
- Other Partners: 12
- Technical Assistance: 545 staff days
- Percentage Leveraging (Ratio Service to Partner): 1:3

Southeast Focus Area Focus Area Plans

- North American Waterfowl Management Plan
- United States Shorebird Conservation Plan
- North American Waterbird Conservation Plan
- North American Bird Conservation Initiative
- State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado (Colorado Parks and Wildlife 2015).
- Statewide Strategies for Riparian and Wetland Conservation: Strategic Plan for the Wetland Wildlife Conservation Program (Colorado Parks and Wildlife 2011)
- Partners in Flight Strategic Action Plan
- Intermountain West Joint Venture Coordinated Bird Conservation Plan
- Conservation plan and agreement for the management and recovery of the southern Rocky Mountain population of the boreal toad *(Bufo boreas boreas)*

San Luis Valley Ecosystem Focus Area



The San Luis Valley (SLV), spanning approximately 100 miles north to south and 60 miles east to west at its widest point, is considered to be one of the largest inter-mountain valleys in the world with an average elevation of 7,700 feet. Numerous high quality wetland and wet meadow habitats are found in the SLV. However, increased human development and landscape modifications have resulted in degradation and loss of wetland habitat throughout the SLV. Water supply, use, and timing are rapidly becoming the primary driver of natural resource management in the SLV. Ground water augmentation projects may become more common in the SLV

Seasonal wet meadow habitat in an active San Luis Valley hayfield. Photo by Corey Kanuckel, USFWS.

Fencing projects help restore San Luis Valley riparian areas for a variety of wildlife including southwestern willow flycatcher and yellow-billed cuckoo. Photo by Corey Kanuckel, USFWS.

and CO PFW may have a role to play in those projects. Water users in the South Platte River basin operate under similar requirements and the CO PFW has found a role assisting in the surface design of augmentation projects to create wildlife benefits. The greatest future potential for wetland and wet meadow habitat restoration and enhancement activities in the SLV lies in analogous voluntary agreements with private landowners who flood irrigate for livestock forage.

The SLV is well known for its quality waterfowl nesting habitat; large numbers of nesting waterfowl, shorebirds, and waterbirds; and seasonal shallow wetlands providing a diversity of stopover foraging habitat (Gilbert et. al. 1996, Laubhan and Gammonley 2000). Therefore, habitat restoration and enhancement activities focus on providing such quality habitat. Focal species in the SLV Focus Area include mallard, cinnamon teal, northern pintail, white-faced ibis, American avocet, and Wilson's phalarope. Habitat restoration and enhancement provides important migration, foraging, hiding, and resting areas for these species. Other high priority Federal Trust Species that benefit from these projects include Northern harrier, marsh wren, American bittern, and northern leopard frog.

Riparian habitat restoration and enhancement activities focus on regeneration of native vegetative communities associated with the rivers and streams in the SLV. Historic and current land use practices, such as livestock grazing, have impacted the regeneration of cottonwoods, willows, and shrubs within riparian areas throughout the SLV. Primary habitat objectives are to restore riparian areas such that they will contain a suitable mixed-age class of cottonwoods with a dense

Wetlands throughout the San Luis Valley are critical nesting and migration habitat for many waterfowl and shorebird species such as this Wilson's phalarope. Photo by Corey Kanuckel, USFWS.

understory of willow and other native shrubs. These areas provide high quality habitat for a wide array of neotropical songbirds including the federally endangered southwestern willow flycatcher and the threatened yellow-billed cuckoo.

Habitat restoration for native fishes of State Concern (e.g., Rio Grande cutthroat trout, Rio Grande sucker, and Rio Grande chub) is a high priority both on private lands and the Baca NWR. Of particular importance is restricting movement of non-native fish species into habitats occupied by native fish through the construction of fish movement barriers. An additional priority is removing and/or replacing detrimental barriers, such as improperly placed culverts, which may restrict access to critical habitats for native fish.

The SLV is within the Intermountain West Joint Venture. Other land management units in the area include three National Wildlife Refuges (Alamosa, Baca, and Monte Vista); Great Sand Dunes National Park and Preserve; Blanca Wetland Management Area, owned and managed by the BLM; numerous Colorado Division of Wildlife State Wildlife Areas; and TNC's 100,000 acre Medano-Zapata Ranch. Additionally, numerous perpetual conservation easements are held throughout the SLV by DU, USDA - NRCS, Rocky Mountain Elk Foundation, Colorado Open Lands, and numerous local land trusts. The PFW program works closely with agencies and organizations, such as the NRCS, U.S. Forest Service, Colorado Division of Wildlife, DU, Trout Unlimited, and TNC.

San Luis Valley Focus Area Focal Species

- Southwestern willow flycatcher (Endangered)
- Western yellow-billed cuckoo (Threatened)
- Rio Grande chub
- Rio Grande sucker
- Rio Grande cutthroat trout
- Mallard
- Cinnamon teal
- Northern pintail
- Greater sandhill crane
- White-faced ibis
- American avocet
- Wilson's phalarope
- American bittern
- Sage thrasher
- Boreal toad

A reconstructed San Luis Valley stream provides habitat for a remnant population of Rio Grande chub and serves as a reintroduction site for Rio Grande sucker. Photo by Corey Kanuckel, USFWS.

San Luis Valley Habitat Targets

- Upland Restoration / Enhancement: 400 acres
- Wetland Restoration / Enhancement: 1,500 acres
- Riparian / Stream Restoration / Enhancement: 15 miles
- Fish barriers constructed: 3

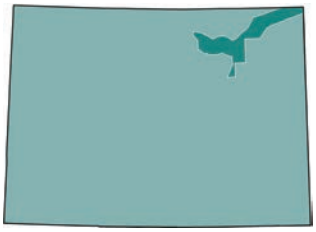
San Luis Valley Partnership Targets

- Private Landowner Agreements: 30
- Partnerships: 243
- Technical Assistance: 250 staff days
- Percentage Leveraging (Ratio Service to Partner): 1:4

San Luis Valley Focus Area Related Plans

- North American Waterfowl Management Plan
- United States Shorebird Conservation Plan
- North American Waterbird Conservation Plan
- North American Bird Conservation Initiative
- State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado (Colorado Parks and Wildlife 2015)
- Statewide Strategies for Riparian and Wetland Conservation: Strategic Plan for the Wetland Wildlife Conservation Program (Colorado Parks and Wildlife 2011)
- San Luis Valley Community Wetlands Strategy
- Partners in Flight Strategic Action Plan
- Intermountain West Joint Venture Coordinated Bird Conservation Plan
- Rio Grande Basin Implementation Plan (Revised Draft April 2015)
- Southwestern Willow Flycatcher Recovery Plan
- Conservation plan and agreement for the management and recovery of the southern Rocky Mountain population of the boreal toad *(Bufo boreas boreas)*
- Rio Grande cutthroat trout *(Oncorhynchus clarkia virginalis* Conservation Strategy
- Rio Grande Chub *(Gila Pandora)*: A Technical Conservation Assessment
- Rio Grande sucker recovery plan (Colorado Division of Wildlife 1994)

Lower South Platte Ecosystem Focus Area



The Lower South Platte Ecosystem Focus Area is located in portions of Weld, Arapaho, Morgan, Logan, Phillips, and Sedgwick counties in northeastern Colorado. The floodplain and tributaries of the Lower South Platte River, along with associated uplands, are interests within the focus area. Although much of the land has been altered in the past by agricultural practices and water development, many farmers, ranchers and recreational landowners have an interest in restoring these lands to benefit wildlife and for groundwater augmentation. Restoration of seasonal emergent wetlands, and associated uplands, is a primary conservation objective. These flood plain projects are commonly associated with conservation easements held by CPW, DU, Colorado Open Lands and other major land trusts. Significant protection of the South Platte River corridor has been accomplished over the last two decades.

Waterfowl on a PFW program-funded project, South Platte River, Colorado. Photo by Greg Stoebner, USFWS.

Win-win conservation practices benefit private landowners and wildlife. Photo by Greg Stoebner, USFWS.

Migratory water and grassland bird species, along with a host of other wetland-dependent species, will benefit from these efforts. These include snow goose, Canada goose, mallard, northern pintail, American avocet, Wilson's phalarope, common garter snake, and northern leopard frog. Projects which include a groundwater augmentation component will help keep local agriculture sustainable and also continue to contribute to Platte River water flows through the "Big Bend" reach in Nebraska, benefiting several federally listed species such as whooping crane, piping plover, and least tern. Of increasing importance in eastern Colorado as well as the Great Plains as a whole, is the decline of many native grassland bird species. Both the South Platte and Republican Focus Areas provide important grassland habitat in northeastern Colorado. Native prairies as well as CRP tracts comprise a significant resource within the landscape of both focus areas. Floodplain wetland restoration, grazing system establishment (fencing, alternate water supply, rotation) and re-seeding of native grasses and forbs will likely constitute the majority of PFW program efforts within the basin. In addition, follow-up efforts on the many existing projects in the focus area will likely be an increasing portion of the workload.

Identified conservation threats and challenges include the spread of invasive noxious weeds (woody and herbaceous), fragmentation due to oil and gas drilling, development, increased demand for water by municipalities, reduction of CRP acres, conversion of native grasslands for crop production, fulfillment of augmentation plans, and inflation of land prices.

Lower South Platte Ecosystem Focus Areas Focal Species

- Mallard
- Northern pintail
- Mountain plover
- American avocet
- Wilson's phalarope
- Greater sandhill crane
- Long-billed curlew
- Loggerhead shrike
- Short-eared owl
- Grasshopper sparrow

Lower South Platte Ecosystem Focus Area Habitat Targets

- Upland Restoration / Enhancement: 1,000 acres
- Wetland Restoration / Enhancement: 700 acres
- Riparian / Stream Restoration / Enhancement: 3 miles

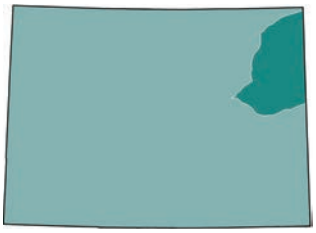
Lower South Platte Ecosystem Focus Area Partnership Target

- Private Landowner Agreements: 10
- Partnerships: 90
- Technical Assistance: 400 staff days
- Percentage Leveraging (Ratio Service to Partner): 1:3

Lower South Platte Ecosystem Focus Areas Plans

- North American Waterfowl Management Plan
- United States Shorebird Conservation Plan
- North American Waterbird Conservation Plan
- North American Bird Conservation Initiative
- Ducks Unlimited- 10-year strategic plan for the South Platte River
- South Platte Wetlands Focus Area Strategic Plan
- Partners in Flight
- State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado (Colorado Parks and Wildlife 2015)
- Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint September 2001 (TNC, Neeley et al. 2002)
- The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment
- The Platte River Recovery Implementation Program Biological Opinion
- The Platte River Recovery Implementation Program Final Environmental Impact Statement

Republican River Ecosystem Focus Area



The Republican River Basin consists of short grass prairie, sand sagebrush prairie, and three river drainages: the North and South Forks of the Republican River and the Arikaree River. This geographical area consists of portions of Washington, Yuma, Lincoln, Logan, Sedgwick, Phillips, and Kit Carson counties. The average rainfall varies from 15-20 inches across the landscape. Land use is primarily ranching, hay production, dryland, and irrigated farming.

PFW has been delivering projects within this watershed and with local partner support will move forward in designating this watershed as a focus area within

Republican River basin livestock management project. Photo by Greg Stoebner USFWS.

American avocets on PFW program-restored wetland in northeast Colorado. Photo by Greg Stoebner, USFWS.

our program for this planning timeframe. The biological goals established for this focus area emphasize restoring or improving existing riparian condition (with an emphasis on woody invasive control), playa restoration/ enhancement, rangeland management that improves grassland structure and diversity, and encouraging land management that reduces fragmentation impacts, i.e. incorporating expired Conservation Reserve Program acres into grazing lands. The partnership goals entail engaging individual landowners and partners in assessing their specific goals, finding opportunities to directly meet common goals, and developing plans that utilize habitat restoration and program assets as a tool to meet these goals.

Lack of native vegetative species composition within riparian corridors is also a growing trend attributed to water management, grazing regimes, and invasive species encroachment. The desired biological outcome is to restore hydrology and riparian system function where practical and to promote a diversity of native plant species and plant structure within the riparian corridor and associated uplands for federal trust and local wildlife species of the service and its partners.

Playas are ephemeral lakes located on clay soils away from stream channels that have their own distinct watershed. Playas may be dry for multiple years, but most playas experience wet-dry cycles seasonally. Plant communities are adapted to this type of environment and change accordingly, which in turn influences faunal diversity. More than 340 species of plants have been identified in playas (Haukos and Smith 2003). Playas provide cover and native forage (seeds and invertebrates) important to the survival of waterfowl and other migrating and wetland dependent birds. Playas are a primary source of recharge for the Ogallala Aquifer (PLJV 2016).

The impacts that threaten these basins include: altered hydrology (pitting), upland erosion and subsequent sedimentation, overgrazing, pesticide and fertilizer runoff. Playa basins pose a unique restoration challenge as most basins are on private land; landowner awareness and perceptions, as well as land use needs have to be addressed.

Restoration practices that are often implemented include managing livestock use via exclusion or establishment of a grazing system (fencing, alternate water source development, and management), restoring hydrological function via filling livestock watering pits within the basin, and reestablishment of native vegetation both within the basin and adjacent uplands.

Desired biological outcomes for playa restoration include reduced basin sedimentation, improved aquafer recharge, wetland function, improved plant structure/ diversity,

and increased food production (seeds, macroinvertebrates, and amphibians). Key federal and state species in this focus area include a variety of waterfowl, shorebirds, greater prairie-chicken, northern leopard frog, and common garter snake.

There are approximately 1,400 playas in Logan, Morgan, Phillips, Sedgwick and Weld counties. The average number of playas that have pits is approximately 10%. Identified conservation threats and challenges include the spread of invasive noxious weeds (woody and herbaceous), fragmentation due to oil and gas drilling, conversion to cropland, increased demand for water and lowering of Oglala aquifer, overgrazing, drought and inflation of land/commodity prices. Precise impacts of climate change, here as elsewhere, are largely unknown but by restoring resiliency and resistance to habitat potential impacts will be mitigated to some degree. Increased habitat connectivity through riparian restorations in concert with availability through wetland and upland projects will help provide the flexibility needed to adjust to a changing climate.

Goals for both focus areas are based off of a previous five year average, potential internal and external future funding, and projected landowner interest.

Republican River Ecosystem Focus Area Priorities Species

- Mallard
- Northern pintail
- Mountain plover
- Greater prairie-chicken
- American avocet
- Wilson's phalarope
- Greater sandhill crane
- Long-billed curlew
- Loggerhead shrike
- Short-eared owl
- Grasshopper sparrow
- Lark bunting

Waterfowl on restored South Platte River wetland. Photo by Greg Stoebner, USFWS.

Republican River Ecosystem Focus Area Habitat Targets

- Upland Restoration / Enhancement: 4,000 acres
- Wetland Restoration / Enhancement: 100 acres
- Riparian / Stream Restoration / Enhancement: 7 miles

Republican River Ecosystem Focus Area Partnership Target

- Private Landowner Agreements: 20
- Partnerships: 180
- Technical Assistance: 300 staff days
- Percentage Leveraging (Ratio Service to Partner): 1:2

Republican River Ecosystem Focus Areas Plans

- North American Waterfowl Management Plan
- United States Shorebird Conservation Plan
- North American Waterbird Conservation Plan
- North American Bird Conservation Initiative
- Ducks Unlimited 10-year strategic plan for the South Platte River
- South Platte Wetlands Focus Area Strategic Plan
- Partners in Flight
- State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado (Colorado Parks and Wildlife 2015)
- Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint September 2001 (TNC, Neeley et al. 2002)
- The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment
- The Platte River Recovery Implementation Program Biological Opinion
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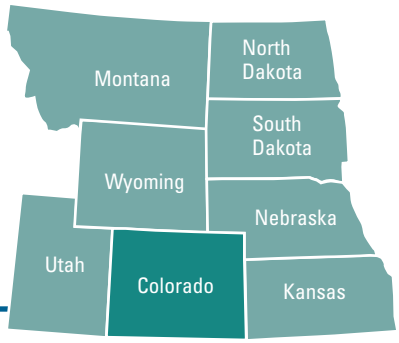
Colorado Statewide Goals



Partnerships

The tenets of the PFW program are based on the establishment of partnerships and collaborative efforts to restore habitat and benefit species. It also is based on the ability to be nimble and responsive to developing opportunities.

Within the South Platte and Arkansas River headwater areas, partnership development and work within the local wetland focus areas is the primary effort. Each area has a working group and they are developing their strategic plans and identifying or summarizing project efforts. The PFW effort will be to assist in these efforts and identify major ecological systems, species, and willing landowners to work with. One example of this is the Badger Creek Headwaters effort. Its watershed covers 96 square miles of South Park and has seen a 64% loss of wetland function due to land use stressors, primarily livestock grazing. There has been significant work done to assess this watershed. A local partnership of state, federal, non-profit, and private stakeholders has been working to address this area's restoration. This restoration has been outlined for each of the tributaries in this watershed and addressing stressors such as sediment, alterations to stream morphology, and grazing practices. This is a great opportunity for CO PFW to engage and restore wetland function on private lands within this watershed as part of the collaborative. Additionally, Park County is developing their strategic master plan and has identified and allocated funding to improve riparian habitat condition, and to assist agricultural producers to link water resources to the landscape. Many other examples exist across the state, including a multi-organizational project in sagebrush habitat, a landowner-driven project with the Three Rivers Alliance in the Republican River watershed, to significant community-based conservation efforts in the San Luis Valley.

Multiple partnerships continue to drive program success. Photo by Greg Stoebner, USFWS.

Looking for invertebrates in a spawning inlet channel for Colorado River cutthroat trout restored by CO PFW. Photo by Corey Kanuckel, USFWS.

Other partnership endeavors involve continued efforts to assist rural communities striving to diversify operations, explore ecotourism, and benefit from land stewardship efforts. These efforts historically, have included sponsoring or assisting in organizing community workshops, youth events, or collaborative restoration efforts. In addition, this PFW focus area has worked to engage youth in restoration efforts and will continue to engage Americorp members and other community based youth groups. The goal is to establish an appreciation of wildlife, habitats, restoration and to develop a stewardship ethic.

Using the national guidance formula or calculating expected partnerships over the life of this 5 year Strategic Plan the CO PFW program anticipates a minimum of 1,456 partnerships over the life of the 2017–2021 Colorado Strategic Plan.

Improve Information Sharing and Communication

The overarching CO PFW objective for this goal is to implement the major tenants of Strategic Habitat Conservation through strengthening existing lines of communication and the establishment of new feedback loops and information exchange.

Internal Communication

- Continue to invite other Service divisions and operational functions to attend and participate in annual PFW staff meetings to foster cross-program cooperation and information exchange.
- Maintain regular communications (at least bi-monthly) with Ecological Services Field Supervisor and National Wildlife Refuge System Zone Supervisor.
- State Coordinator will coordinate on a regular basis with RW, ES, and FWCO Project Leaders in Colorado and with those in surrounding States as needed.
- Coordination and communication with all Landscape Conservation Cooperatives applicable to Colorado issues will be maintained and improved.
- Field trips for Headquarters and Regional office program managers will be arranged by the PFW State Coordinator at least once each fiscal year to view projects and meet cooperators.

External Communication

- Maintain, and if possible, improve the Colorado PFW program's long-standing partnership with the CPW. We will continue to seek to expand habitat types and species which can be addressed with CPW funds.

Colorado Parks and Wildlife surveying for Rio Grande suckers on CO PFW Project. USFWS Photo.

- Seek out new funding partner to increase the programs financial stability.
- Continue bi-monthly meetings with the USDA NRCS State Conservationist and CDOW Private Lands Coordinator.
- State Coordinator will establish and maintain communications with Colorado Congressional Offices and staff. Field trips to meet landowners and visit projects will be arranged as appropriate. Field biologist will be encouraged to establish communications with Colorado Congressional Staff responsible for each Focus Area.
- Maintain Colorado PFW staff presence in the two NRCS offices (Sterling and Colorado Springs) currently providing office space. This arrangement has resulted in net habitat gains and productivity for both agencies.
- Community Based Partnerships: Many rural communities or groups strive to sustain their family operations, community viability, and to provide opportunity to their youth. The techniques related to this approach are largely opportunistic and strive to mesh the goals of the community or landowners with those of the program. The end goal is the building of community trust in the program, a means for the community to interact effectively with the Service, and to approach habitat restoration on a landscape and temporal scale.
  - o Specific examples of implementation include; participation in Wetland Focus Area Committees, landowner organizations (i.e. Three Rivers Alliance) and local Sage Grouse Working Groups
- Maintain and expand PFW assistance and collaboration with organizations pursuing North American Wetland Conservation Act and other grant programs.
- Invite state, NGO, local cooperators, and landowners on field trips arranged by the PFW State Coordinator at least once each fiscal year to view projects and meet cooperators.
- Colorado PFW staff will participate in local workshops/meetings as needed to increase landowner interest in habitat restoration.

Enhance Our Workforce

- All PFW staff will be given the opportunity to acquire a minimum of 40 hours of training each year.
  - o This may include classes, conference/workshop attendance, and informational visits to other programs (Service, State, NGO).
  - o Training will be targeted to accomplish two primary functions: 1) improve program operations, and 2) improve career opportunity options for staff.
- Staff will be encouraged to take advantage of all Service training opportunities at NCTC and elsewhere as well as attendance at conferences and workshops.
- The PFW program would benefit from an entry level Biological Technician position to assist in project management and evaluation. This position would provide a career ladder within the PFW program.
- In accordance with the Employee Performance Appraisal System, performance awards will be given and special achievement awards will be used to recognize specific notable staff efforts.

Increase Accountability

- Projects will be entered into HabITS as soon as the Private Landowner Agreement, Grant Agreement, Co-op Agreement, or similar instrument has been fully executed.
- The PFW State Coordinator will ensure HabITS data entry for accuracy and timeliness.
- The Monitoring and Evaluation Plan developed for the CO PFW program will be implemented.
- Projects will be closed out within the Service's financial system as soon as possible once the project is completed, inspected and invoiced.
- Before and after project photos will be uploaded into the HabITS database.

Monitoring Plan

Background

Since 1989 the CO PFW program has been delivering habitat restoration projects across the State. Colorado's elevation diversity results in a wide variety of ecosystems and attendant Federal Trust Species. Therefore, CO PFW projects range from prairie wetlands to boreal toad habitat to sage steppe restorations. Nearly all projects are in partnership with CPW along with a wide variety of Federal, State, and NGO partners. All these wide ranging efforts have been conceived, designed, and implemented with the use of the best science available to our field biologists. Close cooperation between the Colorado PFW program and research conducted by and for CPW and has provided an adaptive management feedback loop as prescribed by the Strategic Habitat Conservation model. This partnership and communication as well as the on-going research by others, form the foundation for CO PFW project selection and design. Several CO PFW projects have intensive monitoring by our partners completed or on going. These tend to be the more complicated and involved efforts such as stream restoration and watershed level invasive tree removal. These collaborations, while productive can always be improved upon. Therefore, a key point for monitoring efforts is to better utilize existing studies and data applicable to our habitat and species work. At every opportunity, we will continue to work with our conservation partners in a team approach to conduct project monitoring and will share available data with each other. This monitoring plan will assist in these on-going efforts to improve our selection, design, and therefore also improve the biological response of our projects.

Level I Monitoring: Verification

Level I Monitoring will be the collection of basic information required to determine if the scope was completed and close-out the financial assistance award. Level I monitoring will ensure that the on-the-ground habitat restoration practices that were identified within the Landowner Agreement were properly completed and are functioning as described in the Exhibit A. A site visit will be conducted at the time of project completion. Photo points for use in future Level II monitoring will be established at the time of Level I monitoring is completed. Level I monitoring will be conducted by the Service's private lands biologist in coordination with the landowner and, as appropriate, with other project partners. The Site Visit Report form developed by the R6 PFW program (Attachment 1) will meet the requirements for Level I monitoring as well as serve as the close-out report for the financial assistance award in PRISM.

Monitoring Level II: Project Habitat Outcomes

The goal of Level II monitoring is to determine if implementing the actions described within Exhibit A achieved the expected habitat response. Level II–accomplishment level biological monitoring will be completed during the initial compliance monitoring and repeated on or about years 3 and 7 post project completion. During the site visits the project will be evaluated to determine if the vegetative composition and, when possible, the fish and wildlife use of the project is meeting anticipated goals. Photos will be taken from photo point(s) to document changes in project vegetation and other visible attributes. Factors such as the presence/absence of hydrophytes and hydrology for wetland projects, native grass and forbs for upland projects, and evidence of agreed upon grazing management will be recorded. The Colorado PFW Level II Accomplishment Monitoring form (Attachment 2) will be filled out, filed and recorded in appropriate data bases. The information will be shared with project specific cooperators and our programmatic partners.

At this time it is anticipated that all CO PFW projects going forward will be monitored at Level II per the schedule. Should that work load be determined to be impacting project delivery, projects for Level II

Survey for native fishes after invasive tree removal project. Photo by Greg Stoebner, USFWS.

monitoring will then be selected through use of a habitat/species priority ranking matrix to prioritize monitoring of projects by type and Service's investment. For example, in northwestern Colorado, projects targeting Colorado River cutthroat trout or sagebrush habitat restoration would receive a higher priority for monitoring efforts.

Summary of Information to be Collected for Level II

- Check to see if any changes in land ownership or that of any managing employees (when applicable) has occurred. Many counties have ownership records on-line.
- Perform site visits on or about years 3 and 7.
- Compare the project description and purpose within the Exhibit A against actual site conditions to see if the project is meeting its anticipated goals for habitat type and wildlife use, document any unexpected outcomes or use.
- Use the photo points established for Level I to document general project changes, including the plant community.
- Does the vegetation/habitat present support the project goal as presented in Exhibit A?
- Document presence of target species if possible including evidence of use. (CO PFW will experiment in the use of game cameras with willing landowners.)
- Recognize that our partners may also be monitoring the project(s) and therefore specific time frames need to be flexible. i.e., NRCS doing the stream survey and modeling or CPW/TU fish biologists monitoring the native fish populations on their agencies timeframes and NRCS monitoring of SGI projects.
- Utilize competent/willing landowners and simple methodologies to provide reliable data.
- Make a note that if appropriate, the findings can be extrapolated to nearby projects of the same type.

Monitoring Level III: Landscape Scale Biological Outcomes

At this time the CO PFW team does not have the internal resources or staff capacity to conduct Level II monitoring to determine biological outcomes at the landscape scale. However, several of our project partners have initiated monitoring protocols for specific projects that will yield estimates of biological outcomes and those results will be uploaded into HabITS. Also, the CPW Wetlands Program is developing a monitoring protocol for projects it has funded. It is currently being developed in-house and then will be vetted past major partners. CO PFW will assist in plan development and implementation and the resulting data will be made available for our use. As several of CO PFW focal species/habitats are of significant importance to the Service and its partners, major efforts are now being developed and implemented which will generate landscape scale information we can use. Prominent examples

Table 1. Level II Monitoring Information

Habitat Target	Key Habitat Attributes (Presence or Absence)	Federal Trust Species (Presence or Absence Only)
Wetland Restoration/Enhancement	Hydrology (Y/N) Hydrophytes (Y/N) Mudflats (Y/N)	Shorebirds, T&E Species, Migratory Waterbirds, Amphibians (Y/N)
Native Grass Restoration/Enhancement	Perennial Cover (Y/N) Native Grass Species (Y/N) Native Forb Species (Y/N) Milkweed (Y/N)	Grassland Songbirds (Y/N) Shorebirds (Y/N) T&E Species (Y/N) Monarch Butterfly (Y/N)
Sage Steppe Restoration/Enhancement	Native Grass Species (Y/N) Native Forb Species (Y/N) Invasive trees (Y/N)	Greater sage-grouse Sage sparrow, sage thrasher (Y/N)
Stream Restoration/Enhancement	Installed Features Stable (Y/N) Channel Morphology within design Goals (Y/N)	Native fishes Riparian dependent species Desired Aquatic Invertebrates (Y/N)
Riparian Enhancement	Native Grass Species (Y/N) Wetland Plants (Y/N) Native Understory Shrubs (Y/N) Native Trees (Y/N)	Native Riparian Avian species, Amphibians Utilizing the Project (Y/N)

include greater and Gunnison's sage-grouse, lesser prairie-chicken, southwestern willow flycatcher, and native salmonids. We will utilize data from these efforts as they become available to feed back into the CO PFW program. Further, organizations such as joint ventures, major conservation non-profits and universities have programs and efforts that can assist with our information needs. All other opportunities to add Level III monitoring to projects through our conservation partners will be explored.

Attachment 1

CO PFW Level I Monitoring Form

SITE VISIT REPORT

Landowner Agreement #_____

Prism FA Award # _____

Final or Interim
Select One

Scope of Work
(Describe the restoration activities ex. fence and/or livestock watering facilities were installed to facilitate proper grazing management, grassland enhancement and migratory bird conservation).

Project Status
(To be used for an interim report ie…what's been done up to the 1 year mark)
(Example Language)-About 2 paragraphs

Species Benefited
_____. (You can reference conservation plans as/if you deem necessary)

Optional/ Literature Cited: (Example)

U.S. Fish and Wildlife Service [USFWS]. 2012. Partners for Fish and Wildlife Program Mountain-Prairie Strategic Plan, 2012–2016. U.S. Fish and Wildlife Service, Lakewood, Colorado.

Payment Method
Describe selection of the payment method (Ex. SF-270, this is a private landowner who chose to be waived from the ASAP system)

As the PFW biologist managing this project I certify that Landowner Agreement # ____(project type ex. Wetland enhancement) has been completed (or for interim…is in the process of being completed) in accordance with all provisions of the agreement.

_____ _____
PFW Biologist Date

_____ _____
Landowner / Cooperator Date

Attachment 2

CO PFW Level II

Accomplishment Monitoring Form

To be completed prior to Monitoring Accomplishment

Agreement Date: _____ Date Work Completed: _____

LA Number: _____ County: _____

Accomplishment Type: Upland _____ Wetland _____ Riparian _____

Primary Trust Resources: _____

Accomplishment Objectives: Acres: _____ Miles _____

_____

_____

_____

_____

_____

Photo Point Coordinates (UTM) Minimum of one photo point

Photo Point # _____ UTM: _____

Photo Point # _____ UTM: _____

Photo Point # _____ UTM: _____

Photo Point # _____ UTM: _____

Photo Point # _____ UTM: _____

Current condition of project, habitat, and any general observations (related to Exhibit A)

_____

_____

_____

_____

_____

_____

_____

Factors that influence current condition: (i.e. climate, grazing, time since fire or other disturbances)

Invasive Species Comments:

Landowner/Manager Comments – If possible –: (are their objectives being met?)

Are accomplishment objectives being met: Yes_____ No_____

General comments regarding the project, and/or larger landscape:

Colorado PFW Monitoring Guidelines

- Bring a copy of the LA and any previous monitoring info for the site(s)

- Timing of Monitoring
  - To the greatest extent possible schedule monitoring to coincide with the projects purpose – if applicable (i.e. waterbird nesting habitat should be visited in the spring)
    - Attempt to monitor same time of year (i.e. Fall, Spring)

- Minimum of one photo point
  - Photo point establishment will follow the guidance provided by USDA publications concerning:
    - General selection criteria
    - Photo point marking
    - Reference point
    - GPS
    - Image management

- Standardized photo name
  (LA Number-Year-Month-Day-Photo Point #, Compass Direction)

- Monitoring Veg Response:
  - Ocular estimate of veg condition related to LA objectives to (height, density, species comp)

- Accomplishment objectives being met?
  - Concerns
  - Observations
  - Recommendations
  - Future Project Needs

- Use Google Earth or other timeline satellite photography if a site visit is not possible

- Determine if land ownership remains the same

- As an option: with owner/manager permission, place a game camera for longer term record of use/activity

- If time allows, utilize appropriate species or habitat specific monitoring. Examples may include: pellet surveys, fish sampling, line/point transects, etc.

- Be aware of and seek out data from monitoring efforts that have been performed by our partners

Attachment 3

Known current research and monitoring efforts that may fit the Level II and Level III information needs

CPW is quantifying grouse response to P/J treatments that will eventually be published

CPW has completed a number of published studies for GSG in the NW over the years

CPW will be using Sage Grouse Habitat Assessment Framework (HAF) on State Wildlife Areas

CPW is doing a GSG pellet survey on P/J treatments

TU and CPW are doing intensive monitoring of our native fish projects in the NW

CPW is monitoring PFW developed native fish projects in the SLV/SW

CPW is releasing and monitoring boreal toads on PFW project(s)

WRP assessments are being conducted by private contractor (Wetland Dynamics, LLC) in SLV for NRCS, many are also PFW projects

Dolores River Partnership/TC/TNC are budgeting for monitoring of all tamarisk/riparian projects – RMBO may be looking at bird response (point counts, etc) on tamarisk treated riparian areas

CSU, Learning from the Land Project, is currently monitoring PFW and other sage steppe project sites in the NW

NRCS SGI Science efforts: http://www.sagegrouseinitiative.com/our-work/science-policy/

NRCS line/point veg transect on SGI funded projects for both sage-grouse species

NRCS LPCI Science efforts: http://lpcinitiative.org/our-work/science-research/

Ducks Unlimited is monitoring many wetland projects throughout CO, and is currently working with CPW to further define that effort

Aquatic ecosystem monitoring program (USGS)

Bark Beetle Cooperative (CO)

BLM Eco-regional Assessments

Climate Change Initiative (WY/USGS)

Climate Change Scorecard (FS)

CO River basin study (TNC)

Ecological Restoration Institute - Northern Arizona University

Colorado Forest Restoration Institute - Colorado State University

NM Forest and Watershed Restoration Institute – NM Highlands University

Eco-regional assessments (TNC)

Endangered Fish Recovery Programs

Upper Colorado

San Juan

Intermountain West Joint Venture

Intermountain West Climate Change (Rocky Mountain Research Station – Forest Service)

Invasive species strategic plan (BLM)

Invasive spp. Program (CO)

Inventory and monitoring partnerships (NPS)

National fish habitat assessments

Western Native Trout Initiative (WNTI)

Native plant seeds program (BLM)

NatureServe programs

NIDIS (national integrated drought information system)

NRCS Sage-Grouse Initiative

Partners in Amphibian and Reptile Conservation (Southwest PARC)

Southwest climate change initiative (TNC, feds, universities)

State Natural Heritage Programs

Upper Colorado River Basin Watershed Assessment

Western Association of Fish and Wildlife Agencies

WGA climate adaptation

WGA pilot project – modeling (wildlife)

Wildlife protection program (CO)

Landscape Conservation Cooperative Funded Science

Great Plains LCC – http://www.greatplainslcc.org/science/

Great Northern LCC – http://greatnorthernlcc.org/supported-science

Southern Rockies LCC – http://southernrockieslcc.org/products/science-projects/

Current WSFR Funded Projects in Colorado that Relate to CO PFW Focus Areas and Goals

GIS Habitat Information (F13AF00558/FW-31-P-27)

Threatened & Endangered Plant Database Development in Colorado

Monitor and Improve Water Quality

Colorado Wildlife Action Plan Enhancements

Wetlands Conservation

Sage-Grouse Research

Conservation of Native Reptiles

CO Habitat Water Quality Studies

Landscape-scale habitat restoration project in the Northwest Focus Area of Colorado. USFWS Photo.